

The Importance of Intra-Industry Trade between ASEAN-7 and the Pacific Alliance: A Mechanism to Strengthen Economic Integration and Expanding Trade Across the Pacific.

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Abstract

The trade between Latin America and Asia has been rapidly increasing over the last years, due to the growing commercial interdependence with Asian economies such as China, Japan and South Korea. However, there is still some room for expanding trade and economic cooperation with South East Asia where Latin American products could play an important role in the production networks. This paper explains the importance of the intra-industry trade between the seven ASEAN members of APEC and the members of the Pacific Alliance. The ITT was measured using the trade-weighted Grubel-Lloyd index based on the SITC rev.4 for the commerce among these regions between 2005- 2009. The economic sectors in this analysis include the agro-based, rubber-based, wood-based products, fisheries, health-care, automobile, textile and garments, electronics, and ICT industries.

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The GLI allowed the identification of sectors where there is evidence of ITT among ASEAN-7 and the PA and the trade relation that have the potential to become ITT. These results are relevant in the light of the identification of opportunities to expand trade and straighten the production linkages among APEC members and also because of the importance that SMEs play in the intra-industry trade.

Introduction

The transpacific dimension of APEC has become a major issue in recent years as a result of the economic transformation in Asia and the Americas. Some of the changes that have shaped this evolution include the impact that the U.S. economic downturn had in the world economy, which redefined the economic and political linkages between the two regions; the proliferation of free trade agreements and other trade liberalization initiatives intended to boost trade across the Pacific; and the increasing trade between Asia and Latin America.

The economic crisis evidenced the trends of greater international involvement of emerging economies, particularly in Asia Pacific and Latin America. Most of the economies in Asia and Latin America have overcome the economic crisis and are showing signs of strong growth, while other regions such as North America and Europe are still struggling their way out. While Latin America was also hit by the global economic crisis, this time the region has been able to withstand the severe external shock, coming back on track to achieve a solid recovery ahead of other regions. Furthermore, Latin America became an interesting partner for Asia and other countries throughout the world.

It is within this framework that the relation between Asia and Latin America becomes a core issue for the strengthening regional economic integration and expanding trade among APEC members.

The trade between Latin America and Asia has been rapidly increasing in recent years, mainly due to the booming trade with East Asia. Nonetheless, there are still opportunities

for trade expansion and economic cooperation with South East Asia where Latin American products could play an important role in the production networks.

This paper focuses in the analysis of the intra-industry trade (ITT) between the seven ASEAN members of APEC (hereinafter ASEAN-7)² and the members of the Pacific Alliance (hereafter PA)³. This analysis is aimed at identifying the economic sectors with high potential for intra-industry trade between these two regions. The understanding of this potential is important in the light of the capacity of these sectors to generate effective productive linkages between the two regions. Likewise, the identification of trade patterns is particularly important with a view to identify useful complementary elements for the future consolidation of the PA.

Methodological Approach

The discussion on intra-industry trade is mainly based on the works of Leontief (1954), Verdoorn (1960), Balassa (1963) and Grubel and Lloyd (1975), among others. The intra-industry trade (IIT) is defined as one that occurs "if a country simultaneously imports and exports similar goods and services" (Van Marrewijk, 2009). Within this definition, it is necessary to differentiate between two types of IIT: vertical IIT and horizontal IIT (Greenaway, Hine and Milner, 1995). Horizontal intra-industry trade refers to the simultaneous import and export of goods classified in the same industry and at the same level of processing (Van Marrewijk, 2009). Vertical intra-industry trade is characterized by a two-way exchange of goods classified in the same industry but with different levels of processing (Van Marrewijk, 2009).

Some of the studies that have analyzed the intra-industry trade between Latin America in the past include works by Moneta (1995), which places particular emphasis on trade relations between Mercosur and the economies of East Asia; and more recently the report

² ASEAN-7 Includes ASEAN members also in APEC: Brunei Darussalam, Indonesia, Malaysia, Philippines, Singapore, Thailand and Vietnam.

³ The Pacific Alliance or *Alianza del Pacífico* in Spanish was initially known as *Acuerdo de Integración Profunda* AIP. Currently, the Pacific Alliance members are: Mexico, Colombia, Chile and Peru.

published by ECLAC (2010), which analyzes the potential for intra-industry trade between China and Latin America.

For the purposes of this research, the ITT was measured using the trade-weighted Grubel-Lloyd index based on the Harmonized Commodity Description and Coding System (HS Re. 2002). This analysis considers the trade among the PA and ASEAN-7 members in the period comprised between 2005-2009. The economic sectors included in this analysis are based on the criteria suggested by Austria (2004) and Wattanapruttipaisan (2008). These sectors are: agro-based, automobile, electronics, fisheries, healthcare supplies, ICT, rubber-based, textile and garments, and wood-based products.

For the assessment of intra-industry trade among members of PA and ASEAN-7 economies the weighted Grubel-Lloyd Index (GLI) (Equation 2) is used:

$$\text{Equation 1. } SimpleGLI = \frac{\sum |X_{kij} - M_{kij}|}{\sum (X_{kij} + M_{kij})}$$

$$\text{Equation 2. } WeightedGLI = (GLI_k \times S_k)$$

Where X_{kij} and M_{kij} are the exports and imports of the product or group k of country i to/from country j in a given year or period, respectively. The weighted method takes into account the proportion exported and/or traded at the level of each group k considered. Thus S_k is the weight of each product group in total exports and imports of each country's specific sector (see table 1).

Table1: IIT Levels interpretation

Level 1	$GLI > 0,33$	Evidence of IIT
Level 2	$0,10 \leq GLI \leq 0,33$	Potential of IIT
Level 3	$GLI < 0,10$	Inter-industrial relations

Source: Duran and Alvarez (2008).

1. Trade Characteristics between ASEAN-7 and PA in Selected Sectors

The Asia-Pacific Economic Cooperation (APEC) was established in 1989 including 12 members. Among the participants were Singapore, Thailand, Indonesia, Philippines, Malaysia and Brunei that were already members of ASEAN. Later, in 1997 Vietnam⁴ joined the forum. In 1993, Mexico⁵ was the first Latin American country to become a member of APEC, followed later by Chile in 1994 and Peru in 1997. Colombia has manifested its interest to become but its accession has not been possible due to multiples moratoriums imposed on new members in 1993, 1997 and 2003.

The growing trade between Asia and Latin America has been widely discussed in academic circles and within institutions such as ECLAC⁶, ADB⁷ and authors such as Roldán (2010). They argue that the proliferation of Free Trade Agreements (FTAs) among APEC member economies has been the result of several factors such as the slow liberalization of trade, both within the WTO and APEC, the growing interest of Asia, and particularly of China in Latin America's natural resources, the identification of potential access of Asian products to Latin America markets in recent years, and the conclusion of investment protection agreements among the economies in both regions (ECLAC 2009, Roldán, 2010).

APEC meetings have been an appropriate scenario to strengthen trade relations between Latin America's APEC members and some Asia-Pacific countries. For instance, Mexico already has an Economic Partnership Agreement with Japan and its negotiating a Free Trade Agreement with Korea. Chile currently has nine Free Trade Agreements with countries in Asia Pacific such as: Japan, China, Korea, Australia, New Zealand, Brunei and Singapore, Malaysia and Vietnam; and it is negotiating with Thailand. Peru has Free Trade Agreements with China and Singapore; recently signed an agreement with Korea, and it is negotiations with Japan and Thailand. Colombia is trying to close its foreign policy to Asia; in 2009 it started negotiations with Korea, and is currently moving forward with other Asian countries such as Japan and Singapore.

⁴ Vietnam became an APEC member with Peru and Russia.

⁵ Mexico joined APEC with Papua New Guinea.

⁶ ECLAC: Economic Commission for Latin America and the Caribbean.

⁷ ADB: Asian Development Bank.

As an evidence of the effects of these agreements, the evaluation of the Bogor goals in 2010 proved that the trade among APEC members has grown steadily in recent years. As reported in APEC Yokohama Leader's statement in 2010, APEC trade in goods with the world increased at an annualized rate of 7.1%, reaching US\$11.4 trillion in 2009. The nominal value of trade in commercial services in the APEC region also increased at an annualized rate of about 7%, reaching a total of US\$2.4 trillion in 2009. Moreover, since 1994, the 2010 economies have reduced their tariffs significantly, with the simple average applied tariff rate falling from 8.2% in 1996 to 5.4% by 2008, well below the world average of 10.4% (APEC, 2010).

This increase is explained by trade liberalization in both regions and the establishment of FTAs between some APEC's member economies. The Latin American economies that participate in APEC, namely Chile, Mexico and Peru, have not been unaffected by these trends. Asia Pacific economies have become important trade partners for these countries and as members of APEC they have been at the forefront of strengthening political relations and cooperation between Asia and Latin America.

In the context of the booming trade between Asia and Latin America, some multilateral liberalization initiatives have also flourished. One of the most notable examples is the Trans-Pacific Strategic Agreement signed in 2005 by Brunei Darussalam, Chile, New Zealand and Singapore. Other APEC members such as Australia, Malaysia, Peru, United States, and Vietnam are negotiating their accession to this initiative. Other examples include the Latin American Pacific Arc⁸, created in 2007 to strengthen the commercial relations among the countries in the Latin American Pacific Rim in order to enhance regional influence in Trans-Pacific issues.

The most recent example is the Pacific Alliance created in 2011. This initiative brings together the most dynamic economies in the Latin American Pacific Rim: Chile, Mexico, and Peru (APEC Latin American members), and Colombia (currently lobbying for membership). This group was established as a strategic mechanism to integrate their markets and improve their foothold in Asia and other international markets. The Pacific

⁸ The Latin American Pacific Arc is known as *Arco del Pacífico Latinoamericano* in Spanish.

Alliance was first proposed by Alan Garcia, the former president of Peru, in 2010 based on the growing affinity between a set of countries all betting on market economies, foreign investment and trade with Asia to achieve development. These four countries, whose populations add up to over 200 million, account for approximately one-third of Latin America's total GDP and over half its exports to the rest of the world, with Mexico contributing the greatest share (World Bank, 2011).

The PA agreement is an extensive economic integration pact aiming to facilitate the free movement of goods, services, capital, and people between the member states. Some of the initiatives include:

1. To complement its members bilateral pacts and membership to other Pacific trade treaties such as the Asia-Pacific Economic Cooperation (APEC) and eventually the Trans-Pacific Partnership (TPP).
2. To prompt stronger competition through greater economies of scale.
3. To establish a strategic plan to share trade offices (Proexport Colombia, Prochile and Promperu) in Asia in order to strengthen the trade front and to share experiences in promoting exports and attracting tourism and foreign investment.
4. To develop plans aimed to merge Chile, Colombia, and Peru stock exchanges to create the Integrated Latin American Market (known as MILA).⁹

The Pacific Alliance also serves the purpose of consolidating the relationship between Asia and Latin America. The four members of PA have a huge potential to integrate their markets and products with Asian economies. Some of the most developed members of ASEAN-7 such as Singapore, Malaysia, and Thailand could become important trade partners of PA in the future. Furthermore, ASEAN free trade area has identified key economic sectors within the group that could have complementary elements with the PA in the future.

⁹MILA: *Mercado Integrado Latinoamericano* in Spanish.

Despite the fact that the share of PA trade with ASEAN-7 members is less than 4%, the Pacific Alliance trade with ASEAN-7 members has been growing steadily for the last five years. While PA total exports to the world grew 16.8% from 2005 to 2009, PA exports to ASEAN-7 increased 52%, from US\$ 1,332 million to US\$ 2,024 million in the same period. PA imports from ASEAN-7 also increased from US\$ 10,810 million to US\$ 11,734 million between 2005 and 2009 (see table 2).

Table 2: Pacific Alliance Trade with the World, APEC and ASEAN-7 (US\$ million)

Exports	Exports 2005	Exports 2009	% of total PA Exports 2005	% of total PA Exports 2009	Variation 2005- 2009 (%)
PA to the World	293,777	343,035	100%	100%	16.80%
PA to APEC	240,403	267,281	81.80%	77.90%	11.20%
PA to ASEAN-7	1,332	2,024	0.50%	0.60%	52.00%

Imports	Imports 2005	Imports 2009	% of total PA Imports 2005	% of total PA Imports 2009	Variation 2005- 2009 (%)
PA from the World	288,260	331,579	100%	100%	15.00%
PA from APEC	211,591	245,241	73.40%	74.00%	15.90%
PA from ASEAN-7	10,810	11,734	3.80%	3.50%	8.50%

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

From 2005-2009, ASEAN-7 countries exported an average of US\$ 5,150.75 million to the Pacific Alliance, while imports from this region accounted for US\$ 2,478.28 million. Mexico is the largest destination for ASEAN-7 exports with US\$ 3,839.36 million, followed by Chile US\$ 611.51 million, Colombia US\$ 432.24 million and Peru US\$ 267.64 million. ASEAN-7 exports to Mexico mainly come from Singapore, Malaysia

and Thailand. Thailand is the main exporter to Chile, Colombia and Peru. Mexico is the main source of imports with US\$ 1,233.66 million, followed by Chile US\$ 896.29 million. The main ASEAN-7 importers from PA are Singapore, Thailand and Malaysia. Brunei's trade with PA is fairly small (see table 3).

Table 3: Trade between ASEAN-7 and PA 2005-2009 (US\$ millions)

Exports to Pacific Alliance	Chile	Colombia	Mexico	Peru	Total
ASEAN-7	611.51	432.24	3,839.36	267.64	5,150.75
<i>Brunei Darussalam</i>	0.03	0.01	0.15	0.01	0.20
<i>Indonesia</i>	139.41	97.82	353.25	41.08	631.56
<i>Malaysia</i>	82.00	61.58	1,120.52	57.24	1,321.34
<i>Philippines</i>	30.80	3.91	147.37	10.41	192.49
<i>Singapore</i>	65.61	51.30	1,178.46	25.04	1,320.41
<i>Thailand</i>	233.04	185.37	713.02	114.17	1,245.60
<i>Vietnam</i>	60.62	32.25	326.59	19.69	439.15

Imports from Pacific Alliance	Chile	Colombia	Mexico	Peru	Total
ASEAN-7	896.29	139.43	1,233.66	208.90	2,478.28
<i>Brunei Darussalam</i>	-	-	0.56	-	0.56
<i>Indonesia</i>	199.94	7.31	92.60	34.14	333.99
<i>Malaysia</i>	175.94	4.40	230.37	8.26	418.97
<i>Philippines</i>	57.59	8.04	53.06	33.80	152.49
<i>Singapore</i>	156.30	100.68	555.39	15.11	827.48
<i>Thailand</i>	206.10	14.97	250.06	65.46	536.59
<i>Vietnam</i>	100.42	4.03	51.62	52.13	208.20

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

The main exporting sectors from ASEAN-7 to PA are: ITC with US\$ 1,973.69 million, followed by electronics US\$ 592.03 million, the textile and garments with US\$

457.08million, and the automobile sector with US\$ 379.73 million. The main ASEAN-7 importing sectors from PA are: ITC with US\$ 674.12 million, followed by agro-based sector with US\$ 234.71 million, electronics with US\$ 137.82 million and the wood-based sector with US\$ 122.64 million (see table 4).

Table 4:ASEAN-7 and PA trade, average 2005-2009 (US\$ millions)

	ASEAN-7 exports to PA by Sector	ASEAN-7 imports from PA by Sector
<i>Agro-based</i>	138.96	234.71
<i>Automobile</i>	379.73	40.9
<i>Electronics</i>	592.03	137.82
<i>Fisheries</i>	47.03	97.18
<i>Healthcare</i>	75.56	31.35
<i>ICTs</i>	1,973.69	674.12
<i>Rubber-based</i>	230.25	4.43
<i>Textile and Garments</i>	457.08	26.8
<i>Wood-based</i>	69.19	122.64
Total	3,963.53	1,369.95

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

These figures confirm the hypothesis that ASEAN-7 exports value added products to Latin America, whereas the latter's export basket is basically composed by raw materials, despite the notable ITC trade.

The trade patterns between the two regions in the above-mentioned sectors are evidenced in Table 5. Mexico is the main export destination for ASEAN-7 in almost all sectors. This situation is to some extent explained due to the size of the Mexican economy vis-à-vis the other members of the PA. In the automobile sector, the contributions of exports to PA are very similar, being Chile and Colombia their main destinations.

As for ASEAN-7 imports from PA, Mexico is the most important partner in the automobile, electronics, healthcare, ICT, rubber-based, and textile and garments sectors. Chile is the

most important supplier of wood-based products, fisheries and agro-based products for ASEAN-7. Peru is an important source of agro-based products and textile and garments, while Colombian products seem not to be very relevant for ASEAN-7 with the sole exception of the healthcare sector (see table 5).

Table 5: Share of ASEAN-7 trade with PA by Sectors

ASEAN-7 Exports to PA average 2005 -2009	Mexico	Chile	Peru	Colombia
Agro-based	56.3%	25.7%	9.8%	8.1%
Automobile	26.5%	28.4%	16.9%	28.2%
Electronics	92.0%	3.4%	2.6%	1.9%
Fisheries	89.5%	1.2%	0.4%	8.9%
Healthcare	83.9%	3.9%	2.7%	9.5%
ICT	87.4%	5.0%	3.2%	4.5%
Rubber-based	49.7%	14.3%	10.0%	26.0%
Textile and Garments	70.4%	11.7%	4.7%	13.2%
Wood-based	67.0%	11.4%	13.5%	8.0%

ASEAN-7 Imports from PA average 2005 -200	Mexico	Chile	Peru	Colombia
Agro-based	16.2%	42.2%	39.2%	2.4%
Automobile	85.8%	13.9%	0.0%	0.2%
Electronics	99.8%	0.2%	0.0%	0.0%
Fisheries	17.6%	76.3%	5.1%	1.0%
Healthcare	88.2%	2.4%	0.6%	8.8%
ICT	98.4%	0.6%	0.3%	0.7%
Rubber-based	85.0%	12.5%	0.2%	2.3%
Textile and Garments	81.1%	1.7%	14.2%	3.1%
Wood-based	3.3%	95.6%	0.4%	0.6%

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

2. Intra-Industry trade analysis by priority sectors

2.1. Agro-based sector trade between ASEAN-7 and PA

The agro-based sector generally shows small evidence of intra-industry trade due to its low levels of value added. In this sector, ASEAN-7 exports to PA reached an average of US\$ 138.96 million between 2005-2009, while ASEAN-7 imports from PA accounted for US\$ 234.71 million during the same period (see table 4).

Most of ASEAN-7 exports go to Mexico with 56.3%, followed by Chile with 25.7%. Imports from PA come mainly from Chile with a share of 42.2% and Peru with 39.2%, Mexico accounts for 16.2% and Colombia for only 2.4% (see table 5). With some exceptions, agro-based trade between the two regions is represented by inter-industrial relations. According to the weighted Grubel-Lloyd Index, only relations between the Philippines-Chile (GLI=0.14) and Vietnam-Colombia (GLI=0.14) have some intra-industry potential¹⁰ (see table 6).

Table 6: ASEAN-7 and PA Agro-based Intra-industry Trade Index

GLI-W	Mexico	Chile	Peru	Colombia
Brunei	0.00	0.00	0.00	0.00
Indonesia	0.02	0.04	0.00	0.02
Malaysia	0.02	0.08	0.01	0.00
Philippines	0.00	0.14	0.01	0.00
Singapore	0.01	0.00	0.01	0.04
Thailand	0.03	0.09	0.00	0.04
Vietnam	0.00	0.00	0.00	0.14

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

¹⁰Detailed statistics show specific products such as: coconut (HS0801), coffee (HS0901), tea (HS 0902) and juices and extracts from fruits (HS 1302). This information was compiled by the authors from the trade statistics database of selected countries at the HS-4 level for the period 2005-2009.

2.2. Automobile sector trade between ASEAN- 7 and PA

In the automobile sector, the ASEAN-7 economies have an important trade surplus with PA members. The ASEAN-7 automobile exports to PA averaged US\$ 379.73 million between 2005-2009, while its imports from PA accounted for only for US\$ 40.90 million. This difference explains the low intra-industry levels (see tables 4).

The ASEAN-7 members mainly export to Chile 28.4%, Colombia 28.2%, Mexico 26.5% and Peru trails behind with a share of 16.9%. Mexico, with 85.8%, is the main country of origin for ASEAN-7 automobile imports within PA, followed by Chile with 13.9% (see table 5).

Only the trade relation between Thailand-Mexico (GLI= 0.48) provides with evidence of intra-industry trade. There is an intra-industry potential¹¹ between Philippines-Peru (GLI=0.28) and Malaysia-Chile (GLI=0.20). In the remaining cases, trade between ASEAN-7 and PA is inter-industry (See table 7).

Table 7: ASEAN-7 and PA Automobile Intra-industry Trade Index

GLI-W	Mexico	Chile	Peru	Colombia
Brunei	0.00	0.00	0.00	0.00
Indonesia	0.01	0.03	0.00	0.00
Malaysia	0.04	0.20	0.00	0.00
Philippines	0.01	0.00	0.28	0.09
Singapore	0.06	0.06	0.00	0.01
Thailand	0.48	0.00	0.00	0.00
Vietnam	0.00	0.00	0.00	0.00

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

¹¹ Products such as automobile parts (HS 8708) and (HS 8714).

2.3. Electronics sector trade between ASEAN-7 and PA

In the electronics sector, ASEAN-7 economies have a trade surplus with the PA economies. South East Asia countries exported an average of US\$ 592.03 million from 2005-2009, compare with US\$ 137.82 million imports from PA economies (see table 4). Mexico is the main export destination and the most important source of imports for ASEAN-7 (see table 5).

The electronics sector is a value added sector. Along with this, the electronics sector has a big potential to develop intra-industry trade. The results obtained support this statement, because relations between Vietnam-Mexico (GLI=0.90), Indonesia-Mexico (GLI= 0.54), Thailand- Mexico (IGL=0.53), Singapore-Mexico (GLI=0.40) show high evidence of intra-industry trade¹² (See table 8).

Table 8: ASEAN-7 and PA Electronics Intra-industry Trade Index

GLI-W	Mexico	Chile	Peru	Colombia
Brunei	0.000	0.00	0.00	0.00
Indonesia	0.54	0.00	0.00	0.00
Malaysia	0.18	0.00	0.00	0.00
Philippines	0.10	0.01	0.00	0.00
Singapore	0.40	0.11	0.04	0.02
Thailand	0.53	0.00	0.00	0.01
Vietnam	0.90	0.00	0.00	0.00

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

¹²Products such as air and vacuum bombs (HS 8414), refrigerators and freezers (HS 8418), and automatic data processing machines (HS 8471).

2.4. Fisheries sector trade between ASEAN-7 and PA

The ASEAN-7 economies exported an average of US\$ 47.4 million from the fisheries sector to the Pacific Alliance members from 2005 to 2009, while importing US\$97.18 million during the same period, thus running a trade deficit (see table 4).

Mexico with 89.5% is the main destination for fisheries sector exports from ASEAN-7 countries followed by Colombia 8.9%. Chile is the main fisheries sector supplier for ASEAN-7 with 76.3% followed by Mexico with 17.6% (see table 5).

Fisheries sector by nature shows inter-industrial relation. Only Vietnam-Chile (GLI=0.21) shows some potential of intra-industry trade (see table 9).

Table 9: ASEAN-7 and PA Fisheries Intra-industry Trade Index

GLI-W	Mexico	Chile	Peru	Colombia
Brunei	0.00	0.00	0.00	0.00
Indonesia	0.03	0.00	0.07	0.00
Malaysia	0.01	0.00	0.02	0.00
Philippines	0.08	0.00	0.00	0.00
Singapore	0.00	0.01	0.00	0.00
Thailand	0.05	0.00	0.00	0.00
Vietnam	0.03	0.21	0.09	0.01

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

2.5. Healthcare sector trade between ASEAN-7 and PA

ASEAN-7 economies enjoy a trade surplus in this sector. The ASEAN-7 average exports to PA members were US\$ 75.56 million in 2005-2009, imports from PA averaged US\$ 31.35 million in the same period (see table 4).

Mexico is the main destination for ASEAN-7 healthcare exports to PA with 83.9%, followed by Colombia 9.5% and it is also the most important source of imports from PA with 88.2% followed also by Colombia 8.8% (see table 5).

The estimations obtained by GLI index show evidence of intra-industry trade. The relations between Philippines-Colombia (GLI=0.53), Vietnam-Colombia (GLI=0.51), Malaysia-Mexico (GLI=0.38) and Singapore-Mexico (GLI=0.35) show evidence of intra-industry trade. Relations between Thailand-Mexico (GLI= 0.19) show some potential of intra-industry trade¹³ (see table 10).

Table 10: ASEAN-7 and PA Healthcare Intra-industry Trade Index

GLI-W	Mexico	Chile	Peru	Colombia
Brunei	0.00	0.00	0.00	0.00
Indonesia	0.30	0.00	0.00	0.00
Malaysia	0.38	0.08	0.01	0.05
Philippines	0.02	0.07	0.00	0.53
Singapore	0.35	0.02	0.06	0.00
Thailand	0.19	0.10	0.00	0.02
Vietnam	0.00	0.00	0.00	0.51

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

2.6. The ICT sector trade between ASEAN-7 and PA

The average ASEAN-7 exports to PA for ICTs sector accounted for US\$ 1,973.69 million, while imports from PA accounted for US\$ 674.12 million for 2005-2009 (see table 4). Mexico is the most dynamic country in ICT trade with ASEAN-7.

Due to its value added, the ICTs sector usually present high intra-industry trade levels given the important levels of specialization and differentiation among countries. Despite

¹³Products such as: medicaments of two or more constituents (HS 3004), beauty and makeup preparations (HS 3304), preparations for use on hair (HS 3305), antibiotics (HS 2941), and instruments and appliances for medical purposes (HS 9018).

this reasoning, the results obtained show that only trade between Singapore and Mexico (GLI= 0.52) present evidence of intra-industry trade (see table 11).

Nevertheless, it is interesting to analyze the results and point out which relations have some potential of intra-industry trade. For instance, Mexico has a huge potential of developing intra-industry trade with different countries such as: Thailand-Mexico (GLI=0.27), Malaysia-Mexico (GLI=0.22), Indonesia-Mexico (GLI=0.20), and the Philippines-Mexico (GLI= 0.18)¹⁴ (see table 11).

Table 11: ASEAN-7 and PA ICTs Intra-industry Trade Index

GLI-W	Mexico	Chile	Peru	Colombia
Brunei	0.01	0.00	0.00	0.00
Indonesia	0.20	0.03	0.01	0.01
Malaysia	0.22	0.01	0.01	0.01
Philippines	0.18	0.06	0.07	0.02
Singapore	0.52	0.10	0.03	0.04
Thailand	0.27	0.04	0.00	0.03
Vietnam	0.01	0.01	0.00	0.00

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

2.7. Rubber-based sector trade between ASEAN-7 and PA

Rubber-based ASEAN-7 exports to PA accounted for US\$ 230.25 million, while imports were US\$ 4.43 million (see table 4). ASEAN-7 exports to PA go mainly to Mexico 49.7%, Colombia 26.0%, Chile 14.3% and Peru 10%. Mexico is the main supplier of Rubber-based products for ASEAN-7 (see table 5).

¹⁴ Parts and accessories suitable for electrical machines (HS 8473), printed circuits (HS 8534), electronic integrated circuits (HS 8542), boards, panels and controls for electrical equipment (HS 8537), parts for televisions (HS 8529), printing machines and equipment (HS 8443).

The intra-industry trade levels in this sector are low. However, the relations between Singapore-Mexico (GLI=0.22) and Singapore-Chile (GLI=0.19) show some potential of intra-industry trade¹⁵ (see table 12).

Table 12: ASEAN-7 and PA Rubber-based Intra-industry Trade Index

GLI-W	Mexico	Chile	Peru	Colombia
Brunei	0.00	0.00	0.00	0.00
Indonesia	0.01	0.00	0.00	0.00
Malaysia	0.01	0.00	0.00	0.00
Philippines	0.05	0.04	0.00	0.00
Singapore	0.22	0.19	0.00	0.00
Thailand	0.05	0.00	0.00	0.01
Vietnam	0.07	0.00	0.01	0.04

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

2.8. Textile and garments sector trade between ASEAN-7 and PA

The textile and garments sector is very important for both regions. Nevertheless, trade flows between the two regions reflect an inter-industrial relation. From 2005-2009, ASEAN-7 exports to PA accounted for an average of US\$457.08million, while ASEAN-7 imports from PA averaged US\$26.80 million. Latin American economies have an important deficit with ASEAN-7 in this sector, situation that is explained by the low penetration of Latin America textiles and garments in South East Asia markets (see table 4).

Mexico is the main destination for ASEAN-7 exports to PA with 70.4%, followed by Colombia 13.2%, Chile 11.7% and Peru 4.7%. Mexico is also the most important origin for ASEAN-7 textiles and garments imports(see table 5).

Only relations between Singapore-Peru (GLI=0.16) and Singapore-Mexico (GLI=0.11) show some potential of intra-industry trade (see table 13).

¹⁵Natural rubber (HS 4001), conveyor and transmission belts (HS 4010) and new pneumatic tires of rubber (HS 4011).

Table 13: ASEAN-7 and PA Textiles and Garments Intra-industry Trade Index

GLI-W	Mexico	Chile	Peru	Colombia
Brunei	0.00	0.00	0.00	0.00
Indonesia	0.03	0.00	0.02	0.02
Malaysia	0.00	0.01	0.05	0.00
Philippines	0.00	0.00	0.01	0.03
Singapore	0.11	0.02	0.16	0.09
Thailand	0.04	0.00	0.08	0.01
Vietnam	0.01	0.00	0.00	0.00

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (2010).

2.9. Wood-based sector trade between ASEAN-7 and PA

From 2005-2009 ASEAN-7 exported an average of US\$ 69.19 million to PA members while importing US\$ 122.64 million from the region. Hence, the accumulated trade deficit with PA (see table 4).

Wood-based products from ASEAN-7 are mainly exported to Mexico 67%, followed by Peru 13.5%; Chile 11.4% and Colombia 8%. ASEAN-7 main imports from PA come from Chile 95.6% (see table 5).

Trade at the wood-based sector is predominantly inter-industrial. The results show that only trade between Singapore-Mexico (GLI=0.27) has some potential for intra-industry relations.¹⁶

¹⁶ Paper and paperboard labels (HS 4821); and paper, paperboard and other cellulose fibers (HS 4811).

Table 14: ASEAN-7 and PA Wood-based Intra-industry Trade Index

GLI-W	Mexico	Chile	Peru	Colombia
Brunei	0.00	0.00	0.00	0.00
Indonesia	0.00	0.00	0.00	0.00
Malaysia	0.01	0.01	0.00	0.03
Philippines	0.03	0.00	0.00	0.00
Singapore	0.27	0.00	0.04	0.00
Thailand	0.09	0.00	0.04	0.03
Vietnam	0.01	0.00	0.00	0.00

Source: CEAP-EAFIT estimations based on UNCTAD-COMTRADE data (20

Conclusions

Trade between the Pacific Alliance and ASEAN-7 members has been growing gradually for the last five years. The evaluation of intra-industry trade among members of Pacific Alliance and ASEAN-7 economies using the weighted Grubel-Lloyd Index for the nine identified sectors, shows that trade relations between two regions are mostly inter-industrial. However, there are some evidences of intra-industry trade, mainly in the electronics, ICT, automobile, and healthcare sectors. As for the trade relations between the two regions, Mexico is the most dynamic country among PA members, while Singapore is the most vibrant country among ASEAN-7 members.

This is a standing point for the integration of Latin American products and manufactures to ASEAN-7 production networks. As a result of the analysis, it is possible to highlight Mexico's particular relations with Indonesia, Singapore, Thailand and Vietnam in the electronic sector; with Singapore in the ICT sector and with Thailand in the automobile sector. The healthcare sector presents some interesting evidence of intra-industry trade for Colombia with Philippines and Vietnam, while Mexico has an important relation with Malaysia and Singapore.

The study also provides evidence of potential IIT in all nine sectors: 1) in the agro-based sector, the relations between Philippines-Chile and Vietnam-Colombia demonstrate potential of intra-industry trade; 2) in automobile sector, there is a potential for Malaysia-Chile and Philippines-Peru; 3) in the electronics, the relations between Malaysia-Mexico and Singapore-Chile might become intra-industry as trade increases. 4) In the fisheries sector, there is some potential for Vietnam-Chile. 5) In the healthcare sector, the trade between Thailand and Mexico might tend to become intra-industry with the time. 6) In the ICT sector it is important to mention the relations between Mexico and Thailand, Malaysia and Indonesia because their potential to adopt an intra-industry trade in the near future. 7) In the rubber-based sector the potential exist in Singapore-Mexico and Singapore-Chile. 8) In the textile and garments sector there is some potential between Singapore-Peru and

Singapore-Mexico. 9) Finally, the wood-based sector provides with evidence of the potential IIT between Singapore and Mexico.

The connection with ASEAN-7 seems to be a suitable beginning for PA to boost trade relations with Asia. ASEAN is the most vigorous institution in Asia and it has already defined trade linkages identifying nine particular sectors within the group. Those sectors could be the first step to identify complementary elements for the integration of Latin American products into the production networks in South East Asia.

The attainment of this potential requires that the Pacific Alliance goes beyond the political agreement established among its members and materializes its ideals into concrete actions in terms of economic development and trade liberalization. To achieve this goal, the region must ensure that aspects such as the new government in Peru, the low popularity of the current President in Chile, or the upcoming elections in Mexico do not become obstacles to the integration. For its part, Colombia as an emerging market with an important growth potential within this group must continue to overcome its security problems and need to keep on with the development of its Asia Pacific strategy.

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