

Analysis of the Evolution of Foreign Trade and the Trade Balance of Romania in the Last 25 Years

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This study presents the evolution of some important foreign trade's indicators in the last 25 years of Romania. The work shows the trends and the implications of the overall trade balance and the value indices of external trade or unit value indices for export and imports and attempts to empirically examine the dynamic of these using the time-series data for the period 1994–2018. This research suggests the relationship between the variables that determine the trend of export, import and trade balance for the last two decade in foreign trade of Romania. The empirical results shows that the deficit of overall trade balance is recorded in all years of the period 1994-2018, both FOB / FOB and FOB / CIF prices. Moreover, there exists a situation of foreign trade that has been perpetuating over the last decades as exports of raw materials and little processed materials fail to exceed value imports of processed products, although there have been annual increases in exports but the growth rate did not exceed the growth rate of imports.

Keywords – foreign trade, trade balance, value indices of external trade, unit value indices for export and imports, trend.

JEL Classification: F 10, F14, F 17, F 19, F 40.

1. Introduction

The evolution of foreign trade's in the last 25 years of Romania shows the trends and the implications of the overall trade balance. This work presents the trend of export, import and trade balance for the last two decade in foreign trade of Romania. The empirical results shows that the deficit of overall trade balance is recorded in all years of the period 1994-2018 and this situation has been perpetuating over the last decades as exports of raw materials and little processed materials fail to exceed value imports of processed products, although there have been annual increases in exports but the growth rate did not exceed the growth rate of imports.

2. Short literature review

Contemporary theory of foreign trade has a very important representation in the H.O.S. (Heckscher-Ohlin-Samuelson), aiming at the renewal and adaptation of traditional neoclassical theory to interwar realities. The model takes from the classical theory at least four elements: the concept of comparative cost, the concept of relative advantage in international trade, the concept of mutual benefit for trade partners and the foreign exchange policy of free trade, but reject any relationship of international trade theory of value based on the work.

After explanations and empirical verification tests, specialists have stepped theoretical concerns. Grafted on the HOS model, but taking into account the inequalities between countries in terms of the level of development of the productive forces, the non-technological invoices theory considers that the determinant factor of the foreign trade is the ability to innovate in the field of engineering and technology, of which the best known are: the technological gap theory or technological scale and product life cycle theory.

One of the first analyzes aiming at explaining international trade in terms of technological change has been made by Posner, who started to research the correlation between a country's exports and their previous research efforts. Posner noted that in countries that spend the largest R & D will hold a time, absolute advantages on their partners because those products being exportable.

Hufbauer tests a comparable theory on exchanges with so-called scientific products, distinguishing between two types of trade: technological gap trade and commerce based on low labor costs. This model was then elaborated by Krugman, which divided countries into two groups, the 'North' and the 'South'. Countries in the 'North' are more dynamic, more responsive to new, first apply new technologies, and the group 'South' in possession of these technologies after a certain time.

Theory lifecycle of the product in the field of foreign trade is based on the idea that relative advantage is not static, but as they change over time, depending on the action for capitalize the product on the world market and the feedback we have from him real or potential competitors.

Thus, Raymond Vernon considers that the duration and size of the relative advantage, dynamically viewed, depend on the steps a product during its presence on the market. Such exchanges inter-branch has been the subject of research in recent decades.

3. Methodology

Foreign trade can be a factor of economic growth. This is very important for all countries as international economic exchanges should:

- providing the national economy with inputs;
- participation in international economic exchanges must allow the capitalization of surplus domestic resources or export specialization in the branches in which the respective country has the comparative advantage;
- participation in the global economic circuit allows diversification of domestic supply of goods and services;
- connecting the national economy to the international economic flows allows for the widening of the production series;
- participation in the world economy also creates a favorable climate in political, military, ethnic, religious, cultural.

As specific documents for quantification of trade transactions, the balance of external payments and the trade balance as a component part of the balance of payments are of major importance. In order to measure the balance of trade and to determine whether the evolution of one country's trade with another is favorable or not, the literature has introduced two indicators, namely the coverage ratio and the index of the exchange ratio. Expression of the degree of specialization of a country is done by means of the indicators: the coefficient of specialization and the coefficient of comparative advantages, which helps to clarify the situation regarding the advantage in the specialization of a country in a particular product.

The main features of contemporary global trade are:

- the particularly rapid growth of foreign economic exchanges;
- the advancement of the growth rate of GDP, industrial production, and other national macroeconomic indicators by foreign trade;
- the growth rate of foreign trade, especially of imports, has exceeded the growth rate of international liquidity of the states.

Geographical distribution of foreign economic exchanges showed significant changes, both groups of countries and continents or regions.

Regarding the outlook for international trade, there is a stronger integration of the world economy, namely the increasing interest of nations to join the world economy.

According to the proposed aims we present the evolution of the following indicators:

- **Export value (FOB)** - who include, according NIS, "all goods which by onerous title or free of charge leave the economic territory of the country to the rest of the world destination"(www.insse.ro).
- **Trade balance FOB / FOB** - is calculated based on the value of export FOB and import FOB, as their difference.
 - o FOB price (Free on Board) represents, according NIS (www.insse.ro), "the price at the exporting country border, including the value of goods, all transport expenditure until embarking point, as well as all taxes paid for the goods to be loaded on board".

- **Trade balance FOB/CIF** - is calculated based on the value of export FOB and import CIF, as their difference.
 - o CIF price (Cost, Insurance, Freight) represents, according NIS (www.insse.ro), "the price at importer country border, including both the components of FOB price and the insurance and international transport costs".
- **Value indices of external trade** (previous year = 100) - are calculated, according NIS (www.insse.ro), "under comparable conditions (previous year as base), for export and import separately, from euro basis values".
- **Unit value indices for export and imports** - are calculated, according NIS (www.insse.ro), "based on the average unit values, for a representative goods nomenclature from the Combined Nomenclature (CN), at 8 digits level, according to Paasche formula. For the aggregation of unit value indices, calculated at 8 digits level, on different levels of CN and total exports, respectively total imports, it is used as weighting element, the goods value from the current period. The used calculation base for the calculation of unit value indices is the previous year, and unit value indices with other bases are calculated by chaining."
 - o In Romania, the unit value indices were calculated for the first year in 1996. In period 1996 -1999 these indicators have been calculated in USD, and in euro starting with 2000.

4. Results and discussions

The informations have been taken from the National Institute of Statistics (NIS) www.insse.ro, Tempo on-line. Thus, in table 1, we presented the trade balance in FOB/FOB or FOB/CIF prices, expressed in millions dollars (USD) and millions Euro (EUR). Also, in table 1 we presented the evolution of export in FOB prices in millions dollars (USD) and millions Euro (EUR), as well as the evolution of import in CIF prices in millions dollars (USD) and millions Euro (EUR). Trade balance FOB/FOB or FOB/CIF - is calculated as difference between the value of export FOB and import FOB, respectively as difference between export FOB and import CIF.

Table 1. Trade balance FOB/FOB and FOB/CIF

No.	Years	Trade balance FOB/FOB in millions dollars (USD)	Trade balance FOB/FOB in millions euro (EUR)	Trade balance FOB/CIF Millions dollars (USD)	Trade balance FOB/CIF Millions euro (EUR)	Export FOB in millions USD	Export FOB in millions euro	Import CIF in millions USD	Import CIF in millions euro
1	1994	-411	-347	-958	-808	6151	5186	7109	5994
2	1995	-1577	-1220	-2368	-1832	7910	6117	10278	7949
3	1996	-2471	-1973	-3351	-2676	8084	6454	11435	9129
4	1997	-1980	-1753	-2849	-2522	8431	7469	11280	9991
5	1998	-2624	-2318	-3536	-3128	8302	7400	11838	10528
6	1999	-1257	-1186	-2070	-1950	8487	7977	10557	9927
7	2000	-1683	-1867	-2688	-2962	10367	11273	13055	14235
8	2001	-2969	-3323	-4167	-4661	11385	12722	15552	17383
9	2002	-2611	-2752	-3986	-4206	13876	14675	17862	18881
10	2003	-4537	-3955	-6385	-5587	17618	15614	24003	21201
11	2004	-6664	-5323	-9179	-7346	23485	18935	32664	26281
12	2005	-9618	-7806	-12733	-10313	27730	22255	40463	32568
13	2006	-14836	-11759	-18770	-14896	32336	25850	51106	40746
14	2007	-24523	-17822	-29943	-21773	40471	29549	70414	51322
15	2008	-28124	-19109	-34612	-23515	49674	33725	84286	57240

16	2009	-9582	-6870	-13765	-9869	40579	29084	54344	38953
17	2010	-7823	-5901	-12604	-9509	49494	37360	62098	46869
18	2011	-7607	-5430	-13499	-9660	63042	45292	76540	54952
19	2012	-9466	-7379	-12364	-9634	57921	45069	70285	54703
20	2013	-4609	-3475	-7640	-5755	65879	49562	73519	55317
21	2014	-4809	-3644	-8021	-6056	69886	52466	77907	58522
22	2015	-6363	-5765	-9243	-8361	60618	54610	69861	62971
23	2016	-7961	-7195	-11038	-9972	63589	57392	74627	67364
24	2017	-11178	-9843	-14695	-12960	70629	62644	85325	75604
25	2018	-13855	-11794	-17800	-15134	80078	67733	97878	82867

Source: own calculations based on the dates of NIS www.insse.ro

The evolution of the overall trade balance calculated in FOB prices for export and import is presented in the Figure 1, and shows that is negative during to the entire period, in the years 1994-2018, because de values of imports are bigger that the values of exports. Also, the trend is the same whether imports and exports are denominated in dollars or Euro. It is worth noting that in 2015 the largest balance of payments deficit was registered.

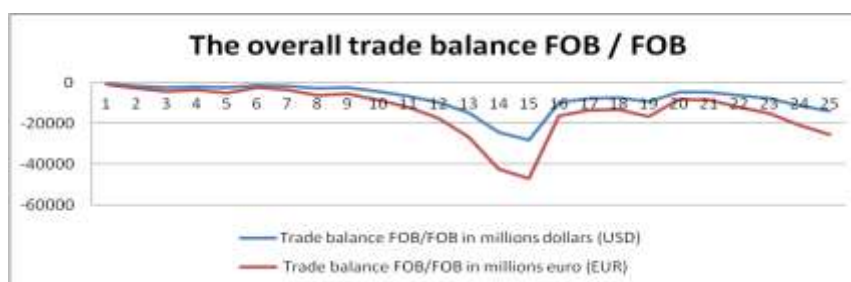


Figure 1. The evolution of the trade balance FOB/FOB

Source: Author, by using the NIS Data, Tempo on-line (2019)

The data presented in the Figure 2 shows the evolution of trade balance estimated in FOB prices for export and in CIF prices for import, and shows it has also a negative trend due to the deficit recorded throughout the 25 years. It is noteworthy as this time trend is the same whether imports and exports are denominated in dollars or Euro.

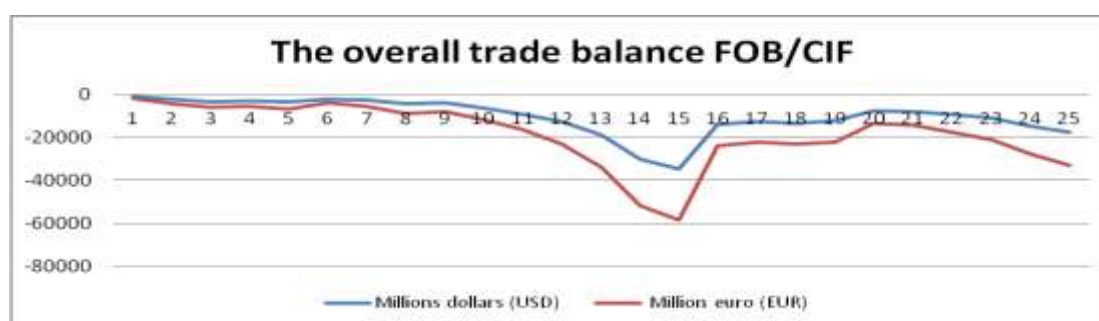


Figure 2. The evolution of the trade balance FOB/CIF

Source: Author, by using the NIS Data, Tempo on-line (2019)

The evolution of export, import and trade balance was analyzed with regression statistics method for the entire period during 1994-2018 and we got it the following results:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.996354403
R Square	0.992722097
Adjusted R Square	0.992267228
Standard Error	681.7280029
Observations	18

ANOVA

	df	SS	MS	F	Significance F
Regression	1	1014293615	1014293615	2182.436	1.55081E-18
Residual	16	7436049.119	464753.07		
Total	17	1021729664			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	887.6362817	245.3664242	3.617594724	0.002312	367.4827022	1407.78986	367.4827022	1407.789861
X Variable 1	1.44719482	0.030978208	46.71654455	1.55E-18	1.381523954	1.51286569	1.381523954	1.512865686

RESIDUAL OUTPUT

Observation	Predicted Y	Residuals	Standard Residuals
1	-877.9413986	-699.0586014	-1.056980364
2	-1967.679098	-503.3209019	-0.76102391
3	-1649.296238	-330.7037623	-0.500025867
4	-2466.961311	-157.0386891	-0.237443342
5	-828.7367748	-428.2632252	-0.6475363
6	-1814.276447	131.2764471	0.198490694
7	-3921.392105	952.392105	1.440021984
8	-3095.043863	484.0438628	0.731876924
9	-4836.019231	299.0192312	0.452118686
10	-6815.781745	151.7817449	0.229494815
11	-10409.16648	791.1664829	1.196247977
12	-16129.92761	1293.927606	1.956425499
13	-24904.2698	381.2697995	0.576481987
14	-26766.80953	-1357.190467	-2.052079285
15	-9054.592131	-527.4078686	-0.797443534
16	-7652.260351	-170.7396492	-0.258159268
17	-6970.631591	-636.3684094	-0.962192457
18	-9791.214295	325.2142947	0.491725762

PROBABILITY OUTPUT

Percentile	Y
2.777777778	-28124
8.333333333	-24523
13.88888889	-14836
19.44444444	-9618
25	-9582
30.55555556	-9466
36.11111111	-7823
41.66666667	-7607
47.22222222	-6664
52.77777778	-4537
58.33333333	-2969
63.88888889	-2624
69.44444444	-2611
75	-2471
80.55555556	-1980
86.11111111	-1683
91.66666667	-1577
97.22222222	-1257

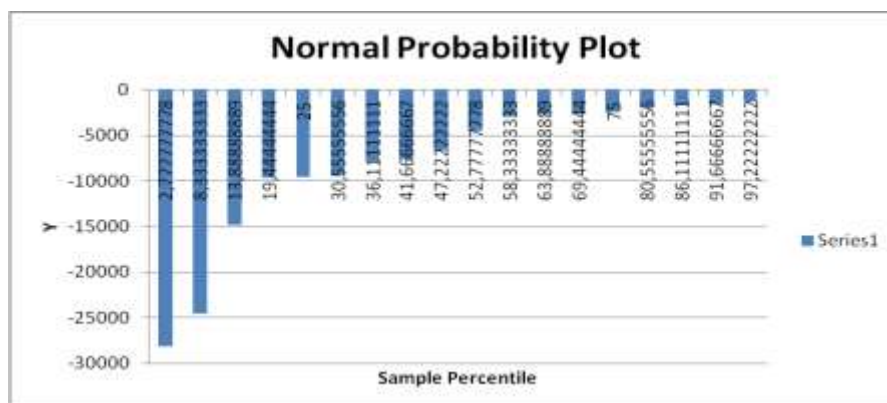


Figure 3. The evolution of the Normal probability plot
Source: Author, by using the NIS Data, Tempo on-line (2019)

The follows informations have been taken from the National Institute of Statistics (NIS) www.insse.ro, Tempo on-line. Thus, in Table 2, we presented the value indices of external trade for export and import, expressed in percentages.

Table 2. Value indices of external trade for export and import

No.	Years	Value indices of external trade - Export (%)	Value indices of external trade - Import (%)
1	1994	124.1	107.6
2	1995	118	132.6
3	1996	105.5	114.9
4	1997	115.7	109.4
5	1998	99.1	105.4
6	1999	107.8	94.3
7	2000	141.3	143.4
8	2001	112.9	122.1
9	2002	115.4	108.6
10	2003	106.4	112.3
11	2004	121.3	124
12	2005	117.5	123.9
13	2006	116.2	125.1
14	2007	114.3	126
15	2008	114.1	111.5
16	2009	86.2	68.1
17	2010	128.5	120.3
18	2011	121.2	117.2
19	2012	99.5	99.5
20	2013	110	101
21	2014	105.9	105.8
22	2015	104.1	107.6
23	2016	105.1	107
24	2017	109.2	112.2
25	2018	108.1	109.6

Source: NIS www.insse.ro

It is worth noting that in year 2000 the highest value of the indices of external trade for export and import was registered and in year 2009 the lowest level of these indicators were recorded. The data presented in the Figure 4 shows that evolution as well as the trend of these determinate with two period moving averages.

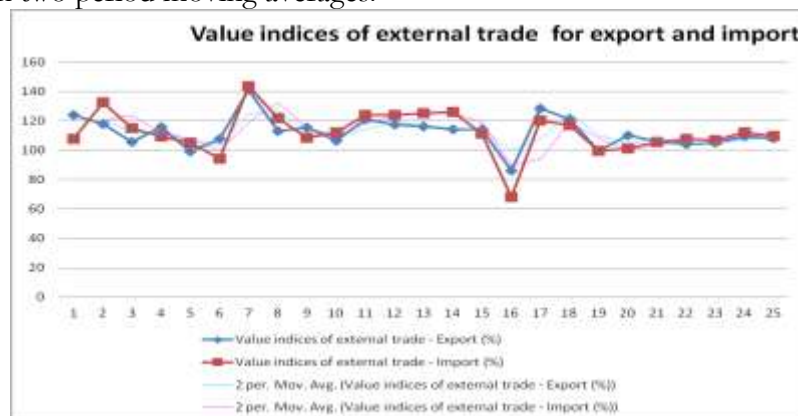


Figure 4. The evolution of the value indices of external trade for export and import and their trends

Source: Author, by using the NIS Data, Tempo on-line (2019)

The evolution of the value indices of external trade for export and import were analyzed with regression statistics method for the years during 1994 - 2018 and we got it the following results:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.799789322
R Square	0.639662959
Adjusted R Square	0.623996132
Standard Error	6.646330682
Observations	25

ANOVA

	df	SS	MS	F	Significance F
Regression	1	1803.574235	1803.574235	40.82913	1.60771E-06
Residual	23	1015.995365	44.17371153		
Total	24	2819.5696			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	44.49282026	10.69414656	4.160483495	0.000377	22.37029272	66.6153478	22.37029272	66.61534781
X Variable 1	0.603359968	0.094425964	6.389767644	1.61E-06	0.40802498	0.79869496	0.40802498	0.798694955

RESIDUAL OUTPUT

Observation	Predicted Y	Residuals	Standard Residuals
1	109.4143528	14.68564721	2.257110642
2	124.498352	-6.498351988	-0.998764251
3	113.8188806	-8.318880559	-1.278570401
4	110.5004007	5.199599264	0.799152442
5	108.0869609	-8.986960865	-1.381251008
6	101.3896652	6.410334778	0.985236445
7	131.0146396	10.28536036	1.580808527
8	118.1630723	-5.263072327	-0.808907935
9	110.0177128	5.382287238	0.827230672
10	112.2501446	-5.850144642	-0.899138018
11	119.3094563	1.990543734	0.305936632
12	119.2491203	-1.749120269	-0.268831051
13	119.9731522	-3.77315223	-0.579914656
14	120.5161762	-6.216176201	-0.955395241
15	111.7674567	2.332543332	0.358500262
16	85.58163407	0.618365934	0.095039756
17	117.0770244	11.42297562	1.755654311
18	115.2066085	5.993391515	0.921154348
19	104.5271371	-5.027137055	-0.772645862
20	105.432177	4.567822993	0.702051584
21	108.3283049	-2.428304852	-0.37321833
22	109.4143528	-5.314352794	-0.816789487
23	109.0523368	-3.952336813	-0.607454432
24	112.1898086	-2.989808646	-0.459518659
25	110.6210727	-2.521072729	-0.387476289

PROBABILITY OUTPUT

Percentile	Y
2	86.2
6	99.1
10	99.5
14	104.1
18	105.1
22	105.5
26	105.9
30	106.4
34	107.8
38	108.1
42	109.2
46	110
50	112.9
54	114.1
58	114.3
62	115.4
66	115.7
70	116.2
74	117.5
78	118
82	121.2
86	121.3
90	124.1
94	128.5
98	141.3

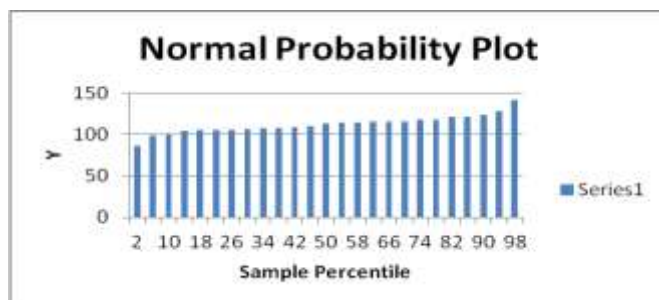


Figure 5. The evolution of the Normal probability plot

Source: Author, by using the NIS Data, Tempo on-line (2019)

The following informations have been taken from the National Institute of Statistics (NIS) www.insse.ro, Tempo on-line. Thus, in table 3, we presented the evolution of unit value indices for export and import

It is worth noting that in year 2009 was registered the lowest level of these indicators, as well as the fact that in almost all the years considered in the analysis the value of these indicators was almost equal or exceeded 100%.

The data presented in the Figure 6 shows that evolution as well as the trend of these determinate with two period moving averages.

Table 3. Unit value indices for export and import (%)

Number	Years	Unit value indices for export (%)	Unit value indices for import (%)
1	2000	108.9	103.6
2	2001	100.6	99.7
3	2002	98.5	98.7
4	2003	98.2	96.7
5	2004	105.1	100.7
6	2005	109.5	105.3
7	2006	108.2	103.6
8	2007	106	98.2
9	2008	103.8	103.4
10	2009	89.3	89.3
11	2010	107	104.2
12	2011	107.9	106.2
13	2012	103.9	100.8
14	2013	97	98
15	2014	98.5	97.6
16	2015	100.2	97.7
17	2016	98.2	97.6
18	2017	101.6	102.9

Source: NIS www.insse.ro

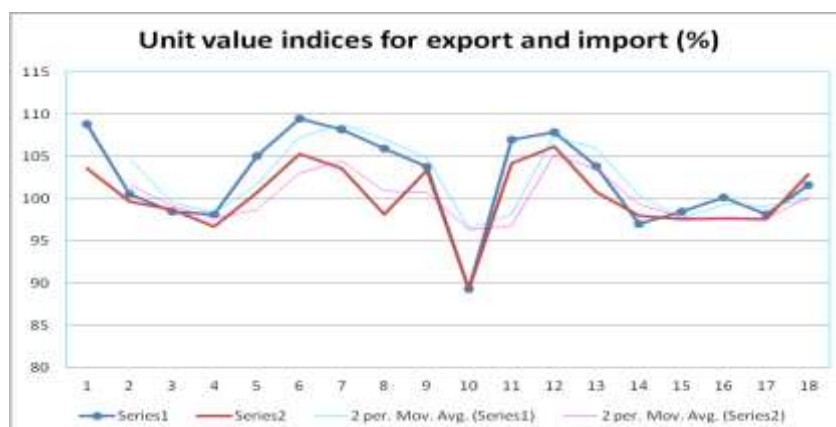


Figure 6. The evolution of unit value indices for export and import (%) and their trends

Source: Author, by using the NIS Data, Tempo on-line (2019)

In Romania, the unit value indices were calculated for the first year in 1996. In period 1996 -1999 these indicators have been calculated in USD, and in euro starting with 2000. "For this reason for the years 1996-1999 are not comparable with the ones calculated starting 2000 and will not be present in TEMPO" (www.insse.ro).

The evolution of the unit value indices of external trade for export and import were analyzed with regression statistics method for the years during 1994 - 2018 and we got it the following results:

SUMMARY OUTPUT

Regression Statistics	
Multiple R	0.899041809
R Square	0.808276174
Adjusted R Square	0.796293435
Standard Error	2.391579874
Observations	18

ANOVA					
	df	SS	MS	F	Significance F
Regression	1	385.8099758	385.8099758	67.45337	3.93697E-07
Residual	16	91.51446869	5.719654293		
Total	17	477.3244444			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-15.00480105	14.30069816	-1.04923556	0.309661	-45.32092666	15.31132456	-45.32092666	15.31132456
X Variable 1	1.170871532	0.142563192	8.213000257	3.94E-07	0.868651068	1.473091997	0.868651068	1.473091997

RESIDUAL OUTPUT

Observation	Predicted Y	Residuals	Standard Residuals
1	106.2974897	2.602510285	1.121687897
2	101.7310907	-1.131090738	-0.4875027
3	100.5602192	-2.060219206	-0.887959199
4	98.21847614	-0.018476141	-0.007963259
5	102.9019623	2.198037729	0.947359299
6	108.2879713	1.21202868	0.522387139
7	106.2974897	1.902510285	0.819986293
8	99.97478344	6.02521656	2.596882146
9	106.0633154	-2.263315408	-0.975494128
10	89.5540268	-0.254026801	-0.109486133
11	107.0000126	-1.26343E-05	-5.44543E-06
12	109.3417557	-1.441755699	-0.62140001
13	103.0190494	0.880950576	0.379691717
14	99.74060913	-2.740609133	-1.181208817
15	99.27226052	-0.77226052	-0.332846054
16	99.38934767	0.810652327	0.349393011
17	99.27226052	-1.07226052	-0.462146741
18	105.4778796	-3.877879642	-1.671375013

PROBABILITY OUTPUT

Percentile	Y
2.777777778	89.3
8.333333333	97
13.88888889	98.2
19.44444444	98.2
25	98.5
30.55555556	98.5
36.11111111	100.2
41.66666667	100.6
47.22222222	101.6
52.77777778	103.8
58.33333333	103.9
63.88888889	105.1
69.44444444	106
75	107
80.55555556	107.9
86.11111111	108.2
91.66666667	108.9
97.22222222	109.5

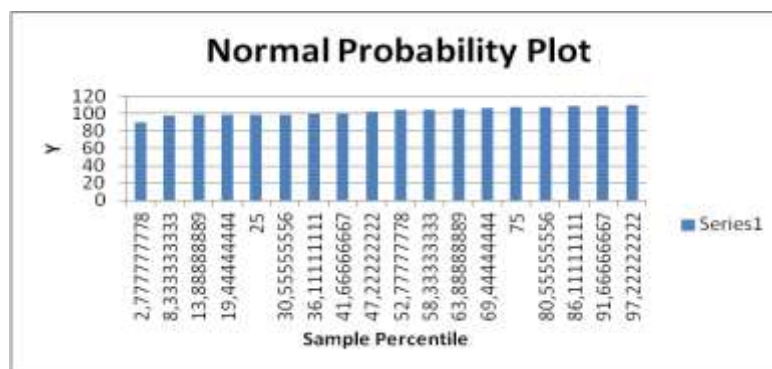


Figure 7. The evolution of the Normal probability plot

Source: Author, by using the NIS Data, Tempo on-line (2019)

5. Conclusions

Foreign trade can be a factor of economic growth, very important for all countries, as international economic exchanges should:

- providing the national economy with inputs;
- participation in international economic exchanges must allow the capitalization of surplus domestic resources or export specialization in the branches in which the respective country has the comparative advantage;
- participation in the global economic circuit allows diversification of domestic supply of goods and services;
- connecting the national economy to the international economic flows allows for the widening of the production series;
- participation in the world economy also creates a favorable climate in political, military, ethnic, religious, cultural.

As specific document for measure of foreign trade, the trade balance is of major importance to determine whether the evolution of one country's trade with another is favorable or not. This study presents the evolution of some important foreign trade's indicators in the last 25 years of Romania, as well as theirs trend determined with statistical methods.

References

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