dr hab. Małgorzata FRONCZEK, prof. UE
Wydział Ekonomii, Uniwersytet Ekonomiczny w Katowicach
e-mail: malgorzata.fronczek@ue.katowice.pl
ORCID: 0000-0002-1502-1168

DOI: 10.15290/OES.2022.03.109.06

THE EU-CHINA TRADE IN GOODS IN THE YEARS 2004–2020 – IS THE EU EXPLOITING ITS COMPARATIVE ADVANTAGE?[1]

Abstract

Purpose – The study aims to identify the EU's and China's comparative advantage in reciprocal trade and indicate the relations between the structure of this trade and such advantage.

Research method – The study used Balassa's Revealed Comparative Advantage index (RCA), which shows the competitive position in the exports of particular commodities compared to a selected partner. The calculations were based on 2004–2020 data, obtained from the UN Comtrade Database.

Results – The results show that in the years under examination the EU-China bilateral trade followed a trend unfavourable for the EU (with an increasing negative balance). The most important commodities were machinery and equipment and they manifested a negative change for the EU. It meant that at the beginning of the analysed period (2004–2006) the EU had a comparative advantage in their exports, which was lost in 2007 and had not been regained by the end of the analysed years. Despite this change, machinery and equipment remained the dominant group of goods exported by the EU to China.

Originality/value/implications/recommendations – The answer to the question posed in the title is that in bilateral trade China makes better use of its comparative advantage in exports, while the European Union has the imports structure that is more compatible with its comparative advantage. The EU countries shape the structure of their imports more effectively and, in the vast majority of cases, they purchase goods that they are not competitive with. On the other hand, they definitely underperform as suppliers to the Chinese market, selling goods (mainly machinery and equipment) in which they ceased to be competitive years ago.

Key words: Balassa's Index, RCA, comparative advantage, foreign trade, international trade

JEL Classification: F14

1. Introduction

The comparative advantage index shows whether a country is in a competitive position to export specific goods/services in relation to its selected trading part-

[1] The article was supported by the Ministry of Science and Higher Education as part of a grant for maintaining the research potential of the Faculty of Economics of the University of Economics in Katowice.
Article received: 13.05.2022, article accepted: 16.09.2022.

ner(s). Accordingly, it is possible to identify the types of goods that the country should specialise in and export (goods in which the country has a comparative advantage) and the goods that should be imported (goods in which the country does not have a comparative advantage) [Gawlikowska-Hueckel, Śledziewska, 2016].

A variety of measures are used to determine a comparative advantage in foreign trade (e.g. export/import coverage index – EXIM, contribution to trade balance, Bowen's Net Trade Index, the Michaely index) [OECD, 2011; Cieślik, 2000; Michaely, 1962; CEPII, 2016; Iliopulos, 2005; OECD, 2005; Bowen, 1983].

The most widely used, however, is an index showing the position of a country in the export of specific goods/services compared to a reference group of countries, developed by H.H. Liesner in 1958, improved and popularised by B. Balassa, known as Balassa's index (Revealed Comparative Advantage – RCA) [Liesner, 1958; Benedictis, Tamberi, 2002].

The Balassa index is expressed as [Balassa, 1965; 1989]:

$$RCA = \frac{Exij}{\sum_{i=1}^{n} EXij} : \frac{EXiw}{\sum_{i=1}^{n} EXiw}$$

where:
RCA – Balassa's revealed comparative advantage index,
EXij – the country's export of the i product to the m market,
EXiw – the export of the i product to the m market by the reference group of countries,
n – a number of sectors, products, industries.

The Balassa index was modified by many authors, who proposed different variants of the formula presented above [e.g.: Laursen, 2015; Vollrath, 1991; Hadzhiev, 2014].

This article uses Balassa's RCA Index to determine the comparative advantage. It adopts values higher than 0. A value above 1 indicates that the country under examination has a comparative advantage in the export of a given product, which means that it is competitive in relation to its partner. A value between 0 and 1 indicates that the country has no comparative advantage concerning a given product (it is not competitive). Hinloopen and Marrewijk [2001] distinguished four categories of comparative advantage based on the value the RCA index adopts:

Class A: $0 < RCA \leq 1$ no comparative advantage of a sector,
Class B: $1 < RCA \leq 2$ weak comparative advantage of a sector,
Class C: $2 < RCA \leq 4$ moderate comparative advantage,
Class D: $RCA > 4$ strong comparative advantage.

This classification, however, is not widely used, as it was based on a study of the distributions of the index for the EU countries.

The article aims to examine the Revealed Comparative Advantage in the EU-28's bilateral trade with China and determine to what extent the export and import structure of the two partners is consistent with their comparative advantage.

The calculations used international data for 2004–2020 obtained from the UN Comtrade database. They covered 97 groups of goods, classified in two-digit HS (Harmonized System) chapters. Then, the analysis determined the RCA indices for each chapter containing goods in reciprocal trade and the commodity structure of the EU-China bilateral foreign trade. In the next step, the values of the RCA index were compared with the share of commodity groups in the bilateral trade between the EU and China. In order to obtain comparable results, the EU membership over the entire period under examination was set at 28 countries. In addition, the study used Hinloopen and Marrewijk's taxonomy mentioned above, as the analysis concerned the EU countries.

2. The value of the 2004–2020 EU-China trade

The European Union as a whole was undoubtedly the largest actor in international trade in the years under examination (Table 1). Its share in global exports and imports declined from approx. 41% in 2004 to approx. 33% in 2020. Nevertheless, its imports and exports still accounted for a third of global trade in goods. During the period under examination, China's share both in global exports and imports increased significantly. Its share in exports rose from 6.4% in 2004 to 14.7% in 2020, while in imports – from 5.9% to 11.5%.

TABLE 1

Foreign trade of the UE-28 and China in the years 2004–2020

Years	UE-28				China			
	Exports (in bn USD)	Share in world exports (in %)	Imports (in bn USD)	Share in world imports (in %)	Exports (in bn USD)	Share in world exports (in %)	Imports (in bn USD)	Share in world imports (in %)
2004	3 690.2	40.9	3 732.1	39.8	593.3	6.4	561.2	5.9
2005	3 987.3	38.8	4 078.2	38.5	762.0	7.3	650.0	6.1
2006	4 530.3	37.9	4 713.4	38.5	968.9	8.0	791.5	6.4
2007	5 269.3	38.2	5 503.9	39.0	1 220.1	8.7	956.1	6.7
2008	5 838.0	36.8	6 177.2	37.8	1 430.7	8.9	1 132.6	6.9
2009	4 512.3	36.7	4 643.0	37.1	1 201.6	9.6	1 005.6	7.9
2010	4 947.6	33.9	5 144.4	34.5	1 577.8	10.3	1 396.0	9.1
2011	5 832.4	33.2	6 040.9	33.8	1 898.4	10.4	1 743.4	9.4
2012	5 548.1	31.4	5 627.7	31.4	2 048.8	11.1	1 818.2	9.7
2013	5 808.4	32.1	5 688.1	31.2	2 209.0	11.7	1 950.0	10.3
2014	5 879.6	32.4	5 800.5	31.7	2 342.3	12.3	1 959.2	10.3
2015	5 112.1	32.6	4 992.5	31.3	2 273.5	13.7	1 679.6	10.0
2016	5 114.4	33.5	5 026.6	32.4	2 097.6	13.1	1 587.9	9.8
2017	5 596.7	33.3	5 534.1	32.3	2 263.4	12.8	1 843.8	10.3
2018	6 176.0	33.1	6 161.0	32.4	2 494.2	12.7	2 135.0	10.8
2019	5 987.8	33.1	5 966.7	32.3	2 498.6	13.1	2 069.0	10.8
2020	5 591.1	33.3	5 549.2	32.4	2 590.6	14.7	2 055.6	11.5

Source: [UN, 2022; UNCTAD, 2022; own calculations].

The analysis of individual countries shows that China's position in world trade strengthened in the years under examination [UNCTAD, 2022]. It moved up from the third place in the list of world exporters in 2004 to the second place in 2007 and to the first place in 2009. It remained first until 2020. As an importer, China ranked third in 2004, similarly to its position in exports, but as early as in 2009 it moved to the second place and remained there until the end of the examined period (the first place was held by the US).

Among the EU member states, Germany, France, Italy, the UK and the Netherlands were listed in the top ten global exporters and importers [UNCTAD, 2022]. Germany ranked the highest both as an exporter and an importer, while in the years 2004–2008 it was the world's largest exporter. In 2009 it dropped to the second place (behind China) and since 2010 it had already been in the third place (behind China and the US). Analogically, in 2004–2008 Germany was the world's second largest importer (behind the US) and in 2009 it dropped to the third place (behind China and the US), where it stayed until 2020.

3. The EU-China bilateral trade

In the period under examination, the EU-28's foreign trade with China was characterised by a rapidly growing negative balance. In 2004, the deficit in the EU's foreign trade with China has exceeded USD 100 billion. By 2020, it had almost reached USD 300 billion (Table 2).

TABLE 2

The EU-28's trade in goods with China in 2004–2020 (in bn USD)

Years	Exports	Imports	Balance
2004	59.8	174.1	-114.3
2005	63.2	220.1	-156.9
2006	80.4	270.1	-189.7
2007	98.6	348.9	-250.3
2008	115.4	405.8	-290.4
2009	115.2	336.7	-221.5
2010	149.2	413.9	-264.7
2011	187.8	449.3	-261.5
2012	182.6	406.8	-224.2
2013	193.5	409.1	-215.6
2014	215.0	447.2	-232.2
2015	184.8	419.4	-234.6
2016	184.0	417.2	-233.2
2017	218.2	452.6	-234.4
2018	245.2	501.5	-256.3
2019	247.4	507.2	-259.8
2020	243.9	531.2	-287.3

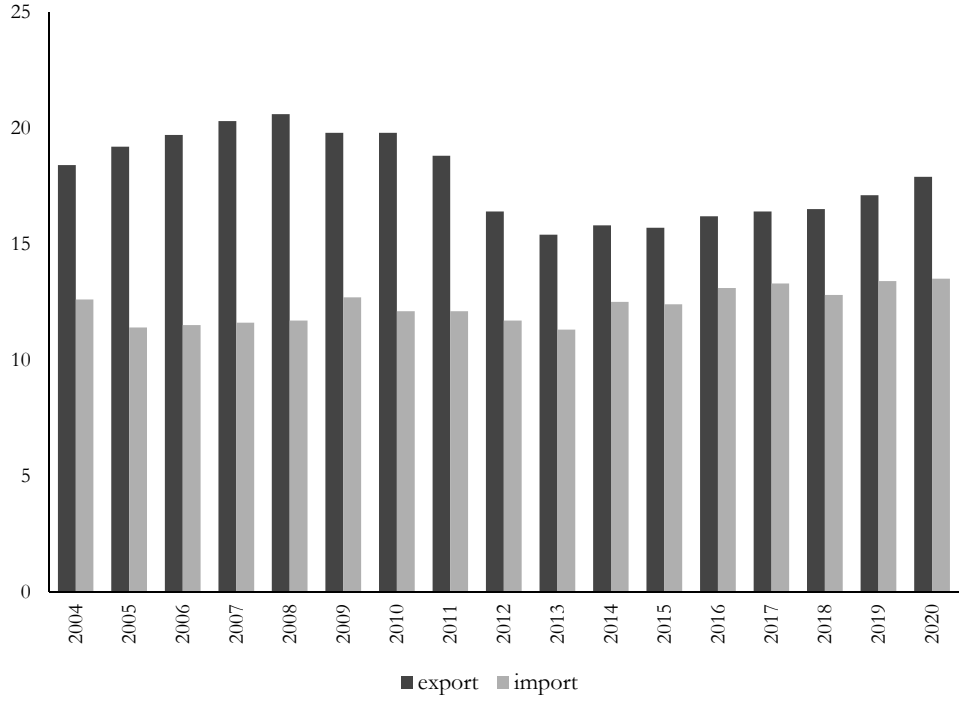
Source: [UN, 2022; own calculations].

Machinery and mechanical appliances; electrical and electrotechnical equipment[2] were the main goods exported to China by the EU-28 countries. The share of those goods in the global EU exports to China decreased from 50% in 2004 to 33% in 2020. However, it was still EU's most significant export to China. The second major group of goods comprised transport equipment. Its share increased from 12% in 2004 to around 20% in 2020. The third group contained chemical products, whose share increased from approx. 7.5% to 12.5%. In the period under examination, these groups of products accounted for about 65–70% of all the EU-28's exports to China.

The EU's imports from China were also dominated by equipment and machinery. In the years 2004–2020, they accounted for 46–48% of goods imported from China to the EU. The second most important group of goods comprised textiles and textile articles. Their share stood at 10–14%. The third largest group included miscellaneous manufactured articles (e.g. furniture, toys and others). They accounted for 9–10% of the total EU's imports from China. Jointly, these three groups of goods accounted for approx. 65–70% of all products imported from China to the EU.

FIGURE 1

The share of the EU-28 in China's foreign trade in 2004–2020 (in %)



Source: [UN, 2022; own calculations].

[2] Own calculation based on: [UN, 2022].

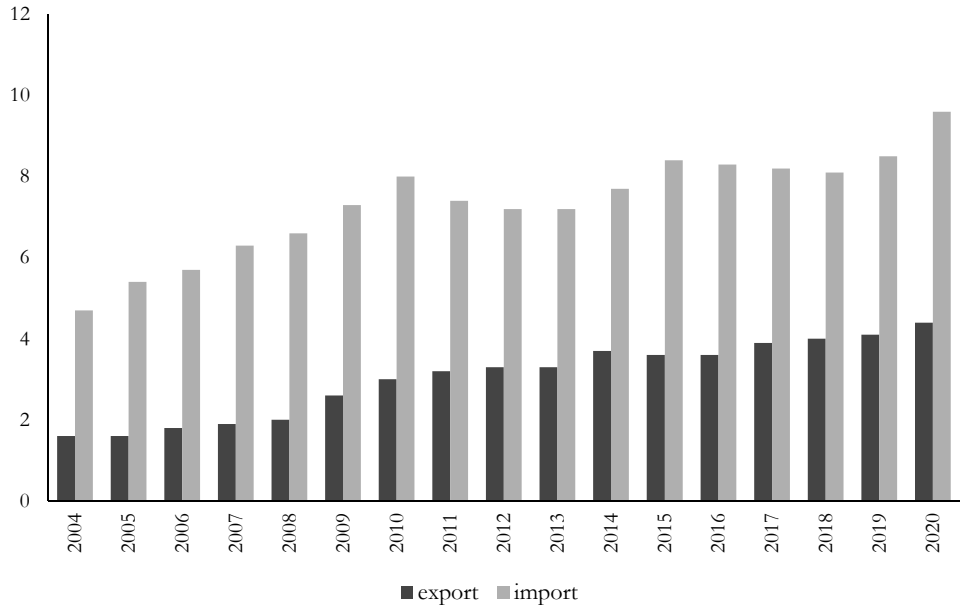
The EU was an important trading partner for China (Figure 1), particularly as a market for Chinese goods. In the years 2004–2011, it accounted for around 20% of China's exports. In the following years, this share decreased slightly. In 2012, it fell to 16.4%, in 2013 to 15.4%, only to start rising slowly to reach almost 18% in 2020.

The role of the EU as a supplier of goods to China was of slightly lesser importance. In the period under examination, goods from the EU-28 countries accounted for approx. 11.5–13.5%. In 2004–2015 this stayed at a similar level of 11.5–12.5%, while starting from 2016 it increased marginally to reach 13.5% in 2020.

For the European Union, the role of China as a trading partner was of lesser importance than the significance of the EU to China (Figure 2).

FIGURE 2

China's share in the EU-28's foreign trade in 2004–2020 (in %)



Source: [UN, 2022; own calculations].

China was a much more important supplier of goods to the EU-28 than a buyer from the EU-28. In 2004 it supplied 4.7% of all imported goods to the EU markets. The data shows that in the following years China strongly expanded into the European markets and in 2020 it supplied almost 10% of the goods imported by the EU.

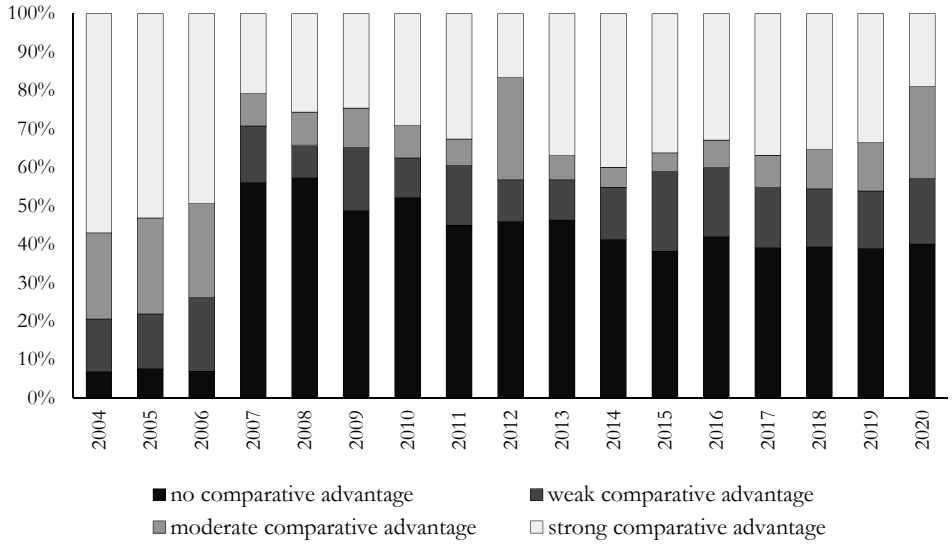
China's role as a buyer of goods exported by EU Member States was significantly less prominent, but the UN data show that its importance clearly increased. In 2004, the EU countries sent 1.6%, while in 2020 – as much as 4.4% of their total commodity exports to China.

4. RCA in bilateral trade

The comparison of the indices of the revealed comparative advantage in the EU's bilateral trade with China, calculated for 97 groups of goods by two-digit HS chapters, with the structure of the EU's and China's exports and imports allowed for the assessment of what proportion of their exports and imports is consistent with their comparative advantage. The synthetic results are presented graphically in Figures 3–6.

FIGURE 3

Structure of the EU-28's exports to China according to the comparative advantage in the years 2004–2020 (in %)



Source: [UN, 2022; own calculations].

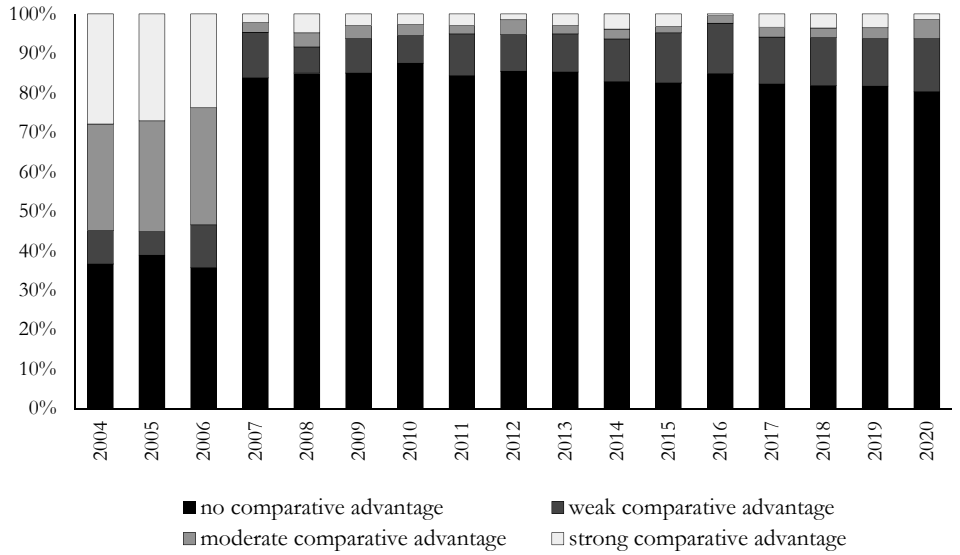
The analysis of the structure of the EU-28's exports to China revealed that in the years 2004–2006 it was strongly aligned with its comparative advantage. The EU's exports to China were dominated by the groups of goods in which it had a strong comparative advantage. In 2004 they accounted for as much as 57% of the EU's exports to China. 22.4% comprised the goods in which the EU had a moderate comparative advantage, while 13.6% the goods in which it had a weak comparative advantage. In total, 93% of the EU-28's exports to China were the goods in which the EU had a comparative advantage. The situation changed radically in 2007, when as much as 56% of exports were the goods in which the EU did not have a comparative advantage in trade with China. Despite some improvement, in the following years the situation remained similar, because in 2020 the share of those goods in the EU's exports to China accounted for 40%.

This dramatic change was caused by the loss of the EU's comparative advantage over China in the most important types of goods, namely machinery and equipment. In the years 2004–2006, the EU had a strong comparative advantage in these goods in trade with China. In 2007, it lost this advantage and had not regained it by the end of the period under examination, while at the same time the volume of trade in those goods continued to be very high (as mentioned above, it accounted for around 30% of the EU's total exports to China in 2020).

The EU's imports from China, on the other hand, were much better aligned with their comparative advantage (Figure 4). The EU countries mainly imported goods in which they did not have a comparative advantage. In the years 2007–2020, such goods accounted for 80–85% of total imports from China. The exception was the period of 2004–2006, when the EU imported only approx. 36% of the goods in which it did not have a comparative advantage over China and approx. 30% of the goods in which it had a strong comparative advantage.

FIGURE 4

Structure of the EU-28's imports from China according to the comparative advantage in the years 2004–2020 (in %)



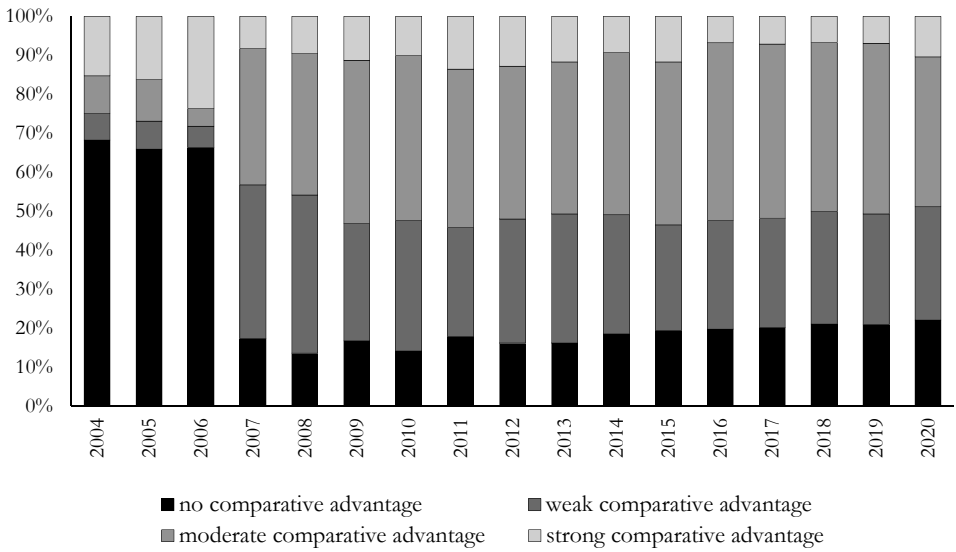
Source: [UN, 2022; own calculations].

Taking China's perspective, in the years 2004–2006 its exports to the EU were relatively inconsistent with their comparative advantage, because as much as 70% of the exports consisted of the goods in which China did not have a comparative advantage over the EU (Figure 5). The situation improved in 2007, when 82% of exported goods were those in which China had a comparative advantage, and it continued until the end of the period under examination. This was the result of the

EU's loss of its comparative advantage in bilateral trade in machinery and equipment discussed above. Since they constituted the most important part in China's exports to the EU (approx. 46–48%), China's position in relation to the EU in bilateral trade significantly improved.

FIGURE 5

Structure of China's exports to the EU-28 according to the comparative advantage in the years 2004–2020 (in %)



Source: [UN, 2022; own calculations].

Notably, starting in 2007, approx. 40% of China's exports to the EU included the goods in which China had a moderate comparative advantage and 7–13% in which China had a strong comparative advantage.

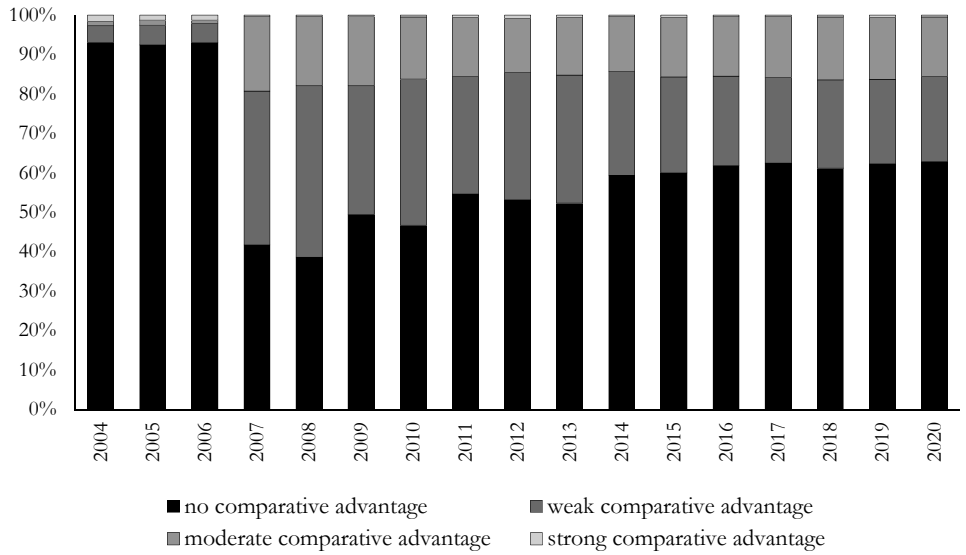
China's imports from the EU-28 manifested a strong consistency with the country's comparative advantage in bilateral trade in the years 2004–2006. In this period, more than 90% of the goods imported from the EU included those in which China did not have a comparative advantage. Then the situation changed. In 2007, the share of such goods in imports from the EU-28 decreased to 42%, only to increase in the following years, but in 2020 it was still considerably lower than in 2004–2006, as it reached 63%. As pointed above, this was the result of China's increased advantage in the trade in machinery and equipment, which continued to account for the dominant share of its imports from the EU.

It is, however, difficult to identify unequivocally the underlying reasons for this situation. Literature [Puślecki, 2012] proposes that the major factor that contributed to the growth of the European Union's exports to China was primarily the high GDP growth rate in China. In the years 2000–2020, China's average GDP growth

rate was 13.3% [UNCTAD, 2022]. According to Puślecki [2012], China's economic growth caused an increase in the demand for raw materials and fuels and, in consequence, contributed to an increase in the export of energy materials from the European Union. The country's economic growth led to the emergence of the middle class and boosted the demand for high-value goods, mainly the products of the automotive industry. The increase in the European Union's exports to China was also a result of the liberalization of the economy and more open access to the market following China's accession to the WTO in 2001, as well as the growing activity of European companies in China. The change in the RCA index discussed earlier may also have been caused by the yuan-euro exchange rate favourable for Chinese exporters and the depreciation of the US dollar against the yuan, which resulted in a decreased competitiveness of Chinese products in the United States and an increased interest in European markets. Puślecki [2007] argues that the EU enlargement, which took place in 2004 and 2007 to include ten countries from Central and Eastern Europe, was another important factor that stimulated the growth of the EU's imports from China. As a consequence of the enlargement, the EU market increased by 20%.

FIGURE 6

Structure of China's imports from the EU-28 according to the comparative advantage in the years 2004–2020 (in %)



Source: [UN, 2022; own calculations].

Still another factor driving changes in the comparative advantage in the EU's trade with China may be foreign direct investment. According to Eurostat, in the years 2013–2017, approx. 2.3–2.4% of the entire EU's FDI outside the EU was

based in China [Eurostat, 2022b]. The EU's FDI in China mainly targeted the industrial sector, especially in automotive, chemical and pharmaceutical industries, as well as machinery and equipment, i.e. sectors that were the main contributors to EU-China trade [Eurostat, 2022a]. It is possible that the trend was related to European companies relocating to China (e.g. because of lower labour costs) and then importing their manufactured goods to the EU market. However, due to the lack of relevant and comparable data, it is difficult to verify these conclusions.

China's FDI in the EU, on the other hand, cannot be easily analyzed. Since the 1980s, China has been implementing a "state-driven investment strategy" to enable a strong export-driven economy. The *Belt and Road Initiative* launched in 2013, together with *Made in China 2025* (*MIC 2025*) launched in 2015, are the most significant Chinese investment strategies for economic growth and aim to increase China's influence abroad, including its impact on the EU. According to the European Court of Auditors [Europejski Trybunał Obrachunkowy, 2020], it is very difficult to obtain complete and timely data regarding investments that are a part of the Chinese investment strategy in the EU.

The driving force for this growth is the *Going Global strategy*initiated in 1999, two years before China's admission to the World Trade Organisation (WTO). The *Going Global strategy* was mainly focused on importing oil resources and other raw materials to facilitate its labour-intensive economy, while manufacturing goods with low added-value (heavy industry e.g. iron, steel and basic machineries) were predominantly exported globally. However, over the last ten years, the *Going Global strategy* has been changed,shifting towards an economy more focused on the production of high added-value goods. In this context, the industrial strategy *Made in China 2025* was particularly important. This showed China's ambition to become a global technological power. The Mercator Institute for China Studies (MERICS) reported that over 1,800 government industrial investment funds related to this strategy have an aggregate size of about EUR 390 billion [Zenglein, Holzmann, 2019].

The review of Eurostat statistics, conducted by the European Court of Auditors, indicates that China's investment in the EU has increased, but remains relatively low. In 1995, only 0.3 % of the FDIs in the EU were held by Chinese investors. China's share of the total FDIs in the EU increased in the years 1995, 2005 and 2015. At the end of 2018, this proportion increased to 3%. The Chinese FDIs (stocks) in the EU amounted to EUR 202 bn. In response to the limitations of official FDI statistics, the Commission (DG TRADE) constructed a new non-public database, the "EC-JRC Foreign Ownership Database", using firm-level data. Based on the EC-JRC Foreign Ownership Database, the total amount of assets, including FDIs, controlled by Chinese investors at the end of 2017 amounted to EUR 2,114 bn. This represents 0.89 % of total companies in the EU by value, and 0.18% of the total number of companies in the EU [Europejski Trybunał Obrachunkowy, 2020].

Since 2014, China's FDI in the EU has remained higher than the EU's FDI in China. Notably, China's FDIs in the EU have been mainly acquisitions and mergers (brownfield investments). They are motivated by the pursuit of markets and the acquisition of strategic assets [Radomska, 2018].

Chinese investors invest in the EU primarily in high-tech, engineering, ICT, transportation and infrastructure, and energy companies. Their area of interest also covers shares in manufacturing and chemical companies as well as companies with household brands, holding ownership of unique technologies, patents and other strategic assets [European Union Chamber of Commerce in China, 2013; Hansakul, Levinger, 2014; Świderek, 2016].

The sectors of Chinese FDIs from 2000 to 2019 included strategically important areas such as transportation and infrastructure (29.1%), information and communications technologies (ICT) (12.4%), energy (10.1%), automotive (14.1%), real estate and hospitality (11.2%) [Europejski Trybunał Obrachunkowy, 2020].

Compared with the EU, China is less open to investment. China's foreign investment regime, including its 'Negative Lists', limits the access of foreign investors to the Chinese market in several sectors, including some of those defined as key technological sectors in the *MIC 2025 strategy* [European Union Chamber of Commerce in China, 2019]. With regards to post-entry conditions, the Chinese legal framework and the unequal access to the Chinese market, as well as government funding, place European firms at a disadvantage compared to their Chinese counterparts [JRC, 2019].

5. RCA and the structure of trade between the EU and China

The observations presented in point 6 are additionally confirmed by the coefficients illustrating the correlation between the structure of exports and imports and the values of the RCA index (Table 3)[3]

The European Union had a much higher correlation between the RCA indices and the share of particular types of goods imported from rather than exported to China. In the years 2004–2006 the coefficients were slightly above 0.4, which means that the relationship between the structure of the EU's exports to China and the RCA indices was moderate and positive. The higher the comparative advantage index for individual commodity groups, the higher the share of those groups in exports to China. In the following years, the correlation was low (at 0.22–0.26), but it still manifested the same relationship as in 2004–2006.

The relationship was stronger for the EU's imports from China. In most years under examination, the coefficient was at a level of approx. -0.5 (high correlation). However, the relationship was converse, i.e. a higher value of the RCA index for particular groups of goods was associated with a lower share of these goods in the EU's imports from China.

[3] Calculations were performed for 97 commodity groups based on two-digit HS codes. Spearman's rank order correlation coefficient was used to determine the correlations, as the scatterplots indicated that the possible relationships were not linear.

TABLE 3

Correlation coefficients[a] between the RCA index and the structure of exports and imports in the EU-China's bilateral trade

Years	Correlation between RCA and the structure of EU-28 exports to China	Correlation between RCA and the structure of EU-28 imports from China	Correlation between RCA and the structure of China's exports to EU-28	Correlation between RCA and the structure of China's imports from EU-28
2004	**0.42**	**-0.30**	**0.27**	**-0.40**
2005	**0.41**	**-0.31**	**0.28**	**-0.40**
2006	**0.41**	**-0.34**	**0.28**	**-0.41**
2007	**0.25**	**-0.46**	**0.49**	**-0.22**
2008	**0.22**	**-0.51**	**0.54**	-0.16
2009	**0.26**	**-0.51**	**0.54**	-0.19
2010	**0.26**	**-0.49**	**0.53**	-0.18
2011	**0.26**	**-0.50**	**0.56**	-0.18
2012	**0.23**	**-0.53**	**0.58**	-0.18
2013	**0.26**	**-0.53**	**0.58**	**-0.24**
2014	**0.25**	**-0.52**	**0.56**	**-0.25**
2015	**0.26**	**-0.51**	**0.57**	**-0.22**
2016	**0.23**	**-0.53**	**0.55**	**-0.21**
2017	**0.23**	**-0.52**	**0.54**	**-0.22**
2018	**0.22**	**-0.50**	**0.53**	**-0.20**
2019	**0.22**	**-0.49**	**0.50**	**-0.22**
2020	**0.22**	**-0.48**	**0.49**	**-0.23**

a Spearman's rank correlation coefficient (Rs).

The results significant at $p<0.05$ are marked in bold.

Source: [UN, 2022; own calculations].

The analysis of the situation from China's perspective revealed, in turn, that China had a higher consistency of its comparative advantage with exports to the EU than with imports from the EU. For exports, the coefficients were low (0.27 to 0.28) in 2004–2006 and high (0.49 to 0.58) in 2007–2020. For imports, on the other hand, the correlation coefficients reached a value of -0.4 in 2004–2006, while from 2007 they have been significantly lower (from -0.16 to -0.24).[4] The relationship between the value of RCA indices and the share of goods in China's exports to the EU-28 was positive (a higher RCA index for individual groups of goods correlated with a higher share of those groups in exports). In contrast, there was a negative relation-

[4] It should be mentioned that in the years 2008–2012 the results did not show statistical significance, but taking into account all the results from the years under examination a claim can be risked that a weak negative correlation existed. If the calculations had been performed at a lower level of data aggregation, i.e. by increasing the number of cases, the results obtained would most likely have shown statistical significance.

ship between the values of the RCA indices and the share in China's imports from the EU-28 (a higher RCA index correlated with a lower share in imports).

6. Conclusions

The analysis of the data and results revealed that the EU's trade with China grew dynamically during the period under examination, but unfortunately, the balance was increasingly unfavourable for the EU. The EU was a much more important partner for China than China was for the EU, while bilateral trade was dominated by machinery and equipment.

The assessment of the consistency of the structure of reciprocal trade with the comparative advantage showed that the EU's exports to China were at a low level of consistency, while China's exports to the EU were at a much higher level. As regards imports, the situation was the opposite. The structure of the EU's imports from China was highly consistent with the EU's comparative advantage, whereas the structure of China's imports from the EU-28 was consistent with the country's comparative advantage only to a small extent.

As a result, the answer to the question posed in the title is that in bilateral trade China makes better use of its comparative advantage in exports, while the European Union has the import structure that is more consistent with its comparative advantage.

Therefore, the EU countries are more effective at shaping the structure of their supplies and, in the vast majority, buy goods which they would produce at higher prices. On the other hand, they perform much worse as suppliers to China's market, selling goods (mainly machinery and equipment) where they used to have a comparative advantage but lost it many years ago. China, in turn, effectively shaped the structure of its exports to the EU, focusing on goods in which it had an advantage over the EU countries. However, it is difficult to identify the explicit reasons for this situation. The following factors may have contributed: easier access to the EU market as a result of China's accession to the WTO, China's dynamic economic growth resulting, on the one hand, in a larger market for the EU suppliers but, on the other hand, in China's increased production capacity, the relocation of the production of certain products from the EU to China and, subsequently, their import back to the EU. Unfortunately, due to the lack of precise and comparable data, particularly as regards the latter factor, it is difficult to determine the scale of this phenomenon.

Finally, it is worthwhile to consider the trends. The structure of the EU's exports to China showed a slight tendency to become more consistent with its comparative advantage, which is a positive development. The structure of China's exports to the EU, on the other hand, tended to follow the opposite trend (less aligned with the country's comparative advantage), which is also advantageous for the EU. The analysis of the EU's imports from China shows a tendency for a decreasing consistency between their structure and the EU's comparative advantage (which is not

a positive development) and China's imports from the EU reveal a tendency for their structure to become more aligned with the country's comparative advantage.

Today it is difficult to determine who will make a better use of the comparative advantage in the future. On the one hand, if these trends continue, the EU's trading position with China should improve as its exports should increasingly be based on goods in which it has an advantage over China. On the other hand, this may be invalidated by the structure of its imports from China becoming increasingly inconsistent with its comparative advantage. The data presented in the article show that despite these trends, the EU's balance of trade with China was consistently negative and deteriorating further. This implies that the gradual improvement in the structure of the EU's exports to China towards increasing the share of goods in which the EU had a comparative advantage did not bring positive effects in the form of an improvement in the balance of bilateral trade in goods. Furthermore, it seems likely that such a positive effect will not occur as long as this trade (both exports and imports) is dominated by machinery and equipment, in which China has a comparative advantage.

References

Balassa B., 1965, *Trade Liberalisation and "Revealed" Comparative Advantage*, "Manchester School of Economic and Social Studies", vol. 33, http://onlinelibrary.wiley.com/doi/10.1111/j.1467-9957.1965.tb00050.x/ abstract [date of entry: 10.12.2015].

Balassa B., 1989, *Comparative Advantage, Trade Policy and Economic Development*, Harvester Wheatsheaf, New York.

Benedictis L., Tamberi M., 2002, *A Note on the Balassa Index of Revealed Comparative Advantage*, "Universita' Politecnicadelle Marche Working Papers", vol. 158, http://docs.dises.univpm.it/web/quaderni/pdf/158.pdf [date of entry: 14.05.2016].

Bowen H.P., 1983, *On the Theoretical Interpretation of Trade Intensity and Revealed Comparative Advantage*. "Weltwirtschaftliches Archiv", vol. 119(3), DOI: 10.1007/BF02706520.

CEPII, 2016, *International Trade Indicators*, http://www.cepii.fr/%5C/anglais-graph/bdd/chelem/indicators/indicspeit.htm [date of entry: 16.05.2016].

Cieślik A., 2000, *Nowa teoria handlu zagranicznego w świetle badań empirycznych*, PWN, Warszawa.

European Union Chamber of Commerce in China, 2013, *Chinese Outbound Investment in the European Union,* https://www.europeanchamber.com.cn/en/publications-archive/10/Chinese_ Outbound_Investment_in_the_European_Union [date of entry: 31.08.2022].

European Union Chamber of Commerce in China, 2019, *European Business in China Position Paper 2019/2020*, https://www.europeanchamber.com.cn/en/publications-archive/756/European_ Business_in_China_Position_Paper_2019_2020 [date of entry: 31.08.2022].

Europejski Trybunał Obrachunkowy, 2020, *Reakcja UE na państwową strategię inwestycyjną Chin*, https://www.eca.europa.eu/ Lists/ECADocuments/RW20_03/RW_EU_response_to_China_pl.pdf [date of entry: 30.08.2022].

Eurostat 2022a, *EU direct investment flows, breakdown by partner country and economic activity (BPM6)*, https://ec.europa.eu/eurostat/web/economic-globalisation/globalisation-in-business-statistics/foreign-direct-investments [date of entry: 20.06.2022].

Eurostat 2022b, *EU direct investments indicators in % of GDP, impact indicators and rate of return on direct investment (BPM6)*, https://ec.europa.eu/eurostat/web/economic-globalisation/globalisation-in-business-statistics/foreign-direct-investments [date of entry: 20.06.2022].

Gawlikowska-Hueckel K., Śledziewska K., 2016, *Handel zagraniczny Polski po akcesji Polski do UE ze szczególnym uwzględnieniem dóbr wysokich technologii*, [in:] *Analiza handlu zagranicznego Polski w świetle najnowszych koncepcji teoretycznych. Implikacje dla polityki gospodarczej w dobie kryzysu,* Gawlikowska-Hueckel K., Umiński S. (red.), Wydawnictwo Naukowe Scholar, Warszawa.

Hadzhiev V., 2014, *Overall Revealed Comparative Advantages*, "Eurasian Journal of Economics and Finance", vol. 2, http://eurasianpublications.com/pdf/ejocaf/EJEF-4.pdf [date of entry: 16.05.2016].

Hansakul S., Levinger H., 2014, *China–EU relations: Gearing up for growth*, https://www.dbresearch.com/PROD/RPS_EN-PROD/China-EU_relations%3A_Gearing_up_for_growth/RPS_EN_DOC_VIEW.calias?rwnode=PROD0000000000435629&ProdCollection=PROD0000000000451972 [date of entry: 31.08.2022].

Hinloopen J., Marrewijk C., 2001, *On the empirical distribution of the Balassa Index*, "WeltwirtschaftlichesArchiv", vol. 137(1), pp. 1–35, DOI:10.1007/BF02707598.

Iliopulos E., 2005, *Trade Indicators of Specialization,* http://eleni.iliopulos.free.fr/files/class3_final.pdf [date of entry: 16.05.2016].

JRC, 2019, *China – Challenges and Prospects from an Industrial and Innovation Powerhouse*", Publications Office of the European Union, Luxembourg, https://op.europa.eu/en/publication-detail/-/publication/c89434b2-88cd-11e9-9369-01aa75ed71a1/language-en [date of entry: 31.08.2022].

Laursen K., 2015, *Revealed Comparative Advantage and the Alternatives as Measures of International Specialization,* "Eurasian Business Review", vol. 5(1), pp. 99–115, DOI 10.1007/s4081-015-0017-1.

Liesner H.H., 1958, *The European Common Market and British Industry*, "The Economic Journal", vol. 68(270), pp. 302–316, DOI: 10.2307/2227597.

Michaely M., 1962, *Concentration on International Trade*, North-Holland Publishing Company, Amsterdam.

OECD, 2005, *OECD Science, Technology and Industry Scoreboard 2005*, Paris, DOI: 10.1787/sti_scoreboard-2005-en.

OECD, 2011, *STAN Indicators – Collection of Calculation Formula,* 6 April, www.oecd.org/sti/ind/47447210.pdf [date of entry: 7.09.2015].

Puślecki Z., 2007, *Polska w warunkach członkostwa w Unii Europejskiej i globalizacji*, Wydawnictwo Forum Naukowe, Poznań.

Puślecki Z., 2012, *Relacje Unii Europejskiej z Chińską Republiką Ludową wobec wyzwań gospodarki globalnej 2012,* „Wyzwania gospodarki globalnej. Prace i Materiały Instytutu Handlu Zagranicznego Uniwersytetu Gdańskiego", nr 31(1), pp. 316–330, http://ekonom.ug.edu.pl/web/pimihz/index. html?lang=pl&ao=numer_31_/_2012 [date of entry: 31.08.2022].

Radomska E., 2018, *Chińskie bezpośrednie inwestycje zagraniczne w Unii Europejskiej – kontrowersje i wyzwania*, „Kwartalnik Naukowy Uczelni Vistula", nr 2(56), pp. 84–108, https://i.vistula.edu.pl/media/docs/g0BemJiIdb30HYFF8fJXPL4kP.pdf [date of entry: 31.08.2022].

Świderek T., 2016, *Chińczycy masowo skupują firmy na świecie,* https://www.obserwator-finansowy.pl/forma/rotator/chinczycy-masowo-skupuja-firmy-na-swiecie/ [date of entry: 31.08.2022].

UN, 2022, Comtrade Database, https://comtrade.un.org/data [date of entry: 18.02.2022].

UNCTAD, 2022, https://unctadstat.unctad.org/ wds/TableViewer/tableView.aspx [date of entry: 29.03.2022].

Vollrath T.L., 1991, *A Theoretical Evaluation of Alternative Trade Intensity Measures of Revealed Comparative Advantage*, "Weltwirtschaftliches Archiv", vol. 127(2), pp. 265–280, DOI: 10.1007/BF02707986.

Zenglein M.J., Holzmann A., 2019, *Evolving Made In China 2025: China's industrial policy in the quest for global tech leadership*, Mercator Institute for China Studies (MERICS), https://merics.org/en/report/evolving-made-china-2025 [date of entry: 31.08.2022].