Taiwan in RCEP's Regional Supply Chain

Chin-Ming Lin

Tamkang University

June 2017

For the past decades, Taiwan has been specializing in certain specific products, especially in parts and components, which are amazingly dominating the world markets. For example, Taiwan Semiconductor Manufacturing Company (TSMC), also known as Taiwan Semiconductor, is the world's largest dedicated independent (pure-play) semiconductor foundry. Diptronics Manufacturing, Inc. has produced switches which accounts for nearly 50% of notebook market globally. Hence, Taiwan has been a key player in global value chain (GSC).

However, for decades Taiwan's terms of trade have been deteriorating increasingly with its ambitious market penetrating strategies (see below). And, as its economy is more and more relying on world market, it is getting harder and harder to avoid being severely affected by ups and downs in the major markets. Furthermore, with growing trends in negotiating regional or bilateral free trade agreements around the world, which could be regarded as consolidating or rearranging the GVC in various regions, Taiwan is now facing a serious problem in retaining in the GVC and continuing developing its industries based on part and component production since it has been generally excluded from nearly every trade negotiation.

In this paper, the Regional Comprehensive Economic Cooperation, RCEP) initiated in ASEAN plus Three, later to ASEAN Plus Six, is used as a starting point to pinpoint its effects on Taiwan's status in GVC and hence its industrial development. Since Taiwan is especially intensive in network trades, which involve trade in those products crucial in global or regional production networks, it is encountering a prominent challenge of losing its competitiveness by the danger of displacement by other Asia- Pacific economies.

The paper is also arguing why deteriorating terms of trade in Taiwan is significantly related to deteriorating qualities of its exporting products to major market. This will further lower its competitiveness and, therefore, its prospect in industrial development.

From AEC to RCEP

We first examine the expected effects of the forthcoming RCEP which could be regarded as an extension of or as triggered by ASEAN Economic Community (AEC). Characteristics and elements of the AEC are:

- a single market and production base;
- a highly competitive economic region;

- a region of equitable economic development;
- a region fully integrated into the global economy.

Therefore, AEC as a single market for goods and services will facilitate the development of production networks in the region and enhance ASEAN's capacity to serve as a global production center and as part of the global supply chain.

AEC has two approaches in integrating with the global economy: i) a coherent approach toward external economic relations through free trade agreements (FTAs) and closer economic partnerships (CEPs), and ii) enhanced participation in global supply networks.¹

It can, therefore, be inferred that RCEP is partly the result of sustained efforts by ASEAN to promote regional economic integration. Relatively speaking, the agreement will be confined mainly to market access and connectivity issues— reflecting the region's focus on **production chains** rather than "behind-the-border" rules targeted by the Trans-Pacific Partnership (TPP) agreement. RCEP represents an **intermediate destination** for AEC which will be proved, in time, to be a scheme for ASEAN to form a more competitive and integrated market and production base.

The benefits of RCEP are estimated to be large. A CGE simulation has estimated that its income gains could reach 0.6% of world GDP in 2025 or US\$644.4 billion which are larger than gains from TPP (0.2% of GDP), due largely to the effects of trade liberalization among China, India, Japan and Korea. Much of the benefits of integration accrue to economies with the highest initial barriers such as Vietnam, Laos and Cambodia.

Vast majority of benefits would reflect trade-creation and productivity increases within it, rather than trade diversion from outsiders. Trade diversion losses mainly occur in **Taiwan** (a **loss of income of \$16.1 billion, 1.9% of GDP**, more than half of the total loss of income) while some other economies would represent about 5% of the total benefits of gainers (see table 1).

	GDP (Billions of US de	Income gains ollars, 2007 prices)	Percentage changes
Americas	24,867	2.5	0.0
Canada	1,978	-0.1	0.0
Chile	292	0.0	0.0
Mexico	2,004	2.8	0.1
Peru	320	0.0	0.0
United States	20,223	-0.1	0.0
Asia	34,901	627.0	1.8
Brunei	20	1.2	5.8

Table 1 Income Gains from RCEP (2025 estimates)

¹ ASEAN, ASEAN Economic Community Blueprint (Jakarta: ASEAN Secretariat, 2008).

	249.7	1.4
406	46.8	11.5
5,233	91.3	1.7
1,549	17.7	1.1
5,338	95.8	1.8
2,117	82.0	3.9
431	14.2	3.3
322	7.6	2.3
415	2.4	0.6
840	-16.1	-1.9
558	15.5	2.8
340	17.3	5.1
83	1.6	1.9
1,634	21.7	1.3
1,433	19.8	1.4
201	1.9	0.9
41,820	-6.8	0.0
22,714	5.1	0.0
2,865	-5.3	-0.2
16,241	-6.6	0.0
33,045	155.1	0.5
35,290	617.9	1.9
58,951	553.0	0.9
	1,549 5,338 2,117 431 322 415 840 558 340 83 1,634 1,433 201 41,820 22,714 2,865 16,241 33,045 35,290	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

Source: Peter A. Petri and Ali Abdul-Raheem, "Can RCEP and the TPP Be Path Ways to FTAAP?" Chapter 2 in PECC, *State of the Region, 2014-2015* (2014).

Production Networks and Regional versus Global Economic Integration

Conventional trade flow analysis such as the above-mentioned CGE estimate can yield an unbiased picture of regional economic integration only if *component trade* and *final goods trade* follow the same geographic patterns. However, there is a notable asymmetry in the degree of regional trade integration in East Asia where there has been a rapid increase in *intra-regional imports* while the expansion in *intra-regional exports* has been consistently slower. 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. The asymmetry between intra-regional shares of imports and exports is much sharper when components are netted out, 36.9% versus 63% (see Table 2). So, what is the implication here?

Table 2Intra-regional shares of manufacturing trade: Total, parts and components, andfinal good trade, 1992-93 and 2007-08 (percent)

East Asia	Developing East Asia	ASEAN	NAFTA	EU 15
	2			

		(DEA)			
(a) Total trade					
Exports					
1992-93	47.2	38.2	20.7	44.4	61.2
2007-08	<u>43.9</u>	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
<u>Trade</u>					
(exports+imports)					
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					
Exports					
1992-93	46.0	36.8	16.1	44.7	60.9
2007-08	<u>36.9</u>	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
<u>Trade</u>					
(exports+imports)					
1992-93	50.3	35.7	14.3	39.4	63.3
2007-08	44.2	34.1	18.1	37.4	57.3

Source: Prem-chandra Athukorala, "Production Networks and Trade Patterns in East Asia: Regionalization or Globalization?" ADB Working Paper Series on Regional Economic Integration No. 56 (August 2010).

There is an increasing trend in *international production fragmentation*—the rise of **global value chains** (GVCs) fueled by continuing removal of various obstacles that had been restraining the extent to which the production of a good could be unbundled internationally. **International production networks** have largely evolved in three regions—North America, East Asia, and Europe. GVCs is in part related to the importance of *proximity* and the "**regionality**" of supply chains is intrinsically related to certain *agreements and/or arrangements* that occur across countries

Consequently, trade in parts and components and final assembly within production networks— "network trade", has generally grown faster than total world trade in manufacturing. Therefore, new pattern of trade needs a new way of analysis, especially concerning competitiveness. The combined share of East Asian countries in world non-oil exports recorded a three-fold increase, from 11% to 30.7%, between 1969-1970 and 2007-2008 (see Table 3). Thus, there is no indication of China "crowding out" its neighbors—China's market share gains have been at the expense of that of the rest of the world, not from the rest of Asia (well, perhaps Taiwan is the exception).

	Total (non-oil) trad	de (%)	Manuf	acturing tra	de (%)
	1969/70	1989/90	2007/8	1969/70	1989/90	2007/8
<u>Exports</u>						
East Asia	11.0	23.8	30.7	12.0	26.7	34.8
Japan	5.3	10.4	4.6	8.9	12.7	7.4
Developing East Asia	4.7	13.4	24.4	3.1	14.0	27.4
China	0.8	2.9	12.7	0.5	3.0	14.9
Hong Kong	0.9	1.7	0.6	1.3	2.0	0.6
South Korea	0.3	2.2	3.0	0.3	2.6	3.5
Taiwan	0.6	2.7	2.0	0.6	3.1	2.4
ASEAN	2.1	3.7	6.0	0.3	3.3	5.8

Table 3 East Asia in World Trade (%)

Source: Prema-chandra Athukorala and Archanun Kohpaiboon, "Intra-Regional Trade in East Asia: The Decoupling Fallacy, Crisis, and Policy Challenges," ADBI Working Paper No. 177 (December 2009).

From about the early 1990s the emergence of China as the "global factory" of electronic and electrical goods assembly based on parts and components imported from other countries has contributed to rapid expansion of production networks in the region. World network trade increased from US\$ 1,207 billion (about 23.8% of total manufacturing exports) in 1992-93 to US\$ 4,850 billion (45.7%) in 2006-2008, accounting for nearly *two-thirds* of the total increment in world manufacturing exports during this period (see Table 4).

Table 4	Share of Network Products in Manufacturing Exports, 1992-93 and 2006-08
	(percent)

		Network Products								
	Parts and components		Final As	ssembly	То	tal	and components ir network			
							Proc	lucts		
	1992-3	2007-8	1992-3	2007-8	1992-3	2007-8	1992-3	2007-8		
East Asia	29.6	42.8	34.1	37.5	32.2	40.3	39.0	56.5		
Japan	15.2	9.1	20.8	9.9	18.4	9.5	35.0	51.3		

Developing East Asia	14.4	33.7	13.3	27.6	13.8	30.9	44.3	58.1
China	1.7	13.5	2.4	15.7	2.1	14.5	35.0	49.4
Hong Kong	1.5	0.8	1.2	0.5	1.3	0.7	46.8	65.2
South Korea	3.7	4.0	2.0	2.2	2.7	3.2	58.4	67.2
Taiwan	2.2	5.6	2.0	3.7	2.1	4.7	45.0	63.5
ASEAN	5.2	9.8	5.8	5.5	5.6	7.8	39.9	66.9

Source: Prem-chandra Athukorala, "Production Networks and Trade Patterns in East Asia: Regionalization or Globalization?"

In all Asian countries, except the PRC and Thailand, components accounted for *well* over half of total network exports (and imports) by 2007-2008. In 2007-2008, exports within production networks accounted for 65.7% of total manufacturing trade in Taiwan (up from 42.3% in the early 1990s), which is much higher than the world average of 51% (Table 5).

		•						
Reporting country	EA	Japan	DEA	China	ASEAN	NAFTA	EU 15	World
Exports								
East Asia	47.6	32.9	50.1	51.6	54.5	25.1	24.1	34.1
Japan	42.0		42.0	41.5	47.9	31.5	30.4	34.4
Developing East Asia	48.1	33.4	53.9		65.2	22.7	21.6	34.0
China	36.2	25.2	40.6		49.1	17.1	16.3	25.6
South 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
ASEAN	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
EU 15	31.4	18.7	34.8	30.4	46.5	22.1	22.0	22.4
Imports								
East Asia	51.7	48.8	52.8	34.8	68.3	54.7	33.1	42.1
Japan	34.2		34.2	23.1	44.9	41.0	18.9	29.9
Developing East	55.5	47.7	59.5		74.3	40.3	31.7	44.2
Asia								
China	55.2	47.5	59.2		74.0	40.1	31.6	44.0
South 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
ASEAN	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
EU 15	25.0	33.6	22.8	14.9	37.9	34.1	22.1	23.4

Table 5 Share of Parts and Components in Bilateral Trade Flows, 2007/8 (percent)

Source: Prem-chandra Athukorala, "Production Networks and Trade Patterns in East Asia: Regionalization or Globalization?"

From the table we can see that *Components* account for a much larger share in Taiwan's trade with East Asian and ASEAN countries, with the exception of China, compared to its world trade and trade with the EU and NAFTA, which implies that Taiwan relies more on the rest of the world as *a market for final goods* than as a market for components.

Global Financial Crisis Reveals No Intra-regional Integration in Final Goods

A notable outcome of the rapid expansion of production networks has been the rapid growth of cross-border trade in parts and components within the region. However, there is *no evidence* of rapid intra-regional trade integration in final products (the decoupling thesis).

This inference is basically consistent with the behavior of trade flow following the onset of the global financial crisis. The remarkably synchronized nature of trade contraction across countries in the region is generally consistent with close trade ties among East Asian countries forged within regional production networks (see Table 6), regardless of the differences among these countries in the degree of export orientation, or the degree of dependence on the U.S., and other developed, market. These patterns suggest that the drying up of trade credit and traders' overreaction to a possible collapse in demand would have played a role in the total decline in trade.

	2007	2007	2007	2007	2008	2008	2008	2008	2009	2009	2009	2009	2010	2010
	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2	q3	q4	q1	q2
Exports														
Hong Kong	8.4	11.1	7.8	8.6	11.0	8.2	6.0	-1.4	-20.9	-12.1	-13.5	-1.9	24.9	24.6
China	27.3	27.6	26.4	25.8	24.6	22.4	19.1	17.6	3.5	-22.2	-18.0	-16.1	-2.3	35.5
South Korea	16.4	14.8	11.4	19.4	19.2	22.4	20.7	-14.2	-32.3	-27.6	-22.3	8.9	37.2	35.7
Taiwan	8.6	6.8	9.7	15.2	16.9	18.2	7.5	-25.1	-37.5	-31.9	-20.5	10.7	32.4	34.3
Imports														
Hong Kong	8.7	12.1	8.9	11.3	12.3	9.9	7.6	-3.3	-21.1	-14.1	-9.7	3.2	32.9	31.9
China	19.1	18.0	19.6	20.3	24.0	30.6	22.4	18.7	2.4	-25.2	-15.8	-11.1	6.4	53.3
South Korea	14.0	15.2	7.0	26.1	30.0	31.2	43.2	-7.8	-32.6	-35.7	-30.8	0.6	36.6	44.3
Taiwan	2.3	7.3	9.0	13.1	25.9	18.0	19.1	-22.7	-47.8	-37.4	-28.7	18.1	78.9	54.3

Table 6Developing East Asia: Growth of total merchandise exports and imports,2007Q1-2010Q2 (year-on-year percent change)

Source: U.N. Comtrade.

The degree of export contraction suffered by Taiwan and South Korea has been much smaller compared with Japan whose exports to the developed countries are directly exposed to the global economic decline and exports of components of electronics and electric goods have been indirectly affected by a decline in final (assembled) exports from China,² but, on average, notably higher compared with the other East Asian countries. As in the case of japan, growing exports to China does not seem to have provided a cushion against collapse in world demand for these two countries. There is no evidence to suggest that the regional dynamic growth of East Asia has made its economies less susceptible to the world-wide trade contraction.

As expected, for East Asia and also for all individual countries, the rate of contraction in exports to the U.S. has been much sharper compared with exports to all other destinations. Exports to China too, however, have recorded a significant contraction, more than 10% in most cases.³ China's imports from Japan, South Korea and Taiwan have shrunk more rapidly than imports from other countries. This is not surprising, givern the dominant role played by the former countries in the supply of parts and components to ICT assembly activities in China, which are heavily exposed to contraction in import demand in the U.S. and other developed countries.

Krugman points to the vertical integration of global production as a possible explanation for the surprisingly large trade contraction in the crisis compared to the Great Depression.⁴ Vertical integration of production implies that a given degree of contraction in demand for a final (assembled) product has ramifications over trade flows from many other countries that are involved in the production chain. Given that global production sharing is much more important for trade expansion in East Asia compared to other countries, this explanation also seems relevant for East Asia's greater trade contraction compared to overall trade contraction at the global level.

A notable pattern observable for manufacturing exports is the relatively sharper contraction in the category of machinery exports (in which network trade is heavily contrated) compared to other product categories, in particular, traditional labor-intensive products such as textile and garments, footwear, and other miscellaneous manufactures.⁵ Exports belonging to the machinery and transport equipment category, in particular, ICT products and electronics are predominantly consumer durables and the demand for which is generally more susceptible to income contraction. In traditional labor-intensive products, developing country producers have the ability to perform better purely on the basis of cost competitiveness, even in a

² Kyoji Fukao and Tangjun Yuan, "Why Is Japan So Heavily Affected by the Global Economic Crisis? An Nalysis Based on the Asian International Input-Output Tables," VOX: CERP's Policy Portal, 8 June 2009 (http://voxeu.org/article/why-has-japan-been-so-hard-hit-global-crisis).

³ Prema-chandra Athukorala and Archanun Kohpaiboon, "Intra-Regional Trade in East Asia: The Decoupling Fallacy, Crisis, and Policy Challenges," ADBI Working Paper No. 177 (December 2009) (https://think-asia.org/bitstream/handle/11540/3765/2009.12.11.wp177.intra.regional.trade.east.asia.pdf ?sequence=1), Table 8.

⁴ Paul Krugman, *The Return of Depression Economics and the Crisis of 2008* (New York: W.W. Norton, 2009).

⁵ Prem-chandra Athukorala, "Production Networks and Trade Patterns in East Asia: Regionalization or Globalization?" Tables 12 and 13.

context of depressed demand.

In general, during crisis period, network trade was significantly affected while final goods, though high-end products were likely substituted by low-end products, were must less influenced. Growing trade in components has made the East Asian region increasingly reliant on extra-regional trade for its growth. The remarkably synchronized nature of trade contraction across countries in the region is generally consistent with close trade ties among East Asian countries forged within regional production networks.

Implications for Taiwan

Taiwan has been a main player in regional network trade but for the last decade its intra-regional exports has been consistently slower. Ups and downs of Taiwan's exports were clearly simultaneous with ups and downs in China's production mainly due to close links in supply chain across Taiwan Strait. The other noteworthy phenomenon is the continuing downturn of Taiwan's terms of trade, which has been declining from the peak of 182.80 at June of 1998 to the lowest point of 98.50 at February 2012, returning to 110.70 at January this year.⁶

Taiwan's unit-value-based quality ranking (Halak and Schott, 2011) has declined from 15 in 1989 to 22 (out of 43 countries) in 2003 (see Table 7)—its exclusion from major regional integration schemes will certainly cause its *terms of trade* to get worse further. East Asia in general, and Taiwan in particular, is really much more dependent on *extra-regional markets* than is revealed by the standard intra-regional trade ratios—the benefits of joining RCEP would simply be wiped out if global financial crisis happens.

			Rank							
						Normalized quality				
Country	1989	1993	1998	2003	change	1989	1993	1998	2003	change
Switzerland	1	2	2	4	-3	0.93	0.84	0.73	0.62	-0.31
Sweden	2	3	5	6	-4	0.83	0.75	0.65	0.55	-0.28
Germany	3	5	7	9	-6	0.77	0.66	0.54	0.41	-0.36
Finland	4	4	3	3	1	0.67	0.67	0.67	0.67	0.00
Italy	5	6	8	8	-3	0.66	0.59	0.51	0.42	-0.24
France	6	8	9	10	-4	0.63	0.54	0.44	0.34	-0.29
Japan	7	9	10	12	-5	0.57	0.47	0.33	0.20	-0.38
Taiwan	15	17	18	22	-7	0.24	0.15	0.03	-0.09	-0.33
South Korea	21	15	14	11	10	0.17	0.19	0.21	0.23	0.06
Singapore	27	14	4	2	25	-0.19	0.19	0.66	1.13	1.31
China	35	37	37	37	-2	-0.48	-0.48	-0.48	-0.48	0.00
Indonesia	37	33	28	23	14	-0.59	-0.45	-0.27	-0.09	0.50
Thailand	39	41	39	32	7	-0.68	-0.59	-0.48	-0.37	0.31
The Philippines	41	39	27	18	23	-0.74	-0.52	-0.24	-0.04	0.78
Malaysia	42	34	21	7	35	-0.83	-0.46	0.01	0.47	1.31

Table 7 Quality Ranking (All Manufacturing)

⁶ Trade statistics from Taiwan's Ministry of Public Finance.

* The number of countries evaluated is 43 $\,\circ\,$

Source: Juan Carlos Hallak and Peter K. Schott, "Estimating Cross-Country Differences in Product Quality," Quarterly Journal of Economics, 126(1) (2011), Table IV.

Taiwan's deep involvement in regional production networks also implies that Taiwan's industries are *complements* to other Asian economies rather than as competitors—Taiwan's exports will not be displaced as long as they complement other countries' exports. However, in view of drastic decline of Taiwan's terms of trade, it seems that Taiwan is trying very hard to avoid being displaced by other countries by continuously depressing export prices or product qualities relative to other exporters. Does this relate to her being excluded from regional free trade agreements recently, or being increasingly stuck in quagmire in market access?

Taiwan's competitiveness is also declining at the same time. The growth competitiveness index (GCI) of Taiwan published by the World Economic Forum (WEF) was ranked 5th in 2005 (one place lower than 2004) but has fallen to the 14th place in 2015. It is noteworthy that China's GCI has been raised from the 49th in 2005 to 28th in 2015, while Malaysia's ranking has being improved from 31 to 20, not the mention that Singapore's ranking has jumped from 6 to 2.⁷ Taiwan used to be an exemplified model for ASEAN countries, especially during the 1997-98 Asian financial crisis when countries in Southeast Asia, along with South Korea, had been seriously impacted while Taiwan got through the turmoil safely only with a small dent. Contradictorily, many ASEAN countries are now already admirable competitors as well as partners to Taiwan when they are ready, this year, to celebrate the 50th anniversary of ASEAN's establishment.

The ASEAN countries have also encountered export setback as Taiwan faced with a fall in trade values between 20% to 24%, but they are now quite confident in preparing to embrace the "ASEAN 2025 Blueprint" as a new milestone. The trend of protectionism induced by global economic stagnation and the deepening hostility toward globalization have hampered the endeavoring in regional integration as well as broken down GVC. Furthermore, growth of the area's enterprises has been lagging behind their international commitments, the new wave of global free trade negotiations has been endangered, and the progress of TPP has been stopped by Trump's winning in U.S. presidential election. All these have increased the pressure on RCEP's negotiations by ASEAN and other countries. The ASEAN chairing countries were further pressured by the troubles caused by several member countries in abiding by regulations current ASEAN as well as ASEAN plus one free trade agreements. The lacking of dispute settlement mechanisms in these agreements further worsens the situation.

To solve all those problems mentioned above, ASEAN needs to resort to the so-called ASEAN Way of consensus building and not sticking to regulations. Limitations on financial budget and human resources will also be a burden for completing trade

 ⁷ WEF, Global Competitiveness Report 2004/2005 (http://www.ieseinsight.com/casos/study_0035.pdf);
WEF, The Global Competitiveness Report 2014/2015

⁽http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2014-15.pdf).

negotiations for regional economies. Economic challenged faced by ASEAN countries such as increasing political and economic self-assertiveness in China, uncertainty and protectionism in Trump's administration, misgivings in the Brexit and instability in the EU, as well as the doubt in the possibility of resurgence of global financial crisis, all are testing the wisdom and leadership of ASEAN annual chairing countries such as the Philippines this year.