

Received: 2023-09-25

Accepted: 2023-10-18

Online published: 2023-11-13

DOI: <https://doi.org/10.15414/meraa.2023.09.01.41-50>*Original Paper*

Overview of the last decade of development of the international trade with cocoa and cocoa beans

Roman Serenčes^{1*}, Ivan Holúbek¹, Zuzana Strápek¹, Kristína Čičútová¹

¹ Slovak University of Agriculture, Faculty of Economics and Management, Institute of Economic Policy and Finance

ABSTRACT

The aim of the contribution is to characterize the development and state of the international trade with cocoa and cocoa beans and the competitiveness indicator. An indicator of revealed comparative advantages RCA was used. Among the world's largest exporters, Germany dominates with the highest export value in 2022, specifically, 6.42 trillion US dollars. Among the importers, the USA dominates with the highest import value of cocoa and cocoa beans in 2021, specifically, 5.7 trillion US dollars. Based on the available statistics, we identify the ten largest importers and exporters of cocoa and cocoa beans in the world. The development of the international trade in cocoa and cocoa beans over the last decade is described. We specify the international trade indicators of selected world importers and exporters of cocoa and cocoa beans.

KEYWORDS: RCA index, import, export, cocoa and cocoa beans

JEL CLASSIFICATION: F00, F10, F20, F40, Q17

INTRODUCTION

Organizations that regulate international trade with cocoa and cocoa beans

The International Cocoa Organization [6] is an intergovernmental organization established in 1973 under the auspices of the United Nations (UN), which operates within the framework of successive international agreements on cocoa, which we will then summarize in chronological order. The International Cocoa Organization has a seat in Abidjan - Ivory Coast. It was established to implement the first international cocoa agreement negotiated in Geneva at the UN International Cocoa Conference. The organization consists of 51 member countries, of which 22 countries export cocoa and 29 countries import cocoa. Together, these member

* Corresponding author: Roman Serenčes, Slovak University of Agriculture, Faculty of Economics and Management, Institute of Economic policy and Finance, Tr. A. Hlinku 2, 949 76 Nitra, e-mail: roman.sereneces@uniag.sk

countries account for 92% of world cocoa exports and 80% of world cocoa imports [6]. The vision is to achieve the goals set out in the Global Cocoa Program for a sustainable world cocoa economy. This program [6], which resulted from the First World Cocoa Conference held in Abidjan in 2012, is a plan determined by the interested parties in the cocoa area to achieve a sustainable cocoa economy. Interested parties, jointly agreed to solve key challenges and they will take action with regard to: sustainable production, sustainable industrial chain, sustainable consumption and strategic management of the cocoa sector. The organization has a mandate to promote the sustainable development of the global cocoa sector, by supported the cooperation among its member countries and among future ones and other interested parties. This mandate is derived from the International Cocoa Agreement of 2010, which was ratified by the UN. For the years 2019-2024, ICCO members have agreed on a 5-year strategic action plan with key priorities, which are shown in the scheme (Figure 1, Figure 2) [6].

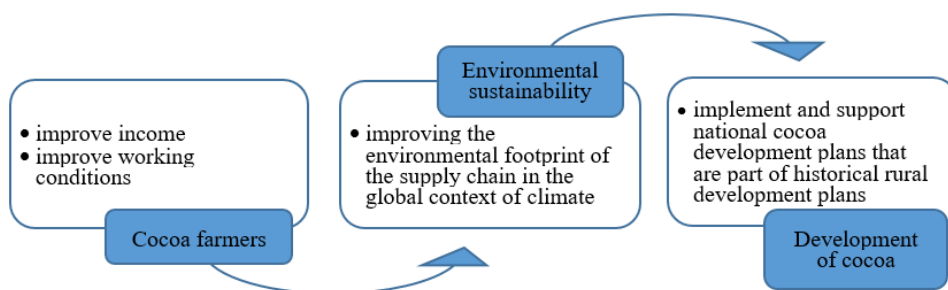


Figure 1 Scheme of ICCO Strategic Plan
Source: [6], own processing

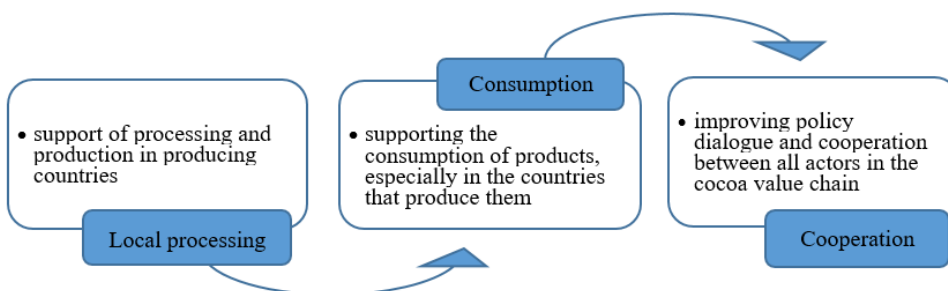


Figure 2 Scheme of ICCO Strategic Plan
Source: [6], own processing

European Cocoa Association (ECA)

The European Cocoa Association was founded in 2000. The main pillars of the ECA describe the original mission of the ECA. The mission sounded: it is necessary to study, research and implement adequate solutions for any issue affecting the industry, trade, and logistics of the cocoa sector in the broadest sense. The association is a non-profit organization and does not provide any direct financial resources for its members [5]. For implementation of its purpose, the association mainly tries to facilitate effective communication between the industry, trade, and logistics of the cocoa sector on the one side, and on the other side the scientific community, statutory and governing bodies of the European Union, the Council of Europe,

and other European organizations, as well as with local associations operating at the national level and with cocoa producers of countries around the world. Furthermore, the association seeks to facilitate and exchange scientific research, information, and services, to improve the quality of production, transport, and supply of cocoa and cocoa products, and in general all services related to the institutional, regulatory, and environmental aspects of the cocoa sector. To inform its members about both current and planned legislation and regulations, to influence the cocoa market at national, European, and international level. To cooperate with similar national or international associations in order to facilitate the achievement of the above purposes [7]. In accordance with the new Belgian companies and the Association Code, the association develops business activities with a disinterested purpose. These commercial activities include the publication of studies and documents and the organization of events related to the association's activities, including forums, conferences, educational seminars or webinars [8]. The Association will not distribute or provide directly or indirectly any financial benefits to its members or directors [4].

MATERIAL AND METHODS

The aim of the contribution is to characterize the development and state of the international trade with cocoa and cocoa beans and the competitiveness indicator. The production of cocoa beans caught our attention during the analysis of foreign trade in agricultural commodities of the Slovak Republic (this is our priority research), where the Slovak Republic had chocolate as an export unit in selected years (Slovakia does not grow cocoa beans). Based on the available statistics, we identify the ten largest importers and exporters of cocoa and cocoa beans in the world. The development of the international trade in cocoa and cocoa beans over the last decade is described. We specify the international trade indicators of selected world importers and exporters of cocoa and cocoa beans. Important statistical data about the export and import of the commodity cocoa and cocoa beans are obtained from the UN Trade Database available on the Comtradeplus website [1], which provides the most up-to-date statistical data on the issue being addressed. In specifying the most important importers and exporters of the commodity cocoa and cocoa beans, we used the OEC trade database [10], which shows the most up-to-date trade patterns of cities, states, and provinces, and of course trade data for examination through DataExplorer. An integral part of the research method is the use of a comparative advantage indicator known as the RCA Index, which can be used to compare relative production costs and subsequently identify sectors and markets that have the greatest probability of success, in our case with the commodity of cocoa and cocoa beans. The indicator of revealed comparative advantages (RCA) [9] is calculated as the logarithm of the share of exports and imports of the relevant commodity in total exports and imports.

$$RCA = \ln[(x/m)/(X/M)] \quad (1)$$

where:

x - export value of the commodity, m - import value of the commodity,
X - value of total agri-food export, M - value of total agri-food import,

When interpreting the RCA indicator, the following applies:

If $RCA > 1$, it is a comparative advantage.

If $RCA < 1$ it is a comparative disadvantage.

RESULTS AND DISCUSSION

Ten-year development of international trade with cocoa and cocoa beans

For a clearer processing, we have qualified this statistical analysis for the export and import of the given commodity cocoa and cocoa beans, which was processed over the last ten years, where the OEC statistical database helped us significantly.

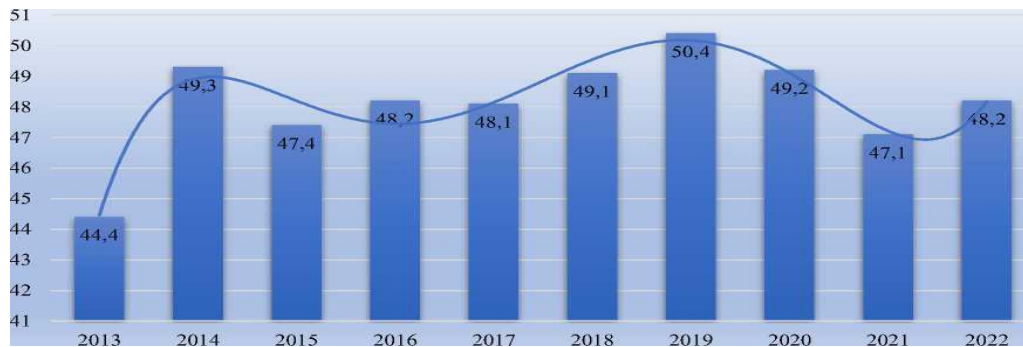


Figure 3 The development of import for ten years with the commodity cocoa and cocoa beans expressed in trillions of US dollars

Source: [10], own processing

As can be seen from the graph of import for the period 2013-2022 (Figure 3), the lowest import value was reached in 2013 (44.4 trillion US dollars) and the highest in 2019 (50.4 trillion US dollars). In 2013, the USA was the world's leading importer with a value of 4.37 trillion US dollars. USA accounted for 9.85% of the total import. In second place is Germany with a value of 4.08 trillion US dollars (9.18%). In 2014, the total import volume compared to 2013 increased from 44.4 trillion US dollars to 49.3 trillion US dollars. The USA retained the lead in imports (share 9.81%, value 4.84 trillion US dollars), followed by Germany (8.93%, 4.41 trillion US dollars), the Netherlands (8.91%, 4.4 trillion US dollars, France (6.76%, USD 3.33 trillion US dollars) and Great Britain (5.91%, 2.92 trillion US dollars). In 2015, the USA once again had the largest share of world import of cocoa and cocoa beans, which increased to 10.5% compared to previous years (specifically 4.98 trillion US dollars), while the total import volume compared to 2014 decreased from 49.3 trillion US dollars to 47.4 trillion US dollars. Import recorded a growing trend between 2015 and 2019, and the USA still maintained its lead in terms of share. In 2019, the world import for the monitored period was the highest with a value of 50.4 trillion US dollars. Since 2020, the development of world import has recorded a downward trend again. Until the end of the monitored period, the ranking of countries based on the share of import remains unchanged.

From the graph showing the development of export (Figure 4) for the monitored period of 2013-2022, it follows that the lowest volume of world export was achieved in 2015 in the amount of 47.3 trillion US dollars and the highest in 2018 with a value of 50.2 trillion US dollars. In 2015, the total export with cocoa and cocoa beans decreased by 2.2 trillion US dollars compared to the previous year in international trade. This year, the championship in the share of exports was won by the Ivory Coast (11.8%, 5.61 trillion US dollars), followed by Germany (11.4%, 5.38 trillion US dollars), the Netherlands (10.2%, 4.86 trillion US dollars) and finally Ghana and France. In 2017, Germany came to the fore again with an

export share of 11.9% (5.76 trillion US dollars), followed by the Ivory Coast, the Netherlands, Belgium, and Ghana. In 2018, when the world export of cocoa and cocoa beans reached the highest value during the monitored period, the Netherlands overtook Ivory Coast in order of export shares. The order of the other countries remained unchanged in the following years.

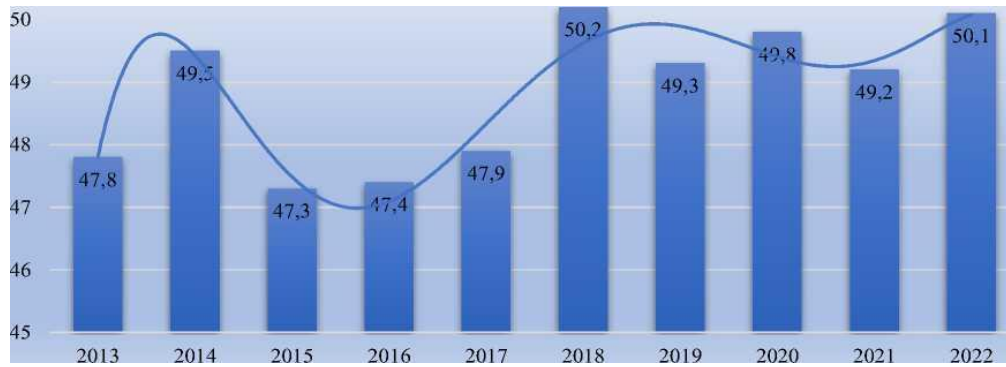
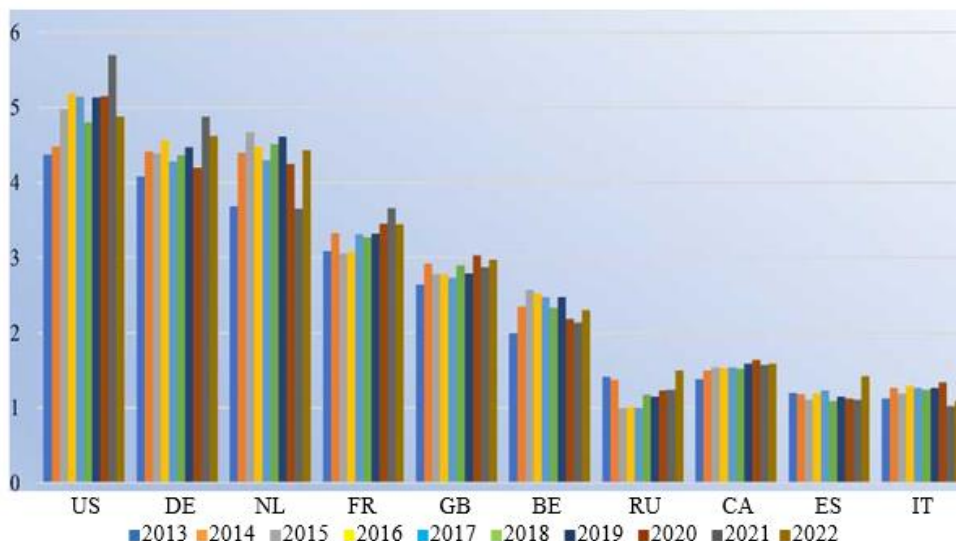


Figure 4 The development of export for ten years with the commodity cocoa and cocoa beans expressed in trillions of US dollars

Source: [10], own processing

Analysis of importers with a significant position in the international trade of cocoa and cocoa beans

In the mentioned chapter, we specify the countries to which the importing countries import the commodity cocoa and cocoa beans. We will list the values and the percentage. The data for processing the chapter come from the statistical database Comtradeplus.com and OEC.com [1], [10].



Note: US – USA; DE – Germany; NL – Netherlands; FR – France; GB – Great Britain; BE – Belgium; RU – Russia; CA – Canada; EC – Spain; IT – Italy

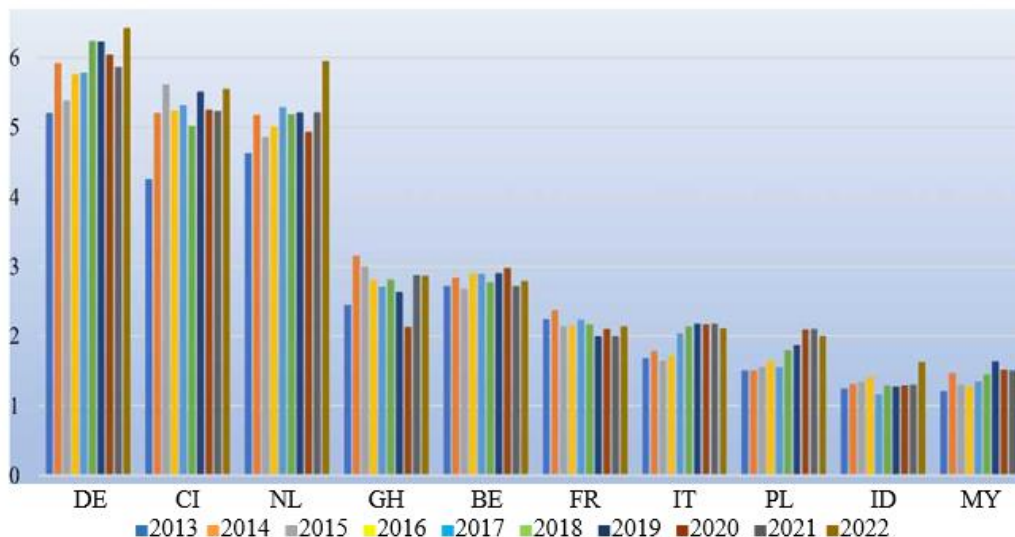
Figure 5 Analysis of importers over the last decade that have a significant position in international trade in the commodity cocoa and cocoa beans expressed in trillions of US dollars

Source: [10], own processing

In 2013, the USA imports the most from Canada (24.5%, 1.07 trillion US dollars), from the Ivory Coast (19.7%, 860 billion US dollars), from Mexico (523 billion US dollars). Over the observed period, the development of USA import has a predominantly increasing trend, the highest value was reached import in USA in 2021 (5.7 billion US dollars) and the lowest value in 2013. Germany dominated on the second place among importers. In 2013, Germany imported the most cocoa and cocoa beans from the Netherlands (33.1%, 1.35 trillion US dollars), Belgium (11.2%, 457 billion US dollars) and France (9.57%, 390 billion US dollars), similarly in the other monitored years. The lowest import in Germany was in 2013 (4.37 trillion US dollars), the highest in 2021 (4.88 trillion US dollars). In third place in the import of cocoa and cocoa beans was the Netherlands, which imported the most in 2013 (as well as in other monitored years) from Ivory Coast (25%, 918 billion US dollars), Ghana (14.6%, 538 billion US dollars) and Nigeria (9.77%, 359 billion US dollars). The next importer in the order was France, the most imported in 2013 from the countries Germany (19.9%, 614 billion US dollars), Belgium (17.2%, 532 billion US dollars), Ivory Coast (14.9%, 461 billion US dollars).

Analysis of exporters with a significant position in the international trade of cocoa and cocoa beans

In the monitored period, Germany exported the most to France (in 2013, 11.2% of export, 674 billion US dollars), Poland (9.65% in 2013, 583 billion US dollars) and Great Britain (8.89%, 537 billion US dollars). Germany recorded the lowest export in 2013 (5.2 trillion US dollars) and the highest in 2022 (6.42 trillion US dollars).



Note: DE – Germany; CI – Ivory Coast; NL – Netherlands; GH – Ghana; BE – Belgium; FR – France; IT – Italy; PL – Poland; ID – Indonesia; MY – Malaysia

Figure 6 Analysis of exporters over the last decade that have a significant position in international trade in the commodity cocoa and cocoa beans expressed in trillions of US dollars
Source: [10], own processing

In second place among exporters is Ivory Coast, which exports the most during the monitored period to the Netherlands (for 2013, 24.4%, 1.28 trillion US dollars), the USA (14.5%,

760 billion US dollars) and France (9.81%, 515 billion US dollars). The lowest export of the country was achieved in 2013 (4.25 trillion US dollars) and the highest in 2015 (5.61 trillion US dollars). The third in the order is the Netherlands with the lowest export for the monitored period in 2013 (4.63 trillion US dollars) and the highest in 2022 (5.95 trillion US dollars). The Netherlands exported the most to Germany, Belgium, and France. Another important exporter was Ghana, which exported the most to Germany, the Netherlands, and the USA. After Ghana, the countries Belgium, France, Italy, Poland, Germany, Indonesia, and Malaysia are in order. Belgium exported the most to Germany, France to Belgium, Italy to France, Poland to Germany, Indonesia to the USA, and Malaysia to Singapore.

Comparative advantage indicator RCA

The RCA comparative advantage indicator is used to quantify the competitiveness of the main commodity trade, which in our case was cocoa and cocoa beans. Subsequently, the ECI index was also used – the Economic Complexity Index, which is a holistic measure of the production capabilities of large economic systems, usually cities, regions or countries. The aim of ECI is mainly to explain the knowledge accumulated in the population, which is expressed in the economic activities present in the city, country, or region. Many low-income countries, including Bangladesh, Venezuela, and Angola, have failed to diversify their know-how and face low growth prospects. Other countries such as India, Turkey and Malaysia have successfully added manufacturing capacity to enter new sectors and will drive growth in the coming years.

Indexes that have been used to measure the commercial openness of cocoa at the macroeconomic level show that Mexico is not competitive, except for a few years in which competition was lower. The increase was due to temporary or external factors, with the exception of 2019, which saw a significant increase in production, while production in previous years was maintained rather than changed [2].

Table 1 Selected countries with comparative advantage in the export of cocoa and cocoa beans

Country	ECI value	Average RCA index 2013-2022
Ivory Coast	-1.17	169.64
Ghana	-1.32	55.28
Ecuador	-1.01	15.57
Dominican Republic	-0.33	6.39
Belgium	1.33	3.29
Netherlands	1.13	3.28
Papua New Guinea	-1.80	3.18
Poland	1.03	2.73
Venezuela	-1.07	2.63
Indonesia	-0.09	2.47
Peru	-0.68	2.32
Malaysia	1.02	1.95
Germany	1.88	1.55
Italy	1.30	1.54
France	1.34	1.52
China	0.96	0.044

Source: [1], [10], own processing

The African continent is known for its favorable conditions for growing cocoa. Therefore, countries from the African continent show the best RCA values and are therefore excellent exporters. This is also the case with Ivory Coast, which is located in Africa. The table shows that RCA achieves a high rate of 169.64 and thus a comparative advantage in the export of cocoa and cocoa beans. On the other side, Ivory Coast has an economic disadvantage in Silk of 0.00015. If one country has a comparative advantage in one commodity, there is a country that has a comparative disadvantage in that commodity. Ivory Coast has an ECI value of -1.17. Another evaluated country, also from the African continent, is Ghana, whose RCA index reached a value of 55.28, as shown in the table. In third place is Ecuador, followed by the Dominican Republic.

Indonesia's position in dominating the cocoa export market is relatively weak considering that Indonesia is actually one of the largest producers of cocoa after Ivory Coast and Ghana. In 2018, Indonesia was only able to rank 9th as a cocoa exporter. The decline in Indonesian cocoa bean exports is believed to be due to lower demand from importing countries [3].

Among the European countries, Belgium is among the first in the table with an RCA index value of 3.29. Among the European countries, the Netherlands follows with a positive value of the economic complexity index of 1.13 and with an RCA value of 3.28, followed by Poland, Germany, Italy, and France.

CONCLUSIONS

The aim of the contribution was to evaluate the current state and development of world trade in the commodity of cocoa and cocoa beans and to assess comparative advantage as an important indicator of the competitiveness of the evaluated countries for the monitored period of 2013-2022. The production of cocoa beans caught our attention during the analysis of foreign trade in agricultural commodities of the Slovak Republic (this is our priority research), where the Slovak Republic had chocolate as an export unit in selected years (Slovakia does not grow cocoa beans). Based on the available statistics, we identify the ten largest importers and exporters of cocoa and cocoa beans in the world. Within the monitored period, the world trade with the mentioned commodity reached the highest import in 2019 in the value of 50.4 trillion US dollars and the lowest import in 2013 with a value of 44.4 trillion US dollars. On the other hand, export reached the highest value in 2018, specifically 50.2 trillion US dollars and the lowest value in 2015 was 47.3 trillion US dollars. The largest importer for the monitored period is the USA and the largest exporter is Germany. USA reached the highest import value in 2021 (5.7 trillion US dollars) and the lowest value in 2013 (4.37 trillion US dollars). Germany reached the highest export value in 2022 (6.42 trillion US dollars) and the lowest value in 2013 (5.2 trillion US dollars). Within the framework of the analysis and calculations of the RCA competitiveness indicator, the countries of Ivory Coast (RCA = 169.64), Ghana and Ecuador have the best comparative advantage in foreign trade with the commodity cocoa and cocoa beans. Among the European countries, Belgium (RCA = 3.28), the Netherlands and Poland occupied the first ranks. The lowest value of the competitiveness indicator is achieved by China (RCA = 0.044). In the analysis of cocoa bean exporters, Côte d'Ivoire was the first country with the largest export and RCA confirmed its competitive advantage. China was chosen for its size in terms of land area, population, investor in Ivory Coast in the field of mineral resources. Despite these economic preferences, China's RCA is negative on trade in cocoa beans. Within the framework of the solved issue, it

would be important to examine the mutual relationship between the RCA and ECI indicators, which, however, could not be included this time due to the scope of the contribution. The ECI indicator was chosen as a comparative indicator.

REFERENCES

- [1] *Comtradeplus* (2022). Retrieved 2022-02-16 from <https://comtradeplus.un.org/TradeFlow?Frequency=A&Flows=X&CommodityCodes=18&Partners=0&Reporters=all&period=2022&AggregateBy=none&BreakdownMode=plus>
- [2] Duana-Ávila, D., Hernández-Gracia, T.J., Martínez-Muñoz, E., García-Velázquez, M.D.R., & Román-Gutiérrez, A.D. (2023). Study of the Mexican cocoa market: an analysis of its competitiveness (2010–2021). *Agronomy*, 13, 378. Doi: <https://doi.org/10.3390/agronomy13020378>
- [3] Fahmid I.M., Wahyudi, Salman D., Kariyasa I.K., Fahmid M.M., Agustian, A., Perdana, R.P., Rachman, B., Darwis, V., & Mardianto S. (2022) "Downstreaming" policy supporting the competitiveness of Indonesian cocoa in the global market. *Front. Withstand. Food syst.* 6:821330. Doi: 10.3389/FSUFS.2022.821330
- [4] Hnát, P. (2009). *The Global Political Economy of New Regionalism and the European Union*. Doctoral dissertation. Prague: VŠE. Retrieved 2022-02-16 from <https://theses.cz/id/p84ttj/?lang=en>
- [5] Honaizer, M., & Svobodová, V. (2009). *An interdisciplinary approach to the study of cultural aspects in international marketing*. In: Economics and Business: Scientific journal of the Faculty of Economics and Business BVŠP 2009, roč.3, č.1, 64-76 s. ISSN 1337-4990.
- [6] International Cocoa Organization (2022). *ICCO Quarterly Bulletin of Cocoa Statistics (QBCS)*. Retrieved 2022-02-16 from <https://icco.org/statistics/production-and-grindings/production.html>
- [7] Kemp, M.C. (2011). *International Trade Theory*. A critical review. New York: Routledge. 208 p.
- [8] Klimková, M. (2008). *Payment transaction*. Bratislava: Marada 204 p.
- [9] Latruffe, L. (2010). Competitiveness, Productivity and Efficiency in the Agricultural and Agri-Food Sectors. *OECD Food, Agriculture and Fisheries Papers*, No. 30, OECD Publishing. Doi: <http://dx.doi.org/10.1787/5km91nkdt6d6-en>
- [10] *OECD* (2022). Retrieved 2022-02-16 from <http://www.oec/en>