

**THE EVOLUTION OF INTERNATIONAL TRADE UNDER THE IMPACT OF THE  
HEALTH AND ECONOMIC AND FINANCIAL CRISIS**

**CONSTANTIN ANGHELACHE**

*PROF. PHD, BUCHAREST UNIVERSITY OF ECONOMIC STUDIES / „ARTIFEX” UNIVERSITY  
OF BUCHAREST*

*e-mail: actincon@yahoo.com*

**MĂDĂLINA-GABRIELA ANGHEL**

*ASSOC. PROF. PHD, „ARTIFEX” UNIVERSITY OF BUCHAREST*

*e-mail: madalinagabriela\_anghel@yahoo.com*

**ȘTEFAN VIRGIL IACOB**

*LECTURER PHD, „ARTIFEX” UNIVERSITY OF BUCHAREST*

*e-mail: stefaniacob79@yahoo.com*

**DANA LUIZA GRIGORESCU**

*PHD STUDENT, BUCHAREST UNIVERSITY OF ECONOMIC STUDIES*

*e-mail: danaluiza2004@yahoo.com*

**Abstract**

*This study aimed to analyse how the pandemic and economic and financial crisis influenced the concrete results, an aspect materialized by the level of Gross Domestic Product, given that it depends on net exports. Databases of the National Institute of Statistics and a series of statistical-econometric methods and models were used that highlight the correlated evolution of the Gross Domestic Product and international trade. The methods used and the results obtained are presented in the specific points of the article. In this sense, we make only a few clarifications to reveal the importance of the study.*

*International trade represents for each state, an opportunity to capitalize on the surplus results obtained domestically in terms of production of goods and services to export, but also to supplement the resources and conditions to carry out the activity harmoniously domestic production of goods and services, this being done through imports.*

*Obviously, international trade (import-export) activity has an effect on the final results that each country achieves. Thus, the indicator called net exports results from the difference between exports and imports, which may have a negative or positive value, i.e. be deficient or in surplus. In the case of Romania, this value is negative from one period of time to another, due primarily to the fact that it imports more than it exports. As a consequence, the contribution of international trade to the realization of the Gross Domestic Product is negative, i.e. it leads to a reduction of the concrete results obtained in a period of time, usually one year. Of course imports that are much higher, for example in September there was a deficit of 1,541,000,000 euros requires a reduction in the concrete results obtained by Romania.*

*Under the impact of the pandemic crisis, exports fell more sharply than imports and therefore led to an increase in the deficit, and therefore the macroeconomic results. This is because a series of productive activities have diminished, others have been closed and as such domestic production, in excess of Romania's domestic needs, has diminished from one period of time to another.*

**Keywords:** *international trade, production of goods and services, Gross domestic product, pandemic and economic and financial crisis, European Union, econometric model.*

**JEL classification:** *F20, F40*

## 1. Introduction

In this article, the authors set out to analyse the evolution of Romania's international trade in the context of the current pandemic and financial-economic crisis.

The main objective is to demonstrate, using a statistical-econometric model that the current crisis has had and will have a destructive negative effect on Romania's economic growth. The authors appreciated and sought to demonstrate that this perspective, using complete databases, which highlights the dependence of the growth of the Gross Domestic Product and the net export, which registers growing deficits. In more detail, they focused on issues considered essential in the logic of the exposure.

Regarding the evolution of international trade under the impact of the health and economic and financial crisis, the authors focused on an analysis over a longer period of time, but with the tendency and concern to reach today, when under the impact of the pandemic crisis, coupled with the economic and financial crisis as a result of the first crisis, international trade had an increasingly negative role in the realization of the Gross Domestic Product.

The authors concretely analyse the situation in 2020, presenting the results recorded for the first two months, then continuing to compare this situation with that of the two months of 2019. They then resorted to a monthly analysis from January 2015 to September 2020, highlighting the way in which imports and exports have changed and consequently the final effect of this international trade activity.

Data are presented on this situation based on the structure of imports and exports, on the effect they had and how they contributed or not to the formation of revenues in previous years and with additional emphasis on the perspective of 2020.

The study shows a series of trends that show a negative trend of completing the international trade activity on the one hand and the effect of this activity on the concrete results obtained by Romania.

An analysis is also made in terms of intra-state and extra-state trade, as both imports and exports take place within the European Union, but at the same time outside the European Union, in the rest of Europe or in terms of world wide. A number of issues are highlighted that give meaning to intra-state and extra-state trade, i.e. inside and outside the 27 Member States.

## 2. Literature review

The activity of international trade is important for any country, because through exports and imports macroeconomic proportions and correlations can be regularized, thus avoiding destabilization. This aspect becomes even more important now in the conditions of the pandemic crisis and the financial-economic one. A number of economists and researchers have addressed these issues over time in their studies and research. Thus, Miti M., Itskhoki O., Konings J. (2014) addressed a number of issues regarding imports and exports in international trade. Anghel M.G., Iacob S.V., Haseganu D.A. (2020) published a study on the analysis of Romania's international trade in the current conditions of the pandemic and financial-economic crisis, and Anghelache C., Anghel M.G. (2017) analyzed international trade, a factor of economic growth in the Member States of the European Union. Also, Anghelache, C. (1999), Anghelache, C. et al. (2006), Baron, T., Biji, E.M., Tövissi, L. et al. (1996) and Ber Py B. (1989) address in the works some aspects related to international trade activity being thus concerned with macroeconomic analyses, and some statistical-econometric methods of analysis of economic phenomena at macroeconomic level are addressed by Tövissi, L., Scarlat, E., Taşnadi, Al. (1979) and Pecican, E., Tănăsioiu, O. (1989). In the same vein, Anghelache C., Anghelache G.V., Anghel M.G. (2016) dealt with the analysis of

Romania's foreign trade, and Anghelache C., Anghel M.G., Capusneanu S., Topor D.I. (2019) approached in an analysis the econometric model used in the analysis of the correlations of statistical aggregates. Berbard A.B., Jensen J.B., Redding S.J., Schott P.K. (2012) study the evolution of international trade. Elgstrom O. (2007) makes an extensive study on the international trade of the European Union, and Hill C., Smith M. (2011) makes an analysis on the international economic relations of the European Union. Hummels D. (2007) deals with the study of the cost of international trade in the age of globalization. Kehoea T., Pujolasd P., Ruhle K. (2016) dedicate a study to the main aspects of international trade. Also, Staiger R., Sykes A. (2011) analyse the activity of foreign trade in terms of treatment and national regulations.

### 3. Methodology

In the analysis, collection, processing and interpretation of data were used statistical-mathematical methods such as: comparative study, use of the index method, linear regression model, logical analysis, extra and interpolation to complete the data.

To facilitate the analysis of the data in this article, we briefly present the main methodological provisions used by the National Institute of Statistics / Eurostat in the calculation of statistical indicators. Thus, the international trade in goods statistics are established by summing the data from the intra-state and extra-state statistical systems, respectively: the intra-state system: for intra-EU trade (trade in goods between Romania and the other member states of the European Union) and the extra-state system: for extra-EU trade (trade in goods between Romania and states that are not members of the European Union).

For intra-EU trade: includes shipments of goods from Romania to another EU Member State and introductions (entries) of goods into Romania with another EU Member State as the country of dispatch.

Shipments from Romania include goods in free circulation that leave the statistical territory of Romania to another EU Member State and goods that have been placed under the customs procedure of inward processing (within the country) or processing under customs control in Romania and which are destined for other states.

Introductions (entries) into Romania include goods in free circulation in an EU Member State entering the statistical territory of Romania and goods which have been placed under the inward processing procedure or under customs control in another EU Member State and which enter the statistical territory of Romania.

With regard to extra-EU trade, it includes the exchange of goods between Romania and non-EU member states, having as object the direct import of goods for consumption, the imported goods taken out of the customs warehouses or the free zones to be put for consumption, the export of goods domestic origin, as well as the export of imported goods, declared for domestic consumption. It also includes temporary imports of foreign goods for inward processing (within the country), exports of compensating products resulting from inward processing, temporary exports of goods for inward processing (processing in other countries) and imports of compensating products resulting from inward processing abroad and goods imported or exported under the financial leasing system (at the full value of the goods). At the same time, quasi-exports are included, for which export customs declarations related to the international transactions of non-resident economic operators are drawn up at the national border.

The international trade does not include goods in transit, goods temporarily admitted / removed in / from the country (except for those for processing), goods purchased by international organizations for own use in Romania, goods for and after repairs and related parts.

Value data are expressed in FOB prices for exports and in CIF prices for imports. The FOB (Free on Board) price represents the price at the border of the exporting country, which includes the value of the good, all transportation costs to the point of embarkation, as well as all taxes that the good must bear in order to be loaded on board and the CIF price (Cost, Insurance, Freight / Cost, Insurance, Shipping) represents the border price of the importing country, which includes both the components of the FOB price and the cost of insurance and international transport.

Value data are expressed in euros and lei. The conversion into euros of the value data expressed in lei (collected through intra-state statistical declarations and customs declarations), is done using the average monthly exchange rate lei / euro communicated by the National Bank of Romania, for the intra-state system and the lei / euro exchange rate communicated by the National Bank of Romania for the penultimate Wednesday of the month, for the extra-state system.

For the calculations of statistical indicators on intra- and extra-EU imports and exports, the data sources provided and contained in the official reference documents are used. Thus, the data are obtained from intra-state statistical declarations collected by the National Institute of Statistics directly from economic operators that have achieved a value volume of intra-community shipments of goods and / or a value volume of intra-community entries of goods above the level of intra-statistical threshold -state established for each flow and reference year, as well as the customs declarations collected and processed by the National Agency for Fiscal Administration, for intra-community trade in goods for internal processing or processing under customs control; goods moving from / to parts of the statistical territory of the EU but not belonging to the fiscal territory of the EU.

With regard to extra-EU trade, the data are provided by the National Agency for Fiscal Administration, which collects and processes export and import customs declarations. Economic operators authorized for simplified customs procedures send export / import data to the NIS using a pre-established form.

Data on international trade in goods with electricity and natural gas are collected on statistical forms from importing / exporting companies and from network operators (CN Transelectrica SA and SNTGN Transgaz SA) by INS. Import and export do not include the physical quantities of electricity and natural gas transported through pipelines transiting the national territory.

The degree of data collection through intra-state statistical research was over 95.0% for both introductions and intra-community shipments of goods, compared to the total volume of introductions and intra-community shipments of goods, respectively. For the rest of approx. 5.0% representing the value of trade below the intra-state and non-response statistical thresholds, data estimates were made.

For the purpose of the analysis, the index method, the dynamic series method, the structural study and the dynamic comparisons were used.

#### **4. Data, results and discussions**

Regarding international trade in goods between January and September 2020, FOB exports amounted to EUR 44,810.7 million, while CIF imports amounted to EUR 57,868.9 million. Exports also decreased by 13.6%, while imports decreased by 9.5% compared to the same period in 2019. Therefore, the trade deficit (FOB / CIF) in January-September 2020 was 13,058.2 million euros, higher by 998.5 million euros than the one registered in the similar period of 2019.

If we refer to September 2020, FOB exports amounted to 6,070.7 million euros, while CIF imports amounted to 7,611.8 million euros, resulting in a deficit of 1,541.1 million euros, and if we compare the data with the results recorded in September 2019, we find that exports decreased by 0.5% and imports increased by 4.4%.

To reveal the influence of the health and economic and financial crisis on international trade, we conducted a study from January 2015 to September 2020, which resulted in a series of data, which are presented below.

Between January and September 2020, there are important shares in the structure of exports and imports by product groups: machinery and transport equipment, respectively 47.5% for export and 36.6% for import and other manufactured products, respectively 30.8% for export and 30.2% for import, respectively.

The data for the period January - September 2020, compared to the same corresponding period of 2019 reveals an increase in the balance of external payments. The data synthesis is highlighted in table number 1.

Table no. 1. International trade by product groups according to CSCI Rev.4, during 1.01-30.09.2020

	FOB exports			CIF imports		
	1.01-30.09.2020			1.01-30.09.2020		
	Millions of euros	Share in total exports (%)	in% compared to 1.01-30.09 2019	Millions of euros	Share in total exports (%)	in% compared to 1.01-30.09 2019
<b>TOTAL</b>	<b>44810,7</b>	<b>100,0</b>	<b>-13,6</b>	<b>57868,9</b>	<b>100,0</b>	<b>-9,5</b>
of which, in relation to the EU 27	32915,6	73,5	-12,9	42372,6	73,2	-8,8
Food and live animals	<b>3255,4</b>	<b>7,3</b>	<b>-4,6</b>	<b>5118,1</b>	<b>8,8</b>	<b>+4,9</b>
of which, in relation to the EU 27	1467,5	3,3	-9,3	4425,3	7,6	+4,7
Drinks and tobacco	<b>1169,4</b>	<b>2,6</b>	<b>+42,1</b>	<b>532,4</b>	<b>0,9</b>	<b>-1,0</b>
of which, in relation to the EU 27	884,7	2,0	+25,5	399,5	0,7	+1,3
Raw, inedible materials, excluding fuel	<b>1619,1</b>	<b>3,6</b>	<b>-6,0</b>	<b>1555,4</b>	<b>2,7</b>	<b>-14,0</b>
of which, in relation to the EU 27	936,4	2,1	-5,9	943,8	1,6	-14,0
Mineral fuels, lubricants and derived materials	<b>1172,4</b>	<b>2,6</b>	<b>-44,3</b>	<b>3091,6</b>	<b>5,3</b>	<b>-36,4</b>
of which, in relation to the EU 27	507,4	1,1	-38,2	893,9	1,5	-18,9
Oils, fats and waxes of animal and vegetable origin	<b>139,5</b>	<b>0,3</b>	<b>+5,2</b>	<b>142,1</b>	<b>0,2</b>	<b>+19,7</b>
of which, in relation to the EU 27	92,9	0,2	-18,3	114,1	0,2	+15,1
Chemicals and derivatives not specified in another section	<b>2294,5</b>	<b>5,1</b>	<b>-3,9</b>	<b>8730,7</b>	<b>15,1</b>	<b>+2,4</b>
of which, in relation to the EU 27	1468,5	3,3	-3,5	6843,3	11,8	-2,0
Manufactured goods classified mainly by raw material	<b>7321,9</b>	<b>16,3</b>	<b>-14,4</b>	<b>10902,1</b>	<b>18,8</b>	<b>-11,1</b>
of which, in relation to the EU 27	5362,0	12,0	-14,1	7729,5	13,4	-13,8
Transport machinery and equipment	<b>21264,2</b>	<b>47,5</b>	<b>-13,5</b>	<b>21162,8</b>	<b>36,6</b>	<b>-10,8</b>
of which, in relation to the EU 27	16797,9	37,5	-12,0	16236,9	28,1	-11,0
Miscellaneous manufactured articles	<b>6488,7</b>	<b>14,5</b>	<b>-19,5</b>	<b>6617,4</b>	<b>11,4</b>	<b>-7,9</b>
of which, in relation to the EU 27	5384,6	12,0	-19,3	4773,1	8,2	-10,7
Goods not included in another section of the CSCI	<b>85,5</b>	<b>0,2</b>	<b>-4,5</b>	<b>16,3</b>	<b>*)</b>	<b>+9,3</b>
of which, in relation to the EU 27	13,6	*)	-24,4	13,4	*)	+8,6

Source: National Institute of Statistics release number 290/9 November 2020

Data on imports, exports and the balance of trade can be easily seen from the above table. Also, for those interested, the data in the table can be used to calculate the balance of foreign trade balance, in total or on the structure of this activity. In the database used (summarized in the table) absolute and relative figures were used for both years 2019 and 2020.

Following the study, we find that the value of intra-EU trade in goods between January and September 2020 was 32,915.6 million euros for exports and 42,372.6 million euros for imports, representing 73.5% of total exports and 73.2 % of total imports. Also, the value of extra-EU trade in goods between January and September 2020 was 11,895.1 million euros in exports and 15,496.3 million euros in imports, representing 26.5% of total exports and 26.8% of total imports.

Next, in order to highlight the influence that the international trade activity has on the economic development of Romania, we will make a statistical-econometric analysis using the simple linear regression model, and the statistical data are structured in table number 2.

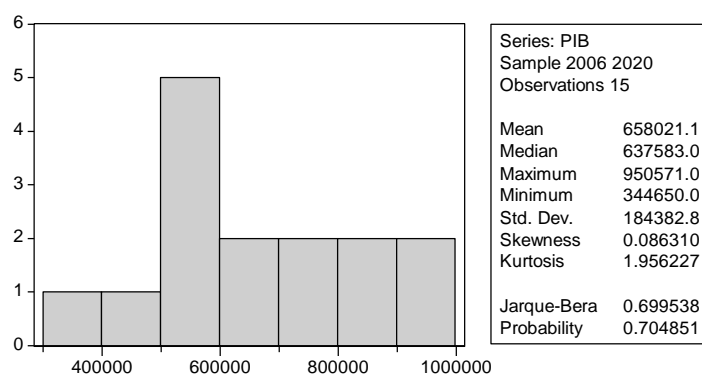
Table no. 2. Evolution of GDP and net exports in 2006-2020

Year	GDP	NET EXPORT
2006	344650	41405
2007	416006	57788
2008	524388	69485
2009	510522	32722
2010	533881	32785
2011	565097	31456
2012	596681	29613
2013	637583	4261
2014	668590	2940
2015	712587	4428
2016	765135	7091
2017	856726	18221
2018	907900	5960
2019	950571	8473
2020	880000*	7474*

\* For 2020, the data are estimated

Source: National Institute of Statistics

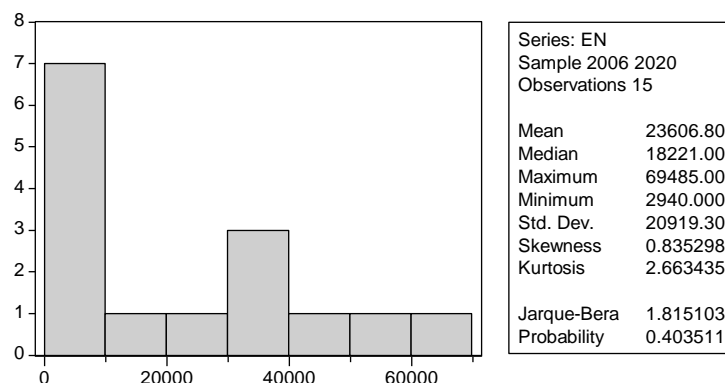
The evolution of the Gross Domestic Product in the period under analysis is highlighted in graph number 1.



Note: PIB = Gross Domestic Product

Graph no. 1. Histogram of the evolution of the Gross Domestic Product in the period 2006-2020

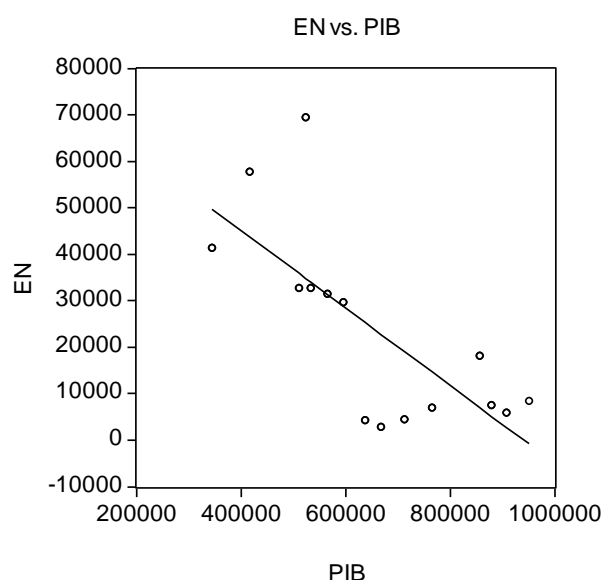
Interpreting the results presented in chart number 1, we find that the maximum value registered for the Gross Domestic Product of Romania in the period between 2006 and 2020 is 950,571 million RON, while the average is 658,021.1. In other words, the value of 0.08 of the Skewness test indicates that the distribution is not perfectly symmetrical and is also slower with a value of 1.95 of the Kurtosis test, which is less than 3. Histogram of evolution of the net export indicator is shown in graph number 2.



Note: EN = net export

Graph no. 2. Histogram of the evolution of Net Export in the period 2006-2020

Regarding the evolution of Net Exports in the period 2006-2020, the distribution is also slower than normal and is not perfectly symmetrical if we follow the values of the Kurtosis test of 2.66 and the Skewness test of 0.83 which is significantly different from scratch. In order to follow and interpret the correlation between the Gross Domestic Product and the Net Export, graph number 3 was drawn up.



Note: PIB = Gross Domestic Product  
EN = net export

Graph no. 3. Correlation between Gross Domestic Product and Net Export

In graph number 3 we notice that the point cloud related to the values recorded by the two macroeconomic indicators studied in their evolution describes a straight line, which allows us to continue the study using a simple linear regression model, which has the following relationship:

$$PIB = a + b \cdot EN + \varepsilon \quad (1)$$

where: *PIB* is the dependent variable (Gross Domestic Product);

*EN* is the independent variable (Export Net);

*a* and *b* are the regression parameters;

$\varepsilon$  represents the residual variable.

Both for estimating the parameters *a* and *b*, respectively  $\hat{a}$  and  $\hat{b}$ , using the least squares method, and for testing the significance of the model, the statistical-econometric analysis program EViews was used, and the results are presented in table number 3.

Table no. 3. Results of the analysis of the dependence of the GDP on the evolution of the Net Export

Dependent Variable: PIB

Method: Least Squares

Sample: 2006 2020

Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	810949.2	51512.53	15.74276	0.0000
EN	-6.478137	1.657626	-3.908082	0.0018
R-squared	0.540199	Mean dependent var		658021.1
Adjusted R-squared	0.504830	S.D. dependent var		184382.8
S.E. of regression	129747.1	Akaike info criterion		26.50813
Sum squared resid	2.19E+11	Schwarz criterion		26.60253
Log likelihood	-196.8110	F-statistic		15.27310



According to the results of the analysis presented in table number 3, the model is a good one and can be used in macroeconomic forecasts. This is confirmed both by the significantly different values of zero recorded by the estimated parameters, which are in the second column (Coefficient column) rows 1 and 2, and by the statistical tests F-statistic and t-Statistic, of whose values are higher than the tabulated ones. Also, the minus sign of the Export Net indicator is the expected one considering the negative effect that the increase of the trade deficit has on the economic growth.

## 5. Conclusions

From the study carried out by the authors, which was the basis for writing this article, some theoretical conclusions are drawn, but especially practical. The first conclusion is that this pandemic crisis, combined with the economic and financial crisis caused by the health situation, have a negative effect on international trade. This is because, on the one hand, the level of production of goods and services has decreased a background on which exports have decreased substantially from one period to another.

According to the data used and the estimates made, it appears that in the next period the increase in the external balance of payments deficit will worsen and will have a negative effect on economic growth.

In the same vein, imports also decreased, but in a more reasonable time, as the needs of the national economy necessitated the completion of additional imports primarily to ensure economic balance, but also to complete the range consumer goods, which is a negative element in the context in which domestic production is not sufficiently encouraged.

We appreciate that the results obtained are relevant and should be an alarm signal regarding Romania's development strategy. This study was limited by the use of provisional and incomplete data for 2020. This analysis will become even more relevant in the context of having full data for 2020.

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