Revealed Comparative Advantage, International Production Chain and the Evolving ASEAN-China Trade Linkages

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Abstract

This paper reviews Chinese and ASEAN trade statistics to determine whether trade relations between the two regions are evolving to be competitive or complementary. The latest trend data and revealed comparative advantage indices show that China and ASEAN are experiencing growing bilateral trade while simultaneously competing in the production and export of major goods to similar trade destinations. The two regions, however, are becoming more engaged, highlighted by the increasing trade of intermediate goods and the slow but sure emergence of an integrated regional production and supply chain. As the ASEAN economies are diverse, dealing with the realities of an advancing ASEAN-China economic integration means each country enhances its competitive advantages, finds a niche in the regional production chain, and manages the competition with its neighbor. Strengthening the trade in parts and components is a way to improve trade complementarities between the regions.

Keywords: ASEAN; economic integration; comparative advantage; international production chain

JEL classification: F13, F14, F15

1. Introduction

Whether China is a strategic trade partner or competitor to the ASEAN economies has remained unclear five years since the implementation of the ASEAN-China Free Trade Area (ACFTA) in January 2010. The ASEAN economies and China are in a precarious position as both are experiencing growing bilateral trade while simultaneously competing in the production and export of major goods to similar trade destinations. Economic integration, to be fair, tends to heighten competition among industries with similar factor endowments, goods production and export market; but it also opens opportunities for production synergy and linkages to international production chain for industries with strong complementarities. Managing the competition and enhancing the complementarities are perhaps the better response in dealing with the realities of an advancing ASEAN-China economic integration.

Managing the competition as big as China, however, may prove difficult. Aslam (2012) notes that unlike the NAFTA and EU, the ACFTA is generally composed of developing countries which normally compete among themselves in international trade and foreign capital. Strong competition and the homogeneity in production and exports in the regions have led to real trade and investment diversion from ASEAN to China. Tong and Chong (2010) acknowledge the risk of trade diversion and related structural adjustments, but optimistically assess that over time, individual ASEAN economies will develop their own niches in their economic relations with China. Meanwhile, Jiang and Cai (2013) recommend that China pursues its own structural adjustment by gradually phasing out backward, high-polluting and resource-based industries that compete with ASEAN. The authors advise

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China to improve cooperation by considering the resource characteristics, economic structure and technological level of the ASEAN region.

Other researches reveal more upbeat assessments with the evolving ASEAN-China trade relation. Instead of being competitors, trade between the regions is becoming reciprocal. Product fragmentation and specialization, for instance, are becoming dominant so that bilateral trade now involves more trade in parts and components. Vertical specialization is specifically taking place in the manufacturing of electronics where each country produces based on its technological capability (Sheng, Tang & Xu, 2012; Yin, 2011). Moreover, studies that utilized gravity models and computable generable equilibrium models not only predict trade creation, but also project a positive growth trajectory in trade between the ASEAN economies and China (D. Park, I. Park & Estrada, 2009; Lee & van der Mensbrugghe, 2007; Roberts, 2004). On top of these developments, China has emerged as an important consumer market that buoyed the ASEAN economies from the slump of the Great Recession.

This paper reviews Sino-ASEAN trade statistics in order to provide an assessment of the economic importance of China to ASEAN and vice versa. It seeks to understand whether the evolving trade relations between the two regions are competitive or complementary. It also discusses the restructuring regional production chain, citing anecdotal evidences, to illustrate opportunities for ASEAN economies to promote reciprocity and mutual growth with China. This study uses data on total export and import volume per country and region, and per product classification from 2000-2013 based on the UNCTADstat Trade database. The principal source of the database is the UN DESA Statistics Division, UN COMTRADE, which provides detailed trade data for both reporting country and its trading partners, and by product grouping. The trade data reflects product based on SITC Rev. 3 commodity classification, with the most detailed level of product aggregation at two digits.

2 On the ASEAN-China Bilateral Trade Relation

2.1 Growing bilateral trade between ASEAN and China

The total volume of trade between ASEAN and China has been growing steadily in the past decade. From 2000 to 2013, Sino-ASEAN trade has expanded by US$322 billion or equivalent to a compounded annual growth rate of 19.2%, reaching to nearly US$360 billion in 2013. This growth figure has outstripped the annual growth of China's global trade in the same period, calculated at 18.2%. While the steady growth was temporarily dented during the global financial crisis, the 11% decline of Sino-ASEAN trade from 2008 to 2009 was smaller than the 14% decline in China's global trade. More importantly, bilateral trade quickly rebounded the following year registering a substantial 34% year-on-year increase.

China has now emerged as the ASEAN's second largest trading partner, constituting 14% of total ASEAN trade in 2013. Its volume was second only to intra-ASEAN trade, comprising a quarter of overall trade. Following behind China are the traditional trade partners that include the European Union, Japan and the United States. With the Republic of Korea, India and Australia, these eight countries/regions have cornered roughly 80% of the region's trade in the past decade (see Table 1). ASEAN trade volume with each partner has increased from 2000 through 2013: relations with the EU grew annually at 6.7%; with Japan at 4.6%; and with the US at 3.4%. But what is astounding is the speed in which China leaped over ASEAN's traditional partners to dominate trade. As early as 2000 and before formal negotiations of a free trade area began, China constituted a mere 5% of total trade volume while Japan and the US each comprised 16%. Japanese and US shares have since then consistently fallen while Chinese share has risen to 14% in 2013.

ASEAN, on the other hand, is China's third largest trading partner in the world and its largest trading partner among developing countries. The region accounts for 11.1% of China's overall trade in 2013. It closely follows the European Union which corners 14.0% and the United States which corners 12.8% of Chinese total trade. In the past 13 years, ASEAN trade relation with China grew the fastest among China's major partners.

Between the two regions, the balance of trade is in favor of China. ASEAN has been constantly enduring deficits with its trade relation with China since 2000. Where the trade deficit was only US$3.7 billion more than a decade ago, it has now widened to US$51.8 billion. The deficit may not necessarily be a problem though. There are two reasons to consider with this argument. First, imports arose out of domestic demand for foreign goods be it because a country cannot sufficiently cover its own requirement or because a foreign country is producing a commodity more efficiently. ASEAN countries will still have to cover their demand with or without China. Not buying from China does not eliminate the deficit but only transfer the deficit direction to other countries. Second, ASEAN's overall trade with the world which still generate a surplus for the region. ASEAN has repeatedly enjoyed trade surpluses with the EU, the US, Australia and India; but has consistent trade deficit with China and the Republic of Korea. It has deficits with Japan since 2000, which turned into surpluses in 2011 and 2013.

The composition of ASEAN exports to China is 41.2% primary commodities and 58.6% manufactured goods (See Table 2). Bulks of the primary commodities are made up of fuels, followed by food items, agricultural materials and ores and metals. Of the manufactured goods, parts and components of electrical and electronic goods dominate with a share of 22.8%, followed by chemical products (14.5%) and other manufactured goods (10.2%). Among ASEAN's top exports to China are goods that are largely intermediate; of which, cathode valves and tubes comprise 18.3%, natural rubber and similar gums account for 5.1%, and parts and accessories for machines account for 2.1%. Petroleum oils and bituminous minerals also appear prominently and are meant to satisfy China's energy demand. ASEAN has gained increasing importance for China's economic model, underpinned by manufacturing intensive industries. With rising wages and a burgeoning middle class population expected to rise to 600 million by 2020, China is expected to increasingly serve as an export market for ASEAN primary and manufactured products (Devonshire-Ellis, 2014a).

Meanwhile, the composition of ASEAN imports from China is chiefly manufactured goods. Topping the list are consumer non-durables such as footwear and apparel, leather and rubber manufactures, textile, fabrics and paper products; and durables such as furniture and building fixtures. Parts and components for electrical and electronic goods are also imported prominently, followed by industrial machinery and transport equipment. While consumer products still dominate China's exports to ASEAN, the sizable contribution of electric and electronic parts and components to trade likely reveals product fragmentation and the emergence of a regional supply chain between the two regions.

Table 1. ASEAN's Total Imports and Exports with Major Trade Partners, 2013 (In US$ Billions; shares in parenthesis)

Partner country/region		*2000*	*2005*	*2010*	*2013*
ASEAN	Export	98.2 (23%)	165.4 (25%)	263.0 (25%)	330.5 (26%)
	Import	84.3 (22%)	154.3 (26%)	236.4 (25%)	288.0 (23%)
	Total Trade	**182.5 (23%)**	**319.7 (25%)**	**499.4 (25%)**	**618.5 (25%)**
China	Export	16.5 (4%)	53.7 (8%)	113.7 (11%)	153.2 (12%)
	Import	20.2 (5%)	63.0 (10%)	127.2 (13%)	205.0 (16%)
	Total Trade	**36.7 (5%)**	**115.7 (9%)**	**240.9 (12%)**	**358.2 (14%)**
EU	Export	63.9 (15%)	84.2 (13%)	116.2 (11%)	128.5 (10%)
	Import	41.9 (11%)	60.8 (10%)	89.1 (9%)	117.9 (9%)
	Total Trade	**105.8 (13%)**	**145.0 (12%)**	**205.3 (10%)**	**246.4 (10%)**
Japan	Export	57.9 (14%)	73.1 (11%)	103.2 (10%)	122.9 (10%)
	Import	74.0 (19%)	83.6 (14%)	115.8 (12%)	113.1 (9%)
	Total Trade	**131.9 (16%)**	**156.7 (12%)**	**219.0 (11%)**	**236.0 (9%)**
US	Export	80.9 (19%)	94.3 (14%)	100.6 (10%)	115.1 (9%)
	Import	51.9 (14%)	61.1 (10%)	82.2 (9%)	90.7 (7%)
	Total Trade	**132.8 (16%)**	**155.4 (12%)**	**182.8 (9%)**	**205.8 (8%)**
Republic of Korea	Export	15.8 (4%)	25.1 (4%)	45.1 (4%)	53.2 (4%)
	Import	19.6 (5%)	28.8 (5%)	57.4 (6%)	79.0 (6%)
	Total Trade	**35.4 (4%)**	**53.9 (4%)**	**102.5 (5%)**	**132.2 (5%)**
India	Export	6.7 (2%)	15.0 (2%)	36.7 (3%)	43.0 (3%)
	Import	3.4 (1%)	8.9 (1%)	20.4 (2%)	28.4 (2%)
	Total Trade	**10.1 (1%)**	**23.9 (2%)**	**57.1 (3%)**	**71.4 (3%)**
Australia	Export	10.6 (2%)	22.4 (3%)	37.8 (4%)	45.4 (4%)
	Import	8.4 (2%)	12.4 (2%)	19.0 (2%)	22.5 (2%)
	Total Trade	**19.0 (2%)**	**34.8 (3%)**	**56.8 (3%)**	**67.9 (3%)**
Others	Export	76.3 (18%)	122.2 (19%)	236.1 (22%)	277.9 (22%)
	Import	76.3 (20%)	129.8 (22%)	205.3 (22%)	300.2 (24%)
	Total Trade	**152.6 (19%)**	**252.0 (20%)**	**441.4 (22%)**	**578.1 (23%)**
World	Export	426.8 (100%)	654.5 (100%)	1,052.4 (100%)	1,269.6 (100%)
	Import	380.0 (100%)	602.7 (100%)	952.9 (100%)	1,244.9 (100%)
	Total Trade	**806.8 (100%)**	**1,257.3 (100%)**	**2,005.3 (100%)**	**2,514.5 (100%)**

Source: UNCTAD (2013)

Table 2. Composition of ASEAN Exports to and Imports from China, 2013 (shares in percent)

	ASEAN Exports to China	ASEAN Imports from China
Primary commodities	**41.2**	**11.6**
All food items	9.2	3.4
Agricultural raw materials	8.3	0.6
Ores and metals	6.5	2.6
Fuels	17.2	4.9
Manufactured goods	**58.6**	**88.3**
Parts and components for electrical and electronic goods	22.8	23.4
	4.6	7.6
Electronic excluding parts and components	14.5	9.3
Chemical products	10.2	27.0
Other manufactured goods[1]	6.5	21.0
General industrial machinery, metalworking and power-generating machinery and transport equipment		
Pearls, precious stones and non-monetary gold	**0.2**	**0.001**
Total	**100.0**	**100.0**

Note: Other manufactured goods are composed mainly of products classified under SITC 6 and 8 (less 667 and 68): leather and leather manufactures, rubber manufactures, cork and wood manufactures, paper, textile yarns and fabrics, furniture, building fixtures travel goods, handbags and similar containers, articles of apparel and clothing accessories, footwear, etc.

Source: UNCTAD (2013)

2.2 Diversity among ASEAN countries leads to diverse trade performance with China

Differences in economic background among ASEAN countries influence each country's trade relation with China. ASEAN countries widely differ in their level of technology and development with high-income countries, Singapore and Brunei, integrated into a regional bloc with low-income countries, Cambodia and Laos. Resource-rich economies like Indonesia and Malaysia have expectedly specialized in resource-intensive industries; and labor-rich economies like Viet Nam with labor-intensive industries. Even within manufacturing industries, where many ASEAN countries have comparative advantages, the skill-content incorporated by each country has varied from low- to high-skill.

Singapore is especially positioned to reap benefit from the trade relation with China given its established role as trade middleman in the region and its society's predominantly Chinese background. It has consistently had the highest value of exports and imports to and from China, accounting for 25.8% of Sino-ASEAN trade and was surprisingly the only ASEAN country that enjoyed a trade surplus with China in 2013 (See Table 3). It historically had trade deficits with China, which since the global financial crisis, has turned into surplus. Much of the recent surplus is attributed to China's purchase of petroleum fuels and bituminous mineral, which has increased and maintained from less than 8% share of trade, pre-crisis, to more than 13%, post-crisis. The biggest driver of Singapore's exports to China has traditionally been parts and components for electrical and electronic goods.

Viet Nam's share of total ASEAN trade with China has grown the most rapid, increasing from 7.7% in 2003 to 16.1% in 2013. This has been driven largely by the growth in exports of primary commodities such as natural rubber and coal; and manufactured goods

such as cathode valves and tubes, and textile yarns. The country, however, also registers the highest net trade deficits among ASEAN countries, with a whopping US$26.6 billion in 2013. This figure is 2.5 times bigger than the deficit of Thailand, the next country with the biggest deficit. Viet Nam has been enduring trade imbalance since 2001 and has substantially relied on the imports of telecommunication equipment and parts, fertilizer, fabrics and petroleum products from China.

Among all ASEAN countries, Brunei has the smallest trade volume with China at US$0.5 billion. Given its resource endowment, 97% of exports in 2013 mainly involve petroleum, oils from bitumen materials and crude oil. The top imports of Brunei from China in the same year were consumer durables such as cotton fabrics (11.6%), and knitted and crocheted fabrics (3.7%); and non-durables such as iron and steel bars (10.4%). Brunei has previously enjoyed trade surplus with China but not in the past two consecutive years. Brunei is selling less fuels to China as reflected in a marked decrease in its top exports: US$0.5 billion in 2011, US$0.4 billion in 2012 to US$0.1 billion in 2013 while imports are maintained at US$0.4 billion in the same three years.

Table 3. ASEAN Member Country Trade with China, 2003, 2013 (In US$ Billions)

Country	***2003***			***2013***		
	Trade Volume	Share of ASEAN Trade	Rank	Trade Volume	Share of ASEAN Trade	Rank
Brunei	0.3	0.5%	8	0.5	0.1%	10
Cambodia	0.3	0.5%	9	3.2	0.9%	8
Indonesia	7.4	11.4%	4	54.3	15.2%	5
Laos	0.07	0.1%	10	1.2	0.3%	9
Malaysia	14.1	21.6%	2	64.6	18.0%	3
Myanmar	0.8	1.3%	7	4.2	1.2%	7
Philippines	4.1	6.3%	6	15.1	4.2%	6
Singapore	21.2	32.6%	1	92.3	25.8%	1
Thailand	11.8	18.1%	3	65.0	18.1%	2
Viet Nam	5.0	7.7%	5	57.8	16.1%	4
ASEAN	5.1	100.0%		358.2	100.0%	

Source: UNCTAD (2013)

Malaysia, Thailand and Indonesia are three other significant players in the region. Malaysia had previously the second highest volume of trade with China, before being overtaken by Thailand. The volume of trade of both countries with China is roughly US$65 billion each, which is four times bigger their levels a decade ago. The exports profile of both countries to China appears similar: for Malaysia, 63.9% are manufactured goods while 35.8% are primary commodities; for Thailand, 61.7% are manufactured goods while 38.2% are primary commodities. However, further disaggregating the two classifications show that Malaysia exports more parts and components of electric and electronic products as opposed to Thailand which exports more chemical products. Even with primary commodities, there is difference: Malaysia exports more food items while Thailand exports more agricultural raw materials. Meanwhile, Indonesia's trade performance is more remarkable, registering an eight-fold increase since 2003. Its 2013 volume stands at US$54.3 billion and fifth among all ASEAN members. Bulk of Indonesia's exports to China is in primary commodities; of which, fuels account for 36.4% while ores and metals account for 18.1%. Manufactured goods dominate the three countries' imports from China: 92.2% for Thailand, 91.1% for

Indonesia, and 86.9% for Malaysia. Of the manufactured goods, machinery and transport equipment has the biggest share at more than 50% for all three.

Finally, other players with minor trade shares are the Philippines, Myanmar, Cambodia, and Laos. Each of these countries have less than 5% share to total trade. The Philippines has consistently ranked among the lower half of ASEAN countries, having a 4.3% share in 2013. Electrical and electronic products, including parts and components, dominate its exports to China while machinery and transport equipment and consumer durables are its chief imports from China. Myanmar, Cambodia and Laos heavily export natural resources with a huge share of agricultural raw materials, basic food and ores and metals. Manufactured goods, particularly with articles of apparel and clothing accessories also figures in as one of Cambodia's top exports to China. These countries import mostly manufactured consumer durable goods, and a growing volume of intermediate inputs such as knitted and crocheted fabrics.

Overall, bilateral trade relation between ASEAN and China is booming and at all-time high. In the short span of a decade, China has become the top international trading partner of ASEAN while ASEAN has become the third major trade partner of China. There appears to be an emerging reciprocity in the pattern of trade: ASEAN exports primary commodities while China exports manufactured goods. It is true that ASEAN also exports a sizable chunk of manufactured goods to China but disaggregating the manufactures reveals that they are mostly parts and components of electronic and electrical products, which are intermediate goods; and chemicals and related products from high-skill and technology-intensive industry.

3 Revealed Comparative Advantage and export competition in the world market

There is reservation in the overall relation between the two regions. For even if bilateral trade is expanding, many fears that China is intrinsically an ASEAN competitor in the global market. It is thus worth examining how ASEAN and China compare with each other in their trade with the world; and determine which commodities each has comparative advantage.

Table 1 reveals an important observation: even with China on the scene, ASEAN exports with its traditional partners have been consistently increasing in absolute terms since 2000. Among ASEAN's top three traditional trade partners, moreover, the annualized growth rate of exports to the US is registered at 3% (2000-2005), 1% (2005-2010), and 5% (2010-2013); growth rate of exports to Japan is 5%, 7% and 6%, respectively; and growth rate of exports to the EU is 6%, 7% and 3%. Hence, the evidences show that neither export volume nor growth rates with the three partners have diminished over time.

However, the fear of a China-threat is realized when comparing the trend of ASEAN's and China's share of US, EU and Japanese imports on specific product lines. In the manufacturing sector, in particular, ASEAN has a 24.3% share of US imports of electronic goods (excluding parts and components) in 2000 which fell to 9.3% in 2013. China's share, meanwhile, rose from 16.6% to 57.9%. The same is true with the experience with Japan: ASEAN share on Japanese import of electronic goods is originally at 35.0% in 2000 which slid to 18.3% in 2013; China, on the other hand, saw its share rose from 13.7% to 72.0%. On another key manufacturing export: textile fibres, yarn, fabrics and clothing, ASEAN's share performance has actually improved while China's performance has improved even greater. ASEAN's share of US imports of textile and clothing commodities rose from 12.9% in 2000 to 18.7% in 2013; China's share rose from 13.0% to 38.8%. In Japan, ASEAN's share rose from 8.1% to 15.5% while China's share, 66.2% to 70.5%. And in the EU, ASEAN's share is maintained at 5.2% while China's share went from 7.7% to 22.2%.

3.1 Applying Balassa's Revealed Comparative Advantage Index to ASEAN and China

Balassa (1965) introduced the revealed comparative advantage (RCA) index to measure a country's export performance vis-a-vis a set of countries for a specific commodity or industry. The comparative advantage is 'revealed' through the observed patterns of trade, instead of using autarky prices which theories recommend but are generally unobservable. The RCA index is computed as follow:

$$RCA = \frac{X_{cj}/X_{ck}}{X_{wj}/X_{wk}} = \frac{X_{cj}/X_{wj}}{X_{ck}/X_{wk}}$$

where X refers to exports, c is a country, w is a set of countries, j is a commodity or industry, and k is a set of commodities or industries. A country is said to have a comparative advantage in commodity or industry j if the computed index is greater than unity; and a comparative disadvantage if the computed index is less than unity. An index equals to one implies that the share of the commodity or industry in a country's exports is just as big as the share of the same commodity or industry in the set of countries' exports.

We compute for the RCA by comparing the performance of ASEAN countries and China relative to the world. Table 4 depicts the RCA index for China and selected ASEAN countries on manufactured goods based on degree of manufacturing. Table 5 shows the RCA index for China and all ASEAN countries by selected commodities.

China has a comparative advantage in the production of manufactured goods which are labor-intensive and resource-intensive; and low-skill and technology-intensive. These labor-intensive and resource-intensive goods are manufactures mostly associated with 'Made-in-China' articles such as apparel and clothing accessories, footwear, travel goods, handbags and similar containers, cork and woods manufactures, textile yarn and related products, etc. The low-skill and technology-intensive commodities are mainly iron and steel, manufactures of metals, and motorcycles and trailers. The RCA index for high-skill and technology-intensive manufactures is a few points away from unity, and can possibly tip into the area of comparative advantage in succeeding years. This suggests that Chinese industries are now shifting into high-skill manufactures that can possibly match ASEAN. Further disaggregating the high-skill and technology-intensive manufactures into electronics (excluding parts and components), electronic and electrical parts and components, and other high-skill manufactures (e.g. chemicals and related products) reveal that China already has comparative advantage with electronic goods. Parts and components has an RCA index of 1.39 while electronics (excluding parts and components) is at 2.49.

Table 4. RCA Index on Manufactured Goods Based on Degree of Manufacturing, 2013 ASEAN Countries (less Brunei, Laos, and Myanmar) and China

Manufactured goods	*China*	*Cambodia*	*Indonesia*	*Malaysia*	*Philippines*	*Singapore*	*Thailand*	*Viet Nam*
Labor-intensive and resource-intensive manufactures[1]	1.76	6.67	2.82	0.77	0.98	0.14	0.70	3.53
Low-skill and technology-intensive manufactures[2]	1.07	0.43	0.81	0.50	0.44	0.45	0.76	0.73
Medium-skill and technology-intensive manufactures[3]	0.71	0.08	0.73	0.57	0.74	0.58	1.17	0.41
Electronics (excluding parts and components)	1.90	0.00	1.21	1.11	0.08	0.43	2.41	0.41
Parts and Components for electrical/electronic goods	0.96	0.03	0.86	1.84	1.13	1.09	0.96	0.42
Others (excluding electronics)	0.66	0.08	0.70	0.47	0.73	0.54	1.15	0.41
High-skill and technology-intensive manufactures[4]	0.98	0.07	0.68	1.56	1.36	1.77	1.02	0.74
Electronics (excluding parts and components)	2.49	0.00	1.17	2.34	1.81	0.84	2.29	0.96
Parts and Components for electrical/electronic goods	1.39	0.04	0.37	3.02	3.16	3.55	0.88	1.53
Others (excluding electronics)	0.51	0.09	0.73	0.75	0.48	1.16	0.83	0.35

Notes: Authors' calculations. This product classification is taken from the Trade and Development Report (TDR) 2002 Annexes to Chapter III. Manufactured goods are classified as follow:
1. SITC 61, 63, 64, 65, 66, 82, 83, 84, 85
2. SITC 67, 69, 785, 786, 791, 793, 895, 899
3. SITC 62, 71, 72, 73, 74, 77 (less 776), 781, 782, 783, 784, 81, 893, 894
4. SITC 5, 75, 76, 776, 792, 87, 88, 891, 892, 896, 897, 898

Comparative advantage in the production of high-skill and technology-intensive manufactures are also held by Singapore, Malaysia, the Philippines and Thailand. These four countries have sizable production of electronic and electrical goods and parts and components, which fall under this classification. In 2013, ASEAN's exports of telecommunication equipment and parts to the world was 8.1% of its entire exports, automatic data processing machines at 8.2%; and cathodes valves and tubes at 4.1%. These three products are together valued at US$454 billion. ASEAN export to China of parts and components is at 22.8% while China's export to ASEAN of the same products is at 23.4%. The trade in parts and components, and the comparative advantage enjoyed by these countries are encouraging signs of product integration in the region. This type of trade cannot be thought of as competitive, but more complementary as the components are intermediate goods that go into final production.

Where ASEAN competition with China becomes apparent are on manufacturing industries that are labor-intensive and resource-intensive, and produce not intermediate but final consumption goods. Indonesia, Cambodia and Viet Nam happen to have comparative advantage in the production of these lines of manufactures. For Indonesia, these products are mainly cork and wood products, paper and rubber manufactures from resource-intensive industries that can well compete with China but the country also has advantage in the

production of footwear and articles of apparel where China has traditionally dominated. For both Cambodia and Viet Nam, their comparative advantages are also on the manufactures of footwear and articles of apparel and clothing, industries that compete with China.

4 Trade Reciprocity through an Integrated Supply Chain

Building an integrated supply and production chain is not a new economic experiment in the ASEAN region. As early as the 1980s, Japanese companies have outsourced and offshored manufacturing operations in ASEAN countries, creating an integrated supply chain of components and assembly plants. Thailand became a big recipient of Japanese foreign direct investment, establishing a strong automotive industry; Singapore benefited with investments going into electronics and petrochemical industries; while Malaysia harnessed its heavy industries. The rest of the region, however, have not caught up with the early trend, hindered by domestic turmoil, weak infrastructure or simply, autarkic economies. The trend towards an integrated regional chain has not subsided, with Japanese and Korean firms still relocating operations in the region, but a boost is already undergoing from China.

The stage has been set for another round of expansion of regional production chain in the ASEAN region. The ACFTA has effectively lowered tariffs on imported goods between China and major ASEAN countries in 2010, and with the entire region in 2015. Multinational companies will, as a result, view China and ASEAN as a single market and restructure their production networks and supply chains to take advantage of low cost opportunities in the free trade area. Manufacturing of certain product lines or product components may have to shift from one country to another.

Moreover, China is driving the integration in regional production as it structurally shifts from an export-oriented to a consumption-driven economy. Such structural transition necessitates the rise in the purchasing power of the Chinese public while industries will have to move up the value-added ladder. This shift does not mean that China abandons low-value manufacturing but that, it will rationally outsource or offshore the production to cheaper locations either inland or to neighboring countries. Some manufacturing have, in fact, already shifted inland with firms such as Unilever Plc, Samsung Electronics Co. Ltd and Dell Inc. relocating to less expensive regions. This fits into China's strategy of shifting low-skill manufacturing to less developed areas in order to allow the manufacturing centers on the coasts to do more advanced, value-added activity (Zhang, 2013). Still, some evidences have shown that as labor costs increase in the coastal manufacturing hubs and as tax exemptions scaled back, China-based firms are also relocating manufacturing to nearby ASEAN countries (Devonshire-Ellis, 2014b; Yin, 2012).

China's textiles and garments industry recorded nearly a third of manufacturers moving all or part of their production outside China, with Zhongshan Liancheng Co. as one such company, relocating its operations to Cambodia at a quarter of the labor costs (ASEAN Affairs, 2012). Multinational corporations have also transferred with Adidas closing its factory in Suzhou and Nike closing its only Chinese footwear factory in Suzhou in 2009. Of the 16,000 Hong Kong-owned factories at risk of closure in 2011, about 30% ceased operations while the figures of closures of Taiwanese-owned factories are similar with many relocating to ASEAN. Vietnam has reaped the benefits with the relocation of a US$3.2 billion Samsung mobile plant in Thai Nguyen (Vettoretti, 2014) while Indonesia is expecting a major investment as Taiwan's Foxconn Technology Group, the major supplier of Apple products, relocates low-end manufacturing to the country.

The push factors associated with relocating manufacturing elsewhere can be seen as part and parcel of China's gradual economic transition. A rapidly expanding consumer middle class is fueling demand for higher end products and nearby manufacturing hubs in Vietnam and Indonesia are being tapped to satisfy these requirements. Rising wages and

comparatively high mandatory social welfare contributions reinforce moves to set up factories elsewhere in Southeast Asia as Chinese labor costs are becoming less competitive (see Table 6). Such relocations are largely industry-specific with lower-value and traditional, labor-intensive industries such as shoes, textiles, garments and leather being most vulnerable to competition from low labor costs elsewhere.

Table 5. RCA Index for ASEAN Countries and China by Selected Commodities, 2013

Commodity	*China*	*Brunei*	*Cambodia*	*Indonesia*	*Laos*	*Malaysia*	*Myanmar*	*Philippines*	*Singapore*	*Thailand*	*Viet Nam*
Food	0.44	0.02	0.90	0.97	1.24	0.50	2.95	1.25	0.24	1.93	2.60
Beverage	0.12	0.01	0.10	0.08	0.11	0.66	0.04	0.07	1.11	0.91	0.24
Tobacco	0.27	0.00	1.71	2.12	1.13	0.70	0.61	2.58	0.77	0.18	0.85
Petroleum products	0.09	3.57	0.00	0.53	0.00	0.87	0.04	0.22	1.30	0.40	0.63
Natural gas and manuf	0.06	19.37	NA	4.75	NA	4.29	18.21	0.04	0.04	0.03	0.01
Organic chemicals	0.70	0.84	0.09	0.75	0.00	0.90	0.05	0.31	2.80	1.30	0.12
Inorganic chemicals	1.57	0.04	0.07	0.40	4.87	0.41	0.05	0.99	0.40	0.43	0.42
Leather products	0.52	0.05	0.16	0.43	0.59	0.06	0.03	0.08	0.26	1.53	1.78
Rubber products	1.22	0.06	0.30	1.44	0.02	1.29	0.16	0.37	0.37	3.92	1.24
Wood products	1.33	0.01	0.34	4.32	0.58	3.31	0.80	16.11	0.06	1.16	0.87
Furniture	2.90	0.01	0.23	1.08	0.06	1.19	0.24	0.50	0.06	0.61	4.11
Paper products	0.69	0.01	0.04	2.13	0.00	0.45	0.01	0.17	0.39	0.70	0.46
Textile products	2.90	0.02	0.38	1.41	0.15	0.45	0.13	0.18	0.13	0.94	2.31
Iron and steel	1.02	0.07	0.00	0.34	0.02	0.40	0.20	0.11	0.33	0.45	0.76
Apparel	3.00	0.08	26.02	1.62	2.77	0.77	2.23	1.11	0.14	0.69	5.18
Footwear	3.25	0.00	12.85	2.94	1.07	0.09	1.01	0.09	0.11	0.43	10.51
Office and automatic data processing machines	3.32	0.00	0.00	0.32	0.00	2.03	0.00	2.57	2.02	2.30	1.00
Electrical machinery, apparatus and appliances	1.55	0.01	0.08	0.43	0.10	2.62	0.03	4.39	3.47	1.16	0.63
Professional and Scientific instruments	1.25	0.03	0.13	0.09	0.02	1.10	0.02	0.75	1.12	0.46	0.20

Source: Authors' calculations.

Table 6. Labor Costs of Selected Chinese and ASEAN Cities

City	*Average Worker Salary (US$, per calendar month)*	*Mandatory Welfare (percentage of salary)*
Guangzhou, China	760	41%
Bangkok, Thailand	460	5%
Ho Chi Minh City, Vietnam	150	22%
Jakarta, Indonesia	240	4.8%
Kuala Lumpur, Malaysia	800	12%
Manila, Philippines	500	25%

Notes: Guangzhou welfare can vary depending upon amount of housing fund contribution. Shown is the mean average. All other country welfare figures can vary depending on a number of circumstances. Shown are the typical contribution rates paid.
Source: Devonshire-Ellis (2014b)

The pull factors drawing China-based companies to relocate some or all of their operations to ASEAN include tax breaks and other investment incentives offered to foreign companies – the kind previously offered by China during an earlier stage in its rapid industrialization during the 1980s and 1990s. Corporate income tax rates, for instance, have been varied across the region but countries such as Thailand and Viet Nam offer investors competitively low rates (see Table 7). Improved manufacturing capabilities in the region have moreover been cited as a reason for increased foreign investment, underpinned by the ASEAN's abundance of commodity resources, predominantly young demographics and the regional single trade bloc. And while a production gap exists between China and neighboring ASEAN, analysts note of the advantage to build manufacturing capacity in an external location with facilities that can achieve 70% of China's existing production levels; and that the production gap will likely decrease as regional infrastructure improves (Devonshire-Ellis, 2014a).

Table 7. Corporate Tax Rates in China and Selected ASEAN Countries

Country	*Corporate Income Tax (CIT) Rate*	*Dividend Tax Imposed*
China	25%	10%
Indonesia	25%	20%
Malaysia	25%	0%
Philippines	30%	15%
Thailand	20%	10%
Vietnam	22%	0%

Note: Vietnam to further reduce its CIT rate to 20% in 2016.
Source: Devonshire-Ellis (2014b)

Multinational companies also drive the integration of regional production chain. Under what has been labeled a 'China Plus One' framework, companies maintain the bulk of their operations in China but shift the additional manufacturing capacity needed to service increasing regional demand to at least one other country. For example, Volkswagen shifted the base of its Asian production to Thailand, geared toward the ASEAN market, while still holding operations in China to service Chinese clients. Moreover, low-end manufacturing is often undertaken in nearby Southeast Asia while final assembly and supply chain management takes place in China, a strategy suggesting that the two regions have production areas and industries marked by complementarity rather than competition. Such an approach is motivated by the need for diversification, the ability to exploit free trade agreements and better tap into regional markets.

While China moves away from low-value added manufacturing and benefits low-income ASEAN countries, a concern is how the shift affects the major ASEAN countries which are dominantly involved with high-value manufactures. Singapore, Malaysia, Thailand and the Philippines have comparative advantages in producing medium- to high-skill and technology-intensive goods. Competition in final goods may not bode well for the four ASEAN countries given the industrial capacity and rising competitiveness of China in the same product lines. However, trade in intermediate goods will integrate the region and highlight another aspect of regional production chain, not with offshoring operations, but with outsourcing inputs from a neighboring country. Foreign outsourcing and the resulting product fragmentation within the region is becoming evident with the increasing volume of trade in parts and components. Data reveals that from 2000 to 2013, ASEAN's total trade volume in parts and components with China rose annually at 19.0%, compared with the world at 4.3%. Moreover, the share of parts and components to overall trade between the two rose from 3.4% in 2000 to 18.6% in 2013.

In spite of the rising costs and leakages of manufacturing to neighboring countries, China's competitiveness rest on its well-established infrastructure and facilities, ability to scale quickly and strong involvement in global supply chains. Existing operations in China are evolving to encapsulate more logistics and planning-based operations – importing, warehousing, distributing products manufactured in a related factory elsewhere. As the country moves toward a consumption-driven economic model, it has to rationalize low-value industries and transfer some stages of production to more efficient producers. China can see the ASEAN region as a trade partner and ASEAN with China as both exploit the benefits of a regional integration of production chain.

6 Conclusion

The ASEAN region, as a whole, benefits from its relation with China primarily since China offers itself as a huge market for ASEAN products. Bilateral trade between the two regions has significantly improved in the past decade, and China has overtaken many countries to become ASEAN's second top trading partner. As the ACFTA is being rolled out, the two regions are becoming more engaged, highlighted by the slow but sure emergence of an integrated regional production and supply chain. Low-income ASEAN economies have already benefitted in the shift of low-value manufacturing industries into their countries. The rest, however, see a growing threat as China takes over production and export of similar high-value manufactured product lines. A glimmer of hope to parry the competition is the sizable trade of intermediate goods. As the ASEAN region is diverse, dealing with the realities of an advancing ASEAN-China economic integration means each country enhances its competitive advantages, finds a niche in the regional production chain, and manages the competition with its neighbor. Strengthening the trade in parts and components is a way to improve trade complementarities between the regions.

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