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Algeria-Italy Trade Patterns: Empirical Evidence (2005-2024)

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Abstract:

This paper examines the evolution and structure of trade relations between Algeria and Italy over the period 2005-2024 using four key indicators: Export Similarity Index (ESI), Trade Complementarity Index (TCI), Revealed Comparative Advantage (RCA), and Bilateral RCA (BRCA). The results reveal very low export similarity, confirming limited competition and strong structural differences between the two economies. While Italy exhibits a diversified export structure with broad industrial competitiveness, Algeria remains concentrated in hydrocarbons, with gradual diversification. The analysis highlights asymmetric complementarity: Italian exports strongly match Algerian import demand, whereas Algerian exports show-limited alignment with Italy's needs. BRCA findings confirm energy and fertilizers as core bilateral trade pillars, alongside significant untapped potential in other sectors. Overall, the relationship is characterized by complementarity and imbalance but with a strong potential for diversification, deeper industrial cooperation, and enhanced value-chain integration.

Keywords: Algeria; Italy; Trade; RCA; Potential.
Jel Classification Codes: F14, O13, O57

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1. INTRODUCTION

Bilateral economic relations between Algeria and Italy represent a key partnership in the central Mediterranean, shaped by geographical proximity, historical ties, and sustained cooperation. Over time, this relationship has evolved into a multidimensional framework encompassing trade, energy, industry, infrastructure, and investment flows (IMF, 2023) (World Bank, 2022).

Although natural gas remains central, reducing the relationship to hydrocarbons overlooks broader industrial interconnections. Italy has a diversified and technologically advanced manufacturing base integrated into global value chains, while Algeria combines natural resource endowments with efforts toward economic diversification. This has fostered industrial cooperation, with Italian firms contributing to infrastructure, engineering, and machinery, and Algeria supplying energy and intermediate inputs.

These interactions reflect functional interdependence within regional value chains (Krugman, 1981), where Algeria provides primary inputs and Italy supplies manufactured goods. From a theoretical perspective, this aligns with comparative advantage (Ricardo, 2004), while modern trade theory highlights the role of product differentiation and scale economies (Krugman, 1981). However, Algeria's exports remain concentrated in hydrocarbons, whereas Italy maintains diversified industrial competitiveness.

To assess whether these structures are competitive or complementary, this study employs key trade indicators, including the Export Similarity Index (ESI), Trade Complementarity Index (TCI), Revealed Comparative Advantage (RCA), and Bilateral RCA (BRCA) (Balassa, 1965) (Drysdale, 1969) (Finger & Kreinin, 1979).

Despite the importance of this partnership, existing literature largely focuses on EU-level relations or energy diplomacy, leaving limited analysis of bilateral trade structures. This paper addresses this gap by examining Algeria-Italy trade patterns over 2005-2024, with four objectives: analyzing

trade evolution, assessing structural convergence or divergence, evaluating export–import alignment, and identifying sectoral comparative advantages.

The paper contributes to the literature on trade dynamics and Mediterranean integration, offering policy insights on diversification, industrial cooperation, and value-chain integration. The remainder of the paper is organized as follows: Section 2 reviews historical relations, Section 3 presents methodology and Section 4 discusses results.

2. Historical Economic Relations between Algeria and Italy:

Economic relations between Algeria and Italy have developed gradually over several decades and are largely shaped by geographical proximity, Mediterranean connectivity, and complementary economic structures. Both countries occupy strategic positions in the Mediterranean basin, which has historically facilitated trade, investment, and economic cooperation. Over time, their bilateral relations evolved from relatively limited commercial exchanges to a strategic partnership centered primarily on energy cooperation and industrial trade (Guemoula & Bencheikh, 2024) (Özgür, 2025).

Following Algeria's independence in 1962, the country sought to establish economic partnerships with European economies in order to rebuild its productive capacity and support industrialization. During the 1960s and 1970s, Algeria adopted a state-led development strategy emphasizing heavy industry, infrastructure development, and national control over natural resources (Entelis, 2016) (Amani & Laridji, 2018).

Within this context, Italy emerged as an important economic partner due to its geographic proximity and long-standing Mediterranean trade connections. Italian firms participated in several infrastructure and industrial projects in Algeria, particularly in construction, engineering, and mechanical industries. These early collaborations helped establish the foundations for stronger economic relations between the two countries in subsequent decades (Entelis, 2016)

Energy cooperation became central from the 1970s, driven by Algeria's hydrocarbon expansion and Italy is growing energy demand. This led to long-term collaboration between Sonatrach and Eni, notably through

the Trans-Mediterranean gas pipeline (TransMed), operational since the early 1980s, which strengthened bilateral energy trade (Aissaoui, 2001).

Beginning in the 1990s and accelerating in the 2000s, bilateral economic relations expanded beyond energy cooperation. Economic reforms in Algeria and increasing integration into global markets contributed to greater trade flows and foreign investment (Amrani, 2021). Italy gradually became one of Algeria's leading European trading partners.

Italian exports to Algeria mainly consist of industrial products, including machinery, mechanical equipment, vehicles, and chemical products. These exports reflect Italy is strong manufacturing specialization and its role as a major industrial economy within Europe (World Bank, 2023). At the same time, Italian firms strengthened their presence in Algeria in sectors such as energy services, infrastructure development, and construction. Bilateral agreements and economic cooperation frameworks further supported the expansion of trade and investment relations between the two countries (Saidi & Saidi, 2025).

During the 2000s and 2010s, Algeria - Italy economic relations intensified further, particularly in the energy sector. Algeria remained a key supplier of natural gas to Italy, contributing significantly to Italy's energy security strategy. More recently, geopolitical developments and shifts in global energy markets have reinforced the strategic importance of this partnership. Italy has sought to diversify its energy supply sources, which has increased the importance of Algerian gas exports within the European energy market (Saidi & Saidi, 2025).

At the same time, both countries have expressed interest in expanding cooperation in new areas such as renewable energy, industrial partnerships as automobile sector, and infrastructure projects. These initiatives reflect a broader effort to strengthen economic relations and promote more diversified bilateral cooperation.

Despite the expansion of cooperation, the structure of trade between Algeria and Italy remains characterized by strong sectoral specialization. Algeria's exports to Italy are largely dominated by hydrocarbons, while Italian exports to Algeria mainly consist of manufactured goods and

industrial equipment. This trade structure may reflect the comparative advantages of both economies but also highlights the challenges associated with Algeria's heavy reliance on hydrocarbon exports. Consequently, economic diversification has become a key policy objective in Algeria's development strategy (Amrani, 2021).

3. Method:

To analyse the evolution of trade relations between Algeria and Italy over the period 2005 - 2024, this study adopts a quantitative approach based on widely used international trade indicators. These indexes allow the identification of patterns of specialization, competitiveness, and complementarity between trading partners.

Trade pattern analysis is commonly conducted using indicators derived from international trade theory and empirical trade literature (Balassa, 1965) (Finger & Kreinin, 1979) (Amani & Kaci, 2022). These indicators provide complementary insights into the structure of bilateral trade between Algeria and Italy by measuring specialization, competitiveness, complementarity, and similarity in export structures.

Trade data used in this analysis are obtained from the United Nations conference on trade and development (UNCTAD) and World Trade Organisation (WTO). The data covers a period from 2005 to 2024 in annual frequency.

3.1. Export Similarity Index (ESI)

The Export Similarity Index (ESI) measures the similarity between the export structures of two countries. It was introduced by Finger and Kreinin (1979). The index is calculated as:

$$ESI_{jk} = \left\{ \sum_{i}^{n} min \left(\frac{X_{jc}^{i}}{X_{jc}}, \frac{X_{kc}^{i}}{X_{kc}} \right) \right\} * 100$$

Xijc denotes exports of product i from country j to the third market c, while Xjc represents the total exports of country j to that market. Similarly, Xikc refers to exports of product i from country k to the third market c, and Xkc indicates the total exports of country k to the same market.

The value of the index ranges from 0 to 100. Higher values indicate stronger export similarity and, consequently, greater competitive pressure between the two countries in the third market (Finger & Kreinin, 1979).

For Algeria and Italy, the ESI is expected to be relatively low because the two countries specialize in very different sectors.

3.2. Trade Complementarity Index (TCI)

The Trade Complementarity Index (TCI) measures how well the export structure of one country matches the import structure of another country (Drysdale, 1969). The concept was originally developed by (Finger & Kreinin, 1979). The index is defined as:

$$TCI_{j/k} = 100\ (1 - \sum_{i}^{n} \frac{|M_{ik} - X_{ij}|}{2})$$

Where Xik represents the share of product k in exports of country i and Mjk represents the share of product k in imports of country j.

The index ranges from 0 to 1. Values closer to 1 indicate strong trade complementarity while values closer to 0 indicate weak complementarity. To note that the index is directional, meaning TCI (Algeria/Italy) doesn't necessarily equal TCI (Italy/Algeria).

In the context of Algeria and Italy, high complementarity is expected because Algeria exports energy resources while Italy imports significant quantities of energy to support its industrial sector.

3.3. Revealed Comparative Advantage (RCA)

Béla Balassa introduced the concept of Revealed Comparative Advantage (RCA) to measure whether a country has a relative advantage in exporting a specific product (Balassa, 1965). The RCA index is defined as:

$$RCA_{ji} = \frac{\frac{X_j^i}{X_j}}{\frac{X_w^i}{X_w}}$$

Where Xij represents the exports of product i by country j, Xit represents the total exports of country j, Xiw represents the world exports of product i and Xw represents the total world exports. An RCA value greater

than 1 indicates that the country has a comparative advantage in that product; while an RCA, value less than 1 suggests a comparative disadvantage.

In the case of Algeria, previous studies indicate strong revealed comparative advantages in hydrocarbons and energy-related products, while Italy should show comparative advantages in machinery, vehicles, and manufactured goods.

3.4. Bilateral Revealed Comparative Advantage (BRCA)

While the RCA index measures global competitiveness, the Bilateral Revealed Comparative Advantage (BRCA) focuses on specialization between two specific countries. The BRCA index can be expressed as:

$$BRCA_{ji} = \frac{\frac{X_j^i}{X_j}}{\frac{M_j^i}{M_j}}$$

Where Xij represents the exports of country j to country i, Xj represents the total exports of country j, Mij represents the imports of country j from country i and Mj represents the total imports of country j.

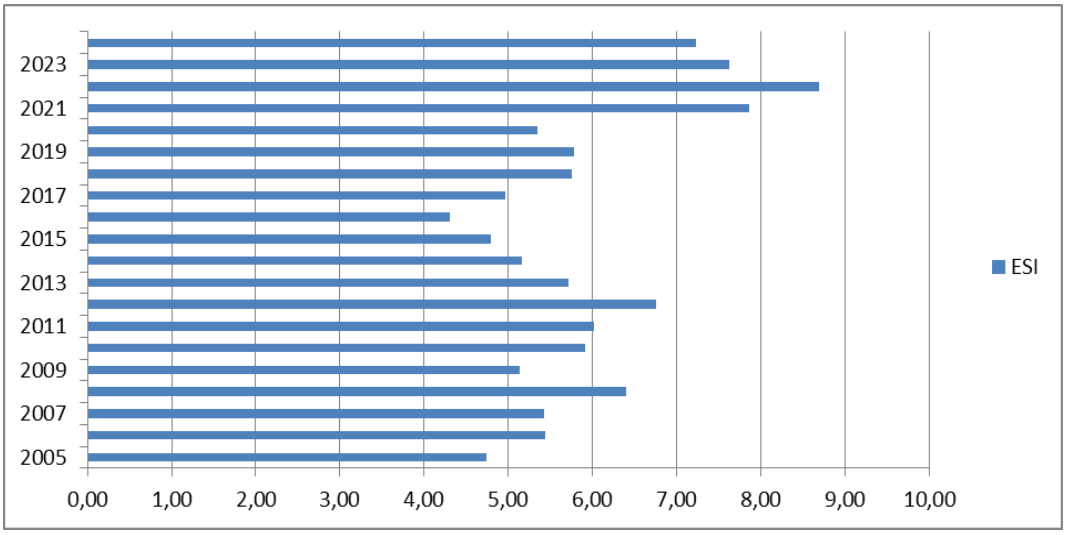
A BRCA greater than 1 indicates that country i has a competitive advantage in exporting the product to country j. This indicator is particularly useful in evaluating whether Algeria's export structure matches Italian import demand and whether Italy holds bilateral advantages in specific industrial sectors within the Algerian market.

4. Results and Discussion:

4.1. Exports Similarity:

The results presented in Figure 1 show that export similarity between Algeria and Italy remains very low over the period 2005 - 2024. The index fluctuates between 4.31 and 8.70, values that remain very close to the lower bound of the index. Such levels indicate a very limited overlap in the export baskets of the two countries, suggesting that Algeria and Italy rarely compete in the same product categories in international markets.

Fig.1. Algeria-Italia Export Similarity Index (2005-2024)



Source : Realised by the author

The persistently low values of the index largely reflect the structural differences in the productive and export structures of the two economies. Algeria's exports are heavily concentrated in hydrocarbon products, particularly crude oil and natural gas, while Italy's export basket is dominated by manufactured goods, machinery, transport equipment, and industrial products (Vrontis, Tardivo, Bresciani, & Viassone, 2018) (Saidi & Saidi, 2025).

This pattern is consistent with the literature on international specialization, which suggests that countries with distinct factor endowments and levels of industrial development tend to export very different types of goods, thereby reducing the degree of export similarity (Krugman ,1980) (Helpman & Krugman, 1985). Consequently, Algeria and Italy occupy largely differentiated positions in the global trading system, limiting the potential for direct export competition.

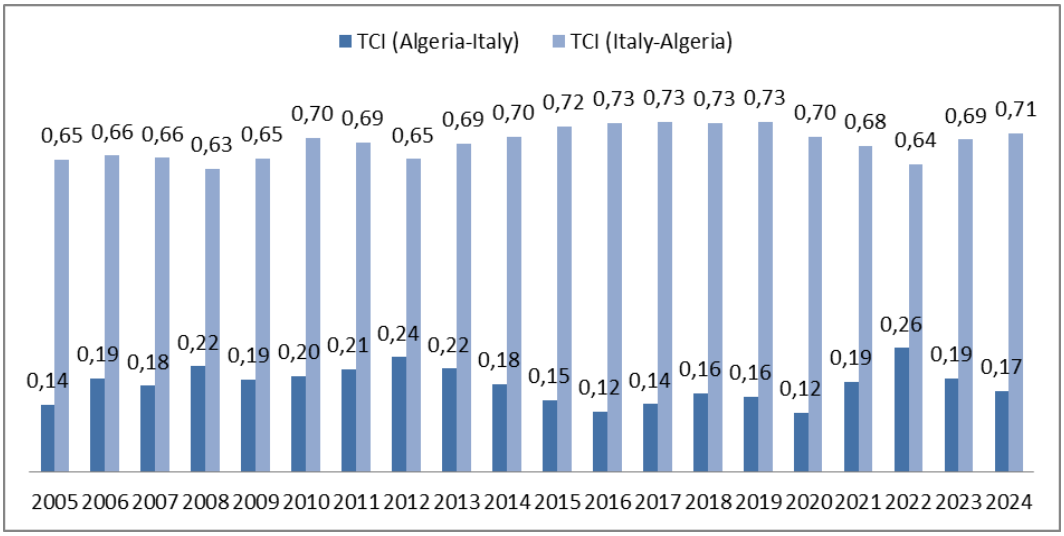
These findings provide an important starting point for the analysis of bilateral trade patterns. While the Export Similarity Index focuses on the degree of competition between the two countries' exports, it does not indicate whether their trade structures may be mutually compatible. To further investigate this dimension, the next subsection examines the Trade

Complementarity Index (TCI), which evaluates the extent to which the export structure of one country corresponds to the import demand of the other. This will help determine whether the low export similarity observed here translates into stronger trade complementarity between Algeria and Italy.

4.2. Trade Complementarity:

The Trade Complementarity Index (TCI), as seen before, measures how well the export structure of one country corresponds to the import structure of its partner. Calculation results are shown in the Figure 2 below:

Fig.2. Algeria-Italia Trade Complementarity Index (2005-2024)



Source: Realised by the author

The results presented in Figure 2 reveal a clear asymmetry in trade complementarity between Algeria and Italy over the period 2005 - 2024. The TCI calculated for Algerian exports to Italy remains relatively low throughout the period, fluctuating between 0.12 and 0.26. In contrast, the TCI for Italian exports to Algeria remains consistently high, ranging between 0.63 and 0.73.

The low values of TCI (Algeria → Italy), through the studied period, indicate that the structure of Algerian exports corresponds only weakly with the import demand of the Italian economy, suggesting limited structural complementarity. This pattern may reflect a high concentration of Algerian

exports, especially in hydrocarbon products, while Italy's imports are largely diversified, including manufactured goods, intermediate inputs, and industrial equipment. Thus, the overlap between Algerian exports and Italian import demand remains limited. The literature emphasizes that countries whose exports are heavily concentrated in natural resources often exhibit low trade complementarity with diversified industrial economies (Sachs & Warner, 2001).

In contrast, the results show that TCI (Italy → Algeria) remains consistently high during the entire period. These results indicate a strong compatibility between the structure of Italian exports and Algeria's import demand. This strong complementarity can be explained by the composition of Algeria's imports, which consist largely of machinery, industrial equipment, transport equipment, and manufactured consumer goods. These categories correspond closely to the core part of the Italian exports. As a result, Italian exports naturally align with Algeria's import needs. According to the theoretical literature on international trade, industrialized countries tend to specialize in the export of manufactured goods and technology-intensive products, while resource-rich economies rely on imports of these products to support domestic production and consumption (Krugman P. , 1980) (Helpman & Krugman, 1985).

Overall, the results highlight a structural asymmetry in the bilateral trade relationship between Algeria and Italy. From a policy perspective, these findings suggest that export diversification and the development of higher value-added sectors would be essential for Algeria to improve the compatibility of its export structure with the import demand of industrialized partners such as Italy.

4.3 Comparative Advantage:

The Revealed Comparative Advantage (RCA) index provides insight into the sectors in which a country is relatively more competitive in international trade.

The results for Algeria indicate a limited number of sectors with a revealed comparative advantage throughout the period 2005 - 2024, although, this number is going up through the time attesting the

diversification policy results (Amrani, 2021) (World Bank, 2023) (Guemoula & Bencheikh, 2024). At the beginning of the period (2005 - 2013), Algeria's export competitiveness was extremely concentrated, with only 1 to 2 product categories (out of 97) showing a comparative advantage mainly in energy-related commodities. Starting from 2014, a gradual improvement can be observed. The number of sectors with an RCA > 1 increased from 2 in 2013 to 6 in 2015, indicating a slight diversification of Algeria's export competitiveness and remained stable until 2024, with a maximum of 7 products in 2023, suggesting a modest but persistent improvement in Algeria's export structure.

In contrast, Italy demonstrates a more diversified export competitiveness structure. Throughout the period, the number of sectors with an RCA > 1 fluctuates between 46 and 54 out of the 97 product categories, indicating that Italy maintains comparative advantages in approximately half of all product groups. At the beginning of the period (2005 - 2010), Italy exhibited an RCA superior to 1 in around 49 to 51 sectors, showing a relatively balanced distribution between sectors with comparative advantage and disadvantage. This reflects the diversified nature of Italy's industrial and manufacturing base (Fortis, Corradini, & Carminati, 2015). Overall, the RCA results highlight Italy's strong export diversification, with a large number of sectors maintaining international competitiveness over time.

Comparing the two countries reveals a significant structural difference in export competitiveness. While Algeria exhibits comparative advantage in a small number of sectors, Italy demonstrates competitiveness across a wide range of industries. This contrast reflects the different economic structures of the two countries. Algeria's exports is largely concentrated in a set of primary commodities, with a certain improvement in the last years, whereas Italy's export structure is characterized by diversified industrial production, allowing it to maintain comparative advantages across numerous product categories.

Table 1. Best products in terms of RCA for Algeria (Mean of last 5 years)

Product	Algeria	Italy
Fertilizers	8,07	0,26
Mineral fuels, mineral oils and products of their distillation; bituminous substances	7,32	0,24
Salt, sulphur, earths and stone, plastering materials, lime and cement	4,90	0,71
Cork and articles of cork	2,80	0,95
Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	2,53	0,44
Sugars and sugar confectionery	2,15	0,33
Pig iron, iron and steel	0,70	1,24
Lead and articles of lead	0,63	0,49
Edible fruits; peel of citrus fruits or melons	0,52	1,06
Hides and skins (other than furskins) and leather	0,30	7,06

Source: Realised by the author

Table 1 shows that Algeria has very high RCA values in several resource-based and intermediate goods sectors, while Italy records low RCA values in the same products. This indicates strong opportunities for Algeria to expand exports toward Italy. This sectors include Fertilizers (RCA Algeria = 8.07 vs Italy = 0.26), Mineral fuels and petroleum products (7.32 vs 0.24), Salt, sulphur, earths and stone (4.90 vs 0.71), Cork and articles of cork (2,80 vs 0,95) Inorganic chemicals (2.53 vs 0.44) and Sugars and sugar confectionery (2.15 vs 0.33). These sectors reflect Algeria's specialization in natural resources and basic industrial inputs, while Italy lacks competitiveness in these areas.

The energy sector, in particular, represents the most strategic opportunity. Italy's low RCA combined with high demand makes it a natural destination for Algerian hydrocarbons, reinforcing an already established trade relationship. Additionally, fertilizers and chemicals present important opportunities for expanding trade, especially considering their role in agriculture and industrial production within Italy.

Table 2. Best products in terms of RCA for Italy (Mean of last 5 years)

Product	Italy	Algeria
Hides and skins (other than furskins) and leather	7,06	0,30
Wool, fine or coarse animal hair; horsehair yarn and woven fabric	6,20	0,14
Silk	5,47	0,01
Articles of leather; saddlery and harness; travel goods, handbags and similar containers	4,60	0,01
Arms and ammunition; parts and accessories thereof	3,23	0,01
Ceramic products	3,18	0,01
Preparations of cereals, flour, starch or milk; pastrycooks' products	3,01	0,06
Footwear, gaiters and the like; parts of such articles	2,95	0,01
Furskins and artificial fur	2,58	0,01
Preparations of vegetables, fruit or other parts of plants	2,38	0,02

Source: Realised by the author

Table 2 highlights sectors where Italy holds very strong comparative advantages, while Algeria shows extremely low RCA values, often close to zero. It includes Leather and hides (7.06 vs 0.30), Wool and animal hair (6.20 vs 0.14), Silk (5.47 vs 0.01), Articles of leather and travel goods (4.60 vs 0.01), Ceramic products (3.18 vs 0.01), Prepared food products (3.01 vs 0.06) and Footwear (2.95 vs 0.01). These sectors are mainly manufactured goods and high value-added products, reflecting Italy's specialization in design-intensive and processing

Algeria's very low RCA in these sectors indicates a strong dependence on imports, creating significant opportunities for Italy to expand its exports. In particular, Textiles, leather, and fashion-related industries reflect Italy's global competitiveness while processed food products match Algeria's growing domestic demand and ceramics and manufactured goods align with Algeria's infrastructure and consumption needs.

Although, some sectors show less extreme differences in RCA, suggesting opportunities not only for trade but also for joint production and industrial cooperation. It includes Pig iron, iron and steel (Algeria: 0.70 vs Italy: 1.24) and Edible fruits (Algeria: 0.52 vs Italy: 1.06) for example.

These sectors may offer potential for co-investment and joint ventures, technology transfer and regional value chain integration particularly in the context of Mediterranean value chains (De Wulf & Maliszewska, 2009). For instance, in steel and metals, Italy could provide technology while Algeria supplies inputs or in agriculture and agro-processing, both countries could develop complementary value chains.

The overall comparison clearly reveals a high degree of complementarity between the two economies. Algeria specializes in natural resources, energy products and basic industrial goods while Italy specializes in manufactured goods, consumer products and high value-added industries. This structure supports a mutually beneficial trade relationship, where Algeria provides inputs for Italian industry while Italy supplies finished and high-quality goods to Algeria.

To fully exploit these opportunities, both countries could strengthen trade agreements and logistics infrastructure promote industrial partnerships and joint ventures, encourage technology transfer and diversification strategies, particularly in Algeria. Ultimately, the results suggest that deeper economic cooperation could lead to a more balanced, diversified, and sustainable bilateral trade relationship.

These results provide an important foundation for the next step of the analysis. While the RCA index identifies sectors where each country holds a comparative advantage, it does not indicate whether these competitive sectors correspond to the partner country’s import needs. Therefore, we will examine the Bilateral Revealed Comparative Advantage (BRCA) index in order to assess the extent to which the comparative advantages of Algeria and Italy translate into mutually beneficial trade complementarities.

Table 3. Best products in terms of BRCA for Algeria (Mean of last 5 years)

Product	Algeria	Italy
Mineral fuels, mineral oils and products of their distillation; bituminous substances	7,72	5,17
Fertilizers	2,42	1,91
Salt, sulphur, earths and stone, plastering materials, lime and cement	0,66	1,58
Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	0,62	0,72
Sugars and sugar confectionery	0,29	0,05
Hides and skins (other than furskins) and leather	0,18	4,84
Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants	0,13	0,12
Cork and articles of cork	0,13	0,13
Ores, slag and ash	0,12	0,01
Pig iron, iron and steel	0,11	1,14

Source: Realised by the author

A key result is the existence of sectors where both Algeria and Italy exhibit BRCA > 1, indicating strong bilateral trade intensity and mutual relevance. First, mineral fuels and petroleum products (Algeria: 7.72 vs Italy: 5.17) that stands out as the most important pillar of bilateral trade. Algeria's very high BRCA confirms its strong specialization in exporting hydrocarbons to Italy, while Italy's relatively high BRCA reflects its active participation in this trade flow, likely through refining, distribution, or re-export activities. Same for Fertilizers (Algeria: 2.42 vs Italy: 1.91) where both countries also show BRCA > 1, suggesting a shared bilateral relevance. Algeria's natural resource base (natural gas inputs for fertilizers) complements Italy's agricultural demand and industrial processing.

These sectors represent established and scalable trade relationships, where further integration could be achieved through investment and industrial cooperation. They present opportunities for expanding trade volumes, developing joint agro-industrial value chains.

In the other hand, some sectors appear among Algeria's best BRCA products, inferior to 1, but still show stronger Italian competitiveness, indicating asymmetric but potentially expandable trade. It stands for Salt, sulphur, earths and stone (Algeria: 0.66 vs Italy: 1.58) and Pig iron, iron and steel (Algeria: 0.11 vs Italy: 1.14). However, their presence in Algeria's

top list suggests emerging or potential competitiveness that could be enhanced throught technology transfer from Italy to Algeria, industrial partnerships to develop local capacity and future export diversification for Algeria. The literature emphasizes that such asymmetries can foster industrial development through learning and foreign investment (Hausmann et al., 2007).

Finally, some sectors where Algeria had strong RCA do not translate into strong BRCA, indicating a mismatch with Italian demand. We can cite inorganic chemicals (Algeria: 0.62 vs Italy: 0.72) or sugars and sugar confectionery (Algeria: 0.29 vs Italy: 0.05). Despite Algeria's global comparative advantage, these sectors show BRCA < 1, meaning they are not well integrated into bilateral trade with Italy. This can be due to Italy importing these products from other partners or Algerian exports, in this products, not meeting quality, standards, or logistics requirements sought by Italy. Although, this could be an opportunity for Algeria to enhance trade through improving product standards and market access or targeting niche segments within the Italian market.

Table 4. Best products in terms of BRCA for Italy (Mean of last 5 years)

Product	Italy	Algeria
Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious metal	6,87	0,01
Mineral fuels, mineral oils and products of their distillation; bituminous substances	5,17	7,72
Ships, boats and floating structures	4,86	0,01
Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	4,85	0,01
Hides and skins (other than furskins) and leather	4,84	0,18
Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables; articles thereof	3,42	0,01
Arms and ammunition; parts and accessories thereof	3,19	0,02
Copper and articles thereof	3,07	0,01
Articles of stone, plaster, cement, asbestos, mica or similar materials	2,54	0,01
Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter	2,44	0,01

Source: Realised by the author

Table 4 highlights sectors where Italy shows very strong BRCA, while Algeria has almost no competitiveness (BRCA $\approx$ 0), outside of mineral fuel discussed in last section. These sectors include precious stones and metals (6.87 vs 0.01), ships and boats (4.86 vs 0.01), live plants and floriculture (4.85 vs 0.01), leather (4.84 vs 0.18), textile intermediates (3.42 vs 0.01), copper products (3.07 vs 0.01), construction materials (2.54 vs 0.01). These sectors reflect Italy's diversified industrial and manufacturing base and reflect strong opportunities for Italian exports to Algeria, meeting Algeria's domestic demand in industrial and consumer goods and supporting Algeria's infrastructure and industrial development. Empirical studies on Italy's trade structure emphasize its strong position in medium-technology manufacturing and design-intensive industries (Fortis & Corradini, 2017).

To note that some sectors show low BRCA values for both countries, indicating weak bilateral trade links. It includes for example oil seeds, agricultural raw materials, cork, and cork products. These sectors are currently underexploited and could represent future diversification opportunities, especially if supported by trade facilitation policies and investment in processing industries.

The BRCA comparison confirms three major structural features. First, a strong dependence on energy trade where hydrocarbons dominate bilateral exchanges creating stability but also concentration risk. Second an asymmetry in industrial capabilities where Italy focus on diversified, high-value exports and Algeria concentrate in resource-based sectors. Third and most importantly the existence of an untapped diversification potential as several Algerian sectors show latent competitiveness (RCA > 1 but BRCA < 1) where Italy could play a role in unlocking this potential through investment and cooperation, as it is being done in automobile sector for example.

The BRCA analysis highlights that bilateral trade between Algeria and Italy is both complementary and unevenly distributed. It showed established strengths for Algeria in energy and fertilizers while Italy dominate the manufactured and high-value sectors. The analysis also shown Algerian

potential for some underexploited sectors needing better integration into Italian demand. To enhance bilateral trade, both countries could promote sector-specific partnerships (energy, chemicals, and metallurgy) and encourage joint ventures and technology transfer but also support export diversification strategies in Algeria. Overall, the results suggest that while trade relations are already strong in key sectors, there remains significant room for expansion and diversification, particularly by aligning Algeria's export structure more closely with Italy's import needs.

5. CONCLUSION

This study examined the structural evolution of trade relations between Algeria and Italy over the period 2005–2024 using four key indicators: Export Similarity Index (ESI), Trade Complementarity Index (TCI), Revealed Comparative Advantage (RCA), and Bilateral RCA (BRCA). The results provide a multidimensional understanding of this strategic Mediterranean partnership.

The findings confirm low export similarity and strong structural differentiation between the two economies. Algeria and Italy operate in largely distinct export domains, reflecting differences in industrialization and factor endowments, which limits direct competition and reinforces functional specialization. At the same time, a clear asymmetry in trade complementarity emerges: Italian exports strongly align with Algerian import demand; whereas Algerian exports show, limited compatibility with Italy has diversified import structure.

RCA results further highlight this divergence, with Algeria's comparative advantages concentrated in hydrocarbons and a few resource-based sectors, while Italy maintains diversified competitiveness across manufacturing industries. The BRCA analysis confirms energy and fertilizers as core pillars of Algeria's exports to Italy, while Italy dominates industrial and high-value-added exports to Algeria. It also reveals untapped potential in sectors where Algeria holds global advantages but lacks strong bilateral integration.

Overall, Algeria–Italy trade is characterized by complementarity combined with structural imbalance. While mutually beneficial, the

relationship remains concentrated and asymmetric, raising challenges for long-term resilience in the context of energy transition.

From a policy perspective, Algeria should prioritize export diversification, value-added production, and better integration into global value chains. Improving standards, logistics, and market access is essential. For Italy, opportunities lie in strengthening industrial cooperation, investment, and technology transfer.

In conclusion, although the partnership is strong, significant potential remains underexploited. Deepening industrial integration and diversifying trade structures will be key to building a more balanced and sustainable economic relationship..

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