

CHAPTER 5

DATA ANALYSIS AND INTERPRETATION

5. Data Analysis and Interpretations

The present chapter divided into four sections. First, it analyzes ASEAN7 countries top exports to and imports from India in pre and post-agreement period at HS 2 digit level. The second section measures trade weighted average IIT index at HS 4 digit level by using GL index (1975) for each ASEAN7 member countries with India in the identified sectors based on the top exports and imports with India in 2010 and 2016, the sectors are 27, 29, 71, 72, 84, 85 and 87. This section demonstrate pre and post AIFTA direction and composition of two-way trade. It also suggests how countries direction and composition is changing within ASEAN bloc. Third section examines the possible determinants of higher IIT at 2 digit HS classification level in pre-post AIFTA period trade between ASEAN7 and India at the identified sectors. The last section demonstrates the changing pattern of two way trade between ASEAN7 and India in pre and post agreement.

5.1. Research Questions:

- A. Does Regional Trading Agreements significantly promote Intra-Industry trade?
- B. What are the possible determinants of IIT trade between ASEAN6 and India?
- C. Is there any diversification/expansion in the pattern of IIT after ASEAN-India Free trade agreement in goods signed between ASEAN and India?

5.2. Data Analysis and Interpretations

Section I

5.2.1. ASEAN7 Top Exports and Imports with India and IIT index at HS 4 digit level in 2010 and 2016 – Reflection of Direction and Composition of Trade

27- Mineral Fuels, Oils & Product Exports and Imports to/from India in 2010 and 2016

Country-Wise Analysis – Exports to India

In the year 2010, the ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, and Philippines) that exported to India had the respective percentage shares- 38%, 36%, 24%, 0%, 1% and 0%. While in the year 2016, their respective percentage shares increased to 62%, 25%,

11%, 1%, 1%, and 0%. Clearly, from the percentage share figures we can see that Singapore's share decreased by 27%, Indonesia's share increased by 26%, Malaysia's share increased by 1 %, Thailand's share increased by 1%, Vietnam and Philippines share remained the same. Looking at the trade value figures in table 5.1, total trade in this sector decreased by approximately 1.2 billion \$USD. Although, Thailand's percentage share has increased but its trade value has decreased. Similarly, Vietnam and Philippines share did not change but their trade value decreased.

Sectoral Analysis– Exports to India

The top traded HS 4 digit commodities in chapter 27 as per highest exports and imports by ASEAN7 countries in the year 2010 are - 2710 by Singapore, 2701 by Indonesia, Vietnam and Philippines, 2709 by Malaysia and 2707 by Thailand. In the year 2016, this trend changed and the top exported HS 4 digit commodities were- 2701 by Indonesia, 2709 by Malaysia and Vietnam, 2710 by Singapore, 2707 by Thailand and 2713 by Philippines. The most traded commodity for the year 2010 was 2710 and for the year 2016 was 2709.

Comparison of Exports to India in 2010 and 2016

Table 5.1 demonstrates that from 2010 to 2016, there have been some significant changes. Earlier, Singapore was the largest exporter followed by Indonesia but now Indonesia has become the largest exporter followed by Malaysia. Singapore's share has gone down by 27% while Indonesia's share has increased 26%. Malaysia's share has also increased 1%. Thailand did not export to India in 2010, but in 2016, it contributes 1% to India's total exports. The total trade of India also decreased significantly by approximately 1.2 billion \$USD.

Table 5.1: 27- Mineral Fuels, Oils & Product Exports to India in 2010 and 2016 (Value in 1000 \$ USD)

27- Mineral fuels, oils & product in 2010 - Exports to India				27- Mineral fuels, oils & product in 2016 - Exports to India			
S. No.	Reporting Country	Value	Share	S. No.	Reporting Country	Value	Share
1	Singapore	2626900.0	38%	1	Indonesia	3474417.7	62%
2	Indonesia	2483985.7	36%	2	Malaysia	1392627.9	25%
3	Malaysia	1628952.3	24%	3	Singapore	636984.1	11%
4	Vietnam	80395.6	1%	4	Vietnam	53547.4	1%
5	Thailand	10257.8	0%	5	Thailand	41649.8	1%
6	Philippines	9500.8	0%	6	Philippines	4596.6	0%
Total Trade	6839992.2			Total Trade	5603823.5		

Source: Author's compilation by using WITS database

Country-Wise Analysis – Imports from India

In the year 2010, imports from India were majorly to countries - Singapore, Indonesia, Malaysia and Thailand. Singapore's share has the highest and Thailand's share being the lowest. Their shares were 88%, 8%, 2% and 1% respectively. India's total trade was 7.2 billion \$USD. In 2016, the countries which imported from India were- Singapore, Malaysia, Philippines, Thailand and Indonesia with Singapore's share being the highest and Indonesia's share being the lowest. Their respective shares were 70%, 22%, 6%, 1% and 1%. The total trade was 4.05 billion \$USD. Clearly, from the percentage share figures we can see that Singapore's share decreased by 18%, Indonesia's share decreased by 7%, Malaysia's share increased by 20%, Thailand, Vietnam and Cambodia's share remained the same and Philippines's share increased by 6%. Looking at the trade value figures, total trade in this sector decreased by approximately 3.2 billion \$USD. Although, Thailand, Vietnam and Cambodia's share did not change but Thailand and Cambodia's trade value decreased and Vietnam's trade value increased.

Sectoral Analysis

The top traded HS 4 digit commodities by these 7 ASEAN countries in the year 2010 and 2016 was 2710. Also, the most traded commodity for the year 2010 and 2016 was 2710.

The information can be seen from the table 5.2 below:

Table 5.2: 27- Mineral Fuels, Oils & Product Imports from India in 2010 and 2016 (Value in 1000 \$ USD)

27- Mineral fuels, oils & product of the 2010- Imports from India				27- Mineral fuels, oils & product of th in 2016 - Imports from India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Singapore	6383309.4	88%	1	Singapore	2847857.8	70%
2	Indonesia	606185.0	8%	2	Malaysia	877147.4	22%
3	Malaysia	156770.8	2%	3	Philippines	230144.3	6%
4	Thailand	63585.4	1%	4	Thailand	43656.1	1%
5	Vietnam	10137.7	0%	5	Indonesia	43120.8	1%
6	Philippines	1147.1	0%	6	Vietnam	11893.4	0%
7	Cambodia	184.3	0%	7	Cambodia	11.0	0%
Total Trade	7221319.7			Total Trade	4053830.9		

Source: Author's compilation by using WITS database

29- Organic Chemicals Exports and Imports to/from India in 2010 and 2016

Country-Wise Analysis – Exports to India

In the year 2010, the 7 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Cambodia and Philippines) that exported to India had the respective percentage shares- 54%, 8%, 19%, 18%, 0%, 0% and 0%. While in the year 2016, their respective percentage shares changed to 57%, 7%, 15%, 20%, 0%, 0% and 0%. Clearly, from the percentage share figures we can see that Singapore's share increased by 3%, Indonesia's share decreased by 1%, Malaysia's share decreased by 4%, Thailand's share increased by 2%, Vietnam, Cambodia and Philippines's share remained the same. Looking at the trade value figures in table 5.3 shows that total trade in this sector decreased by approximately 3 billion \$USD. Although, Singapore and Thailand's percentage share has increased but their trade value has decreased.

Sectoral Analysis

The top traded HS 4 digit commodities by the 7 ASEAN countries in the year 2010 are- 2902 by Singapore, Malaysia and Indonesia, 2915 by Indonesia and 2917 by Thailand. In the year 2016, this trend changed and the top imported HS 4 digit commodities were- 2902 by Singapore and Thailand and 2915 by Malaysia and Indonesia. In 2010 and 2016, the most exported product to India was 2902.

Table 5.3: 29- Organic Chemicals Exports to India in 2010 and 2016 (Value in 1000 \$ USD)

29- Organic Chemicals 2010 - Exports to India				29- Organic Chemicals 2016- Exports to India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Singapore	1109647.3	54%	1	Singapore	1009639.3	57%
2	Malaysia	399765.3	19%	2	Thailand	362791.1	20%
3	Thailand	373433.5	18%	3	Malaysia	266305.0	15%
4	Indonesia	168814.7	8%	4	Indonesia	133022.7	7%
5	Philippines	3743.6	0%	5	Philippines	2113.7	0%
6	Vietnam	814.6	0%	6	Vietnam	1624.6	0%
Total Trade	2056219.1			7	Cambodia	550.0	0%
				Total Trade	1776046.4		

Source: Author's compilation by using WITS database

Country-Wise Analysis – Imports from India

In the year 2010, the 7 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Cambodia and Philippines) that imported from India had the respective percentage shares- 22%, 41%, 15%, 13%, 7%, 0% and 2%. While in the year 2016, their respective percentage shares changed to 22%, 32%, 21%, 13%, 9%, 0% and 3%. Clearly, from the percentage share figures we can see that Singapore's share remained the same, Indonesia's share decreased by 9%, Malaysia's share increased by 6%, Thailand's share also remained the same, Vietnam's share increased by 2%, Cambodia's share remained the same and Philippines's share increased by 1%. Looking at the trade value figures in table 5.4 shows that total trade in this sector increased by approximately 0.2 billion \$USD. Although, Singapore and Thailand's percentage share has not changed but their trade value has increased. Similarly, in the case of Cambodia, trade value has decreased.

Sectoral Analysis

The top traded HS 4 digit commodities by these 7 ASEAN countries in the year 2010 are- 2902 by Singapore, Malaysia and Indonesia and 2941 by Thailand. In the year 2016, this trend changed and the top imported HS 4 digit commodities were- 2902 by Indonesia and Malaysia, 2933 by Singapore and 2941 by Thailand. The most traded commodities for the year 2010 and 2016 was 2902.

Table 5.4: 29- Organic Chemicals Imports from India in 2010 and 2016 (Value in 1000 \$ USD)

29- Organic Chemicals 2010 - Imports from India				29- Organic Chemicals 2016- Imports from India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Indonesia	435963.2	41%	1	Indonesia	401120.7	32%
2	Singapore	230557.9	22%	2	Singapore	271443.1	22%
3	Malaysia	154851.4	15%	3	Malaysia	265835.1	21%
4	Thailand	142842.7	13%	4	Thailand	168312.4	13%
5	Vietnam	71371.2	7%	5	Vietnam	116282.5	9%
6	Philippines	26126.9	2%	6	Philippines	39203.5	3%
7	Cambodia	334.1	0%	7	Cambodia	300.7	0%
Total Trade	1062047.5			Total Trade	1262498.0		

Source: Author's compilation by using WITS database

71- Natural/Cultured Pearls, Precious Stone Exports and Imports to/from India in 2010 and 2016

Country Wise Analysis – Exports to India

In the year 2010, the respective shares of Thailand, Singapore, Malaysia, Vietnam, Philippines and Indonesia are 59%, 40%, 1%, 0%, 0% and 0%. In the year 2016, their respective shares changed to 32%, 66%, 0%, 0%, 1% and 2%. Clearly, Malaysia's share has decreased by 27%, Singapore's share has increased by 26%, Malaysia's share has decreased by 1%, Vietnam's share has remained the same, Philippines's share has increased by 1% and Indonesia's share has increased by 2%. Although, from the percentage share, Thailand's share has decreased but its trade value has increased. Moreover, the total trade has also increased.

Sectoral Analysis

The most traded commodity that is exported to India by the countries is 7113 in the year 2010 by Thailand and Singapore and 7117 in the year 2016 by Malaysia and Vietnam. Besides that, the other top commodities are traded are 7102 by Thailand and Malaysia and 7115 by Malaysia in the year 2010. In the year 2016, the top traded commodities were 7102 by Singapore and Thailand and 7108 by Singapore.

Given below are the table 5.5 related to the exports to India by different ASEAN countries along with the trade value, and percentage share.

Table 5.5: 71- Natural/Cultured Pearls, Precious Stone Exports to India in 2010 and 2016 (Value in 1000 \$ USD)

71-Natural/cultured pearls, prec stone 2010 - Exports to India				71-Natural/cultured pearls, prec stone 2016 - Exports to India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Thailand	236357.9	59%	1	Singapore	578889.3	66%
2	Singapore	160253.8	40%	2	Thailand	279708.3	32%
3	Malaysia	3481.6	1%	3	Indonesia	14511.7	2%
4	Philippines	120.5	0%	4	Philippines	7589.1	1%
5	Indonesia	91.8	0%	5	Malaysia	812.8	0%
6	Vietnam	8.4	0%	6	Vietnam	53.5	0%
Total Trade		400314.1		Total Trade		881564.8	

Source: Author's compilation by using WITS database

Country-Wise Analysis – Imports from India

In the year 2010, the 7 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Cambodia and Philippines) that imported from India had the respective percentage shares- 63%, 0%, 6%, 31%, 1%, 0% and 0%. While in the year 2016, their respective percentage shares

changed to 62%, 0%, 2%, 27%, 9%, 0% and 0%. Clearly, from the percentage share figures in table 5.6 we can see that Singapore's share decreased by 1%, Indonesia's, Cambodia's and Philippines's share remained the same, Malaysia's share decreased by 4%, Thailand's share decreased by 4% and Vietnam's share increased by 8%. Looking at the trade value figures, total trade in this sector increased by approximately 1 billion \$USD. Although, Singapore's percentage share has decreased but its trade value has increased. Similarly, Indonesia and Philippines's percentage share is the same but their trade value has increased.

Sectoral Analysis

The most traded commodity in the year 2010 and 2016 was 7102. Besides that, the top traded commodities by the individual countries were 7113 and 7102 by Singapore and 7102 by Thailand, Malaysia and Vietnam in the year 2010. While in the year 2016, these were 7102 and 7113 by Singapore, 7102 by Thailand, Vietnam and Malaysia and 7113 by Malaysia.

Given below are the table 5.6 related to the imports from India by different ASEAN countries along with the trade value and percentage share.

Table 5.6: 71- Natural/Cultured Pearls, Precious Stone Imports from India in 2010 and 2016 (Value in 1000 \$ USD)

71-Natural/cultured pearls, prec stone 2010 - Imports from India				71-Natural/cultured pearls, prec stone 2016 - Imports from India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Singapore	671083.8	63%	1	Singapore	701345.0	62%
2	Thailand	326786.6	31%	2	Thailand	306462.7	27%
3	Malaysia	64657.1	6%	3	Vietnam	96965.3	9%
4	Vietnam	6430.5	1%	4	Malaysia	24123.6	2%
5	Indonesia	198.4	0%	5	Indonesia	336.4	0%
6	Philippines	27.1	0%	6	Philippines	257.6	0%
7	Cambodia	0.369	0%	Total Trade	1129490.5		
Total Trade	1069183.8						

Source: Author's compilation by using WITS database

72 –Iron and Steel Exports and Imports to/from India in 2010 and 2016

Country-Wise Analysis – Exports to India

In the year 2010, the countries that exported to India were Malaysia, Singapore, Thailand, Vietnam, Indonesia and Philippines. Their respective shares in total exports to India are 29%, 28%, 21%, 16%, 4% and 3%. In the year 2010, their shares changed to 21%, 29%, 19%, 4%,

26% and 1% respectively. Clearly, the share of Malaysia decreased by 8%, Singapore's share increased by 1%, Thailand's share decreased by 2%, Vietnam's share decreased by 12%, Indonesia's share increased by 22% and Philippines's share decreased by 2%. The total trade of ASEAN increased from the year 2010 to 2016. Although Thailand's percentage share in exports to India decreased, but its exports to India increased and similarly, the percentage figures with Indonesia have increased but the exports to India from Indonesia have decreased.

Sectoral Analysis

In sector 72, the major imports of India was of the product 7219 from mostly all the countries. The exports to India of product 7219 were also the most exported product of the countries- Malaysia, Vietnam and Indonesia. Other products which were exported to India were product 7217 by Malaysia, 7204 by Singapore, 7210 by Thailand, 7229 by Vietnam and 7204 by Indonesia in 2010. While in the year 2016, 7204 is the most exported product to India by the countries- Singapore, Indonesia, Thailand and Vietnam. Other products which were exported majorly by the countries include 7214 by Singapore, 7202 by Indonesia, 7220 and 7219 by Malaysia and 7210 by Vietnam.

Given below are the table 5.7 related to the exports to India by different ASEAN countries along with the trade value and percentage share.

Table 5.7: 72- Iron and Steel Exports to India in 2010 and 2016 (Value in 1000 \$ USD)

72- Iron and steel. 2010 - Exports to India				72- Iron and steel. 2016 - Exports to India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Malaysia	135953.5	29%	1	Singapore	186789.1	29%
2	Singapore	126996.8	28%	2	Indonesia	166911.3	26%
3	Thailand	95139.4	21%	3	Malaysia	134842.1	21%
4	Vietnam	71901.7	16%	4	Thailand	122890.0	19%
5	Indonesia	18561.0	4%	5	Vietnam	22863.5	4%
6	Philippines	12460.9	3%	6	Philippines	5634.5	1%
Total Trade	461013.4			Total Trade	639930.6		

Source: Author's compilation by using WITS database

Country-Wise Analysis – Imports from India

In the year 2010, the 7 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Cambodia and Philippines) that imported from India had the respective percentage shares- 9%, 32%, 14%, 35%, 6%, 0% and 5%. While in the year 2016, their respective percentage shares

changed to 2%, 28%, 29%, 17%, 21%, 0% and 2%. Clearly, from the percentage share figures in table 5.8 we can see that Singapore's share decreased by 7%, Indonesia's share decreased by 4%, Malaysia's share decreased by 8%, Thailand's share decreased by 18%, Vietnam's share increased by 15% and Philippines's share decreased by 3%. Looking at the trade value figures, total trade in this sector increased by approximately 0.23billion \$USD. Although, Indonesia's percentage share has decreased but its trade value has increased.

Sectoral Analysis

The top traded HS 4 digit commodities by these 7 ASEAN countries in the year 2010 are- 7202 by Thailand, 7219 by Indonesia, 7222 and 7210 by Malaysia, 7210 and 7222 by Singapore, 7222 and 7219 by Vietnam and 7202 and 7210 by Philippines. In the year 2016, this trend changed and the top imported HS 4 digit commodities were- 7218 by Malaysia, 7219 by Indonesia, 7219 and 7222 by Vietnam, 7202 and 7225 by Thailand, 7202 and 7222 by Singapore and 7202 and 7222 by Philippines. In 2010, the most imported product from India was 7222 but now it has changed to 7202 along with 7222.

Given below are the table 5.8 related to the imports from India by different ASEAN countries along with the trade value and percentage share.

Table 5.8: 72- Iron and Steel Imports from India in 2010 and 2016 (Value in 1000 \$ USD)

72- Iron and steel. 2010 - Imports from India				72- Iron and steel. 2016 - Imports from India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Thailand	168254.8	35%	1	Malaysia	208276.2	29%
2	Indonesia	152857.2	32%	2	Indonesia	203839.7	28%
3	Malaysia	68948.9	14%	3	Vietnam	147006.7	21%
4	Singapore	44937.2	9%	4	Thailand	122963.3	17%
5	Vietnam	27345.1	6%	5	Singapore	17096.1	2%
6	Philippines	21788.6	5%	6	Philippines	16597.7	2%
Total Trade	484131.9			7	Cambodia	95.4	0%
				Total Trade	715875.1		

Source: Author's compilation by using WITS database

Country-Wise Analysis – Exports to India

In the year 2010, the 7 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Cambodia and Philippines) that exported from India had the respective percentage shares- 60%, 3%, 15%, 21%, 1%, 0% and 1%. While in the year 2016, their respective percentage shares changed to 51%, 3%, 14%, 27%, 23%, 0% and 2%. Clearly, from the percentage share figures in table 5.9 we can see that Singapore's share decreased by 9%, Indonesia's share remained the same, Malaysia's share decreased by 1%, Thailand's share increased by 6%, Vietnam's share increased by 2% and Philippines's share increased by 1%. Looking at the trade value figures, total trade in this sector decreased by approximately 1200000 in 1000 USD dollars. Although, Indonesia's percentage share has decreased but its trade value has increased and similarly in the case of Thailand, trade value has decreased.

Sectoral Analysis

The top traded HS 4 digit commodities by these 7 ASEAN countries in the year 2010 are- 8408 and 8415 by Thailand, 8462 by Indonesia, 8473 by Malaysia, 8473 by Singapore, 8483 by Vietnam and 8471 by Philippines. In the year 2016, this trend changed and the top exported HS 4 digit commodities were- 8471 by Malaysia, Indonesia, Vietnam, Singapore and Philippines and 8415 by Thailand. In 2010, the most exported product to India was 8473 but now it has changed to 8471.

Table 5.9: 84 - Nuclear Reactors, Boilers, Exports to India in 2010 and 2016 (Value in 1000 \$ USD)

84- Nuclear reactors, boilers, mchy & m 2010 - Exports to India				84- Nuclear reactors, boilers, mchy & m 2016- Exports to India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Singapore	3164491.7	60%	1	Singapore	2107541.9	51%
2	Thailand	1100837.8	21%	2	Thailand	1097931.3	27%
3	Malaysia	820938.2	15%	3	Malaysia	573453.5	14%
4	Indonesia	146061.3	3%	4	Vietnam	139258.4	3%
5	Vietnam	40838.8	1%	5	Indonesia	132022.8	3%
6	Philippines	29377.2	1%	6	Philippines	72054.6	2%
Total Trade	5302545.0			7	Cambodia	45.7	0%
				Total Trade	4122308.3		

Source: Author's compilation by using WITS database

Country-Wise Analysis – Imports from India

In the year 2010, the 7 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Cambodia and Philippines) that imported from India had the respective percentage shares- 33%, 18%, 16%, 25%, 6%, 0% and 2%. While in the year 2016, their respective percentage shares changed to 18%, 19%, 14%, 16%, 17%, 0% and 16%. Clearly, from the percentage share figures in table 5.10 we can see that Singapore's share decreased by 15%, Indonesia's share increased by 1%, Malaysia's share decreased by 2%, Thailand's share decreased by 9%, Vietnam's share increased by 11% and Philippines's share increased by 14%. Looking at the trade value figures, total trade in this sector increased by approximately 9 billion \$USD. Although, Singapore, Malaysia and Thailand's percentage share has decreased but their trade value has increased.

Sectoral Analysis

The top traded HS 4 digit commodities by these 7 ASEAN countries in the year 2010 are- 8407 and 8402 by Thailand, 8445 by Indonesia, 8481 by Malaysia, 8473 and 8408 by Singapore, 8410 by Vietnam and 8473 by Philippines. In the year 2016, this trend changed and the top imported HS 4 digit commodities were- 8419 and 8481 by Malaysia, 821 and 8402 by Indonesia, 8402 by Vietnam, 8408, 8483 and 8414 by Thailand, 8481 by Singapore and 8402 by Philippines. In 2010, the most imported product from India was 8473 but in 2016 it changed to 8402.

Table 5.10: 84 - Nuclear Reactors, Boilers, Imports from India in 2010 and 2016 (Value in 1000 \$ USD)

84- Nuclear reactors, boilers, mchy & m 2010 - Imports from India				84- Nuclear reactors, boilers, mchy & m 2016 - Imports from India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Singapore	306882.2	33%	1	Indonesia	337768.4	19%
2	Thailand	235182	25%	2	Singapore	332065.5	18%
3	Indonesia	173606.2	18%	3	Vietnam	310334.7	17%
4	Malaysia	146078.2	16%	4	Philippines	283585.0	16%
5	Vietnam	57114.48	6%	5	Thailand	283542.7	16%
6	Philippines	21286.88	2%	6	Malaysia	255690.0	14%
7	Cambodia	938.118	0%	7	Cambodia	5016.712	0%
Total Trade		941088.1		Total Trade		1808003.0	

Source: Author's compilation by using WITS database

Country-Wise Analysis – Exports to India

In the year 2010, the 7 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Cambodia and Philippines) that exported from India had the respective percentage shares- 61%, 3%, 18%, 7%, 7%, 0% and 3%. While in the year 2016, their respective percentage shares changed to 46%, 2%, 23%, 11%, 18%, 0% and 1%. Clearly, from the percentage share figures in table 5.11 we can see that Singapore's share decreased by 15%, Cambodia's share remained the same, Indonesia's share decreased by 1%, Malaysia's share increased by 5%, Thailand's share increased by 4%, Vietnam's share increased by 11% and Philippines share decreased by 2%. Looking at the trade value figures, total trade in this sector increased by approximately 0.3 billion \$USD.

Sectoral Analysis

The top traded commodity for both the years 2010 and 2016 was 8542. Besides that, the top traded HS 4 digit commodities by the countries were 8544 by Indonesia and Thailand, 8511 by Indonesia, 8542 by Philippines, Singapore and Malaysia, 8525 by Vietnam, and 8504 by Thailand in the year 2010. In the year 2016, these were 8517 by Singapore and Vietnam, 8542 by Singapore, Malaysia and Philippines, 8525 by Thailand, 8504 by Thailand and Philippines and 8501 by Indonesia.

The table 5.11 related to the exports done to India by different ASEAN countries along with the trade value and percentage share.

Table 5.11: 85 - Electrical Machinery Equipment Parts Thereof Exports to India in 2010 and 2016 (Value in 1000 \$ USD)

85- Electrical mchy equip parts thereof 2010 - Exports to India				85- Electrical mchy equip parts thereof 2016- Exports to India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Singapore	2946952.5	61%	1	Singapore	2338100.4	46%
2	Malaysia	863461.7	18%	2	Malaysia	1154260.9	23%
3	Vietnam	361575.3	7%	3	Vietnam	899883.3	18%
4	Thailand	360057.7	7%	4	Thailand	581144.2	11%
5	Indonesia	164259.7	3%	5	Indonesia	96675.6	2%
6	Philippines	162514.6	3%	6	Philippines	46901.2	1%
Total Trade	4858821.5			Total Trade	5116965.6		

Source: Author's compilation by using WITS database

Country-Wise Analysis – Imports from India

In the year 2010, the 7 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Cambodia and Philippines) that imported from India had the respective percentage shares- 26%, 36%, 16%, 15%, 5%, 0% and 3%. While in the year 2016, their respective percentage shares changed to 23%, 14%, 18%, 18%, 18%, 1% and 8%. Clearly, from the percentage share figures in table 5.12 we can see that Singapore's share decreased by 3%, Cambodia's share increased by 1%, Indonesia's share decreased by 22%, Malaysia's share increased by 2%, Thailand's share increased by 3%, Vietnam's share increased by 13% and Philippines share increased by 5%. Looking at the trade value figures, total trade in this sector decreased by approximately 0.4 billion \$USD.

Sectoral Analysis

The top traded commodity for the year 2010 was 8525 and for the year 2016 was 8504. Besides that, the top traded HS 4 digit commodities by the countries were 8525 by Indonesia, Singapore, Malaysia and Thailand and 8504 by Vietnam and Philippines in the year 2010. In the year 2016, these were 8535 by Indonesia, 8502 by Thailand, 8504 by Malaysia and Philippines, 8543 by Singapore and 8517 by Vietnam.

Table 5.12: 85 - Electrical Machinery Equip Parts Thereof Imports from India in 2010 and 2016 (Value in 1000 \$ USD)

85- Electrical mchy equip parts thereof 2010 - Imports from India				85- Electrical mchy equip parts thereof 2016 – Imports from India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Indonesia	465235.3	36%	1	Singapore	205494.7	23%
2	Singapore	345695.8	26%	2	Malaysia	165494.9	18%
3	Malaysia	211728.5	16%	3	Thailand	162989.2	18%
4	Thailand	190882.8	15%	4	Vietnam	161709.8	18%
5	Vietnam	59410.9	5%	5	Indonesia	128070.9	14%
6	Philippines	35572.8	3%	6	Philippines	75122.5	8%
7	Cambodia	373.709	0%	7	Cambodia	6865.78	1%
Total Trade	1308899.8			Total Trade	905747.8		

Source: Author's compilation by using WITS database

Country-Wise Analysis – Exports to India

In the year 2010, the 7 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Cambodia and Philippines) that imported from India had the respective percentage shares- 14%, 7%, 1%, 61%, 3%, 0% and 14%. While in the year 2016, their respective percentage shares

changed to 17%, 13%, 4%, 57%, 7%, 0% and 2%. Clearly, from the percentage share figures in table 5.13 we can see that Singapore's share increased by 3%, Cambodia's share remained the same, Indonesia's share increased by 6%, Malaysia's share increased by 3%, Thailand's share decreased by 4%, Vietnam's share increased by 4% and Philippines share decreased by 12%. Looking at the trade value figures, total trade in this sector increased by approximately 0.18 billion \$USD. Although, Thailand's percentage share has decreased but its trade value has increased. Similarly, Cambodia's percentage share is the same but their trade value has increased.

Sector Wise Analysis

The most traded commodities in both the years was 8708. In the year 2010, it was in the top traded HS 4 digit commodities for all the countries and similar was the case in the year 2016 except commodity 8714 was also in the top traded commodities of Malaysia.

The below table 5.13 are related to the exports to India by different ASEAN countries along with the trade value and percentage share.

Table 5.13: 87 - Vehicles Other Than Railway/Tramway Roll-Stock etc. Exports to India in 2010 and 2016 (Value in 1000 \$ USD)

87- Vehicles o/t railw/tramw roll-stock 2010 - Exports to India				87- Vehicles o/t railw/tramw roll-stock 2016 - Exports to India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Thailand	264412.7	61%	1	Thailand	350806.1	57%
2	Singapore	62735.7	14%	2	Singapore	106586.8	17%
3	Philippines	58876.0	14%	3	Indonesia	78774.0	13%
4	Indonesia	30278.3	7%	4	Vietnam	44341.2	7%
5	Vietnam	13204.3	3%	5	Malaysia	21887.0	4%
6	Malaysia	5149.1	1%	6	Philippines	14806.4	2%
7	Cambodia	19.4	0%	7	Cambodia	2642.2	0%
Total Trade		434675.5		Total Trade		619843.6	

Source: Author's compilation by using WITS database

Country-Wise Analysis – Imports from India

In the year 2010, the 7 ASEAN countries (Singapore, Indonesia, Malaysia, Thailand, Vietnam, Cambodia and Philippines) that imported from India had the respective percentage shares- 20%, 38%, 4%, 22%, 3%, 0% and 13%. While in the year 2016, their respective percentage shares

changed to 2%, 28%, 3%, 24%, 16%, 1% and 13%. Clearly, from the percentage share figures in table 5.14 we can see that Singapore's share decreased by 18%, Cambodia's share increased by 1%, Indonesia's share decreased by 10%, Malaysia's share decreased by 1%, Thailand's share increased by 2%, Vietnam's share increased by 13% and Philippines share increased by 13%. Looking at the trade value figures, total trade in this sector increased by approximately 0.21 billion \$USD. Although, Malaysia's percentage share has decreased but its trade value has increased.

Sectoral Analysis

The top traded commodity for the year 2010 was 8704 and for the year 2016 was 8708. Besides that, the top traded HS 4 digit commodities by the countries were 8704 by Indonesia, Singapore and Vietnam, 8708 by Thailand, 8711 and 8714 by Philippines and 8703 by Malaysia in the year 2010. In the year 2016, these were 8708 by Indonesia, Thailand and Malaysia, 8704 by Indonesia, 8711 by Philippines and Singapore and 8703 by Philippines and Vietnam.

Table 5.14: 87 - Vehicles Other Than Railway/Tramway Roll-Stock etc. Imports from India in 2010 and 2016 (Value in 1000 \$ USD)

87- Vehicles o/t railw/tramw roll-stock 2010 - Imports from India				87- Vehicles o/t railw/tramw roll-stock 2016 - Imports from India			
S. No.	Reporting Country	Trade Value	Share	S. No.	Reporting Country	Trade Value	Share
1	Indonesia	234748.3	38%	1	Indonesia	233672.1	28%
2	Thailand	139430.8	22%	2	Philippines	212890.5	26%
3	Singapore	124286.8	20%	3	Thailand	195952.8	24%
4	Philippines	83483.2	13%	4	Vietnam	135843.6	16%
5	Malaysia	24587.4	4%	5	Malaysia	27428.1	3%
6	Vietnam	15908.9	3%	6	Singapore	18762.4	2%
7	Cambodia	577.6	0%	7	Cambodia	5672.0	1%
Total Trade	623023.0			Total Trade	830221.6		

Source: Author's compilation by using WITS database

Section II

5.2.2. IIT index of ASEAN7 with India in Pre (2010) and Post Agreement (2016) at HS 4 digit level of Classification Level

The table 5.15 shows the trade weighted average IIT in the pre and post AIFTA at 4 digit HS classification level. The table represents the composition and direction of trade.

The Chapter 27 on Minerals and oils represents high average IIT between Singapore and India with 37% of two-way trade in commodity 2710. 2710 is mainly exported to Singapore by India and it has maximum share in the total trade. On the other hand, Malaysia also represents high average IIT with 2% in 2710 but Malaysia exported this commodity to India in 2010. Indonesia also represents high IIT in 2710 in 2010 and Indonesia has trade deficit in this commodity. In 2016, 2710 is having high average IIT with Singapore with lesser share as 13% compare to 2010 of 37%. India is having trade surplus in this commodity with Singapore. Post AIFTA, the commodity total two-way trade declined with its share.

The Chapter 29 on Organic Chemicals is showing high average IIT with Singapore, Malaysia, Thailand and Indonesia. 2902 is a common commodity at 4 digit HS classification level for two-way trade between Singapore, Malaysia, Thailand, Indonesia and India. India is having trade deficit in 2902 with Singapore, Malaysia and Thailand but trade surplus in 2902 with Indonesia. 2902 is having highest IIT with Singapore, Malaysia and Indonesia. Apart from 2902, there are commodities like 2933, 2922, 2905, 2915 and 2916 are also showing relatively high average IIT than other commodities under chapter 29. The highest two-way trade is with Singapore and Indonesia followed by Malaysia and Thailand. With Indonesia, India is having trade surplus in 2902 and 2905 but deficit in 2915.

In 2016, there are relatively more commodities at 4digit HS classification level have shown high levels of average IIT. The commodity 2902 was still prevalent in 2016 for Singapore, Malaysia, Thailand and Indonesia. Out of all trading partners, Singapore share of average IIT in 2902 is still higher than other trading partners. There is also an emergence of a new commodity whose IIT index is higher – 2933 traded with Singapore followed with Thailand. The commodities apart from 2902 and 2933, Singapore two way trade basket is diversified in post-AIFTA period with an expansion of commodities like 2905, 2914, 2915, and 2934. India is having trade surplus with Singapore in 2914, 2933 and 2934 and deficit in all other commodities. The two-way trade with Malaysia is in 2902 and 2917 with higher IIT. 2902 is a commodity in which India has a trade surplus with Malaysia. Thailand two-way trade with India is in commodities like 2902, 2922, and 2933. Out of which in commodity 2933, India is having trade surplus. In 2902, 2915 and

2922 shows high IIT index with Indonesia. India is having trade surplus with Indonesia in 2902 but trade deficit in commodities like 2915 and 2922. The observation also suggests that though the post-AIFTA trade has diversified with expanded commodities but relatively lower IIT than 2010. The direction of trade is also moving towards other ASEAN member countries but the share of Singapore is the highest.

The Chapter 71 on Natural Pearls and Precious Stones has shown very high share of average IIT in commodities like 7113 and 7102 with Singapore and Thailand. Both the commodities 7113 and 7102 IIT index is exported more than India's imports in the same commodity by Singapore. With Thailand, 7102 is having higher share of average IIT than 7103 and 7113. Thailand imports of 7102 are higher than its exports with India in same commodity. But 7103 and 7113 are having trade surplus of Thailand. In post-AIFTA period, there is not much expansion in the basket of chapter 71 except a commodity named 7108 from Singapore to India. This commodity has trade surplus of Singapore with India. The direction of trade and composition of trade with Singapore and Thailand is showing similar pattern like 2010. The change in post-AIFTA is seen with higher volume of two way trade with Singapore and India in 7102 and 7113 and Thailand and India in 7102 and 7103 commodities. This reflects that in post-AIFTA, India is preferred destination for 7102 and 7113 for Singapore and Thailand.

The Chapter 72 on Iron and Steel suggested higher average IIT in 7210 with Singapore and Thailand followed by Malaysia. This chapter shows two-way trade between India and Singapore, Malaysia, Thailand, Indonesia and Vietnam. There are commodities like 7204 and 7219 also shown relatively high average IIT in 2010. With Malaysia, commodities like 7204 and 7210 are having two-way trade. Thailand and India two-way trade represents commodities like 7210 and 7219 followed by 7219 with Indonesia and Vietnam also. India is having trade surplus in 7210 with Malaysia and 7219 with Indonesia and Vietnam. In post-AIFTA period, Singapore lost its share in two-way trade in commodities like 7210 and substituted with 7202 average IIT with Malaysia, Indonesia and Vietnam. There are other new commodities introduced in post-AIFTA period as 7222 and 7214. There is an increase in the overall two-way trade with Malaysia and Indonesia. India's two-way trade surplus is registered with Malaysia in 7222, Indonesia in 7219 and 7202 with Vietnam. The volume of two-way trade with Indonesia is higher in 2016 than Singapore in 2010.

The Chapter 84 on Nuclear Reactors represented commodities like 8473 is the highest average IIT two-way trade with Singapore followed by 8471, 8431 and 8409. With Thailand, only 8414 are seen in two way trade. India is having trade deficit in all commodities of chapter 84 with Singapore and Thailand in 2010. In 2016, India has seen consistent average IIT with trading partners as Singapore, Thailand, Malaysia and Indonesia. India has shown all commodities trade surplus with its ASEAN partner countries unlike in 2010. The expansion in volume and direction of trade also suggests benefits for India to have higher market access with ASEAN countries in chapter 84. There are large number of commodities been identified in post-AIFTA period as 8409, 8411, 8431, 8475, and 8481 with Singapore; 8419 and 8481 with Malaysia; 8408, 8414 and 8483 with Thailand and 8421 with Indonesia. The chapter 84 shows no specific common commodity at 4digit across ASEAN and India. This sector represents higher volume in 2016 period than 2010.

The Chapter 85 on Electrical Machinery shows high average IIT in 8504, 8525, 8535 and 8542 with Singapore and 8517 with Malaysia. India has trade surplus with Singapore in commodity 8525 in pre-AIFTA period. Highly two-way trade is found in commodity 8504 and 8525. In post-AIFTA period, Thailand and Vietnam also started two-way trade with India in commodities like 8536 and 8517 respectively. Malaysia continued with same commodity as 8517. The Singapore two-way pattern has changed to commodity like 8536 and 8543 in 2016 as compare to 8525 and 8535 in 2010. The overall trade in chapter 85 is reduced in 2016 than in 2010. In 2016, India is having trade deficit in all commodities listed in 85 with all the mentioned trading partners of ASEAN.

The Chapter 87 on Vehicles other than railway and tramway represents major share of average IIT with Thailand in 8708 followed by Indonesia, Malaysia and Singapore in same commodity. Apart from 8708, 8714 and 8704 is also a part of this chapter in 87. India has trade surplus in commodity like 8708 with Malaysia, 8704 with Thailand and 8714 with Philippines. In 2016, 8708 continued to have high average IIT between Thailand and India followed by Indonesia in the same commodity. In post-AIFTA period, Philippines dropped its two way trade with India with an expansion with Vietnam in 8708. The Thailand two-way trade started taking place in commodities like 8701, 8708 and 8714. Singapore two-way trade in 8711 and 8708 continued in 2016. The direction and composition of trade is changed in 2016 and became more ASEAN members oriented by inclusion of other members with new products.

The overall assessment of average IIT at 4digit suggests that in ASEAN – Singapore has the highest share in two-way trade followed by Thailand, Malaysia, Vietnam, Indonesia and Philippines. There is decline in the chapter 27, 85, 84 and 29 in post-AIFTA period. The highest volume wise commodity pertains to chapter 27 followed by 85, 84 and 29. This means all the mentioned chapters have huge potential but due to market access in ASEAN, India has to be prepared with its competitors trading partner.

Table 5.15: Trade Weighted Average IIT in the Pre and Post AIFTA at 4 digit HS Classification level - Representation of Composition and Direction of Two-Way Trade

Product Code	Reporter Name	Product Description	Simple IIT	Trade Weighted Average IIT
27 - Mineral Fuels, Oils & Product				
2010 - Pre-AIFTA				
2710	Singapore	Petroleum oils and oils obtained fr	0.58	0.37
2710	Malaysia	Petroleum oils and oils obtained fr	0.98	0.02
2710	Indonesia	Petroleum oils and oils obtained fr	0.13	0.01
2016 - Post-AIFTA				
2710	Singapore	Petroleum oils and oils obtained fr	0.35	0.13
29 - Organic Chemicals				
2010 - Pre-AIFTA				
2902	Singapore	Cyclic hydrocarbons	0.27	0.05
2933	Singapore	Heterocyclic compounds with nitrogen	0.82	0.01
2902	Malaysia	Cyclic hydrocarbons	0.77	0.04
2902	Thailand	Cyclic hydrocarbons	0.83	0.01
2922	Thailand	Oxygen-function amino-compounds.	0.63	0.01
2902	Indonesia	Cyclic hydrocarbons	0.48	0.05
2905	Indonesia	Acyclic alcohols and their halogena	0.52	0.01
2915	Indonesia	Saturated acyclic monocarboxylic ac	0.60	0.01
2916	Indonesia	Unsaturated acyclic monocarboxylic	0.51	0.01
2016 - Post-AIFTA				
2902	Singapore	Cyclic hydrocarbons	0.18	0.03
2905	Singapore	Acyclic alcohols and their halogena	0.20	0.01
2914	Singapore	Ketones and quinones, whether or no	0.84	0.01
2915	Singapore	Saturated acyclic monocarboxylic ac	0.21	0.01
2933	Singapore	Heterocyclic compounds with nitrogen	0.90	0.03
2934	Singapore	Nucleic acids and their salts; other	0.55	0.01
2902	Malaysia	Cyclic hydrocarbons	0.13	0.01
2917	Malaysia	Polycarboxylic acids, their anhydri	0.63	0.01

2902	Thailand	Cyclic hydrocarbons	0.37	0.01
2922	Thailand	Oxygen-function amino-compounds.	0.63	0.01
2933	Thailand	Heterocyclic compounds with nitrogen	0.71	0.01
2902	Indonesia	Cyclic hydrocarbons	0.16	0.01
2915	Indonesia	Saturated acyclic monocarboxylic ac	0.34	0.01
2922	Indonesia	Oxygen-function amino-compounds.	0.80	0.01
71 - Natural/Cultured Pearls, Precious Stone				
2010 - Pre-AIFTA				
7113	Singapore	Articles of jewellery and parts the	0.48	0.11
7102	Singapore	Diamonds, whether or not worked, bu	0.13	0.02
7102	Thailand	Diamonds, whether or not worked, bu	0.39	0.07
7103	Thailand	Precious stones (other than diamond	0.84	0.04
7113	Thailand	Articles of jewellery and parts the	0.22	0.01
2016 - Post-AIFTA				
7102	Singapore	Diamonds, whether or not worked, bu	0.88	0.28
7103	Singapore	Precious stones (other than diamond	0.83	0.01
7108	Singapore	Gold (including gold plated with pl	0.09	0.01
7113	Singapore	Articles of jewellery and parts the	0.21	0.04
7102	Thailand	Diamonds, whether or not worked, bu	0.83	0.17
7103	Thailand	Precious stones (other than diamond	0.90	0.04
7113	Thailand	Articles of jewellery and parts the	0.74	0.01
72 – Iron and Steel				
2010 - Pre-AIFTA				
7210	Singapore	Flat-rolled products of iron or non	0.79	0.03
7204	Malaysia	Ferrous waste and scrap; remelting	0.42	0.01
7210	Malaysia	Flat-rolled products of iron or non	0.43	0.01
7210	Thailand	Flat-rolled products of iron or non	0.69	0.03
7219	Thailand	Flat-rolled products of stainless s	0.26	0.01
7219	Indonesia	Flat-rolled products of stainless s	0.07	0.01
7219	Vietnam	Flat-rolled products of stainless s	0.81	0.02
2016 - Post-AIFTA				
7202	Singapore	Ferro-alloys.	0.38	0.01
7202	Malaysia	Ferro-alloys.	0.82	0.03
7222	Malaysia	Other bars and rods of stainless st	0.98	0.02
7214	Thailand	Other bars and rods of iron or non-	0.39	0.01
7219	Thailand	Flat-rolled products of stainless s	0.47	0.01
7202	Indonesia	Ferro-alloys.	0.55	0.05
7219	Indonesia	Flat-rolled products of stainless s	0.09	0.01
7202	Vietnam	Ferro-alloys.	0.59	0.01
84 - Nuclear Reactors, Boilers etc.				
2010 - Pre-AIFTA				

8473	Singapore	Parts and accessories (other than c	0.12	0.02
8471	Singapore	Automatic data processing machines	0.05	0.01
8431	Singapore	Parts suitable for use solely or pr	0.29	0.01
8409	Singapore	Parts suitable for use solely or pr	0.53	0.01
8414	Thailand	Air or vacuum pumps, air or other g	0.44	0.01
2016 - Post-AIFTA				
8409	Singapore	Parts suitable for use solely or pr	0.48	0.01
8411	Singapore	Turbo-jets, turbo-propellers and ot	0.37	0.01
8431	Singapore	Parts suitable for use solely or pr	0.14	0.01
8475	Singapore	Machines for assembling electric or	0.48	0.01
8481	Singapore	Taps, cocks, valves and similar app	0.54	0.01
8419	Malaysia	Machinery, plant or laboratory equi	0.92	0.01
8481	Malaysia	Taps, cocks, valves and similar app	0.93	0.01
8408	Thailand	Compression-ignition internal combu	0.42	0.01
8414	Thailand	Air or vacuum pumps, air or other g	0.22	0.01
8483	Thailand	Transmission shafts (including cam	0.50	0.01
8421	Indonesia	Centrifuges, including centrifugal	0.93	0.01
85 - Electrical Machinery Equipment Parts Thereof				
2010 - Pre-AIFTA				
8504	Singapore	Electrical transformers, static con	0.80	0.02
8525	Singapore	Transmission apparatusfor radio-tel	0.86	0.03
8535	Singapore	Electrical apparatus for switching	0.84	0.01
8542	Singapore	Electronic integrated circuits and	0.04	0.01
8517	Malaysia	Electrical apparatus for line telep	0.89	0.01
2016 - Post-AIFTA				
8504	Singapore	Electrical transformers, static con	0.63	0.01
8536	Singapore	Electrical apparatus for switching	0.40	0.01
8543	Singapore	Electrical machines and apparatus,	0.36	0.02
8517	Malaysia	Electrical apparatus for line telep	0.43	0.01
8536	Thailand	Electrical apparatus for switching	0.87	0.01
8517	Vietnam	Electrical apparatus for line telep	0.20	0.01
87 - Vehicles Other Than Railway/Tramway Roll-Stock etc.				
2010 - Pre-AIFTA				
8708	Singapore	Parts and accessories of the motor	0.13	0.01
8708	Malaysia	Parts and accessories of the motor	0.76	0.01
8704	Thailand	Motor vehicles for the transport of	0.85	0.01
8708	Thailand	Parts and accessories of the motor	0.66	0.22
8708	Indonesia	Parts and accessories of the motor	0.73	0.02
8714	Indonesia	Parts and accessories of vehicles o	0.74	0.01
8714	Philippines	Parts and accessories of vehicles o	0.33	0.01
2016 - Post-AIFTA				

8708	Singapore	Parts and accessories of the motor	0.14	0.01
8711	Singapore	Motorcycles (including mopeds) and	0.55	0.01
8708	Malaysia	Parts and accessories of the motor	0.57	0.01
8701	Thailand	Tractors (other than tractors of he	0.93	0.02
8708	Thailand	Parts and accessories of the motor	0.72	0.23
8714	Thailand	Parts and accessories of vehicles o	0.76	0.01
8708	Indonesia	Parts and accessories of the motor	0.91	0.10
8714	Indonesia	Parts and accessories of vehicles o	0.33	0.01
8708	Vietnam	Parts and accessories of the motor	0.42	0.01

Source: Author's compilation by using WITS database

Section III

5.2.3. Determinants of IIT between ASEAN7 and India

The extent of IIT is normally and commonly computed by using a variant of the standard Grubel-Lloyd index (GL, 1975) which takes the following form:

$$IIT_c = 1 - \frac{|X_c - M_c|}{X_c + M_c} \quad (1)$$

where X_c and M_c stands for exports and imports of commodity c respectively. This measures ranges between zero (Inter-industry trade) and one (Intra-industry trade). The GL index is the most commonly used IIT measure in the literature. It has few limitation biases like aggregation bias which means IIT calculations at 2 digit or higher aggregation would not give proper results. Therefore, IIT calculations at 4 or 6 digit is appropriate disaggregation.

Accordingly, all IIT calculation in this study is based on 4 digit level of HS classification and then averaged upto the 2 digit level for reporting purposes. Menon and Dixit (1997), Varma (2015) and Ramakrishnan and Varma (2014) clearly mentions the appropriateness of using 4 digit is the ideal for calculating IIT because of highly disaggregated at 6 digit would result in the presence of inter-industry trade and at a highly aggregated level there will be IIT. The GL index has been calculated for identified sectors in Section I and II such as Chapter 27, 29, 71, 72, 84, 85 and 87 and sub-headings at 4 digit level of HS classification between ASEAN7 member countries and India. The study calculated simple IIT index as well as trade-weighted approach based on the study by Swayer and Sprinkle (2010)

The identified sectors are selected based on the top exports and imports of ASEAN7 with India from 2000 to 2016. The 12 years represents good time period before the AIFTA agreement signed in 2005 - 2010 and after the AIFTA agreement from 2011- 2016. The studies by Veeramani and Varma mainly focused on the agriculture IIT and selected papers of Veeramani

consider manufacturing sectors in Asia. The current study understands the trade quantum, share and pattern at 2 and 4 digit level HS classification of ASEAN7 member countries IIT with India. To examine the possible determinants of IIT between ASEAN7 and India, we estimate the following formula:

$$IIT_{ijt} = \beta_0 + \beta_1 \ln DGDP_{ijt} + \beta_2 \ln DPCGDP_{ijt} + \beta_3 \ln TO_{ijt} + \beta_4 \ln FDI_{ijt} + \beta_5 \ln Dist_{ij} + \beta_6 AIFTA + \varepsilon_{ijt} \quad (2)$$

IIT_{ijt} = Intra – industry trade between country i and j at specific time period

ln DGDP_{ijt} = log of Differences in GDP between country i and j at specific time period

ln DPCGDP_{ijt}

= log of difference in per capita between country i and j at a specific time period

ln TO_{ijt} = log of trade openness is a share of merchandise trade in GDP

ln FDI

= log of Foreign direct investment net inflows between country i and j at a specific time period

ln Dist_{ij} = log of distance between tradin partners

AIFTA = dummy variable of AIFTA as 0 and 1, pre

– agreement as 0 and post agreement as 1

The dependent variable is the trade weighted IIT index between Pre-AIFTA – 2005-2010 and Post-AIFTA – 2011-2016.

The explanatory variables on the right hand side of the equation shows the logarithm of differences in absolute GDP measures in current international USD. This is calculated as per the chapter 2 – 2.5.2.1.2 section. This accounts for the effect of economic size on IIT. Helpman and Krugman (1985) shown that the smaller the difference in the relative size of economies trading with each other, larger the volume of IIT. If the market size of economies is more similar then volume of IIT is higher.

Another important IIT determinant is the log of per capita GDP absolute difference measured in current international USD. Helpman and Krugman suggested that the similarity in factor endowments between trading partners as proxies by the difference in the per capita GDP (DPCGDP). IIT would be more intense among countries with more similar levels of per capita GDP.

The share of merchandise trade in GDP as a proxy of Trade openness is also expected to have a positive sign with IIT. Bruelhart (2008) Trade openness is congruent with less trade barriers and large volume of trade shows the results in higher IIT levels.

FDI promotes IIT, especially when foreign affiliates are set up to take advantage of the factor endowments of the host country and then production is subsequently exported back to the home country with rising share of IIT in FDI. As Sprinkle and Swayer (2010) mentioned Asia is becoming a factory hub for many foreign affiliates in assembling and intermediate production. Therefore, the study includes the net inflows of FDI as a share of GDP (FDI) in the model to account for the prominent role of export-oriented FDI and intra-firm trade by multinationals in Asia.

Distance stands for the natural log of the trade-weighted average distance in nautical miles between the capitals of an ASEAN7 and India. The consideration of distance represents geographical proximity in terms of trade costs with lower transportations and information costs determines the level of IIT.

Lastly, the regression equation includes dummy variables that account for the role of FTAs and economic integration on IIT. AIFTA takes the value of 1 in the post-agreement period and 0 in the pre-agreement period for ASEAN7 and India. As countries sign FTAs to promote trade by reducing and removing tariff barriers on selected commodities, the expected sign for FTA dummy to have positive effect on IIT.

As the IIT index takes the value of 0 and 1, estimation of the regression via Ordinary Least Square (OLS) would result in inconsistent estimates. Therefore, the study employs a Tobit specification which captures the lower and upper censoring of the dependent variable and produces consistent maximum likelihood estimates.

The computation of IIT index was based on data from World Integrated Trade Solution (WITS), UNCOMTRADE database published by United Nations Statistics Division. Data on GDP, PCGDP, and Trade openness obtained from World Bank database. The explanatory variables are country specific factors combined with Gravity model variables as distance, its database obtained from CEPII.

5.3. The Patterns of IIT between ASEAN7 and India

The IIT index for individual countries of ASEAN with its trading partner - India for 12 years in selected sectors averaged at 2 digit HS level of classification. The table 5.16 depicts the extent of

IIT in the form of simple average and trade-weighted average to present each sector country-wise. In all the ASEAN 6¹ countries, the simple average IIT shows higher extent of IIT is with Thailand, Philippines, and Malaysia, in all the selected countries followed by Indonesia, Singapore and Vietnam.

The trade weighted average also represents the same picture; the share of IIT in total trade is higher for countries like Thailand, Philippines, and Malaysia, in all the selected countries followed by Indonesia, Singapore and Vietnam. This table shows that the Thailand and India bilateral Trade is 60% comprised of IIT. The IIT index shows the extent of intra-industry trade for countries like Philippines 49%; Malaysia 48%; Indonesia and Singapore 44% and Vietnam 40% for 12 years.

The selected sector wise representation shows that the huge potential of higher IIT is prevailing in chapter 87 with simple average of 58% of the extent of IIT in ASEAN6. This trend is followed by chapter 72 – 53%, chapter 84 – 49% , Chapter 85 – 48%, Chapter 71 – 45% and Chapter 27- 40% and Chapter 29 – 40%. Though the trade-weighted average shows higher IIT is happening in the chapter 84, 85 and 27. This is true in two aspects: firstly, chapter 84 and 85 are having more number of sub-headings in the chapters. These two sectors have huge potential of higher IIT extent due to its nature and product differentiation (Swayer and Sprinkle 2010) and (Ramakrishna and Varma 2014). Secondly chapter 27 does not have many sub-headings under chapter but due to its sector characteristic, it is only one sub-heading called 2710 – Petroleum oils and oil obtained from comprised of more than 90% of trade within ASEAN7 and India.

The each sector-wise trade weighted IIT representation for chapter 27 – minerals fuels and mineral oils and products etc. is high for Singapore and Malaysia. For sector 29 – organic chemicals IIT is high for Malaysia, Thailand and Indonesia. Chapter 71 – Natural or cultured pearls etc. shows high IIT for Thailand. Chapter 72 – Iron and steel shows high IIT for Thailand, Philippines, Vietnam, Malaysia and Indonesia. Chapter 84 shows higher extent of IIT for countries like Philippines, Vietnam, Thailand and Malaysia. Countries like Philippines, Vietnam, Thailand, Malaysia shows high IIT than countries like Indonesia and Singapore. And lastly chapter 87- Vehicles other than railway and tramway etc. shows Philippines with higher extent

¹ ASEAN6 – Singapore, Malaysia, Indonesia, Thailand, Philippines and Vietnam, Cambodia excluded due to data unavailability

of IIT followed by Thailand, Vietnam and Indonesia. The Singapore and Malaysia has very low IIT in this chapter.

The lowest presence of IIT is in the chapters of Natural Pearls etc. -71, Iron and Steel - 72, Vehicle other than railway and tramway - 87 and organic chemicals -29. The highest IIT is in the chapters of Nuclear reactors etc.-84, Minerals and fuels- 27 and Electrical machinery etc. within ASEAN6 and India.

Overall countries participation in higher IIT in ASEAN6 is Thailand, Philippines and Malaysia followed by Vietnam, Indonesia and Singapore. The trade with Singapore has declined drastically post agreement.

Table 5.16: Simple and Weighted Average GL IIT index of ASEAN 7 with Trading Partner as India for 12 years

S. No.	Country	27		29		71		72		84		85		87	
		Minerals fuels, mineral oil and products etc.		Organic Chemicals		Natural or cultured pearls, precious and semi- precious etc.		Iron and Steel		Nuclear reactors, boilers etc.		Electrical machinery etc.		Vehicles other than railway and tramway etc	
		IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average
1	Singapore	0.48	0.20	0.41	0.04	0.64	0.00	0.06	0.01	0.21	0.04	0.24	0.04	0.58	0.01
2	Malaysia	0.34	0.17	0.80	0.10	0.17	0.00	0.78	0.03	0.43	0.07	0.33	0.06	0.53	0.00
3	Indonesia	0.16	0.09	0.42	0.05	0.31	0.00	0.43	0.02	0.66	0.04	0.71	0.05	0.40	0.02
4	Thailand	0.56	0.03	0.62	0.08	0.68	0.12	0.73	0.08	0.38	0.12	0.48	0.08	0.71	0.08
5	Philippines	0.32	0.01	0.14	0.01	0.47	0.00	0.41	0.04	0.72	0.14	0.74	0.15	0.62	0.15
6	Vietnam	0.51	0.03	0.04	0.00	NA	NA	0.34	0.05	0.55	0.13	0.36	0.11	0.61	0.03
Average ASEAN		0.40	0.52	0.40	0.28	0.45	0.13	0.46	0.23	0.49	0.53	0.48	0.49	0.58	0.29

Source: Author's calculations using data from WITS database

Note: Cambodia dropped due to unviability of data and 71 sector data for Vietnam was not available; mostly it is exported by India to Vietnam.

This table has an outcome of each year wise, country-wise and sector-wise analysis of ASEAN7 with India from 2005 to 2016.

The table 5.17 below shows simple and weighted average of GL index of ASEAN7 with India in the pre and post AIFTA agreement. The sector-wise analysis of the identified sectors demonstrate the rise in trade weighted average of IIT in sectors like 27- Minerals fuels, mineral oil and products etc. with 0.52 and sector 84 - Nuclear reactors, boilers etc. with 0.52. Sector 85 - Electrical machinery etc. also shows the rising sign in the ASEAN7 with India – 0.48. The sectors 29, 71, 72 and 87 are showing lower trend of IIT. Though the sectors like Natural or cultured pearls, precious and semi -precious etc. as 71, Organic chemicals as 29 and Iron and Steel – 72 are such sectors in which India has its advantage but not been able to reap full benefits from the sector.

The sector wise and country wise analysis of sector 27- mineral oil and products etc. shows that between Singapore and India trade-weighted average is declining, otherwise for all other countries like Malaysia, Indonesia, Thailand, Philippines and Vietnam the average of IIT is increasing significantly. This sector is showing great potential in promoting IIT.

The sector 29 – Organic chemicals showing increasing trend in post AIFTA agreement in trade weighted average for countries like Singapore, Malaysia, Indonesia, Thailand and Philippines but for Vietnam it is showing constant trend. This is also true when at 4 digit IIT is seen post AIFTA agreement, there are large number of sub headings trade at 4 digit started between ASEAN7 and India

Table 5.17: Simple and Weighted Average GL index of ASEAN 7 with Trading Partner as India for Pre and Post AIFTA Agreement

S. No	Country	Years Pre - 2005-10 Post - 2011-16	27		29		71		72		84		85		87	
			Minerals fuels, mineral oil and products etc.		Organic Chemicals		Natural or cultured pearls, precious and semiprecious etc.		Iron and Steel		Nuclear reactors, boilers etc.		Electrical machinery etc.		Vehicles other than railway and tramway etc.	
			IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average	IIT-Simple Average	Trade-Weighted Average
1	Singapore	2005-2010	0.66	0.12	0.39	0.01	0.58	0.03	0.60	0.00	0.19	0.02	0.31	0.02	0.69	0.00
		2010-2016	0.30	0.08	0.42	0.02	0.70	0.03	0.36	0.00	0.23	0.02	0.18	0.02	0.48	0.00
2	Malaysia	2005-2010	0.11	0.02	0.70	0.03	0.06	0.00	0.77	0.01	0.32	0.02	0.40	0.02	0.53	0.00
		2010-2016	0.57	0.15	0.89	0.07	0.28	0.00	0.79	0.02	0.54	0.04	0.27	0.03	0.52	0.00
3	Indonesia	2005-2010	0.24	0.04	0.37	0.02	0.3	0.00	0.38	0.01	0.83	0.02	0.64	0.01	0.46	0.00
		2010-2016	0.09	0.05	0.47	0.03	0.33	0.00	0.49	0.01	0.48	0.02	0.78	0.03	0.34	0.01
4	Thailand	2005-2010	0.43	0.01	0.61	0.02	0.48	0.03	0.72	0.04	0.36	0.03	0.57	0.04	0.61	0.02
		2010-2016	0.68	0.01	0.64	0.05	0.88	0.09	0.75	0.04	0.41	0.08	0.39	0.03	0.81	0.06
5	Philippines	2005-2010	0.27	0.00	0.13	0.00	0.51	0.00	0.56	0.04	0.66	0.02	0.72	0.07	0.82	0.07
		2010-2016	0.36	0.01	0.14	0.01	0.44	0.00	0.25	0.00	0.77	0.12	0.76	0.09	0.43	0.09
6	Vietnam	2005-2010	0.45	0.01	0.05	0.00	NA	NA	0.35	0.02	0.29	0.01	0.54	0.04	0.59	0.00
		2010-2016	0.57	0.02	0.04	0.00	NA	NA	0.43	0.03	0.81	0.12	0.18	0.08	0.63	0.03
Total				0.52		0.27		0.18		0.22		0.52		0.48		0.28

Source: Author's calculations using data from WITS database

Note: Cambodia dropped due to unviability of data and 71 sector data for Vietnam was not available; mostly it is exported by India to Vietnam.

5.4. Estimation Results

In the estimation results as the IIT index is limited to values between 0 and 1, estimation of the regression via Ordinary least Square (OLS) would result in inconsistent estimates. Therefore, we employed a Tobit Regression model which captures the lower and upper censoring of the dependent variable and produces consistent maximum likelihood estimates. Therefore, the table represents the result from both OLS and Tobit regression, so to make the model estimates consistent.

Table 5.18: Results from Tobit and Regression Model on Intra-Industry Trade between ASEAN6 and India

	Tobit model	Regression model
Independent Variable	IIT – Intra-Industry Trade	IIT – Intra-Industry Trade
Intercept/Constant	.011 (0.11)	.012 (0.10)
lnDGDP	0.037 (1.31)	.036 (1.24)
lnDPCGDP	-.019 (-0.47)	-.018 (-0.43)
lnFDI	-.144 (-3.24)**	-0.144 (-3.12)**
lnTO	.011 (2.21)*	.011 (2.13)*
lnDIST	-.0041 (-0.35)	-.004 (0.35)
FTA	.020 (5.17)***	.020 (4.93)***
No. of Observations = 66 LR Chi2 (6) = 33.95 Prob>Chi2 = 0.000*** Log likelihood = 186.513		No. of Observations = 66 S stats = 6.78 Significant = 0.000*** R Square = .408 Adjusted R square = .348

Source: Author's computation by using STATA

Note: ***, **, * denote 1%, 5%, 10% significant levels respectively. T statistics presented in the parenthesis

5.5. Hypothesis Testing

Hypothesis 1: The smaller the difference of GDP, higher the IIT index.

The DGDP accounts for the effect of economic size on IIT. The smaller the difference in the relative size of countries trading with each other, the larger is the volume of IIT. The DGDP is a

proxy of difference in market and economic size. This variable is also generated in gravity model in which the size of GDP defines the IIT. If higher the GDP, higher is the IIT.

The estimated results are showing that the difference in GDP is positively related to higher IIT. It means ASEAN6 countries are more aligned to India in terms of market size except Singapore; all other countries are having similar market structure, similar demand patterns (Linder 1961) and economic size will increase IIT. Greenway and Milner (2002) suggested that if countries have similar demand patterns then this similarity favours trade of varieties of same quality or HIIT. Therefore, the results support that the difference in income is positively related to IIT.

Hypothesis 2: The difference in per capita income between trading partners decreases, IIT index increases.

The variable DPCGDP represents the difference in per capita incomes between the two countries. Various studies through empirical research present that per capita income differences are a good determinant of IIT. It is a country specific variable which affects IIT. This variable also depicts the income distribution among countries; if differences in per capita income are higher, countries require more high end products (Vertical IIT) than low end products (Horizontal IIT). High income differences create demand of high quality products. Helpman and Krugman (1985) deliberate differences in per capita income as differences in factor endowments. Falvey and Kierzkowski (1987) and Jumbor (2014) also suggest that the per capita income is a proxy of factor endowments differences.

The variable could take positive or negative coefficient value in the results. The variable is positive with IIT, when small differences in per capita income are prevailing. This type is known as Horizontal IIT. Latter describes from the demand side factors which predict that the larger differences in per capita income of the countries are negatively associated with IIT or vertical IIT. The relation in the latter is negative due to higher share of vertical IIT in the total IIT.

Loertscher and Wolters (1980) and Greenway et al. (1994) provide empirical support for a negative relation between the differences in per capita income and IIT. Linder (1961) study considers that the countries with similar demands will trade similar products. Therefore, Linder suggests negative sign for the coefficient of this variable. Various studies on IIT determinants consider the per capita income differences as a proxy of consumer tastes and preferences. Based on the empirical argument, if per capita income of two countries becomes equal, it means that the

tastes and preference of their consumers are also similar. Therefore, the share of IIT increases if the difference in per capita declines.

The results validate clearly that per capita GDP differences captures the differences in demand as well as factor endowments. The negative sign of coefficients shows the negative relationship between the differences in per capita GDP and IIT. This means that the difference in per capita GDP is higher in ASEAN6 countries which are resulting higher IIT.

Though GDP represents similar market structure and economic size but differences in per capita income showing demand pattern to be more of qualitative products or VIIT between ASEAN and India. The ASEAN6 countries per capita income is higher than India in post agreement period which reflects the demand of high end products than similar type of products. This is also possible due to intra-ASEAN trade within bloc.

Hypothesis: The presence of Foreign Direct Investment increases IIT.

Participation in foreign investment promotes IIT especially if foreign affiliates are set up to take advantage of the factor endowments of the host country and their production is subsequently exported back to the home country. Therefore, model includes FDI net inflows to check its impact on IIT. The FDI is an industry specific factor reviewed in the literature.

The estimated result for this model is negatively related to IIT, this is due to a very fact of ASEAN agreement which is been signed only in trade in goods (2010) and then trade in services (signed in 2012). As the investment agreement is not negotiated in the AIFTA agreement. Therefore, the negative sign of FDI shows only a picture of exports and imports than foreign affiliates set up in ASEAN countries or vice-a-versa.

Hypothesis: The Trade Openness promotes higher IIT

Trade openness variable is corresponding with lower trade barriers and larger volumes of trade which have been shown to result in higher IIT levels (Bruehler, 2008). This variable is a country specific variable affecting IIT.

The present study considers the share of merchandise trade as a percentage of GDP. It is used as a proxy for trade openness. The estimated results supports trade openness is positively related to IIT. This is seen in favour of an agreement which is been signed between ASEAN and India in 2010 in trade in goods. In this agreement almost 80% tariff lines are opened up and rest 20% are

in the phase of removal and reduction. Therefore, this variable supports higher IIT between ASEAN and India.

Hypothesis: The IIT is higher when closer the countries are geographically

As per the gravity model, the distance is negatively related to trade. The distance between countries represents transportation costs. If the countries are in closer proximity then the trade would be cheaper.

The distance variable indicates the geographic proximity between reporting countries with its trading partner by taking logarithm of the distance between the capital cities of trading partners. The distance is expected to take negative sign. The estimated results are highly significant with higher IIT. This is due to ASEAN countries proximity with India which shows ASEAN countries prefer doing trade with its neighbouring countries than the countries are beyond its proximity. This is true with transaction costs which increase, if trading partners are far off.

Hypothesis: The IIT is higher when countries have Free Trade Agreements

The free trade environment facilitates higher IIT. In free trade agreements, removal of tariff barriers and allowed market access promotes higher IIT. This is not only true in the case of EU or NAFTA but also in the case of present study. The ASEAN free trade agreement has promoted IIT and different aspects of trade and investment.

The present study uses dummy variable to capture effects of FTAs on IIT. The results are significant at 1% level which demonstrates the role of FTAs in higher IIT between ASEAN and India.

The overall estimated result shows that FDI, trade openness and FTAs are significant at 5%, 10% and 1% level of significance. This means the IIT is largely explained from these variables.