Revista Pădurilor 137(1) (2022) 001-050

Revista Pădurilor

available online at: www.revistapadurilor.com

EXTERNAL TRADE FACTS FOR ROMANIAN FORESTRY SECTOR

Adelin-Ionuț NICORESCU[a], Aureliu-Florin HĂLĂLIȘAN[b], Bogdan POPA[b]

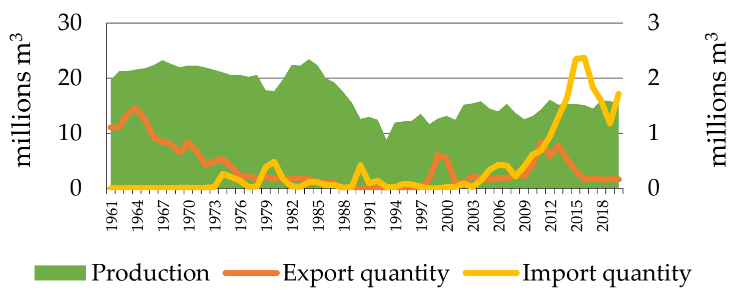
[a] University of Eastern Finland, School of Forest science, 1 Tulliportinkatu, Joensuu 80130, Finland, adelinic@student.uef.fi (A.I.N.)

[b] Department of Forest Engineering, Forest Management Planning and Terrestrial Measurements, Faculty of Silviculture and Forest Engineering, Transilvania University of Brașov, Şirul Beethoven 1, Brasov 500123, Romania, aureliu.halalisan@unitbv.ro (A.F.H.), popa.bogdan@unitbv.ro (B.P.)

HIGHLIGHTS

- Romania is a net importer of roundwood and paper industry products.
- Romania is a net exporter of sawnwood and secondary processed products.
- The trade balance of forest sector is positive.

GRAPHICAL ABSTRACT



ARTICLE INFO

Article history:
Manuscript received: 20 February 2022
Received in revised form: 25 February 2022
Accepted: 25 February 2022
Page count: 14 pages.

Article type:
Research Article

Editor: Stelian Alexandru Borz

Keywords:
External trade
Forest sector
Romania
Wood processing
Wood trading

ABSTRACT

The aim of the paper is to analyze the Romanian forest sector trade balance using the value of main imported and exported wood-based products. Also, an overview of the production, import and export of roundwood, sawnwood, secondary processed and paper industry products is presented. Two types of data were collected from the FAOSTAT database and processed for in depth analysis: i) quantities for production, import and export and ii) values for export and import in order to calculate the trade balance. In the last decade Romania has become a net importer of roundwood and paper industry products and a net exporter of sawnwood and secondary processed wood products. The production and import of sawnwood increased, while the export decreased. Al these facts and values determined a positive trade balance of the sector indicating that Romania is benefiting from the added value by importing raw materials and processing it inside the county's borders. In the last years, the production and exports of secondary processed products increased, showing that the Romania is benefiting from the added value determined by importing raw materials and processing it inside the country in a developing wood processing industry marked by important investments. Furniture industry can be included in future studies to provide a clearer overview.

* Corresponding author. Tel.: +40-268-418600; fax: +40-268-475705.
E-mail address: popa.bogdan@unitbv.ro

1. INTRODUCTION

With a forest area covering 28% of the territory [1] Romania has an economically significant forestry sector, with a Gross Domestic Product (GDP) contribution varying between 3,5 % and 4,5% in the last two decades [2-4]. Recovering after a transition period affected by forestland privatization and market economy transition, Romanian forestry sector is nowadays passing a consolidation phase, with increasing investments and concern awarded to processing industry and value addition [4] despite inherent difficulties along the wood supply chain [5]. It is known that value addition by domestically processing the round wood brings value and opportunities for the forestry and adjacent sectors [6]. For this, investments in wood processing industry are the triggering factors followed usually by high value added products, mainly for export [3, 6]. The aim of this paper is to assess and discuss the facts describing Romanian forest-based industry foreign trade in order to shed light on the evolution and the status of the sector and its contribution to the country economic development. Also, an overview of the production, import and export of roundwood, sawnwood, secondary processed and paper industry products is presented. Production, import, export and trade balance can provide insights about the past situation and current trends of the forestry sector's economy and performance.

This paper takes into consideration the economical phases passed by Romania in the last 60 years and tries to couple the general evolution of the country's economy and the evolution of the forestry sector foreign trade. The period between 1961 and 1970 was defined by the growth of heavy industrial production and an increasing emphasis on autarchic economy, which included a high diversification of goods. During this period, the GDP doubled [7], and the foreign trade was mainly oriented towards communist countries, members of the Council of Mutual Economic Assistance (CMEA). Romania almost tripled its GDP between 1970 and 1980, indicating a very prosperous economic decade, despite the country's heavy reliance on foreign capital. With a diverse range of industrial goods, the economic sector is defined by an increased quantity of products, added value, and access to new markets [7]. After that, until the fall of the communism (1989) Romania continued to export in large quantities of goods, but the quality of its goods progressively deteriorated and western markets slowly become marginal [7]. Due to compelled exports and restricted imports (a communist strategy to face the external debts), the importance of western countries in Romania's foreign trade decreased, while exports to CMEA countries grown back. After the fall of the Communism, Romanian economy followed its transition to the open market economy, being affected by dramatic institutional, legal and economic changes, with the industry being gradually privatized and EU becoming the main external trade/investment partner.

In general terms, the trade balance is the net amount of a country's exports and imports of goods, excluding all financial transfers, investments and other financial components [8]. A country's trade balance is positive (meaning that it has a surplus) when the value of exports exceeds the value of imports; on the other hand, a country's trade balance is negative or deficient if the value of imports exceeds that of exports [8]. The higher the value of the trade balance of a country (or a sector) is, the more one can argue that that country (or that sector) have better economic performance. If the phenomenon is coupled with a high import of raw materials, then the economic performance is even better. From this perspective, the trade balance can be a very good indicator for the economic characterization of a country. For these reasons the present paper considers the forestry sector trade balance as an indicator for the intended assessment.

Wood products manufacture and foreign trade are areas of great research interest. In many recent studies, researchers present facts and make correlative and trend identification analysis. The estimation of the import export trends was studied in 2008 in Iran [9], followed by a paper studying the correlation between import and export with the major macroeconomic variables [10], then an investigation about wood production and its trends [11], and in 2018 a wood products' trade prediction [12]. Other countries also have similar studies: in China there are papers studying wood foreign trade [13] but also the non-wood products trade [14]. In Poland wood and wooden products were studied over a period of 9 years [15]. Some modeling and forecasting methods for wood based panel was used in India [16]. Moreover, the trade performance and the impact of international trade was also studied in central Europe [3,6,17]. There are relatively few studies focusing wood products foreign trade in Romania, this area being inexplicably avoided by scientists. The existing studies mainly focus on profitability [3] and internal production and development issues [5,18,19] or are referring to foreign trade only marginally [4]. However, in the last years, the interest increased. In [20] for instance, the research is analyzing the wood products export performance making a comparison between Romania and Bulgaria. There were 21 products taken into account using the Standard International Trade Classification (SITC) codes. The results show that Romania presents a more diversified palette of products and that both countries present a positive relative trade balance [20]. Moreover, it comes into sight that Romanian forest products have superior added value [20].

2. MATERIALS AND METHODS

2.1. Data Collection

Documentation was the main methodological approach. Data were collected from the FAOSTAT database [21] from 1961 to 2020 for Romania: i) quantities for production, import and export and ii) values for export and import in order to calculate the balance trade. The external trade balance was employed in order to find out if different sub-sectors produce surplus of value for the sector and, after that, if all of them combined produce a surplus to the country's trade balance. Afterwards an Excel® database was used to produce the illustrative graphs.

2.2. Product classification

The production, import and export data were extracted for roundwood, sawnwood, secondary processing products and paper industry products (**Table 1**). The product classification was conducted using "forest products definitions" handbook [22].

Table 1. Product classification

No.	Category	Products
1	Roundwood	Fuel wood
		Industrial roundwood
2	Primary processing	Sawnwood
3	Secondary processing	Wood charcoal
		Wood pellets and other agglomerates
		Wood chips, particles, and residues
		Veneer sheets
		Wood based panels
4	Paper industry	Wood pulp
		Recovered fibber pulp
		Recovered paper
		Graphic paper
		Other paper and paperboard

Roundwood, sawnwood and secondary processing products were collected in cubic meters and the products of the paper industry were extracted in metric tons. However, wood pellets and other agglomerates and wood charcoal were initially expressed in tons, and for sake of consistency with the entire category (secondary processing) they were converted to m^3 using conversion factors of 2.19 and 5.93, respectively (averages at Europe level) [23].

3. RESULTS

3.1. Roundwood

The period up to 1970 was marked by a slight increase in the production and imports of roundwood, with declining exports. This period is characterized by historical peaks in roundwood exports, particularly in the first years of the period, which corresponds to a period of low development of the wood processing sector. Consequently, Romania exported significant quantities of roundwood along with other raw materials to Soviet Union [7] (**Figure 1**). Gradually, with the development of the processing industry and the general orientation of the national economy towards autarchy, the exports of roundwood began to decrease. They remained at a low level for the entire communist period. From 1970 to 1980, production and exports declined, while imports increased. From 1980 to 1989, all components had a decreasing trend.

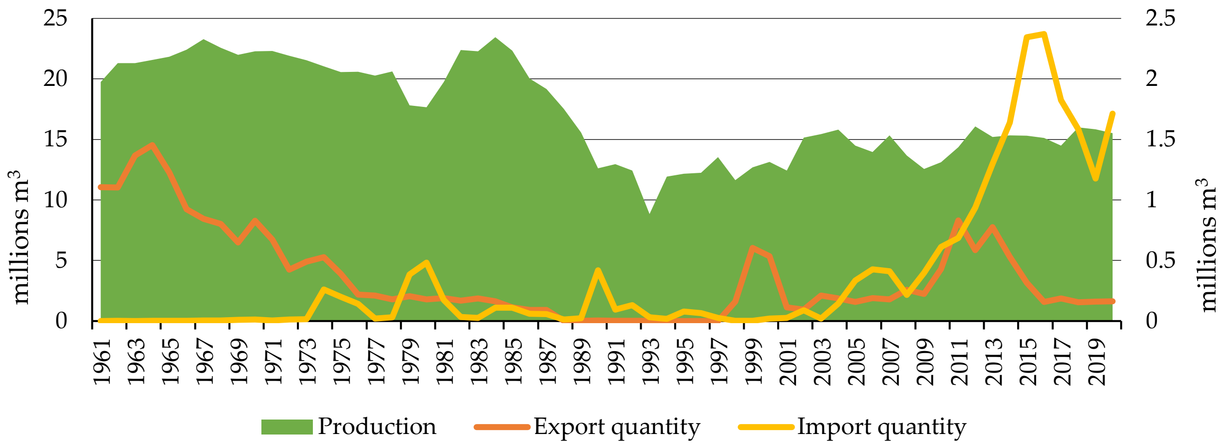


Figure 1. Roundwood production, import and export evolution (from 1961 to 2020) (production being on the left axis and import and export being on the right axis)

After the fall of Communism, production fluctuates throughout the period, but ends up to about 15 million m^3. Imports were growing significantly, exceeding exports by large, reaching a minimum value in 1989. Nowadays, Romania is currently a net importer of roundwood.

3.2. Sawnwood

Throughout the studied timeframe, sawnwood industry keeps up comparable and consistent production, import, and export patterns (**Figure 2**).

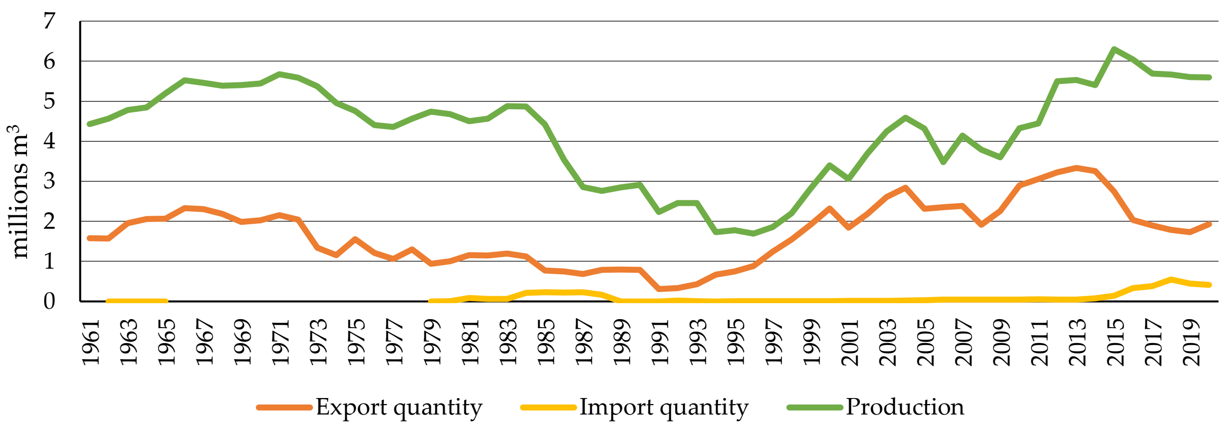


Figure 2. Sawnwood production, import and export evolution (from 1961 to 2020)

From 1961 to 1970, there was a modest rise, followed by a minor fall (until 1980), with values resembling the 1961 levels. Production and exports have decreased since 1980, while wood imports marginally increased. After 1989, all values declined for 5-6 years, then went up to 2015, when they declined again. The fall in exports from 1973 to 1990s was the consequence of the growth of the wood processing sector. It is important to notice that after 2015, although the production kept quite high levels, imports declined rapidly.

3.3. Secondary processing

The secondary processing category has a growing tendency throughout the investigated period, except the decade 1989–1999. Approximately half of the secondary processing output was exported. Excepting the period 1997–2007, the trade balance was positive (**Figure 3**). Again, one can see that exports for secondary processed good has increased steadily in the last period.

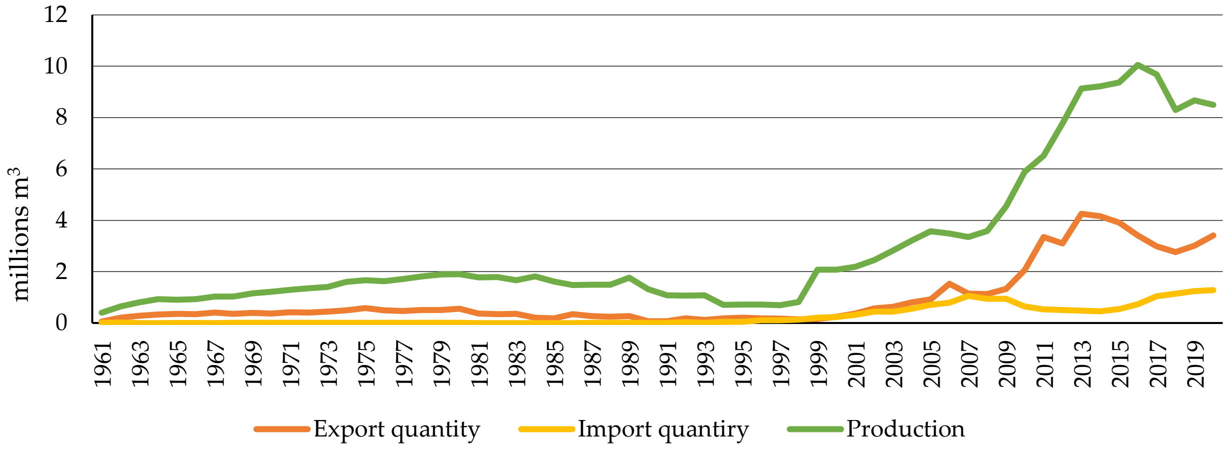


Figure 3. Secondary processing production, import and export evolution (from 1961 to 2019)

There are two maxima for exports of secondary processing products: the first is between 1970 and 1979, and the second after 2011, which stopped growing in 2015.

3.4. Paper industry

The production of these specific products peaked between 1977 and 1983, after which declined gradually and significantly, never reaching the 1977 level (**Figure 4**).

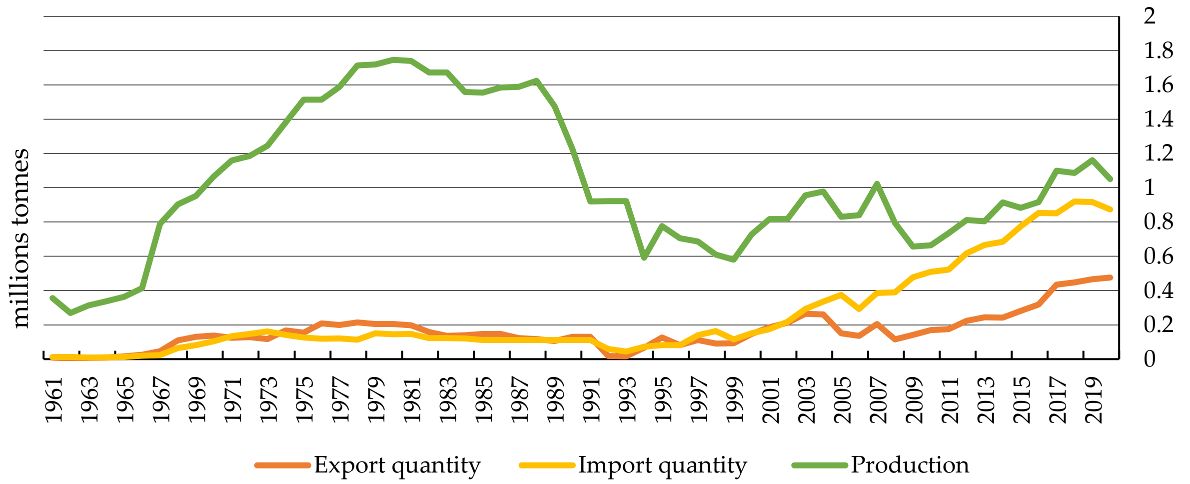


Figure 4. Paper industry production, import and export evolution (from 1961 to 2020)

Imports and exports vary dramatically throughout the first three decades, but exports remained marginally higher than imports until 1992, when exports of products in this category started to outpace imports and eventually reached near production levels in 2015. The volume exported remained small.

3.5. External trade balance for forestry products

From 1961 to 1980, the trade balance for roundwood is mostly positive. Following that, until 1989, there was and equilibrium, and the era following the collapse of communism is marked by significant oscillations, with a bias toward a negative balance (**Figure 5**). There is a cumulated deficit of -55 million USD for the whole studied period.

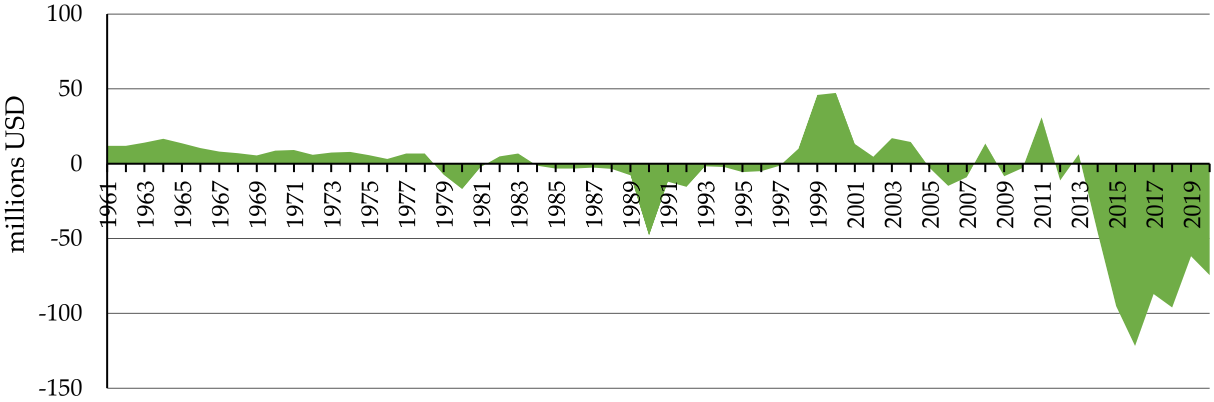


Figure 5. Roundwood balance trade

The sawnwood trade balance was positive, indicating a surplus throughout the entire investigated period (**Figure 6**), indicating that Romania was and continues to be a net exporter of sawnwood, despite a significant decrease in the last 3-5 years. Until 1990, the surplus values were stable at a level around 130 million USD, but the trade balance increased during the last three decades. Romania boosted its timber exports after 1989, mainly due to the decline of the state-owned secondary wood processing industry. However, in the last five years, due to a steady growth of production capacity via private investment, and timber demand on internal markets for secondary processing, sawnwood exports declined.

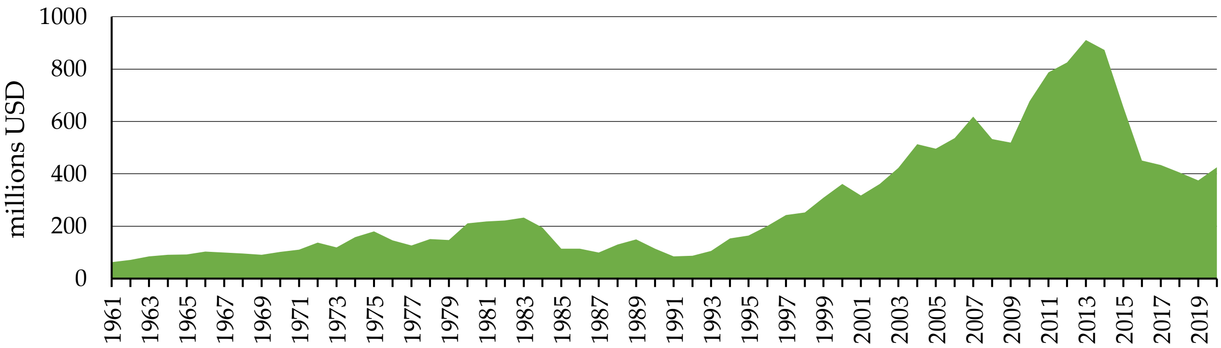


Figure 6. Sawnwood balance trade

The trade balance for secondary processing industry is predominantly positive (**Figure 7**), a situation that has been more pronounced over the past five years. From 1961 to 1990, the average surplus was 44 million USD. Beginning with 1990, a deficit developed, which eventually transformed into a surplus in 2009. Following that, the excess was tremendous, reaching a peak of 784 million USD.

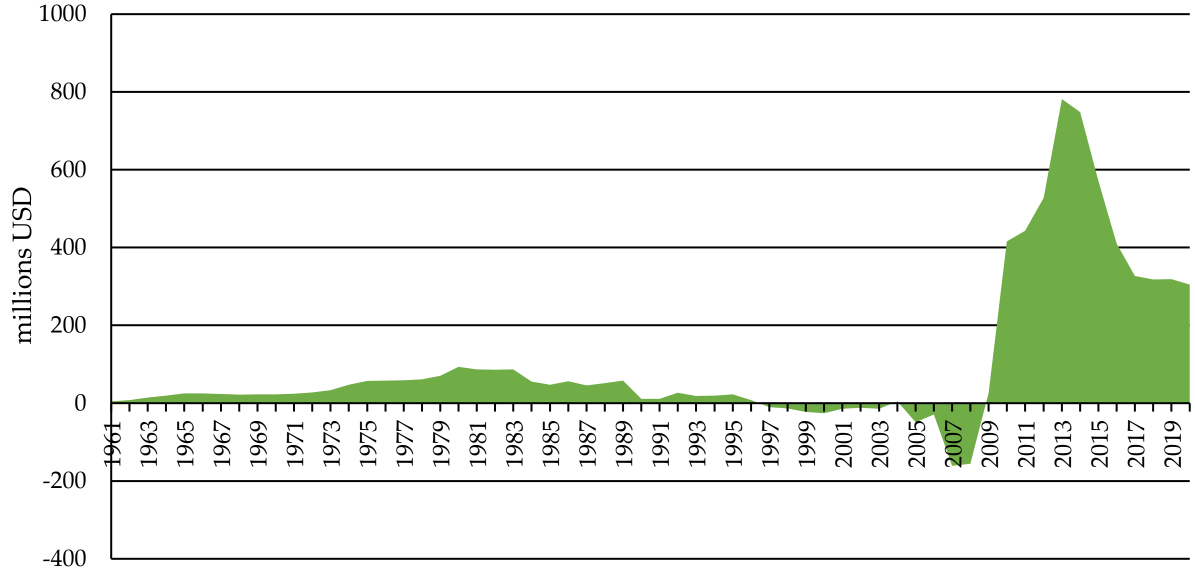


Figure 7. Secondary processing industry balance trade

For the pulp and paper sub-sector, until 1991 the trade balance varied, with only a minor deficit between 1970 and 1974. Following this period, it falls into a large deficit, with losses of up to $ 503 Million USD (**Figure 8**). Thus, Romania became a net importer of paper industry products after 1991.

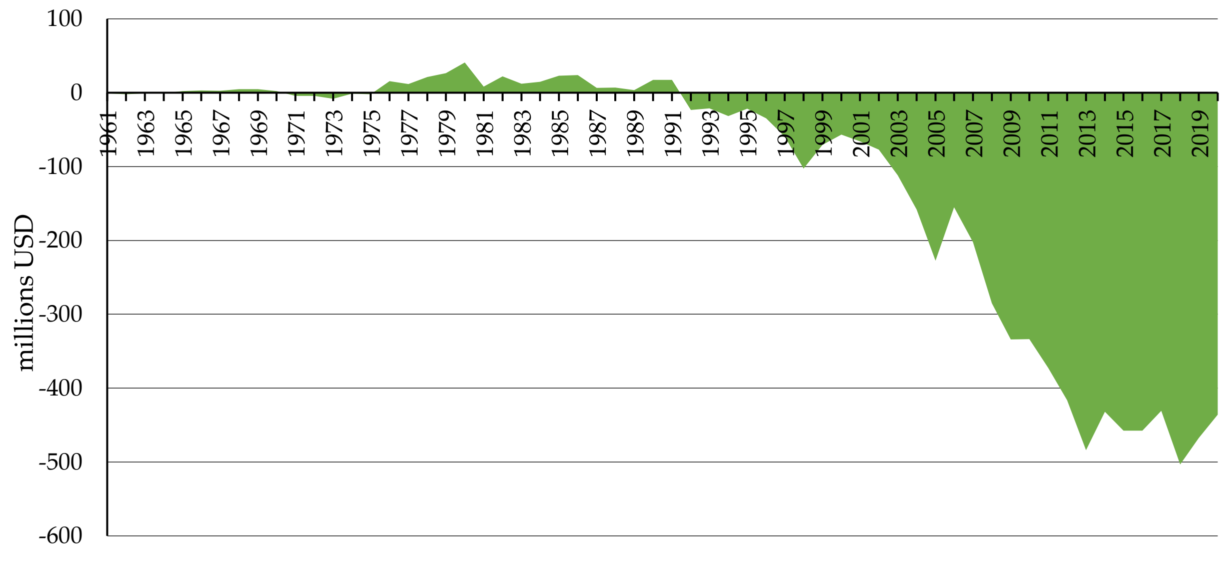


Figure 8. Paper industry balance trade

3.6. External trade balance for the whole forestry sector

The entire trade balance was considered without taking into account the furniture industry. And throughout the whole period, forest sector balance was positive, without furniture (**Figure 9**).

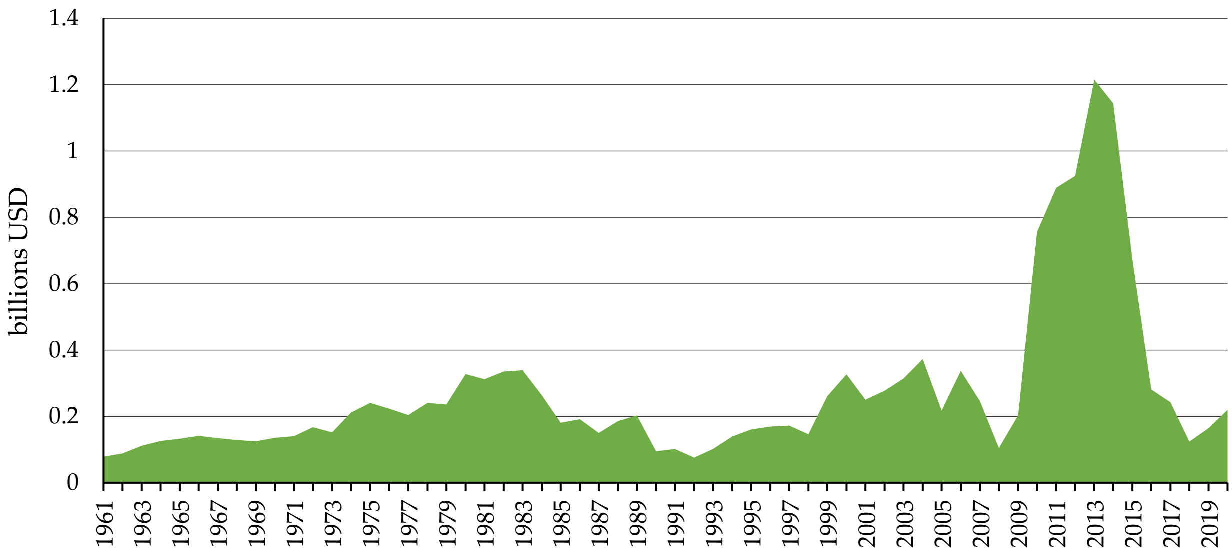


Figure 9. Forestry sector balance trade (without the furniture industry)

There were two periods of maximum, one in 1983 (of 339 million USD) and one in 2013 (of 1,2 billion USD). After the maximum in 2013 the trade balance decreased significantly and hit a minimum of 124 million USD only to increase in 2019 and further in 2020.

4. DISCUSSIONS

The current study was carried out in order to characterize the Romanian forestry sector through production and trade balance (import and export) of roundwood, sawnwood, secondary processed products, and paper industry products, between 1961 and 2020. By employing the trade balance, the study sheds light on the general economic performance of the forest sector, including specific wood processing industries. The study also presents an overview of the general economic performance of the sector.

Some traits of the trade balance were identified, by Halalisan et al. [4] in the following order: i) between 1970 and 1980, the emphasis was on technical progress, meaning a minor but constant improvement in the trade balance; ii) between 1980 and 1990, the public debt became noticeable, and the trade balance started to deteriorate; iii) after 1990, the trade balance properly mirrored the shift from Communism to a capitalist economy. Additionally, the forestry industry suffered the effects of the 2007 economic crisis, with a slight decline in turnover.

During the analyzed period, Romania turned into a net roundwood importer. The trade balance for roundwood followed the evolution of processing industry, mirroring, especially with the high imports in the last 5-10 years, the development of the wood processing industry. Moreover, in the last period the sawnwood exports decreased, while the internal demand for unprocessed or primarily processed wood has increased – again a hint that the processing industry is developing. Figures describing the secondary processing sector confirmed the steady increase in production and export. In this context, the sawnwood pattern of recent years, which indicates a fall in exports, is most likely attributable to the country's increased capacity to process the wood, as a result of investment in this industry. When we consider the dramatic increase in roundwood imports (**Figure 1** for quantity and **Figure 5** for value), the hypothesis is confirmed. In the case of secondary processed products, the two maxima 1979 and 2016 correspond to different influences according to Halalisan et al. [4] such as: the first corresponds to the general trend of the command-and-control economy toward autarchy, industrialization, and added value (between 1970 and 1979), and the second corresponds to the second growth in the wood processing industry after 2011, fueled mostly by foreign investments.

The evolution of production and the external balance for wood products indicate the same upward trend in value added, production diversification, increased processing and export orientation: exports of roundwood and timber decreased steadily and significantly, while imports of these product categories reached historical highs in the last decade. All against the background of the significant increase in the value of production and exports of high value-added products, resulting from secondary processing. All these have led to a significant surplus in the balance of the forestry sector, which also reached an all-time high in 2013 of 1,2 billion USD. Worth noting that our study didn’t consider the furniture industry, which could provide even a higher amount of value to the balance. The decline in the trade balance after 2016 is difficult to explain, having in mind the multitude of factors, including COVID pandemic, but it may indicate a crisis of raw material and, according to some sources, a prescriptive forest management regulatory frame, affecting the costs of placing round wood on the market [24]. In 2013, the positive forest sector balance is significant in the country’s context of a negative trade balance around 7,5 billion USD [22], indicating a great potential of the forest sector. In 2020, the surplus was 0,2 billion USD, while, Romania registered a negative general trade balance of 21.020 billion USD [25]. Under these conditions, the envisaged crisis of raw material may seriously affect the contribution of sector, lacking governmental policy measures. However, there is still room for in depth analysis before dropping conclusions.

Working on high-end products, with more added value will provide substantially more economic benefits. It can be seen that the whole sector’s balance trade is positive, which result confirms the indications of Verter [20]. Positive trade balance of Romanian forest sector indicates the importance of the forestry sector in this country. A study done by Halalisan et al. [7] found the same results that the forestry sector is “increasingly efficient, productive and innovative” in the context of the relation between the standardization and market evolution.

Romanian forest sector has a significant potential of contributing to the country’s economy and this potential should be further investigated and used. This study also offers new opportunities for future research. For example, the furniture industry can be used to assess the whole economic performance and to provide a clear and transparent view of the whole wooden products used nowadays.

5. CONCLUSIONS

1. In the last decades, Romania has become a net importer of roundwood and products from the paper industry. It should be understood that the mediatized information about the amount of wood seen to leave the country is misleading, because it is in fact coming and domestically processed;
2. In contrast to the roundwood and paper industry products, Romania is a net exporter of sawnwood and secondary processed products. Last year's trend suggests that the sawnwood export is going down and the export of secondary products has been going up after 2017;
3. In the last years the production and exports of secondary processed products increased, showing that the Romania takes advantage from the added value determined by importing raw materials and processing it domestically, in a developing wood processing industry, where important investments have been deployed.

FUNDING

This work received no external funding.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGEMENT

The authors would like to thank Transilvania University of Brașov for supporting the research.

EXTENDED ABSTRACT – REZUMAT EXTINS

Titlu în română: *Concret despre comerțul exterior al sectorului forestier din România*

Introducere: *Sectorul forestier al României este unul foarte important pentru economia țării, deoarece contribuția la produsul intern brut (PIB) este de 3,5%. Cu cât produsele sunt mai mult procesate pe plan intern, cu atât apar mai multe oportunități pentru sectoarele adiacente. Exportul de produse din lemn și investițiile străine sunt considerate factori de declanșare a creșterii şi prosperității pentru industria de prelucrare a lemnului. Balanța comercială este valoarea netă a exporturilor și importurilor de bunuri ale unei țări, excluzând toate transferurile financiare, investițiile și alte componente financiare. Cu cât este mai mare valoarea balanței comerciale a unei țări (sau a unui sector), în condițiile în care produsele exportate au un grad mai mare de prelucrare, rezultând etapele finale ale lanțului valoric, cu atât se poate susține că acea țară (sau sectorul respectiv) are performanțe economice mai bune. Importul și exportul de lemn și produse din lemn au fost studiate în Iran, Polonia, India și Europa Centrală. Producția, importul, exportul și balanța comercială pot oferi perspective asupra economiei și performanței sectorului forestier.*

Materiale şi metode: *Datele au fost colectate din baza de date FAOSTAT pentru România din anul 1961 până în 2020. Au fost colectate două tipuri de date: i) cantități pentru producție, import și export și ii) valori pentru export și import pentru a calcula balanța comercială. Producția, importul și exportul au fost colectate pentru lemn rotund, cherestea, produse de prelucrare secundară și produse din industria hârtiei. Clasificarea produselor a fost realizată folosind* *manualul „definiții ale produselor forestiere" al FAO. Lemnul rotund, cheresteaua și produsele de prelucrare secundară au fost extrase în m³, iar produsele din industria hârtiei au fost extrase în tone metrice, fiind utilizați apoi coeficienți consacrați de conversie.*

Rezultate: *Perioada până în 1970 a fost marcată de o ușoară creștere a producției și importurilor de lemn rotund, exporturile fiind în scădere. Această perioadă se remarcă prin maxime istorice ale exporturilor de lemn rotund, în special în primii ani ai perioadei, ceea ce corespunde unei perioade de dezvoltare foarte scăzută a sectorului de prelucrare a lemnului, în urma căreia România exportă cantități masive de lemn.*

Din 1961 până în 1970, se constată o creștere modestă a producției de cherestele, urmată de o scădere minoră (până în 1980), valorile revenind la nivelurile anului 1961. Producția și exporturile au scăzut din 1980, în timp ce importurile au crescut marginal. După 1989, toate valorile scad timp de 5-6 ani înainte de a crește până în jurul anului 2015, când scad din nou. Scăderea exporturilor din 1973 și până în anii 1990 reflectă reducerea exporturilor de lemn rotund, ambele fiind legate de creșterea sectorului de prelucrare a lemnului. Categoria de prelucrare secundară are o tendință de creștere pe parcursul perioadei investigate, cu excepția anilor 1989–1999.

Aproximativ jumătate din producția de produse de prelucrare secundară este exportată, restul fiind comercializat pe piața locală. Cu excepția perioadei 1997–2007, importurile de produse provenite din prelucrarea secundară din această categorie sunt mai mici decât exporturile. Importurile și exporturile de produse din industria hârtiei variază dramatic de-a lungul primelor trei decenii, dar exporturile rămân marginal mai mari decât importurile până în 1992, când exporturile de produse din această categorie au început să depășească importurile și, în cele din urmă, au ajuns aproape de niveluri de producție în 2015. Volumul exportat a rămas mic.

Discuții: *Una dintre cele mai importante caracteristici ale importului și exportului de lemn rotund este că valoarea importată este mult mai mare decât cea exportată, generând o balanță comercială negativă. Motivul pentru care o balanță comercială negativă nu este considerată nefavorabilă se datorează faptului că balanța de cherestea oferă, pe de o parte, mai multe venituri și are o valoare adăugată superioară și, pe de altă parte, oferă oportunități pentru industria de prelucrare secundară sau industriei hârtiei și mobilei (care poate oferi valoare adăugată incomparabilă).*

Concluzii: *România a fost în ultimii ani şi este în prezent importator net de lemn rotund şi hârtie. În ultimii ani a crescut producția și importul de cherestea, ceea ce poate fi văzut ca un fapt bun, arătând că România devine din ce în ce mai conștientă de beneficiile valorii adăugate și beneficiile importului de materii prime și procesării acesteia în interiorul granițelor. Una peste alta, din perspectiva industriei lemnului rotund, a cherestelei, a prelucrării secundare și a industriei hârtiei, România are o balanță comercială pozitivă, arătând importanța economică a sectorului și necesitatea acordării unei atenții sporite studierii fenomenului economic din domeniul silvic și al industriei de prelucrare a lemnului.*

Cuvinte cheie: *export, sector forestier, România, prelucrarea lemnului, comerțul lemnului.*

REFERENCES

1. INS, 2021. Statistica activităţilor din silvicultură în anul 2020. Available online at: https://insse.ro/cms/ro/content/statistica-activităţilor-din-silvicultură-în-anul-2020 (accessed on 09.11.2021).

2. Ioraș F., Abrudan I.V., 2009: The Romanian forestry sector: privatization facts. International Forestry review 8(3): 361–367, doi.org/10.1505/ifor.8.3.361.

3. Kovalcic M., 2011: Profitability and competitiveness of forestry in European countries. Journal of Forest Science, 57(9):369–376.

4. Hălălişan A.F., Nicorescu A.I., Popa B., Neykov N., Marinescu V., Abrudan I.V., 2020: The relationships between forestry sector standardization, market evolution and sustainability approaches in the communist and post-communist economies: The case of Romania. Notulae Botanicae Horti Agrobotanici Cluj-Napoca, 48, 1–16, doi:10.15835/nbha48312007.

5. Nunvailer L., Negru C., Popa B., 2020: Wood harvesting sector in Suceava county: financial and economic challenges. Revista Pădurilor, 135, 1–14.

6. Sujová A., Michal J., Kupčák V., Dudík R., 2017: The impact of international trade of raw wood to the economic growth of forest-based sectors in the Czech and Slovak Republics. BioResources, 12, 1102–1111, doi:10.15376/biores.12.1.1102-1111.

7. Zaman G., Georgescu G., 2018: A retrospective study on Romania's external trade in the past 100 years. Munich Personal RePEc Archive, MPRA Paper No. 89707. Available on line at: https://mpra.ub.uni-muenchen.de/89707/1/MPRA_paper_89707.pdf (Accessed on 16.03.2020).

8. Dictionarul juridic, 2021. Trade balance. Available online at: https://www.dictio.ro/juridic/balanta-comerciala (Accessed on 09.11.2021).

9. Bayat K., Rafighi A., Azizi M., Amiri S., Kabouran A., 2008: Estimate of timber and wood products export and import trend in Iran. The Journal of Agriculture and Natural Resources Sciences, 15, 73–83.

10. Limaei M.S., Heybatian R., Heshmatol Vaezin S.M., Torkman J., 2011: Wood import and export and its relation to major macroeconomics variables in Iran. Forest Policy and Economy, 13, 303–307, doi:10.1016/j.forpol.2011.03.001.

11. Foumani B.S., Limaei S.M., Shahraji T.R., 2016: Investigation of wood production and trading in Iran. Journal of Forensic Sciences, 62, 407–412, doi:10.17221/8/2016-JFS.

12. Khosravi S., Maleknia R., Adeli K., Mohseni R., Hodges D.H., 2018: The future of wood products' trade and industry in Iran. Iranian Journal of Wood and Paper Industry, 9, 1–14.

13. Guang-Qian, Z.H.U., 2006: Reviews on the Wood Import-Export Trade and the Wood Industry in China. China Wood Industry, 2.

14. Jihe T.A.N.G., Cheng B.A., 2012: An Empirical Study on the Import and Export of China's Non-Wood Forest Products [J]. Business Economics, 8.

15. Zając S., 1998: An analysis of export and import of wood and wood-based products in Poland in 1987-1996. Sylwan, 142(4), 5–18.

16. Upadhyay V.K., 2013: Modelling and forecasting export and import of Indian wood based panel using ARIMA models. Elixir Stat, 63, 18145–18148.

17. Paluš H., Parobek J., Liker B., 2015: Trade Performance and Competitiveness of the Slovak Wood Processing Industry within the Visegrad Group Countries. Drvna industrija: Znanstveni časopis za pitanja drvne tehnologije, 66, 195–203, doi:10.5552/drind.2015.1431.

18. Duduman G., Bouriaud L. ,2007: Managing innovations in wood harvesting and primary processing firms – case study of Suceava. Forestry Studies | Metsanduslikud Uurimused, 46, 89–101.

19. Nastase C., Nichiforel L., Bulinschi R., Bouriaud L., 2005: Factors of Development of the harvesting firms in Suceava, Romania. Economic Studies, 1, 55–67.

20. Verter N., 2019: Wood products export performance in Bulgaria and Romania. Bulgarian Journal of Agricultural Science, 25, 949–958.

21. FAO. Available online: https://www.fao.org/faostat/en/#data/FO (accessed on 09.12.2021).

22. FAO. Available online at: https://www.fao.org/forestry/34572-0902b3c041384fd87f2451da2bb9237.pdf (accessed on 09.12.2021).

23. FAO. Available online at: https://www.fao.org/3/ca7952en/CA7952EN.pdf (accessed on 09.12.2021).

24. Popa B., Niță M.D., Hălălișan A.F., 2019: Intentions to engage in forest law enforcement in Romania: An application of the theory of planned behavior. Forest Policy and Economics, 100, 33–43, https://doi.org/10.1016/j.forpol.2018.11.005.

25. INS. Available online at: http://statistici.insse.ro:8077/tempo-online/#/pages/tables/insse-table (accessed on 09.12.2021).