Wood products export performance in Bulgaria and Romania

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Abstract

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This article investigates export performance in wood products in Bulgaria and Romania using Balassa index, relative trade balance (RTB), diversification ratios and other descriptive approaches. The Balassa index suggests that both countries have comparative advantages in the overall wood products. Nonetheless, both countries' comparative advantages have steadily declined over the years. Both product and market diversification ratios indicate that Romania has diversified more than Bulgaria, implying that the latter has been more vulnerable to shocks within its importing countries than the former. As expected, both countries witnessed substantial positive RTB in the overall wood trade, and in eight out of the top ten (8/10) wood product groups traded within the period under study. Romania appears to have added more value to its exported products than Bulgaria. By and large, both countries have performed and remained competitive in their top ten wood product groups in the global markets. Nevertheless, there is a need for more market and product diversification, especially in Bulgaria.

Keywords: export; competitiveness; diversification; RCA; shocks; RTB; SITC
List of abbreviations*:* SITC – Standard international trade classification; RCA – 'revealed' comparative advantage; RTB – relative trade balance

Introduction

Productivity is part and parcel of export performance and competitiveness (Porter, 1990; WEF, 2018). Global competitiveness is a measure of a nation's advantage or disadvantage in selling its goods and services in the global markets (WEF, 2018). Hence, trade performance and competitiveness are occasioned by the capacity of economies to produce products in large quantities to meet the test of global competition (Krugman, 1994).

In foreign trade, economic competitiveness is driven by the export performance of countries involved (Sujová & Hlaváčková, 2015; Priede & Pereira, 2015; Zdráhal & Bečvářová, 2018). Globally, countries are known to be competitive when value-added products are exported more than imported. The products traded are induced by the individual country's competitive or comparative advantage (Repkine & Walsh, 1999; Zaghini, 2005; Zhelev & Tzanov, 2012).

Given that this paper focuses on the forestry (wood) resources, it is worthy of looking at some profiles of the countries under study regarding the sector. The forest area (of land area) covered about 35.2% of Bulgaria and 29.8% of Romania in 2015 (World Bank, 2018). By species, out of this total area, coniferous trees (spruce, pine, fir) occupied about 26%, beech trees about 31%, oak about 16%, other hardwoods 20%, and other softwoods 7% in Romania (USDA, 2017a). Similarly, in Bulgaria, the deciduous forests occupied about 69% of the total forests, and coniferous forests – 31%. The forests in the country with one dominating tree species represents 46%, mixed forests (5-6 tree species) at 44%, and forests with 2-3 tree species at 10% in 2015. The forestry sector is a relevant economic sector in Romania and Bulgaria (USDA, 2017b).

The wood sector is seen as a vehicle for socioeconomic progress as the sector creates jobs, especially in the country-side (Nambiar, 2015; FAO, 2014a; FAO, 2014b; FAO, 2016; FAO, 2018; UNECE/FAO, 2018). The sector also contributes to trade balances and GDP growth in countries (FAO, 2014a; FAO, 2014b; Bykanova et al., 2018). Thus, the significance of wood products in economies cannot be overemphasised.

Recent studies have investigated trade performance of wood products in countries (Bojnec & Ferto, 2011; Bojnec & Fertő, 2014; Paluš et al., 2015; Sujová & Hlaváčková, 2015; Sujová et al., 2017; Granabetter, 2016; UNECE/FAO, 2017). Whereas more evidence on trade in the wood sector exists today than ever before, there is still a need to dig deeper into the export dynamics in Bulgaria and Romania in recent years. This study is an attempt to contribute to the existing literature and throw more light on the development of wood exports in the two selected countries.

Materials and Methods

The article aimed at assessing export performance, structure, and competitiveness in the wood sector in Bulgaria and Romania. The statistical data for this study were obtained from the International Trade Centre (ITC) for the period between 2012 and 2017. Also, the methods for the study are substantially adopted from the ITC calculations. The ITC developed trade performance within the framework of the Harmonized System (HS; Table 1), aimed at assessing and monitoring the multifaceted dimensions (structure) of export competitiveness by industry and by country. The wood product groups (at 4 digits' level exported) are divided into raw, semi-processed to processed materials.

Table 2 presents the rationale and the calculation of each indicator in trade performance index (TPI), divided into three sections: general profile indicators; the composite index (CI) indicators; and the Decomposition of changes (change-related indicators) in the world market. All indicators are calculated at the product level. The ITC uses original data in the calculation is at the 6-digit level of the HS nomenclature (1996 edition).

Relative trade balance (RTB) used to analyse whether Bulgaria and Romania have specialised in wood exports (as net-exporter) or imports (as net-importer). The RTB model is mathematically presented as follows:

$$RTB_{ds}^{t} = 100x\frac{x_{ds}^{t} - M_{ds}^{t}}{x_{ds}^{t} + M_{ds}^{t}}, \tag{1}$$

where t is the current year, d is the country under study, s is the chosen sector, X is the exports, and M is the imports. The

Table 1. HS- Standard International Trade Classification (SITC) Revision 3 wood product groups

SITC code	Industry – wood and articles of wood
4400	All industries in sector 44
4401	Fuel wood; wood in chips or particles; sawdust & wood waste & scrap
4402	Wood charcoal (including shell or nut charcoal)
4403	Wood in the rough
4404	Hoop wood; split poles; piles, pickets, stakes; chipwood
4405	Wood wool; wood flour
4406	Railway or tramway sleepers (cross-ties) of wood
4407	Wood sawn/chipped lengthwise, sliced/peeled
4408	Veneer sheets & sheets for plywood &other wood sawn lengthwise
4409	Wood continuously shaped along any edges
4410	Particle board and similar board of wood or other ligneous materials
4411	Fibreboard of wood or other ligneous materials
4412	Plywood, veneered panels and similar laminated wood
4413	Densified wood, in blocks, plates, strips or profile shapes
4414	Wooden frames for paintings, photographs, mirrors or similar objects
4415	Packaging materials of wood
4416	Casks, barrels, vats, tubs, etc. of wood
4417	Tools, tool & broom bodies & handles, shoe lasts of wood
4418	Builders' joinery & carpentry of wood
4419	Tableware and kitchenware of wood
4420	Wood marquetry & inlaid wood; caskets & cases or cutlery of wood
4421	Articles of wood, nes

Source: ITC

Table 2. Wood products: trade performance index

General description	Code	Indicator's description
General Profile	N	Number of exporting countries for the ranking in the sector
	G1	Value of exports (in millions US$)
	G2	Export growth in value (%)
	G3	Share in national exports (%)
	G4	Share in national imports (%)
	G5	Relative trade balance (%)
	G6	Relative unit value (world average = 1)
Position for Current Index (the composite index (CI))	P1	Net exports (in millions US$)
	P2	Per capita exports (US$/inhabitant)
	P3	Share in the world market (%)
	P4	Product diversification (Number of equivalent products)
	P5	Market diversification (Number of equivalent markets)
Decomposition of changes in world market share (last 5 years)	C1	Relative change of world market share (%)
	C1a	Competitiveness effect (%)
	C1b	Initial geographic specialisation (%)
	C1c	Initial product specialization (%)
	C1d	Adaptation effect (%)
Indicators included	A	Absolute change of world market share (% points)

Source: ITC

RTB takes values between -100 and +100 (%), where positive values indicate that the country's exports outweigh its imports.

Product diversification is a good indicator of production structures and the development of the industry. In this study, it intends the measure the identical number of wood product groups exported by the two selected countries. The model is mathematically presented as follows:

$$NDPX_{ds}^{t} = 100x\frac{1}{HIP_{ds}^{t}}, \qquad (2)$$

where *HIP* is the Herfindahl index, calculated as follows:

$$HIP_{ds}^{t} = \sum_{p=1}^{np_s}\left(\frac{x_{dp,s}^{t}}{x_{ds}^{t}}\right)^2, \qquad (3)$$

where $x_{dp,s}^{t}$ is the export of product *p* by country *d* for a given year *t*; x_{ds}^{t} is country *d* exports of all products belonging to the sector *s*; $\frac{x_{dp,s}^{t}}{x_{ds}^{t}}$ is the share of product *p* in total exports of country *d* in sector *s*. The index takes values between 0 and +∞. The larger the index value, the greater the diversification of exports, and thus, the better the ranking and vice versa.

Similarly, market diversification shows (the equivalent number) the degree of market diversification (of wood export markets in this study). The model is mathematically presented as follows:

$$NDMX_{ds}^{t} = \frac{1}{HIM_{ds}^{t}}, \qquad (4)$$

where *HIM* is the Herfindahl index, mathematically presented as follows:

$$HIM_{ds}^{t} = \sum_{m=1}^{nm_s}\left(\frac{x_{dm,s}^{t}}{x_{ds}^{t}}\right)^2, \qquad (5)$$

where $x_{dm,s}^{t}$ is the export of all products belonging to the sector *s* by country *d* to the market *m*, for a given year *t*; x_{ds}^{t} is country *d* exports of all products belonging to the sector *s*; $\frac{x_{dm,s}^{t}}{x_{ds}^{t}}$ is the share of product *p* in total exports of country *d* in sector *s*. Diversifying partner nation reduces its reliance on a few numbers of export markets and the vulnerability to external shocks within destination countries (ITC, 2018).

The concept of 'revealed' comparative advantage (RCA) was coined by Liesner (1958); and later developed by Balassa (1965; 1979), known as Balassa index. This model has been used in the forestry and wood sectors in recent years (Han et al., 2009; Bojnec & Fertő, 2011; Sujová & Hlaváčková, 2015; Sujová et al., 2017). The Balassa index pinpoints product groups that a nation has an obvious advantage in the global market. Interestingly, the Balassa index brings out comparative advantages/disadvantages in global markets and sheds more light on the factors causing those movements. The index is mathematically shown as follows:

$$RCA_{d,i} = \frac{x_{d,i}}{x_d}\bigg/\frac{x_{w,i}}{x_w}, \qquad (6)$$

where *d* is the nation under study, *w* indicates the set of all

exporting nations, *i* signifies a specific industry and *X* are the exports. If it takes a value of less than *1*, this implies that the country is not specialized in exporting the product (the share of that product in the country under review's exports is less than the corresponding world share). Similarly, if the index exceeds *1*, this implies that the country is specialized in exporting the product.

By and large, the topic is chosen because the author believes that it would bring new knowledge and showcase the positions of the selected countries in the global market of the wood sector. Also, given that wood products have been recognised in livelihoods, especially in the countryside (Arnold, 2002; Sunderlin, 2006; Shackleton et al., 2007; UN-ECE/FAO, 2017), the author assumes that looking at trade performance in this sector is relevant.

Results and Discussion

In 2017, Romania accounted for about 1.4% and ranked 22, whilst Bulgaria accounted for about 0.7%, and ranked 52ⁿᵈ position in global wood (SITC 44) exports. On the other hand, Romania accounted for 0.6% and ranked 31, whilst Bulgaria accounted for 0.2% and ranked 63 of global wood imports (ITC, 2018). This dynamic of the overall wood export performance in Bulgaria and Romania for the period 2012-2016 is presented in Table 3 and Table 4, respectively.

Table 3 shows that the value of Bulgaria's wood exports (SITC 44) fluctuated but slowly rose from $337 million in 2012 to $394 million in 2014, then declined to $291 million in 2016. Table 4 shows that the value of Romania's wood exports also fluctuated, slowly increased from $2 billion in 2012 to $2.41 billion in 2014, and then declined to $1.75 billion in 2016.

Interestingly, both Bulgaria and Romania witnessed continued positive trade balance and relative trade balance (RTB) in the overall wood trade for the period 2012 and 2016 (Table 3 and Table 4). Also, Bulgaria witnessed substantial positive RTB in all the top ten product groups except product groups SITC 4411 (fibreboard of wood or other ligneous materials) and SITC 4418 (builders' joinery and carpentry of wood). On the other hand, Romania witnessed negative trade balance and RTB in two (SITC 4403 (wood in rough), and SITC 4411) out of the top ten export product groups during the same period under study.

Arguably, Romania has largely witnessed negative trade balance and RTB in SITC 4403 because the country imported raw wood to add value for domestic consumption and re-export**,** unlike Bulgaria that substantially witnessed a positive trade balance and RTB in the SITC 4403 throughout the

period under study. Similarly, Bojnec and Ferto (2011) argue that Central and Eastern European (CEE) countries export lower value-added raw wood and semi-finished wood products to Austria. On the other hand, Austria exports higher value-added wood products to the CEE countries, such as Romania and Bulgaria.

As earlier explained, the Balassa/RCA index is used to identify comparative advantages in countries. Table 3 and Table 4 also show Balassa index in Bulgaria and Romania, respectively between 2012 and 2016. The RCA findings suggest that these countries have had a comparative advantage in the total wood exports (SITC 44), as values have been more than 1, and in almost all the top ten wood products, albeit Romania has performed more than Bulgaria. Also, the RCA shows that few Bulgarian wood product groups (SITC 4403; SITC 4404 (hoop wood; split poles; piles, pickets, stakes); SITC 4411; SITC 4418; SITC 4421 (articles of wood)) have been below 1 in some years. In general, the nations have been able to favourably compete in the world market with the top ten wood products, albeit Bulgaria needs improving its performance.

Based on the dollar values, the structure Bulgaria's wood exports have been dominated by product groups: SITC 4410 (particle board and similar board of wood); SITC 4407 (wood sawn/chipped lengthwise, sliced/peeled); and SITC 4401 (fuel wood; wood in chips or particles; sawdust and wood waste/scrap). Also, product structure shows highest RCA in SITC 4410, the highest RTB in the product SITC 4403; and the highest regarding global market share SITC 4404 in Bulgaria (Table 3). Similarly, the structure of Romania's wood exports in dollar values has been dominated by product groups: SITC 4407; SITC 4410; and SITC 4418 (Table 4). Also, Romania's product structure shows that the most export product with RCA was SITC 4410, highest with RTB were SITC 4407, SITC 4410, SITC 4421, and the highest regarding global market share was SITC 4410 (Table 4). Trade competitiveness based on the product structure shows that both countries are diversified and largely processed before exports. The product structure suggests that Romania exports wood with higher value-added than Bulgaria.

Trade performance index

As earlier explained, trade performance index (TPI) as developed by the ITC assesses and monitors the multi-faceted indicators of export competitiveness and performance in wood sector in 148 (N- number of nations calculated) countries in the world. The TPI indicators for Bulgaria and Romania are presented in Table 5 and Table 6, respectively. The indicators are divided into three sections: general profile (indicators from G1 to G6); the composite index (indicators from P1 to P5); and the decomposition of changes (indicators from C1 to C1d) in the world market.

Table 3. Trade performance HS (US$, millions, %, indices) in Bulgaria, 2012-2016

Industry 2012/SITC	4400	4410	4407	4401	4403	4412	4411	4415	4409	4418	4404
Exports (US$, millions)	337.5	99.1	53.4	49.3	32.2	27.7	23.9	13.4	9.01	9.0	5.9
Balance (US$, millions)	176.3	66.7	43.5	43.6	29.5	9.1	-22.6	6.0	5.0	-3.8	5.6
RTB (%)	35.4	50.8	68.8	79.3	84.6	19.8	-32.1	28.6	38.2	-17.4	92.6
Exports (% of national exports)	1.26	0.37	0.20	0.18	0.12	0.10	0.09	0.05	0.03	0.03	0.02
Exports (% of world exports)	0.29	1.37	0.17	0.75	0.24	0.19	0.25	0.46	0.19	0.06	3.24
Share of top 3 export markets (%)	69.9	64.0	85.1	95.2	99.9	66.9	77.5	77.9	49.9	37.2	91.0
Balassa Index / RCA Index	2.0	9.3	1.2	4.5	1.7	1.3	1.8	2.5	1.0	0.4	0.7
Industry 2013/SITC	4400	4410	4407	4401	4412	4411	4403	4415	4409	4418	4421
Exports (US$, millions)	342.5	96.3	68.1	50.9	26.4	23.1	22.3	14.6	8.8	8.2	6.5
Balance (US$, millions)	181.6	61.2	59.4	46.9	7.9	-22.6	20.1	5.9	4.8	-5.2	2.1
RTB (%)	36.1	46.6	77.4	85.6	17.6	-32.8	82.2	25.1	37.7	-23.9	19.0
Exports (% of national exports)	1.16	0.33	0.23	0.17	0.09	0.08	0.08	0.05	0.03	0.03	0.02
Exports (% of world exports)	0.26	1.21	0.19	0.67	0.17	0.23	0.14	0.47	0.18	0.05	0.12
Share of top 3 export markets (%)	71.7	70.4	86.8	88.5	65.3	77.3	94.8	81.6	53.8	42.5	68.2
Balassa Index / RCA Index	1.7	8.3	1.2	4.3	1.1	1.6	0.9	2.5	1.0	0.4	0.7
Industry 2014/SITC	4400	4410	4401	4407	4403	4412	4411	4415	4409	4418	4404
Exports (US$, millions)	394.1	88.2	79.9	73.2	41.5	28.6	22.9	17.7	9.9	8.9	6.4
Balance (US$, millions)	222.0	48.5	75.0	64.8	38.8	7.5	-24.9	9.7	6.6	-7.3	6.3
RTB (%)	39.2	37.8	88.6	79.4	87.9	15.0	-35.2	37.9	49.5	-29.0	97.4
Exports (% national exports)	1.34	0.30	0.27	0.25	0.14	0.10	0.08	0.06	0.03	0.03	0.02
Exports (% of world exports)	0.29	1.12	0.99	0.19	0.24	0.17	0.22	0.52	0.19	0.05	3.07
Share of top 3 export markets (%)	75.1	70.0	93.1	88.4	94.8	64.6	77.2	86.0	60.9	57.6	85.8
Balassa Index / RCA Index	1.9	7.5	6.8	1.3	1.6	1.1	1.6	3.0	1.0	0.3	0.7
Industry 2015/SITC	4400	4410	4401	4407	4412	4411	4415	4403	4409	4418	4404
Exports (US$, millions)	328.7	75.7	69.2	63.2	27.4	20.4	18.6	16.4	8.3	7.4	6.2
Balance (US$, millions)	167.6	44.0	61.0	54.1	9.1	-25.1	9.8	15.4	4.6	-8.7	6.0
RTB (%)	34.2	41.0	78.6	74.9	19.9	-38.1	35.7	88.1	38.4	-37.0	95.6
Exports (% of national exports)	1.28	0.29	0.27	0.24	0.11	0.08	0.07	0.06	0.03	0.03	0.02
Exports (% of world exports)	0.27	1.10	0.91	0.19	0.18	0.22	0.61	0.12	0.18	0.05	3.10
Number of export markets	82	20	31	43	34	34	39	10	16	37	11
Balassa Index / RCA Index	1.7	7.3	5.4	1.2	1.2	1.3	3.5	0.8	1.0	0.3	0.7
Industry 2016/SITC	4400	4410	4407	4401	4412	4415	4411	4403	4409	4421	4418
Exports (US$, millions)	291.5	70.6	51.5	45.8	26.1	25.6	17.5	13.6	7.6	7.4	7.2
Balance (US$, millions)	112.3	35.9	41.2	37.0	4.6	13.8	-28.5	12.7	3.6	3.2	-10.2
RTB (%)	23.9	34.2	66.6	67.8	9.7	36.7	-44.9	86.9	30.9	28.0	-41.5
Exports (% of national exports)	1.12	0.27	0.20	0.18	0.10	0.10	0.07	0.05	0.03	0.03	0.03
Exports (% of world exports)	0.23	0.94	0.150	0.59	0.17	0.84	0.19	0.10	0.17	0.13	0.05
Imports (% of world imports)	0.14	0.47	0.03	0.10	0.16	0.42	0.51	0.01	0.09	0.07	0.13
Number of exported products	63	4	8	5	5	2	5	4	3	2	8
Share of top 3 exported products (%)	37.9	99.9	97.4	96.5	97.5	100	97.4	96.4	100	100	84.7
Number of export markets	73	20	37	27	27	38	27	11	23	24	31
Share of top 3 export markets (%)	70.2	68.8	89.1	94.2	55.5	83.8	76.9	78.0	57.9	80.5	65.5
Balassa Index / RCA Index	1.4	5.4	0.9	3.6	1.1	5.0	1.2	0.6	1.0	0.8	0.3

Source: Author's analysis based on ITC, 2018

The performance indicators: G1 to G6 represent the general profile of the two countries' export performance in wood products. Whereas the volume of wood exports in dollar values (G1) slightly increased from about $489 million to $613 million in Bulgaria, it decreased in Romania from $2.3 billion to $2.1 billion between 2012 and 2016. Also, the five-year average export growth rate (G2) shows that Bulgaria recorded positive throughout, while Romania recorded negative growth between

Table 4. Trade performance HS (US$, millions, %, index) in Romania, 2012-2016

Industry 2012/SITC	4400	4407	4410	4411	4421	4401	4408	4418	4412	4403	4415
Exports (US$, millions)	2 006.5	854.4	375.3	146.9	119.7	102.8	84.8	81.6	73.4	41.7	32.8
Balance (US$, millions)	1 555.3	826.9	328.1	26.9	102.3	90.2	52.1	21.4	45.5	-14.4	11.8
RTB (%)	63.3	93.8	77.6	10.1	74.6	78.2	44.4	15.1	44.9	-14.8	22.0
Exports (% of national exports)	3.47	1.48	0.65	0.25	0.21	0.18	0.15	0.14	0.13	0.07	0.06
Exports (% of world exports)	1.71	2.72	5.18	1.51	2.34	1.56	3.09	0.59	0.51	0.32	1.13
Share of top 3 export markets (%)	27.5	47.1	33.9	67.4	73.6	80.1	49.7	45.0	66.4	80.1	66.4
Balassa Index/RCA Index	5.5	8.7	16.3	5.0	7.0	4.5	15.0	2.0	1.6	1.0	3.0
Industry 2013/SITC	4400	4407	4410	4401	4411	4421	4418	4408	4412	4403	4415
Exports (US$, millions)	2 393.9	940.5	542.5	156.0	148.2	128.9	97.1	91.5	91.1	62.9	36.4
Balance (US$, millions)	1 908.8	907.4	503.0	131.1	22.4	113.3	28.1	59.0	59.8	3.2	11.4
RTB (%)	66.3	93.2	86.5	72.5	8.2	78.4	16.9	47.6	48.8	2.6	18.5
Exports (% of national exports)	3.63	1.43	0.82	0.24	0.22	0.20	0.15	0.14	0.14	0.10	0.06
Exports (% of world exports)	1.83	265	6.82	2.06	1.49	2.41	0.61	3.34	0.60	0.39	1.16
Share of top 3 export markets (%)	26.4	44.4	34.1	81.6	64.5	69.5	41.5	38.8	54.5	88.5	67.2
Balassa Index/RCA Index	5.3	7.5	20.5	6.0	4.4	6.7	1.9	14.0	1.8	1.1	3,.0
Industry 2014/SITC	4400	4407	4410	4411	4418	4401	4421	4408	4412	4403	4415
Exports (US$, millions)	2 407.9	918.8	530.2	145.9	143.9	138.7	137.1	106.2	96.4	49.4	38.4
Balance (US$, millions)	1 861.6	880.3	487.7	10.0	64.6	114.9	123.3	71.3	58.3	-37.2	13.5
RTB (%)	63.3	92.0	85.2	3.6	28.9	70.7	81.7	50.6	43.3	-27.3	21.3
Exports (% of national exports)	3.45	1.31	0.76	0.21	0.21	0.20	0.20	0.15	0.14	0.07	0.05
Exports (% of world exports)	1.74	2.42	6.72	1.41	0.87	1.71	2.38	3.74	0.58	0.29	1.13
Share of top 3 export markets (%)	24.7	40.5	27.2	63.4	59.1	79.8	68.6	37.0	51.6	85.0	71.0
Balassa Index/RCA Index	4.8	6.6	19.0	4.2	2.3	5.0	6.7	15.0	1.6	0.8	2.5
Industry 2015/SITC	4400	4407	4410	4418	4421	4411	4408	4412	4401	4415	4403
Exports (US$, millions)	1 929.8	697.6	426.5	145.7	133.1	130.1	96.6	87.6	74.9	34.8	24.3
Balance (US$, millions)	1 373.8	653.9	386.8	62.8	118.3	2.6	62.4	52.6	59.3	12.9	-89.9
RTB (%)	55.3	88.2	83.0	27.5	80.0	1.0	47.7	42.9	65.5	22.6	-64.9
Exports (% of national exports)	3.18	1.15	0.70	0.24	0.22	0.21	0.16	0.14	0.12	0.06	0.04
Exports (% of world exports)	1.56	2.10	6.21	0.96	2.34	1.40	3.56	0.58	0.98	1.15	0.18
Share of top 3 export markets (%)	24.9	42.2	26.4	60.2	64.8	60.0	34.6	54.2	65.6	65.2	80.2
Balassa Index/RCA Index	4.3	5.8	17.5	2.7	7.3	3.5	8.0	1.6	2.4	3.0	0.5
Industry 2016/SITC	4400	4407	4410	4418	4421	4411	4408	4412	4401	4415	4409
Exports (US$, millions)	1 748.2	535.8	422.3	193.9	138.5	113.0	95.5	81.7	53.5	31.3	20.3
Balance (US$, millions)	1 081.1	452.4	364.6	100.6	121.4	-35.8	65.8	45.1	32.8	6. 3	6.2
RTB (%)	44.8	73.1	76.0	35.0	78.0	-13.7	52.5	38.1	44.3	11.1	18.0
Exports (% of national exports)	2.75	0.84	0.66	0.30	0.22	0.18	0.15	0.13	0.08	0.05	0.03
Exports (% of world exports)	1.39	1.54	5.64	1.26	2.44	1.20	3.38	0.54	0.69	1.03	0.45
Growth of exports in value (%)	-3	-11	3	24	4	-6	3	3	-15	-1	-7
Growth of imports in value (%)	10	32	5	12	0	6	-2	7	13	5	-3
Number of exported products	63	8	4	9	2	5	3	4	5	2	3
Share of top 3 exported products (%)	41.2	97.0	99.9	78.9	100	99.5	100	94.1	97.4	100	100
Number of export markets	116	80	88	49	54	69	50	55	31	40	35
Share of top 3 export markets (%)	27.8	42.9	26.7	62.6	63.1	48.8	30.5	56.5	63.1	51.2	46.6
Balassa Index/RCA Index	3.5	3.8	13.2	3.0	5.5	3.0	7.5	1.4	1.6	2.5	1.0

Source: Author's analysis based on ITC, 2018

Table 5. TPI in Wood products (US$ millions, %, & rank) in Bulgaria, 2012-2016

Code	2012		2013		2014		2015		2016	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank
N	146	–	147	–	147	–	148	–	148	–
G1	588.6	–	668.7	–	740.4	–	639	–	613	–
G2	9%	35	24%	22	12%	32	0%	48	1%	54
G3	2%	–	2%	–	2%	–	2%	–	2%	–
G4	2%	–	2%	–	2%	–	2%	–	2%	–
G5	–5%	–	–1%	–	2%	–	0%	–	–4%	–
G6	1.6	–	1.3	–	1.7	–	1.1	–	1.1	–
P1	–74	66	–25.2	55	33.8	42	9.8	46	–54.0	61
P2	80.6	40	92.0	40	102.8	39	89	39	86	40
P3	0.18%	55	0.19%	55	0.20%	54	0.19%	53	0.19%	53
P4	19	19	19	19	22	14	23	14	24	13
P5	7	59	8	56	8	57	7	58	8	55
C1	8.52%	–	15.6%	–	7.35%	–	2.75%	–	1.21%	–
C1a	12.23%	18	15.6%	18	7.50%	23	1.27%	48	1.13%	50
C1b	–2.85%	137	–1.87%	123	–1.19%	122	0.01%	90	–0.40%	84
C1c	2.38%	35	3.03%	31	2.00%	47	0.89%	60	0.60%	63
C1d	–3.24%	119	–1.22%	97	–0.96%	88	0.57%	62	–0.12%	74
A	0.01%	25	0.02%	23	0.01%	23	0.01%	30	0.00%	36

Source: Compiled from ITC, 2018[1]

Notes: C1a – C1d = Change 2008–2012 for Change Index 2012; C1a – C1d = Change 2011–2015 for Change Index 2015; C1a – C1d = Change 2012–2016 for Change Index 2016; Rank denotes global ranking; P2* = raw data

[1]The calculation includes wood, wood products and paper (SITC Revision 3) as follows: 244 cork, natural, raw; waste; 633 cork manufactures; 245 fuel wood, wood charcoal; 634 veneers, plywood, etc.; 246 wood in chips, particles; 635 wood manufactures, nes; 247 wood rough, rough squared; 641 paper and paperboard; 248 wood, simply worked; 642 paper, paper board, cut, etc; 251 pulp and waste paper; 8215 wooden furniture

2015 and 2016. It thus indicates that Bulgaria performed slightly above Romania in G2 within the period under study.

The share of wood exports (% of national exports, G3) shows that the product accounted for an average of about 2% and 3% in Bulgaria and Romania respectively, between 2012 and 2016. Similarly, the share of wood imports (% of national imports, G4) shows that the product accounted for an average of 2% in both countries' total national imports within the same period. It shows that wood exports have been slightly more critical to Romania's trade than Bulgaria. The findings further show Romania with positive RTB (G5) and net trade balance (P1) between 2012 and 2016. On the other hand, Bulgaria recorded positive RTB only in 2014. The relative unit value (RUV- G6) suggests that the quality of wood exports in these countries has been above the world average unit quality as the standard of both countries' export product quality was above 1 during the period under study (Table 5 and Table 6).

The current index based on simple performance indicators (P1 to P5), shows the position of the countries in the global markets. Only Romania recorded positive net exports (P1) in wood products throughout for the period 2012-2016. Also, P2 (per capita exports (US$/inhabitant)) results show Romania with more value in per capita wood exports than

Bulgaria between 2012 and 2016. The finding suggests that Romanians have produced wood for global markets more than Bulgarians. Similarly, P3 (share in the world market) for Bulgaria and Romania shows that these countries have been global players in the wood products (Table 5 and Table 6), albeit with a minimal global market share.

Product diversification delves into the structure of production and the level of development of the wood sector. It limits the reliance on a few numbers of products and thus reduces a nation's vulnerability to industry-specific external shocks. Export product diversification in wood products (P4) shows that both countries are well diversified as almost all product groups (SITC 4401-4421) in the sector are represented, indicating the level of wood development in the countries. This suggests that these countries have not been too vulnerable to the demand shocks in the global markets, albeit Bulgaria has diversified more than Romania.[1]

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[1] Export product diversification (number of equivalent products) and global ranking: Bulgaria moved from 19 wood product groups exported and ranked 19th position in 2012 to 24 wood product groups exported and ranked 13th position in 2016 in the world. Similarly, Romania moved from 10 wood product groups exported and ranked 51st position in 2012 to 17 wood product groups exported and ranked 24th position in 2016 in the world.

Table 6. TPI in Wood products (US$ millions, %, & rank) in Romania, 2012-2016

	2012		2013		2014		2015		2016	
Code	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank
N	146	–	147	–	147	–	148	–	148	–
G1	2 293	–	2 752	–	2 777	–	2 250	–	2 112	–
G2	11%	28	18%	34	11%	37	–1%	56	–2%	84
G3	3%	–	4%	–	3%	–	3%	–	3%	–
G4	2%	–	2%	–	2%	–	2%	–	2%	–
G5	19%	–	24%	–	22%	–	15%	–	6%	–
G6	1.2	–	1.3	–	1.2	–	1.7	–	1.8	–
P1	745.4	18	1 089	17	1 003	20	597.6	22	273.0	28
P2*	107.5	34	137.5	34	139.4	35	113.5	35	106.5	35
P3	0.69%	28	0.78%	27	0.76%	29	0.68%	30	0.64%	32
P4	10	51	11	47	12	43	14	33	17	24
P5	22	2	22	23	25	1	24	1	24	1
C1	9.92%	–	9.92%	–	6.13%	–	1.63%	–	–1.24%	–
C1a	10.30%	22	8.80%	26	6.22%	31	0.42%	62	–1.16%	82
C1b	–0.67%	101	–0.95%	102	–0.94%	113	–0.71%	103	–1.27%	113
C1c	–0.37%	85	0.65%	60	0.99%	65	0.76%	63	0.55%	66
C1d	0.68%	64	1.05%	46	–0.14%	66	1.16%	53	0.64%	56
A	0.05%	10	0.05%	6	0.04%	9	0.01%	23	–0.01%	128

Source: Compiled from ITC, 2018
Notes: C1a – C1d = Change 2008–2012 for Change Index 2012; C1a – C1d = Change 2011–2015 for Change Index 2015; C1a – C1d = Change 2012–2016 for Change Index 2016; Rank denotes global ranking; P2*= raw data

Export market diversification (P5) shows that Romania has diversified its export markets (Table 4 and Table 6). On the other hand, Bulgaria has relied on a few markets for its wood export destinations. It suggests that while Romania has diversified its markets, Bulgaria has depended on a small number of countries for wood exports, and thus the vulnerability of Bulgaria to shocks within its importing partners has been intensified (Table 3 and Table 5).[2]

Also, the decomposition of changes (indicators from C1 to C1d) in market shares (5-year intervals) of wood products in the world for the period between 2008 and 2016 for Bulgaria and Romania are presented in Table 5 and Table 6, respectively. The change in competitiveness effect signifies a quota of the relative change in the global market share of Romania and Bulgaria. The positive relative change of world market share (C1) in wood products indicates that both Romania and Bulgaria shares in the world market have improved, nevertheless Romania witnessed negative values in 2016 (which was for the period 2012-2016). It signifies

that Bulgaria performed better in the global market than Romania within the period under study.

Similarly, the global competitiveness effect (C1a) suggests that Bulgaria recorded positive outcomes throughout the period, while Romania witnessed negative effect (-1.24%) for the period 2012-2016. Bulgaria's ranking declined from 18th position (2008-2012) to 50th position (2012-2016), whereas Romania's declined from 22nd position to 82nd position within the same period under study (Table 5 and Table 6).

The initial geographic specialisation (C1b) results show negative signs in both countries throughout the period, except for Bulgaria in 2012. It suggests that both countries have not been well positioned on dynamic destination markets for the period 2011-2016. On the other hand, the initial product specialization (C1c) results show positive signs in both countries throughout the period, except for Romania in 2012 (for the change 2008-2012). It suggests that both countries have been well positioned on the dynamics of wood products for the period 2011-2016 (Table 5 and Table 6).

Also, adaptation effects (C1d) and the global ranking in wood products suggest Romania can adjust its wood exports (supply) to the changes in the global demand over time. The country's ranking in the world also improved from 64th position to 56th position within the period under study. On the

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[2] Export market diversification (number of equivalent markets) and global ranking: Bulgaria moved from 7 number of export markets and ranked 59th position in 2012 to 8 number of export markets and ranked 55th position in 2016 in the world. Similarly, Romania moved from 22 number of export markets and ranked 2nd position in 2012 to 24 number of export markets and ranked 1st position in 2016 in the world.

other hand, Bulgaria witnessed negative changes in 2012 (for change 2008-2012) and 2016 (for change 2008-2012). It also suggests that these countries' market share in importing partners have not been dramatically improved. Similarly, the absolute change of world market share (A) indicator shows that these countries' position in the global market may have been threatened.

Trading partners, vulnerability and market access

The share of Romania's wood exports (% of national wood exports) to Bulgaria decreased from 3.2% in 2012 to 2.4% in 2017, while Bulgaria's exports to Romania also declined from 7.2% in 2012 to 4.8% in 2017 (ITC, 2018). The tops Bulgarian and Romanian wood importing partners are presented in Table 7. Greece, Turkey, Italy, Germany and Romania, were the leading wood importing countries from Bulgaria. Similarly, Italy, China, Japan, Germany and Turkey were the leading importers from Romania.

A critical look at the export destinations shows that Bulgaria (heavily concentrated as top 5 countries, accounted for over 76%) was highly volatile relative to Romania (top 5 countries accounted for over 40%) in 2017. Also, Romania's wood export markets have been spread beyond the EU, whereas Bulgaria exports highly within the EU single market area. Nevertheless, the vulnerability of Bulgaria to shocks within its destination partners has been intensified. In the same vein, study by USDA (2017a) suggests that Romanian wood export reaches every corner of the world as the country exported various wood product groups to approximately 120 countries in 2016.

The findings further suggest that intra-industry specialization has improved the level of value-added products. Although these countries' average export growth rates between the period 2013-2017 declined (by -4% Bulgaria and -9% Romania); it rose (by 9% Bulgaria and 2% Romania) between 2016/2017. The decline in exports could be attributed to the decrease in exports to Turkey, which is among the major export markets for both Bulgaria and Romania. Similarly, exports from Romania to Japan also contracted (Table 7).

Even though there is market access to wood export within the EU borders, most non-EU countries charge import duties. Thus, Bulgaria and Romania have faced some tariffs (estimated) in countries outside the EU common market (Table 7). Similarly, ITC (2018b) report shows that an average import duty (most favoured nation-MFN) faced by Bulgaria and Romania on wood products SITC 44 in importing countries in 2017 were as follows: Japan 2.5%, China 2.6%, Australia 4.3%, UAE 4.9%, Pakistan 9.1%, and Russia 8.8%, and Côte d'Ivoire 14%. Arguably, tariffs faced by Bulgarian and Romanian wood exporters in other continents might have partially impeded them from penetrating the non-EU markets.

Conclusions

This article investigates export performance in wood products in Bulgaria and Romania in recent years. Some methods, such as Balassa index, RTB, and diversification ratios were used. The Balassa index reveals that both countries

Table 7. Bulgaria and Romania's top wood export markets (SITC 44, US$ million, %) in 2017

Indicator	Ex 2017 (US$)	Balance 2017 (US$)	ExShare (%)	ExG 2013-17 (%)	ExG 2016-17 (%)	Tariff
			Bulgaria			
Total exports	343.8	127.0	100	-4	9	–
Greece	117.1	106.9	34.0	1	3	0
Turkey	62.1	44.6	18.1	-19	-9	0
Italy	46.5	41.8	13.5	4	8	0
Germany	19.5	-17.4	5.7	21	50	0
Romania	16.5	-28.7	4.8	22	40	0
EU28	236.6	91.6	68.8			
			Romania			
Total exports	1 857.2	1 075.8	100	-9	2	
Italy	196.5	167.2	10.6	-7	2	0
China	187.7	129.8	10.1	2	43	2.6
Japan	161.6	161.5	8.7	-9	-11	2.5
Germany	114.9	12.2	6.2	-8	-5	0
Turkey	82.9	67.7	4.5	-19	-2	0
EU 28	879.2	413.3	47.3	–	–	–

Source: Compiled from ITC, 2018
Note: Ex = exports (US$ million); ExShare = share in a country's exports (%); ExG = export growth rate (%); Tariff = average tariff faced (%)

have competitive advantages in the global wood market. Both product and market diversification ratios indicate that Romania has been more diversified than Bulgaria.

Interestingly, both countries witnessed positive trade balance and RTB in overall wood trade (SITC 44) between 2012 and 2016. Also, both countries witnessed substantial positive RTB in 8/10 of the top product groups within the period under study. The findings further suggest that Romania has processed its exported products more than Bulgaria. By and large, both countries have performed and remained competitive in the wood sector in the global markets. Nevertheless, there is a need for more market and product diversification, especially in Bulgaria.

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