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Assessing the Stability of EU Countries in International Chemical Trade (2016–2021): Insights from the State-Corporation Hegemonic Stability Theory

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Abstract:

Purpose: *The purpose of this paper is finding a stability of positions of particular EU states on exports and imports of chemicals and related products. The research method is a describing political-economic analysis which bases on statistical data.*
Design/Methodology/Approach: *The design is finding the rules of the production and international trade of chemicals and related products according to the State-corporation Hegemonic Stability Theory. Author proves that less developed countries are subordinated to the collective global hegemony of state-powers and biggest transnational corporations. Therefore, the modern and low-emission production of chemicals is located in high developed countries, while dangerous and toxic production is realized in less developed states.*
Findings: *Stable positions of EU particular states in international trade of chemicals and related products.*
Practical Implications: *The result can be considered to elaborate the short-term and long-term EU trade policy.*
Originality / Value: *Original research paper.*

Keywords: *Chemicals, international trade, end of covid-19 pandemic, Poland's dependency on chemical imports, State-corporation Hegemonic Stability Theory.*

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1. Introduction and Literature Review

The purpose of this paper is finding a stability of positions of EU particular states in international trade of chemicals and related products. Chemicals and related product are important parts of the world economy and international trade because of their necessity in industrial and agricultural production and in consumption of households in spite of the health risks associated with their use.

However, the control of the production and use of chemicals is necessary, (Kristiansson *et al.*, 2021). Herbicides, especially glyphosates are popularly used the agriculture but their residues in crops are reported for cereals, pulses, canola, and soy. Therefore, their use is monitored and regulated by EU, (Lemke *et al.*, 2021).

The REACH (Registration, Evaluation and Authorization of Chemicals) programme of EU established in 2007 is named the safety net of the system that includes limitations, conditions and prohibitions of production and use of chemicals deemed to pose an unacceptable risk, (Berghamp, ed., 2013, 5-14). However, the REACH regulations concerning waste and the protection of water and air cause enormous costs for chemical industry in Poland and other new EU member-states, (Angerer *et al.*, 2008).

Nowadays, the EU chemical production is dominated by platform chemicals and polymers for plastics that contain the bio-based share amounting to 0.3%-0.4% only. Moreover, the important part of European production of chemicals are adhesives, cosmetics and personal care products, and lubricants. Whereas, paints, coatings, inks, dyes and plasticizers have of low importance for the EU chemical production, (Spekreijse *et al.*, 2019).

In other way, the production and exports of India are dominated by low technology and labour-intensive goods in spite of a development a technology-intensive exports of organic chemicals, dyes and colouring materials, (Fayaz *et al.*, 2022). China is an important producer and exporter of pesticides which are necessary for EU food production.

A tension and disputes between EU and China concern the mutual recognition of food-quality certificates because of EU policy to reduce a use of pesticides, (Zolin *et al.*, 2018). The EU plan of Green Deal promoted since 2019, includes the reduction to use plastic, especially in food contact materials in the aim to ensure the safe food and to limit plastic waste, (Tsochatzis *et al.*, 2022).

2. Theoretical Background and Hypothesis

European Union is the first importer of chemicals over the world and therefore, the EU regulations are important for the global trade, (Motaal, 2009). Tong *et al.* (2022) use arguments characteristic to the Modern World System Theory to explain unequal

ecological advantages and costs connected with international trade in chemicals, products and waste. According to this opinion, agricultural societies of peripheral and semi-peripheral countries suffer the exposure to chemicals that are used for production of goods which are consumed in the core states. In this way, the high developed countries (named the core) exploit less developed countries (called the periphery or semi-periphery), (Wallerstein, 1974).

However, according to Author's opinion, such a situation is better described by the State-corporation Hegemonic Stability Theory. This theory stresses that weaker states and smaller companies are subordinated to the collective global hegemony of state-powers and transnational corporations.

Moreover, there should be common interests of the collective hegemony in spite of various contradictive aims of particular state-powers and corporations (Staszczak, 2011; 2015; 2019; 2020). In this way, the highest developed EU countries are net exporters of chemicals and related products.

This is possible because the biggest transnational corporations place a modern and low-emission production of chemicals in the highest developed states (named the First World) but a dangerous and toxic production of chemicals is transferred to less developed countries. The next steps are exports of particular chemicals made by transnational corporations in the highest developed countries to the less developed countries and imports of other chemicals which are produced by global corporations or small or medium companies in the less developed states to the First World.

In this way the less developed countries obtain lower advantages from the international trade than highest developed states (Staszczak, 2012). Such a solution means a subordination of less developed countries to the collective global hegemony of states and transnational corporations.

A similar effect is promoted the REACH regulations which forced the chemical industry of the new EU country-members (mostly the former Soviet bloc's countries named the Second World) to cover big costs of transformation of the production processes. Some companies will not be able to adapt and will go bankrupt.

Then transnational corporations purchase companies in Eastern European countries. This is also an example of lobbying by the strongest states and the biggest transnational corporation in the European Union.

Author tries to prove the two following hypothesis: the first one that highest developed EU countries dominate in exports and imports of chemicals and the second hypothesis that the State-corporation Hegemonic Stability Theory explains contemporary situation in production and international trade in chemicals and related products.

3. Changes of Positions of EU-27 Net Exporters of Chemicals and Related Products in 2016, 2019 and 2021 within the Background of International Trade Balance in all Goods

There were eight chemical net exporters in the European Union in the analysed time period, except nine ones in 2016. Four of the first five EU net exporters of chemicals and related products, except Ireland, were highest developed countries and this fact confirms the first hypothesis.

Germany dropped from the first to the second position and Ireland advanced from the second to the first position in 2016-2019. Germany regained the first position and Ireland the returned to the second position in 2021. Belgium and Netherlands exchanged the third and the fourth positions. France maintained the fifth place while Denmark and Sweden remained on the sixth and seventh positions respectively in 2016, 2019 and 2021. The above facts confirm a relatively stable positions of the major EU net exporters of chemicals. The first four EU net exporters of chemicals were net exporters of all goods in 2016, 2019 and 2021.

Table 1. *Changes of positions of EU net exporters of chemicals and related products in 2016, 2019 and 2021*

Position	Country	Trade balance in chemicals and related products	Trade balance in all products	Position	Country	Trade balance in chemicals and related products	Trade balance in all products	Position	Country	Trade balance in chemicals and related products	Trade balance in all products
		billions euro				billions euro				billions euro	
2016				2019				2021			
1	Germany	57.71	251.72	1	Ireland	75.33	61.19	1	Germany	74.93	178.39
2	Ireland	51.63	44.85	2	Germany	58.50	228.26	2	Ireland	72.72	59.27
3	Netherlands	26.63	63.17	3	Netherlands	32.34	65.16	3	Belgium	47.32	29.55
4	Belgium	19.60	16.92	4	Belgium	23.17	16.03	4	Netherlands	36.96	66.10
5	France	13.38	-60.02	5	France	19.57	-74.73	5	France	15.14	-109.65
6	Denmark	8.26	8.84	6	Denmark	12.68	11.53	6	Denmark	12.32	4.72
7	Sweden	1.42	-1.6	7	Sweden	2.98	1.41	7	Sweden	2.97	2.32
8	Slovenia	0.72	2.14	8	Slovenia	0.01	0.83	8	Lithuania	0.59	-3.19
9	Malta	0.49	-2.93	-	-	-	-	-	-	-	-

Source: *Eurostat 2022.*

4. Changes of Positions of EU-27 Net Importers of Chemicals and Related Products in 2016, 2019 and 2021 within the Background of International Trade Balance in all Goods

European Union had eighteen net importers in 2016 and nineteen ones in 2019 and in 2021. Many EU net importers of chemicals and related products were less developed countries that confirmed the second hypothesis that chemicals made according to expensive and low emission processes were produced and exported by transnational

corporations located in high developed states in accordance with the State-corporation Hegemonic Stability Theory.

Table 2. *Changes of positions of EU net importers of chemicals and related products in 2016, 2019 and 2021*

Position	Country	Trade balance in chemicals and related products	Trade balance in all products	Position	Country	Trade balance in chemicals and related products	Trade balance in all products	Position	Country	Trade balance in chemicals and related products	Trade balance in all products
		billions euro				billions euro				billions euro	
2016				2019				2021			
1	Poland	-9.64	3.88	1	Poland	-10.43	1.19	1	Poland	-14.34	-0.58
2	Italy	-6.77	49.64	2	Spain	-8.95	-34.62	2	Romania	-10.90	-24.41
3	Spain	-6.68	-19.01	3	Romania	-8.28	-17.59	3	Spain	-9.54	-30.95
4	Romania	-6.61	-9.97	4	Czechia	-6.39	17.94	4	Czechia	-8.01	12.24
5	Czechia	-6.09	17.71	5	Portugal	-5.32	-20.07	5	Portugal	-6.95	-19.53
6	Greece	-4.15	-16.87	6	Greece	-4.56	-21.86	6	Italy	-5.95	44.91
7	Portugal	-4.08	-11.38	7	Slovakia	-3.19	-0.44	7	Greece	-5.29	-25.40
8	Slovakia	-2.93	2.13	8	Croatia	-1.55	-9.80	8	Slovakia	-3.84	-0.04
9	Bulgaria	-1.47	-2.14	9	Bulgaria	-1.51	-3.86	9	Croatia	-2.10	-5.39
10	Croatia	-1.38	-7.30	10	Finland	-1.43	-9.80	10	Bulgaria	-2.00	-4.41
11	Finland	-1.28	-2.67	11	Estonia	-0.99	-1.72	11	Estonia	-1.25	-1.77
12	Austria	-0.92	-5.10	12	Italy	-0.96	56.11	12	Slovenia	-1.16	-0.24
13	Estonia	-0.81	-1.62	13	Luxembourg	-0.85	-6.98	13	Luxembourg	-1.13	-7.78
14	Latvia	-0.69	-1.93	14	Latvia	-0.79	-2.91	14	Latvia	-0.96	-3.04
15	Luxembourg	-0.57	-5.50	15	Cyprus	-0.41	-5.07	15	Austria	-0.95	-14.19
16	Lithuania	-0.37	-2.13	16	Lithuania	-0.36	-3.32	16	Hungary	-0.82	-1.01
17	Cyprus	-0.29	-4.40	17	Hungary	-0.31	2.85	17	Finland	-0.79	-3.40
18	Hungary	-0.16	7.24	18	Austria	-0.28	-5.42	18	Cyprus	-0.42	-5.39
-	-	-	-	19	Malta	-0.16	-3.75	19	Malta	-0.12	-3.00

Source: *Eurostat, 2022.*

Poland maintained the first position in the whole researched period. This fact proved the dependency of Poland on imports of chemicals and related products. The Polish deficit in chemicals promoted a reduction of the surplus on the balance of trade in all products in 2016 and 2019 and contributed to the small deficit of total trade in 2021.

Italy decreased a chemical trade balance drastically in 2016-2019 and dropped from the second to the twelfth position. However, Italian trade deficit in chemicals increased and this country achieved the sixth place in 2021.

Other major net importers of chemicals changed their positions minimally, e.g., Spain advanced from the third position in 2016 to the second place in 2019 and dropped again to the third position in 2021, while Romania advanced from the fourth place in 2016 to the third position in 2019 and to the second place in 2021.

Most EU net importers of chemicals and related products were also net importers of all products, with exception of Italy and Czechia in 2021. Moreover, Poland and Hungary were net exporters of all goods in 2016 and 2019 and Slovakia in 2016.

5. Positions of Particular Major EU-27 Countries in the Exports of Chemicals and Related Products: Importance of Exports of Chemicals in the Exports of all Goods in 2016, 2019 and 2021

The major EU-27 chemical exporters achieved a stable growth in value of exports of chemicals in the analysed time period. The first two countries, i.e. Germany and Belgium retained their positions. Other main exporters also maintained or minimally changed their positions. The Netherlands advanced from the fourth to the third place and France dropped from the third to the fourth position in 2019 and 2021.

Table 3. *Changes of positions of major EU-27 countries in the value of exports of chemicals and related products in 2016, 2019 and 2021*

Position		Exports			Position		Exports			Position		Exports		
	Country	chemicals	all products	Share*		Country	chemicals	all products	Share*		Country	chemicals	all products	Share*
		billions euro		%			billions euro		%			billions euro		%
2016					2019					2021				
1	Germany	191.49	1205.49	15.9	1	Germany	216.43	1330.41	16.3	1	Germany	254.96	1380.14	18.5
2	Belgium	105.87	359.76	29.4	2	Belgium	120.90	399.10	30.3	2	Belgium	162.59	461.62	35.2
3	France	83.95	453.07	18.5	3	Netherlands	108.34	633.06	17.1	3	Netherlands	127.49	708.11	18.0
4	Netherlands	83.31	515.93	16.1	4	France	96.13	509.95	18.8	4	France	104.01	494.74	21.0
5	Ireland	66.27	118.23	56.0	5	Ireland	92.89	151.51	61.3	5	Ireland	98.73	161.20	61.2
6	Italy	52.56	417.27	12.6	6	Italy	67.80	480.35	14.1	6	Italy	73.54	516.26	14.2
7	Spain	34.55	262.04	13.2	7	Spain	40.48	298.34	13.6	7	Spain	52.00	323.49	16.1
8	Austria	18.08	137.41	13.1	8	Denmark	23.53	99.24	23.7	8	Poland	27.94	285.83	9.8
9	Denmark	17.90	86.14	20.8	9	Austria	21.89	159.59	13.7	9	Denmark	26.35	106.53	24.7
10	Poland	16.86	184.17	9.1	10	Poland	21.63	238.18	9.1	10	Austria	25.73	171.54	15.0
11	Sweden	15.68	125.90	12.4	11	Sweden	18.96	143.42	13.2	11	Sweden	21.47	160.51	13.4
12	Hungary	10.31	92.07	11.2	12	Hungary	13.06	110.58	11.8	12	Hungary	15.93	119.91	13.3

Source: *Eurostat 2022 and Author's calculations – percentage shares (*share of exports of chemicals and related products in total exports)*

Poland, the first net chemical importer in the searched time period, advanced from the tenth position in 2016 and 2019 to the eighth place in 2021 in the value of chemical exports. This country achieved the lowest share of chemical exports in the total exports in 2016, 2019 and 2021. Ireland – the first net chemical exporter in 2019 and the second one in 2016 and 2021 was the fifth exporter in value of chemicals in the analysed time period.

Moreover, this country achieved the highest share of chemical exports in the exports of all products. This fact proves the chemical orientation of Irish production and exports. The chemical exports are an important part of total exports for all major EU-27 chemical exporters.

The first four countries in the value of chemical exports were highest developed states that confirmed the first hypothesis.

6. Positions of Particular Major EU-27 Countries in the Imports of Chemicals and Related Products: Importance of Imports of Chemicals in the Imports of all Goods in 2016, 2019 and 2021

The major EU-27 chemical importers achieved a stable growth in value of imports of chemicals in the analysed time period. The first two countries, i.e., Germany and Belgium maintained their positions. Other main importers also maintained or minimally changed their positions. The Netherlands advanced from the fifth position in 2016 to the third place in 2019 and 2021. France dropped from the third to the fourth place in 2019 and 2021 in spite of the growing imports of chemicals. All major EU-27 chemical importers increased their value of chemical imports.

Table 4. *Changes of positions of major EU-27 countries in the value of imports of chemicals and related products in 2016, 2019 and 2021*

Position	Country	Imports			Position	Country	Imports			Position	Country	Imports		
		chemicals	all products	share *			chemicals	all products	share *			chemicals	all products	share *
		billions euro		%			billions euro		%			billions euro		%
2016					2019					2021				
1	Germany	133.78	953.76	14.0	1	Germany	157.93	1102.15	14.3	1	Germany	180.03	1201.74	15.0
2	Belgium	86.27	342.83	25.2	2	Belgium	97.72	383.06	25.5	2	Belgium	115.27	432.07	26.7
3	France	70.57	513.10	13.7	3	Netherlands	76.00	567.89	13.4	3	Netherlands	90.53	642.01	14.1
4	Italy	59.33	367.62	16.1	4	France	76.56	584.68	13.1	4	France	88.87	604.39	14.7
5	Netherlands	57.18	452.76	12.6	5	Italy	68.76	424.24	16.2	5	Italy	79.49	472.07	16.8
6	Spain	41.23	281.06	14.7	6	Spain	49.42	332.96	14.8	6	Spain	61.54	354.44	17.4
7	Poland	26.50	180.28	14.7	7	Poland	32.06	236.99	13.5	7	Poland	42.28	286.41	14.8
8	Austria	19.00	142.51	13.3	8	Austria	22.17	165.01	13.4	8	Austria	26.68	185.73	15.4
9	Ireland	14.64	73.38	19.9	9	Czechia	17.91	159.96	11.2	9	Ireland	26.01	101.94	25.5
10	Czechia	14.63	129.27	11.3	10	Ireland	17.55	90.33	19.4	10	Czechia	22.13	179.33	12.3
11	Sweden	14.26	127.46	11.2	11	Sweden	15.98	142.01	11.2	11	Sweden	18.50	158.19	11.7
12	Hungary	10.47	84.83	12.3	12	Hungary	13.37	107.73	12.4	12	Hungary	16.76	120.92	13.9

Source: *Eurostat 2022 and Author's calculations – percentage shares (*share of imports of chemicals and related products in total imports).*

Poland was ranked seventh and Ireland ninth (except tenth in 2019) in the value of chemical imports in the analysed time period. Belgium and Ireland had the biggest percentage share of chemical imports in the total imports. A high percentage share of chemical imports in the total imports is a characteristic phenomenon for all major EU-27 importers of chemicals and related products.

The first five countries in the value of chemical imports were highest developed states in spite of the fact that these states were not the biggest net importers of chemicals (except the second place of Italy in 2016) that confirmed the first hypothesis.

7. Conclusions and Perspectives

Major EU-27 chemical net exporters and net importers, and major EU-27 countries in the value of exports and imports of chemicals and related products had a relatively stable positions and changes were not so important that confirmed the first hypothesis. The ending covid-19 pandemic did not change this situation. The growing economy promoted an increase of chemical exports and imports value.

Poland was the first net importer of chemicals and related products with the lowest share of chemical exports in the total exports in the analysed time period. This fact confirmed the Polish dependency on chemical imports. Whereas, Ireland was the first (in 2019) and the second (in 2016 and 2021) net exporter with the highest share of chemical exports in the exports of all goods. This fact proved the chemical orientation of Irish production and exports.

Author proved the occurrence that major EU net exporters of chemicals and related products, except Ireland, were highest developed countries, and major EU net importers were less developed countries. Highest developed countries exported more expensive chemicals that were made by use modern and low emission technology.

Less developed countries exported cheaper chemicals which were produced by adaptation of harmful for health and the environment production methods. In this way, Author proves the second hypothesis that less developed countries are subordinated to the collective global hegemony of state-powers and biggest transnational corporations according to the the State-corporation Hegemonic Stability Theory.

This situation was relatively stable in 2023. European Union and China were net exporters of chemicals with balance amounting to 198 billion euro and 22 billion euro respectively. EU is the biggest global exporter of chemical products with exports amounted to 523 billion euro and imports amounted to 325 billion euro. The biggest growth of EU sold chemical production was between 2020 and 2022. U.S.A. was net importer with a balance amounting to -61 billion euro, (Eurostat, 2025). The above facts confirm the existence of the collective global hegemony.

Author claims that if the Green Dear is not changed or cancelled, it can reduce the EU production and exports of chemicals and related products in the near future.

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