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AN EMPIRICAL ASSESSMENT OF PAKISTAN'S INTRA-INDUSTRY TRADE POTENTIAL

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Abstract

Intra-industry trade has a paramount value in the theory of international trade due to the reason that it establishes the base for exploiting economies of scale and product differentiation, which ultimately ensures the existence of comparative advantage. The current research is an endeavour to examine the determinants of intra-industry trade through Augmented Gravity Equation (AGE) and the potential of intra-industry trade through revealed comparative advantage (determined by the Balassa index); in the selective industries of Pakistan, with its top eleven trading partners. For this purpose, the top five exporting industries of Pakistan are selected which include textile and clothing, agro-food, engineering goods and manufacturing goods, leather and minerals and metals. Data for the period from 2003 to 2016 is used for analysis. The random effects panel data model is used to estimate the independent factors of IIT such as the difference in market size, the difference in per capita income, common border, economic distance, and free trade agreement. The results calculated through AGE mainly showed that the difference in market size and per capita income significantly alter the course of IIT in Pakistan due to variations in the development stage between Pakistan and its trading partners. Further, the RCA showed the highest trend in the textile and clothing industry and the lowest in the transportation industry of Pakistan. Finally; it is suggested that in Pakistan, innovative and differentiated goods are required to be produced to attain economies of scale and capture international markets. In this way, its balance of payments can be improved.

Keywords: Intra-Industry Trade, Augmented Gravity Equation, Revealed Comparative Advantage, Balassa Index.
JEL Classification: F10, F11, F19.

I. Introduction

The terminology "Intra-Industry Trade" (IIT) is employed to depict a two-way trade of goods within the same industrial cluster across two countries. Adhering to Helpman and Krugman (1985) IIT has culminated on the bases of product differentiation, better exploitation of resources and economies of scale. The empirical study provided by

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Grubel and Llyod (1975), highlighted the importance of IIT and provided a way to measure it. The intra-industry argument lacked solid theoretical backing until it was provided by Krugman (1981) and Helpman and Krugman (1985). It was further strengthened by Krugman (1996) who pointed out that previous studies had ignored product differentiation and increasing return to scale as a major factor for intra-industry trade and argued that trade was dominated by the monopolistic competition framework.

The empirical studies on intra-industry trade (IIT) Manrique (1987), Ray (1991), McCorriston and Sheldon (1999), Nielsen and Lüthje (2002), and Clark (2005 and 2007) are based on developed states (DCs). Over the accumulated set of decades, less developed countries (LDCs) have received little attention on IIT. The major reason for such biased attention is that the actual relationship between IIT and stages of economic development is virtually left undiscovered. The main cause of this negligible research is the economic significance of IIT was unknown before the 1970s. At that time the industrial giants were far ahead in pursuit of economic welfare. This left a definite gap in the elevation of understanding on the subject of IIT over different stages of economic growth. In order to investigate how IIT oscillates as economies progressively develop, the study of LDCs regarding their economic potential of IIT has been increasingly becoming pertinent. Therefore, in the last decade, various studies such as Janda and Münich (2004), Bhattacharyya (2007), Veeramani (2007), Černoša (2009), Gul and Yasin (2011), Shahbaz and Leitao (2011) are conducted in the field of IIT.

The pattern of IIT cannot be traced from traditional trade theories predicted by Ricardo and Heckscher-Ohlin; which generally deal with differences on supply sides. These traditional theories inspect trade to take place between countries on the basis of factor endowments. Moreover, trade between most of DCs takes place with relatively equivalent factor endowments. The empirical study provided by Grubel and Llyod (1975); highlighted the importance of intra-industry trade and provided a way to measure it. The theoretical foundations on intra-industry were firstly provided by Krugman (1981) and Helpman and Krugman (1985) and was further strengthened by Krugman (1996) who pointed out that previous studies had ignored product differentiation, increasing returns to scale and the monopolistic competition framework. Thus, intra-industry trade can be defined as a two-way trade of goods within the same industrial cluster across two countries referred to as intra-industry trade.

Intra-industry trade occurs as countries exploit their economies of scale in production, which gives a competitive advantage to the industries of a country and allows the country to focus on producing fewer products and importing variety from other nations. Countries that have recently opened to trade, and are developing, have a wider gain from trade in varieties of products than open economies. Pakistan, like other developing economies, has liberalized its trade with an aim to improve prospective growth by higher investments and trade. To some extent, the free trade phenomenon has failed to deliver the desired benefits to the developing world which are being exploited by the developed countries through free trade [Pacheco and Thirlwall (2011)]. Pakistan requires substan-

tial revenues to boost its development process. It shares only 0.13 per cent of the world exports and 0.25 per cent[1] of world imports. This leads to a deficit balance of payments and consequently economic chaos. Therefore, IIT becomes pertinent in the respect that it promotes inter-industry product differentiation, efficiency and economies of scale which may assist Pakistan in resolving the deficit BOPs difficulties in the future.

In the current arena of international trade, the deficit balance of payments is a major problem being witnessed by Pakistan due to enhancing imports of high-value manufactured goods and exports of low-valued manufacturing goods. Major economic giants of the world have attained favourable balance of payments (BOPs) due to efficiency and product differentiation which are the essentials of intra-industry trade. Thus, IIT becomes pertinent for Pakistan, by exploring Pakistan's IIT potential, specific industries which need more efficiency and product differentiation can be identified. This may assist in resolving the deficit BOPs problem to much extent. The present research aims to evaluate and assess determining factors and potential of Pakistan's IIT. Hence, this research is pertinent in the respect that it has analyzed the important determinants of intra-industry trade (by using Augmented Gravity Equation) and has computed comparative advantage (by employing Balassa Index) in various industries of Pakistan. In this way, the research contributes by explaining the determinants which can positively contribute to boosting the trade potential of Pakistan with selected trading partners. It also analyzes the industries (among the selected) which can acquire economies of scale, product differentiation and comparative advantage.

The empirical analysis of product differentiation and efficiency in industrial units of Pakistan is not prevailing and needs to be explored. Therefore, the primary objective of this research is to analyze and evaluate primary determinants of IIT by utilizing Augmented Gravity Equation (AGE) and to explore Revealed Comparative Advantage (RCA) by employing Balassa Index for Pakistan's industries. The study tends to examine Pakistan's industries (among the research selected) which can acquire economies of scale, product differentiation and comparative advantage.

This study proceeds in the following way: Section II presents the review of literature, Section III depicts methodology, Section IV portrays data for estimation, Section V illustrates estimated results and discussion, and last Section VI represents conclusion and policy recommendations.

II. Review of Literature

International trade focuses on the simultaneous import and export of goods between countries. The intra-industry trade is pertinent in the regard that it focuses on the trade within the same industries of two trading partners. The development of the theory behind the concept of intra-industry trade has gone through many phases but the fundamental

[1] Country profile of Pakistan at WTO, 2021.

reasons behind such type of trade are specialization, economies of scale and product differentiation. The following sections provide the rationale of the research by illustrating the existing literature in the field of IIT and comparative advantage.

1. Comparative Advantage Theory

David Ricardo (1817) highlighted a flaw in the theory of absolute advantage and thus presented comparative advantage theory i.e., a country produces only those commodities which it can produce better in comparison with other countries. He considered opportunity cost in place of the financial cost and placed importance on the fact that commodity specialization is for the effective production of goods. In today's world, specialization leads to economies of scale in production and is a means for the betterment of nations.

To evaluate the efficiency and competency of industries of a country, the index for revealed comparative advantage which is broadly used is made by Bela Balassa (1966). The revealed comparative advantage is measured by using the export values in relation to the total exports of a country divided by the relation of trading partner to its total exports. The magnitude of the Revealed Comparative Advantage index; derived from post-trade data, does not have any ordinal or cardinal property. It is an important tool for measuring the comparative advantage of a country's particular commodity.

Adhering to Chang (2009), the concept of comparative advantage is one of the few concepts in economics that is more than common sense. He further illustrated that the good part of this theory is that a country can even trade for the product in which it has an absolute cost disadvantage by specializing in the products in which it has the least disadvantage.

The term Revealed Comparative Advantage (RCA) was first introduced by Liesner (1958) but was refined and popularized by Bela Balassa (1965 and 1989). This index is used to identify structural trade patterns between countries, [Hinloopen and Marrewijk (2006)]. In the current study, this index is utilized to identify strong sectoral clusters and specialization patterns in the selected industries of Pakistan.

2. The Gravity Model

Tinbergen (1962) and Poyhonen (1963) first used the gravity model for examining the pattern of bilateral trade flow among the European states. In the gravity model; exports from country 'a' to country 'b' are explained with their respective economic sizes (measured by GDP or GNP) and the geographical distance among them. Several types of dummy variables have been previously added to the gravity model for examining specific factors- like cultural and geographical factors- that can enhance or hinder trade flows between countries.

3. Intra-Industry Trade and Grubel Lloyed Index

Industrial specialization and two-way trade in international markets led to the observation of IIT by Verdon (1960) and Balassa (1966); for the first time. They judged that some developed nations imported and exported the same categories of products.

Since the 1980s, the contributing factors of IIT have been examined by many studies. According to Krugman (1981), the major determinants of IIT are economies of scale and consumers' preferences for diverse products. Stone and Lee (1995) and Hummels and Levinsohn (1993), argued that country-specific factors such as the size of the economy, distance, per capita income and orientation of trade are the prominent factors behind IIT. Krugman (1979) presented the model that IIT can occur between economies which are identical.

There are many attempts undertaken to explain the concept of intra-industry trade Helpman and Krugman (1985). In the traditional approach, explain that in a monopolistically competitive market, differences in factor endowments about the existence of IIT. They considered two factors (capital and labour), two countries (a and b) and two homogenous commodities among which one is labour intensive and the other is capital intensive. They further explained that if country 'a' is labour intensive and country 'b' is capital intensive then both will import differentiated goods. Thus, production, demand, and supply of differentiated products across countries in accordance with the factor endowments specialization and economies of scale; upraise the phenomenon of intra-industry trade. In this way, an economies-of-scale is an important scenario for trade to take place among countries possessing similar factors and technologies.

In other alternative models, Falyey (1981) and Kierzkowski (1987) explained that trade takes place in perfectly competitive markets, with two goods (homogeneous and differentiated). two factors (labour and capital) and two countries (a and b). They introduced in the homogenous goods sector the existence of technological differences. The sector of technological differences depicts the Ricardian kind of trade theory and the sector of a differentiated product shows the H-O model. It is assumed that in the differentiated goods sector; capital-intensive commodities and high-quality products are produced. Thus, the capital-abundant country would specialize in producing and exporting high-quality differentiated goods and labour-abundant countries in low-quality goods. Every consumer prefers to consume high-quality goods but provided with income constraints, consumes low-quality goods. Therefore, when income increases, the economy switches to high-quality commodities and vice versa. The different income levels prevalent in each economy ensure the demand for different varieties of goods and the IIT emerges.

The well-known index to measure IIT is developed by Grubel and Lloyd (1975), i.e., the concurrent import and export of the same categorical products. This index measures the intensity level or the proportion of intra-industry trade of the host country with its trading partners, Xiaoling Hu et., al. (2017). This research utilizes this index

to measure the IIT potential of Pakistan to analyze the intensity and diversity of trade in the selected industrial clusters.

4. Determinants of Intra-Industry Trade

Intra-industry trade endogenously depends upon various factors, which lead a country towards product differentiation and economies of scale. Economists have analyzed various determinants of IIT, among which theoretical studies like Verdon (1960) and Balassa (1966), Greenaway, et al., (1994), Hummels (1995) Burenstam-Linder (1961), Turkcan (2005), Leitao and Faustino (2008) and Zaheer, et al., (2013) suggested following variables to be taken under consideration:

a) The Difference in Per Capita Income ($DGNPC_{xt}$)

The intensity of IIT is positively correlated with the differences in per capita income between the trading partners, the underlying assumption being that the relative capital abundance is reflected in relative income per capita. Per capita, income difference is defined as the absolute difference of per capita GNP in current dollars between two trading partners.

IIT is low if the difference in per capita income between countries is high. A greater difference in per capita income indicates the decreasing volume of intra-industry trade. Adhering to Burenstam Linder (1961), if per capita income is considered as an indicator of demand structure, a greater difference in per capita income infers that the demand structures are dissimilar in the two trading partners. Resultantly, this shows that the potential for intra-industry trade decreases.

There is a positive correlation in differences in per capita income among the trading partners, by considering the assumption that relative factor endowments are reflected between the trading partners by relative per capita income. Per capita income can influence the pattern and volume of a country's trade through the demand and supply patterns. In Helpman and Krugman's (1985) analysis, per capita, income differences are analyzed as a supply side scenario, i.e., capital-labour endowments' differences. Consequently, a larger difference in per capita income reveals decreasing trends of intra-industry trade. Apart from the supply side, if per capita income is analyzed as the determinant of demand pattern, higher inequality in respect of per capita income yields the demand structures to be more different among the trading partners, and a reduction in the potential of intra-industry trade is the outcome [Burenstam-Linder (1961)].

The approach employed by Bergstrand (2013), implies - per capita income, size of economy and country's average development level – are prominent determinants of Horizontal Intra-industry Trade (HIIT). Moreover, Linder's theory also contributed to IIT by yielding income levels to be determining the extent of HIIT between the two trading partners.

b) The Difference in Economic Size ($DGDP_{xy}$)

GDP measures the export capacity of a country: this implies that higher GDP will portray a higher exporting capacity. Likewise, the higher GDP of an importing country postulates its higher capacity of absorbing imports by higher demand for imported goods.

IIT is high if the difference in economic size between countries is low. When resources are reallocated from a comparatively small and capital-intensive country to a comparatively large and labour-rich country; the differentiated goods' production increases in the larger country and decreases in the smaller country. Hence, intra-industry trade diminishes. Therefore, a larger differentiation in economic size between two states results in a low capacity of intra-industry trade [Helpman (1981)].

The valuation conducted by Wolter and Loertscher (1980) suggests that an economic difference among countries reveals a negative impact on IIT. Countries having similar demand patterns will enhance their trade in similar products, Linder (1961). A negative impact was found in the studies done by Greenaway, et al., (1994), Hummels (1995) and Turkcan (2005). Conversely, Leitao and Faustino (2008) found a positive impact. In the results established by Shahbaz and Leitao (2011) differences in GDP; exerts a significant impact on IIT.

The paper presented by Bhattacharyya (2007) concludes that the prevalent relationship between IIT and levels of economic development is a positive one. Moreover, concerning the arrangement of IIT amid DCs and LDCs, he argued that over the ages IIT in manufacturers among DCs and LDCs is not insignificant. It fluctuates between 17 per cent (for the Japanese economy) and 44 per cent (for France's economy) of aggregate trade.

c) Distance

The lesser the distance the higher the IIT. Krugman (1980) states that as the distance among the trading partners increases, the transportation costs also increase and thus the volume of intra-industry trade reduces. Hence, distance is negatively related to IIT.

Krugman (1980) explained that increasing transaction costs would reduce IIT among countries. Moreover, Balassa (1986) Hummels (1995) explained that there is an inverse relation between IIT and geographical distance between two countries. Learner and Levinsohn (1995) asserted that distance has a prominent impact on trade patterns and it cannot diminish over time. Contrary to the popular concept; the world is becoming smaller.

According to Brun Jean-François (2005), distance is defined as an augmented transaction cost that includes the price of oil, indexes of infrastructure and composition of trade.

d) Border

Common border-sharing countries have higher IIT. Geographical proximity and common border results in psychological and cultural resemblances among consumers across borders. This creates similar consumption patterns and increases trade in differentiated products. Therefore, sharing of common borders results in greater IIT [Young Sun Lee (1993)]. Grubel and Lloyed (1975) suggested that the countries sharing a common border may have more capacity for intra-industry trade because of reduced transaction costs.

e) Free Trade Agreement

FTA ensures high IIT, other things being equal; all kinds of trade restrictions tend to reduce the volume of intra-industry trade by offsetting the effects of economies of scale. Thus, the existence of FTA among countries enhances their trade potential among them.

Krugman (1985) argued that countries specialize more in accordance with their comparative advantage in a free trade area so there is a positive sign between free trade agreements and IIT. According to Stephen E. Reynolds (1993), the patterns of production determine the existence of FTA between countries.

5. An Overview of Studies in Pakistan

Product differentiation is one of the major ingredients of intra-industry trade as Akram and Mahmood (2012) found that the volume of Pakistan's IIT in the SAARC region consists mainly comprised of vertical IIT. They further investigated that the existence of economies of scale in the production process diminishes the average cost of production and henceforth increases profit-making prospects for the firms. Consequently, the level of IIT of manufactured goods rises with the rise in the size of the market. Samina and Reema (2007) analyzed export diversification by deepening cooperation with China. The paper undertakes an analysis of the implications of the Pak-China FTA. The results drawn show that although Pakistan's economy is much smaller than that of China's in terms of GDP, trade, reserves etc., the FTA offers a huge potential for Pakistan's economy. Pakistan can change its chronic trade deficit with China by exploiting the increased market access given by China. Moreover, Kemal (2004) established that parallel comparative advantage and low trade complementarity are the main inhibitions to trade.

GDP or market size of an economy is one of the important determinants of intra-industry trade. The results estimated by Shahbaz, et al., (2011) indicate that IIT is a negative function of the difference in GDP per capita between Pakistan and its trade partners. Furthermore, the study presented by Fatima (2010) finds that worsening terms of trade has a negative impact on the economic growth of Pakistan, as it ultimately reduces gross domestic product.

Trade liberalization, trade agreements and policy reforms are the major reasons for expanding the trade potential of various developing countries; as Baig (2009) asserted that the capacity constraints and the lack of belief in the virtues of trade liberalization have led to a situation where the more significant trade reforms are not working. Further, the study presented by Musleh-ud-Din et al. (2009) examines the prospects of expanding bilateral trade between Pakistan and China after signing the free trade agreement. The authors showed that bilateral trade between the two countries is heavily tilted in favour of China and this situation may persist in the short term. Likewise, the study presented by Nazia and Yasin (2011) undertakes the trade potential of Pakistan with various regional blocs and analyses that Pakistan has the highest trade potential with countries in the Asia-Pacific region (the Association of Southeast Asian Nations [ASEAN]), the European Union (EU), the Middle East, Latin America, and North America.

III. Methodology

Intra-Industry trade (dependent variable) to calculate between the trading countries, Grubel-Lloyd Index is used and for calculation of revealed comparative advantage, Balassa Index is utilized.

1. The Grubel-Lloyed Index

The formula used to calculate Grubel-Lloyd Index is expressed in Equation (1):

$$IIT = GL = 1 - (X_i - M_i)/(X_i + M_i) \quad (1)$$

where, X_i denotes Export of *i'th* commodity and M_i denotes the Import of *i'th* commodity, Grubel-Lloyd index varies from 0 to 1, where, values closer to 0 represent no intra-industry trade and values close to 1 suggest a high level of intra-industry trade.

2. Model for Estimation of Augmented Gravity Equation

The present research by incorporating other variables ($DGNPC_{xy}$, $DGDP_{xy}$ $DIST_{xy}$, $BORD_{xy}$ and FTA_{xy}) pertinent for bilateral trade to take place between countries; uses augmented gravity equations. By considering the theoretical establishments, the empirical model thus formulated is depicted by Equations (2) and (3):

$$IIT_{xy} = f\{\textit{difference in per capita income, difference in market sizes, economic distance between trading partners, common border, Free Trade Agreement}\} \quad (2)$$

$$IIT = \beta_0 + \beta_1 DGNPC_{xy} + \beta_2 DGDP_{xy} + \beta_3 DIST_{xy} + \beta_4 BORD_{xy} + \beta_5 FTA_{xy} + \mu \quad (3)$$

where, β_0 is constant, IIT_{xy} is the volume of intra-industry trade between Pakistan and the selected countries in dollars, $DGNPC_{xy}$ is the absolute difference in GNP per capita, $DGDP_{xy}$ is the absolute difference in GDP, $DISTT_{xy}$ is the distance in kilometers between Pakistan and selected trading partners, $BORD_{xy}$ is the common border and FTA_{xy} is the existence of free trade agreement between Pakistan and selected economies.

3. Balassa Index

Data on Revealed Comparative Advantage in the selected industries is calculated by utilizing Balassa Index (1996) and the data for exports of Pakistan, its trading partners and at world levels is obtained from UNCOMTRADE database for the period of 2012 to 2016 which is illustrated by the Equation (4):

$$RCA_{ij} = \frac{x_{ij} / x_i}{x_{wj} / x_w} \tag{4}$$

RCA is Revealed Comparative Advantage of country "*i*" for commodity "*j*".x_{ij} / x_i is the ratio of Pakistan's exports for commodity '*j*' and Pakistan's total exports. x_{wj} / x_w is the ratio of world exports of commodity '*j*' and total exports. If RCA_{ij} is greater than 1; it shows that Pakistan has the comparative advantage in the respective commodity and if it is lesser than 1, it shows that Pakistan has a comparative disadvantage in the respective commodity.

4. Random Effects Model

One side effect of the features of fixed-effects models is that they cannot be used to investigate time-invariant causes of the dependent variables. The rationale behind the random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. An advantage of random effects is that to include time invariant variables (i.e. distance, border and FTA). In the fixed effects model these variables are absorbed by the intercept.

IV. Data for Estimation

Data for calculating the three indices; intra-industry trade, revealed comparative advantage and trade intensity index is taken from UNCOMTRADE database. Data for explanatory variables; GDP and GNP are taken from World Development Indicators (WDI) and the distance variable is taken from CEPII database. The distance between Pakistan and its trading partners is the difference in kilometres between their capitals. The units for dummy variable free trade agreement (FTA) are taken from a

database of Pakistan's ministry of commerce. Data for the augmented gravity equation is taken from 2003 to 2016 and revealed comparative advantage from 2012-2016.

The difference in per capita income among Pakistan and selective trading partners is proxied by the absolute difference in GNP per capita (DGNPCXY) in the model and the absolute difference in GDP is taken as a proxy for the difference in market sizes between the selected countries (DGDPxy). Dummies are taken for the other three variables; distance, border and FTA.

1. Selection of Industries and Countries

The industries for Gravity Model estimation and computing RCA are chosen based on their total respective monetary value in total exports of Pakistan. For this aspect, five export industries along with their respective sub-industries of Pakistan are taken as a sample for this research. The industries are textile and clothing, agro-food (including vegetables and fruits), engineering goods and other manufactured goods (including machinery and transport equipment and chemicals), leather industry (including raw leather and footwear) and minerals and metals industry (including stone and glass).

For analysis purposes, the top 11 trading partners of Pakistan which are consistently trading from 2011 to 2015 in the selected industries are chosen for the research. The countries are; the USA, the UK, China, the UAE, Saudi Arabia, Japan, Germany, Indonesia, Malaysia, Kuwait, and Afghanistan.

V. Estimation Results and Discussion

For all the industries, the random effect panel data model is utilized for estimation purposes after rationalizing the presence of time invariant dummy variables in the model. Moreover, the Housman test also provided the base for the application of the random effects model, instead of the fixed effect model. The results of the estimated model by utilizing AGE are depicted in Table 1. Moreover, the considered variables in the current research are verified with the diagnostic tests of multicollinearity and heteroskedasticity and reveal the absence of such issues in the data.

The difference in GDP variable has shown a positive coefficient for textile and clothing, machinery and transport equipment, chemicals, raw leather and stone and glass industries and insignificant behaviour for the vegetable industry. According to the theory, IIT increases if the difference in economic size between trading countries is low.[2] With positive coefficients of DGDP, the relation shows that when differences in market sizes increase, IIT also increases (DGDP taken in logarithmic form). Thus, the positive coefficient contradicts the theory. A similar positive relationship is also shown by Lars Nilsson (1999). In Pakistan, due to the presence of a large textile market

[2] IIT and difference in economic size between two trading partners has an inverse relation i.e. when one variable increases the other one decreases.

TABLE 1

Estimation Results for Augmented Gravity Equation

Industries	LDGDP	LDGNPC	Distance	Border	FTA
Textile and Clothing	0.643285	0.545137	-0.717833	-0.07873	-0.33112
	(0.0107)	(0.0002)	(0.0158)	(0.0006)	(0.0253)
Vegetables	0.061157	0.121616	-0.25833	0.34993	-0.10164
	(0.4207)	(0.1044)	(0.0232)	(0.0867)	(0.0274)
Fruits	-0.44886	0.134674	0.620586	0.812379	-0.24908
	(0)	(0.2161)	(0.0561)	(0.0089)	(0.0385)
Machinery and Transport Equipment	0.325864	-0.27545	0.717833	-0.77772	0.253311
	(0.0107)	(0.0002)	(0.0158)	(0.0006)	(0.0253)
Chemicals	0.040672	-0.06865	-0.32945	0.023392	0.161843
	(0.0304)	(0.0475)	(0.0531)	(0.0884)	(0.0782)
Raw Leather	0.174236	-0.15238	-0.27006	0.155302	0.164218
	(0.0564)	(0.0261)	(0.0434)	(0.0390)	(0.0916)
Footwear	-0.09864	0.058425	0.079985	-0.01626	-0.03691
	(0.0901)	(0.0390)	(0.0420)	(0.0424)	(0.0393)
Stone and Glass	0.21895	-0.11991	-0.571243	-0.31752	0.204673
	(0.043)	(0.3474)	(0.0484)	(0.0930)	(0.0697)

Source: Authors' estimation based on data from COMTRADE.

and unfavourable incentives to textile exporters, the DGDP has shown a positive coefficient. Moreover, the machinery and transport and chemical industry are very less developed in Pakistan, so their respective coefficients are positive. Further, the positive coefficient of DGDP for the stone and glass industry can be regarded as the cause of a less developed export market for this industry, in Pakistan. For the leather industry, Pakistan mainly exports raw leather and imports expensive manufactured leather goods. This factor dilutes the inverse relationship between IIT and DGDP so in the estimated results DGDP has a positive relation with IIT. The estimated results for the fruits and footwear industry show a negative coefficient for DGDP. This negative coefficient is in-line with the theory. According to Krugman (1993), FTA countries impact on vertical IIT is negative tend to specialize in accordance with their comparative advantage which is depicted by the fruits industry of the country. Along with this, as Pakistan possesses a comparative disadvantage in the footwear industry, as differentiated footwear articles are not being produced and the impact is negative.

The difference GNPC variable is insignificant in the fruit industry and has a positive relation with IIT in the footwear industry. The contradictory behaviour of DGNPC in the fruits industry is due to the reason that technological factors and skills utilized

in the labour force affect the trade patterns. These factors also impact consumer demand and the country's ability to supply [Gabriel G. Manrique (1987)]. Furthermore, according to Krugman (1993), FTA countries tend to specialize in accordance with their comparative advantage so its impact on vertical IIT is negative. As Pakistan possesses a comparative disadvantage in the footwear industry, exports are less as differentiated footwear articles are not being produced.

Interestingly, the dummy variables-distance, border and FTA- have shown coefficients contradictory to theoretical establishments in some industries. Firstly, the distance has shown a positive coefficient for the fruits industry. In the research, only two neighbouring countries are considered, namely, Afghanistan and China which have the least economic distance from Pakistan. Among the fruits, mangoes and oranges are the major exports of Pakistan. Despite their good quality, these fruits are not priced competitively in the markets of neighbouring countries. Therefore, they are exported to distant countries and, the distance variable has a positive coefficient for fruits. Secondly, the border has negative coefficients for machinery and transport equipment, footwear, stone and glass industries. The cause behind the negative border coefficient is very much obvious that in the analysis only two countries (Afghanistan and China) have common borders with Pakistan. The trade with Afghanistan is mainly underground [Nazia and Yasin (2011)]. Additionally, the previous studies conducted by Baier, et al., (2007) and Feenstra, et al., (2001) found that the border variable to negatively affect both exports and imports of differentiated goods. Thirdly, the FTA variable has negative coefficients for the agro-food industry (vegetables and fruits) and footwear industry. Nguyen Trung Kien (2009) found that the distance variable has been asserted as an impediment for exports flow in a free trade agreement.

1. Revealed Comparative Advantage

The Balassa Index is utilized to calculate the revealed comparative advantage of the selected set of industries. Table 2 portrays the RCA of selected industries from 2012 to 2016. The table is followed by a detailed discussion of the industries depicting comparative advantages and disadvantages in the respective period.

a) Industries with Comparative Advantage

Table 2 shows that the Textile and clothing industry of Pakistan, there exists a comparative advantage for the last five years along with minor fluctuations in RCA - such as a deviation from 12.46 in the year 2015 to 13.72 in 2016 - reveal that this industry is expected to enjoy a comparative advantage in the coming years. For the agri-food industry of Pakistan, both vegetables and fruits possess a comparative advantage. The comparative advantage of vegetables seems to be declining year after year since 2012 which show its tendency to move towards comparative disadvantage

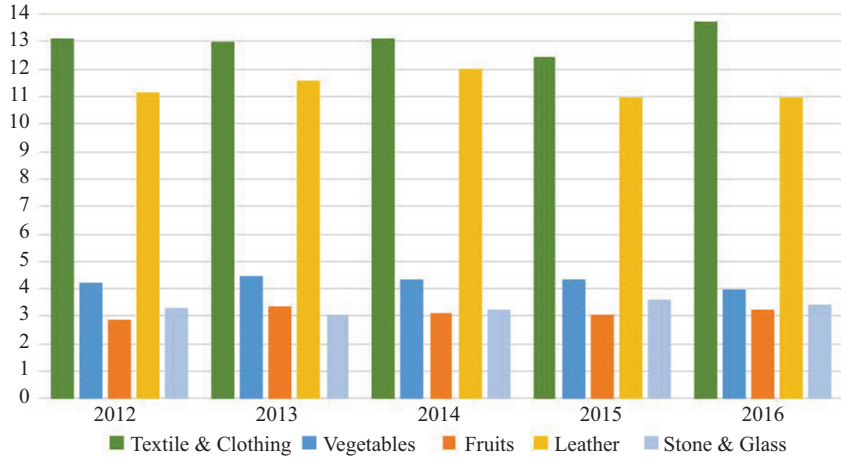
TABLE 2

RCA in Selected Industries of Pakistan

Year	2012	2013	2014	2015	2016
Textile & Clothing	13.10	12.98	13.13	12.46	13.72
Vegetables	4.23	4.47	4.32	4.32	3.97
Fruits	2.86	3.35	3.13	3.05	3.26
Transportation	0.03	0.03	0.02	0.02	0.02
Leather	11.16	11.56	12.03	10.99	10.97
Footwear	0.57	0.56	0.62	0.63	0.62
Chemicals	0.17	0.18	0.19	0.17	0.18
Stone & Glass	3.30	3.03	3.26	3.63	3.45

Source: Authors' estimation based on data from COMTRADE.

in years ahead. The fruits industry has shown minor fluctuation in the last five years. In the leather industry, raw leather possesses a comparative advantage which is declining over the last five years which shows its tendency to switch to a comparative disadvantage. The stone and glass industry has had a comparative advantage over the last five years with minor fluctuations in the successive years. Figure 1 show the selected industries of Pakistan possessing comparative advantage based on the figures attained from RCA, which is computed by utilizing Balassa Index from the year 2012 to 2016.



Source: Authors' estimation based on data from COMTRADE.

FIGURE 1

Industries with Comparative Advantage: 2012 - 2016

The highs and lows of elevated bars show the degree of comparative advantage in the respective industries. The highest bar of textile and clothing industry shows the highest comparative advantage of Pakistan. The lowest height of the stone and glass industry bar shows that Pakistan possesses the lowest comparative advantage in among the selected sample of industries for this research.

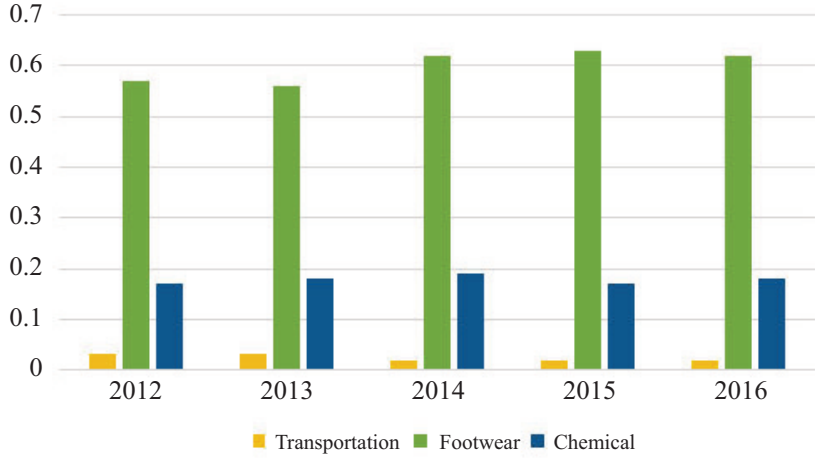
b) Industries with Comparative Disadvantages

Statistics in Table 2 show that the transportation, footwear and chemicals industries of Pakistan have a comparative disadvantage with little tendency to switch to comparative advantage soon due to the reason that since 2012 these industries are witnessing a high degree of comparative disadvantage.

In the last five years, the transportation industry is fluctuating between the figures of 0.03 and 0.02, showing a heightened comparative disadvantage. The footwear industry has witnessed the highest comparative disadvantage of 0.56 in 2012 and the lowest of 0.63 in 2015. The chemical industry of Pakistan has shown the lowest comparative disadvantage with a figure of 0.19 in 2014.

Figure 2 illustrates the comparative disadvantage in the transportation, footwear and chemicals industries of Pakistan based on calculations of RCA from the year 2012 to 2016. The bars in the figure show that higher the peak of bar the lower the comparative disadvantage and the lower the peak the higher the comparative disadvantage.

Hence, in Figure 2, the footwear industry of Pakistan shows the lowest comparative disadvantage and the transport industry shows the highest comparative disadvantage which is also depicted by the figures calculated from Balassa Index in Table 2.



Source: Authors' estimation based on data from COMTRADE.

FIGURE 2

Industries with Comparative Disadvantage: 2012 - 2016

VI. Conclusion and Policy Recommendations

This study empirically evaluates the primary determinants of intra-industry trade of Pakistan by employing the Augmented Gravity Equation and has explored the potential of its industries for attaining comparative advantage by using the Balassa Index. Firstly; the results show that the difference in market size has significant positive behaviour in all the industries except in fruits and footwear industries and the difference in per capita income has a significant positive relation with IIT in textile, vegetables and footwear industries. The dummy variables distance, border and FTA have shown mixed behaviour. Secondly; all the selected industries have comparative advantages except transportation, chemicals and footwear industry among-which chemicals and footwear industry have the potential to switch to comparative advantage, if proper policies are made and implemented in letter and spirit.

The research unlocks the opportunity for future research with more detailed industrial units. Moreover, the study can be expanded by employing the services sector of Pakistan, to establish a better understanding of intra-industry trade patterns and formulation of trade policies. Furthermore, the GSP Plus status of Pakistan should also be considered in future studies.

From the policy maker's point of view; the quality of exports of Pakistan needs to be improved in order to gain ground in the competitive world markets. The product base of the industrial units possessing comparative advantage should be enhanced and the production of export-oriented industries should be augmented; to encourage exports of Pakistan. Global competitiveness can be achieved by complying with international standards and by gradually switching from labour-intensive to skills and technologies intensive productive techniques. In this context, establishing linkages with friendly countries like China for technology transfer can yield diverse and sophisticated exports, especially in the industries in which Pakistan lacks a comparative advantage. Moreover, to streamline FTAs and cross-border exports; the political stability and coherence of trade policies with other related state policies are required. In this relevance, high trade barriers, mainly non-tariff barriers and restrictive rules and regulations; should be considered while designing the trade policies. Further, revitalizing economic and trade diplomacy in foreign relations is extremely important for boosting-up trade of Pakistan.

The current study had an objective to analyze and examine the determinants of intra-industry trade in the selective top merchandise industries of Pakistan. The current research can be expanded by employing the services sector of Pakistan. Moreover, the GSP+ status of Pakistan can also be considered in this regard.

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