AN ANALYSIS OF MARKET DIVERSIFICATION STRATEGY AND COMMERCIAL COMPETITIVENESS IN THE COCOA BEAN EXPORTING COMPANIES

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Abstract

The research aimed to analyze the competitiveness and diversification of Peru's cocoa bean exports. The main issue revolves around the need to avoid market concentration, which could lead to price dependency, and the importance of maintaining high competitiveness to ensure the continuity and leadership of exports. To this end, two key indicators were used: 1) the Herfindahl-Hirschman index (HHI), widely used in various studies, and 2) the revealed comparative advantage (RCA) indicator to evaluate competitiveness. The findings indicate that Peru maintains a competitive position in markets such as Malaysia, Indonesia, and Mexico, albeit with some variability. Additionally, it is noted that the Netherlands, Germany, Malaysia, and the United States (US) are the main importers of cocoa, with fluctuations in their import volumes. The research concludes that although Peru has achieved a comparative advantage in several markets, it is crucial to focus on improving production quality and efficiency, as well as diversifying markets to mitigate risks associated with price volatility. The relevance of the article lies in its contribution to understanding market dynamics and formulating strategies that enhance the competitiveness and diversification of Peru's cocoa sector, ensuring its economic and social sustainability.

Keywords: International Business, Globalization, Developing Countries, Cacao, Competitiveness, Market Diversification

Authors' individual contribution: Conceptualization — J.C.M.N.; Methodology — J.C.M.N., D.A.L.J., I.B.P.G., and M.d.l.A.G.V.; Investigation — J.C.M.N., D.A.L.J., L.E.C.S., M.T.F.L., and M.d.l.A.G.V.; Writing — J.C.M.N., J.E.B.S., and I.B.P.G.; Supervision — J.C.M.N., R.M.A., and M.d.l.A.G.V.; Project Administration — J.C.M.N. and M.d.l.A.G.V.

Declaration of conflicting interests: The Authors declare that there is no conflict of interest.

1. INTRODUCTION

Peru is positioned as one of the main producers of cocoa beans, distinguished by quality, evidenced by its participation in demanding markets and international awards highlighting its excellence. Recently, not only the bean itself has been valued but also its by-products (Sánchez et al., 2023). A significant milestone for Peruvian cocoa and chocolate was during the International Chocolate Awards 2020–2021, where Peru stood out for its quality and flavor. In this competition, Cacaosuyo won the gold medal in the Dark Origin category with its Cuzco 80 chocolate, also receiving accolades such as the overall winner (champion of champions) and awards in categories like best chocolatier, direct trade, and emerging country. Other Peruvian companies like Maraná and Tesoro Amazónico also received accolades in various categories, demonstrating the excellence and competitiveness of Peruvian cocoa on the global stage[1]. This recognition reflects not only the country's natural wealth but also the effort and dedication of Peruvian producers who seek a distinct aroma, an aroma that constantly changes according to the chocolate process (Quelal et al., 2023). In this context, diversification and competitiveness emerge as central axes to amplify Peru's export potential, opening new routes for economic development through the agricultural sector.

Global cocoa bean production has experienced significant fluctuations over the years, reflecting the complexity of its supply chain, especially as new products are being developed from it (Soares et al., 2023). Historically, West Africa has dominated the cocoa production landscape, with Ivory Coast and Ghana together contributing approximately 60% of the world's supply[2]. This predominance is due to favorable climatic conditions and a highly specialized production structure, in addition to technological advances that preserve the inherent properties of cocoa (Putra et al., 2023). Exports are concentrated in producing countries, with West Africa, and to a lesser extent Latin America and Asia, leading. The European Union (EU) and the United States (US) are the main cocoa importers, highlighting their high consumption (Hapsari & Yuniasih, 2020).

Therefore, the study establishes a reference framework for public policies, business strategies, and collective actions aimed at optimizing Peru's export potential. Additionally, the literature highlights a knowledge gap regarding important indicators of competitiveness and diversification in products like cocoa, particularly applied to Peru, where analysis is mostly focused on products like blueberries, asparagus, and coffee, among others.

Regarding the problematic reality, one of the main economic challenges in the cocoa industry is the volatility of international prices as it directly impacts the economic stability of producers, many of whom are small farmers relying on cocoa as their main source of income. Research shows how climate change affects the geographical distribution of pests and diseases in cocoa-growing areas (Cilas & Bastide, 2020), while other studies emphasize the importance of sustainable agricultural practices and land management to prevent deforestation and increase resilience to climate change. Cocoa producers need to adapt to these new conditions, which requires investments in research, the development of resistant varieties, sustainable agricultural practices, and grain selection for commercialization (Zhinin-Vera et al., 2023). Socially, cocoa production faces issues of child labor, and despite women playing key roles in this sector, they face barriers limiting their access to resources, training, and economic opportunities (Bulkis et al., 2020). Hence, the research question arises:

RQ: What is the diversification and competitiveness of Peru's cocoa bean exports?

Theoretically, this work contributes to the existing knowledge on economic development, international trade, and sustainability. It delves into indicators explaining market diversification and competitiveness, particularly concerning agricultural exports, and offers the opportunity to test theories on competitive and comparative advantages in real situations. Methodologically, the research introduces a novel approach by combining qualitative analysis of unexploited indicators in this sector. This method allows a dynamic understanding of the export market, establishing a model that could guide future research in the agricultural field and beyond.

The research objective was to determine the diversification and competitiveness of Peru's cocoa bean exports. To achieve this objective, the following specific goals were set: Describe the international demand for cocoa beans, complement this with a description of Peru's cocoa exports, and then calculate the Herfindahl-Hirschman Index (HHI) of export destinations, companies, and exporting regions. Finally, calculate the normalized revealed comparative advantage (RCA) of the main destination countries for Peru's cocoa.

The article is structured as follows. Section 2 analyzes previous studies on cocoa production and export, highlighting Ivory Coast, Ghana, and Ecuador as major global producers, as well as market diversification and competitive challenges, the importance of sustainable agricultural practices, and cocoa quality. Section 3 describes the quantitative methodology used, including documentary review and export data analysis. Section 4 presents the study's findings, such as the dynamics of the global cocoa import market, and analysis of the HHI and Peru's RCA in various markets. Section 5 interprets the results, highlighting Peru's competitive position in key markets and the need for strategies to improve production quality and efficiency. Section 6 summarizes the main findings and offers strategic recommendations to diversify markets and strengthen the competitiveness of Peruvian cocoa.

2. LITERATURE REVIEW

In recent years, cocoa production and export have been the subject of various studies. Ivory Coast stands out as the world's largest producer and exporter of cocoa beans, accounting for approximately 40% of global production (Gyan & Bajan, 2023, p. 375). Ghana is the second largest cocoa producer after Ivory Coast, with its economy also highly concentrated on cocoa exports, making it susceptible to the same vulnerabilities as Ivory Coast (Essah et al., 2023). Competitively, although Ghana is renowned for the quality of its cocoa, the country faces challenges in maintaining its market share against emerging producers. Ecuador, on the other

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[1] https://shorturl.at/xHPsr
[2] https://www.fao.org/faostat/en/#data/QCL

hand, excels in the cocoa market with its production of fine and aromatic cocoa, considered among the best in the world (Comité Europeo para la Formación y la Agricultura [CEFA], 2024). Despite Ecuador's success in diversifying its export markets due to the reputation of its fine and aromatic cocoa, the challenge lies in expanding its presence in less traditional markets and increasing the proportion of processed cocoa for export while dealing with non-tariff restrictions (Vázquez-deCastro et al., 2024). Competition with African countries, which dominate the market in terms of volume, and with other fine cocoa producers such as Peru, remains intense, despite Ecuador having outstanding production zones (Salazar et al., 2023).

In Peru, market diversification is a critical aspect of the cocoa industry, given its capacity to reduce vulnerability to international price fluctuations and changing consumer demands. Currently, Peruvian cocoa is mainly exported to Europe and the US, markets that, while highly lucrative, are also very competitive and subject to strict quality and sustainability regulations (Muro Montalvo & Tineo Porras, 2023). The challenge for Peru lies in expanding its presence in emerging and growth-potential markets, such as Asia and the Middle East, where the demand for high-quality cocoa products with distinctive characteristics is increasing (Alcalá Raymundo et al., 2022). Exploring these new markets requires marketing strategies adapted to cultural and consumption preferences, as well as investment in promoting the Peru brand as synonymous with the highest quality fine and aromatic cocoa. Another dimension of the diversification challenge is expanding the base of exportable products. Currently, most Peruvian cocoa exports are concentrated in the raw bean itself, with relatively low added value.

Peru has positioned itself as a significant player in the global cocoa market (Guardia Escalante et al., 2023), particularly in the organic and high-quality cocoa segment. Economic indicators show that, in recent years, the country has experienced sustained growth in cocoa bean exports, attributable to the growing international demand for fine chocolate and cocoa products (Azabache Morán, 2022). From a statistical perspective, Peruvian cocoa bean exports have registered notable increases. The country exported approximately 58,000 tons of cocoa in 2022, representing a significant increase compared to figures from the past decade (Pantoja Montalvo & Uceda Cobba, 2023). This growth is reflected in the value of exports, which exceeded 300 million US dollars, marking a milestone in the commercial history of Peruvian cocoa, especially in key markets such as the US (Muro Montalvo & Tineo Porras, 2023).

In terms of destination markets, Europe and North America constitute the main recipients of Peruvian cocoa, with countries such as Belgium, Germany, the US, and Canada standing out (Cotrina & Joaquin, 2023; Rosillo Lozano, 2023). These markets highly value Peruvian cocoa for its superior quality and unique organoleptic characteristics, which translates into a willingness to pay premium prices for the product. Additionally, Peruvian cocoa benefits from international certifications such as fair trade and organic, which reinforce its position in specific market segments focused on sustainability and fair trade (Alcalá Raymundo et al., 2022).

Calmon da Conceição et al. (2020) analyzed the competitiveness of Brazilian cocoa agriculture, highlighting a shift from Brazil being an exporter to an importer due to a decline in production and productivity. On the other hand, Trisanti Saragih et al. (2021) examined the effects of the export duty policy on the competitiveness and exports of Indonesian cocoa products, ob-serving a long-term effect on the competitiveness and exports of cocoa paste and powder. Additionally, Werdiyasa (2021) discussed the expansion of fermented cocoa products from Jembrana to the Japanese market, highlighting Indonesia's strategic position as the third-largest cocoa exporter worldwide. Novirani et al. (2022) proposed a simulation model to optimize the distribution and transportation of cocoa in Central Java, Indonesia, addressing challenges in cocoa bean transport management. Furthermore, Abdul-Karim and Damba (2024) demonstrated that cocoa beans have a positive impact on long-term economic growth, supporting the theory that growth is driven by exports. Conversely, Nisa et al. (2023). In Indonesia, a study was conducted on cocoa beans in the international trade. It concluded that the export value is affected by production, export volume, economic distance, the population of exporting countries, the harvested area, and the exchange rate.

Competitiveness, measured through the RCA indicator, is conceptualized as a country's ability to achieve a sustainable and growing share in international markets, specifically in the realm of car exports (Saki et al., 2019). This indicator is calculated as the proportion of a specific good's exports from a country relative to its total exports, compared to the proportion of global exports of that same good relative to total world exports. A higher RCA value suggests that the country has a comparative advantage in that sector, indicating that it specialises in the production and export of that product or service and is therefore internationally competitive in that area (Ganai et al., 2024). The RCA not only facilitates the identification of sectors with export potential but also contributes to the formulation of trade policy strategies by promoting the optimal allocation of resources in sectors where the country has an RCA. This methodology, therefore, provides an analytical framework for assessing and guiding the evolution of a country's international competitiveness, aimed at maximizing its export performance as the literature mentions concerning agro-exported products.

Diversification refers to the expansion and variation of the products and services a country exports (Mora & Olabisi, 2023). This strategy seeks to decrease dependence on limited economic sectors and mitigate the risks arising from global market volatility. The measurement of this process is carried out through the HHI, which evaluates the concentration or dispersion of exports across various sectors or markets. A low HHI value in this index indicates broad diversification, meaning that exports are distributed among multiple products or services, minimizing vulnerability to changes in sector demand or prices. Conversely, a high HHI value denotes a strong concentration in a few export lines, reflecting less diversification and, consequently, greater susceptibility to external risks (Zarach & Parteka, 2023).

3. RESEARCH METHODOLOGY

The methodology aligns with a quantitative approach due to the nature of the data and their treatment for descriptive purposes. The analysis addresses the free-on-board (FOB) export value over the analyzed period, starting in 2019 and ending in 2023. The data description allows for a comprehensive evaluation, identifying various patterns over time as well as the variability or persistence of the indicators. The data were not manipulated but presented as provided by the source (Arbulú et al., 2024), with only the unit of presentation modified to enhance visual appeal.

The recorded population comprised all data on exports of the national subheading 1801.00.19.00 (cocoa beans, whole or broken, raw except for sowing) (Ministerio de Economía y Finanzas del Perú, 2022, p. 49). To collect these data, a documentary review guide was employed, which synthesized the exports year by year according to destination and exporting company. This analysis protocol, previously studied, is crucial for obtaining reliable results.

To ensure a comprehensive analysis, the entirety of the data available from Trademap (https://www.trademap.org) was utilized, allowing for a meticulous and reliable approach to diversification. The HHI was employed to assess this diversification. This indicator measures diversification across various contexts, including markets, companies, products, regions, etc. The HHI is calculated by summing the squares of each item's share (for the study, export markets and exporting companies). The results range from 0 to 10,000, where a value close to 0 indicates high diversification and a value near 10,000 denotes greater concentration. Similarly, when the value reaches 1,800, it is considered moderate diversification. In the study, a low HHI suggests that exports are directed toward a larger number of markets, thereby reducing the concentration on a specific country (Ampuero Gonzalez et al., 2021).

The Balassa index (RCA) is used to analyze how specialized a country is in the production and export of a specific product (Sharma et al., 2023). This index is calculated by comparing the proportion of the export value of a specific commodity from a country to its total exports, and then to the global export proportion of that commodity. An index value between 0.33 and 1 indicates a comparative advantage, suggesting that the country is specialized and competitive in exporting that product. A value between -0.33 and -1 signifies a comparative disadvantage, implying that the country is less competitive in exporting that product compared to others globally. Lastly, a value between -0.33 and 0.33 suggests intra-industry trade, indicating that the country imports and exports similar products, which points to potential integration or complementarity with international markets in that specific sector (Balassa, 1965).

To approach the research from an alternative methodology, mixed methods could be considered to complement the predominant quantitative approach. For instance, a qualitative approach might involve in-depth interviews with cocoa exporters, representatives of trade associations, and industry experts. This method would allow for a deeper understanding of the perceptions, strategies, and challenges faced by cocoa exporters in Peru. Additionally, focus groups with key market actors could provide valuable insights into competitiveness and diversification dynamics, as well as innovative practices within the sector.

4. RESEARCH RESULTS

In Table 1, the highest annual growth was observed in Türkiye for the period 2021–2022, with a 50.72% increase. The largest total growth over the period 2018–2022 was recorded in Malaysia, with an 80.66% increase. The smallest annual decline was also in Türkiye during 2019–2020, with a -0.29% decrease. The smallest total decline was in the Netherlands, with a -4.29% decrease. The highest average annual growth was in Malaysia, at 17.29%, while Türkiye exhibited the highest standard deviation in growth rates, at 39.61%.

Table 1. World demand for cocoa beans (imports in millions of USD)

Country	2018	2019	2020	2021	2022
Netherlands	2283	1814	1939	1541	2185
Malaysia	827	973	1210	1070	1494
Germany	1183	1210	1244	1182	1338
Belgium	720	793	992	865	978
US	931	1027	1303	943	804
Indonesia	585	505	617	547	732
France	415	458	480	457	477
Canada	225	259	330	337	359
Italy	248	302	342	283	320
Türkiye	248	341	340	209	315
Others	1935	2024	2056	1555	1846
World [a]	9599	9707	10853	8989	10849

Note: [a] Includes reporting and non-reporting countries, in addition to estimations obtained by the International Trade Center and the United Nations Statistics Division.

In Table 2, Malaysia experienced a maximum annual growth of 312.5% in 2023 and an average of 91.39%, indicating high demand. The Netherlands peaked at 37.04% in 2021 and averaged 6.80%, showing stable demand. Indonesia grew by 54.55% in 2021 and averaged 5.64%, suggesting a recovery. Mexico stood out with a growth of 100% in 2022 and an annual average of 31.25%, indicating changes in consumption or trade. Malaysia exhibited the greatest variability with a standard deviation of 24.17. The Netherlands and Indonesia had standard deviations of 7.01 and 6.69, respectively, while Mexico had the lowest at 5.76, suggesting more consistent imports.

Table 2. Cocoa beans exports from Peru by destination market in FOB (million USD)

Country	2019	2020	2021	2022	2023
Malaysia	10	10	13	16	66
Netherlands	37	27	37	45	43
Indonesia	35	22	34	40	35
Mexico	8	6	9	18	18
Italy	10	8	12	9	14
Belgium	10	26	18	6	13
Spain	5	7	4	7	8
US	13	17	12	8	4
Algeria	1	0	2	2	4
Turkey	0	0	2	0	3
Others	10	9	9	8	9
Total	139	132	151	159	217

Source: Customs merchandise declaration (declaración aduanera de mercancías — DAM]) registered in National Superintendence of Customs and Tax Administration (Superintendencia Nacional de Aduanas y de Administración Tributaria — SUNAT; https://www.aduanet.gob.pe/aduanas/informgest/ExpoDef.htm).

The examination of the data in Table 3 reveals that the HHI for destination countries between 2019 and 2023 shows significant fluctuations in market concentration. The highest growth in concentration was recorded at 17.42% in 2022, suggesting a notable increase in the dominance of certain market players that year. Conversely, the least pronounced decline in concentration was -15.47% in 2020, indicating the smallest decrease in market concentration during the analyzed period. This information is relevant for understanding the resilience or recovery of market concentration in the face of potential disruptions. Additionally, the average annual variation in market concentration was 2.38% over the studied period.

Table 3. Herfindahl-Hirschman index of destination countries

Index	2019	2020	2021	2022	2023
HHI	1642	1388	1504	1766	1752

Source: DAM registered in SUNAT (https://www.aduanet.gob.pe/aduanas/informgest/ExpoDef.htm).

In Table 4, Cafetalera Amazonica experienced a growth of 82.95% in 2022 and a decline of 9.91% in 2021, with an average annual growth of 23.58% and a standard deviation of 42.40%. Agro San Gerardo saw an increase of 257.49% in 2021 and a rise of 18.45% in 2022, with an annual average of 141.26% and a standard deviation of 100.93%. SUMAQAO achieved a growth of 59.69% in 2021 and a reduction of 20.23% in 2022, with an annual average of 14.62% and a standard deviation of 34.31%. Qori Mayo, Amazonas Trading Peru, Asociacion Cacaotera De Tocache, and Cooperativa Agraria Acopagro reached their highest growth in 2023, 2020, 2023, and 2019, respectively.

Table 4. Exports of cocoa beans by companies in Peru in FOB terms (million USD)

Company	2019	2020	2021	2022	2023
Cafetalera Amazonica	21	20	18	33	42
Agro San Gerardo	2	6	16	18	39
SUMAQAO	18	18	29	23	28
Qori Mayo	0	0	3	9	20
Amazonas Trading Peru	17	17	15	14	16
Kallpa-Apagro	3	4	5	9	10
Asociacion Cacaotera De Tocache	3	5	6	7	9
Cooperativa Agraria Acopagro	9	6	8	7	5
Cuencas Del Huallaga	1	1	2	2	4
Exportadora Romex	16	9	7	5	4
Other companies	50	46	41	32	39
Total	139	132	151	159	217

Source: DAM registered in SUNAT (https://www.aduanet.gob.pe/aduanas/informgest/ExpoDef.htm).

In Table 5, the HHI for raw cocoa exports varied between 2019 and 2023. In 2020, it decreased to 761 from 789 in 2019, indicating increased competition or market redistribution. However, it steadily rose to 1070 by 2023, signaling greater market concentration. The largest increase in the index was in 2022, while the smallest increase occurred in 2020. The average annual growth rate of the index was 8.21%, with a standard deviation of 7.99%, reflecting significant fluctuations.

Table 5. Herfindahl-Hirschman index of exporting companies

Index	2019	2020	2021	2022	2023
HHI	789	761	835	993	1070

Source: DAM registered in SUNAT (https://www.aduanet.gob.pe/aduanas/informgest/ExpoDef.htm).

Table 6 presents Peru's exports by the department. Lima leads, although its figures decreased until 2022 and rose in 2023. San Martín increased from 19.27 million in 2019 to 91.43 million in 2023. Ucayali and Cuzco showed consistent growth, while Piura and Ica fluctuated. Lima experienced its highest annual growth in 2023 with 25.55% and its lowest in 2021 with -13.14%, with an average growth of -2.34% and

accounting for 39.31% of total exports. San Martín grew by 182.60% in 2021 and declined by 28.73% in 2020, with an annual average of 47.50% and a share of 19.81%. Ucayali grew by 64.39% in 2021 and contracted by 27.94% in 2023, with an annual average of 18.14% and accounting for 3.94% of total exports.

Table 6. Exports by the department of Peru in FOB (million USD)

Region	2019	2020	2021	2022	2023
Lima	94.74	88.44	76.66	68.62	86.14
San Martín	19.27	13.73	38.86	52.86	91.43
Ucayali	4.72	5.17	8.50	12.71	9.15
Cuzco	0.52	0.49	5.67	9.16	10.87
Junin	4.10	4.50	7.56	6.21	10.80
Piura	2.43	2.72	2.34	2.07	1.46
Ica	2.09	4.69	3.46	3.11	2.96
Cajamarca	0.77	1.02	0.45	0.18	1.07
Ayacucho	1.66	0.83	1.15	0.55	1.04
Huanuco	3.32	6.01	3.19	1.18	0.67
Other	5.39	4.40	3.16	2.35	1.41
Total	139	132	151	159	217

Source: DAM registered in SUNAT (https://www.aduanet.gob.pe/aduanas/informgest/ExpoDef.htm).

Table 7 shows the HHI for cocoa bean exporting regions. In 2019, the HHI was 4.948, indicating a highly concentrated market. In 2020, it decreased to 4.610, suggesting less consolidation. Between 2020 and 2021, it dropped to 3.298, a reduction of 28.48%, indicating greater market distribution. In 2022, it further decreased to 3.055, but in 2023 it rose to 3.523, an increase of 15.31%, suggesting a potential recovery. The average annual growth rate of -7.69% over five years indicates a trend towards lower market concentration.

Table 7. Exporting regions' Herfindahl-Hirschman index

Index	2019	2020	2021	2022	2023
HHI	4.948	4.610	3.298	3.055	3.523

Source: DAM registered in SUNAT (https://www.aduanet.gob.pe/aduanas/informgest/ExpoDef.htm).

In Table 8, Peru exhibits a comparative advantage across all years, with RCA values ranging from 0.93 to 0.97. The highest annual growth was 3.23% in 2020, and the total growth over the period was 4.30%, with no declines recorded in any year. The average annual variation was 1.07%.

Table 8. Revealed comparative advantage of Peru-Malaysia

Index	2019	2020	2021	2022	2023
RCA	0.93	0.96	0.96	0.96	0.97

Source: Data obtained up to August 2023 in Trademap (https://www.trademap.org).

In Table 9, Peru exhibits a comparative advantage across all years, with RCA values ranging from 0.70 to 0.82. The highest annual growth was 9.33% in 2022, while the smallest annual decline was -8.54% in 2023. The average annual variation was -0.86%, indicating a slight overall decrease in comparative advantage over time. The standard deviation of 0.0475 reflects moderate variability in RCA values during the analyzed period.

Table 9. Revealed comparative advantage of Peru-Netherlands

Index	2019	2020	2021	2022	2023
RCA	0.79	0.70	0.75	0.82	0.75

Source: Data obtained up to August 2023 in Trademap (https://www.trademap.org).

In Table 10, Peru demonstrates a constant comparative advantage with RCA values ranging from 0.98 to 0.99. The highest annual growth was 1.02% in 2021, while the smallest annual decline was -1.01% in 2020. The average annual variation was 0.0025%, indicating nearly total stability in comparative advantage over time. The standard deviation of 0.004 reflects extremely low variability in RCA values during the analyzed period, demonstrating remarkable consistency in Peru's comparative advantage relative to Indonesia.

Table 10. Revealed comparative advantage of Peru-Indonesia

Index	2019	2020	2021	2022	2023
RCA	0.99	0.98	0.99	0.99	0.99

Source: Data obtained up to August 2023 in Trademap (https://www.trademap.org).

In Table 11, Peru exhibits a comparative advantage across all years, with RCA values ranging from 0.59 to 0.79. The highest annual growth was 18.64% in 2021, while the smallest annual decline was -8.86% in 2023. The total growth over the period was 33.90%. The average annual variation was 2.18%, indicating an overall increase in comparative advantage over time. The standard deviation of 0.082 reflects moderate variability in RCA values during the analyzed period.

Table 11. Revealed comparative advantage of Peru-Mexico

Index	2019	2020	2021	2022	2023
RCA	0.67	0.59	0.70	0.79	0.72

Source: Data obtained up to August 2023 in Trademap (https://www.trademap.org).

In Table 12, Peru demonstrates a consistent comparative advantage in its exports to Italy, with RCA values ranging from 0.67 to 0.75. The highest annual growth was 5.97% in 2020, while the smallest annual decline was -2.82% in 2023. The total growth over the period was 11.94%. The average annual variation was 0.86%, indicating a slight overall increase in comparative advantage over time. The standard deviation of 0.0314 reflects low variability in RCA values during the analyzed period.

Table 12. Revealed comparative advantage of Peru-Italy

Index	2019	2020	2021	2022	2023
RCA	0.67	0.71	0.75	0.71	0.69

Source: Data obtained up to August 2023 in Trademap (https://www.trademap.org).

In Table 13, Peru demonstrates a consistent comparative advantage in its exports to Belgium, with RCA values ranging from 0.65 to 0.89. The highest annual growth was 25.35% in 2020, while the smallest annual decline was -5.62% in 2021. The total growth over the period was 36.92%. The average annual variation was 5.05%, indicating an overall increase in comparative advantage over time. The standard deviation of 0.0917 reflects moderate variability in RCA values during the analyzed period.

Table 13. Revealed comparative advantage of Peru-Belgium

Index	2019	2020	2021	2022	2023
RCA	0.71	0.89	0.84	0.65	0.80

Source: Data obtained up to March 2023 in Trademap (https://www.trademap.org).

5. DISCUSSION

Data reveals that the Netherlands, Germany, Malaysia, and the US are key players in the importation of cocoa beans, with significant fluctuations in their import volumes. Although the Netherlands maintains a dominant position, it has experienced a reduction in its share, contrasting with the notable growth of Belgium and Canada. These variations may reflect changes in consumer preferences and investments in the chocolate industry, aligning with the assertion by Sánchez et al. (2023) about the increasing value of cocoa by-products and the recognized quality of Peruvian cocoa in demanding markets. The HHI analysis reflects a fluctuation in the concentration of the cocoa export market. A decrease in concentration suggests a more equitable market distribution among competitors, while an increase indicates market consolidation. This correlates with the theoretical basis indicating a growing geographic diversification in cocoa production, where countries in Latin America and Asia are increasing their participation (Soares et al., 2023).

The RCA analysis indicates that Peru maintains a competitive position in key markets such as Malaysia, Indonesia, and Mexico, albeit with some variability. This situation resonates with the theoretical basis that Peru stands out for the quality of its cocoa, allowing it to maintain a strong position in international markets (Sánchez et al., 2023; Quelal et al., 2023). The moderate variability in RCA suggests that despite challenges, Peru has managed to maintain a competitive advantage, supporting the need for strategies aimed at improving production quality and efficiency to strengthen this advantage (https://shorturl.at/xHPsr).

The findings imply the need for a diversified and competitive strategy for the cocoa sector in Peru. The country should focus on improving production quality and efficiency to maintain and increase its competitiveness in international markets. Additionally, market and product diversification is crucial to mitigate risks associated with price volatility and changing consumer preferences. This aligns with the suggestions of Sánchez et al. (2023) and Soares et al. (2023), who emphasize the importance of diversification and competitiveness in the cocoa sector.

6. CONCLUSION

Despite fluctuations in the dynamics of the global import market, countries such as the Netherlands, Germany, Malaysia, and the US remain key players, while Peru emerges as a significant competitor due to its high-quality and specialty cacao. At the market level, the fluctuation in the HHI indicates significant variability in market concentration, suggesting a more equitable distribution of market shares among a larger number of competitors. The analysis of RCA shows that Peru has maintained a consistently competitive position in key markets such as Malaysia, Indonesia, and Mexico, which evidences the quality and acceptance of its cacao beans in the international market. However, moderate variability in this advantage indicates the need for focused strategies to improve and stabilize Peru's competitiveness in the sector. It is crucial for Peru to continue diversifying its export markets and strengthening the quality and sustainability of its cacao production, adapting to the demands of internationally valued sustainable and ethical practices.

Peru should leverage its recognition as a producer of high-quality cacao by focusing on improving production efficiency, market diversification, and strengthening its competitive position. This will ensure the economic sustainability of Peru's cacao sector and contribute to the country's economic and social development. The implementation of policies

and strategies that promote innovation, quality, and sustainability will be fundamental in enhancing Peru's cacao sector on a global scale.

For the government, the cacao sector, and producing entities in Peru, it is imperative to implement a holistic strategy that addresses production, quality improvement, market diversification, and the adoption of sustainable and ethical practices, based on empirical evidence and adapting to the dynamics of the global market. Consolidating strategic alliances that integrate producers, cooperatives, and processing companies is crucial for strengthening the cacao value chain. Companies and producers should prioritize the continuous improvement of cacao quality through technologies that optimize fermentation and drying processes, and obtaining international certifications to access premium market segments, which could translate into better valuation and higher prices for their products in the international market.

This article is important for future research because it offers a detailed analysis of Peru's emerging role in the global cacao market and highlights the factors that have contributed to its competitiveness. It provides an understanding of market dynamics and the distribution of shares among key players, essential for exploring international cacao trade. Additionally, it underscores the importance of sustainable and ethical practices in cacao production, relevant in a global context where consumers demand responsible products. However, the research has limitations, such as the need for more recent and specific data on cacao production and marketing practices in Peru and the generalization of results to other contexts. Future research should consider comparative studies between different cacao-producing countries to identify patterns and differences that can inform tailored strategies.

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