

Implication of Intra-Industry Trade on FTA policy

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Article History

Received: 12.02.2024

Accepted: 24.02.2024

Published: 08.03.2024

Abstract: Across the globe, the topic of free trade agreements (FTAs) has remained a subject of ongoing debate. This paper aims to clarify recent misconceptions surrounding India's FTA strategy, particularly within the framework of the Act East Policy. It achieves this objective by examining the factors influencing Intra-Industry Trade (IIT), a dominant form of trade that conventional trade theories struggle to explain. Significantly, the paper explores the economics of IIT especially in the presence of FTAs using innovative trade theories. The theoretical analysis is supported by vast economic literature. The paper, therefore, underscores that an FTA in goods and services among ASEAN+6 countries lead to an increased trade integration under RCEP. This trade pattern has been witnessed particularly with India's active participation in global value chains, which has the potential not only to stimulate Intra-Industry trade flows in the relevant region but also to sustain them.

Keywords: ASEAN, Intra-Industry Trade, Free Trade Agreement, RCEP.

1. INTRODUCTION

The Heckscher and Ohlin factor-proportions theory elucidates the dynamics of trade flows in complementary goods by considering the relative abundance and intensity of factors used in production. In a perfectly competitive trading environment, countries engage in trade based on their comparative advantage, driven by differences in factor endowments. Notably, Grubel and Lloyd (1975) observed a peculiar phenomenon: a significant portion of international trade among industrialized nations involves the exchange of similar goods within the same category, presumably with similar factor intensities. This kind of trade, termed "intra-industry trade," encompasses transactions in closely related products, often due to imperfect competition or variations in consumer preferences across countries.

Early critics of this analysis contended that intra-industry trade (IIT) was merely a statistical artifact, a result of aggregating Heckscher-Ohlin trade. This viewpoint suggested that if the Standard International Trade Classification (SITC) product categories were further disaggregated, the resulting trade would ultimately reflect the original products characterized by unique factor ratios. However, both theoretical and empirical responses have challenged this perspective.

Most notably, Bhagwati (1994) revisited IIT within the framework of the Heckscher-Ohlin model, defining it as two-way trade in commodities sharing similar factor-intensity characteristics. This new theory hinges on concepts like scale economies at the firm level and imperfect competition, rather than focusing solely on factor endowments or intensities. Bhagwati demonstrated that it's always possible to identify factor endowments for which 100 percent of trade is intra-industry trade, suggesting that substantial portions of IIT may not contradict the factor endowments theory.

Moreover, it's been shown that trade in differing products often involves commodities with the same factor intensity, thus constituting non-Heckscher-Ohlin trade. In terms of empirical tests, Gray (1979) found that while more disaggregated IIT data may yield reduced values, the phenomenon of intra-industry trade persists and does not entirely vanish.

Numerous studies (Aggarwal, 2017b, 2020; Aggarwal and Chakraborty, 2020a, 2020c, 2022; Nag et al., 2021) conducted after Grubel and Lloyd's research have consistently revealed a correlation between a country's level of economic advancement and the specialization of its trade structure. In essence, more advanced and developed economies tend to exhibit a higher degree of specialization in their trade patterns. Specifically, industrialized nations tend to engage in a greater volume of intra-industry trade (IIT) compared to developing countries. This pattern follows a general continuum where middle-income countries tend to have higher levels of IIT than their low-income counterparts but still fall below the levels observed in industrialized nations.

Additionally, successful exporting nations, such as those in East Asia and other Newly Industrialized Countries, often experience a rapid and substantial increase in their levels of intra-industry trade. This observation suggests that a higher level of IIT reflects a greater capacity to compete effectively in a dynamic trading environment. Moreover, significant changes in IIT levels indicate a degree of adaptability and flexibility in response to competitive pressures.

To simplify this interpretation, one might conclude that countries considering entering into a liberalizing agreement with the European Union (EU) and possessing relatively high or recently increasing levels of intra-industry trade, are potentially better positioned to successfully adapt to the challenges of a new trading environment.

It's important to clarify that intra-industry trade (IIT) is an outcome or consequence of increased specialization rather than its cause. The factors underlying a country's readiness to compete on the international stage and its ability to adapt to changing circumstances are shaped by a variety of factors, including fiscal and monetary policies, the dynamics of factor markets, investment patterns, and international trade policies such as tariffs and quotas. These broader issues are extensively discussed in the papers authored by Nsouli et al. (1996) and Havrylyshyn (1997).

However, it's worth noting that specialization can offer significant advantages in the context of trade liberalization. Specifically, adjusting through specialization within the same industry can often be less costly than making new industrial investments. This approach also places less demand on labor mobility, resulting in fewer social costs. Furthermore, increased specialization enhances competitiveness and serves as a catalyst for the development of new innovations, technologies, and economic growth. These considerations are highly relevant for policymakers aiming to minimize both social and economic costs during the process of trade liberalization.

It is important to exercise caution when interpreting intra-industry trade (IIT) as a definitive indicator of preparedness. On one hand, a high level of IIT generally suggests greater adaptability to international competition, indicating a certain level of readiness for trade liberalization. On the other hand, one could argue for a reverse causation: trade liberalization, even in relation to the European Union alone, may stimulate investment and efficiency enhancements, which could subsequently manifest as an increased IIT index.

The proposition that trade liberalization leads to heightened IIT is indeed discussed in the literature, although it remains an unresolved matter. Globerman and Dean (1990) challenge this proposition through an analysis of the Canada-U.S. Free Trade Agreement. They present findings from a survey of Canadian firms, which indicates that these firms do not anticipate a significant increase in specialization. Furthermore, their study suggests a plateauing or even a reversal of rising IIT levels, casting doubt on the assumption that product specialization is an expected outcome of the FTA between the U.S. and Canada.

Similarly, Hamilton and Kniest (1990) examine whether changes in protection levels have any impact on IIT levels in Australia and New Zealand and find no evidence supporting this hypothesis. However, it's important to note that these studies primarily focus on the effects of liberalization or protectionism on IIT in industrialized countries, where the concept of reaching a saturation point may be more relevant. Nevertheless, most studies tend to agree that the impact of trade liberalization on IIT remains inconclusive.

2. Literature Survey

The foundational work in elucidating the intricacies of Intra-Industry Trade (IIT) through theoretical frameworks is predominantly attributed to Krugman (1979, 1980). Following his lead, subsequent contributions in this realm have been made by Lancaster (1980), Helpman (1981), and Eaton and Kierzkowski (1984). While these models vary in their specifics, they all center around the notion of differentiated products, sharing a significant commonality: the products they analyze exhibit diverse varieties

but maintain a comparable level of quality. This type of differentiation among closely related products is termed horizontal product differentiation.

For instance, Krugman's model adopts a neo-Chamberlinian approach, operating on the assumption that all varieties of differentiated products affect the utility function uniformly due to their similar quality. In contrast, the Lancaster model is grounded in the neo-Hotelling framework, suggesting that horizontally differentiated products influence the utility function asymmetrically. Furthermore, Krugman's model assumes that consumers strive to consume a wide range of varieties of a given product, a concept often referred to as the "love of variety" approach. According to this perspective, each consumer harbors distinct preferences for various alternatives of a commodity, with each consumer favoring one variety above all others, known as the "favorite variety" approach.

Across these models, a common assumption prevails: different varieties are produced at decreasing costs. When countries partake in trade, the similarity in demand patterns fosters intra-industry trade. Particularly in the context of horizontally differentiated products, this form of trade is more likely to occur between countries with akin factor endowments and possibly identical factor intensities. This phenomenon is termed "Horizontal Intra-Industry Trade" (HIIT), a concept that eludes adequate explanation from traditional Heckscher-Ohlin-type theories and models.

When consumers primarily assess products based on their perceived quality and adjust their preferences accordingly, these products are categorized as vertically differentiated. Scholars such as Falvey (1981), Falvey and Kierzkowski (1987), Shaked and Sutton (1984), and Flam and Helpman (1987) have formulated models focused on vertically differentiated products. Within this framework, studies conducted by Greenaway and Milner (1986), Greenaway et al. (1994), Tharakan and Kerstens (1995), and Blanes and Martin (2000) contend that Vertical Intra-Industry Trade (VIIT) can be explained using conventional trade theories of comparative advantage.

Countries abundant in labor have a comparative advantage in producing labor-intensive goods, often perceived as lower-quality varieties. Conversely, nations relatively abundant in capital possess a comparative advantage in capital-intensive products. Therefore, according to the principles of comparative advantage theory, labor-abundant nations typically export labor-intensive varieties, while capital-abundant countries specialize in exporting capital-intensive ones. These models align with updated terminology and are referred to as the "content version" of the Heckscher-Ohlin theorem. Within this framework, the capital content of net exports from capital-abundant countries tends to be higher compared to other countries, as described by Vanek (1968).

As explained by Davis (1995), goods can be categorized based on their perceived quality from the perspective of consumers on the demand side, while from the producers' viewpoint on the supply side, high-quality goods are generally produced in the economy wherein the availability of capital stock is relatively higher. Therefore, for an analysis of modern trade patterns in the context of conventional trade theories, it is imperative to alienate Vertical Intra-Industry Trade (VIIT) goods produced using the same factor proportions.

The literature investigating the intersections between new trade theories and traditional theories effectively integrates consumer preferences, economies of scale, and factor endowments to illustrate how the characteristics of goods significantly influence a country's trade patterns. Hence, distinguishing between products based on Vertical Intra-Industry Trade (VIIT) and Horizontal Intra-Industry Trade (HIIT) becomes crucial for gaining a deeper insight into trade flows that cannot be fully accounted for by theories solely grounded in comparative advantage, such as the Ricardian and Heckscher-Ohlin trade theories.

Helpman and Krugman presented a model in 1985 that encompasses both vertical and horizontal intra-industry trade, effectively blending traditional and new trade theories. This model incorporates factors like factor endowments, declining costs, and horizontal product differentiation, commonly known as the Chamberlin-Heckscher-Ohlin model.

Shifting our attention to previous research, particularly concerning Intra-Industry Trade (IIT) within the Asian region, these studies can generally be classified into two distinct but overlapping categories. The first category, illustrated by the works of Hu and Ma (1999), Zhang et al. (2005), among others, primarily focuses on evaluating the prevalence of IIT within specific Asian countries such as China, South Korea, Japan, India, and others. For instance, Zhang and Chuan (2006) conducted an analysis of the extent and influencing factors of China's IIT in manufactured goods during the 1990s. Shen and Gu (2007) investigated China's bilateral IIT relationships with countries such as the United States, Japan (as examined by Xing, 2007), and Korea (as studied by Lee and Han, 2008). Similarly, tailored analyses of IIT have been performed for particular Asian nations, including Korea (Bhattacharyya, 2005; Byun and Lee, 2005), Japan (Wakasugi, 1997), and India (Das, 2005).

The second group of studies within this context concentrates on examining Intra-Industry Trade (IIT) among Asian regions or trade blocs, with a specific focus on East Asia and the ASEAN. Thorpe and Zhang (2005) undertook an assessment of IIT levels in East Asia, particularly within the manufacturing sector, revealing that the IIT index had surged by more than 100 percent over the preceding three decades of the previous century.

Researchers such as Kimura and Ando (2005), Ando (2006), and Wakasugi (2007) attributed this trend to the escalating engagement of East Asian countries in vertical specialization and the global fragmentation of production. They also explored the establishment of regional production networks. Notably, East Asia was found to exhibit a higher reliance on international specialization compared to North America and Europe, as highlighted by Athukorala and Yamashita (2006) and Aggarwal (2023d, 2023e).

Cortinhas (2007), Sohn and Zhang (2005), and Aggarwal (2023a, 2023c) have contended that Intra-Industry Trade (IIT) plays a crucial role in fostering economic integration within East Asia and among ASEAN member countries. However, the literature offers limited insights into the dynamics of Free Trade Agreements (FTAs) and their contribution to sustaining IIT flows over time.

The emergence of regional value chains and integration with production networks in the ASEAN region by multinational corporations has contributed to the expansion of IIT, thereby assisting in stabilizing the business cycle in this area, as indicated

by Rana (2006, 2007). Brulhart's (2008) research revealed that in 2006, the level of intra-regional IIT in Northeast and Southeast Asia stood at approximately 27 percent and 34 percent, respectively, ranking second only to the highly integrated regions of North America and Western Europe, where IIT accounted for 55 percent and 45 percent, respectively.

Furthermore, Brulhart (2008) found that IIT within South and Central Asia was almost non-existent. However, Rana (2006) reported significantly higher figures when calculating intra-regional IIT by combining ASEAN and East Asia, with IIT levels reaching nearly 55 percent. This surpassed the levels of IIT within NAFTA (45 percent) and approached the levels within the European Union (66.2 percent).

Additional insights from Brulhart (2008) indicated that East Asia was extensively involved in inter-regional IIT with developed countries (21 percent), followed by trade with South Asia (8.5 percent) and Latin America (5.9 percent).

3. Analytical Framework

According to conventional trade theories, in the absence of trade, countries strive to fulfill all their needs domestically, even in sectors where their production efficiency is lacking. However, with the advent of international trade, countries can specialize in producing goods where they hold a comparative advantage and compensate for the rest of their needs through global exchange. The determination of a country's comparative advantage is rooted in its factors of production. Trade acts as a catalyst for fostering higher economic growth for nations and plays a crucial role in addressing unemployment concerns by facilitating industrial expansion.

As economic growth accelerates, market size and per capita income also increase, resulting in heightened domestic demand. This, coupled with global technological advancements and significant innovations, leads to the introduction of new products and variations of existing ones. These factors yield two important conclusions. Firstly, a broader range of products leads to increased trade opportunities, provided trade barriers are minimized. Secondly, a significant portion of trade occurs within industries between countries.

The latter point holds particular significance in our current analysis because trade can transpire even when two nations share similarities in consumer preferences, factor endowments, and factor intensities. In the context of contemporary trade patterns, it's noteworthy that countries engage in Intra-Industry Trade (IIT) even in products where they hold a comparative advantage. This scenario indicates the coexistence of both traditional trade theory and Krugman's approach, which together elucidate the dynamics of IIT. This coexistence arises due to vital interdependence between measures of intra-industry trade and comparative advantage.

4. Relationship between IIT and RCA

As previously elaborated, research has scrutinized the determinants of Intra-Industry Trade (IIT), Vertical Intra-Industry Trade (VIIT), and Horizontal Intra-Industry Trade (HIIT) utilizing the Revealed Comparative Advantage (RCA) Index, underscoring the influence of both traditional and new trade theories on IIT. To delve deeper into this, it's essential to not only examine the linear association where IIT is a function of RCA but also to assess whether the rate

of change in IIT corresponds to the rate of change in RCA. In essence, it's crucial to investigate whether IIT demonstrates a non-linear correlation with RCA. This inquiry arises because as RCA increases, IIT may initially ascend but could eventually peak, following which IIT might decline.

This conceptual framework establishes a linkage between Intra-Industry Trade (IIT) and Revealed Comparative Advantage (RCA) in a quadratic manner, proposing an inverted-U shaped curve. In our model, we posit that IIT is contingent upon RCA, exhibiting a positive first derivative, indicating that as RCA increases, so does IIT. Additionally, IIT is presumed to be influenced by the square of RCA, displaying a negative second derivative, suggesting that once a turning point is reached, IIT begins to decline.

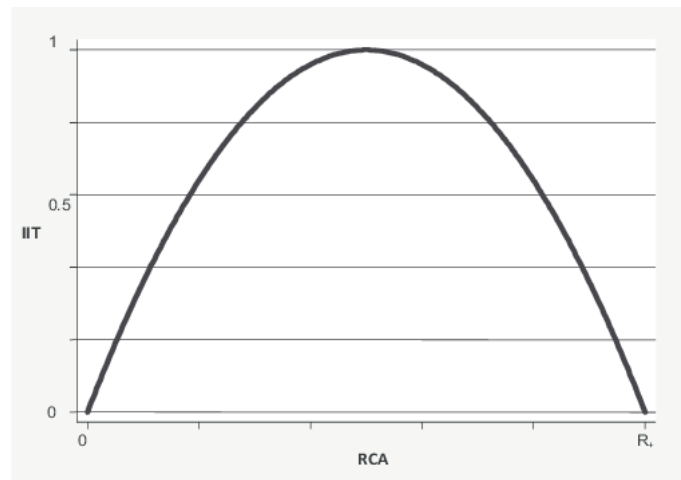
The quadratic correlation between IIT and RCA is anticipated to produce a hump-shaped (or inverted-U shaped) curve. Now, let's briefly outline the theoretical foundation supporting this hypothesis. Drawing from the argument posited by Helpman and Krugman (1985), one might assume that IIT is inversely linked to RCA. Intra-Industry Trade is sensitive to production characteristics, and a lower IIT index suggests reduced competition in product markets due to limited innovation in the production

processes. In such a scenario, firms may primarily differentiate their products through pricing, with factors such as quality carrying less weight. Consequently, trade aligns more closely with factors proposed by traditional theories, resulting in a positive correlation between IIT and RCA.

Nevertheless, in the long run, advancements in technology and increased innovation are expected to foster the emergence of new production processes. Over time, knowledge of production methods becomes disseminated within industries, potentially nullifying comparative advantages rooted in technology among producers. With a multitude of options available for similar products, the significance of horizontal differentiation intensifies for producers within the same industry. In such circumstances, traditional theories struggle to adequately explain trade dynamics, leading to a negative correlation between Intra-Industry Trade (IIT) and Revealed Comparative Advantage (RCA).

The economic rationale behind the relationship between IIT and RCA is depicted graphically in Figure 1. As illustrated, while RCA varies between 0 and any positive value on the x-axis without any binding constraint, IIT, by definition, is confined to vary between 0 and 1.

Figure 1. Inverted-U relationship between IIT and RCA Hypothesis



Source: Author's own estimation

5. Decomposing IIT: VIIT and HIIT

As highlighted earlier, an essential factor influencing Intra-Industry Trade (IIT) in line with the New Trade Theory is product differentiation. Let's explore this concept further. In a given industry, products can differ in both perceived and tangible attributes. For example, producers can distinguish their products through branding and may utilize advertising to implement this strategy. Conversely, consumers differentiate between products based on their personal preferences, tastes, and their capacity to evaluate product quality.

An important aspect to consider about product differentiation is that it operates on a continuum rather than being simply binary. From the viewpoint of consumers, two products can show differentiation yet still be viewed as substitutes. The extent of differentiation between two products can fluctuate; certain products might closely resemble substitutes because of similarities in their attributes, while others may differ significantly despite belonging

to the same industry. Additionally, some product variations may uniformly influence a consumer's utility function, whereas others may have diverse effects.

The microeconomic principles governing Intra-Industry Trade (IIT) as described above enable us to classify IIT into two primary types: Horizontal IIT (HIIT) and Vertical IIT (VIIT). HIIT emerges when consumers exhibit diverse preferences for a set of products, even if their prices are equivalent or nearly so. Conversely, Vertical IIT involves distinct products within the same industry. Although similar products may be differentiated by observable traits, this primarily concerns horizontal differentiation. As a result, the price disparity among products has been widely acknowledged as a metric for distinguishing between VIIT and HIIT.

Several studies have explored Horizontal IIT (HIIT) and Vertical IIT (VIIT) within developing countries (Hu and Ma, 1999; Veeramani, 2002; Zhang et al., 2005; Azhar et al., 2008; Devadson, 2012; Akram and Mahmood, 2012; Aggarwal, 2016, 2023b). These

analyses have noted that the expansion of back-and-forth transactions in vertically fragmented production processes, along with IIT of quality-differentiated goods, has led to a notable increase in VIIT (Aditya and Gupta, 2019; Aggarwal and Chakraborty, 2020b, 2021). This finding is supported by the observation that VIIT shows a positive correlation with differences in consumer preferences. Conversely, HIIT is more common among economies with similar development profiles and capital-labor ratios (Bergstrand, 1990; Frahan and Tharakan, 1998; Hu and Ma, 1999; Varma, 2015).

The aforementioned discussion contributes to examining the correlation between Revealed Comparative Advantage (RCA) and Intra-Industry Trade (IIT), which can be further classified into Horizontal IIT (HIIT) and Vertical IIT (VIIT). In the context of Vertical IIT, products initially categorized together can diverge due to variations in quality. Under this circumstance, trade can be elucidated through conventional trade models such as absolute or comparative advantage, as the production of high-quality goods can be attributed to specific factors. Considering that RCA can encapsulate the principles of traditional trade theories, a positive relationship between RCA and IIT, particularly in the case of VIIT, is expected.

Conversely, HIIT involves goods with similar qualities and prices, a phenomenon effectively expounded by Krugman's model.

6. Impact of FTAs on IIT

Menon and Dixon (1996) provide a theoretical exploration of the promotion of intra-industry trade through intra-regional agreements. Bojnec (2001) conducted a study on agricultural intra-industry trade in East and Central Europe, with a particular focus on the role of regional agreements as a driving force.

In a more recent empirical treatment, Zhang et al. (2005), Thorpe and Zhang (2005), Aggarwal and Chakraborty (2017), Aggarwal and Chakraborty (2019) and Aggarwal et al. (2023a) delved into the determinants of Intra-Industry Trade (IIT) in East Asia, underscoring the significance of Regional Trade Agreements (RTAs). Other studies centered on Asia, including those by Bhattacharya (2005), Ando (2006), and Xing (2007), have contributed influential work that concentrates on the factors shaping trade patterns through bilateral trade.

Sawyer et al. (2010) also ventured into this realm, conducting a significant analysis of the expanding trade facilitated by RTAs among specific Asian nations at a granular level. Nonetheless, it's important to acknowledge that the study conducted by Sawyer et al. (2010) has its constraints.

Acknowledging the widely recognized potential benefits of industrial agglomeration, it is understood that realizing these advantages in the ASEAN+6 region requires significant policy intervention. The concept revolves around advancing production methods to boost output, specifically targeting the sizable market within the ASEAN+6 region. Policies should be crafted to promote increased intra-industry trade, thereby establishing sustainable production networks within the region. Our study advocates for a more significant role of RTAs in shaping and sustaining International Investment and Trade (IIT) and presents a theoretical depiction of the correlation between the level of tariff liberalization within ASEAN+6 RTAs and the development of IIT, as these

agreements facilitate the establishment of resilient value chains in the region.

Adhering to the WTO criteria for a productive and significant Regional Trade Agreement (RTA), a tariff liberalization rate of 95 percent can be deemed as substantial trade coverage. As we move closer to full liberalization, reaching the 100 percent threshold, Intra-Industry Trade (IIT) will invariably approach a value of one. This indicates that trade liberalization will contribute to the long-term sustainability of IIT.

Our fundamental argument centers on the current landscape of extensive commodity production, which underscores the need to tap into robust demand, particularly given the presence of several developing economies. Achieving greater market access through an ASEAN+6 Regional Trade Agreement (RTA) is very essential. This approach not only aids in sustaining supply chains but also fosters Intra-Industry Trade (IIT) flows that can be attained via a comprehensive region-wide trade agreement.

At this point, it is imperative to understand how an RTA can enhance the sustainability of International Investment and Trade (IIT) through various economic mechanisms. Through the enactment of an ASEAN+6 Free Trade Agreement (FTA) concerning goods, IIT can be maintained through its influence on the trade-FDI dynamic, the encouragement of efficiency-oriented economic restructuring, both horizontal and vertical integration, the establishment of origin regulations geared towards development, the achievement of economies of scale, the promotion of competitive dynamics, technological advancements, and product diversification. These elements collectively foster the development of regional value chains by fostering connections between goods and services (as discussed in Das, 2006, 2009, 2013; Das and Ratna, 2011; Kumar, 2007; Aggarwal, 2017a; Aggarwal et al., 2021, Aggarwal et al., 2022).

7. Discussion

The current research has examined the profound theoretical implications for enhancing Intra-Industry Trade (IIT) of the horizontal type, which is primarily determined by factors such as product differentiation, economies of scale, and market imperfections, as outlined in the New Trade Theories (Aggarwal et al., 2023b). It also carries significant policy implications, particularly with regard to India's proactive engagement in RCEP negotiations aimed at deepening trade integration in goods. Such involvement would contribute to the generation of greater Intra-Industry trade flows.

Consequently, this would serve as a vital mechanism for India to enhance its participation in integration with regional production networks and supply chains within the East and South-east Asian region. This participation aligns with the characteristics of Intra-Industry trade flows, thereby sustaining both types of consumer preferences—namely, the "love of variety" and "favorite variety" concepts as explained in the paper.

At this juncture, it's crucial to understand the diverse avenues by which a Regional Trade Agreement (RTA) can bolster the sustainability of International Investment and Trade (IIT). Through the implementation of an ASEAN+6 Free Trade Agreement (FTA) in goods, IIT sustainability can be upheld through several economic impacts: the influence of the FTA on the relationship between trade and Foreign Direct Investment (FDI), the

encouragement of efficiency-oriented economic reorganization, both horizontal and vertical integration, the establishment of origin-based regulations geared towards development, the attainment of economies of scale, the encouragement of competitive dynamics, advancements in technology adoption, and the promotion of product differentiation. These elements collectively foster the evolution of regional value chains by strengthening connections between goods and services.

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