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SILK TRADE IN THE EUROPEAN UNION: TRENDS IN THE PERIOD 2010-2019

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Abstract

The paper analyzed in the EU silk export, import and trade balance in the period 2010-2019 pointing out the main tendencies and the role and position of the major "actors" in silk commercial transactions. The data provided by International Trade Center were processed using the fixed basis index, descriptive statistics, average annual growth rate, and trend method based on regression models. The results showed that the EU-28 is the most important importer and consumer of raw silk and also the top exporter of textiles and fashion products worldwide. However, the silk export and import values declined at the EU level and also in the top 10 countries "players" in the silk market. The countries with the major impact on the silk export and import in the EU are, in the decreasing order: Italy, Romania, France, United Kingdom and Germany whose market share represented 94.32% in the EU export and 86.9 % in the EU import in the year 2019. A lower market share in case of silk import have Bulgaria, Slovenia, Portugal, Spain and Austria as well. China and India are the main suppliers of raw silk and other silk products for the EU, but also Vietnam and Thailand. The EU developed a new clustering strategy enlarging the geographical area where silk products could be produced cheaper, the workforce could be more efficiently used increasing productivity and sales in the silk products market. In this way, raw silk could be provided locally preventing a possible decline of China supply.

Key words**:** *silk, export, import, trade balance, trends, EU-28*

INTRODUCTION

Silk has always been a high value natural fiber, a suitable raw material for producing high quality fabrics and clothes and many other things that humans created for having a better life.

Despite that synthetic fibers dominate the textile and clothes market due to their low production cost, silk is maintaining its position as "Queen of textiles" being a pleasant, fine, delicate, resistant, shining, luxury fiber which confer an elegant appearance to the final products [2, 36, 39, 40]. Mulberry silk dominates production, consumption and international trade, but there are also other sorts of silk such as eri silk, tasar silk, muga silk which are used for various purposes.

Mulberry silk has the most important share in total silk production as it has a large variety of uses: textiles such as silk, deluxe, satin, chiffon, chinnons, crep, broacarde, also clothes such as: scarves, ties, blouses, shirts, skits, dresses, suits, jerkins, socks many of them being carried by well known designers. But silk is also used for producing elegant carpets, furniture covers, draperies, pillow and sofa covers, bed sheets, wall sheets etc [8, 10, 15, 28].

The increasing demand of silk textiles and clothes has led to silk price growth with a positive impact on the development of silkworms growing, silk cocoon and raw silk output in more than 60 countries and also of international trade with silk [3, 26].

Silkworms growing and silk industry stimulate business in small sized enterprises,

require a low capital investment and production processes which are environmentally friendly assuring a sustainable development. Therefore, they are important sources of jobs and income which improve the living standard of the population mainly in the rural areas, limiting migration to the cities [27, 39].

In 2018, the world silk production accounted for 159,649 metric tons. However, silk keeps just 0.2 % of the global textile production, the major producers being in Asia: China, India, Uzbekistan, Vietnam, Thailand, Korea, Japan, followed by South America: Brazil and Columbia [9, 10, 35, 41, 43]. Europe has been for many years the 2nd important silk producer after Asia, but nowadays, it is major silk importer and consumer after the USA.

However, due to the dramatic silk price growth along its chain till the final product, silk demand has changed being oriented to other substitute textiles. As a consequence, a few European countries such as: Italy, France, Germany, United Kingdom and Switzerland have become silk converters. But, the major producer, supplier and consumer of silk and silk products remains Asia. The geographical distribution of silk production and consumption has intensified silk international trade, which is run under the International Trade Rules for Raw Silk (ITR), adopted by ISA Congress in 1997.

The commercial transactions with silk are based on a contract concluded between seller and buyer under ITR as stipulated in the contract clause. These ITR provisions are also applicable to any silk transactions specified in national and transnational agreements [7, 24].

In this context, the purpose of the paper was to analyze the dynamics of the EU silk export and import, as well as trade balance in the last decade, 2010-2019, emphasizing the role and position of the major member states, as "players" in silk international trade.

MATERIALS AND METHODS

Data collection

The statistical data used in this study were picked up from international data bases such us: International Trade Center and International Sericicultural Commission for the last decade, more exactly for the interval 2010-2019 [10, 7].

The main indicators approached in this research have been the following ones:

-silk export, silk import and trade balance at the global level;

- silk export, silk import and trade balance at the EU-28 level;

- silk export, silk import and trade balance in the top 10 EU countries.

-the share of the EU silk export and import in the world silk export and import

-the share of the top EU countries in the EU-28 silk export and import.

Methodology

The main methodological procedures included:

Index method, in its variant, Fixed basis Index, offered the opportunity to examine the dynamics of the indicators in the period 2010-2019. In this case, it was utilized the formula: $I_{t/t0} = (X_t/X_0)100$, where X_t is the level of the indicator X in the last year of the analysis, i.e. 2019, and X_0 is the level of the same indicator X in the first year of the analysis, i.e. 2010.

The market share of a country in the EU export or import value was established using the formulas:

$S_{E\%}= (E_i/E)100$ in case of the export structure, where E_i is the export value of the country i, where i= 1, 2,...10, and E is the EU silk export value.

$S_{I\%}= (I_i/I)100$ in case of the import structure, where I_i is the import value of the country i, where i= 1, 2,...10, and I is the EU silk import value.

The trend method was used to identify the main tendencies in silk export, import and trade balance at the EU level using suitable mathematical models like polynomial equations. The results were explained and commented and presented in tables and graphics. Finally, the corresponding conclusions were drawn.

RESULTS AND DISCUSSIONS

Global Silk Production

Silk production at the global level after a continuous increase till the year 2015, when it

reached 202,072.83 metric tons, it entered in a decline so that in 2018, its level accounted for 159,648 metric tons, being by 21 % smaller than in 2015 (Fig.1).

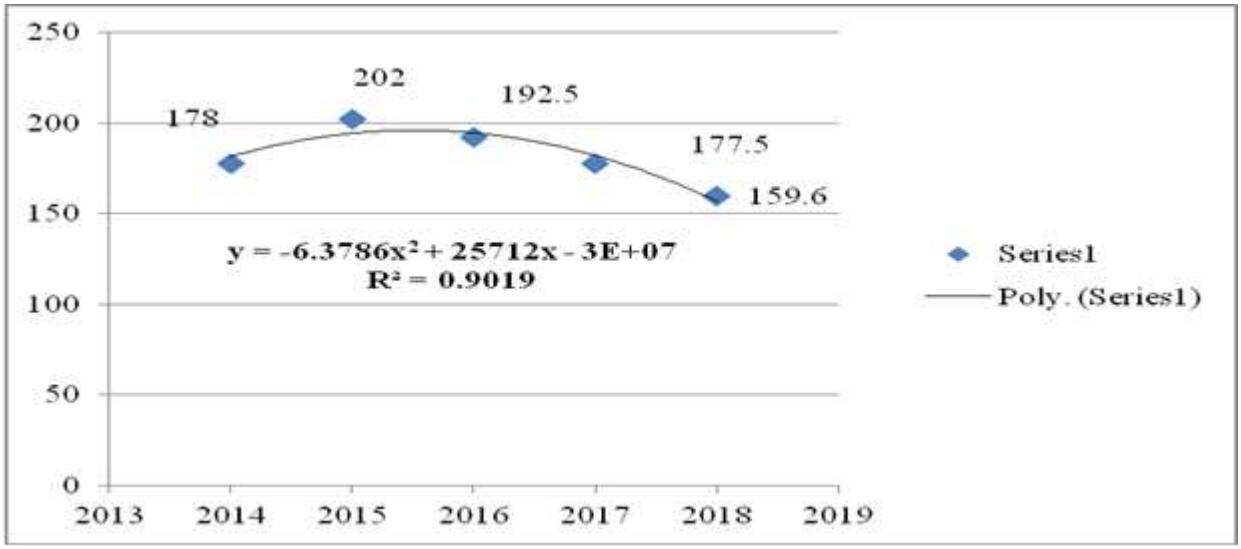

Fig. 1. World raw silk production, 2014-2018 (Thousand metric tons)
Source: Own design based on the data from [10].

In 2018, the highest raw silk production was registered by China, 120,000 metric tons representing 75.16% of the global production and by India, 35,261 metric tons, meaning 22.08 %. Therefore, these two countries are the top silk producers worldwide, all together having 97.24% market share. Other countries have a much smaller contribution to the global silk output; Uzbekistan (1.12%), Vietnam (0.42%), Thailand (0.42%), Brazil (0.41%) and North Korea (0.21).

The figures give above reflect that the EU is not among the world producers of silk, in this field its performance is far away from being competitive. In fact the EU is a top importer and consumer of silk, and also an exporter of final silk products

This happened because of the price growth along the product chain and the pressure of the other natural fibres like cotton and synthetic fibres which have a lower price per final product and determined some changes in consumer' s behaviour [10, 22, 26].

However, the decline in silk production did not affect so much the farmers dealing with silkworms growing because besides silk, a large range of by-products and wastes resulting from this field of activity has an important economic value as well. It is about: defective cocoons (double, pierced, perforated cocoons) which are used for producing fancy silk fabrics, dead and dried pupae are used as feedstuff for fishes and fertilizer, larval dejections are also good fertilizers, mulberry leaves, roots and wood are used as biomass, mulberry fruits are processed in food industry. Therefore, sericiculture is not only a source of silk, but also of many other secondary products which could be successfully used in pharmaceutical, cosmetic, cellulose and food industry. These new opportunities for a better valorisation of sericicultural products could help this field of activity to become more efficient and profitable [1].

World and the EU-28 Silk export

Following the decline in silk production at the global level, silk export registered a decrease by 415 in the last decade. The export reached USD 1.93 Billion in 2019 compared to USD 3.26 Billion in 2010. In the EU, it was noticed a similar decreasing trend, but the decline was not so severe, accounting for only 21.33%. In 2019, the EU-28 silk export value accounted for USD 550 Million compared to USD 700 Million in 2010 (Fig. 2 and Fig. 3).

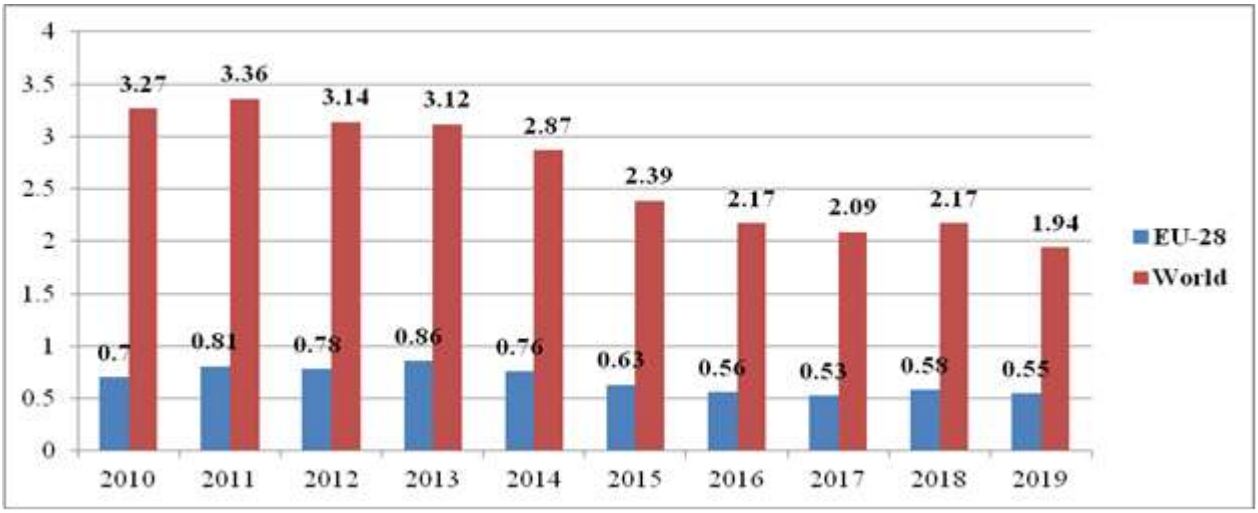

Fig. 2.Dynamics of silk export value at the global and the EU-28 level, 2010-2019 (USD Billion)
Source: Own design based on the data from [11, 12].

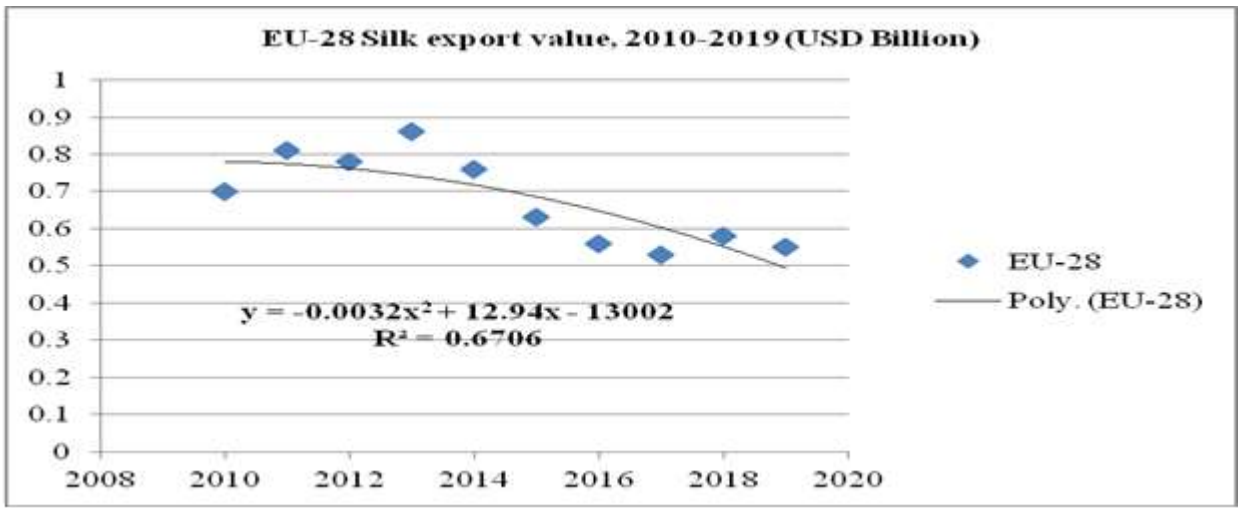

Fig. 3.Silk export value trend in the EU-28, 2010-2019 (USD Billion)
Source: Own design based on the data from [12].

The average annual decline rate in the EU-28 was -2.13%, representing 50% of -4.07% at the global level. As a consequence, the market share of the EU-28 silk export in the world silk export increased from 21.42% in 2010 to 28.40% in 2019.

World and the EU-28 Silk import

The value of silk import also declined at the global level from USD 2.48 Billion in 2010 to USD 1.75 Billion in 2019, meaning -29.75% less, at an average annual decline rate of -2.97.

In the EU-28, the silk import value has also decreased but in a lower proportion. In 2019, the EU import accounted for USD 0.66 Billion compared to USD 0.80 Billion in 2010, meaning by 17.715 less, at an average annual decline rate of -1.77% (Fig.4 and Fig.5).

Position of the EU countries in the EY and World silk export and import value in 2019

In 2019, the main EU-28 silk exporting countries were: Itlay, Romania, France, United Kingdom, and Germany which come on the top 5 positions. They are followed by Slovenia, Belgium, Austria, Spain and Lithuania.

Of these countries, the first five silk exporters of the EU are among the top 10 exporting countries in the world, Italy occupying the 2nd position after China, Romania the 4th position, France the 6th position, United Kingdom the 9th position and Germany the 10th (Table 1).

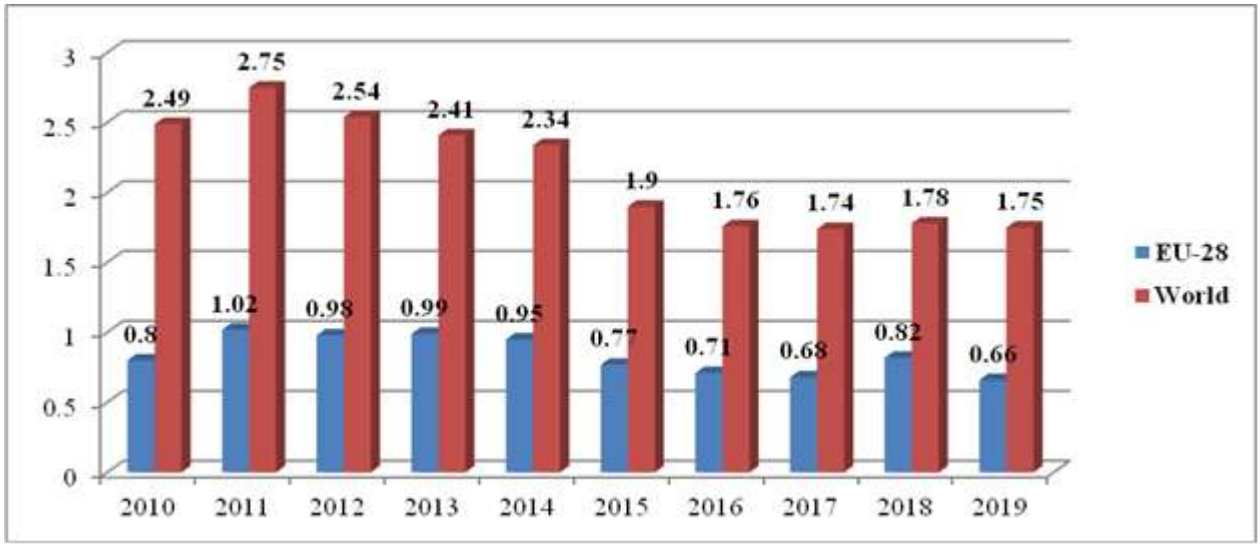

Fig. 4. Dynamics of silk import value at the global and the EU-28 level, 2010-2019 (USD Billion)
Source: Own design based on the data from [13].

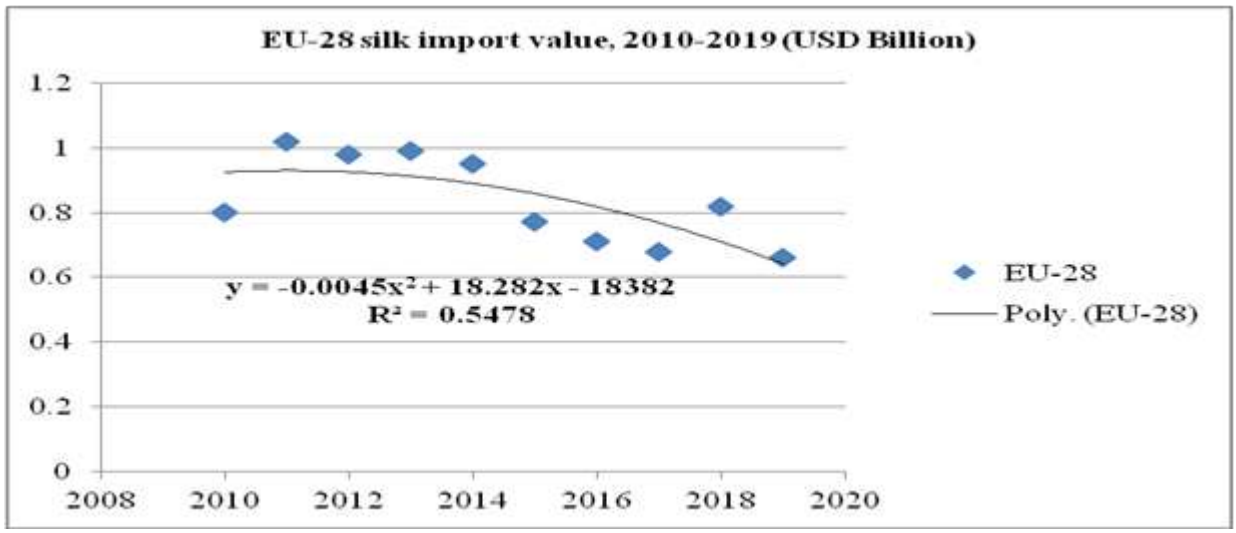

Fig. 5. Dynamics of silk import value trend in the EU-28, 2010-2019 (USD Billion)
Source: Own design based on the data from [13].

Based on the import value in 2019, at the EU level, the top 10 countries are in the decreasing order: Italy, Romania, France, United Kingdom, Germany, Bulgaria, Slovenia, Portugal, Spain and Austria. At the world level, only Italy, Romania and France are among the top 10 silk importing countries, occupying the 1st, the 4th and, respectively, the 7th positions. They are followed by United Kingdom, Germany and Bulgaria, which are ranked the 113th, 14th and 19th at the global level (Table 1).

The evolution of silk export value in the EU top 10 exporting countries

Silk export registered a decrease in almost all top 10 EU countries, except Romania. The decline differed from a country to another varying between 89/76% in Spain, the highest reduction and 8.75 % the lowest one in Bulgaria. In Romania, silk export value increased 2.13 times in the analyzed interval.

The cumulated value of silk export on the whole 2010-2019 interval established the following hierarchy of the top five exporting countries: Italy is on the top position, its export accounting for USD 3,426 Billion. France achieved USD 889.3 Billion, Romania USD 865 Billion, Germany USD 715.1 Billion and United Kingdom USD 387.8 Billion.

The market share of the top 10 silk exporting countries in the EU-28 export value is presented in Table 2.

Table 1. Position of the EU countries in the EU and World silk export and import value in 2019

	Position in the EU-28 for		Position in the World for	
	Export value	Import value	Export value	Import value
Italy	1	1	2	1
Romania	2	2	4	4
France	3	3	6	7
United Kingdom	4	4	9	13
Germany	5	5	10	14
Slovenia	6	7	13	23
Belgium	7	11	18	32
Austria	8	10	18	30
Spain	9	9	22	28
Lithuania	10	14	25	46
Bulgaria	11	6	27	19
Netherlands	12	13	29	41
Poland	13	12	37	33
Hungary	14	15	40	49
Denmark	15	18	41	66
Greece	16	16	42	60
Ireland	17	20	44	77
Sweden	18	25	46	96
Portugal	19	8	48	25
Latvia	20	23	52	82
Czech Republic	21	17	53	62
Finland	22	22	55	79
Croatia	23	19	60	70
Estonia	24	24	66	87
Slovakia	25	21	85	78
Cyprus	26	26	109	109
Malta	27	28	115	121
Luxembourg	28	27	116	112

Source: Own calculation based on the data from [11].

Table 2. The market share of the top 10 exporting countries in the EU-28 silk export value in 2019 compared to 2010 (%)

	2010		2019
EU-28 (USD Billion)	**699.95**	**EU-28 (USD Billion)**	**550.66**
1.Italy	54.28	1.Italy	51.82
2.Germany	12.23	2. Romania	18.24
3.France	11.59	3.France	12.94
4.United Kingdom	6.78	4.United Kingdom	5.70
5.Romania	6.71	5.Germany	5.62
Total	***91.59***	***Total***	***94.32***
6.Spain	4.14	6.Slovenia	2.05
7.Austria	1.44	7.Belgium	0.88
8.Belgium	1.34	8.Austria	0.82
9.Netherlands	0.24	9.Spain	0.54
10.Bulgaria	0.19	10.Lithuania	0.35
Total top 10	**98.94**	**Total top 10**	**98.96**

Source: Own calculation based on the data from [11].

The figures from Table 2 confirm that the main silk exporting countries are Italy, Romania, France, United Kingdom and Germany, all together contributing to the EU-28 silk export value by 94.32 %.

The evolution of silk import value in the EU top 10 importing countries

The value of silk import also registered a descending trend in the last decade in almost all the top 10 countries of the EU, except Romania and Bulgaria. The decline in the interval 2010-2-19 varied between -84.66% in case of Spain, the highest reduction, and -3.295 in case of Italy, the smallest one.

The growth rate in the whole interval was +81.61% for Romania and +27.61 % for Bulgaria.

Based on the cumulated silk import value in the period 2010-2019, the descending hierarchy of the top five countries was the following one: Italy USD 3.79 Billion, Romania USD 1 Billion, France USD 0.96 Billion, Germany USD 772 Billion and United Kingdom USD 0.96 Billion.

The market share of the top 10 silk importing countries in the EU-28 import value is presented in Table 3.

Table 3. The market share of the top 10 importing countries in the EU-28 silk import value in 2019 compared to 2010 (%)

	2010		2019
EU-28 (USD Billion)	**803.82**	**EU-28 (USD Billion)**	**661.47**
1.Italy	41.04	1.Italy	48.24
2.Germany	11.46	2. Romania	15.82
3.France	11.08	3.France	11.90
4.United Kingdom	8.20	4.United Kingdom	5.52
5.Romania	7.16	5.Germany	5.42
Total	***78.94***	***Total***	***86.90***
6.Spain	6.92	6.Bulgaria	2.38
7.Portugal	2.27	7.Slovenia	1.78
8.Austria	1.81	8.Portugal	1.38
9.Belgium	1.62	9.Spain	1.29
10.Bulgaria	1.54	10.Austria	1.17
Total top 10	**93.10**	**Total top 10**	**94.90**

Source: Own calculation based on the data from [11].

The figures from Table 3 attest that the main silk importing countries are Italy, Romania, France, United Kingdom and Germany, all together contributing to the EU-28 silk export value by 86.90 %, being followed by Bulgaria, Slovenia, Portugal, Spain and Austria, all these 10 countries accounting for 94.90% in the EU-28 silk import value.

Italy is both the top silk exporter and also importer and consumer in the EU-28. It comes on the 2nd position in the world for its export value after China and it is on the 1st position for its import value.

Silk yarn and yarn spun from silk waste, put up for retail sale; silk-worm gut, having the code 5006 represent the object of Italy export and import [6].

The evolution of Italy export and import in the period 2010-2019 is presented in Table 4.

Table 4. Italy - Silk yarn and yarn spun from silk waste, put up for retail sale; silk-worm gut, Code 5006 exports and imports, 2010-2019

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2019/ 2020 %
Export Quantity (kg)	56,468	19,927	55,179	66,602	22,792	25,579	17,712	14,039	20,355	5,560	9.84
Import Quantity (kg)	10,341	10,767	24,494	25,337	8,297	13,120	12,701	15,775	11,582	21,030	203.36
Export value USD Billion	1.62	1.46	2.02	1.78	2.42	2.51	1.99	1.50	0.86	0.42	25.92
Import value USD Billion	0.76	0.89	1.54	1.25	1.13	1.44	0.97	0.99	0.90	0.72	94.73

Source: Own calculation based on the data from [42].

The main suppliers of silk yarn and yarn spun from silk waste, put up for retail sale; silk worm gut for Italy in 2019 were: Japan (78%), Romania (8.79%), Germany (6.55%), and China (5.67%).

The main beneficiaries of silk yarn and yarn spun from silk waste, put up for retail sale;

silk worm gut sold by Italy in 2019 were: USA (16.6%), Japan (12.8%), Madagascar (10.3%), Bulgaria (10.3%), Tunisia (7.62%), Hong-Kong (6.53%), China (5.91), Romania (5.54%), Spain (4.81), Germany (4.02%), as mentioned by [38, 42].

Italy silk import consists mainly of raw silk and silk yarn, but also women blouses and garments. Italian silk products are well known worldwide (scarves, ties, blouses, shirts etc).

The core of silk ready-made products in Italy is the region Como, at the border with Switzerland, where a long tradition has been developing across the centuries. The silk industry in the region is well developed as the area is an ideal environment for mulberry trees plantations and silkworms rearing.

Como's silk is very appreciated for elegant dresses, scarves, ties and accessories. Many mills and silk factories were set up in the area and are proud of their high quality products sold on the domestic market and also abroad wearing the label "Made in Italy".

The international trade is in benefit of Italy, the value of exports exceeding the value of imports in the period 2010-2017, the trade balance being a positive one, but in 2019 and 2019 the import value was higher than the export value which led to a negative silk trade balance.

Romania is ranked the 4th in the world and the 2nd in the EU both for silk export and import value. During the last 10 years, Romania passed from the 5th position in 2010 to the 2nd position in 2019. The country has a long tradition in sericiculture, keeping a rich collection of over 60 silkworm breeds and hybrids [16, 18, 19].

The activity is a business of the small family farms, where silk cocoons are processed mainly in a traditional manner in handicrafts, belts, brooches, necklaces, silk blouses, house decorations etc or industrially [17, 20, 21, 25].

The activity is an efficient one mainly in the integrated farms where silk cocoons are processed till the final product using a low investment capital and family labour, emphasizing on production diversification to increase value added, productivity and competitiveness [23, 30, 31, 32, 33, 34].

Romania's trade has negative balance, being a net importing country of silk as long as the import value exceeds the import value. Romania exports mainly silk yarn (75%), woven fabrics (15%, and raw silk (8.4%), and imports: raw silk (74.8%), woven fabrics (18.4%) and silk yarn (5.5%). Silk yarn is the only product with a positive trade balance.

About 99.9% of silk is exported in the EU, while the imports come especially from China (62%) and the EU (38%) [29].

France maintains its 3rd position in the EU both for silk export and import value, but at the global level is ranked the 6th for export and the 7th for import.

France is deeply oriented in high quality silk fabrics, 70% of them being used for clothing and the rest for curtains, wall covers, bed spreads and other internal decorations. The main beneficiary of the French silk products is the USA.

The core of silk industry in France was Lyon area, located in East Central France in the Auvergne-Rhone-Alpes region. Lyon is the capital of silk trade, and an important part of UNESCO World Heritage, where tourists could visit among other important attractions the Silk Museum and the Fabric Museum. Nowadays, silk industry is well developed benefiting of modern techniques and equipments for processing silk into beautiful and high quality final products [6, 14].

United Kingdom is ranked the 4th in the EU both for silk export and import value, and it occupies the 9th position for export and the 13th position for import at the global level.

Silk industry in United Kingdom started in North West England and London area. It is a component of the apparel, interiors and textile trade through the supply of raw and unfinished materials, fabrics and garments. A large range of silk products are achieved in UK such as: silk yarns, fabrics and garments, but also other products for surgery sutures in medicine, silk gloves for pilots, handmade silk fabrics used in the restoration of castles and palaces throughout Europe [6].

Germany remained constant on its 5th position in the EU, while at the global level is ranked the 10th for silk export and the 14th for import. The main silk suppliers for

Germany are China, India and Thailand. Also, smaller amounts of silk are imported from Vietnam and Brazil. The raw silk is transformed into high quality textiles and clothing well appreciated by consumers.

The main silk products imported are: blouses, shirts, handkerchiefs, ties, shawls, scarves, mufflers, mantillas and veils [6].

The silk trade balance in the EU-28 and at the global level

While at the global level, exports exceed imports, and the silk trade balance is a positive one, in 2019, the value of the balance being USD 189.66 Million, at the EU-28 level, the silk trade balance was negative in the analyzed interval (Fig.6).

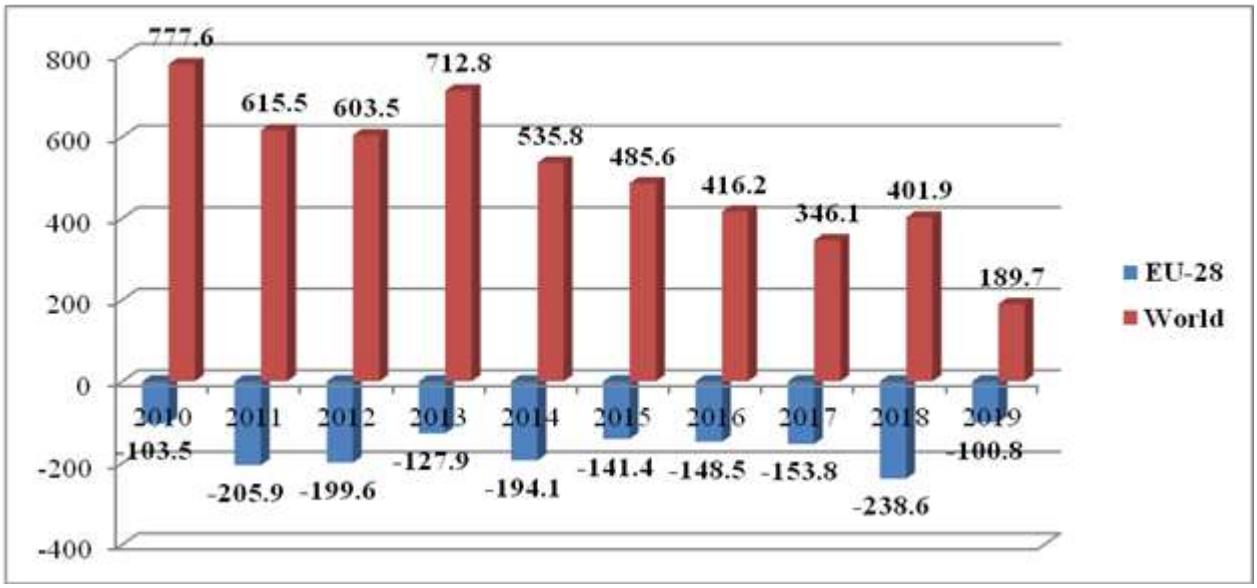

Fig. 6. Silk trade balance in the EU-28 and at the global level, 2010-2019 (USD Million)
Source: Own design and calculations.

The silk trade balance in the top five exporting and importing countries in the EU is presented in Table 5, which shows that all the countries are not importing countries of silk.

Table 5. Silk trade balance in the EU-28 top five exporting and importing countries, 2010-2019 (USD Million)

	Italy	Romania	France	United Kingdom	Germany
2010	+49.9	-10.6	-7.9	-18.4	-6.5
2011	-27.4	-21.7	-15.2	-14.2	-17.5
2012	-7.4	-9.0	-24.5	-21.3	-8.2
2013	-29.6	-29.1	-2.5	-17.5	+ 5.1
2014	-62.4	-7.8	+18.8	-19.7	-8.6
2015	-54.5	-4.2	+4.7	-21.6	-1.4
2016	-39.8	-29.0	+1.7	-15.1	-3.7
2017	-60.3	+3.7	-20.3	-11.8	-6.5
2018	-99.7	-27.5	-19.9	-18.2	-4.8
2019	-33.8	-4.2	-7.5	-5.1	-4.9
2019/2010 %	67.58	39.73	94.16	27.75	74.65
Average annual rate (%)	-3.24	-6.03	-0.58	-7.22	-2.53

Source: Own calculations.

Silk industry plays an important role in the EU textile and clothing sector which is very well developed and industrialized. This sector absorbs 1.7 million people of the EU workforce in more than 185,000 companies whose turnover exceeds Euro 166 Billion. The main feature of these companies is their small size, the number of their employees being smaller than 50 persons. This reflects what an important role plays this sector in the economy in assuring employment and incomes for the local population.

In the EU-28, about 33% of the textile and clothing production is dominated by Italy, France, Germany and Spain. Also, other member states such as Greece, Portugal, Romania, Bulgaria and Poland bring their contribution to clothing production.

The major part of production is sold on the internal market, but about 20% is object of exports on various markets.

During the last decade the high production cost in silk producing and processing has led to a new orientation paying more attention to the regions situated in the Mediterranean area where silk products could be achieved with lower expenses. More than this important innovations and technical changes were made in order to produce a larger variety of high quality products including more value added and in this way to face better the increased competitiveness in the silk market.

In this way, the EU silk products brands could be better sustained based on the new clustering strategy adopted in the textile and clothing industry largely operating on a wider geographical area [4, 37].

Only in this way, the EU could keep its 2nd position as exporter of textiles and clothing in the world and increase its market share in the world sales.

For attaining its goal, the EU developed an investment plan in silk sector as well, based on projects which have the purpose to implement innovations and make sericiculture and reeling sectors sustainable fields of activity providing more high-quality raw silk from the internal producers as an alternative to a possible decline in China's silk output and supply.

This initiative launched by EURATEX, the European Apparel and Textile Confederation, which is the representative of the textile and clothing industry in Europe, will assure a favorable environment for producing textile and fashion products in Europe and will support the sustainable development of the local economy in many regions [4, 5].

CONCLUSIONS

This research proved how important is silk industry as a component of textile and clothing industry in the EU. The EU is at present the most important importer and consumer of raw silk in order to produce high quality and elegant textile and fashion products whose brands are well known all over the world.

The key "players" in the EU-28 exports and imports of raw silk are: Italy, Romania France, United Kingdom and Germany. These five countries, all together, have a market share of 94.32% in the EU-28 silk export value in 2019. Regarding import, these five countries contributed by 86.9 % to the EU-28 silk import value in the same year. Smaller contributions had also Bulgaria, Slovenia, Portugal, Spain and Austria.

Despite that at the EU-28 level the exports and imports of raw silk registered a decreasing trend in the period 2010-2019, and mainly in almost top 10 countries, in Romania the silk export value increased 2.13 times and the silk import value raised in Romania by 8.61 % and in Bulgaria by 27.61%.

The silk trade balance is a negative one at the EU level and also in all the top 10 key "actors" in the silk market, because the EU is focused on imports which supply the raw silk for the textile and clothing industry.

The main suppliers of raw silk and other silk products for the EU are: China and India, but also Vietnam and Thailand, and in a smaller proportion Brazil.

Silk industry looks to strengthen its position within the EU textile and clothing industry grace to the new clustering strategy enlarging the geographical area where silk products could be achieved at lower cost, and offering jobs for the local population and increasing the turnover of the sector.

The EU vision is to transform sericiculture and reeling sector into sustainable activities which could provide more and higher quality silk raw taking into consideration the risk of smaller supply from China in the future.

For the local producers, besides the raw silk production, silk by-products for non-textile purposes may be considered an alternative to enlarge the variety of silk products, to increase productivity and utilize in a more efficient way labor force and satisfy better the consumers' preferences.

REFERENCES

[1]Babu, K. M., 2019, 9 - By-products of sericulture and the silk industry, Silk (Second Edition)
Processing, Properties and Applications, The Textile Institute Book Series, 2019, 207-233
[2]Bukhari, R., Kour, H., 2-10, Background, Current Scenario and Future Challenges of the Indian Silk Industry, International Journal of Current Microbiology and Applied Sciences, Vol.8(5), 2448-2463.
[3]Datta, R.K., Global Silk Industry: A Complete Source Book, Chapter 3. An overview of Global Silk Industry, pp.31, https://books.google.ro/books?id=A8U1lmEGEdgC&pg=PA31&lpg=PA31&dq=global+silk+production+2008-2019&source=bl&ots=Vx3uXknN79&sig=ACfU3U2i4JGPiVyh7tKnq5ZGH_6IW3iFJw&hl=en&sa=X&ved=2ahUKEwi7h73qkaHqAhWEi8MKHXXWCMwQ6AEwFXoECAoQAQ#v=onepage&q=global%20silk%20production%202008-2019&f=false**,** Accessed on 16 June 2020.
[4]Euractiv, 2020, Investment Plan for Europe to Support European Silk Sector? http://pr.euractiv.com/pr/investment-plan-europe-support-european-silk-sector-138829, Accessed on June 21, 2020.
[5]Euratex Annual Report 2018, https://euratex.eu/wp-content/uploads/2019/05/Euratex-annual-report-2018-LR.pdf, Accessed on 16 June 2020.
[6]Eurostat, Textiles and clothing in the EU https://ec.europa.eu/growth/sectors/fashion/textiles-clothing/eu_en, Accessed on 16 June 2020
[7]Franck, R.R., Silk, Mohair, Cashmere and Other Luxury Fibres, Elsevier, https://books.google.ro/books?id=GbejAgAAQBAJ&pg=PA180&lpg=PA180&dq=silk+international+trade&source=bl&ots=IWFahl_Qdm&sig=ACfU3U2G0vLR1W4c_6Eeo-l0byOEvloAUA&hl=en&sa=X&ved=2ahUKEwim3NbB_6DqAhXmlIsKHYM6Cm0Q6AEwD3oECAoQAQ#v=onepage&q=silk%20international%20trade&f=false, Accessed on June 16, 2020
[8]Global Silk Market - 2019-2026, https://www.giiresearch.com/report/dmin908325-global-silk-market.html, Accessed on June 25, 2020.
[9]Goswami, K., 2007, Globalization of silk trade: A comparison analysis between China and India, Indian Journal of Regional Science, 2009, Vol.41(1):122-129.
[10]International Sericicultural Commission, 2020, Global Silk Industry, http://www.inserco.org/, Accessed on June 21, 2020
[11]ITC, 2020, Export Silk 50, Trade Map, International Trade Statistics, https://www.trademap.org/tradestat/Country_SelProduct_TS.aspx?nvpm=1%7c%7c%7c%7c%7c%7c50%7c%7c%7c2%7c1%7c1%7c2%7c2%7c1%7c2%7c1%7c%7c1, Accessed on June 21, 2020.
[12]ITC, 2020, International trade in goods - Exports 2001-2019**,** http://www.intracen.org/itc/market-info-tools/statistics-export-product-country/, Accessed on June 21, 2020
[13]ITC, 2020, International trade in goods - Imports 2001-2019, http://www.intracen.org/itc/market-info-tools/statistics-import-product-country/, Accessed on June 21, 2020.
[14]Lyon: Heart of the European Silk Industry,https://silkroadtoday.com/news/lyon-heart-european-silk-industry/, Accesed on June 25, 2020.
[15]Matei, Alexandra, Popescu Agatha, Dolis, M., Tzenov, P.I., Bougiouskos, K., 2006, Research concerning the world natural silk market, Scientific Papers Series Animal Production, Iasi, Vol.49, 899-905.
[16]Matei, A., Androne, M., Popescu, A., Ungureanu, C., 2008, Study on Phenotypic Characters variability of the egg and larva from the native genetical stock of the Silkmoth Bombyx mori L.sp., Lucrarile stiintifice Seria Zootehnie Iasi, Vol.51(13), p.353-357.
[17]Matei, A., Ciulu, M., Radulescu, R., Dan, M., Popescu, A., 2008, Silk cocoon reeling machine in the peasant individual farms, Lucrari stiintifice INMATEH Nr.25/2008, Ingineria si Managementul dezvoltarii durabile in agricultura, transport si industria alimentara, p.73-76.
[18]Matei, A., Popescu, A., Androne, M., Dezmirean, D., Bentea, M., 2009, Variability of Genetic Parameters within genetic stock of silkmoth Bombyx Mori L.Sp., Scientific Papers Management, Economic engineering in agriculture and rural development, Vol.9(1), p.73-76
[19]Matei, A., Androne, M., Popescu, A., Dezmirean, D., Vlaic, B., 2009, Research concerning the establishment of the best size of races populations from the Gene Stock Sp.Bombyx Mori L., Lucrari stiintifice Seria Zootehnie Iasi, (Scientific Papers Series Animal Science), Vol.52 (14):500-502.
[20]Matei A., Popescu Agatha, 2013, Research concerning the specialists' opinion on the development of integrated sericiculture in family reproduction farms. Lucrari stiinifice-Seria Zootehnie Iasi, (Scientific Papers Series Animal Science), Vol. 59, p.133-138.
[21]Matei A., Popescu Agatha, Sladescu V., 2013, Research concerning the designers' opinion on the use of silk cocoons as raw material for creating products of decorative and handicraft art. Lucrari stiinifice-Seria Zootehnie Iasi, (Scientific Papers Series Animal Science), Vol. 59, p.195-200.
[22]Mote, T.S., Sananse, S.L.,2014, Statistical Analysis of Global Production, Exports and Imports Scenario of Raw Silk, International Journal of Statistika and Mathematika, Vol. 10(2):31-35.
[23]Popescu Agatha, 2006, Gross-margin- a barometer of profitability in agriculture, International Symposium " Durable Agriculture- the Agriculture of the Future, Craiova, 2006, Nov.23, pp.23-24.
[24]Popescu Agatha, 2010, Home and Foreign Trade, Dominor RawexComs Publishing Houes, pp.176-244.
[25]Popescu Agatha, 2012, Managementul fermei sericicole Ed.EIKON Cluj Napoca, coeditare cu Ed.RawexComs, Bucuresti, (Management of the sericicultural farm, EIKON Publishing House Cluj

Napoca, coediting with RawexComs Publishing House, Bucharest), 105 p.
[26]Popescu Agatha, 2013a, Trends in World Silk Cocoons and Silk Production and Trade, 2007-2010, Scientific Papers: Animal Science and Biotechnologies, 2013, 46 (2):418-423.
[27]Popescu Agatha, 2013b, The EU Textile and Clothing Trade and its Impact on Silk Worm Rearing Development, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development, Vol.13, Issue 1/2013, p.309-316.
[28]Popescu Agatha, 2018a, Considerations on the trends in the world silk trade, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 18(1):385-400.
[29]Popescu Agatha, 2018b,Trends and Efficiency in Romania's International Trade with Silk, 31st IBIMA International Conference on Vision 2020: Education Excellence and Management of Innovations through Sustainable Economic Competitive Advantage, Milan, April 25-26, 2018, IBIMA Conference Proceedings pp.3866-3883.
[30]Popescu, A., Matei, A., 2007, Research concerning the economic impact of production integration in the family reproduction sericicultural farm, Bulletin USAMV Cluj-Napoca, Animal Science and Biotechnologies (Zootehnie si Biotehnologii), Vol. 63-64(1-2): 214-218.
[31]Popescu, A., Matei, A., Sladescu, V., 2007, Comparison concerning economic efficiency in silk cocoon processing in handicraftware in the family reproduction sericicultural farm, Bulletin USAMV Cluj-Napoca, Animal Science and Biotechnologies (Zootehnie si Biotehnologii), Vol. 63- 64: 569-570.
[32]Popescu, A., Matei, A., Sladescu, V., 2008a, Market study concerning the processing of unreeling silk cocoons into handicrafts, Bulletin of University of Agricultural Sciences and Veterinary Medicine, ClujNapoca, Horticulture, Vol.65(2): 464.
[33]Popescu, A., Matei, A., Sladescu, V., 2008b, Research concerning production diversification and integration in order to increase productivity and competitiveness of family sericicultural farms, Scientific Papers Animal Science and Biotechnologies, Vol.41(1):702-707
[34]Popescu, A., Matei, A., 2008, Researches concerning the feasibility of Production Integration Management in a family sericicultural farm, Bulletin USAMV Cluj-Napoca, Horticulture, Vol.65 (2): 302-307.
[35]Popescu, A., Stoian, E., Serban, V., 2019, Trends in the world production of natural fibers of animal origin-Silk and Wool, Scientific Papers Series Management, Economic Engineering in Agriculture and Rural Development Vol. 19, Issue 4, 2019, 273-288.
[36]Scott, P., 1993, The Book of Silk, Theme and Hudson Ltd. London.
[37]Silk: A Tradition with a Future?, http://www.tradeforum.org/Silk-A-Tradition-with-a-Future/, Accessed on June 16, 2020
[38]Silk Market 2019 With Top Countries Data: Market Size, Growth, Drivers, Supply Demand Scenario, Opportunities, Limitations, Manufacturers, Regions and Forecast to 2024, 2019, https://www.marketwatch.com/press-release/silkmarket-2019-with-top-countries-data-market-sizegrowth-drivers-supply-demand-scenario-opportunities-limitations-manufacturers-regions-and-forecast-to2024-2019-08-28, on June 21, 2020.
[39]The Global Silk Industry Perception of European Operators toward Thai Natural & Organic Silk Fabric and Final Products, International Business PagesTexman, December 10, 2011, https://www.newclothmarketonline.com/the-global-silk-industry-perception-of-european-operators-toward-thai-natural-organic-silk-fabric-and-final-products/, Accessed June 16, 2020
[40]Tikkanen, A., 2019, Natural fiber, Raw material, Encyclopaedia Britannica, https://www.britannica.com/topic/natural-fiber, on June 21, 2020.
[41]Townsend, T., Sette, J., 2015, Natural Fibres and the World Economy, https://dnfi.org/abaca/natural-fibresand-the-world-economy_1778/, on June 21, 2020.
[42]TrendEconomy, https://trendeconomy.com/data/h2/Italy/5006, Accessed on June 25, 2020.
[43]Wee Y.R., 2017, World Leaders In Silk Production, World Atlas, April 25, 2017, https://www.worldatlas.com/articles/world-leaders-insilk-production.html, on June 21, 2020.