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The Change of Comparative Advantage of Agricultural Activities in East Java Within the Context of Asean Economic Integration

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Abstract

This paper analyses changes on agricultural trade patterns of East Java, Indonesia, versus six main ASEAN exporter countries. Based on the trade flow information, there are some dynamics of comparative advantage and export specialization from 2007 to 2013 in the 545 commodities comprising the agricultural sector. Products are mapped into four-different quadrants according to their level of comparative advantage and export specialization. Advantage-specialization appears to be important features of agro-trade for ASEAN countries because most of the growth in exports is under those competitive commodities. Little diversification towards new products has been found in the recent years. Gains appear to be larger than the losses due to international openness, while opportunities within the region have not been exploited. Agro-trade in the region still focuses towards extra-ASEAN and enjoys high levels of advantage-specialization in some key commodities. A large number of commodities were found to have little competition within ASEAN.

Keywords

Revealed comparative advantage, manufacturing, trade balance, factor intensities and products mapping, international trade, ASEAN.

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Introduction

Since more than two decades ago ASEAN has experienced a strong trade liberalization and integration process. ASEAN agriculture value trade has increased by more than 68% from US$ 89 billion in 2007 to US$ 150 billion in 2013, both pushed by a high demand from neighbouring India, China and East Asian countries and by a strong increase in global prices.

Indonesia is by far the largest economy in ASEAN, both in territory and labor. Indonesian economy has undergone a deep structural transformation shifting from 50% in agriculture as share to GDP in 1960 to 13.40% in 2014. The sector continues being strategic as it absorbs more than 40% of labor, feeds more than 240 million Indonesians and supplies materials for strategic natural-resource-base sectors. Food crops dominate Indonesian agricultural production; however, the largest contribution to exports comes from plantations (almost 50%), while horticulture, fisheries, and livestock experienced large trade deficits.

In 2011, Indonesian government launched a strategic plan called MP3I by defining six special economic corridors. Sulawesi and Papua-Maluku (East of Indonesia) were defined as agricultural-food areas. However, most of the processing of resources and the export are done from Java Island with East Java (henceforth JATIM) as the gate connecting Java Island with the East of Indonesia.

JATIM is the second largest province in Indonesia with nearly 37 million people, with a share of 7% to GDP and almost 15% share on agro-exports. The total JATIM exports experienced a 50% growth from US$10.35 billion in 2007 to US$15.47 billion in 2013. Agricultural exports grew by more than 180% in the same period. However, in the last few years GDP composition and exports of JATIM were challenged by periods of low commodity prices (2008-2009) and shrinking world demand, creating reverse effects in industry structure, policy focus, and dependency on few agricultural commodities. After a rise in exports to US$18.25 billion in 2011 (80% more than 2007), exports dropped to US$15.47 billion. The growth was strongly supported by few commodity groups such as vegetable oils (grew by 872%), machinery

& transport equipment (400%), crude materials (non-fuels, 306%), food and live animals (107%), and beverage and tobacco (100%). The 40% share of manufactured exports on 2007 declined by 15% in 2013. JATIM export partners also experienced a change as the 30% share of exports absorbed by ASEAN in 2007 fell to less than 20% in 2013.

These changes in export-import composition, destination, and volumes signal a change in the pattern of trade and comparative advantage of JATIM, shifting from manufacturing exports to natural resource goods (food, oils, crude materials, organic chemicals, tobacco, and so on) and manufacturing related to natural resources (paper, furniture, rubber, and so forth). Similar changes appear as well in some ASEAN countries, signalling a possible new pattern of trade. As competition among ASEAN members may be tight in the years to come, this paper analyses patterns of agricultural trade of East Java, Indonesia, versus six main ASEAN exporter countries. It looks at the role played by comparative advantage and export specialization in shaping the pattern of the region, as well as to find out changes in advantage-specialization. Finally it questions whether ASEAN liberalization offers opportunities or rather threats for the region by looking at products in which the members compete and collaborate. Looking at advantage-specialization patterns allows assessing the trade performance of the region and allows finding the strength, vulnerabilities and opportunities of each country to expand trade. As Indonesia is significantly larger than all other members, the focus on JATIM allows the researcher to question if the data found at a provincial level show more dynamic differences that are not visible at country level.

Various empirical approaches on comparative advantage

A number of empirical studies on comparative advantage focus their attention in the transformations produced in trade performance by changes in comparative advantage. Yuea and Hua (2002) found that a shift in comparative advantage to labor intensive industries in China together with adjustments in supply side supported economic growth and export performance. For Lee (1995), transferring resources from low to higher marginal labor productivity sectors, specialization, and institutions supported a change in advantage in Korea. Amoroso et al. (2011) found that factor-proportions have twice as much power in determining export patterns in developing countries.

Liberalization, integration, and industrialization are also the channels for improvements in productivity, scale, and export expansion and a way to improve comparative advantage as noted by Balassa (1986), Oladipo and Vasquez G (2009), De Hoyos and Lacovone (2013). Openness in agriculture trade is expected to promote productivity gains and alter specialization as presented by Huang and Chen (1999). Fang and Beghin (2000) found that the least competitive crops in China were the most protected by policies, unintentionally promoting inefficiencies in specialization patterns.

Studies on comparative advantage support that changes in patterns and performance are due to both demand and supply sides, both at domestic and international markets (Widodo, 2009), both in factor-intensities and productivity differentials. Esquivias and Heriqbaldi (2013) noted that improvements in capital, labor, and technology could affect specialization, productivity and resource allocation leading the country to higher levels of scale and lower costs.

Related to ASEAN Agricultural trade, Korinek and Melatos (2009) through a gravity model found that the FTA supports trade expansion within the region and is expected to lower extra-ASEAN trade. However, the RTA does not support significant changes in advantage, as trade base on factor endowments (ASEAN agriculture) had changed little over time. As members tend to produce similar goods, the effects of FTA are not as extensive as expected. Qui et al. (2007) identified that ASEAN enjoys advantage in land-intensive agriculture - vegetable oils, rubber, tropical fruit and vegetables - and positive trade balance versus China and other nations. However, most of ASEAN members have been net-importers on labour-intensive products. The full implementation of the ACFTA will allow some products to gain advantage versus other countries, as they will face lower import tariffs. Okabe and Urata (2014) found that the lowering of tariffs in AFTA has allowed larger intra-AFTA trade and increasing intra-exports. However, trade-flows are not maximal as non-tariff measures still exist.

An objective of this paper is to analyse changes on agricultural trade patterns of East Java, Indonesia, versus six main ASEAN exporter countries.

Materials and methods

The theoretical and empirical debate on the competitiveness of countries is present in a variety of approaches. A number of them use

Revealed Comparative Advantage (RCA), factors affecting changes in RCA and RCA relationship with the use of indicators of industrial specialization (Balassa and Noland, 1988; Bender and Li, 2002; Lee, 1995; Carolan, Singh and Talati, 1998; Das, 2009; Yuea and Hua, 2002; Widodo, 2009, and other scholars).

The present study makes use of two variables expressed as Revealed Comparative Advantage (RCA) indexes and Trade Balance Index (TBI) on the basis of exports to the whole world for 2007-2013 to identify trends in East Java (JATIM) agricultural exports and 6 largest ASEAN countries. Data from SITC Rev 3 at 5-digit level were used for the analysis. The computation of comparative advantage is based on RCA index developed by Balassa (1965). The index denotes "the relative export performance of a country in particular commodities". The advantages of the trading countries are based on both the cost factors as well as on other non-price factors. RCA indexes are obtained by dividing a country's share in the exports of a given commodity category by the share in the world exports.

$$\mathrm{RCA}_{i,j} = \frac{E_{i,j}/E_{tot,j}}{E_{i,world}/E_{tot,world}} \qquad (1)$$

RCA_{ij} = country's j revealed comparative advantage index for commodity group *i*

E_{ij} = exports of commodity *i* by exporter *j*

E_{tot} = total merchandise exports - not including services.

The values of the index vary from 0 to infinity ($RCA_{ij} \geq 0$). RCA_{ij} greater than one means that country *i* has comparative advantage in group of products *j* and vice versa.

Revealed Symmetric Comparative Advantage (RSCA) index developed by Dalum and Laursen (1998) was used to facilitate comparison analysis. RSCA is based on RCA with a "simple decreasing monotonic transformation" (Widodo, 2009) formulated as:

$$RSCA_{ij} = (RCA_{ij} - 1) / (RCA_{ij} + 1) \qquad (2)$$

With this adjustment, the values of $RSCA_{ij}$ index takes values in the range of minus one to one ($-1 \leq RSCA_{ij} \leq 1$). Values of $RSCA_{ij}$ above zero implies a comparative advantage of country *i* in group of commodities *j*. $RSCA_{ij}$ below zero implies a comparative disadvantage of country *i* in group of commodities *j*.

Trade Balance Index (TBI) helps to identify the export position of a country for a group of products, indicating whether the country has specialization in export (as net-exporter) or in import (as net-importer). The assumptions of this index are taken from Lafay (1992). The Index obtained from TBI may indicate whether a specific commodity contributes to the domestic economy (surplus), or whether it is a negative (deficit). TBI is formulated as:

$$TBI_{ij} = (X_{ij} - m_{ij}) / (x_{ij} + m_{ij}) \qquad (3)$$

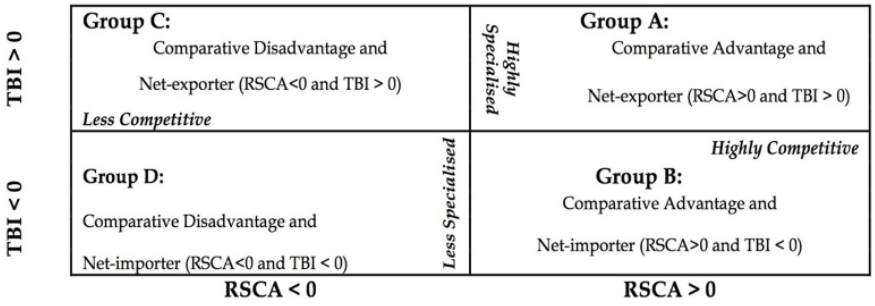
TBI_{ij} = Trade Balance Index of country *i* for group of products *j*

X_{ij} = Exports of group of products *j* by country *i*

m_{ij} = Imports of group of products *j* by country *i*

The values of the TBI index range from -1 to 1. The TBI will be equal -1 if a country only imports (net-importer) and 1 if only exports (net- exporter).

Complementing the analysis of indexes, the "Product Mapping", Widodo (2009), is used to examine comparative advantage from the point of view of the domestic trade balance and the international competitiveness. With RSCA and TBI indexes, products are categorized into four groups A, B, C and D as depicted in Figure 1.



Source: Widodo (2009), APINDO Working Paper No 1. 2013, and author

Figure 1. Product mapping chart.

Group A are products that enjoy both comparative advantage and export-specialization; **Group B** are products with comparative advantage but no export-specialization; **Group C** are products with export-specialization but no comparative advantage; and **Group D** are products with neither comparative advantage nor export-specialization.

All computations of RCA indexes are conducted at product level (5-digit SITC). For the purpose of the analysis, results are aggregated at sector level (1-digit) and 3-digit (sub-sector).

After the computation of the RCA, RSCA and TBI values, all the goods are categorized based on the four groups (A, B, C or D) for each year. Comparative advantage is also evaluated based on the magnitude of the RCA value: non-CA 0 > RCA, Weak 2 > RCA > 1, Medium 3 > RCA > 2, and Strong RCA > 3. Each good is also assigned a status (Fix, Gain or Loss) depending on whether the good has enjoyed and maintained CA (backbone) for the whole period, gain CA (New A), loss CA or never enjoyed CA. The magnitude and the status of the advantage allow tracing inter-temporal changes.

The study maps and does a cross-analysis of all RCA-TBI indicators for all countries identifying products that compete (same status A, to be referred from now on as ***group A*** or ***status A***), goods in which one country enjoys A status and the other B or D (Net-importer), goods in which ASEAN is net-importer (no competition), or goods in which neither has a dominant position but both are actively engaged in trade (combinations of B and C). This allows figuring out the competition environment as well as sizing opportunities-threats.

In order to measure concentration in specialization within particular groups of products (vertical), the number of goods enjoying status A are counted. If the share of total 5-digit products enjoying A is higher than 50% out of the total sub-products under 3-digit group, it is assumed that the country enjoys dominance (specialization) on that particular group.

Measuring RCA and TBI in different periods shows that trade performance is not static but in fact reflects positive and negative changes along time. Countries can reverse low comparative advantage or lose it base on policies. While manufacturing industries might appear less persistent in their nature of trade, low concentration in group A and higher shares of exports under group B or C, agriculture for ASEAN is likely to be highly dependent on goods enjoying advantage-specialization. It is because the main exports are concentrated in products highly competitive in price and volume, such as oils, rubber, coffee, fish, tobacco, seafood, cocoa, cereals, and so on, where ASEAN countries often Ranks in TOP 20's Worldwide.

Data

This study is limited to the six largest ASEAN countries: Indonesia, Thailand, Malaysia, Singapore, the Philippines and Vietnam* (until 2012). Data on Cambodia and Brunei appear with some irregularities, while data on Myanmar and Laos are incomplete. Data of Exports and Imports of East Java were collected from the Indonesian Statistic Bureau (Badan Pusat Statistik Indonesia, BPS) at 5-digit level, based on Standard International Trade Classification (SITC) Rev. 3. Data for the World - exports and imports- were collected from the United Nations Commodity Trade Statistics Database (UNCOMTRADE). This study includes agricultural production as defined by SITC Rev. 3, a total of 545 products at five digit level.

Results and discussion

General view on ASEAN

Singapore is the largest trader in the region, responsible for 32% of exports and 30% of imports, followed by Thailand and Malaysia (Table 1). Indonesia and Vietnam rank 4th and 5th; however, they registered the largest average annual growth of trade during the 2007-2013 period, both intra and extra-ASEAN. All countries experienced larger growth rates in imports than in exports. Except for Singapore and Vietnam, all countries faced larger intra-ASEAN trade growth rates indicating a possible improvement of trade linkages as trade liberalization advances, in line with the finding reported by Korinek and Melatos (2009), Qui et al. (2007).

Except for Singapore and Malaysia, all countries have more than 30% of employment under agricultural sector. However, average agriculture as export share and GDP share represents less than 12%. All ASEAN countries have larger GDP shares of services than industry and agriculture. Agriculture in national GDP is less important but plays an active role in employment, food security, and in creating trade surplus (except for Singapore) (Table 2).

From 2007 to 2013 the six largest ASEAN exporters registered a 75% increase in agricultural

Country	Total Exports (in US $ Million)	Total Imports	Total Trade	Intra ASEAN	Extra ASEAN	Export Growth	Imports Growth
			Average Annual Growth 2007-2013				
Indonesia	182 551.80	186 628.70	12.5	13.99	12.02	8.85	17.3
Malaysia	228 331.30	205 897.40	6.17	7.18	5.81	5.47	6.99
Philippines	53 978.30	65 130.60	2.65	3.09	2.55	1.87	3.33
Singapore	410 249.70	373 015.80	6.31	5.07	6.78	6.06	6.58
Thailand	228 730.20	249 517.10	9.79	10.83	9.52	9.45	10.11
Vietnam	132 664.10	132 109.90	19.24	11.31	21.21	20.00	18.51
Total	1 271 128.10	1 212 299.50	8.65	8.10	8.33	7.81	9.57

Source: ASEAN Trade Statistics Database as of 20 December 2013

Table 1: Country trade performance (2007-2013).

	Agriculture in ASEAN (2012)				Total GDP		GDP Share 2006-2013		
	Agr POP (000)	Employment Share	Export Share	Import Share	(in US $ Million)	GDP growth 06-13	Agriculture	Industry	Services
Indonesia	49 963	34.8	17.04	8.97	860 850	6.0	12.3	39.9	47.8
Malaysia	1 513	12.7	10.54	7.67	312 072	4.6	7.2	36.9	55.9
Philippines	13 571	32.2	10.92	10.82	269 024	5.3	10.4	32.8	56.8
Singapore		-	2.41	3.55	297 941	5.3	0	28.0	71.9
Thailand	18 032	36.2	13.50	5.27	387 574	3.2	8.3	46.0	45.8
Vietnam	30 566	48.4	12.24	7.98	171 219	5.9	17.6	38.6	43.9
Total	142 186		9.60	6.40	2 395 253	5.2			

Source: ASEAN Trade Statistics Database as of 20 December 2013

Table 2: Country trade performance (2007-2013).

exports (from $79 billion US to $138 billion US). The largest contributions came from food, vegetable fats and oils. Beverages and tobacco had the largest rate of growth (151%).

Singapore has the largest export growth rate in ASEAN (152%), followed by the Philippines (113%) and Vietnam (105%). Among the four main groups of commodities (SITC 0, 1, 2, 4) the leadership is clearly determined (Figure 2). Indonesia and Malaysia dominate the exports of vegetable oils and fats; Singapore and Indonesia lead in beverage and tobacco; Thailand and Indonesia lead in crude materials; and Thailand in food with Vietnam catching up.

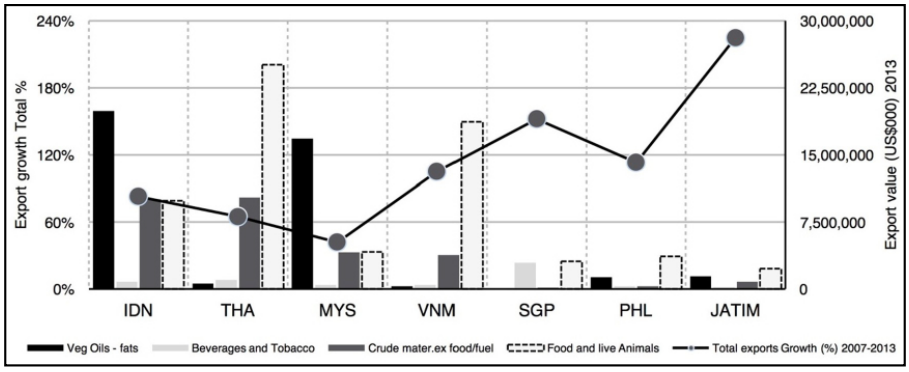
Figure 3 shows the number of commodities exported by each country based on status of comparative advantage, export specialization or both (status A). Thailand is the leader with 119 A goods while Indonesia ranks 2nd (97). JATIM (96) shows status A in 30 goods that do not reveal status A at country level, showing a benefit in looking at provincial data.

In terms of export specialization (TBI), Thailand ranks as the country with the largest number of specialized goods (233); Indonesia, Malaysia and Vietnam ranks 2nd, very near to each other in numbers but differing in the variety of goods. JATIM enjoyed specialization in 190 products, which were more various than Indonesia. RCA ranking follows the same pattern.

Analysis of comparative advantage of East Java (JATIM)

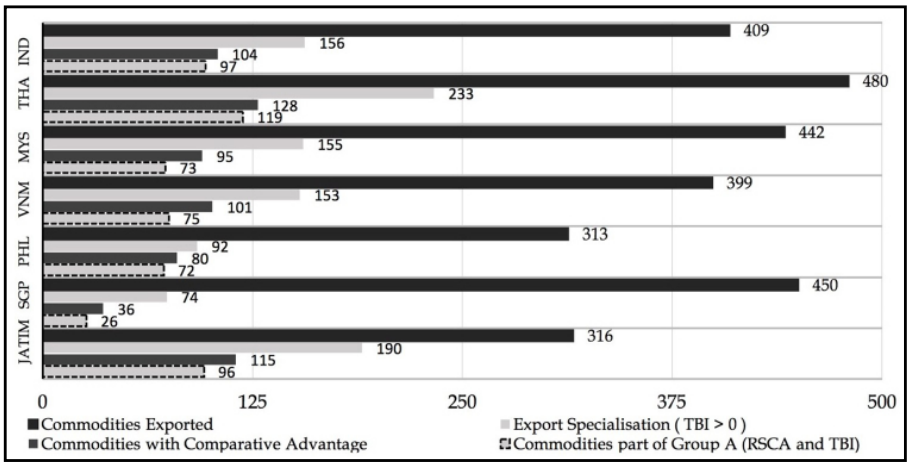
From 2007 to 2013 JATIM experienced a dramatic growth in agricultural exports of 180%. In 2013, JATIM exported 316 different agro-goods (12% more than in 2007) from which 115 enjoyed advantage, and 96 registered both advantage and specialization. Food was found very dynamic as it is the group with the largest number of goods with advantage and specialization, the largest contributor to exports and the largest new A goods (33); however, it also experienced the largest losses (25). Vegetable oils and fats represent 21% of exports (Table 3).

Table 3 shows the total percentage of commodities gaining or losing status A after 2007. While the number of goods is similar (33 – 34), the gains in value are much larger. The backbone of JATIM is



Source: WITS and BPS data (2007-2013) modified by author

Figure 2: Total value exports of agricultural goods (2013, $ 000) - at 1 SITClLevel - and total export growth (2007-2013).



Source: WITS and BPS data (2007-2013) calculated by author

Figure 3: Number of commodities exported, specialized, and with comparative advantage.

	RemainA from 2007-2013[a]		Gain A from 2007-2013[b]		Loss A from 2007-2013[c]		Non Status A (2013)[d]	
	Number Products	% Agro Exports	Number Products	% Agro Exports	Number Products	% Agro Exports	Number Products	% Agro Exports
Animal/veg oil/fat/wax	6	21%	6	6%	0	0%	10	0%
Beverages and tobacco	4	4%	1	0%	3	2%	11	2%
Crude mater.ex food/fuel	5	15%	8	1%	6	0%	43	0%
Food & live animals	48	41%	18	3%	25	2%	156	2%
Grand Total	63	81%	33	11%	34	4%	220	5%

Note: a) Remain A stands for commodities that kept export specialization and advantage (status A) for the whole period. b) Gain A commodities entered into A status during the period of analysis. c) Loss A indicates that a commodity lost status A during 2007-13. d) Non-A status indicates that the commodity never enjoyed status A

Source: WITS and BPS data (2007-2013) modified by author

Table 3: Number of commodities under Group A that remain-gain–loss status A JATIM.

composed by 63 goods representing 81% of exports and contributing to 82% of total growth in exports from 2007 to 2013 (Table 5). The group A (Remain A + Gain A) represents 92% of total agro-exports for JATIM and the new A goods (joining after 2007) added 17% to export growth. Those losing status A lowered its value exports by only 2%. These facts highlight the importance of the role of advantage-specialization in JATIM.

JATIM has also gained in its comparative advantage intensity over time (Table 4), with 89 commodity

groups enjoying strong comparative advantage (RCA > 3) in 2013 versus 69 in 2007. The largest contribution comes from food (60). All sectors (1-digit) registered improvement.

Features of export growth in ASEAN

All ASEAN members, except for Singapore and the Philippines, found the largest export share and largest contribution to exports growth from ***backbone*** products. Those goods grew more than 80% in their export value. For Indonesia, ***backbone*** goods represent 89% of total agro-exports and almost 99% of the total growth in exports (relative to 2007); Malaysia, Thailand, and Vietnam followed similar pattern. The region has depended very much in the same ***backbone*** goods since at least a decade ago. The change in ASEAN seems to be more in gaining specialization and competitiveness rather than shifting to new sectors.

The gain in exports from new commodity members of group A (gaining status A after 2007) has been far larger than the losses from products no longer competitive. JATIM lost 1% of exports from no longer A goods, but it gained 11% in exports value from new A products. Malaysia lost less than 1% and gained 15%, the Philippines lost 2% and gained 32%. This indicates that restructuring exports has offered far more gains than losses for ASEAN (Table 5).

Competition environment within ASEAN and JATIM

In food sector (SITC 4), JATIM enjoys the largest number of advantage-specialized goods (group A, 66) although it faces competition with Vietnam (31) and Thailand (29), as seen in Appendix 2. However,

	Weak CA (2>RCA>1)		**Medium CA** (3>RCA>2)		**Strong CA** (RCA>3)	
	2007	**2013**	**2007**	**2013**	**2007**	**2013**
Animal/veg oil/fat/wax	2	1	0	2	5	9
Beverages and tobacco	0	2	0	0	8	7
Crude mater.ex food/fuel	4	2	2	1	8	13
Food & live animals	28	11	10	7	48	60
Grand Total	**34**	**16**	**12**	**10**	**69**	**89**

Source: Authors calculation, WITS and BPS data (2007-2013)

Table 4: Number of commodities according to intensity of RCA in East Java.

	JATIM	IDN	MLY	PHL	SGP	THA	VNM*
Total expt 2013 ($ 000)	5 157 212	42 258 290	29 866 001	6 173 785	10 656 782	39 999 751	23 284 650
Total expt 2007 ($ 000)	1 844 808	23 608 380	20 458 038	3 134 117	5 819 319	24 769 726	11 290 952
Growth exports 2007-13 (%)	180%	44%	32%	49%	45%	38%	52%
Growth exp Group Fix A (07-13)	82%	92%	81%	55%	40%	85%	79%
Growth exp from New A (07-13)	17%	7%	14%	43%	38%	11%	14%
Loss exports (A Status, 07-13)	-1%	0%	0%	-2%	0%	-1%	-1%
Share of exports % (2013)							
- % commodities Group A	92%	96%	85%	91%	59%	92%	93%
-- % exports Group Fix A	81%	89%	82%	59%	34%	86%	79%
-- % exports New A	11%	7%	3%	32%	25%	6%	14%
- % from non-A commod	8%	4%	15%	9%	41%	8%	7%
Contribution exports Growth (07-13)							
- % From commodities group A	99%	99%	81%	98%	78%	96%	93%
- % from non-A commodities	1%	1%	19%	2%	22%	4%	7%

Note: [a] Fix A (07-13) commodities that remained Status A from 2007 until 2013; [b] New A: commodities that gained status A during the period of 2007-2013; [c] Loos A : products that loss status A during the period 2007-13.
[*] Data for Vietnam includes only until 2012.

Source: Authors calculation, WITS and BPS data (2007-2013)

Table 5: Agricultural export indicators in selected ASEAN countries.

the same group also includes those goods facing less competition.

In oils and fats (SITC 0), JATIM (12 A goods) faces strong competition with Malaysia (9) and the Philippines (8). However, there market is extra-ASEAN offering opportunities for cooperation as they dominate large share of global output. In tobacco (SITC 1) JATIM enjoys large advantage versus competitors offering opportunities for intra-ASEAN expansion. In crude materials (SITC 2) out of the 13 competitive goods in JATIM, it faces competition from the Philippines (7) but less with Malaysia and Thailand and almost non with the others.

In general terms competition among ASEAN countries is not that intense. For example (see Table 6 and Appendix 2) out of 73 commodities under group A in Malaysia, Indonesia enjoys the same status A in 31 of them (42%), the Philippines in 19 (26%), and Singapore in 9 (12%) giving a lot of room for expansion with most of them as the patterns are not clearly the same.

Malaysia faces a medium level of competition with Thailand and Indonesia in almost 30 products that they have in common. Thailand, Vietnam and Indonesia face a more aggressive competition since they have more than 40 common A status goods. Indonesia faces a medium level of competition with Malaysia and the Philippines. Singapore is the most diversified country in the region; it faces little competition with other ASEAN countries.

In 20 product groups JATIM does not face competition from ASEAN countries. However, this represents only 4% of total JATIM exports. In 34 goods JATIM has only one competitor within ASEAN (40% of exports). In 26 products there are two ASEAN countries competing with same goods (11% of exports). In 16 goods, it faces at least three competitors, equivalent to 37% of exports. This indicates a pattern in ASEAN agro-trade in which they share status A in strategic goods with at least one country but differing in less important ones.

Specialization and diversification

There are 13 product groups (3-digit SITC) in which JATIM enjoys advantage- specialization in more than 50% of the total sub-commodities (Table 7). In the remaining 52 groups in which JATIM enjoys status A, it covers less than 35% from total sub-products. Thailand, Vietnam and Malaysia follow a similar pattern with JATIM, but it is at lower degree of concentration since they spread along different categories in which they have relatively small share of sub-products with advantage-specialization. They cover more groups horizontally but less vertically. However, compared to the competition in 2007, the competition of JATIM versus ASEAN countries is now more pronounce. In 2007 only 3 out of 8 groups with more than 50% of sub-commodities enjoying A faced competition (see Appendix 2). By 2013, the number was of 7 out of 13. Interestingly, the main competitors of JATIM remain the same: Malaysia, Vietnam and Thailand.

	MYS	IDN	JATIM	PHL	SGP	THA	VNM	TOTAL A products /country
MYS		31	26	19	9	28	15	73
IND	31		66	33	9	42	42	97
JATIM	26	66		32	6	38	35	96
PHL	19	33	32		6	37	19	72
SGP	9	9	6	6		7	1	26
THA	28	42	38	37	7		43	119
VNM	15	42	35	19	1	43		75

Source: Authors calculation, WITS and BPS data (2007-2013)

Table 6: Competition JATIM A, V.S. ASEAN. Number of same commodities Class A.

	IDN	JATIM	MYS	PHL	SGP	THA	VNM
2013	13	13	9	7	2	11	10
2007	10	8	5	2	0	10	7

Source: Authors calculation, WITS and BPS data (2007-2013)

Table 7: Number of group categories (3-digit SITC) with more than 50% of total commodities under comparative advantage and export specialization (Group A).

In the last years ASEAN countries are becoming more vertically specialized rather than diversifying horizontally as previously. This new pattern adds more pressure and competition to JATIM, as well as among ASEAN countries. Comparative advantage enjoyed at industry level is helping specialization, supporting a rapid diversification towards sub-products and higher disaggregated level.

Backbone categories: Strong RCA and fix status as group A from 2007 - 2013

The share of exports under the backbone criteria is high for Indonesia (86%), JATIM (79%), Malaysia (75%), Thailand (80%), and Vietnam (77%); the share for the Philippines (56%) is considered as medium level and Singapore low (26%). ASEAN agro-exports are highly dependent on strong comparative advantage-specialization for success in exports. ASEAN has diversified only little in the last years, reinforcing advantage in few strategic goods rather than diversifying towards new products. It is noticeable that at provincial (JATIM) level RCA strengthened, while at country level (Indonesia) RCA weakened, indicating the benefits to look at lower aggregated level in sectors where RCA matters more (cost-volume) (Table 8).

Intra-ASEAN trade

Singapore is the only country that is more oriented towards ASEAN exporting more than 40% of its agro-goods. Other ASEAN members remain highly focused on extra-ASEAN trade (83%) often producing similar goods. Singapore also plays the role of trading hub connecting ASEAN with extra-ASEAN. The liberalization of trade in ASEAN has helped increase trade but has not changed the composition of markets (Table 9).

Analysis at country level: Indonesia

In 2013 Indonesia exported 409 different products (10% less than 2007) and enjoyed advantage in 102 of them (16% less than 2007). The loss was felt both in number of goods as well as in the intensity of the advantage, moving from 80 to only 68 products with high RCA.

From the total agro-exports in Indonesia (see Table 5), 96% comes from group A goods, with ***backbone*** exports responsible for 89% of agro-trade. In terms of exports growth, 92% came from backbone goods and 7% from new A ones. ***Backbone*** products are important both for trade success and expansion. In the other hand, it indicates that Indonesia's pattern of trade has not significantly changed

	Weak CA		Medium CA		Strong CA	
	2007	2013	2007	2013	2007	2013
IDN	23	20	19	16	80	68
JATIM	34	16	12	10	69	89
MYS	29	43	12	11	33	41
PHL	18	25	5	8	30	47
SGP	20	16	10	10	12	10
THA	47	50	23	16	64	62
VNM	30	11	10	8	65	54

Source: Authors calculation, WITS and BPS data (2007-2013)

Table 8: Degrees of comparative advantage 2007 and 2013 selected ASEAN countries.

Export from / to	IDN	MYS	PHL	SGP	THA	VNM	ASEAN	NON-ASEAN
IDN		4.80%	1.30%	3.60%	1.40%	1.60%	13.30%	86.70%
MYS	3.20%		2.00%	8.10%	3.20%	3.00%	20.20%	79.80%
PHL	2.30%	3.50%		2.60%	3.40%	1.60%	13.50%	86.50%
SGP	7.90%	13.80%	3.90%		5.70%	8.80%	42.00%	58.00%
THA	3.00%	5.10%	1.40%	1.50%		2.80%	16.50%	83.50%
VNM	1.10%	4.10%	2.00%	2.20%	1.60%		17.50%	87.10%
Share ASEAN	12.70%	25.50%	9.60%	19.60%	10.20%	14.30%	18%	82%

Source: Authors calculation, WITS and BPS data (2007-2013)

Table 9: Share of total agricultural exports to ASEAN countries and non-ASEAN.

into new (differentiated) agricultural products, but it has strengthened specialization in traditional goods. The loss of 25 A goods represents only 0.3% of value exports in 2013, while the 30 new ones give a 7% growth in exports. Openness has not resulted into dramatic losses but in important gains for the country.

Malaysia

Malaysia experienced more significant changes during the 2007-13 period than those of other partners. The number of commodities with advantage significantly increased from 21 to 95, most of which enjoyed high intensity (RCA>2). Malaysia also shifted its specialization to new varieties (lost 56 and gained 45). As a result, in 2013 Malaysia enjoyed 73 products with export specialization- advantage versus 60 in 2007, responsible for 85% of agro-exports and supporting 81% of growth in exports (Table 5). The contribution to trade expansion (14%) of new goods accounted for was far more than the losses (0.22%). The ***backbone*** groups of products are then strategic for Malaysia both as share from exports and as contribution to export expansion, but in a lower degree than that of other ASEAN partners. The growth is mainly vertical (within the same groups), and at a lower degree horizontal (new) (Figure 4).

Philippines

Exports of agricultural commodities in the Philippines recorded 49% growth from 2007 to 2013. The largest contribution comes from goods under group A (91% of agro-exports). The Philippines experienced a more dramatic change in specialization and in group A products than any other ASEAN partners. A total of 38 goods gained status A and only 7 groups lost their status as A. Half of the new products enjoyed strong RCA.

Most of the growth in exports was originated from group A (98% of growth share) indicating the importance of advantage-specialization for the Philippines. ***Backbone*** commodities account for almost 60% of total exports and are responsible for 55% growth of exports. However, versus other ASEAN countries, the Philippines relies more in new products rather than in backbone, contributing 32% to exports in 2013 and 43% of total exports growth. The country is diversifying but following the same pattern of advantage-specialization.

Singapore

The role of Singapore in agricultural exports is less important than most of the other ASEAN members. Only 26 products enjoyed advantage-specialization in 2013. However, Singapore exported 450 different agricultural goods, which were mainly differentiated and not under the pattern of advantage-specialization. 40% of total exports comes from products that neither enjoyed comparative advantage and/or export specialization, mainly differentiated products. However, 78% of growth in value exports came from group A goods. Singapore is less dependent on traditional products; they generate only 34% of exports. New A goods represent 25% of exports

Group C RSCA< 0 and TBI > 0				Group A RSCA and TBI > 0		
	# Products	% exports			# Products	% exports
IDN	214	2%	TBI 1	IDN	97	96%
THA	155	4%		THA	119	92%
MYS	130	4%	Highly Specialised	MYS	73	85%
VNM	78	2%		VNM	75	82%
SGP	221	18%		SGP	26	59%
PHL	194	3%		PHL	72	91%
JATIM	236	1%		JATIM	96	92%
Less Competitive				Highly Competitive		RSCA 1
RSCA -1						
IDN	227	1%	Less Specialised	IDN	7	0.4%
THA	262	2%		THA	9	1.7%
MYS	320	5%		MYS	22	5.3%
VNM	366	2%		VNM	26	13.7%
SGP	288	19%		SGP	10	4.2%
PHL	271	4%	TBI -1	PHL	8	3.0%
JATIM	194	1%		JATIM	19	6.3%
Group D RSCA < 0 and TBI < 0				Group B RSCA > 0 and TBI > 0		

Source: Authors modification from Widodo (2009) and APINDO 2013

Figure 4: Product mapping A-D ASEAN.

in 2013 and are responsible for 38% of export growth, meaning that the trade pattern of agricultural goods is dynamic and expanding towards new and differentiated goods.

Thailand

Agricultural exports in Thailand grew 38% from 2007 to 2013, with group A accounting for 92% of export value and responsible for 96% of export growth. Thailand has 92 groups of A products that remained the backbone of the country since 2007, accounting for 86% of total exports in 2013 and fostering exports in 85%. New A commodities (27) represented only 6% of agro-trade in 2013 and were responsible for 11% of export growth, meaning that they play a less important role in defining export-pattern, relative to ASEAN.

Versus other ASEAN countries, a large number of the goods exported (230) were highly specialized. The structure of commodities according to the intensity of comparative advantage (weak, medium, high) remained relatively the same from 2007 to 2013 (see Table 8).

Vietnam

Agricultural exports in Vietnam experienced the largest growth 52% in ASEAN from 2007 to 2012. Group A gave the largest contributor to exports value (93%) and fostered export growth by 93% in the same period, with 73% originated by backbone commodities. The new members of group A contributed with 14% in value trade, a good contribution to exports.

Vietnam has experienced a strong change in the groups of goods with Status A, with 54 that remained competitive, 39 gain A, and 24 lost status. Backbone goods generated 41% gain in exports, while new group A goods gave additional 7% in exports.

General analysis based on groups A, B, C, D and inter-temporal changes

During the period of analysis there were significant shifts of goods across quadrants. Group B (comparative advantage but less specialized), have the potential to turn into A products if volume escalates and the net-import status is turned into net-export. B goods are less commoditized, value-added becomes more relevant and differentiation matters. Indonesia exports only 0.4% of products under this B status. However, Vietnam exported 13.7% of its total agro exports. On the other hand, the number of products moving from A to B from 2007 to 2013 was small (25) for the whole ASEAN, while 45 moved from group B to A, indicating that B is not the main channel to move goods towards status A.

Group C includes products with lower comparative advantage but highly specialized. These products ordinarily are differentiated where volume is not the main characteristic. Singapore reports a much larger number of products under C status versus ASEAN countries, indicating a pattern in which differentiation and value-added are more relevant. The number of C products in ASEAN is large, but the share of exports is rather small. As countries become more vertically specialized (more value-added and products further processed), it is expected that some of the goods might move from group D to group C, or from group C to group A. For ASEAN case, most of the losses of A status were goods moving from A to C, meaning that the region experienced a loss in specialization rather than a loss in competitiveness. This might be positive if the differentiation leads to more value-added, but the share in exports is too small. On the other hand, the number of goods moving from C to A was large (74). The largest number of new A goods came from C group, indicating a common path towards A.

Group D played an important role as many goods (73) moved from D to A during 2007-2013. The largest shifts happened from quadrant D to C (825), meaning that it is rather easier for countries to gain in specialization than in competitiveness. It also points out a common path towards A. The second largest movement of goods was from group C to A (74).

The analysis indicates three periods of average growth in exports of 33%: from 2007-08, 2009-10 and 2010-11. On average, however, exports fell -17% from 2008 to 2009 and -8% from 2011 to 2012. Both the expansion and contraction of exports were led by group A goods which tend to concentrate in few strategic products, indicating high-risk to changes in prices. Based on the FAO food price index, positive export expansion of JATIM and ASEAN coincided with the rising Food Price Index (FPI) from 89.6 points in 2002 to 201.4 in 2008. However, a sharp decrease in the Index in 2009 from a peak of 201.4 to 160.3 coincided with a significant decrease in ASEAN exports. After a two-year period of strong recovery (a record Food Price Index in 2011 of 229.9) a second period of falling in prices occurred in 2011-13.

Comparison versus other empirical studies

Compared to other empirical studies on changes in comparative advantage as in Yuea and Hua (2002), Lee (1995), the findings in this study somehow differ mainly in four aspects: 1) the advantage did not significantly shifted to new sectors, but rather strengthened in backbone ones; 2) changes in composition of trade were not among the main reasons for trade expansion but rather a strengthening of advantage within group A; 3) relocation of resources from non-competitive to a competitive products is presumably based on productivity basis, while in this case gains are also associated with prices, endowments and demand; 4) the largest contribution to exports mainly belongs to a single quadrant of goods (A) with low share in exports by the other groups (B, C, D) typically important in manufacturing.

The findings are congruent with Ramos-Francia (2011) in which factor endowments (natural resources) have stronger influence in RCA. Versus Oladipo and Vasquez G (2009), De Hoyos and Lacovone (2013) coincides with liberalisation supporting scale, improvements in RCA and expansion. As presented by Huang and Chen (1999), it is possible that the liberalization placed pressure on non-competitive goods, which are in fact exported in relatively low volumes, allowing the most productive ones to gain strength and to spread to related sub-products. It is also in line with Korinek and Melatos (2009) who found that traditional patterns and ties were important determinants of trade flow, as this study finds that ASEAN agricultural trade pattern relies on traditional ***backbone***. The facilitation of trade through AFTA had changed little in terms of destinations as well as product diversification. On the other hand, Agro imports from non-ASEAN members had also increased under full implementation of FTA in line with some studies in trade diversion, e.g. Yang and Martínez Zarzoso (2014). The large increase in agro exports under the same goods might be due to the trade creation effect noted by Schaak et. al (2015) and Yang and Martínez Zarzoso (2014). They also found mix results in trade diversion effects with respect to exports.

While Esquivias and Heriqbaldi (2013) found more significant changes in advantage within manufacturing sector in Indonesia, less dramatic changes are found within agriculture sector. As transportation and logistic cost represent a significant component of ASEAN agro-trade flows as noted by Korinek and Melatos (2009), it is expected that AFTA will have large interaction within China (13.6%), India (6.3%) and the other ASEAN +6 members (representing all-in-all more than 55% of total agricultural exports).

Conclusion

The six largest ASEAN agricultural exporters, plus East Java, have experienced an important growth in agro-exports since 2007. Thailand, Indonesia, and Malaysia are the leaders in agricultural exports, with Vietnam catching up. A common feature is that the most significant contribution to export value (87%) and exports growth (92% on average) has come from commodities enjoying comparative advantage and export specialization (denoted as group A). Improvements in productivity and the increasing production capacity will allow the strengthening advantage (cost) and specialization (volumes and scales) for agribusiness.

All countries have lost some commodities under group A during the sample period (2007-2013). However the gains coming from new A commodities is far bigger. Exports have shrunk by an average of 1% due to losses on comparative advantage-specialization, while new products (group A) grew at an average of 21%, meaning that the strengthening of advantage-specialization has highly contributed to export growth. ASEAN and JATIM have grown vertically (within competitive-specialized products) rather than horizontally (new varieties).

The region remains highly focused on non-ASEAN markets (82 % exports share). However, competition among ASEAN countries and East Java has become more aggressive in some key goods, experiencing higher levels of concentration in competitiveness-specialization within particular groups. As some commodities across ASEAN enjoy very high levels of competitiveness-specialization, there are opportunities for coordinated efforts rather than cannibalizing competition for foreign markets.

The number of goods in which competition is weak or null is large. Malaysia, Thailand and Indonesia are facing medium level of competition. With the rest of the countries, they will have opportunities for trade expansion. Singapore is more diversified and faces little competition within the region. Thailand, Vietnam and Indonesia face stronger competition. 56% of the goods, in which JATIM enjoys advantage-specialization, faces low or null competition. 27% of products within group A

faces 2 competitors, and 17% (representing 37% of export) faces more than 3 countries. There are high opportunities for expansion within the region. A stronger focus within ASEAN will allow growth in agro exports, especially in new differentiated goods and in those in which there is currently little competition.

The pattern of trade towards new varieties and destinations has changed little in most of the ASEAN countries. The pattern has strengthened into the traditional products (***backbone***, enjoying status A since 2007) and slowly introduced new ones.

The use of a more disaggregated data - East Java -, rather than national data - Indonesia - allows the researcher to identify more clearly the patterns of trade, opportunities and challenges for the region. JATIM, when considered in itself, is more competitive than using the sample of Indonesia as proxy for the whole country.

Gains appear to be far larger than losses due to international trade and opportunities for trade expansion are large, giving incentives for countries to seek how to penetrate new markets rather than to enclose themselves in anti-trade policies. However, the development of new industries seems to demand more than business as usual efforts. As space is limited, detailed information on products that have the potential for trade both intra-ASEAN and towards extra-ASEAN are available upon request.

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Appendix

	IDN	JATIM	MYS	PHL	SGP	THA	VNM
Animal/veg oil/fat/wax	10	12	17	9	3	7	5
Animal oil/fat	0	1	1	1	1	0	1
Animal/veg oils procesd	4	5	6	3	0	3	1
Fixed veg oils/fats	6	6	10	5	2	4	3
Beverages and tobacco	5	5	2	5	5	2	0
Beverages	0	1	1	0	4	2	0
Tobacco/manufactures	5	4	1	5	1	0	0
Crude mater.ex food/fuel	17	13	20	17	3	19	10
Crude/synthet/rec rubber	3	4	4	3	2	6	3
Textile fibres	8	6	5	8	0	10	5
Other	6	3	11	6	1	3	2
Food & live animals	65	66	34	41	15	91	60
Coffee/tea/cocoa/spices	18	15	10	1	8	5	13
Fish/shellfish/etc.	20	22	3	12	1	19	19
Vegetables and fruit	10	11	4	15	0	24	17
Other	17	18	17	13	6	43	11
Grand Total	97	96	73	72	26	119	75

Source: Authors calculation, WITS and BPS data (2007-2013)

Appendix 1: Number of products under A category (1-2 SITC) in selected countries ASEAN (2013).

	Product group (1 SITC Level)	JATIM	IDN	MLY	PHL	SGP	THA	VNM	TOTAL
JATIM	Animal/veg oil/fat/wax		9	9	8	0	5	0	12
	Beverages and tobacco		3	0	2	1	0	0	5
	Crude mater.ex food/fuel		7	5	7	1	4	4	13
	Food & live animals		47	12	15	4	29	31	66
IND	Animal/veg oil/fat/wax	9		8	5	0	5	0	10
	Beverages and tobacco	3		0	3	1	0	0	5
	Crude mater.ex food/fuel	7		7	5	1	9	8	17
	Food & live animals	47		16	20	7	28	34	65
MLY	Animal/veg oil/fat/wax	9	8		7	0	6	2	17
	Beverages and tobacco	0	0		0	0	1	0	2
	Crude mater.ex food/fuel	5	7		3	1	7	3	20
	Food & live animals	12	16		9	8	14	10	34
PHL	Animal/veg oil/fat/wax	8	5	7		0	3	1	9
	Beverages and tobacco	2	3	0		1	0	0	5
	Crude mater.ex food/fuel	7	5	3		1	6	4	17
	Food & live animals	15	20	9		4	28	14	41
SGP	Animal/veg oil/fat/wax	0	0	0	0		0	0	3
	Beverages and tobacco	1	1	0	1		0	0	5
	Crude mater.ex food/fuel	1	1	1	1		1	0	3
	Food & live animals	4	7	8	4		6	1	15
THA	Animal/veg oil/fat/wax	5	5	6	3	0		1	7
	Beverages and tobacco	0	0	1	0	0		0	2
	Crude mater.ex food/fuel	4	9	7	6	1		7	19
	Food & live animals	29	28	14	28	6	35		91
VNM	Animal/veg oil/fat/wax	0	0	2	1	0	1		5
	Crude mater.ex food/fuel	4	8	3	4	0	7		10
	Food & live animals	31	34	10	14	1	35		60

Source: Authors calculation, WITS and BPS data (2007-2013)

Appendix 2: Competition within ASEAN Members and JATIM (number of same A products).