Analysis of Market Trends Within the Romanian Silk Industry

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Abstract

According to the scientific literature, sericulture is the science with its focus on the silkworm rearing process, as well as the processing of silk and silk derived products. As a rural economic activity, sericulture is being usually, at small scale, being given a cottage industry character. The main goal of the current paper is to assess the potential of the Romanian silk value chain through the point of view given by the value chain analysis perspective. Main elements used in the current research are represented by the comparative analysis of the values of imports, exports, trade balance and national production of silk and silk derived products in the following period of 2001-2018. The study will help highlight the potential for development within the sericulture national value chain highlighting the entry points in the value chain and identifying new internal and external markets.

Keywords: import, export, trade, silk, sericulture

Introduction

Sericulture, science that includes both silkworm rearing and silk processing into derived products, is an industry that is widely spread, worldwide, being present in over 60 countries, as it is considered being a lucrative industry with high employment potential (Mărghitaș *et al.*, 2013; Popescu A, 2013; Popescu A, 2018). Silk is a sought-after material due to its elegance, delicacy and ecological nature. The origin of these textile fibers is the silk cocoon, which is produced largely by the *Bombyx mori* L silkworm, also known as the mulberry silkworm, and it is widely used in complex fields, from textile industry, medicine and computer science (Furdui *et al.*, 2010; Popescu, 2013).

Therefore the demand for silk is always present on the market, but the possibilities to fulfill the existing demand is constantly affected by different barriers, at productive or economic competitiveness level, such as low cost production of synthetic fibers and low cost natural fibers (such as cotton), production of low-cost silk and silk derived products imports at low levels (from countries such as China, India or Thailand) as well as the migration of the workforce towards other fields (Pașca *et al.*, 2008; Popescu, A, 2013; Akram, 2015; Popescu., A, 2018).

The production of silk, from a value chain approach, follows certain sectors: input sector (silkworm egg production and mulberry plantations), cocoon production (farm level agricultural activi-

ties), cocoon processing (into raw silk), spinning and twisting (silk yarn) and silk weaving (the production of silk textiles). In the case of Romania, the silk industry began to rapidly decline after especially after 1989, as political regimes changed and state owned facilities became private, mulberry plantations have been in decline, the Logoj reeling facility closed and the support system for the silk industry began to decline as well. Losing its input sector, Silk industry in Romania, currently, is mainly focused on production of silk yarn and silk textiles, in complete dependence of foreign inputs (Pop *et al.*, 2018).

The negative effects of the mentioned events affect the sericulture European industry as well as, due to low cost imports, European countries focus more on processing sector of the sericulture value chain. Therefore, the demand for raw inputs is covered by low cost imports mainly from countries like China or India, leaving opportunities for developing countries to relaunch the silk industry and enter the local market to gradually replace the raw material imports, a trend that Romania follows as well (Daltaet *et al.*, 2005; Dezmirean *et al.*, 2008; Kipriotes, 2008; Pasca *et al.*, 2008; Popescu, 2013; Mărghitaș *et al.*, 2013).

The main goal of this article is to analyze, in more depth, the trade from the sericulture industry, focusing on, at a national level, on imports, exports and trade balance, as to identify the main sectors where local production can gradually replace imported inputs.

Materials and methods

The analyzed raw silk and silk derived products will be identified using NACE/CAEN codes, used in classification and identification of economic activities at national level or international levels. The used classification corresponds between the National (Romanian) Institute of Statistics and the statistics system of International Trade Center, aspect that is facilitating data correlation in present analysis.

The following categories of silk and silk derived products are analyzed: silkworm cocoons suitable for reeling (5001); raw silk "non-thrown" (5002); silk waste, including unsuitable cocoons for reeling, yarn waste and garneted stock (5003); silk

yarn (excluding that spun from silk waste and that put up for retail sale) (5004); yarn spun from silk waste (excluding that put up for retail sale; (5005); silk yarn and yarn spun from silk waste, put up for retail sale (5006); silkworm gut and woven fabrics of silk or silk waste (5007). The analyzed data was compiled from two main sources, as the differences in declared data are insignificant: Eurostat and ITC (International Trade Center). The sectors of imports, exports and trade within the silk and silk derived products trade were analyzed, using a series of selected indicators. Analysis of the share of silk derived products within the total silk trade after the following formula: $S = (V_p/V_t) * 100$

Analysis of the Compound Average Growth Rate (CAGR), indicator that, in the case of volatile data, is considered to be a representative figure to show the smoothed growth evolution during a certain given-time frame:

$CAGR = ((EV/IV)^{1/T}) - 1$ where EV = Ending value, IV = initial value, T = number of periods (Investopedia, 2019). For the studied silk derived product categories, the timeframe for analysis is calculated from the first point (from the year import has began).

Net Export Index is often used to analyze the trade of a certain sector or a country within a certain trade sector, as it takes into account the both evolution of import and export, with regard to its impact on production. Its applicability ranges from analysis of economic sector to analysis of trade of specific formulas. Its values are set between -1 (country is a net importer) and +1 (country is a net exporter). The calculation formula is as follows:

$NEI = X_{ij} - M_{ij} / X_{ij} + M_{ij}$, where X_{ij} represents the total exports of product (i) from country (j) and M_{ij} total imports of product (i) from country (j).

The use of the Net Export Index is preferred over the Export index as it is considered more effective as it takes into account the relation between exports and imports rather than the sector of exports alone. (Rytko, 2014).

Table 1. Evolution of Romania's Import of Silk and silk derived products from the World

Category/ Code	Silkworm cocoons suitable for reeling/ 5001	Raw silk "non- thrown"/ 5002	Silk waste, including unsuitable cocoons for reeling, yarn waste and garneted stock/ 5003	Silk yarn (excluding that spun from silk waste and that put up for retail sale)/ 5004	Yarn spun from silk waste (excluding that put up for retail sale/ 5005	Silk yarn and yarn spun from silk waste, put up for retail sale/ 5006	Silkworm gut and woven fabrics of silk or silk waste/ 5007	Total
Year	Thousand Euro							
2001	1	2786	0	36	0	17	3103	5943
2002	0	9357	0	20	0	32	4193	13602
2003	0	6776	0	819	1	34	5785	13415
2004	0	12067	23	3993	1	55	9135	25274
2005	1	19212	4	5645	12	58	12868	37800
2006	0	32875	14	7673	14	60	12194	52830
2007	3	29562	53	9911	107	73	16981	56690
2008	0	36950	70	9567	39	66	16165	62857
2009	0	13095	187	3851	62	44	13351	30590
2010	1	24508	277	4039	239	38	14461	43563
2011	0	42517	241	4993	266	29	18545	66591
2012	0	39980	22	5918	299	116	19569	65904
2013	2	64770	49	6195	436	83	19140	90675
2014	20	55512	110	6781	427	35	17825	80710
2015	0	59111	160	6197	1366	23	16487	83344
2016	7	76632	123	5660	950	48	19127	102547
2017	0	54996	22	6642	1460	78	16812	80010
2018	0	88200	26	6337	1028	115	17055	112761
CAGR	-100.00%	21.16%	0.82%	33.28%	54.26%	11.21%	9.93%	17.76%

Source: Data adaptation and calculation from ITC

Results and discussions

European and worldwide context, it can be stated that Romania, following the trend of many other European countries has turned from a silk cocoon and raw silk exporter to a raw silk importer and producer of textile fibers and producer of textiles and finished garments. At a European level, it can be stated, based on analyzed data and other studies that the silk industry in Romania, focuses mostly on finished textiles and garments, rather than the production of yarn as main processors of this material are represented by, at European level, by France and Italy, possible trade competitors but potential markets as well (Popescu, 2013). Taking into account the open sectors where raw materials

is completely provided by inputs, and also movements to implement sericulture in Eastern European countries once again, the current study undertakes to underline the sectors where the imports can be substituted with exports. The first sector to be analyzed is the imports flowing from the world towards Romania.

The Total Column represents the total silk trade value afferent to each year and its value is constant, therefore CAGR is not calculated. The total silk import value ranges between 5943 thousand Euro in 2001 and 112761 thousand Euro in 2018, with a compound average growth rate of 17.76%. China, Italia, Germany, France, Austria, Belgium, Spain and India represent its

Figure 1. Main Silk Derived Products – Import Evolution (thousand Euro)

Table 2. Structure of Silk and silk derived products imports within Romania

Code	5001	5002	5003	5004	5005	5006	5007	Total
Year	Percentage (%)							
2001	1.68	46.88	0.00	0.61	0.00	0.29	52.22	100.00
2002	0.00	68.79	0.00	0.15	0.00	0.24	30.83	100.00
2003	0.00	50.51	0.00	6.10	0.01	0.25	43.12	100.00
2004	0.00	47.75	0.09	15.80	0.00	0.22	36.14	100.00
2005	0.26	50.83	0.01	14.93	0.03	0.15	34.04	100.00
2006	0.00	62.23	0.03	14.52	0.03	0.11	23.08	100.00
2007	0.53	52.15	0.09	17.48	0.19	0.13	29.95	100.00
2008	0.00	58.78	0.11	15.22	0.06	0.10	25.72	100.00
2009	0.00	42.81	0.61	12.59	0.20	0.14	43.65	100.00
2010	0.23	56.26	0.64	9.27	0.55	0.09	33.20	100.00
2011	0.00	63.85	0.36	7.50	0.40	0.04	27.85	100.00
2012	0.00	60.66	0.03	8.98	0.45	0.18	29.69	100.00
2013	0.22	71.43	0.05	6.83	0.48	0.09	21.11	100.00
2014	2.48	68.78	0.14	8.40	0.53	0.04	22.09	100.00
2015	0.00	70.92	0.19	7.44	1.64	0.03	19.78	100.00
2016	0.68	74.73	0.12	5.52	0.93	0.05	18.65	100.00
2017	0.00	68.74	0.03	8.30	1.82	0.10	21.01	100.00
2018	0.00	78.22	0.02	5.62	0.91	0.10	15.12	100.00
CAGR	-100.00	2.89	-8.75	13.17	37.77	-5.57	-6.65	

Source: Data adaptation and calculation from ITC

main sources for import, worldwide, as they detain the highest values of silk and silk derived products derived traded towards Romania.

According to the data from the Table 1 and 2, it can be stated that the main imported group of products is represented by raw silk (5002,

Table 3. Evolution of Romania's Export of Silk and silk derived products to the World

Code	5001	5002	5003	5004	5005	5006	5007	Total
Year	Thousand Euro							
2001	0	26	0	2826	0	0	226	3078
2002	0	194	0	5472	0	0	691	6357
2003	0	3141	0	5982	0	0	1440	10563
2004	0	6990	0	6210	0	0	5016	18216
2005	0	9384	3	9478	2	0	7824	26691
2006	0	6775	0	24794	0	2	11246	42817
2007	0	3801	0	29344	0	0	12706	45851
2008	0	5780	0	32324	27	10	12653	50794
2009	0	2176	8	22620	3	1	5600	30408
2010	0	2945	23	26572	258	8	5558	35364
2011	0	5553	47	37750	22	9	7419	50800
2012	0	4360	1	44779	4	9	10562	59715
2013	0	5717	0	51835	38	3	10957	68550
2014	0	7911	1	54602	17	11	13402	75944
2015	0	7533	0	59637	855	4	11811	79840
2016	0	6453	5	57830	416	0	11567	76271
2017	0	8210	0	64884	853	0	10211	84158
2018	0	8520	0	66606	74	2	14293	89495
CAGR	0.00%	38.08%	0.00%	19.19%	29.42%	0.00%	25.91%	20.59%

Source: Data adaptation and calculation from ITC

fig. 1), ranging between 2767 thousand euro in 2001 and 88238 thousand euro in 2018, with a CAGR of 21.16%. Its main imported partners are represented by China, Italy and Germany, according to the data provided by International Trade Center. In terms of its share in the total silk trade, it can be observed that it grows from 46.88% in 2001 to 78.22% in 2018, with an average increase rate of 2.89%, becoming most imported commodity within the import aspect of the silk trade. This is mainly due to the fact that Romanian Silk Industry is mostly focused on raw silk processing (as it can be seen also in Table 7) into yarn and silk derived textiles.

The second place is taken by group products named woven silk fabrics (5007, fig. 1) with its imported values ranging between 3103 thousand euro in 2001 to 17055 thousand Euro in 2018, registering a compound growth value of 9.93%, as its upward trend is rather stable. Italy, Germany and France represent the main import markets. In terms of import market share, the value decreases

from 52, 22% in 2001 to 15.12% in 2018, with a compound decrease rate of 6.65%.

Silk yarn, excluding that spun from silk waste and that put up for retail sale (5004, fig. 1) is the group of products that occupies the third place. In 2001, the imported value was of 36 thousand euro and increased, with an average rate of 33.28%, to 6337 thousand euro in 2018. The main trade partners are represented by, mainly, Belgium and Italy. In terms of percentage evolution within the imported Romanian silk trade, its share ranges between 0.61% in 2001, jumps to 17.48% in 2007 and then decreases to 5.62% in 2018, registering an average growth rate of 13.17%.

On the fourth place is the category of silk products represented by Yarn spun from silk waste, excluding that put up for retail sale (5005), whose values of imports, although under ascending trend, have reduced values compared to the other categories of products derived from silk analyzed, namely from a value of 1 thousand euros in 2004 to a value of 1028 thousand euros in 2018,

Figure 2. Main Silk Derived Products – Export Evolution (thousand Euro)

with a growth rate 54.26%. The high value of the growth rate is mainly caused by a sudden increase in imports after 2007. The main exporting countries to Romania are represented by Italy and Germany. In terms of share within import, it can be stated that it decreases from 0.29% in 2001 to 0.10% in 2018, with an average increase rate of 35.04%.

In fifth place is the product category Silk yarn and yarn say from silk waste, put up for retail; silkworm gut (5006), where the value of imports increases from 17 thousand euros in 2001 to 115 thousand euros in 2018. Analyzing the reference period, the observed growth rate has a value of 11.21%. Italy and Germany are the main exporters to Romania. In terms of percentages, it can be observed that this group of products is, in terms of import share, is decreasing with an average rate of 5.57%, from 0.29% in 2001 to 0.10% in 2018.

On the sixth place is the category of silk products represented by Silk waste, including cocoons unsuitable for reeling, yarn waste and garneted stock (5002), where the first import takes place in 2004, worth 23 thousand euros, and, in 2018, it has an import value of 26 thousand euros. In the period studied, 2001-2018, an afferent growth rate of 0.82% has been registered. Imports are mainly provided by Italy and Germany. Its share within the import sector has declined from 0.09% in 2004 to 0.02% in 2018, with an average rate of 6.65%.

On the seventh place is the product group named Silkworm cocoons suitable for reeling (5001). Imports within the same category are relatively low, and towards the end of the period analyzed, the volume of silk donut imports decreased to 0, one of the reasons being the absence of reeling facilities. The next stages of the market analysis are represented by export of silk and silk derived products analysis, followed by trade balance analysis.

The Total Column represents the total silk trade value afferent to each year and its value is constant, therefore CAGR is not calculated.

The aggregate silk export value ranges between 3078 in 2001 and 89495 in 2018, with a compound average growth rate of 20.59%. Main markets where Romania exports silk to are represented by Italy, Hungary, United Kingdom, France, Germany, Switzerland and Bulgaria, focusing its external trade, mainly within and around European Union Region.

In terms of exports, according to the results presented in the tables 3 and 4, it can be stated that on the first place, from within the silk and silk derived products, are the product groups represented by Silk yarn (fig.2), excluding that spun from silk waste and that put up for retail sale (5004), with its exported afferent values ranging from 2826 thousand euro in 2001 to 66606 thousand euro in 2018, registering a compound average growth rate of 29.42%. In terms of export

Table 4. Structure of Silk and silk derived products exports from Romania

Code	5001	5002	5003	5004	5005	5006	5007	Total
Year	Percentage (%)							
2001	0.00	0.83	0.00	91.82	0.00	0.00	7.34	100.00
2002	0.00	3.05	0.00	86.08	0.00	0.00	10.87	100.00
2003	0.00	29.74	0.00	56.63	0.00	0.00	13.63	100.00
2004	0.00	38.37	0.00	34.09	0.00	0.00	27.54	100.00
2005	0.00	35.16	0.01	35.51	0.01	0.00	29.31	100.00
2006	0.00	15.82	0.00	57.91	0.00	0.00	26.27	100.00
2007	0.00	8.29	0.00	64.00	0.00	0.00	27.71	100.00
2008	0.00	11.38	0.00	63.64	0.05	0.02	24.91	100.00
2009	0.00	7.16	0.03	74.39	0.01	0.00	18.42	100.00
2010	0.00	8.33	0.07	75.14	0.73	0.02	15.72	100.00
2011	0.00	10.93	0.09	74.31	0.04	0.02	14.60	100.00
2012	0.00	7.30	0.00	74.99	0.01	0.02	17.69	100.00
2013	0.00	8.34	0.00	75.62	0.06	0.00	15.98	100.00
2014	0.00	10.42	0.00	71.90	0.02	0.01	17.65	100.00
2015	0.00	9.43	0.00	74.70	1.07	0.01	14.79	100.00
2016	0.00	8.46	0.01	75.82	0.55	0.00	15.17	100.00
2017	0.00	9.76	0.00	77.10	1.01	0.00	12.13	100.00
2018	0.00	9.52	0.00	74.42	0.08	0.00	15.97	100.00
CAGR	0.00	14.50	0.00	-1.16	18.71	-5.96	4.41	

Source: own calculation

trade percentage within the silk aggregate value, it can be stated that its share decreases from 91.82% in 2001 to 74.42% in 2018, decreasing, on average, with 1.16% within the studied timeframe. In terms of trade partners, Romania exports silk yarn mainly towards Italy, Belgium, Austria and Bulgaria.

Woven fabrics of silk or of silk waste (5007) product group (fig.2) occupies the second place. The total exported values increases from 226 thousand euro in 2001 to 14293 thousand euro in 2018, at an average (compound) growth rate of 25.91%. In terms of export trade share within the silk aggregate group, its values increases (with a fluctuant trend) from 7.34% in 2001 to 15.97% in 2018, registering a compound average growth rate of 4.41%. In the case of this subcategory of silk derived products, in terms of exports, Italy, Germany, France and China represent main trade partners.

Raw silk "non-thrown" (5002) silk product group (fig.2) is situated on the third place, with

affluent exported values growing, with a compound average rate of 38.08%, from 26 thousand euro (0.83%) in 2001 to 8520 thousand euro in 2018 (9.52%). Its main trade partners, in terms of export, are represented by China and Italy. As Romania has a lower silk processing capacity, due to silk value chain infrastructure decline, some of exports are destined towards exports.

On the fourth place, is the product group represented by Yarn spun from silk waste, excluding that put up for retail sale (5005). The exported values range from 2 thousand euro in 2005 to 853 thousand euro in 2017 (trend peak), then decrease to 74 thousand euro in 2018. The compound average growth rate for the selected period registers the value of 29.42%. In terms of trade percentage, its share are quite low, ranging from 0.01% in 2005 to 0.08 in 2018, at a compound average growth rate of 18.71%. Main markets towards where this group of products is exported to are represented by Italy and Germany.

Table. 5. Silk and silk derived products Romanian Trade Balance

Code	5001	5002	5003	5004	5005	5006	5007	Total
Year	Thousand Euro							
2001	-1	-2760	0	2790	0	-17	-2877	-2864
2002	0	-9163	0	5452	0	-32	-3502	-7245
2003	0	-3635	0	5163	-1	-34	-4345	-2852
2004	0	-5077	-23	2217	-1	-55	-4119	-7058
2005	-1	-9829	-1	3833	-10	-58	-5044	-11109
2006	0	-26100	-14	17121	-14	-58	-948	-10013
2007	-3	-25761	-53	19433	-107	-73	-4275	-10836
2008	0	-31171	-70	22757	-12	-56	-3512	-12064
2009	0	-10919	-179	18769	-59	-43	-7751	-182
2010	-1	-21563	-254	22533	19	-30	-8903	-8198
2011	0	-36964	-194	32757	-244	-20	-11126	-15791
2012	0	-35620	-21	38861	-295	-107	-9007	-6189
2013	-2	-59053	-49	45640	-398	-80	-8183	-22123
2014	-20	-47601	-109	47821	-410	-24	-17825	-18148
2015	0	-51579	-160	53440	-511	-19	-4676	-3505
2016	-7	-70179	-118	52170	-534	-48	-7560	-26269
2017	0	-46786	-22	58242	-607	-78	-6601	4148
2018	0	-79680	-26	60269	-954	-113	-2762	-23266
CAGR	-100.00%	20.54%	0.82%	18.61%	53.54%	11.10%	-0.23%	12.34%

Source: Data adaptation and calculation from ITC

Figure 3. Main Silk Derived Products – Trade Balance Evolution (thousand Euro)

In fifth place is the product category Silk yarn and yarn say from silk waste, put up for retail; silkworm gut (5006), where afferent export values increase from 2 thousand euros in 2006 to 11 thousand euros in 2015 and then decrease back to 2 thousand euro in 2018. Analyzing the reference period, the observed compound average growth rate has a value of 0.00% (as the exported values

from 2005 and 2018 have same direct values). In terms of share percentage within export silk trade, its values, within the entire analyzed trade are situated well beneath 0.1%, and as its afferent growth rate shows, the exports continue to decrease on average, with 5.96%. In terms of export trade partners, there are represented by, mainly, Italy.

Table. 6. Net Exporter Index. Romanian Silk trade

Code/Year	5001	5002	5003	5004	5005	5006	5007	Total
2001	-1.00	-0.98	0.00	0.97	0.00	-1.00	-0.86	-0.32
2002	0.00	-0.96	0.00	0.99	0.00	-1.00	-0.72	-0.36
2003	0.00	-0.37	0.00	0.76	-1.00	-1.00	-0.60	-0.12
2004	0.00	-0.27	-1.00	0.22	-1.00	-1.00	-0.29	-0.16
2005	-1.00	-0.34	-0.14	0.25	-0.71	-1.00	-0.24	-0.17
2006	0.00	-0.66	-1.00	0.53	-1.00	-0.94	-0.04	-0.10
2007	-1.00	-0.77	-1.00	0.50	-1.00	-1.00	-0.14	-0.11
2008	0.00	-0.73	-1.00	0.54	-0.18	-0.74	-0.12	-0.11
2009	0.00	-0.71	-0.92	0.71	-0.91	-0.96	-0.41	0.00
2010	-1.00	-0.79	-0.85	0.74	0.04	-0.65	-0.44	-0.10
2011	0.00	-0.77	-0.67	0.77	-0.85	-0.53	-0.43	-0.13
2012	0.00	-0.80	-0.91	0.77	-0.97	-0.86	-0.30	-0.05
2013	-1.00	-0.84	-1.00	0.79	-0.84	-0.93	-0.27	-0.14
2014	-1.00	-0.75	-0.98	0.78	-0.92	-0.52	-1.00	-0.13
2015	0.00	-0.77	-1.00	0.81	-0.23	-0.70	-0.17	-0.02
2016	-1.00	-0.84	-0.92	0.82	-0.39	-1.00	-0.25	-0.15
2017	0.00	-0.74	-1.00	0.81	-0.26	-1.00	-0.24	0.03
2018	0.00	-0.82	-1.00	0.83	-0.87	-0.97	-0.09	-0.12
CAGR	-100.00%	-0.97%	0.00%	-0.91%	-0.90%	-0.19%	-11.91%	-5.49%

Source: own calculation

On the sixth place is the category of silk products represented by Silk waste, including cocoons unsuitable for reeling, yarn waste and garneted stock (5002), due to the fact that, in terms of export trade, this silk derived product is presented only 7 times within the studied time frame, as the exported values grow from 3 thousand euro in 2005 to 47 thousand in 2012, dropping back to 5 thousand euro in 2016. The compound average growth rate is 0.00% as the exports disappear completely in 2018. In terms of export trade share percentages, its values are situated, within every year of the selected period, well under 0.01%. Main export trade partners are represented by Italy and Germany.

On the seventh place is the product group named Silkworm cocoons suitable for reeling (5001) as within the export sector, this group of products is completely absent.

In terms of the silk trade balance, its evolution can be observed within tables 5 and 6.

When considering the analysis of compound average growth rate regarding the Trade Balance

and Net Export Index, the calculation was implemented using the absolute value in order to properly highlight the growth of the trade surplus or deficit afferent to each silk derived product group. In terms of trade balance significance, if the results are negative, then within the trade there is a deficit within the availability of the analysed product/sector on the afferent market, but if the result is positive it can denote there is a surplus within production and local market, assuring the successful development of that industry.

According to tables 5 and 6, it can be stated that the nature of the Romanian silk trade is rather dynamic, but mostly characterized by deficit in most of its silk and silk derived products, main exception being the trade sector of silk yarn, excluding that spun from silk waste and that put up for retail sale (5004).

From table 5 and 6, it can be observed that the largest values in terms of trade deficit (lack of product on the market) is registered by raw silk product group (5002, fig. 3), as deficit grows with an average rate of 20.54%, silk woven fabrics

Table. 7. National Production – Silk and silk derived products

Code	5001	5004	5007
Thousand Euro			
2001	4.20	Confidential data	19932
2002	3.20	Confidential data	27202
2003	8.70	Confidential data	20687
2004	7.70	Confidential data	19116
2005	13.70	Confidential data	0
2006	5.20	Confidential data	23029
2007	3.60	Confidential data	29579
2008	23.00	Confidential data	25448
2009	18.10	Confidential data	14475
2010	0	Confidential data	16727
2011	0	35192	17635
2012	0	Confidential data	22418
2013	0	Confidential data	26353
2014	0	57968	26493
2015	0	Confidential data	24470
2016	0	56450	24708
2017	0	67236	22729
2018	0	67687	24064
CAGR	-100%	12%	1%

Source: Data adaptation from Eurostat (PRODCOM database)

(5007, fig. 3), as it afferent deficit decreases slowly with a rate of 0.23%. The silk yarnn product group (5004, fig. 3) is positive in value with average growth rate of 18.61%, as exports exceed imports. As seen from the trade balance values, the above mentioned represent the sectors with the highest level of trade activity.

Concerning the NEI Index, as presented in table 6, regarding the following silk silk derived products: raw silk “non-thrown”(5002); yarn spun from silk waste (excluding that put up for retail sale; (5005); silk yarn and yarn spun from silk waste, put up for retail sale(5006); silk waste, including unsuitable cocoons for reeling, yarn waste and garneted stock(5003); and silkworm cocoons suitable for reeling (5001), Romania is a net Importer as the values or the Index are close to -1, meaning the trade activity leans towards imports. The category of woven fabrics (5007) has its NEI index closer to value of), meaning aferent trade, supported by local production, is gaining

capacity to satisfy local demand and forward increase value trade tough exports.

Concerning silk yarn, excluding that spun from silk waste and that put up for retail sale, as the trade balance shows surplus on the local market, NEI Index registers values closer to 1, as trade activity shows ability to satisfy local demand trough combined activity of imports and increasing local production.

The main significance of this aspect is that Romania is a net importer in relation to the majority of raw silk and silk derived products. Therefore, it can be stated that these are the main groups of silk products demanded on the Romanian Silk Market, therefore the sectors afferent to the production of silk yarn and silk derived products represent 2 of the main entry points within the silk value chain as demand exists and competition is low or non-existent, as proven by the volume of import and structure of national silk production

In terms of production, within the sericulture industry, within Romania, the production has

shifted its focus only on the textile manufacture sector, as analyzed data from table 7 will show.

From the data presented in table 7, the best evolution, in terms of production (value of production), was registered by Woven fabrics of silk or of silk waste silk (5007) product group, with a general upward trend, as the average compound growth rate shows with a positive value of 1%. The value of production grows from 19932 thousand Euro in 2001 to 24064 thousand euro in 2018. Concerning silk yarn, excluding that spun from silk waste and that put up for retail sale (2004), from obtained data, it can be stated that local production is present, but statistical data availability is low. Therefore, it can be stated that the production value grows from 35192 thousand euro in 2011 to 67687 thousand euro in 2018, at an average rate of 12%. Silkworm cocoons (5001) had their production stopped in 2009, as the last production value registered presents a sum of 18 thousand euro approximatively, as the agriculture infrastructure afferent to sericulture declines.

From what has been stated above it can be deduced that agricultural sector responsible for providing silkworm cocoons and the connection sector, meaning the filature, are missing from the silk value chain, remaining only the processing sector, meaning the production of silk yarn and silk textiles is still well developed and with a production, that, in terms of value, shows a growing trend. But the complete dependency of foreign raw material has also its risks, as the price movements directly affect the purchasing industry or country.

Therefore, a slow development of silk cocoon production sector and the manufacture of raw silk, slowly substituting the imports with local production can prove to be an opportune driver for the development of Romanian Sericulture as the manufacture sector is dependent on imports of raw silk. The potential identified entry points in the silk value chain can be in the production of silk cocoons and raw silk as these sectors are mainly satisfied by imports. Lack of production within this sectors shows that there is no internal competition within these silk value chain segments.

As previous studies in sericulture industry relaunch possibility state, one vital method is the

launch or a coherent value chain with focus on connecting the broken existing segments from silk manufacturing industry and other organizations (with support functions in production modernization, legislation support, financial support etc). The current study proves there is demand for raw inputs such as silk cocoons and raw silk, therefore providing a secure market (Popescu *et al*, 2008), and, in the same time, opening an entry point in the silk value chain.

In terms of organization forms, for small farms (suitable for sericulture practice, as seasonal activity) it is more viable to enter as a silkworm rearer association (therefore production capacity can be increased and costs lowered). Silk cocoon reeling is a second entry point in the silk value chain, where actors can either join as new companies or existing companies (processors of raw silk, as their activity is proven by the presence of production of silk yarn from raw silk) can enter through expansion of their production line by adding a silk cocoon reeling unit.

Conclusion

Through the analysis of the imports sector of silk and silk derived products, it can be stated that one of the main imported categories is raw silk (5002), where demand on the Romanian Market is satisfied 100% trough imports. The other imported silk derived products group is represented by Woven fabrics of silk or of silk waste, used in production or destined for retail and re-export. The trends afferent to the mentioned subsectors have upward general trends. China, Italy, Germany, France and Belgium represent the main trade partners in the import sectors.

Analyzing the silk and silk derived product export sector, it is observed that the silk fabrics and the silk yarn group, followed by the raw silk, represent the main export groups, whose general trend is an ascending one. The export market is mainly focused on the European market, in countries such as Italy, France, Germany, Belgium and Bulgaria.

The only group of products derived from silk, where the surplus confirms the balance is that of silk yarns, the quantity imported, being doubled by the local production.

At a national level, main silk derived products are represented by Silk yarn (excluding that spun from silk waste and that put up for retail sale (5004) and Woven fabrics of silk or of silk waste (5007), whose production value registers a growing trend, meaning that the silk derived products manufacture sector in Romania is still reasonable developed, denoting the aspect that investing in the development of the sector within sericulture responsible to provide the raw material for the silk textiles manufacture companies, raw materials such as raw silk and silk thread.

The sericulture industry in Romania owns still considerable potential, despite the fact that the manufacture sectors are dependent on importing raw materials such as raw silk, meaning that investments and development strategies should focus on developing the input sectors from the sericulture value chain, meaning the sectors responsible for the development of mulberry orchards, silkworm egg production and commercialization, silkworm cocoon production and raw silk production and marketing, as well as support services meant to connect the broken sectors of the silk value chain. This development direction can also lead to a secondary development benefit, meaning gaining the possibility to replace inputs with local production.

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