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INTRA-INDUSTRY TRADE AND REVEALED COMPARATIVE ADVANTAGE: EMPIRICAL ANALYSIS OF INDIAN &AUSTRALIAN PROCESSED FOOD SECTOR

Shanmukh Sagar K[1], Vikas Saxena[2] & Sapna Arora[3]

[1]Research Scholar, Department of Food Business Management & Entrepreneurship Development, Sonepat, Haryana, India

[2]Associate Professor, National Institute of Food Technology, Entrepreneurship and Management, Sonepat, Haryana, India

[3]Assistant Professor, National Institute of Food Technology, Entrepreneurship and Management, Sonepat, Haryana, India

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ABSTRACT

This study has been undertaken to investigate the level of competitiveness and the determinants of Intra-Industry Trade between India and Australia in the Processed Food Sector. The macroeconomic variables include GDP, Distance, FDI, RSCA etc. For the very purpose yearly time series data has been arranged from 2003 to 2016. The analytical framework contains Comparative Advantage, IIT, HIIT, VIIT & an Econometric evaluation of the variables hypothesized.

KEYWORDS: *Intra Industry Trade, Comparative Advantage, HIIT, VIIT*

INTRODUCTION

The perspective of analyzing international trade has changed the significance of Intra-Industry Trade (IIT). Since the 1960s, a majority of the world trade begins to focus on intra-industry rather than inter-industry trade. In the 1960s, world trade began and described the cause and characteristics of IIT. Falvey (1981) presented the significant work on the concept of horizontal and vertical product differentiation that has introduced in the studies.

According to the work of Falvey (1981), three different kinds of bilateral trade results may occur between nations namely, inter-industry trade, HIIT, and VIIT. Inter-industry trade is a trade of products that belong to different industries whereas intra-industry trade is a trade of products that belong to the same industry. Homogenous products with the similar standard but with different features are known to fall under Horizontal Intra-Industry Trade (HIIT), whereas products traded with different standard and value are known to fall under Vertical Intra-Industry Trade (VIIT). Intra-Industry Trade (IIT) has become a global interest in international trade since the 1990s(Brülhart, 2009) and the dominance of VIIT in overall IIT is also evidenced (Fontagne et al., 2006; Jensen & Lüthje, 2009), specifying the essentials of related theoretical designs for empirical research. However, most of the research is still concentrating on industrial products; with the processed food sector not of great consideration to be examined in previous empirical works, which may be because of processed food sectors that are commonly considered to be quite competitive. According to the evidence of Hirsch and Gschwandtner (2013), the measure of profit persistence in the food industry is extremely low when related with other manufacturing sectors due to intense competition among food processors and high retailer population (Ferto & Jambor,

2015). Typically, the belief was that intra-industry trade operations are significant among developed countries. However, Reinert (2003) shows that this fact is growing even in the Asian nations. Growing IIT indicates lower adjustment values since labor, and different resources would identify it merely to transform 'within' the industry, rather than 'between' the industries. Furthermore, it also suggests greater integration of the nation with the global economy (Burange & Chaddha, 2008).

Among the industrially advanced nations, intra-industry trade takes a significant place in accordance with the manufactured products (Trupkiewicz, 2015). Intra-industry trade extends the opportunity for a new fact in international trade, which covers the exchange of dissimilar goods of the similar industry or large product type. This method of trade has become familiar since the initiation of the European Union or Common Market when all kinds of limitations to the supply of trade among the members of Customs Unions were cleared in 1958. Initially, Balassa (1967) identified this method of trade and identified that improvements in world trade include the exchange of differentiated goods within different industries.

Intra-industry trade helps to remove all types of trade difficulties, decreases unit costs, and aids production units concentrate on the production of several ranges of items and design of a product. The central aspect is that it benefits consumers because of the availability of more choice of goods and services presented in front of them. Nevertheless, it is mentioned that intra-industry trade is considerably contrasted to that of comparative advantage theory, which describes that Intra Industry Trade (IIT) is much powerful of relative development in disguise (Lancaster, 1980). The Ricardian theory is an indication of comparative advantage while intraindustry trade provides an exposition of gained comparative advantage (Grubel & Lloyd, 1975).

RESEARCH METHODOLOGY

Intra-Industry trade has shown a healthy development in the share of global trade due to its significance. The interest in the study of IIT is based on two causes. Firstly, the sectoral similarity of different national economies, and secondly as a representative of the intensity of factor-market adjustment pressures related to trade expansion. Nevertheless, the major share of IIT is within the industrial and improved nations or between same nations, and there is an advancing fashion of IIT between developed and developing countries also. In this regard, numerous empirical studies were conducted to identify the drivers of IIT, which are country set and industry set. The theoretical considerations were evidenced right in many cases. However, there are very few country-specific studies on the processed food sector.

The present research aims to empirically assess various country-specific hypotheses concerning the drivers of Vertical Intra-Industry Trade (VIIT) and Horizontal Intra-Industry Trade (HIIT) between India and her major trading partners. The need to test the drivers of Vertical Intra-Industry Trade and Horizontal Intra-Industry Trade separately is well justified in New Trade Theory (Revolvy, 2017).

The study analyses the IIT, especially after the introduction of trade liberalization and its implications on adjustment costs and food security. The data is taken for a period of 1997-2014 and the level of disaggregation that was considered for calculations was at the four-digit level of HS classification. At a highly disaggregated level, there will be presence of inter-industry trade, whereas, at a highly aggregated level, there will be IIT. As a result, categories should neither be too fine nor too broad (Menon & Dixon, 1997). This was the reason behind choosing the four-digit and six-digit level of HS classification.

HS code

Table 1

HS Code	Description
02	Meat and Edible meat offal
03	Fish and Crustaceans, molluscs and other aquatic invertebrates
04	Dairy products; bird's egg, natural honey, edible products of animal origin, not elsewhere specified or included.
15	Animals or vegetable fats and oils and their cleavage products, prepared edible
16	Preparation of meat, of fish of crustaceans, Ollusks or other aquatic invertebrates
19	Preparation of cereal, flour, starch, or milk, pastry cooks products
20	Preparation of vegetables, fruits, nut or other parts of plants
21	Miscellaneous edible preparation

First, India is reported as home country 'a' and each trading partner as country b, then the intensity of trade index (TII) is calculated using the formula:

$$TII = \frac{X_{ab} / X_a}{M_b / M_w - M_a} \quad \textbf{(1)}$$

Where

TII = Intensity of Trade Index for trade flow from India (country a) to country b.

Xab = the exports of country a (India) to country b (Partner Country)

Xa = the total exports of country a (India)

Ma = the total imports of country a (India)

Mb = the total imports of country b (Partner Country)

Mw = total world imports.

Difference between Four-Digit and Six-Digit Aggregation Level

As far as different studies on international trade are concerned, it depends on the objective of the study that what level of aggregation is required. Some studies may be conducted at the highest level of aggregation i.e., two-digit level while some may be conducted in the lowest level of aggregation i.e., six-digit level of aggregation. Since, theoretical it has been assumed that the level of aggregation affects the degree of intra-industry trade, thus the present study is based on both 4-digit and 6-digit level of aggregation. In the case of food processing industry at the four-digit level, have been considered; while in the case of defining industry at six-digit level, the value of all the products at eight-digit level, under the same six-digit level, have been considered. Therefore, at the four-digit level, then it means that it is carrying the summation of all the values of the six-digit level, at six-digit level the summation of all the values of an eight-digit level has been considered.

There has been presented many theoretical ways of measuring intra-industry trade in the literature so far. Nevertheless, the vast majority of them are based on simple the Grubel-Lloyd index (Grubel & Lloyd, 1975a), which is calculated as follows the index. IIT is explained as the variations among the business balance of the industry i and the complete business of this same industry. For evaluating simpler among industries or nations, the index is shown as a ratio in which the denominator is a complete business.

$$GL_i = \frac{(X_i + M_i) - |X_i + M_i|}{X_i + M_i} = 1 - \frac{|X_i + M_i|}{X_i + M_i}; 0 \le GL_i \le 1 \quad \textbf{(2)}$$

Disentangling Total Intra-Industry Trade into Vertical and Horizontal IIT

The literature on intra-industry trade increasingly emphasizes the importance of differentiating between horizontal and vertical intra-industry trade.

$$IIT = HIIT + VIIT \quad \textbf{(3)}$$

Horizontal intra-industry trade (HIIT) is generally defined as the exchange of commodities differentiated by different attributes but do not differ in terms of quality or price, while vertical intra-industry trade (VIIT) is the exchange of commodities characterized by different qualities which lead to the difference in price also. This is why the presence of one or the other has different implications for the trading partners.

In disentangling total IIT into horizontal IIT (HIIT) and vertical IIT (VIIT), we use the unit value information at the 10-digit HS industry level as follows:

$$IIT_i = HIIT_i + +VIIT_i \quad \textbf{(4)}$$

Where HIITi is given by (2) for those products (k) in a industry i where unit values of imports (UVkim) and exports (UVki x) for a particular dispersion factor (α) satisfy the condition,

$$1-\alpha \le \frac{UV_{ki}^{x}}{UV_{ki}^{m}} \le 1+\alpha \quad \textbf{(5)}$$

And VIITi is given by (2) for those products (k) in aindustry i where,

$$\frac{UV_{ki}^{x}}{UV_{ki}^{m}} < 1-\alpha \text{ or } \frac{UV_{ki}^{x}}{UV_{ki}^{m}} > 1+\alpha \quad \textbf{(6)}$$

Where α = 0.15. Typically, trade flows are defined as horizontally differentiated where the spread in the unit value of exports relative to the unit value of imports is less than 15% of the 10-digit HS level. Where relative unit values are outside this range products are considered as vertically differentiated. The presumption is that transport and other freight costs do not cause a difference in export and import unit values by more than this percentage. Although we used three levels of dispersion factor (namely, α = 0.15, 0.20, and 0.25) to calculate the horizontal and vertical IIT, due to the limitation of space we are reporting the results only for α = 0.15. Both Abd-el-Rahman (1991) and Greenaway et al. (1994, 1995) demonstrate that increasing the range from 15% to 25% does not radically alter the division of trade into horizontally and vertically differentiated products.

The Basic Tobit Structure can be Written as

$$Y* = \beta x + \acute{e} \quad (7)$$

Where the assumption is ἐ˜N (0, ϭ). If Y* ≤ then yji = 0. If y* ≥ 0, then y=y* implying y=max [o, y*]. In the standard to bit regression there is censoring of the normal distribution at zero for the lower tail. Country-specific hypotheses concerning the drivers of horizontal (HIIT) and Vertical Intra-Industry Trade (VIIT) of the Indian Processed Food sector. Here for this objective, we did the analysis of correlation and regression. In the regression model GDP, GDPP, RSCA, RCA, TIMB, EC, FDI are considered as independent variables and IIT, HIIT and VIIT are dependent variables. Correlation is used to find the relationship between independent and dependent variables. Regression analysis is used to find the association between independent and dependent variables.

$$IIT_{ij} = \beta_o + \beta_1 LGDP + \beta_2 LGDPP + \beta_3 LFDI + \beta_4 LEC + \beta_5 RSCA + \beta_6 RCA + \beta_7 TIMB + \beta_8 LDistij + \mu_{ij} \quad (8)$$

$$HIIT_{ij} = \beta_o + \beta_1 LGDP + \beta_2 LGDPP + \beta_3 LFDI + \beta_4 LEC + \beta_5 RSCA + \beta_6 RCA + \beta_7 TIMB + \beta_8 LDistij + \mu_{ij} \quad (9)$$

$$VIIT_{ij} = \beta_o + \beta_1 LGDP + \beta_2 LGDPP + \beta_3 LFDI + \beta_4 LEC + \beta_5 RSCA + \beta_6 RCA + \beta_7 TIMB + \beta_8 LDistij + \mu_{ij} \quad (10)$$

Where

IIT = Intra-industry trade

HIIT = Horizontal Intra-industry trade

VIIT = Vertical Intra-industry trade

GDP = Log of Gross Domestic Product

GDPP = Log of Gross Domestic Product Per capita

FDI = Log of Foreign Direct Investment

RSA = Revealed Comparative Advantage

RCA = Revealed Symmetric Comparative Advantage

TIMB = Trade imbalance

DIST = Log of Geographical distance between the partner country and India

EC = Log of Energy Consumption

RESULTS & DISCUSSIONS

Growth and contribution of trade in the exports and imports between Indian and Australian Processed Food Industry.

Table 1: Contribution and Growth Rate in the export from India to Australia

Year	Reporter	PartnerName	Export in 1000 USD	Growth	Contribution
2003	India	Australia	28134949		4.986
2004	India	Australia	28604585	1.67	5.07
2005	India	Australia	3151023	-88.98	0.56
2006	India	Australia	34192228	985.12	6.06
2007	India	Australia	33325038	-2.54	5.91
2008	India	Australia	25022052	-24.92	4.43
2009	India	Australia	28605949	14.32	5.07
2010	India	Australia	31151886	8.90	5.52
2011	India	Australia	44104276	41.58	7.82
2012	India	Australia	53847269	22.09	9.54
2013	India	Australia	64065707	18.98	11.35
2014	India	Australia	68325898	6.65	12.11
2015	India	Australia	61679421	-9.73	10.93
2016	India	Australia	60058475	-2.63	10.64
Total			**564268756**		

Table 2: Contribution and Growth Rate in the Import by India from Australia

Year	Reporter	Partner Name	Import in 1000 USD	Growth	Contribution
2003	India	Australia	5999025		4.642
2004	India	Australia	1304402	-78.26	1.009
2005	India	Australia	1120704	-14.08	0.867
2006	India	Australia	523357	-53.30	0.405
2007	India	Australia	854623	63.30	0.661
2008	India	Australia	1775414	107.74	1.374
2009	India	Australia	13037732	634.35	10.088
2010	India	Australia	43386545	232.78	33.572
2011	India	Australia	42314760	-2.47	32.743
2012	India	Australia	4344578	-89.73	3.362
2013	India	Australia	3654829	-15.88	2.828
2014	India	Australia	4280365	17.12	3.312
2015	India	Australia	2915091	-31.90	2.256
2016	India	Australia	3723287	27.72	2.881
Total			**129234712**		

Table 1 presents the growth and contribution in the export of processed food from India to Australia between 2003 and 2016. The performance of Indian export witnessed growth in the year 2006 while lowest growth in the year 2004 and highly contributed in 2014 and lowest contributed in the year 2005 respectively. Similarly, **Table 2** above indicates the growth and contribution in the import of processed food, by India from Australia in the period between 2003 and 2016. The performance of Indian import witnessed growth in the year 2009 while lowest growth in the year 2004. India was found to have highly contributed in import in the year 2010 and lowest contributed in the year 2006 respectively.

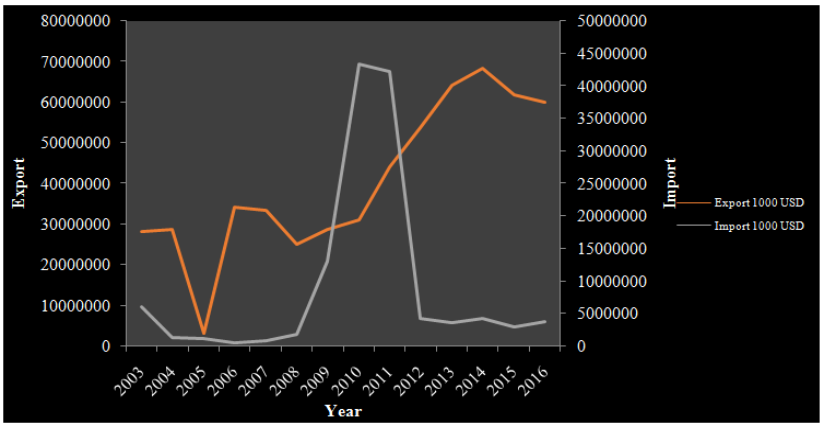

Figure 1: Graph Showing the Import and Export of Processed Food among India and Australia

Table 3: Trade between India and Australia by types

Australia			
Year	**IIT**	**HIIT**	**VIIT**
2003	0.986	0.014	0.972
2004	0.900	0.100	0.799
2005	0.775	0.225	0.550
2006	0.818	0.182	0.635
2007	0.726	0.274	0.452
2008	0.631	0.369	0.263
2009	0.708	0.292	0.416
2010	0.976	0.024	0.952
2011	0.671	0.329	0.342
2012	0.763	0.237	0.525
2013	0.710	0.290	0.420
2014	0.938	0.062	0.876
2015	0.853	0.147	0.705
2016	0.979	0.021	0.959

To empirically examine country-specific drivers in the horizontal (HIIT) and vertical intra-industry trade (VIIT)

4 Digits

Table 4: Correlation Matrix between Dependent and Independent Variables

	IIT	LGDP	LGDPP	LFDI	RSCA	RCA	LEC	Ldist
IIT	1							
LGDP	.004	1						
LGDPP	-.075*	-.380**	1					
LFDI	-.282**	.382**	-.194**	1				
RSCA	.247**	.084**	.033	-.069*	1			
RCA	-.283**	-.272**	.706**	-.250**	-.180**	1		
LEC	-.293**	-.352**	.668**	-.266**	-.191**	.989**	1	
Ldist	.029	.437**	-.027	.046	.039	.112**	.054	1
	HIIT	**LGDP**	**LGDPP**	**LFDI**	**RSCA**	**RCA**	**LEC**	**Ldist**
HIIT	1							
LGDP	-.004	1						
LGDPP	.075*	-.380**	1					
LFDI	.282**	.382**	-.194**	1				
RSCA	-.247**	.084**	.033	-.069*	1			
RCA	.283**	-.272**	.706**	-.250**	-.180**	1		
Table 4: Contd,								
LEC	.293**	-.352**	.668**	-.266**	-.191**	.989**	1	
Ldist	-.029	.437**	-.027	.046	.039	.112**	.054	1
	VIIT	**LGDP**	**LGDPP**	**LFDI**	**RSCA**	**RCA**	**LEC**	**Ldist**
VIIT	1							
LGDP	.004	1						
LGDPP	-.075*	-.380**	1					
LFDI	-.283**	.382**	-.194**	1				
RSCA	.246**	.084**	.033	-.069*	1			
RCA	-.283**	-.272**	.706**	-.250**	-.180**	1		
LEC	-.292**	-.352**	.668**	-.266**	-.191**	.989**	1	
Ldist	.029	.437**	-.027	.046	.039	.112**	.054	1

**p<0.01

Table 4 presents the correlation analysis for 4 digits classification between LFDI, TIMB, RSCA, RCA, LEC, IIT, HIIT and VIIT in the processed food sector for the export and import among India and Australia. The values of correlations are divided into 2 groups. Values between 0 to 0.5 are deemed to exhibit a weak correlation and values between 0.51 and 1 are considered exhibiting strong correlations among the variables. The lowest possible value of a correlation coefficient is zero, meaning that there is no correlation between the variables and its highest value is one indicating there is a perfect correlation between two variables. A table shows that the dependent variable IIT and VIIT has a weak positive correlation with RSCA and also a weak negative correlation with GDPP, FDI, RCA, and EC. Further, dependent variable HIIT has a weak positive correlation with GDPP, FDI, RCA ,and EC and weak negative correlation with RSCA. It is evident from the table that GDPP (r=-0.075), FDI (r=-0.282), RSCA (r=0.247), RCA (r=-0.283) and EC (r=-0.293) does show a significant positive and a negative linear relationship with IIT. Hence, there is a significant relationship between IIT, LGDPP, LFDI, RSCA, RCA ,and LEC.

In HIIT correlation, it is evident from the table that GDPP (r=0.075), FDI (r=0.282), RSCA (r=-0.247), RCA (r=0.283) and EC (r=0.293) does show a significant positive and a negative linear relationship with HIIT. Hence, there is a significant relationship between HIIT, LGDPP, LFDI, RSCA, RCA, and LEC. In VIIT correlation, it is evident from the

table that GDPP (r=-0.075), FDI (r=-0.283), RSCA (r=0.246), RCA (r=-0.283) and EC (r=-0.292) does show a significant positive linear relationship with VIIT. Hence, a significant relationship exists between VIIT, LGDPP, LFDI, RSCA, RCA and LEC.

Table 5: The Industry-Specific Determinants of Intra-Industry Trade

Variables	IIT	HIIT	VIIT
	Coefficient		
LGDP	0.010 (0.822)	-0.010 (0.822)	0.020 (0.841)
LGDPP	0.148 (4.161)**	-0.148 (4.161)**	0.295 (4.164)**
LFDI	-0.055 (-12.380)**	0.055 (12.380)**	-0.109 (-12.382)**
RSCA	0.060 (4.544)**	-0.060 (-4.544)**	0.120 (4.548)**
RCA	-0.302 (-1.278)	0.302 (1.278)	-0.612 (-1.297)
LEC	-0.082 (-0.408)	-0.082 (-0.408)	-0.155 (-0.386)
LDIST	0.059 (2.591)**	-0.059 (-2.591)**	0.117 (2.590)**
C	-0.322 (-0.423)	1.322 (1.738)	-1.667 (-1.095)
Adj: R^2	0.264	0.264	0.263

Dependent Variable: IIT, HIIT and VIIT: **p<0.01, *p<0.05

The association between GDP, GDPP, RSCA, RCA, TIMB, EC, FDI, IIT, HIIT and VIIT of 4 digits processed food sector in the import and export among India and Australia is presented in table 40. In the regression model GDP, GDPP, RSCA, RCA, TIMB, EC, FDI are considered as independent variables and IIT, HIIT and VIIT as dependent variables. The variable GDPP enters significantly in the IIT model and has a predicted positive sign, and also significant in HIIT and VIIT models. The variable FDI (foreign direct investment) enters significantly in the IIT model and has a predicted negative sign, and also significant in both the HIIT and VIIT models. The variable RSCA (revealed symmetric comparative advantage) enters significantly in the IIT model and has predicted a positive sign, and also significant in both the HIIT and VIIT models and has a predicted positive sign for VIIT and has predicted a negative sign for HIIT. The variable RCA (revealed comparative advantage) enters insignificantly in the IIT model and has a predicted positive sign, and also insignificant in HIIT and VIIT models. The variable EC (Energy Consumption) enters insignificantly in the IIT model and has a predicted negative sign and also insignificant in HIIT and VIIT models. The variable GDP enters insignificantly in the IIT model and has a predicted positive sign, but it is significant in HIIT and insignificant in VIIT models. In addition, 26 per cent of the variation in HIIT is dependent on independent variables (Adjusted R-square=0.264). Hence there is an association between GDPP, FDI, RSCA, RCA, EC, FDI, IIT, HIIT and VIIT.

6 Digits

Table 6: Correlation Matrix between Dependent and Independent Variables

	IIT	LGDP	LGDPP	LFDI	RSCA	RCA	LEC	Ldist
IIT	1							
LGDP	.069**	1						
LGDPP	-.030	-.087**	1					
LFDI	-.192**	.290**	-.074**	1				
RSCA	.161**	.069**	.107**	-.064**	1			
RCA	-.203**	.101**	.683**	-.193**	-.081**	1		
LEC	-.213**	-.039	.656**	-.227**	-.104**	.983**	1	
Ldist	.012	.676**	.055**	.092**	-.005	.314**	.209**	1

	HIIT	LGDP	LGDPP	LFDI	RSCA	RCA	LEC	Ldist
HIIT	1							
LGDP	-.069**	1						
LGDPP	.030	-.087**	1					
LFDI	.192**	.290**	-.074**	1				
RSCA	-.161**	.069**	.107**	-.064**	1			
RCA	.203**	.101**	.683**	-.193**	-.081**	1		
LEC	.213**	-.039	.656**	-.227**	-.104**	.983**	1	
Ldist	-.012	.676**	.055**	.092**	-.005	.314**	.209**	1
	VIIT	**LGDP**	**LGDPP**	**LFDI**	**RSCA**	**RCA**	**LEC**	**Ldist**
VIIT	1							
LGDP	.069**	1						
LGDPP	-.030	-.087**	1					
LFDI	-.193**	.290**	-.074**	1				
RSCA	.160**	.069**	.107**	-.064**	1			
RCA	-.204**	.101**	.683**	-.193**	-.081**	1		
LEC	-.213**	-.039	.656**	-.227**	-.104**	.983**	1	
Ldist	.012	.676**	.055**	.092**	-.005	.314**	.209**	1

**p<0.01

Table 6 presents the correlation analysis for 6 digits classification between LFDI, TIMB, RSCA, RCA, LEC, IIT, HIIT and VIIT of processed food sector in the export and import among India and Australia. The values of correlations are divided into 2 groups. Values between 0 and 0.5 are deemed to exhibit a weak correlation and values between 0.51 and 1 are considered to exhibit strong correlations among the variables. The lowest possible value of a correlation coefficient is zero, meaning that there is no correlation between the variables and its highest value is one indicating a perfect correlation between two variables. Table shows that the dependent variable IIT and VIIT has a weakly positive correlation with GDP and RSCA and is weak negative correlated with FDI, RCA and EC. The dependent variable HIIT has a weak positive correlation with FDI, RCA and EC and is weak negative correlated with GDP and RSCA. In IIT correlation, the highest positive correlation is observed between RCA and EC (0.983), while the lowest negative correlation exists between FDI and EC (−0.227). In HIIT and VIIT correlation, the highest positive correlation is observed between RCA and EC (0.983), while the lowest negative correlation exists between GDP and EC (−0.227). Hence, there is significant relationship between IIT, HIIT, VIIT, LGDP, LFDI, RSCA, RCA and LEC.

Table 7: The Industry-Specific Determinants of Intra-Industry Trade

Variables	IIT	HIIT	VIIT
	Coefficient		
LGDP	0.064 (10.593)**	-0.064 (-10.593)**	0.128 (10.564)**
LGDPP	0.194 (11.760)**	-0.194 (-11.760)**	0.386 (11.730)**
LFDI	-0.039 (-16.313)**	0.039 (16.313)**	-0.077 (-16.298)**
RSCA	0.026 (3.508)**	-0.026 (-3.508)**	0.051 (3.476)**
RCA	-1.166 (-9.676)**	1.166 (9.676)**	-2.323 (-9.641)**
LEC	0.783 (7.271)**	-0.783 (-7.271)**	1.557 (7.237)**
LDIST	0.027 (2.144)*	-0.027 (-2.144)*	0.055 (2.146)**
C	-3.167 (-8.979)	4.167 (11.814)	-7.303 (-10.630)
Adj: R^2	0.197	0.197	0.197

Dependent Variable: IIT, HIIT and VIIT: **p<0.01, *p<0.05

The association between GDP, GDPP, RSCA, RCA, TIMB, EC, FDI, IIT, HIIT and VIIT of 6 digits processed food sector in the import and export among India and Australia is presented in the table 43. In the regression model GDP, GDPP, RSCA, RCA, TIMB, EC and FDI are considered as independent variables and IIT, HIIT and VIIT are dependent variables. The variable GDP enters significantly in the IIT model and has a predicted positive sign, and also significant in HIIT and VIIT models. The variable GDPP enters significantly in the IIT model and has a predicted positive sign, and also significant in HIIT and VIIT models. The variable FDI (foreign direct investment) enters significantly in the IIT model and has a predicted negative sign, and also significant in both the HIIT and VIIT models. The variable RSCA (revealed symmetric comparative advantage) enters significantly in the IIT model and has predicted a predicted positive sign for both IIT and VIIT models, and has a predicted negative sign for HIIT, together with significance in both the HIIT and VIIT models. The variable RCA (revealed comparative advantage) enters significantly in the IIT model and has a predicted positive sign, and also insignificant in HIIT and VIIT models. The variable EC (Energy Consumption) enters significantly in the IIT model and has a predicted negative sign and also significant in HIIT and VIIT models. In addition, 20 per cent of the variation in HIIT is dependent on independent variables (Adjusted R-square=0.197). Hence there is an association between GDP, GDPP, FDI, RSCA, RCA, EC, FDI, IIT, HIIT and VIIT.

CONCLUSIONS

Considering the importance of the processed food industry of India, it is imperative to examine how India has been achieving better economic growth through its processed food industry segment. In this regard, the present research was an attempt to examine the various factors affecting IIT in India wherein the level of competitiveness of the nation is also examined. While researching on IIT are vast, there are very few researchers conducted in the processed food industry and no study on the Indian processed food sector.

In the present research, the researcher identified the existence of a positive relationship between GDP and IIT share. The positive relationship has been previously discerned in empirical researchers which have stated that the development of trade exchange depends on the size of trading countries' economies which is generally measured using their GDP. GDP as a factor tends to be crucial in determining the attracting strength of economies as stated by Van Bergeijk and Brakman (2010) and Pietrzak and Kapinska (2014). It is deemed that large markets tend to improve their IIT trade to open new possibilities of production extension which is characterized by the increasing economies of scale. As ascertained by Czarny (2002), it is deemed that when the GDP is large then the nation is better equipped with capital which further favors the development of the processing industry. In line with the findings of the present research, it is evident from Zhang and Chuan (2006) and Onogwu (2013) that there is a positive relationship between GDP of trading nations and their intensity of IIT.

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