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Insights about the Effects of COVID-19 on International Trade during the Main Pandemic Years in Romania and Poland

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Abstract: The COVID-19 crisis disrupted the economic life of the entire world and caused various disturbances at different levels in economies and societies. Consequently, the study of the economic impact of the health crisis became necessary to identify the influences that the health crisis had on numerous activities, including economic ones. There are calls for more studies to be conducted about the effects of COVID-19 at different levels so that lessons can be learned. The present paper answers these calls and focuses on the analysis of the impact of the COVID-19 crisis on international trade at the country level by investigating two European countries, Romania and Poland. First, it analyzes the macro-level context of the two countries during the COVID-19 pandemic. Then, a regression methodology is employed to measure the impact of the COVID-19 burden (which includes the number of cases and the number of deaths related to COVID-19) on the export and import flows in Romania and Poland. The investigation refers to the first two years of the COVID-19 pandemic, 2020–2021, which were the most significant. The results of the regression analysis showed that international trade was affected by the COVID-19 burden in the two countries, but the influences were different in the two countries. Exports and imports in Poland were more affected by COVID-19 than exports and imports in Romania. COVID-19 also had a higher impact on the import than the export flows in both countries during the period considered. The negative assumed relationships between COVID-19 burden and international trade flows were not verified in these specific country cases. This paper provides more evidence about the economic impact of the COVID-19 crisis, contributing to a better understanding of the economic effects of health crises in general.

Keywords: international trade; COVID-19 pandemic; Romania; Poland; economic impact; exports; imports

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1. Introduction

The COVID-19 crisis is seen as having unprecedented and unexpected consequences in various domains, including the economic one [1], with multiple level effects that define an economic crisis at the global level [2,3]. The multiple levels at which the COVID-19 crisis was felt include the world, country, industry, organizational, and individual levels [4,5]. One domain considered to be impacted by the COVID-19 crisis is the economic interdependencies between countries [6]. One of the main forms of economic relationships among nations is international trade [1], which plays a crucial role in global supply chains (GSC) and is frequently encountered in the world economy in the era of globalization [7]. Therefore, there is a great deal of interest in analyzing how GSC and international trade have been affected by the COVID-19 crisis [8,9]. At the onset of the health crisis, during the first shock caused by COVID-19, researchers [10,11] attempted to forecast the impact of the COVID-19 crisis on international trade relations based on simulations. There were only a limited number of studies that used collected data [12,13]. Consequently, there is a call to conduct more studies that actually use econometric models and real data rather than simulations [14,15]. It is also necessary to investigate the impact of the COVID-19

crisis on various aspects of economic and social life [9,16] and at different levels [17], which has been acknowledged in the literature by researchers [18]. The present research answers such calls.

The present paper addresses the following research question: "Did the COVID-19 crisis affect international trade at the country level?".

Accordingly, this study's main aim is to investigate the degree to which the COVID-19 virus-related crisis influenced the evolution of international trade during 2020–2021, which were the most significant years of the COVID-19 pandemic, based on data collected for two selected European countries, Romania and Poland. The main objectives of the research are to identify: the influence of COVID-19 on the countries' economies in general; the impact of COVID-19 on the overall international trade (both total exports and total imports, as two separate components of international trade) of the two countries; and to compare the evolutions and influences in the two countries in respect to the above.

To reach the aim and the above objectives, the analysis starts by presenting the economic evolutions of the two countries during the COVID-19 pandemic and compares them with the pre-COVID-19-outbreak period, considering Gross Domestic Product (GDP) changes, unemployment, and inflation as major macro-level indicators. After setting the general economic context, the analysis continues by looking at how the actual incidence of COVID-19 cases and COVID-19-related deaths (defined in the literature as the COVID-19 burden [12]) influenced the import and export flows in Romania and Poland in the first two years of the pandemic, 2020–2021. The analysis contributes to the existing knowledge and research that looks at the effects of health crises on economic life [19] by addressing the impact of the specific health crisis caused by the COVID-19 virus on international trade at the country level.

The paper has the following organization. The next section revises recent studies that analyzed the influence of the COVID-19 crisis on international trade. This is followed by the methodology section, which comprises details about the two types of analyses that were conducted. The results are depicted in two sections, one that focuses on the economic evolutions at the country level during the COVID-19 crisis and one that presents the findings about the effect of the COVID-19 burden (defined as the number of COVID-19 cases and the number of COVID-19 deaths) on exports and imports in the two selected countries in the period of 2020–2021. The last section comprises discussions and conclusions that include the main findings and how they relate to the literature, theoretical and practical contributions of the research, limitations of the present research, and proposals for further research. The present paper provides more evidence about the impact of COVID-19 on the general international trade at the country level and differentiates itself from other existing studies on the topic by considering multiple statistical models that incorporate the COVID-19 influencing factors as sole indicators or as combined indicators in two ways. First, it uses real data for testing the models, and second, it considers both facets of international trade, exports and imports, as separate flows, given that, at country level, the situation of the two trading activities can be differently influenced by the pandemic [6].

2. International Trade and COVID-19 in the Literature

In general, it is considered that health crises have a contagion effect: a health crisis affects the aggregate demand due to diminished household spending, which leads to higher uncertainty of the future with negative effects on demand, investment, and trade [19].

The COVID-19 crisis is recognized as a huge disruptor of the global economy, including global economic flows [1,7,8,20,21]. As part of this, global supply chains and global value chains (GVC) have also been disturbed during the COVID-19 outbreak [7,17,22]. International trade, as one main component in the functioning of the GVC, was also influenced by COVID-19.

There are some studies that analyzed the influence of the COVID-19 crisis on international trade. These studies agreed that, at the beginning of the crisis, international trade flows were impacted in a negative way by the lockdowns and border closures that took

place in numerous countries [23,24]. Different studies conducted earlier tried to identify the impact of COVID-19 on international trade by focusing on forecasting the evolution of international trade based on assumed conditions and simulations during the COVID-19 period [10,11]. For example, Baldwin and Tomuira [10] and Javorcik [25] demonstrated how global value chains were disrupted and strong production shocks were induced, causing detrimental effects on production, local and international trade, and unemployment. Only a few early studies [12,20] used real data from existing statistics to estimate the impact of COVID-19 on international trade. Subsequently, however, studies based on real data tried to identify the effects of COVID-19 on international trading from different perspectives. Espitia and colleagues [15] discovered that COVID-19 negatively affected international trade, and they also found that specific characteristics of different economic sectors (such as how feasible is remote work, how durable are goods, and how integrated are the economic sectors into the GVC) had a role in either diminishing or increasing the negative effects on trade that were associated with the COVID-19 shocks. Khorana et al. [18] used gravity modelling and examined the link between bilateral trade flows in Commonwealth countries and COVID-19. They found that the influence of COVID-19 in both exporting and importing countries negatively influenced imports but positively influenced exports in the case of more-developed countries. In Romania, Tudorache and Nicolescu [26] found negative influences of COVID-19 deaths on the country's main bilateral trade connections in 2020. Petrylė [27] identified that, in Lithuania, COVID-19 had negative influences on the exports between Lithuania and certain country partners, but it also had positive influences in the case of other country partners. Mena et al. [28] described a number of country-specific factors that either fostered or hampered international trade resilience during COVID-19, including the country's participation in globalization, the degree of economic development, the level of health care preparedness, and the level of governmental response. Urgulu and Jindřichovská [6] found that COVID-19 had an important impact on international trade in Visegrad countries. They also pointed out structural modifications in the foreign trade flows in the analyzed countries during the COVID-19 period. In France, a study [7] identified that companies involved in GVC were more strongly affected by COVID-19, experiencing higher decreases in their exports than non-GVC-exporting companies. They were also able to differentiate the negative impact of the pandemic depending of the position of the company in the GVC, with the companies that were located more downstream in the GVC being more negatively affected by the COVID-19 pandemic, both in terms of imported intermediary inputs and exports of final goods. It can be observed that some of the studies investigating the relationship between COVID-19 and international trade used a company-level perspective, which is one important research direction about the effects of COVID-19 [29,30], while others used a country level perspective, as presented in this study.

However, from the beginning of the COVID-19 crisis, there were calls for research studies to be completed at all levels [17], so that researchers could better understand the influences, of health crises in general and the COVID-19 crisis in particular, on economies and societies at different levels (starting at global level and ending at individual level) [16,17] and in various fields of activity [9,16]. The present study contributes to filling in these research gaps by providing evidence about the economic impact of the COVID-19 crisis on the international trade, offering more information about the COVID-19 effects at country level, and also adding to the literature that considers the economic consequences of health crises in general.

Another call for research was made by Espitia and colleagues [15], who demanded more studies about the economic influence of COVID-19 based on real collected data as opposed to designing scenarios based on simulations, as was the case at the beginning of the COVID-19 outbreak. The present study helps to fill in this research gap by analyzing the effect of COVID-19 incidences on the foreign trade of a country by using econometric models that were tested with real life data collected from international organizations' databases.

Other authors [28] pointed out the need to identify how COVID-19 influenced international trade and how the resilience of foreign trace can be built over the long term. The

present study attempts to fill in this research gap by examining the influence of COVID-19 burden and other factors on international trade during the first two years of the pandemic (2020–2021).

Given the above calls for more research about how COVID-19 impacted international trade, the general purpose of the present research is to explore if and how the COVID-19 burden (number of COVID-19 cases and number of COVID-19 deaths) influenced a country's international trade, given the general economic context of countries during the COVID-19 pandemic.

Starting from the research framework developed by Hayakawa and Mukunoki [12,20] to analyze the impact of COVID-19 on international trading, the present research proposes a research framework that contains two levels:

(a) The first level includes the description of the general economic situation and evolution of a country during the pandemic years, as economic background for the development of its international trade.

(b) The second level includes the analysis of the relationships between independent variables both health related and economic related and the international trade of countries.

Figure 1 presents the research framework.

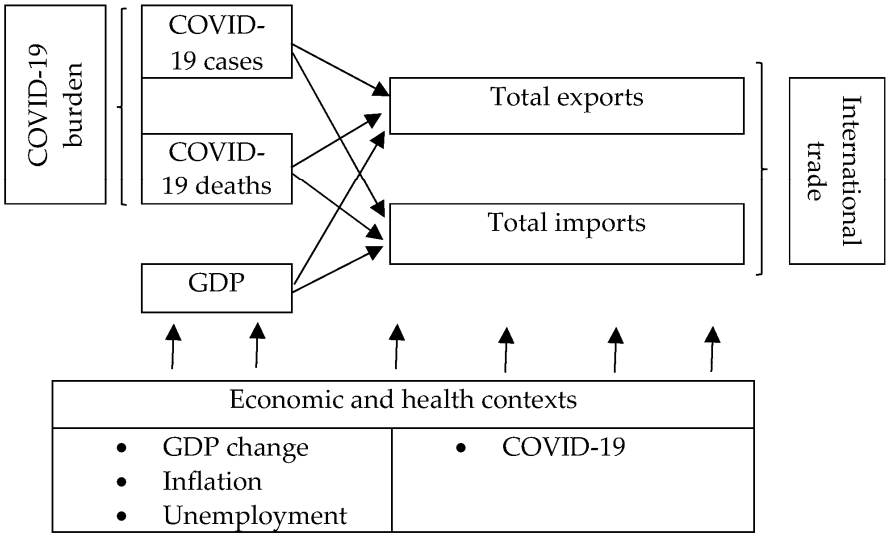

Figure 1. Research framework.

3. Materials and Methods

The major goal of this study is to analyze the influence of the crisis as determined by COVID-19 on international trade at the country level, given the overall economic context during the pandemic, of each respective country. In addition, this paper has several main objectives: (a) to characterize the economic context of countries through an analysis of the effects of COVID-19 on main the macro-level aspects during 2020–2021; (b) to explore the relation between the COVID-19 and exports; (c) to explore the relation between the COVID-19 and imports and d) to compare countries in respect to the influence of COVID-19 on their foreign trade.

Therefore, the research starts with an analysis of the general economic evolution of the selected countries, Romania and Poland, during the COVID-19 period. It then continues with an investigation of factors influencing international trade during the COVID-19 pandemic. Two main categories of factors are considered to study the economic impact of COVID-19 on trade: (a) health-related factors, namely the COVID-19 burden, measured as the number of COVID-19 cases and the number of COVID-19 deaths in a specific country [12,20] and (b) general influencing factors, such as the GDP. GDP is regarded as one of the classical economic factors that influence international trade in general during normal or crisis periods [12,31,32]. The literature exemplifies that the relationship between GDP

and international trade is mutual, as GDP depends on international trade, but international trade also depends on GDP [6]. In the present research, GDP is used as an independent variable, similar to other studies. For example, Khorana et al. [18] discussed how, during the COVID-19 pandemic outbreak, the GDPs of Commonwealth countries were impacted, then showed how the economic downturns of those countries had a further negative impact on their international trade, pointing out at the relationship between GDP and international trade during the pandemic. In a study analyzing the influence of the COVID-19 pandemic on Lithuanian exports, GDP was one of the main regressors considered [27].

The analysis focuses on the largest countries (in terms of population) from Central and Eastern Europe, which are Romania and Poland, respectively. The two countries have been chosen for the analysis based on the findings that point to different impacts of COVID-19 on trade in various categories and groups of countries [12], such as developed and developing countries [20] or high-income and low-income countries [18]. Poland and Romania are part of a specific group of countries, a region presented as Central and Eastern Europe, that comprises the former communist countries from Europe. This group of countries are seen as a distinct group that share historically similar economic and political similarities and have transitional economies [33]. Therefore, Poland and Romania were chosen to represent this specific region and group of countries. Moreover, the two countries are among the countries in Central and Eastern Europe that are also part of the European Union (EU); this distinction makes the study even more interesting as it uses country case studies to illustrate how countries from Central and Eastern Europe that are also EU countries have been economically impacted by COVID-19, with a focus on international trading.

Two types of analyses are conducted; one analysis sets the general economic context during the COVID-19 crisis, and the other is the actual analysis of the influence of COVID-19 on international trade. The two types of analyses are detailed below.

The first analysis, looked at from two aspects, is meant to establish the study's economic context in terms of the relationship between COVID-19 and international trade, including: (a) the evolution of basic macro-level economic indicators during the period of 2019–2021, which includes the pre-COVID-19 period and the two first years of the COVID-19 pandemic and (b) the study of the correlation between the basic macro-level economic indicators and COVID-19. The three main economic aspects considered to characterize economic evolutions and the relation between COVID-19 and the economy in the first analysis were GDP changes, unemployment, and inflation. The frequency of data collected was quarterly for GDP change and monthly for unemployment and inflation. The period included in this analysis was 2019–2021, as in order to analyze the influence of COVID-19, it was necessary to understand the pre-COVID economic situation of the countries (i.e., the year 2019 was also included). The data for this first analysis was collected from Eurostat [34], the European Statistical Recovery Dashboard for the economic data (GDP change, unemployment, and inflation) and from the European Centre for Disease Prevention and Control of EU [35] for the data related to COVID-19. For the correlation analysis, the Pearson coefficient was computed in order to identify the existence and the strength of a linkage between the number of COVID-19 cases/1000 inhabitants and the GDP change, unemployment, and inflation, as these are some of the important indicators that portray the state of the economy of a country.

The second analysis looked directly at the influence of COVID-19 on international trade. The relationships between the two elements of international trade, total exports and total imports, and the COVID-19 burden were studied using the Ordinary Least Squares (OLS) regression analysis, as it is a classical form of regression. The OLS regression methodology was previously employed in other studies that investigated the impact of COVID-19 on international trade. Khorana et al. [18] used this method to analyze how bilateral trading relationships (measured by exports) of Commonwealth countries were affected by COVID-19, considering factors such as COVID-19 cases, COVID-19 deaths, GDP, distance between countries, and sharing a border as independent variables. Espitia

et al. [15] employed OLS to assess the relationship between supply and demand shocks associated with COVID-19 and the growth of bilateral exports during the pandemic.

In the present research, few regression models were tested. In these models, total exports and total imports at country level were the dependent variables and the independent variables were represented by the considered influencing factors. The models are also presented in the regression Equations (1)–(4). The influencing factors included in the models are as follows:

(a) the COVID-19 burden, in order to identify the influence of the COVID-19 crisis on international trade. The COVID-19 burden was defined as the number of COVID-19 cases and the number of COVID-19 deaths, similarly to [12,20].

(b) the GDP was also considered (as an absolute figure, million EUR), as it is recognized in the literature [29,30,36,37] as being, in general, one major influencing factor of international trade.

Four regression models were tested. Two models considered COVID-19 indicators separately: Models 1 and 2 considered the COVID-19 cases and then the COVID-19 deaths as influencers of international trade, respectively. Then, Model 3 considered both the COVID-19 cases and the COVID-19 deaths taken together, and Model 4 considered the COVID-19 burden (cases and deaths) and the GDP taken all together. The four models were tested twice, once for total exports and once for total imports. Their regression equations are as follows:

Model 1:

$$Exp_{i,t} = \beta_0 + \beta_1 logCovCas_{i,t} + \varepsilon_{it} \quad (1a)$$

$$Imp_{i,t} = \beta_0 + \beta_1 logCovCas_{i,t} + \varepsilon_{it} \quad (1b)$$

Model 2:

$$Exp_{i,t} = \beta_0 + \beta_1 logCovDeaths_{i,t} + \varepsilon_{it} \quad (2a)$$

$$Imp_{i,t} = \beta_0 + \beta_1 logCovDeaths_{i,t} + \varepsilon_{it} \quad (2b)$$

Model 3:

$$Exp_{i,t} = \beta_0 + \beta_1 logCovCas_{i,t} + \beta_2 logCovDeaths_{i,t} + \varepsilon_{it} \quad (3a)$$

$$Imp_{i,t} = \beta_0 + \beta_1 logCovCas_{i,t} + \beta_2 logCovDeaths_{i,t} + \varepsilon_{it} \quad (3b)$$

Model 4:

$$Exp_{i,t} = \beta_0 + \beta_1 logCovCas_{i,t} + \beta_2 logCovDeaths_{i,t} + \beta_3 logGDP_{i,t} + \varepsilon_{it} \quad (4a)$$

$$Imp_{i,t} = \beta_0 + \beta_1 logCovCas_{i,t} + \beta_2 logCovDeaths_{i,t} + \beta_3 logGDP_{i,t} + \varepsilon_{it} \quad (4b)$$

where, β_0 represents the intercept; β_1, β_2 and β_3 depict the regression coefficients for the number of COVID-19 cases, the number of COVID-19 deaths and the GDP, respectively, and t and i subscripts refer to the country and the year, respectively. ε_{it} represents the error term.

Based on the previous findings presented in the literature [12,20,21,38], the hypotheses of the research assumed that that the COVID-19 burden (cases and deaths) had a negative influence on the international trade (total exports and total imports) of a country and that the GDP has a direct and positive influence on international trade. In other words, it was expected that an increase in the COVID-19 burden would cause a decrease in a country's total exports and total imports [12,20,21,38], while an increase in the GDP would cause an increase in total exports and total imports of a country [39].

More specifically, the following hypotheses were formulated:

Hypothesis 1a (H1a). *The number of COVID-19 cases in a country had a negative impact on total exports of the country during the COVID-19 pandemic.*

Hypothesis 1b (H1b). *The number of COVID-19 cases in a country had a negative impact on total imports of the country during the COVID-19 pandemic.*

Hypothesis 2a (H2a). *The number of COVID-19-related deaths in a country had a negative impact on total exports of the country during the COVID-19 pandemic.*

Hypothesis 2b (H2b). *The number of COVID-19-related deaths in a country had a negative impact on total imports of the country during the COVID-19 pandemic.*

Hypothesis 3a (H3a). *The GDP had a direct and positive influence on total exports of a country during the COVID-19 pandemic.*

Hypothesis 3b (H3b). *The GDP had a direct and positive influence on total imports of a country during the COVID-19 pandemic.*

Data collection took place for years 2020–2021, which were the main years of the COVID-19 pandemic. Data were gathered from the databases of international organizations as follows: exports and imports were collected from the World Trade Organization [40], the COVID-19 burden (number of COVID-19 cases and number of COVID-19 deaths) from the European Centre for Disease Prevention and Control of EU [35], and data regarding GDP from Eurostat [34]. Monthly data was collected for exports and imports. Data for the COVID-19 burden (cases and deaths) were collected as weekly data that was transformed in monthly indicators. Quarterly data were collected for the GDP, which was then decomposed into monthly data. GDP is usually presented in statistical evidences as quarterly data, but for the present research, monthly data was needed. The Eviews statistical software was used to decompose the quarterly GDP data into monthly data by using the function for converting low frequency data (quarterly GDP) to high frequency data (monthly GDP) based on quadratic-match-sum; this follows the software's recommendation in case of GDP. The data was collected for 2020–2021 for the two countries included in the analysis: Romania and Poland.

4. Results

This section presents the results for the two types of analyses conducted.

4.1. Evolutions of the Economy and of COVID-19 in 2020–2021 in Romania and Poland

In order to analyze the influence of the COVID-19 burden on international trade, the economic evolutions in the two countries are presented in this section to establish the economic context.

Romania had a population of 19,237,691 inhabitants in 2020, while Poland had a population of 37,846,611 in 2020, making the two countries the largest countries in Central and Eastern Europe that were also part of the European Union. The economic evolution of the two countries during the COVID-19 pandemic is considered by analyzing GDP changes, unemployment, and inflation.

Figure 2 illustrates the changes in the quarterly GDP during the period 2019–2021 in order to see the evolution from the pre-pandemic period to the first two years of pandemic. It can be observed that, prior to the COVID-19 crisis, in 2019, both countries had positive economic growth rates that were higher than the European Union average economic growth rate. When the health crisis started, GDP in both Romania and Poland started to decline only in the second quarter of 2020 (2020-Q2), which was unlike other European countries, where the decline started in the first quarter of 2020.

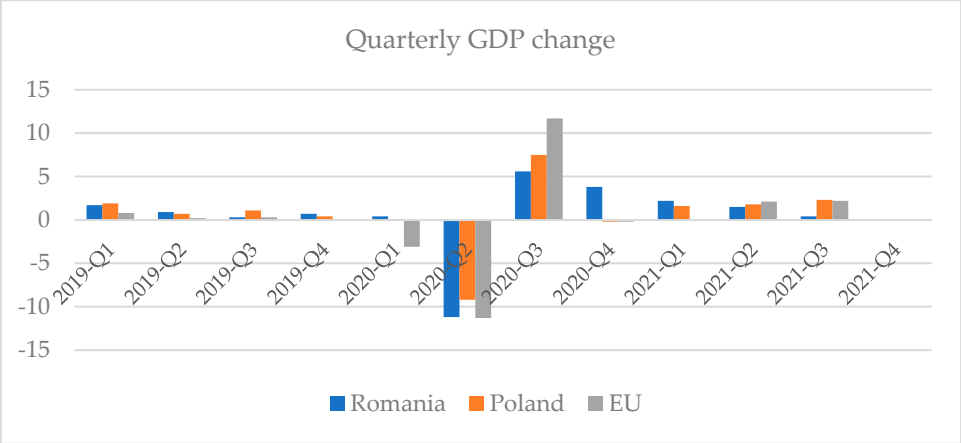

Figure 2. Quarterly GDP change: Poland, Romania, and EU, 2019–2021 (data from Eurostat) [34].

The strongest economic decline occurred in the second quarter of 2020, when Romania had a −11.2% decrease in GDP, similar to the European average of −11.3%, while Poland had a decrease in GDP of only −9.2%. This steep decline was associated with the period of total lockdown that occurred in the first half of 2020 (March–June/July) which took place at the global level, including in Europe and in the analyzed countries. In the third quarter of 2020 (2020-Q3), both countries started to recover, and their GDPs started to increase. In Poland the GDP increased by 7.5%, and by 5.6% in Romania. However, the GDP increase in both countries were smaller than the EU average of 11.7%. Each country's GDP was also lower than the previous quarters' decreases in GDP, illustrating a net economic decrease. In 2020–2021, GDP had fluctuating evolutions, and it can be stated that, by the end of 2021, the increases in the quarterly GDP in the two countries were modest, illustrating a small recovery, and almost an economic stagnation on overall.

Another important macro-level element is a country's unemployment. Figure 2 illustrates the evolution of unemployment in Romania and Poland in the period 2019–2021. Prior to the health crisis, in 2019, the monthly unemployment rates in Romania (4.7–5.1%) and Poland (3–3.2%) were smaller than the EU averages (6.7–7%), although Romania clearly had a higher unemployment rate than Poland. When the COVID-19 outbreak first occurred in 2020, unemployment increased in both Romania (6.2–6.7%) and Poland (3–3.4%) in the first half of 2020. Unemployment only started to decrease at the beginning of 2021 in Romania (at levels below 6%), while in Poland, unemployment continued to increase to levels up to 3.9%. Unemployment continued to be higher in Romania compared to Poland at the end of 2021, with unemployment rates of 3% in Poland and 5.2% in Romania. The overall evolution patterns (in spite of the differences in the absolute values of the unemployment rates) were similar in the two countries, with the unemployment levels at the end of 2021 approaching the levels of the pre-COVID-19 period in each country, as presented in Figure 3.

Inflation also influences highly the economy of a country. Figure 4 presents the evolution of inflation in Romania and Poland in the period 2019–2021. In 2019, prior to the health crisis, inflation rates were generally higher in Romania (3.2–4.4%) and Poland (1.3–3%) compared to the average EU inflation rates (1.1–1.6%), with Poland having lower inflation rates than Romania. Once the COVID-19 crisis started, inflation had different evolutions in the two countries. In Romania, a decrease in the inflation rate was encountered in 2020 (down to 1.7–2.5%); this is similar to the evolution of the average inflation rates in EU that during 2020, which had decreased down to 0.2–0.7%, then increased in 2021 (1.2–5.3%). In Poland, however, inflation rates increased in 2020 (2.9–3.8%) and then continued to increase in 2021 (up to 3.6–8%).

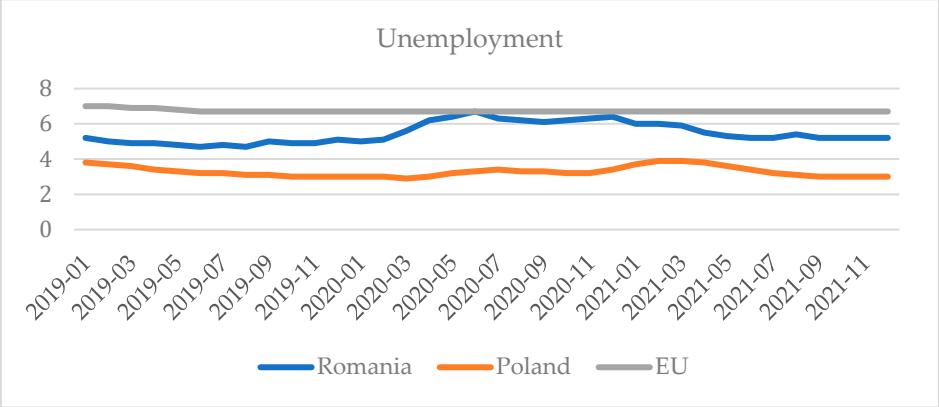

Figure 3. Monthly unemployment: Romania, Poland, and EU, 2019–2021 (data from Eurostat) [34].

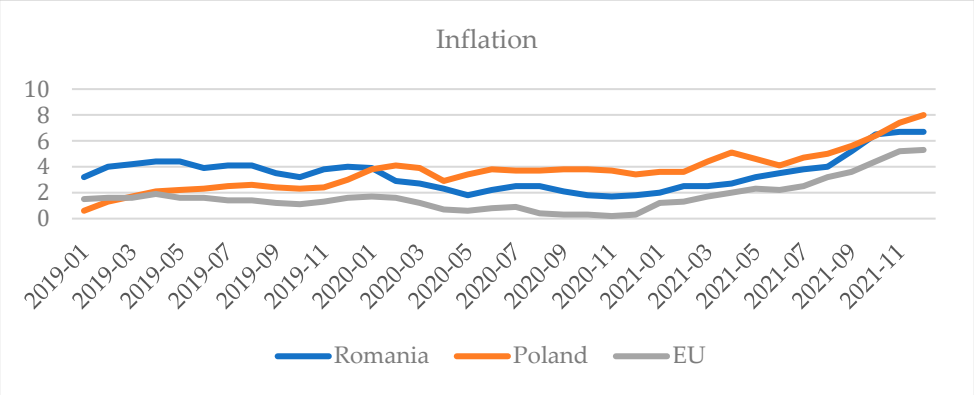

Figure 4. Monthly inflation: Romania, Poland, and EU, 2019–2021 (data from Eurostat) [34].

Overall, the economic evolutions of the two countries in the period 2019–2020 were somehow similar in terms of economic growth, with fluctuating GDPs once the health crisis begun. Poland had a better pre-COVID-19 economic situation than Romania (lower inflation and lower unemployment). Poland also seemed to have a more unfavorable economic evolution compared to Romania in 2020–2021, as it had higher inflation than Romania, but similar patterns of unemployment rates.

It is also of interest to see if the economic evolutions were related to the evolution of COVID-19. Therefore, first, the number of COVID-19 cases/1000 inhabitants in the two countries in the period 2020–2021 was computed, as presented in Figure 5. In this respect, there are two differences between the two countries: (a) the relative number of COVID-19 cases/1000 inhabitants was higher in Poland as compared to Romania and (b) the COVID-19 waves in Poland were stronger, and there were more high and low points with steeper slopes than in Romania. However, the highest number of COVID-19 cases/1000 inhabitants was encountered in Romania during the Delta variant peak in October 2021, when there were 23.68 cases of COVID-19/1000 inhabitants, compared to the highest peak in Poland in March 2021, when there were 19.46 cases of COVID-19/1000 inhabitants.

Second, a correlation analysis was conducted in order to identify if there is an association between the way the three analyzed macro-indicators changed and the way the COVID-19 cases evolved in the two countries during the analyzed period. Table 1 presents the results of the correlation analysis between the number of COVID-19 cases/1000 inhabitants and the three macro-level indicators considered: changes in the GDP, unemployment, and inflation.

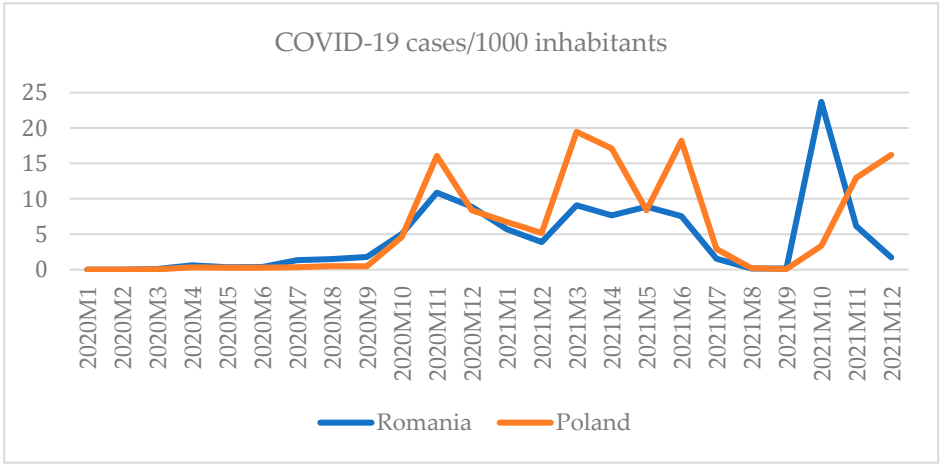

Figure 5. COVID-19 cases/1000 inhabitants: Romania and Poland, 2020–2021 (data from European Centre for Disease Prevention and Control of EU) [35].

Table 1. Correlation analysis of COVID-19 and macro-level indicators Romania-Poland, 2020–2021.

Correlations/Countries	Romania	Poland
Pearson coefficients (r)		
COVID-19 cases/1000 inh. with GDP change	0.0722	0.1644
COVID-19 cases/1000 inh. with unemployment	−0.2014	0.4450
COVID-19 cases/1000 inh. with inflation	0.2520	0.3656
Interpretation of the Pearson coefficients		
COVID-19 cases/1000 inh. with GDP change	Positive, Very weak	Positive, Weak
COVID-19 cases/1000 inh. with unemployment	Negative, Weak	Positive, Medium
COVID-19 cases/1000 inh. with inflation	Positive Weak	Positive, Medium

Note: Strength of the correlation: Very weak—under 0.01; Weak—r between 0.1 and 0.3; Medium—r between 0.3 and 0.6; Strong—r between 0.5 and 0.7 and Very strong—r above 0.7 [41].

The relationship between the relative number of COVID-19 cases and the GDP change was weak and positive in both countries in 2020–2021. In the case of unemployment, the direction of the relationship was different in Romania than it was in Poland; in Romania, the number of COVID-19 cases was negatively and weakly associated with unemployment, while in Poland, the number of COVID-19 cases was positively associated and at a medium strength with unemployment, suggesting a negative influence of COVID-19 on unemployment in Poland.

As far as inflation is concerned, the association between the COVID-19 cases and inflation was positive in both countries, with a low strength in Romania and a medium strength in Poland. So, it can be stated that COVID-19 affected macro-level conditions in the two countries, but with different strengths. The Romanian economy seemed less affected by COVID-19 than the Polish economy, given that the associations between COVID-19 and economic indicators were weak and very weak in Romania, respectively, while in Poland there were medium level correlations between COVID-19 and unemployment and inflation.

4.2. The Influence of COVID-19 Burden on Exports and Imports in Romania and Poland

This section presents first the results of the regression analysis at country level, followed by a comparison between the two analyzed countries regarding the influence of the COVID-19 burden on international trade.

4.2.1. Romania

Table 2 presents the results of the regression analysis for Romania. The examination of the tested regression models illustrates that, of the four considered models, only Model 4 was valid for both exports and imports at a 5% significance level in case of Romania. The testing of Models 1 and 2 showed that they were valid only in the case of imports at a lower 10% significance level. Overall, Model 3 seemed to be valid at 10% significance level for exports and imports, but this did not translate to statistically significant regression coefficients, as regression coefficients had significance levels close to, but higher than 10%, meaning that they were not significant from a statistical point of view. As can be seen in Table 2, Models 1, 2, and 3 have low explanatory values of under 25% for both exports and imports, while Model 4 has a medium explanatory value of 40% in the case of exports and of 43% in the case of imports.

Table 2. Results of the regression analysis—Romania.

	Romania							
	Model 1		**Model 2**		**Model 3**		**Model 4**	
	Exports	**Imports**	**Exports**	**Imports**	**Exports**	**Imports**	**Exports**	**Imports**
COVID-19 cases regression coefficients	0.0251 (0.017)	0.028 * (0.015)	-	-	0.060 (0.038)	0.0537 (0.034)	0.058 (0.034)	0.0522 * (0.030)
COVID-19 deaths regression coefficients	-	-	0.0560 (0.034)	0.0543 * (0.030)	0.008 (0.044)	0.0120 (0.039)	−0.018 (0.041)	−0.0131 (0.036)
GDP regression coefficients	-	-	-	-	-	-	0.591 ** (0.246)	0.5474 ** (0.216)
R squared (coefficient of determination)	0.0850	0.1374	0.1181	0.1368	0.2192	0.2362	0.4085	0.4361
F-statistics [*p*-value]	1.9526 [0.1768]	3.3453 * [0.0815]	2.6785 [0.1173]	3.1719 * [0.0901]	2.6678 * [0.0952]	2.9381 * [0.0773]	4.1442 ** [0.0213]	4.6419 ** [0.0142]
Akaike information criterion (AIC) for model fit	−0.1746	−0.4330	−0.1590	−0.3890	−0.1899	−0.4203	−0.3767	−0.6330

Note: ( ) standard errors in parentheses; [ ] *p*-value; ** *p*-value < 0.05; * *p*-value < 0.10.

Based on the low explanatory power of the models and the low level of statistical significance of the models that include only the COVID-19 burden indicators (either as individual factors or combined), it can be considered that the COVID-19 burden influenced the Romanian international trade in the period 2020–2021, but the influence was rather limited.

Further on, the analysis of the regression coefficients for Romania illustrates that only in Models 1 and 2, and solely in the case of imports, the regression coefficients had a 10% statistical significance; there was no statistical significance of the regression coefficients for any of the four models. Therefore, as illustrated in Model 1, when the number of COVID-19 cases increased in Romania, a small increase in imports occurred in the period 2020–2021. Similarly, Model 2 depicts that an increase in the number of COVID-19-related deaths was also associated with a small increase in Romanian imports.

However, Model 3, which combined the number of COVID-19 cases and the number of COVID-19 deaths in one multiple regression, had no statistically significant coefficients for either exports or imports. Model 4, which considered three factors at the same time, confirmed statistical significance only for the GDP factor in the case of both international trade components (exports and imports), reiterating that when the GDP increases, an increase in both exports and imports occurs.

The comparison of the goodness-of-fit of the tested models is performed using the Akaike information criterion (AIC), as it is one of the most widely used model selection tools in statistical practice [42] and is suitable for time series; it is also considered to perform

better with smaller sample sizes [43]. The minimum value of AIC in relative terms depicts the model with the best fit [42]. In the case of the four models and eight submodels that were tested on the same sets of data for Romania indicates that Model 4 is the optimal fitted model for both exports and imports.

Based on the results of the regression analysis, it can be confirmed that the influence of the COVID-19 burden on the overall international trade for the period 2020–2021 was rather small in Romania. This is explained by several factors: (a) The small explanatory powers of the models interpreted via the coefficients of determination (R-squared) for three out of the four models tested. The models that include as influencing factors only COVID-related indicators have the lowest explanatory values. (b) Only a few of the regression coefficients are statistically significant (4 out of 14), and the size of the regression coefficients is reduced. This illustrates the small changes in exports and imports that are determined by the changes in the COVID-19 burden.

Therefore, for Romania, it can be concluded that:

1. The Romanian international trade was influenced by the COVID-19 crisis during the period 2020–2021, but only in terms of total imports, and the influence was rather limited, manifesting at a modest level; there was no influence identified on total exports.

2. Imports were more influenced than exports by the evolution of the COVID-19 pandemic, with imports' increases associated with the increases in the COVID-19 burden indicators, probably caused by higher imports in medical supplies. In Romania, imports of medicinal and pharmaceutical products increased from 786 mill. USD in 2019 to 1358 mill. USD in 2021 [44], while imports of medical and surgical instruments increased from 354 mill. EUR in 2019 to 388 mill. EUR in 2021 [45].

3. The GDP impacts the Romanian international trade, even during the health crisis, proving that GDP is a strong influencing factor for exports and imports in various environmental and economic conditions.

4. The initial hypotheses according to which increases in the COVID-19 burden (cases and deaths) would cause decreases in international trade were not confirmed, as in three models, the relationships between the COVID-19 burden (both cases and deaths) and the exports and imports were direct and positive for both statistically significant and not statistically significant coefficients. In Model 4 only, there was an indirect relationship between the number of COVID-19 deaths and both exports and imports, illustrating a decrease in the international trade associated with an increase in the COVID-19 burden. However, the size of the coefficients was small and not statistically significant. Neither of the COVID-19-related hypotheses were verified for Romania.

4.2.2. Poland

Table 3 presents the results of the regression analysis for Poland. All four models with the two variants (exports and imports) were tested and found to be statistically significant. The explanatory power of the econometric models varied from a small explanatory value (15–19%) for Model 2 that included only the number of COVID-19 deaths as an influencing factor to a medium explanatory value (31–39%) for Models 1 and 3 and a large explanatory value for Model 4 (65–75%), which included all considered factors.

Therefore, it can be stated that the changes in the COVID-19 number of cases alone justified 35% of the changes in Polish exports and 31% of the changes in Polish imports in the period 2020–2021. At the same time, the changes in the number of COVID-19 deaths alone explained 19% of the export changes and 15% of the import changes in Poland in the two years analyzed.

The overall COVID-19 burden (that considered both cases and deaths taken together) explained 39% of the export changes and 36% of the import changes in Poland during 2020–2021. At the same time, the combined factors, including the overall COVID-19 burden and the country's GDP, explained 67% of the export changes and 75% of the import changes in Poland in the first two years of the COVID-19 pandemic.

Table 3. Results of the regression analysis—Poland.

	Poland							
	Model 1		**Model 2**		**Model 3**		**Model 4**	
	Exports	**Imports**	**Exports**	**Imports**	**Exports**	**Imports**	**Exports**	**Imports**
COVID-19 cases regression coefficients	0.0535 *** (0.016)	0.0547 *** (0.018)	-	-	0.0088 ** (0.035)	0.1014 ** (0.039)	0.0581 ** (0.027)	0.0616 ** (0.026)
COVID-19 deaths regression coefficients	-	-	0.0418 *** (0.018)	0.0403 * (0.021)	−0.0418 (0.037)	−0.0552 (0.041)	−0.0366 (0.028)	−0.048 * (0.026)
GDP regression coefficients	-	-	-	-	-	-	1.076 *** (0.273)	1.3921 *** (0.258)
R squared (coefficient of determination)	0.3563	0.3108	0.1954	0.1509	0.3963	0.3687	0.6759	0.7585
F-statistics [*p*-value]	11.0739 *** [0.0033]	9.0201 *** [0.0070]	4.8592 *** [0.0039]	3.5544 * [0.0740]	6.2366 *** [0.0082]	5.5497 ** [0.0126]	12.5166 *** [0.0001]	18.8488 *** [0.0000]
Akaike information criterion (AIC) for model fit	−0.9288	−0.6774	−0.7056	−0.4688	−0.9019	−0.6743	−1.4332	−1.5444

Note: ( ) standard errors in parentheses; [ ] *p*-value; *** *p*-value < 0.01; ** *p*-value < 0.05; * *p*-value < 0.10.

All four models were tested for both exports and imports and displayed regression coefficients that were statistically significant. As reported by the interpretation of Model 1, the increase in COVID-19 cases in 2020–2021 resulted in a small increase of both exports and imports. The testing of Model 2 illustrates similar results as Model 1 with the increase in the COVID-19 deaths, determining small increases in both exports and imports in Poland in 2020–2021. Model 3 shows that the relationships between the number of COVID-19 cases and exports and imports were direct and positive and also statistically significant, while the relationships between the number of COVID-19 deaths and exports and imports were indirect and negative, and they were not statistically significant. In Model 4, all regression coefficients for all three factors (COVID-19 cases, COVID-19 deaths, and GDP) were statistically significant in the case of imports in Poland during 2020–2021, while in case of exports, only the number of COVID-19 cases and the GDP had statistical significance. Model 4 illustrates that Polish imports were influenced by all three factors in 2020–2021, while exports were only influenced by the number of COVID-19 cases and the GDP.

Using the AIC to compare the four models applied for the same sets of data collected for Poland, the minimum values of AIC indicate Model 4 as the best fitted model among those tested for predicting both exports and imports during the COVID-19 crisis situation.

Based on the econometric analysis conducted for Poland, it can be stated that the COVID-19 burden (including COVID-19 cases and deaths) influenced Polish exports and Polish imports at a medium level during 2020–2021 for several reasons: (a) the explanatory power (based on R squared interpretation) of the four models was medium to high, and all models were statistically significant; (b) numerous regression coefficients (11 from the total of 14) were statistically significant (with 4 being statistically significant at a 1% level, 4 being statistically significant at a 5% level, and 2 being statistically significant at a 10% level).

Consequently, regarding Poland, the following conclusions can be made:

1. The COVID-19 crisis had a medium effect on the total Polish international trade in the first two years of the pandemic, 2020–2021.

2. The evolution of COVID-19 had an impact on both exports and imports in 2020–2021, but the impact was limited; the changes in the number of cases and deaths of COVID-19 triggered small changes in exports and imports, with the imports being influenced by COVID-19 at a slightly higher level than exports.

3. In the case of Poland, the GDP was the factor with the highest influence on the evolution of exports and imports during the COVID-19 crisis.

4. The hypotheses that assumed an indirect relationship between COVID-19 cases and exports and imports were not verified by data in the case of Poland. The increase in the number of COVID-19 cases did not cause a decrease in exports and imports in Poland in 2020–2021. The hypotheses that assumed an indirect relationship between the number of COVID-19 deaths and exports and imports were partially verified; only four of the total of six tested relationships in all four models were negative, with only one relationship being statistically significant. Only one COVID-19-deaths-related hypothesis was verified. Thus, the increase in the incidence of COVID-19 cases did not determine a decrease in exports and imports in Poland as was assumed; instead, the increase in the number of deaths related to COVID-19 were associated with small decreases in Polish exports and imports during the first two years of the COVID-19 pandemic. However, only one of the relations between COVID-19 deaths and imports was statistically significant.

4.2.3. Romania vs. Poland

It is of interest to investigate the impact of COVID-19 burden on international trade in both Romania and Poland through a comparative analysis. The study of the influence of the COVID-19 burden on exports and imports (as the two sides of international trade) in the two analyzed countries shows the existence of similarities and differences between the two countries. The comparison of the results of the regression analyses that depict the impact of COVID-19 on international trade of Romania and Poland is presented Table 4.

Table 4. Comparison of the regression analyses for Romania and Poland.

Elements of Comparison/Countries	Ro	Pl
Regression models' validity (total 8)	4	8
Regression models' explanatory value (R^2) (total 8)	4 VS; 2 S, 2 M	1 VS; 1 S; 4 M; 2 L
Regression coefficients' statistical significance, all coefficients (total 14)	5	10
Regression coefficients' statistical significance, exports (total 7)	1	5
Regression coefficients' statistical significance, imports (total 7)	4	5
Regression coefficients' statistical significance, GDP (total 2)	2	2
Regression coefficients' statistical significance, COVID-19 cases (total 6)	2	6
Regression coefficients' statistical significance, COVID-19 deaths (total 6)	1	3
Number of verified hypotheses	0 Ex	0 Ex
(4 equations for each: 4 exports and 4 imports—total 8;	0 Im	1 Im
2 equations for GDP—total 2)	2 GDP	2 GDP

Note: Ro—Romania; Pl—Poland; VS—very small (under 20%), S—small (20–30%), M—medium (30–60%), L—large (over 60%); Ex—exports, Im—imports.

The main similarities between the two countries are as follows: (a) International trade was affected by COVID-19 burden in Poland and in Romania in the first two years of the COVID-19 pandemic, 2020–2021. (b) In the two countries, imports were fairly more affected by COVID-19 than exports (based on the number of statistically significant regression coefficients, the size of the coefficients, and the testing of the hypotheses). The more intense influence of COVID-19 on imports can probably be explained by higher imports of specific medical supply determined by a higher COVID-19 burden. (c) The most powerful influencing factor of international trade in the analyzed period for both countries is the GDP, illustrating that GDP continues to be a highly influencing factor in a period of health crisis, similar to normal situations as also recognized in the literature [31,36,37]. For both Romania and Poland, the GDP-related hypotheses were verified. (d) The hypotheses assuming an indirect relationship between COVID-19 cases and international trade were not verified in either country for the period 2020–2021.

The main differences identified between Romania and Poland are as follows: (a) in Poland, the impact of the COVID-19 burden on international trade was stronger than in Romania (due to a higher explanatory power of all four models in Poland as well as the larger number of regression coefficients that have statistical significance in Poland as compared to Romania); (b) in Romania, only imports seem to have been affected by COVID-19, while in Poland both imports and exports were affected by COVID-19; (c) in Poland, there were more coefficients (four out of six) that indicated an indirect relationship between COVID-19 deaths and international trade, while in Romania there were only two coefficients (out of six) that indicated such an indirect relationship between COVID-19 deaths and international trade, even though many were not statistically significant; (d) in Romania, only the hypotheses related to the GDP were verified, but in Poland the hypotheses related to GDP were verified as well as one hypothesis related to the number of COVID-related deaths. Therefore, in Romania, the assumed relationships between variables were less present than they were in Poland. Again, the conclusion is that COVID-19 had a lower influence on international trade in Romania than in Poland in 2020–2021.

5. Discussion and Conclusions

The present paper analyzes the influence of the COVID-19 crisis on the trading relationships of two European countries, Romania and Poland.

The analysis of the economic context during the COVID-19 period shows that Poland had a better economic situation than Romania prior to the outbreak of the COVID-19 pandemic in terms of evolution of GDP, unemployment, and inflation. At the same time, at the macroeconomic level, Poland was more affected by the evolution of COVID-19 than Romania during 2020–2021, with increasing and higher inflation rates, but similar patterns in terms of unemployment evolution.

The regression analysis was used to measure the impact of the COVID-19 burden (measured through the number of COVID-19 cases and the number of COVID-19-related deaths) on total exports and total imports of the two countries in the main years of the COVID-19 pandemic, 2020–2021.

The main findings of this study are that the COVID-19 outbreak and the subsequent health crisis impacted international trade in the two countries, as the incidence of COVID-19 cases and also COVID-19 deaths affected imports and also exports in Romania and Poland in years 2020 and 2021. However, the influence was not the expected one, as the associations between exports and imports and the COVID-19 burden indicators were not negative, as had been assumed. Instead, COVID-19 was associated with increases in the total exports and imports of the two examined countries in 2020–2021. On the whole, imports were affected to a higher extent than exports in both countries by the COVID-19 burden. Results illustrate that the increase in the number of COVID-19 cases was associated with increases in imports in Poland and Romania, which was probably connected to the increased imports of highly needed medical supplies during that time. In regards to the impact of the number of COVID-related deaths, results were contradictory, as the number of deaths were positively related to exports and imports in some models, and in other tested models, an increase in the COVID-19-related deaths was associated with a decrease in exports and imports (especially in Poland). The best model explaining the influence of COVID-19 on international trade was Model 4 in both countries and in both cases that considered exports and imports as dependent variables.

The findings of this study indicate both similarities and differences regarding the influence of the COVID-19 burden on foreign trade flows in both countries analyzed. The main similarities identified are as follows: (a) The COVID-19 burden impacted international trade in the considered countries and the impact is small (or, at most, medium in Poland) in 2020–2021. (b) For both Romania and Poland, the relationship between the COVID-19 cases and flows of international trade were positive (contrary to expectations), indicating that when the number of COVID-19 cases increased, exports and imports also increased. (c) Considering the relationships between the COVID-19 deaths and exports and imports

in the two countries, both positive and negative relationships were encountered, indicating contradictory findings. (d) In both countries, the COVID-19 burden impacted imports at a higher level than exports. (e) In both countries, the GDP manifested a positive and direct relationship with foreign trade, with exports and imports increasing as the GDP increased. At the beginning of the COVID-19 pandemic (first quarters of 2020), both the countries' GDPs and their foreign trade faced sharp declines, only to recover later on and offset some of the negative impact of the first months of the pandemic [18], illustrating a direct relationship between the two types of variables. This reconfirms that GDP is one main influencing factor for international trade, both in normal times and also during times of health crises [32,46–48].

The differences between the two countries include: (a) the COVID-19 burden impacted international trade in Poland more than it did in Romania; (b) in Poland, the incidence of COVID-19 cases had a larger effect on exports and imports than the number of deaths, while in Romania, the impact of COVID-19 cases and deaths was somehow similar and small for both exports and imports; (c) one COVID-19 hypothesis was verified for Poland (the negative impact of the raise of COVID-19 deaths on Polish imports found in Model 4), while in Romania, neither of the COVID-19-related hypotheses were verified.

The unexpected identified relationships between COVID-19 burden and international trade (positive rather than negative) and the contradictory results (some models revealed positive connections while others revealed negative connections) may be explained by the following aspects: (a) COVID-19 manifested in waves with irregular increases and decreases in both number of cases and number of deaths, and the waves were not automatically and immediately reflected further in the evolution of exports and imports, as in international trade, there is a time lag between the moment of order and the actual shipments in case of exports and imports; (b) exports and imports were rather influenced by the direct and the indirect effects of the containment measures that governments applied when the COVID-19 outbreak took place. Romania and Poland implemented restrictions during the COVID-19 pandemic. Similar to the rest of the world, the containment measures were high and very restrictive at the beginning of the crisis (second quarter of 2020) [49], and later on there was the tendency toward relaxation (end of 2020), only to be raised again with increased COVID-19 incidences; ultimately, restrictive measures fluctuated together with the COVID-19 waves [16,50]. Containment measures, such as lockdowns with schools and workplace closures, stay at home restrictions, border closures, cancellation of public events and gatherings, face covering, and restrictions of domestic and international travelling were taken in both countries during the COVID-19 pandemic. According to the stringency index and the containment and health index [51] for the two countries, strong measures were taken in April 2020 (Ro: 69; Pl: 64–67), in November–December 2020 (Ro: 73–74; Pl: 64–69), in January–February 2021 (Ro: 77–75; Pl: 71–70); March–April 2021 (Ro: 74; Pl: 62–67), and in Romania at the end of 2021 (Ro: 71–72; Pl: 44–56). During 2020–2021, both countries had multiple periods with very strong containment measures, with Poland overall being a bit less restrictive than Romania [51].

The results of this research supplement the findings of other similar studies that looked at how international trade was affected by COVID-19 and were conducted either in the earlier stages of the COVID-19 crisis [12,20,38] or during the health crisis [7,21,28,52]. For example, researchers [12,20] analyzed the influence of the COVID-19 burden on foreign trade at the outset of 2020 and found that COVID-19 impacted the international trade worldwide. In developing countries, exports were the most unfavorably affected by COVID-19 and the negative effect further spread in the integrated global trade. Similarly, Megits et al. [38] found that, at the beginning of 2020, COVID-19 negatively affected the commercial exchanges between countries in Central and Eastern Europe and China. In France, Lebastard et al. [7] identified that, in the period 2020–2021, the French companies that were integrated in GVC had a sharper decrease in their exports at the beginning of the pandemic and recovered more slowly than non-GVC companies. Similar to the present research findings, Khorana et al. [18] found that the COVID-19 pandemic had an effect on

imports, and countries with a higher incidence of COVID-19 cases imported more from the rest of the world during the pandemic. Unlike the present study, Ando and Hayakawa [53] found that, in the particular case of international trade of services, imports of services were negatively impacted by the COVID-19 damages, especially in low income countries.

In Romania and some other European countries, authors [24,26,54–56] studied the impact of the COVID-19 crisis on economic relationships between countries and on the economic situations of countries. They found that both the macro-level economic activity of countries and international trade of countries were influenced by the COVID-19 crisis. However, the findings about the influence of the COVID-19 burden on international trade showed very diverse situations in different countries. For example, in Lithuania [27], COVID-19 had mixed effects on the country's exports; exports towards certain countries were negatively influenced by COVID-19, while the exports towards other countries were positively influenced by COVID-19.

The present paper has a number of contributions for theory and practice: (a) From a theoretical perspective, the research proposed and tested models that measure the impact of the COVID-19 indicators (cases and deaths) on the overall international trade of a country (total exports and total imports). The models have been either totally (for Poland) or partially (for Romania) validated by the data analyzed, indicating their theoretical relevance. (b) From a practical point of view, this paper offers information and contributes lessons for policy makers and authorities as well as business decision makers that can be used as future actions in health crises situations. The results can assist practitioners and policy makers in identifying ways to either decrease the negative effects on companies' and countries' trade determined by health crises (by economically supporting actors, industries, and regions in need) or benefit from the situations created by the health crisis. Both authorities and companies can use health crises to stimulate trading (particularly exports) of particular products and services in high demand in such periods (examples could include medical products, health-related products, and food products). (c) This paper also contributes a statistical analysis that used real data for the 2020–2021 period that comprises the main years of COVID-19 pandemic with the purpose of identifying the long-term effects of the COVID-19 burden on international trade.

The outcomes of the actual study shed more light onto the influences of COVID-19 on foreign trade by completing the results of previous studies with evidence from two other European countries, Romania and Poland. The results illustrate once more that findings about the effects of COVID-19 on international trade are diverse and sometimes divergent, leading us to the assumption that the influence of COVID-19 on international trade could also vary depending on countries and their historical and current economic situation during a health crisis, the product category, the industry type, and other elements.

The general conclusion is that global health crises can affect economic interdependencies between countries, including international trade, in either positive or negative ways, depending on various factors. Consequently, such impacts have to be taken into consideration by decision makers at different levels to either contain the negative economic effects of health crises or stimulate the positive ones. One way to contain negative effects of health crises on international trade is to sustain trade resilience via cohesion policies and financial support, such as the policies implemented in the EU for export recovery of different affected European regions [57]. Measures and policies to support both people and businesses are needed, and in case of global health crises (such as the COVID-19 crisis), national (governmental) and international level measures are necessary, requiring international cooperation, as was also acknowledged by United Nations [8].

As with any study, the present study has a number of limitations. (a) First, it included an analysis about the overall international trade at country level, using as dependent indicators total exports and total imports of a country, while the situation could be different depending on the country partners or the type of traded product. (b) Only two countries were considered in the analysis, and the conclusions are related to the cases of these two countries and cannot be generalized at a larger level.

As the topic is of high interest, future research can continue with the analysis of more specific influences of the COVID-19 crisis on international trade, and could include analyses on the bilateral trade relationships between countries during the COVID-19 period or the analysis of international trade influences for specific industries and product categories. Research can also be extended by including other countries in Europe or other regions and countries at world level.

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