

Analysis of the Level of Industrial Integration in the Euro-Mediterranean Agreement on Pan-Euro-Mediterranean Rules of Origin Using the Intra-Industry Trade Index (Grubel-Lloyd)

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Abstract:

This study aimed to analyze the prospects of industrial integration within the framework of the Agadir Agreement, focusing on examining the factors that promote or hinder this integration. By analyzing trade exchange data among member states, as well as sectoral specialization, the study utilized the Grubel-Lloyd index to measure intra-industry trade, incorporating the inter-trade index and distinguishing between horizontal and vertical intra-industry trade.

The study concluded that the Agadir Agreement faces significant challenges in achieving full industrial integration, particularly due to weak trade integration among member states and unstable trade patterns. It also highlighted disparities in the level of intra-industry integration among member states, emphasizing that differences in trade policies and production capacities between countries pose obstacles to successful industrial integration.

Keywords: *Pan-Euro-Mediterranean Rules of Origin Agreement (Agadir), Industrial Integration, Intra-Industry Trade, Inter-Trade.*

Jel Classification Codes : *F13 ; F15; O25 ; O47 ; F14 ; F10*

1. Introduction :

International trade is a vital driver of economic growth and a cornerstone of relations between nations, as it contributes to increased productivity and efficiency through the exchange of goods and services between countries. To enhance this trade, the need arose to establish economic blocs that bring countries together to facilitate trade exchange and address shared economic challenges.

With the expansion and deepening of economic relations, industrial integration emerges as one of the most important factors contributing to the success of economic blocs. It strengthens economic cooperation between nations and contributes to the development of an interconnected economic system that enhances efficiency and competitiveness. Industrial integration can also lead to the establishment of new value chains, which in turn strengthens the ability of countries to compete in global markets.

Both the intra-industry trade index and inter-trade are important tools for analyzing the level of industrial integration between countries. They help in understanding the extent to which countries specialize in the production of specific goods and in determining their integration into production chains. An increase in intra-industry trade indicates greater specialization and division of labor, which enhances efficiency and productivity. Meanwhile, an increase in inter-trade reflects growing interdependence between countries in production chains, contributing to the development of new industries and strengthening economic cooperation among nations.

In the context of the Arab region, the Euro-Mediterranean Partnership project has witnessed numerous initiatives aimed at achieving economic integration between the region and the European Union. The Agadir Agreement stands out as a prominent example of these initiatives. This agreement represents a significant step toward enhancing economic cooperation among Mediterranean Arab countries, carrying high hopes for achieving economic and social development for its member states. However, the trade reality of the countries in this agreement indicates that these goals still face significant challenges.

Problem Statement:

Despite more than 15 years since the agreement came into force, the economic and industrial integration among the member states of the agreement remains limited. It has not significantly contributed to the formation of industrial clusters to support regional development, as the rules of origin have not achieved the desired impact in increasing intra-trade flows among member states. Intra-trade among the agreement's countries does not exceed 10% of their total external trade (Kamel, E. M, The rupture of the hub-spoke effect of bilateral trade flows when rules of origin are relaxed: The case of Agadir agreement countries., 2020, pp. 01-04). Additionally, member states primarily focus on exporting raw materials or low-value-added products, accounting for over 80% of their exports. Despite some successes in certain sectors, integration has not yet achieved the desired goals and remains superficial (Hammad, S, 2023, pp. 01-05).

What are the factors hindering the achievement of the desired integration under this agreement? And what are the ways to overcome these obstacles and enhance trade exchange and industrial cooperation among member states?

Hypotheses:

- The lack of sufficient trade integration among member states of the agreement has contributed to the decline in the level of industrial integration.
- The Agadir Agreement faces structural and institutional challenges that hinder industrial integration.
- The agreement's failure to develop a clear and effective sectoral specialization among member states limits opportunities for industrial integration and the growth of intra-trade.

Research Significance:

This research seeks to evaluate the extent to which the Agadir Agreement has succeeded in achieving its integration objectives, particularly in the field of industrial integration. To achieve this, the research provides a clear vision of the volume and patterns of intra-trade among the agreement's countries, identifying the most exchanged goods and the sectors dominated by trade. Through this perspective, the research helps identify the opportunities and challenges facing industrial integration among the agreement's countries and offers recommendations to enhance cooperation and address obstacles hindering greater integration.

Research Objectives:

This research aims to measure the level of trade integration among the Agadir Agreement countries by using intra-trade and intra-industry trade indicators. To understand this integration more deeply, the research will analyze the patterns of intra-trade among member states, identify the prevailing trends and patterns in this trade, and determine the most exchanged goods. Additionally, the research will include a study of sectoral specialization in each member state and identify the sectors dominated by intra-industry trade. Based on these analyses, the research will provide practical recommendations to enhance industrial integration among the agreement's countries.

Research Methodology:

This research adopts a descriptive and analytical methodology. The descriptive approach will be used to present the concepts of the Agadir Agreement, industrial integration, and intra-industry trade, while the analytical approach will be employed to study applied data and draw conclusions. The research will rely on secondary data from international and regional organizations, such as the United Nations and the Arab Monetary Fund. Intra-trade and intra-industry trade indicators will be used to measure the level of trade integration and understand trade patterns among member states.

Previous Studies:

- **Hammad, S. (2023). Industrial Clusters: Ambassadors for Regional Development: Case Study of Agadir Agreement.** This study provides an in-depth analysis of the role of the Agadir Agreement in promoting industrial clusters as a driver of regional development, focusing on the automotive sector as a case study. The study reviews the theoretical frameworks of industrial clusters and evaluates the extent to which the Agadir Agreement has succeeded in promoting them. By analyzing international trade flows of six automotive products between the Agadir Agreement countries and the European Union, the study concludes that the agreement's countries have achieved only superficial integration and have failed to achieve deep integration as a large cooperative industrial bloc. The study highlights the importance of enhancing

industrial cooperation among the Agadir Agreement countries and developing regional value chains.

- **Kamel, E. (2020). The Rupture of the Hub-Spoke Effect of Bilateral Trade Flows When Rules of Origin Are Relaxed: The Case of Agadir Agreement Countries.** This study examines the Agadir Agreement as a model for preferential trade agreements, discussing the impact of rules of origin on trade flows between the agreement's countries and the European Union. The study relies on a bilateral gravity model and the Poisson Pseudo-Maximum Likelihood (PPML) estimator to analyze trade data from 2000 to 2014. The results indicate that relaxing restrictions on rules of origin could enhance intra-trade among the Agadir Agreement countries, as well as trade between these countries and the European Union. The study emphasizes the importance of renegotiating the rules of origin in the Agadir Agreement to strengthen industrial integration and encourage intra-industry trade.
- **Bahgat, H., & Hanna, M. (2021). An Analytical Study of Trade Relations Among Agadir Agreement Countries (Egypt, Tunisia, Morocco, Jordan).** The study examined the reality of foreign trade between Egypt and the Agadir Agreement countries during the periods before and after joining the agreement. It highlighted the decline in trade volume between Egypt and the agreement's countries despite the removal of tariff and non-tariff barriers among members. The study aimed to shed light on the volume of intra-trade among the Agadir Agreement member states and to understand the trade volume between Egypt and the agreement's countries to enhance economic cooperation and leverage opportunities for cumulation of origin. The study relied on descriptive and quantitative methods to analyze data published in World Bank reports and the Trade Map database. The results showed an increase in the value of Egypt's exports to Agadir countries, but at a weak rate compared to its total exports. It also revealed that Egypt has a comparative advantage in exporting petroleum and chemical products, while transportation equipment and spare parts were the least traded in its exports to Agadir countries. This study provides direct insights into the role of intra-industry trade in the context of the Agadir Agreement and contributes to understanding the challenges associated with enhancing intra-trade among member states.
- **Al-Johari, A. (2011). Intra-Industry Trade in the Context of Economic Integration Among GCC Countries.** The study discusses intra-industry trade and its role in economic integration, emphasizing the importance of such trade in achieving economic development. It highlights the low level of intra-industry trade among GCC countries and explains that the growth of this trade requires a set of necessary conditions. The study assumes a positive relationship between the growth of intra-industry trade and the level of economic development, income convergence among countries, and the availability of economies of scale in production. It uses the Grubel-Lloyd index to measure the level of intra-industry trade among GCC countries during the period (2001-2007). The results confirm a relationship between the growth of intra-industry trade and economic integration, indicating that trade liberalization and the removal of tariff and non-tariff barriers contribute to increasing this trade. The study provides important insights into the role of intra-industry trade in enhancing regional economic integration and helps understand the challenges and opportunities associated with promoting this trade among Agadir Agreement countries.

These studies have employed a variety of indicators to measure different dimensions of integration. The Grubel-Lloyd index was adopted to assess the level of intra-industry trade, aligning with the examination of the agreement's impact on market expansion and trade barrier reduction. Additionally, the bilateral gravity model and the Poisson pseudo-maximum likelihood estimator were used to

analyze trade data, evaluating the impact of rules of origin on trade flows, which helps examine the extent to which trade in components and intermediate goods is facilitated. Furthermore, the analysis of international trade flows, particularly in the automotive sector, was utilized to assess the degree of specialization and industrial integration, which is linked to promoting vertical specialization in industries. Lastly, the focus was placed on analyzing the volume of trade exchanges, particularly between Egypt and the agreement's member states, to determine the overall impact of the agreement on trade.

These studies indicate that the Euro-Mediterranean Agreement on Agadir's diagonal cumulation of origin faces challenges in achieving industrial integration. They highlight the significance of intra-industry trade as a tool for fostering integration and shed light on issues such as rules of origin, industrial cooperation, and sectoral specialization to achieve the agreement's objectives.

This study provides a deeper analysis of the integrative aspirations of the Agadir Agreement, with a particular focus on industrial integration, offering a broader perspective and practical recommendations for achieving sustainable integration. It emphasizes the analysis of the Grubel-Lloyd index for intra-industry and inter-industry trade, discussing its role in stimulating industrial integration and the importance of rules of origin in this context. Additionally, it provides a detailed analysis of trade exchanges among member states, focusing on traded goods and the challenges these countries face in developing their industrial and technological sectors. The study also considers the expansion of market size, reduction of trade barriers, promotion of vertical specialization, and facilitation of trade in components and intermediate goods in assessing the impact of integration on intra-industry trade.

2. The Agadir Agreement: A Vision for Enhancing Industrial Integration

The Agadir Agreement represents an ambitious step toward fostering economic cooperation and integration between the Maghreb and Mashreq countries, aiming to achieve economic and social development for its member states. This research is grounded in the importance of understanding the concept of industrial integration and its theoretical foundations as a first step toward assessing the prospects of such integration within the framework of the Agadir Agreement.

To achieve this objective, this theoretical section provides a comprehensive overview of the Agadir Agreement and its goals, delves into the concept of industrial integration and its significance for developing countries in general and the agreement's member states in particular, and discusses the concept of intra-industry trade along with key indicators used to measure it. These indicators serve as crucial tools for evaluating the level of industrial integration and understanding its patterns. This theoretical foundation will establish a solid basis for analyzing the empirical data presented in the following section.

2.1. The Conceptual Framework of the Agreement

The official establishment of the Euro-Mediterranean Free Trade Area for the diagonal cumulation of origin between Egypt, Jordan, Tunisia, and Morocco was marked on February 25, 2004. The agreement subsequently came into effect on July 6, 2006, and following the issuance of customs circulars by the member states, its actual implementation began on March 27, 2007 (Adnan, 2008, p. 17).

A Technical Unit was also established in Jordan to oversee the implementation of the agreement's provisions. The agreement has an indefinite duration, and any member state may withdraw by

notifying the Ministry of Foreign Affairs. The withdrawal becomes effective three months after the notification, at which point the agreement ceases to apply to the withdrawing country (Technical Unit of the Agadir Agreement, 2017, p. 08).

The agreement aims to enhance the global economic position of its member states by (Adnan, 2008, p. 17):

- Achieving an adequate level of harmonization of foreign trade legislation among member states;
- Coordinating economic, sectoral, financial, and tax policies;
- Increasing trade exchanges among member states and strengthening industrial integration;
- Improving the competitiveness and productivity of enterprises.

2.1.1 Characteristics of the Euro-Mediterranean Free Trade Agreement A. Agreement Provisions

The agreement stipulates the following (Adnan, 2008, pp. 18-19):

- Upon the agreement's entry into force, a full exemption was granted for industrial products and all agricultural and processed agricultural goods exchanged between the member states of the Greater Arab Free Trade Area (GAFTA), effective from January 1, 2005.
- Liberalization of services in accordance with the General Agreement on Trade in Services (GATS) of the World Trade Organization (WTO).
- Adoption of the Euro-Mediterranean Protocol on Rules of Origin, both in its current and future versions.
- Any Arab or Mediterranean country that has a bilateral partnership agreement with the European Union (EU) may join the Euro-Mediterranean Free Trade Agreement, as all current member states have established bilateral partnership agreements with the EU.

B. Euro-Mediterranean Rules of Origin Accumulation System

The application of diagonal cumulation of origin within the Euro-Mediterranean region follows the principle of "variable geometry." This principle stipulates that origin accumulation is only applicable among countries that have free trade agreements incorporating the Euro-Mediterranean Protocol on Rules of Origin.

Regarding the eligibility conditions for benefiting from origin accumulation, the following criteria must be met (Adnan, 2008, pp. 18-19):

- The existence of a free trade agreement between the countries involved.
- A direct trade link between the manufacturing country and the destination country.
- Harmonization of rules of origin, meaning that the free trade agreement must include rules of origin that are consistent with the Euro-Mediterranean Protocol.

2.1.2 Relationship with the Euro-Mediterranean Partnership Agreement and Other Agreements

The Euro-Mediterranean Free Trade Agreement represents the first step toward economic and social integration within the Arab Mediterranean region and an additional step toward achieving the objectives of the Euro-Mediterranean Partnership Agreement. The European Union (EU) has

committed to political and financial support for the Agadir Agreement to promote South-South trade integration (Péidy, 2005, p. 329).

Additionally, the agreement aligns with key international trade rules and practices, as the Agadir Agreement member states are also members of the World Trade Organization (WTO). Furthermore, it is consistent with the Charter of the Arab League and the principles of the Greater Arab Free Trade Area (GAFTA), both of which aim to enhance and strengthen Arab economic cooperation (Technical Unit of the Agadir Agreement, 2019, p. 06).

2.2 The Concept of Industrial Integration

2.2.1 Definition of Industrial Integration

The concept of industrial integration refers to the degree of interconnection between a new industry and other industrial sectors, whether in terms of inputs (raw materials) or outputs (distribution and manufacturing). Industrial integration occurs at three levels (Behrman, J. N., 1972, pp. 48-53):

- National Industrial Integration: Defined as the interconnection between a new industry and other industrial sectors within the same country.
- Regional Industrial Integration: This type of integration refers to the interconnection between a new industry and other industrial sectors within a group of countries in a specific geographic region.
- International Industrial Integration: This refers to the interconnection between a new industry and other industrial sectors on a global scale.

2.2.2 Forms of Industrial Integration

- Vertical Integration: This type of integration involves linking production units at different stages of the manufacturing process, from raw materials to the final product. It helps reduce costs and increases control over the supply chain (Frank, L. K., 1925, p. 179).
- Horizontal Integration: This occurs when companies at the same production stage within the same industry merge to increase market share and reduce competition. An example of this would be the merger of two automobile manufacturers (Galtung, J., 1968, p. 375).

2.2.3 Importance of Industrial Integration

The importance of industrial integration in the context of developing countries, particularly Arab countries, can be highlighted in the following points (Ghantus, E. T., 1982, p. 23):

- Improvement in Resource Efficiency: By specializing in the production of specific goods and services, countries can achieve economies of scale and reduce production costs.
- Promotion of Economic Growth: Expanding market size leads to increased demand for goods and services, stimulating investment, job creation, and higher production.
- Achieving Greater Self-Reliance: Integration helps reduce developing countries' dependence on foreign markets and enhances their ability to meet domestic needs.
- Overcoming the Constraints of Small Domestic Markets: Through integration, Arab countries can expand their markets and achieve economies of scale in industries that require large-scale production.
- Diversification of Arab Economies: Integration supports the development of new industrial sectors, reducing Arab countries' reliance on raw material exports.

- Enhancement of Arab Economic Cooperation: Integration contributes to the establishment of closer economic ties between Arab countries and strengthens solidarity.

2.3 The Concept of Intra-Industry Trade

2.3.1 Definition of Intra-Industry Trade

Grubel and Lloyd (1975) were the first to highlight the concept of intra-industry trade, noting that a significant portion of international trade occurs within the same product category that belongs to a single industry. They described this phenomenon as the exchange of similar products that differ in certain characteristics (Nashwa, 2011, pp. 52-53).

In the study by Falvey (1981), intra-industry trade is defined as:

"A bilateral trade where a country both imports and exports goods within the same product category at the same time." This contrasts with traditional inter-industry trade, where countries specialize and exchange clearly different goods. Falvey argues that the current theoretical frameworks, which primarily explain trade between industries based on comparative advantage, are insufficient to account for the large volume of intra-industry trade observed (Falvey & Rodey, 1981, p. 495).

It is also defined as "the simultaneous exchange of exports and imports within the same industry" (Menon & Dixon, 1996, p. 02).

2.3.2 Patterns of Intra-Industry Trade

Intra-industry trade is classified into two main types:

- **Horizontal Intra-Industry Trade (HIIT):** This involves the exchange of products within the same industry that have different characteristics other than quality. These products are often in the same production stage and have similar prices (Srivastava, A & Medury, Y, p. 153). Horizontal intra-industry trade is typically explained by consumers' preferences for variety and producers' ability to exploit economies of scale (Ramakrishnan, A & Varma, P, p. 132).
- **Vertical Intra-Industry Trade (VIIT):** This involves the exchange of goods within the same industry but differentiated by quality levels, which often reflect in their different prices (Srivastava, A & Medury, Y, p. 153). Vertical intra-industry trade can be understood through traditional trade theories based on differences in factor productivity and factor abundance, where countries specialize in different quality levels within the same industry (Ramakrishnan, A & Varma, P, p. 132).

Intra-industry trade is an economic phenomenon that involves the exchange of goods and services within the same industry or product category, but they differ in detailed characteristics such as quality, design, brand, or technical specifications. This challenges the traditional trade pattern based on comparative advantage and explains a significant part of international trade.

2.3.3 The Relationship Between Intra-Industry Trade and Industrial Integration

Several studies have shown a strong relationship between intra-industry trade and industrial integration, particularly in the context of regional trade agreements (Zaninović, 2022, p. 129). Industrial integration contributes to enhancing intra-industry trade through the following mechanisms:

- **Market Size Expansion:** Trade integration agreements create a larger and unified market, encouraging greater specialization and product differentiation within industries (Bano, S & Lane, P, p. 147).

- **Reduction of Trade Barriers:** The removal of tariffs and other trade barriers facilitates the two-way flow of similar goods within industries (Bano, S & Lane, P, p. 147).
- **Encouraging Vertical Specialization:** Relaxed rules of origin allow countries to source inputs from different places, enhancing specialization at specific stages of production within an industry, increasing vertical intra-industry trade (Kamel, E. M, 2020, p. 18).
- **Facilitating Trade in Components and Intermediate Goods:** This contributes to increasing intra-industry trade, especially in industries where production is fragmented across various countries (Kamel, E. M, 2020, p. 18).

Empirical studies have shown that industrial integration agreements, such as the Central European Free Trade Agreement (CEFTA) and the European Union, have a significant positive impact on intra-industry trade (Zaninović, 2022, p. 129). However, some studies have also found that the impact of industrial integration agreements on intra-industry trade may vary depending on the level of economic development among member countries (Ramakrishnan, A & Varma, P, 2014, p. 141).

In turn, intra-industry trade (IIT) contributes to enhancing industrial integration through several mechanisms:

- **Deepening Specialization and Division of Labor:** Intra-industry trade encourages countries to specialize in the production of specific goods or components within a particular industry, rather than trying to produce all products by themselves (Wakasugi, R, 2007, p. 36). This specialization increases efficiency and productivity, promoting industrial integration by creating integrated value chains across borders (Menon & Dixon, 1996, p. 2). For instance, one country may specialize in the production of car components, while another focuses on final assembly, leading to an integrated production chain.
- **Stimulating Innovation and Technology Transfer:** The competition generated by intra-industry trade drives companies to innovate in order to differentiate their products and meet changing consumer preferences. This leads to increased technology and knowledge transfer between countries, thus enhancing industrial integration by disseminating best practices and developing new capabilities (Lundberg, L, 1992, p. 406).
- **Creating the Need for Integration Agreements:** Increased intra-industry trade between countries may lead to a greater need for integration agreements to facilitate trade and coordinate policies (Kamel, E. M, 2020, p. 18). These agreements may include unified rules of origin, tariff reductions, and the removal of non-tariff barriers, further boosting industrial integration.

2.3.4 Intra-Industry Trade Index

Researchers have strived to develop optimal methods to measure intra-industry trade, leading to the emergence of various formulas that have been widely discussed in academic literature. In this paper, we present the most commonly used index developed by Grubel and Lloyd (1975), which takes the following form (Bano, S & Lane, P, p. 136):

$$IITi = \frac{\sum_{i=1}^n (X_i + M_i) - \sum_{i=1}^n |X_i - M_i|}{\sum_{i=1}^n (X_i + M_i)} \times 100$$

Where:

- $i=1 \dots n$, and n represents the number of industries in the sample population;
- X_i and M_i are the exports and imports of industry i ;

– IIT_i is the intra-industry trade index for a specific country's industries.

This index provides a range from 0 to 100, where higher values reflect a greater level of intra-industry trade (IIT). It can also be used to calculate the weighted average for total trade or industry groups. However, its main drawback is that when trade is unbalanced, IIT reduces its value. To address this, Grubel and Lloyd developed a modified formula that takes into account the difference between the value of exports and imports. This modified index increases the value of the base index in proportion to the magnitude of this difference. Therefore, if the trade imbalance is expressed as follows (Bano, S & Lane, P, p. 136):

$$K = \frac{|X_i - M_i|}{(X_i + M_i)}$$

The base index can be adjusted by (K-1/1), and thus, the modified Grubel-Lloyd index is:

$$IIT_i = \frac{\sum_{i=1}^n (X_i + M_i) - \sum_{i=1}^n |X_i - M_i|}{\sum_{i=1}^n (X_i + M_i) - |\sum_{i=1}^n X_i - \sum_{i=1}^n M_i|} \times 100$$

The horizontal and vertical intra-industry trade can be separated as follows (Srivastava, A & Medury, Y, pp. 156-157):

The total IIT (TIIT) is the sum of HIIT and VIIT, as shown in the equation:

$$IIT = HIIT + VIIT$$

To disentangle IIT into HIIT and VIIT, the following equation is used:

$$1 - \alpha \leq \frac{UV_{exp}}{UV_{imp}} \leq 1 + \alpha$$

Where products are categorized into two groups, horizontal differentiation (HIIT) and vertical differentiation (VIIT), based on the ratio of unit value of export (UV_{exp}) to unit value of import (UV_{imp}) compared to a dispersion factor "α". A commonly used value for α is 0.15 (15%). If the ratio of UV_{exp} to UV_{imp} falls between 0.85 and 1.15, the product is considered to have horizontal differentiation (HIIT). If the ratio is less than 0.85 or greater than 1.15, the product is considered to have vertical differentiation (VIIT).

Additionally, if the ratio is less than 0.85, the VIIT is of low quality (LQVIIT). If it is higher than 1.15, the VIIT is considered of high quality (HQVIIT).

The formula used to calculate unit values is as follows:

$$UV_{exp} = \frac{Value_{exp}}{Unis_{exp}}$$

And :

$$UV_{imp} = \frac{Value_{imp}}{Unis_{imp}}$$

3. Prospects for Industrial Integration Among Agadir Agreement Countries: A Perspective Based on Trade Exchanges and Sectoral Specialization

The Agadir Agreement represents a significant step toward strengthening economic integration among Euro-Mediterranean Arab countries. This section aims to explore the prospects for industrial integration among the member states of this agreement through a comprehensive vision based on an analysis of trade exchanges and sectoral specialization. In this context, intra-trade patterns and the volume of trade exchange between member states will be examined, along with an analysis of the Grubel-Lloyd index for intra-industry trade at the bilateral level to understand the nature of sectoral specialization and the level of integration in different industries.

3.1 Intra-Trade Among Agadir Free Trade Agreement Countries

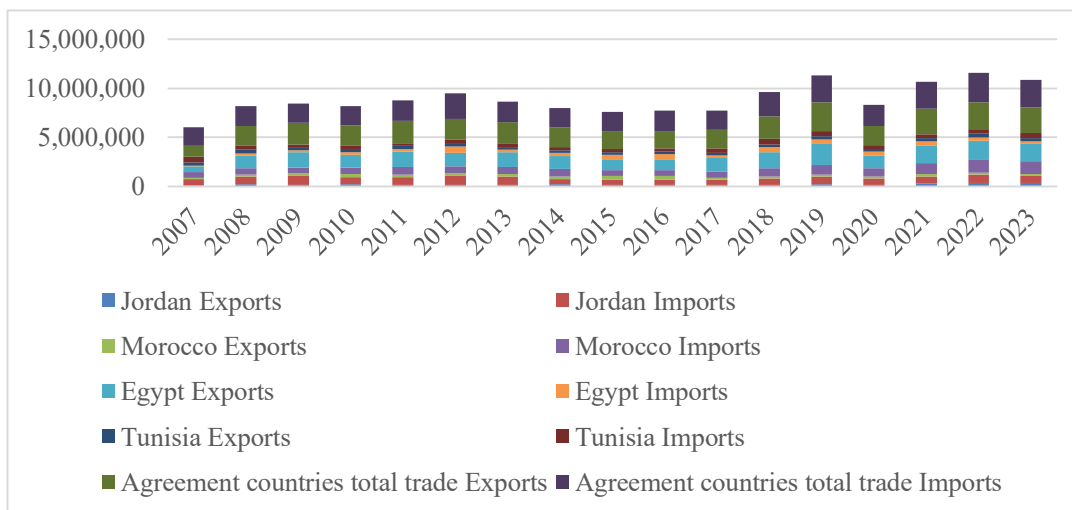
This section summarizes the reality of trade exchanges and the commodity structure of the Agadir Agreement countries by analyzing the volume and trends of intra-exports and imports, with a focus on the main exchanged goods. The objective is to assess the level of trade integration and identify the opportunities and challenges these countries face in their pursuit of enhancing economic cooperation and diversifying their commodity structure.

3.1.1 Volume of Intra-Trade Exchange

Egypt is the leading exporter within the Agadir Agreement, recording the highest export volume in all years except for 2010, with its exports surpassing USD 1 billion on multiple occasions. Meanwhile, Morocco's exports have shown significant growth, particularly between 2010 and 2015, while Tunisia's exports have remained relatively stable over the years analyzed. Jordan's exports, however, have fluctuated, experiencing noticeable growth between 2020 and 2022.

Import data reveals divergent trends among the agreement's member states. Jordan's imports have risen significantly from all other countries, particularly from Morocco and Tunisia—its imports from Morocco reached USD 826,886 thousand in 2018 and USD 740,395 thousand in 2021. Morocco's imports have also shown consistent growth across all years, especially from Egypt. Conversely, Tunisia's imports from other countries have exhibited fluctuations, while Egypt's imports remain the lowest among the member states, with a noticeable decline in recent years. This is illustrated in figure (01).

Figure (01): "Volume of Intra-Trade Exchanges Among Agadir Agreement Countries (2007-2023) in Thousand USD"



Source: Prepared by researchers based on: (International Trade Center, 2024).

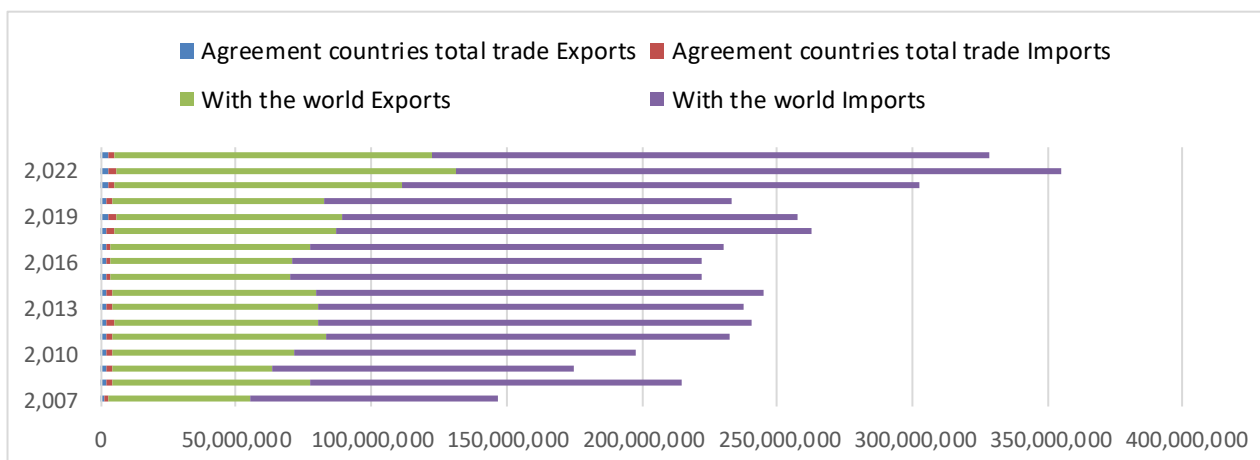
3.1.2 Volume of Trade Exchanges with the World

The total trade exchange volume between the Agadir Agreement countries and the world is illustrated in figure (02) below.

From the figure, a noticeable growth in trade exchanges among the member states can be observed, with a significant increase between 2014 and 2016. The exports of the member states rose from USD 1,117,887 thousand in 2007 to USD 2,895,908 thousand in 2016. Meanwhile, trade exchanges between the Agadir countries and the world also exhibited significant growth during this period, with exports rising from USD 52,353,943 thousand in 2007 to USD 106,004,890 thousand in 2015, and imports increasing significantly from USD 91,549,710 thousand in 2007 to USD 223,058,329 thousand in 2021.

When comparing intra-trade with global trade, it is evident that these countries rely heavily on imports from the world rather than intra-exports, with a large gap in most years. This indicates an imbalance between exports and imports, with a clear increase in the volume of imports. Additionally, intra-trade among Agadir Agreement countries remains marginal compared to their trade with the rest of the world, as intra-exports account for no more than 0.3% of total global exports, while intra-imports range between only 1% and 2% of total global imports. This suggests a weak level of trade integration among the member states.

Figure (02): "Total Trade Volume Between Agadir Agreement Countries and the World (in Thousand USD)"



Source: Prepared by researchers based on: (International Trade Center, 2024).

3.1.3 Analysis of Intra-Trade Growth Rates Among Agadir Agreement Countries Before and After Implementation

To analyze the trend of intra-trade among the Agadir Agreement countries, the growth rates were calculated using a simple method, as shown in **table (01)**. The calculation follows this formula:

$$\text{Trade Growth Rate} = \frac{(\text{Final Value} - \text{Initial Value})}{\text{Initial Value}} \times 100$$

- Final Value: The total intra-trade value in the last year of the specified period.
- Initial Value: The total intra-trade value in the first year of the specified period.

The growth rate was calculated for consecutive years, and the average rate was computed for every five years to ensure a fair comparison of growth trends over equal periods, providing a more precise analysis.

Table (01): "Intra-Trade Growth Rate Among Agadir Agreement Countries"

Growth Rate		Before Agreement Implementation		After Agreement Implementation		
		2001-2006	2007-2012	2017-2012	2017-2023	2007-2023
Morocco	Exports	13.76	15.95	-3.18	3.72	5.38
	Imports	32.97	6.31	-0.49	12.81	6.62
Egypt	Exports	41.82	25.29	-1.02	8.2	11.3
	Imports	14.69	58.06	-2.06	4.98	19.37
Jordan	Exports	17.52	16.93	-2.57	16.38	10.63
	Imports	55.71	7.87	-9.19	8.15	2.64
Tunisia	Exports	17.61	5.26	-4.92	6.31	2.48

	Imports	9.87	9.39	6.27	3.26	6.12
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Source: Prepared by researchers based on: (International Trade Center, 2024).

From the table, we observe that during the pre-agreement period (2001-2006), Egypt recorded the highest export growth rate at 41.82%, while Jordan had the highest import growth rate at 55.71%. In contrast, Morocco exhibited a lower export growth rate of 13.76%, whereas Tunisia recorded the lowest import growth rate at 9.87%.

Following the implementation of the agreement, we divided the post-agreement period into three phases:

A. Immediately After the Agreement (2007-2012):

- Egypt continued to lead in export growth at 25.29%, although this was lower than in the pre-agreement period. However, its import growth rate increased significantly to 43.37%.
- Morocco experienced a decline in import growth to 26.31%, while its export growth saw only a slight increase of 2.19%.
- Jordan recorded a significant drop in import growth, falling to 47.84%, while its export growth remained stable.
- Tunisia experienced a decline in export growth by 12.35%, while its import growth rate remained unchanged.

B. The 2012-2017 Period:

This phase was characterized by a decline in growth rates across all member states. This decline may be attributed to economic and political events preceding or occurring during this period, such as the 2008 global financial crisis and the Arab Spring (2010-2012).

C. The 2017-2023 Period:

- Intra-trade showed signs of recovery, albeit at weak growth rates.
- Jordan and Egypt recorded the highest export growth rates at 16.38% and 8.20%, respectively.
- Morocco led in import growth at 12.81%.

Overall, intra-trade growth rates increased after the agreement's implementation, despite significant variations between member states. Egypt experienced the highest trade growth (both exports and imports), followed by Jordan and Morocco, which saw moderate growth rates. Tunisia, however, exhibited the lowest intra-trade growth, which may be attributed to its weaker trade integration with other member states.

3.1.4 Analysis of the Intra-Trade Structure of Agadir Agreement Countries

The study and analysis of the commodity structure enable us to identify the key product groups exported and relied upon by the member states of the Agadir Agreement, as well as the main sectors upon which these countries depend. Additionally, this analysis helps assess the potential for economic integration among various sectors. The following table illustrates the intra-trade structure of the member states during selected periods:

Table (02): "The Commodity Structure of Agadir Agreement Countries, Indicating the Relative Importance in Intra-Trade Among Arab Blocs"

2010-2013	APP	2014-2017	APP	2017-2021	2017	2021
Nature of Goods and Industries		Nature of Goods and Industries		Nature of Goods and Industries	APP	
Metals and their products	17.6	Vegetable products	8.7	Raw materials	33.2	39.2
Chemical industry products	12.7	Chemical industry products	8.5	Foodstuffs	25.4	27.8
Vegetable products	9	Machinery and electronic devices	7.9	Chemical products	21.6	19.9
Food, beverages, and tobacco products	8.7	Food, beverages, and tobacco products	7.4	Machinery and transport equipment	15.4	14.3
Machinery and electronic devices	7.4	Plastics, rubber, and their products	7.2	Manufactured goods	26.7	24.7
Paper and its products	6.4	Metals and their products	6	Labor- and resource-intensive industries	16	15.7
Plastics, rubber, and their products	4.4	Live animals and their products	5.8	Low-skilled and technology-intensive manufactures	6.8	6.2
Animal and vegetable fats and oils and their products	3.8	Cement and its products	4.8	Medium-skilled and technology-intensive industries	23.9	11.4
Cement and its products	3.7	Paper and its products	3.5	Labor- and resource-intensive industries	20.1	25.5

APP = Average Percentage of the Period

Source: Prepared by researchers based on: (Arab Monetary Fund, 2013-2017-2022)

The table above highlights a transformation in the commodities exchanged among the Agadir Agreement countries over different periods. Between 2010 and 2013, "metals and their products," "chemical industry products," and "vegetable products" were among the most traded goods. However, from 2014 to 2017, "machinery and electronic devices" gained prominence alongside "vegetable products" and "chemical industry products." The period from 2017 to 2021 witnessed a significant increase in the importance of "raw materials," "food products," and "chemical products," with "manufactured goods" becoming increasingly relevant in 2021.

This indicates opportunities for greater diversification in the exchanged goods among member states and a shift towards more complex industries. However, the dominance of low value-added products in intra-trade suggests that these countries still face challenges in developing their industrial and technological sectors.

According to the Arab Trade Finance Program report, the Agadir Agreement has had noticeable effects on certain export sectors within member states, particularly in the following areas (Mansari, 2015, pp. 242-246):

- **Textiles and Apparel:** This industry is a crucial economic driver for the member states. Morocco and Tunisia have strong positions in supplying garments to the European Union, while Egypt and Jordan direct their exports toward North American markets. The sector has flourished due to competitive production costs, rapid market response, and high product quality. However, it faces intense competition from Asian countries, particularly after the European market opened to Chinese exports. Addressing this challenge requires cooperation among member states to develop joint strategies.
- **Leather and Footwear:** This sector presents an opportunity to enhance trade integration among member states. However, it faces multiple challenges, such as meeting the growing demand for tanned leather and the necessity of adopting modern technologies in footwear manufacturing to achieve competitive costs. Collaboration among countries is essential to overcoming these obstacles and advancing the sector.
- **Automobile Industry:** Member states have small car markets that struggle to attract manufacturers due to their limited size. Additionally, the customs exemptions provided under the Agadir Agreement have not yielded the desired results due to non-tariff barriers restricting the free flow of exports among member states. This necessitates efforts to develop the sector, increase exports, and diversify production.

3.2 Analysis of Intra-Industry Trade Indicators for Euro-Mediterranean Free Trade Agreement Countries

To assess the level of intra-industry trade, we relied on the Grubel and Lloyd index, which was previously discussed in detail in the theoretical section of this research. The calculations were based on trade data from the United Nations Comtrade database for the period 2007–2023, using the Harmonized System (HS) classification. The following table presents the index results for each country in relation to other agreement members:

Table (04): Intra-Industry Trade Between Morocco and Agreement Members

Years	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Egypt	21.49	21.13	43.69	39.77	27.14	45.81	50.53	38.97	79.26	79.98	23.41	25.43	23.7	26.74	18.41	11.67	10.69
Jordan	35.36	55.43	56.08	44.62	59.56	52.49	61.19	67.3	91.99	74.9	62.73	98.83	96.42	99.08	28.58	40.82	52.5
Tunisia	57.02	54.04	57.17	72.14	56.73	67.07	56.28	63.89	73.18	67.88	60.08	61.99	51.42	60.61	72.48	55.9	63.94

Source: Compiled and calculated from (United Nations, 2024).

We notice from the table above that the Grubel-Lloyd intra-industry trade index data between Morocco and the Agadir Agreement countries show notable differences in trade patterns. While the relatively low values of the index with Egypt, ranging from 10.69% in 2023 to 79.98% in 2016, indicate limited intra-industry trade between the two countries, this index shows significant fluctuations over the specified period, with a notable rise in 2009, 2010, 2015, and 2016, followed by

a sharp decline in 2017 and a continued decrease until 2023. In contrast, trade with Jordan shows a higher level of integration, with relatively high index values in most years, ranging between 28.58% in 2021 and 99.08% in 2020, with relative stability from 2007 to 2019. As for trade with Tunisia, it is considered the most integrated, with consistently high index values throughout all years, ranging from 51.42% in 2019 to 73.18% in 2015, with notable stability during the specified period, indicating strong economic integration between the two countries.

Table (05): Intra-Industry Trade Between Jordan and Agreement Members

Years	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Morocco	42.78	57.73	47.44	57.07	95.78	84.27	63.97	74.76	91.02	55.62	52.1	75.21	73.51	85.9	46.26	81.23	49.74
Egypt	23.25	34.81	23.63	34.3	28.45	27.19	31.22	39.91	36.19	34.48	38.82	40.94	34.88	38.45	44.98	53.23	48.88
Tunisia	56.66	78.71	70.09	58.03	61.34	78.53	37.34	71.14	59.27	79.24	99.35	75.37	81.71	79.18	88.83	92.83	92.43

Source: Compiled and calculated from (United Nations, 2024).

The data from the intra-industry trade index between Jordan and the Agadir Agreement countries show a clear variation in the level of trade integration. While the index with Morocco shows noticeable fluctuations over the years, with values ranging between 42.78% in 2007 and 95.78% in 2011, the index with Egypt indicates a lower level of integration, with values ranging between 23.25% in 2007 and 53.23% in 2022. In contrast, trade with Tunisia shows a high level of integration and notable stability, with index values ranging from 37.34% in 2013 to 99.35% in 2017, indicating strong economic ties between the two countries.

Table (06): Intra-Industry Trade Between Tunisia and Agreement Members

Years	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Morocco	60.93	55.3	47.91	59.86	56.23	75.61	66.56	79.12	82.6	81.15	78.81	63.05	58.18	65.04	65.67	62.11	75.26
Egypt	59.76	68.1	65.58	69.66	61.13	50.14	44.3	57.17	63.24	45.71	21.87	24.25	21.85	34.33	40.17	31.43	26.85

Analysis of the Level of Industrial Integration in the Euro-Mediterranean Agreement on Pan-Euro-Mediterranean Rules of Origin Using the Intra-Industry Trade Index (Grubel-Lloyd)

Jordan	53.95	86.68	83.31	67.92	67.46	84.08	79.92	52.01	54.48	74.01	81.04	94.93	95.72	72.4	96.02	77.43	65
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Source: Compiled and calculated from (United Nations, 2024).

The data from the intra-industry trade index between Tunisia and the Agadir Agreement countries show varying levels of trade integration. With Morocco, the index shows high values ranging from 47.91% in 2009 to 82.6% in 2015, indicating a significant intra-industry trade and a relatively stable trade relationship. As for Egypt, there is a noticeable decline in the level of integration starting from 2012, with the index dropping from 61.13% to 26.85% in 2023, which may reflect changes in Egypt's economic structure and trade policies. Despite some fluctuations, trade with Jordan shows a high level of integration, with index values ranging from 52.01% in 2014 to 96.02% in 2021, confirming strong economic ties between the two countries.

Table (07): Intra-Industry Trade Between Egypt and Agreement Members

Years	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Jordan	35.85	26.1	14.32	29.44	27.77	46.79	25.38	30.69	29.56	29.23	33.37	42.05	31.45	39.26	44.71	52.25	47.72
Morocco	24.12	20.25	21.93	28.92	20.11	40.81	29.48	38.77	95.88	92.24	45.21	49.63	39.5	47.7	42.12	10.51	5.42
Tunisia	21.61	59.68	31.63	49.61	56.52	94.09	45.31	53.07	69.39	77.98	22.01	43.95	24.68	44.28	44.54	38.11	20.26

Source: Compiled and calculated from (United Nations, 2024).

We notice from the data in the table above for the intra-industry trade index between Egypt and the Agadir Agreement countries a relatively weak level of trade integration, especially with Morocco, where the index recorded a sharp decline from 95.88% in 2015 to 5.42% in 2023, indicating a fundamental change in the trade pattern between the two countries. As for trade with Jordan, a higher level of integration is observed, with index values ranging from 14.32% in 2009 to 52.25% in 2022, with an upward trend in recent years. Meanwhile, trade with Tunisia showed a high level of integration during a specific period, with the index reaching 94.09% in 2012, but it declined significantly in the subsequent years to reach 20.26% in 2023.

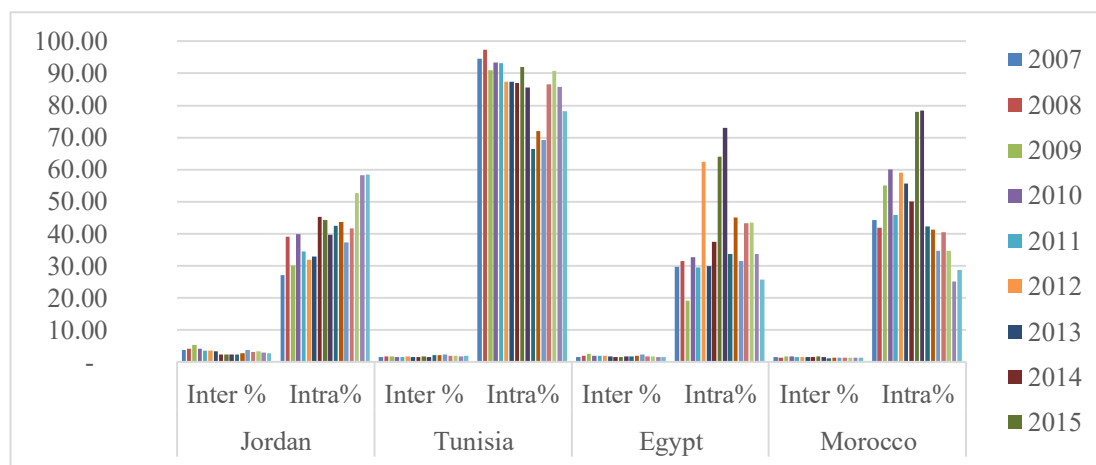
The analysis of the Grubel-Lloyd index for intra-industry trade between the Agadir Agreement countries shows a significant variation in the level of integration. Tunisia appears to be the most integrated with all other member countries, particularly with Jordan, where the index consistently records the highest values. In contrast, Morocco shows a good level of integration with Tunisia and Jordan, but intra-industry trade with Egypt is the weakest, while Egypt shows the lowest level of integration with other agreement countries, especially with Morocco, where the index has significantly declined in recent years. Despite this variation, it is noted that there is no clear pattern or stable overall trend in the Grubel-Lloyd index values from 2007 to 2023, suggesting that intra-

industry trade is influenced by various factors such as changes in the trade policies of each country, structural changes in the economy of each country, as well as external factors like global economic crises and the effects of the COVID-19 pandemic.

3.3 Analysis of intra-regional trade patterns among Agadir Free Trade Agreement countries:

Measuring the level of trade integration among countries is important to understand their economic interconnection and to identify the opportunities and challenges they face in their pursuit of enhancing cooperation and trade exchange. This analysis highlights intra-regional trade among the Agadir Agreement countries, an agreement that aims to establish a free trade area among its member states. The analysis specifically aims to measure the level of trade integration among these countries by comparing two key indicators: the inter-industry trade index, which measures the percentage of each country's trade with other agreement members relative to its total trade with the world, and the intra-industry trade index, which measures the percentage of trade within the same industry among these countries. By comparing these indicators and analyzing their evolution over the period from 2007 to 2023, the analysis will assess the extent to which the Agadir Agreement has succeeded in achieving its integration objectives, identify the main trends and patterns in intra-regional trade, and highlight the opportunities and challenges these countries face in their quest for greater economic integration. The following figure illustrates the development of these two indicators over the specified study period:

Figure (03): intra-industry trade index and inter-industry trade index for the total exchanged products among Agadir Agreement countries



Source: Compiled and calculated from (United Nations, 2024).

From the figure above, we observe that the inter-industry and intra-industry trade indicators for the Agadir Agreement countries show a significant weakness in trade integration, as intra-regional trade does not exceed 4% of their total trade with the world. This indicates that these countries direct most of their external trade towards markets outside the region. Although the intra-industry trade index shows relatively higher values ranging between 20% and 97%, indicating the presence of some trade specialization among the member countries, these values remain limited and are affected by the overall weak trade integration, in addition to significant disparities among countries and notable fluctuations during the period from 2007 to 2023.

Thus, despite the fact that the Agadir Euro-Mediterranean Free Trade Agreement aims to enhance industrial integration among its member states, the data indicate that progress in this regard remains limited. Therefore, further efforts are needed to overcome the obstacles hindering trade and to strengthen economic cooperation among these countries

4. Conclusion:

The study shows that the Agadir Free Trade Agreement (FTA) with its ambitions for integration still faces significant challenges in achieving full industrial integration among the member countries. The applied analysis of trade exchanges and sectoral specialization has shown that the volume of intra-regional trade remains limited compared to trade with the rest of the world, and that the level of intra-industry integration varies significantly among the member states, influenced by several structural and institutional factors.

The key findings of the research are:

- Weak trade integration, as the low percentage of intra-regional trade indicates that the Agadir Agreement has not yet led to significant trade integration among the member countries.
- Variation in the level of intra-industry integration, as the level of intra-industry trade differs among the member countries and is affected by factors such as sectoral specialization and the level of economic development.
- Fluctuations and lack of stability, as fluctuations in the inter-industry and intra-industry trade indicators indicate that the trade patterns among the agreement countries remain unstable and are influenced by changes in policies and external factors.

Based on these findings, the research presents the following recommendations:

- Work on coordinating the industrial and trade policies of the member countries to achieve greater integration and avoid conflicts in goals and strategies.
- Efforts should be made to remove non-tariff barriers that hinder the flow of goods and services between the member countries, such as technical restrictions and complicated administrative procedures.
- Direct investments towards sectors with high integration potential, such as manufacturing industries and technology.
- Enhance cooperation in research and development and technology transfer: cooperation in these fields will help develop more competitive industrial sectors and promote innovation.
- Reconsider origin rules to facilitate intra-industry trade and encourage the creation of regional value chains.

Finally, the research emphasizes that achieving sustainable industrial integration among the Agadir Agreement countries requires strong political will and joint efforts from all member countries to face the challenges and capitalize on the available opportunities.

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