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**REVEALED COMPARATIVE ADVANTAGE: A CASE STUDY OF  
MACEDONIA**

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**Abstract**

In this study, the comparative advantage of Macedonia in international markets has been analyzed for the period of 2013-2016. "Revealed Comparative Advantages Index", developed by Balassa (1965), and RCA4 index, developed by Vollrath (1991), have been calculated for 150 product groups within cluster 4 digit of Macedonia that have been obtained from Trade Map database, and it has been investigated whether external trade of Macedonia underwent a structural change within the mentioned period. According to the findings of the study, it has been concluded that Macedonia's competitiveness advantage continues in the products for which its competitiveness is high, it produces new RCA's during the analysis period and its external trade structure is moving from agricultural to capital intensive products.

**Keywords:** Revealed Comparative Advantages, Balassa Index, Competitiveness, Export

**INTRODUCTION**

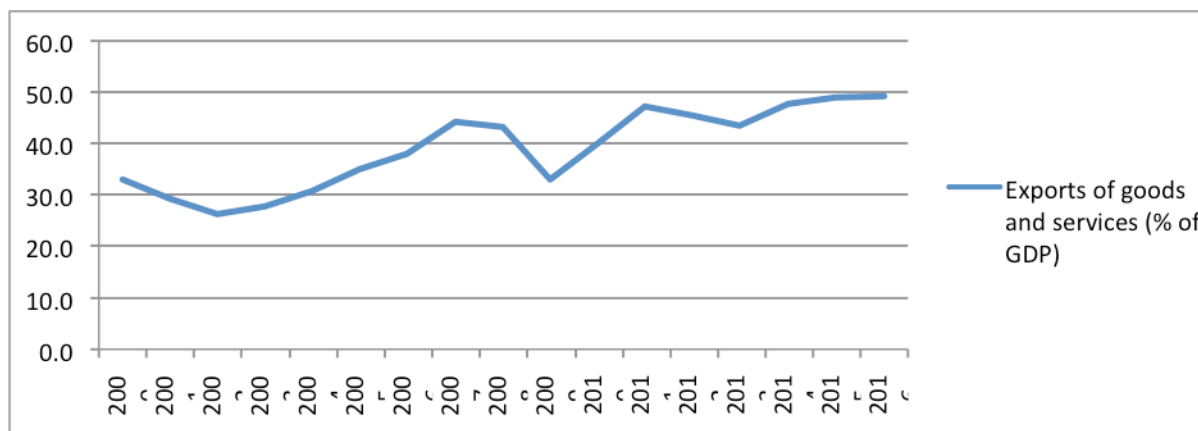
It is not necessary for a small open economy to depend upon external demand in order to enlarge its export because of its tendency to make production by taking the market price as guiding data. The amount of export goods that it will provide is not big enough to affect the prices in the relevant markets. For this reason, the demand does not create a limitation and the export depends upon supply and competitiveness. 2008-2009 crisis led to the opinion that export is a significant factor especially in small open economies so that economic growth can be sustained. For a small open economy such as Macedonia, the prerequisite for a sustainable growth and development is to enlarge consumption and investment spending in addition to trade sector and export. This requires some political arrangements in terms of both macro policies and structural reforms (Gligorov, 2017: 3).

In recent years, the Republic of Macedonia has developed some active reforms for signing trade agreements. During this period, the Republic developed a quite liberal external trade policy and signed bilateral agreements that enabled local producers to reach EU and other markets and hence turned Macedonia into a very competitive production and export platform. In this context, after signing Stability and Partnership Agreement with EU in April 2001, free access to European markets was allowed for most of Macedonian products. In the scope of regulations developed for external trade, Customs Law dated 2006 increased the compatibility of

Macedonia’s customs legislation with EU standards (PwC, 2012:8-24). Macedonia, that signed free trade agreements with Turkey and Ukraine, has been a member of EFTA and CEFTA since 2006 (USAID, 2008: 1-17). The Republic of Macedonia became an official member of World Trade Organization on April 4, 2003 (USITC, 2013: 20).

In light of these regulations and applied macro policies, export performance in Macedonia has increased strongly in the last ten years and the country’s competitiveness has increased and hence the gap with other developing European countries has decreased. The share of goods and services export within GDP is highly above those of West Balkan states. The export enabled the economy to move away from the short-term stagnation observed after the global crisis of 2012 by providing significant contributions to real growth. Since the middle of 2000’s, Macedonia has developed some policies aimed at improving business environment and encouraging FDI in trade sectors which are important components of the country’s export strategy. (IMF, 2015: 4-9).

The export in Macedonia was USD 3.403.569.538 in 2003 while it increased to USD 4.375.159.212, USD 3.935.587.548, USD 4.403.207.550 respectively and reached to USD 5.195.581.936 in 2017. According to World Development Indicators data, the share of export in GDP showed increase until the shrinkage of 2008. The ratio of export to GDP started to increase again in 2010 and amounted to 39.8 %. The ratio of Macedonia export to GDP was 49.2% in 2016. The export showed increase by 11% in 2016 when compared to the previous year.



Kaynak: World Development Indicators

This growth in export results mostly from the export into Germany. According to WITS data, the export into Germany was USD 2.248.626.190 in 2016, which amounts to about 47% of the country’s total export. Following Germany, the countries that have the highest amount of share in Macedonia’s export are Serbia (USD 423.706.020), Bulgaria (USD 246.501.900), Belgium (USD 189.266.770), Italy (USD 175.224.890), Greece (USD 163.326.560), Romania (USD

134.712.130), Spain (USD 117.303.250), Croatia (USD 89.275.610) and Bosnia and Herzegovina (USD 82.021.510). On the other hand, as a result of increase in the capacity of manufacturing industry and slowly changing currency, increase was observed in Macedonia's export into the countries outside Euro-zone (Economic Report, 2016:1-3).

**Table 1: Macedonia's Export Compared to Countries, 2012-2016, Annual USD Thousand and Share of Market in Total Exports in 2016 (%)**

Importers	Exported value in 2012	Exported value in 2013	Exported value in 2014	Exported value in 2015	Exported value in 2016	Share of Market in Total Exports in 2016
World	4015403	4298766	4964132	4489934	4784605	
Germany	1180747	1539463	2046138	1990053	2248626	47,00
Serbia	690604	548359	491401	392105	423706	8,86
Bulgaria	287163	325665	327858	270794	246502	5,15
Belgium	41620	67595	151646	143025	189267	3,96
Italy	281180	286963	310483	181363	175225	3,66
Greece	188486	213675	227729	165702	163327	3,41
Romania	52757	87172	94562	107390	134712	2,82
Spain	46939	44754	69945	100825	117303	2,45
Croatia	98502	100415	94000	80033	89276	1,87
Bosnia and Herzegovina	84545	95458	93078	79485	82022	1,71
Turkey	66811	71812	67605	73384	70721	1,48
Slovenia	74272	59471	56772	55727	65881	1,38
Albania	75656	78581	74932	65966	62756	1,31
Netherlands	65996	68174	71338	57987	61634	1,29
United Kingdom	62928	80909	68860	46999	58369	1,22
United States of America	56400	45972	53070	40525	50768	1,06
Slovakia	72743	78077	82145	67236	49445	1,03
Russian Federation	33144	31581	42068	35087	48953	1,02
China	158846	106952	92632	142820	47810	1,00
Hungary	9120	8265	17883	21792	45062	0,94
Austria	48984	47356	51494	40632	43177	0,90
Czech Republic	34890	28717	32613	29298	42426	0,89
Poland	18153	18870	18855	27669	32434	0,68
Switzerland	33348	42202	52464	42837	29194	0,61
Taipei, Chinese	13960	13819	59931	41437	28142	0,59

Montenegro	31475	32802	31753	26255	27615	0,58
France	20349	25658	38617	39225	25210	0,53
India	23960	29362	22008	13829	19205	0,40
Sweden	11335	12691	15365	12284	13517	0,28
Portugal	11154	11880	7198	4309	8486	0,18
South Africa	539	295	2889	12361	6719	0,14
Ukraine	17862	22503	9508	6668	6688	0,14

Sources: ITC calculations based on UN COMTRADE statistics.

With a share of 47%, Germany has the highest share in Macedonia's export. Germany maintained its share in Macedonia's trade during 2013-2016 with a small increase. While Belgium, Romania, Slovenia, the USA, Russian Federation, Hungary, Czech Republic,

Poland, Portugal and South Africa increased their market shares, Serbia, Bulgaria, Italy, Greece, Bosnia and Herzegovina, Turkey, Albania, Netherlands, Slovakia, Austria, Switzerland, France, Ukraine and Montenegro's market share decreased.

As of 2016, main export goods of Macedonia include reaction initiators, reaction accelerators and catalytic preparations (USD 972.532.000), centrifuges (USD 550.025.000), insulated "incl. enamelled or anodised" wire, cable "incl. coaxial cable" and other insulated (USD 387.120.000), motor vehicles for the transport of >= 10 persons (USD 142.175.000), ferro- alloys (USD 140.740.000) and seats (USD 130.054.000) (Trade Map, 2016).

**Table 2: Macedonia Export Products, 4 Digits, 2012-2016, Annual US Dollar Thousand**

Code	Product label	Exported value in 2012	Exported value in 2013	Exported value in 2014	Exported value in 2015	Exported value in 2016
'TOTAL	All products	4015403	4298766	4964132	4489934	4784605
'3815	Reaction initiators, reaction accelerators and catalytic preparations, n.e.s. (excluding rubber ...	493924	638339	860082	856749	972532
'8421	Centrifuges, incl. centrifugal dryers (excluding those for isotope separation); filtering or ...	175961	267675	424388	474340	550025
'8544	Insulated "incl. enamelled or anodised" wire, cable "incl. coaxial cable" and other insulated ...	24292	62266	266828	274623	387120

'8702	Motor vehicles for the transport of $\geq$ 10 persons, incl. driver	6034	15765	93560	104613	142175
'7202	Ferro-alloys	460610	438946	388803	300417	140740
'9401	Seats, whether or not convertible into beds, and parts thereof, n.e.s. (excluding medical, ...	30149	38760	69680	102382	130054
'2401	Unmanufactured tobacco; tobacco refuse	121340	153245	127876	95856	118120
'6204	Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, ...	146016	157667	151804	108649	107288
'6203	Men's or boys' suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches ...	101927	99655	137163	104227	101452
'7208	Flat-rolled products of iron or non-alloy steel, of a width $\geq$ 600 mm, hot-rolled, not clad, ...	134137	100092	123920	83189	96345
'7306	Tubes, pipes and hollow profiles "e.g., open seam or welded, riveted or similarly closed", ...	92883	92530	76452	65226	92583
'7210	Flat-rolled products of iron or non-alloy steel, of a width $\geq$ 600 mm, hot-rolled or cold-rolled ...	88655	123070	102970	85154	83277
'6205	Men's or boys' shirts (excluding knitted or crocheted, nightshirts, singlets and other vests)	93298	92574	93625	76824	77889
'3004	Medicaments consisting of mixed or unmixed products for therapeutic or prophylactic uses, put ...	83503	80214	81342	69717	75939
'6206	Women's or girls' blouses, shirts and shirt-blouses (excluding knitted or crocheted and vests)	84993	82843	83627	71112	65749
'1905	Bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa; communion ...	47557	54856	61767	58819	60979
'2204	Wine of fresh grapes, incl. fortified wines; grape must, partly fermented and of an actual ...	72466	68180	63519	43642	52781
2603...9020	Others	1757660	1732097	1756714	1514393	1529572

Source: Trade Map

In the framework of this article, Macedonia's comparative advantages in external trade for the period of 2013-2016 were investigated by means of RCA index, developed by Balassa (1965). Based on export data obtained from Trade MAP 4 digits sector, a RCA index was calculated for Macedonia. In the first part of the study, literature review was presented while information

regarding the adopted model was given in the second part. The findings and the results were shared in the third and fourth parts respectively.

### **1-LITERATURE REVIEW**

The Revealed Comparative Advantages index, which provides data regarding weak and strong points of countries in external trade, was analyzed first by the economist Balassa (1965). In the following years, the model was developed by different economists. Hillman (1980), concluded that RCA's export share measure is in compliance with the comparative advantage expressed with pre-trade relative prices. In addition to reaching same results as Hillman (1980) regarding the relation between export share measure and pre-trade relative price, Bowen (1983) showed that appropriate competition refers to the ratio of net trade to the expected production. Yeats (1985) and Vollrath (1991) among the researchers that made a detailed analysis of RCA measures. Vollrath (1991), changed RCA model to prevent double-counting and made contribution to the relevant literature in order to develop three alternative methods of RCA. These models that have been modified from RCA are relative trade advantage, logarithm of relative export advantage and revealed competitiveness.

Hinloopen and Marrewijk (2001), analyzed the empirical distribution of Balassa index by using trade data of 12 EU member states and Japan. They concluded that this distribution was relatively stable in terms of time. On the other hand, the distribution of Balassa Index shows

significant differences according to regions. This situation hardens the index comparison among the countries. The findings of the study show that Germany has the most permanent comparative advantages while Greece has the most mobile ones.

Miteva-Kacarski analyzed the external trade between the Republic of Macedonia and the Republic of Croatia for the period of 2006-2013 by using Balassa Index. The obtained findings showed that the Republic of Macedonia has a comparative advantage especially in the export of most of such product categories as food and beverages according to Standard International Trade Classification. Apart from tobacco products, it has advantage in manufacturing goods classified mostly with materials. Kostoska (2010), examined Macedonian economy's competitiveness within European economy by using RCA's four indexes. Muamer, Snjezana and Vedrana (2015), analyzed the export performances of old Yugoslavian countries (Bosnia-herzegovina, Croatia, Macedonia, Montenegro, Serbia, Slovenia) for the period of 2006-2013 by means of Balassa RCA index, Michaely index, Herfindahl-Hirschman concentration indexes etc.

Zorkociova, Petrikova and Skodova (2017), analyzed the trade relations of Macedonia with the Republic of Slovac for the period of 2006-2016 by using RCA indexes. Tuna, Georgiev and Nacka (2013), examines the competitiveness of tobacco sector of Macedonia during 2005-2010, depending upon Porter Diamond competitiveness approach, which is supported with Ballasa index. They concluded that Macedonia has the most appropriate conditions among the selected countries (Greece, Bulgaria, Turkey) as well as competitiveness in terms of tobacco production.

Obadi (2016), carried out an analysis of EU and U.S. sector for the period of 2000-2014 by using RCA index. Clark and Sawyer (2007), presented the comparative advantage model of

U.S. regions and states for the period of 1987-2000. Tripa, Coc and Oana (2016), researched the competitiveness of Romanian Textile and Clothing Industry with Global Market between 1990 and 2014 by using three indexes of RCA. Startienea and Remeikiene (2014), investigated the competitiveness of Lithuanian industry products in global markets during 2007-2011 by means of revealed symmetric comparative advantage indexes. As Abteu (2017) mentioned in his study, the studies analyzing external trade models of African countries [Ndayitwatwayeko et al. (2014), Isaac and Othieno (2011), Chingarande, Mzumara and

Karambakuwa (2013), Beyene (2014), Felix, Bongani and Macleans (2013), Mwashu and Kweka (2014)], benefited from RCA method very often.

Using RCA indexes, Küçükahmetoğlu (2000) put forth that Turkey has a comparative advantage in 50% of “standard” industrial products while it has a certain disadvantage in “advanced” technological products compared to EU. Karakaya and Özgen (2002), surveyed trade creation (TC) and trade diversion (TD) effects on Turkey’s integration into EU by means of RCA index. With this index, the effect of Turkey’s participation into Customs Union and European markets on the trade of Mediterranean countries (Greece, Portugal and Spain) was examined. According to the results, export structures between Turkey and EU show differences to a significant extent. The RCA index calculated in the study provided data suggesting that intraregional trade creation effect would occur in commodity groups such as agriculture, food, beverage, tobacco, textile, paper products, base metal and metal manufacturing.

Utkulu and Seymen (2004), examined sector-based trade flow from Turkey into EU and the competitiveness of trade for the period of 1990-2003 by calculating different RCA indexes. The results showed that Turkey had a comparative advantage in seven product groups among 63 ones. Çakmak (2005) analyzed the competitiveness of different groups in world markets by means of RCA and other indexes that were calculated for sub-sectors in textile and garment industry. Kaya (2006), calculated RCA for manufacturing industry for the periods of 1991-1996 and 1996-2006. In this analysis, it was found out that Turkey had started to develop in terms of specialization in some industries before integrating into European Customs Union and maintained this trend while specialization in export decreased in some industries.

Serin and Civan (2008), analyzed Turkey’s comparative advantage in EU market in such industries as tomatoes, oil, fruit juice for the period of 1995-2005. Altay and Gürpınar (2008), made calculations for Turkish furniture sector for the period of 2001-2006 by using such different competition power indexes as Revealed Comparative Advantage Index (RCA), Relative Export Advantage Index (RXA), Relative Import Penetration Index (RMP) and Relative Trade Advantage Index (RTA). In light of this study, it was concluded that Turkey gained strength in terms of competition in furniture sector, but it was necessary to pay attention to Re&De and other competition factors in order to keep and develop it. In his study,

Şahinli (2011) calculated RCA index with the data regarding Turkey's cotton sector of 2001-2009 and it was concluded that most of the examined cotton products had comparative advantage. Using Balassa's Revealed Comparative Advantages (RCA) Index, Gülmez (2012) analyzed competitiveness of Turkey's automotive sector in EU market after integrating into Customs Union.

## 2- MODEL

RCA measures are important indicators used in order to analyze the export potential of a country. RCA shows whether the mentioned country is in the process of expanding its product range in which it has export potential rather than the conditions under which the number of products to be exported is stable. According to RCA model, it is not very probable for the countries with similar RCA profiles to have high bilateral trade intensity. The model provides beneficial information regarding new partnerships and potential trade opportunities (World Bank, Trade Indicators). The RCA, developed by Balassa (1965), can be expressed as follows:

$$RCA_{ij} = (x_{ij}/X_{it}) / (x_{wj}/X_{wt})$$

$x_{ij}$  : Exports of  $i$ th country in ' $j$ 'th product  $X_{it}$  : Total Exports value of the  $i$ th country.  $x_{wj}$  : Total World Exports of ' $j$ 'th product  $X_{wt}$  : Total World Exports

In a condition of  $RCA > 1$ , it suggests that country " $j$ " has a comparative advantage in product " $i$ ". In other words, the share of this products in country's total export is higher than its share in world trade. In a condition of  $RCA < 1$ , it suggests that there is a comparative advantage in this product. It mentions that the country's market share in the export of the mentioned product is lower than its average share in world export. If RCA is equal to 1, the market share of the country for product (sector) " $k$ " in world export is equal to its average share in world export. Hinloopen and Marrewijk (2001), classifies the power of comparative advantage in four steps:

Class a:  $\rightarrow 0 < RCA \leq 1$ ; No comparative advantage Class b:  $\rightarrow 1 < RCA \leq 2$ ; A weak comparative advantage

Class c:  $\rightarrow 2 < RCA \leq 4$ ; A moderate comparative advantage Class d:  $\rightarrow 4 < RCA$  ; A strong comparative advantage

Vollrath (1991), contributed to the model by modifying Balassa Index.  $RCA_{ij4} = (X_{ij}/X_{ik}) / (X_{nj}/X_{nk}) - (M_{ij}/M_{ik}) / (M_{nj}/M_{nk})$

$$RCA_{ij5} = \ln[(X_{ij}/X_{ik}) / (X_{nj}/X_{nk})] \quad RCA_{ij6} = \ln[(M_{ij}/M_{ik}) / (M_{nj}/M_{nk})]$$



Xij; j product export of i country, Xik; total export of i country, Mij; j product import of i country Mnk; world import of j product. While Pozitif RCAij4, RCAij5 or RCAij6 implied a comparative advantage, a negative index value puts forth a comparative disadvantage (Vollrath, 1991: 276).

### 3- FINDINGS

In the study, classical Balassa (1965) RCA index and Vollrath (1991) RCA4 index values were calculated. Data related to Macedonia, world import and export were obtained from Trade map digit 4 cluster, and index values were calculated accordingly.

**Table 3: Macedonia Balassa RCA and Vollrath RCA4, digit 4, 2013-2016**

Code	Product label	RCA 2013	RCA 2014	RCA 2015	RCA 2016	RCA4 2013	RCA4 2014	RCA4 2015	RCA4 2016
'3815	Reaction initiators, reaction accelerators and catalytic preparations, n.e.s. (excluding rubber ...	174,76	186,76	184,31	192,50	171,85	185,82	182,80	189,46
'8421	Centrifuges, incl. centrifugal dryers (excluding those for isotope separation); filtering or ...	20,40	25,82	30,01	31,32	18,09	23,03	27,13	28,69
'8544	Insulated "incl. enamelled or anodised" wire, cable "incl. coaxial cable" and other insulated ...	2,41	8,38	9,00	11,67	1,37	6,40	6,39	8,63
'8702	Motor vehicles for the transport of >= 10 persons, incl. driver	4,30	20,65	24,32	30,69	2,84	19,85	23,15	29,90
'7202	Ferro-alloys	78,80	54,57	54,15	24,48	78,41	54,13	53,14	23,82
'9401	Seats, whether or not convertible into beds, and parts thereof, n.e.s. (excluding medical, ...	2,47	3,61	5,28	6,00	1,70	2,99	4,68	5,11
'2401	Unmanufactured tobacco; tobacco refuse	52,24	40,24	31,68	34,81	47,86	38,25	29,04	30,00
'6204	Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, ...	12,24	8,77	6,26	5,75	11,84	8,38	5,89	5,35
'6203	Men's or boys' suits, ensembles, jackets, blazers, trousers, bib and brace overalls, breeches ...	9,73	10,39	7,86	7,19	9,26	9,86	7,40	6,68
'7208	Flat-rolled products of iron or non-alloy steel, of a width >= 600 mm, hot-rolled, not clad, ...	8,62	9,47	7,89	8,95	0,33	2,81	-0,31	0,55

7306	Tubes, pipes and hollow profiles "e.g., open seam or welded, riveted or similarly closed", ...	16,46	11,15	11,87	16,44	15,44	10,09	10,51	14,73
7210	Flat-rolled products of iron or non-alloy steel, of a width $\geq$ 600 mm, hot-rolled or cold-rolled ...	10,75	7,63	7,29	6,71	10,18	7,06	6,69	6,17
6205	Men's or boys' shirts (excluding knitted or crocheted, nightshirts, singlets and other vests)	26,95	21,89	18,40	17,25	26,58	21,51	18,01	16,78
3004	Medicaments consisting of mixed or unmixed products for therapeutic or prophylactic uses, put ...	1,08	0,91	0,79	0,79	0,04	-0,07	-0,01	-0,03
6206	Women's or girls' blouses, shirts and shirt-blouses (excluding knitted or crocheted and vests)	27,99	22,97	19,61	16,95	27,57	22,48	19,12	16,38
1905	Bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa; communion ...	7,84	7,35	7,24	6,50	5,04	4,64	4,60	4,10
2204	Wine of fresh grapes, incl. fortified wines; grape must, partly fermented and of an actual ...	8,59	6,94	5,01	5,42	8,54	6,90	4,97	5,38
2603	Copper ores and concentrates	5,38	3,91	3,95	3,57	5,38	3,91	3,95	3,57
8507	Electric accumulators, incl. separators therefor, whether or not square or rectangular; parts ...	1,80	2,77	3,99	3,95	0,57	1,65	2,85	2,92
2607	Lead ores and concentrates	51,66	39,54	32,32	25,28	51,66	39,53	32,28	25,28
2710	Petroleum oils and oils obtained from bituminous minerals (excluding crude); preparations containing ...	0,34	0,21	0,22	0,25	-1,62	-1,74	-1,75	-1,73
8537	Boards, panels, consoles, desks, cabinets and other bases, equipped with two or more apparatus ...	7,04	5,96	5,19	2,12	6,34	5,24	4,55	1,50
8708	Parts and accessories for tractors, motor vehicles for the transport of ten or more persons, ...	0,28	0,18	0,12	0,28	0,08	-0,11	-0,20	-0,10
	Footwear with outer soles of rubber, plastics, leather or								

'6403	composition leather and uppers of ...	3,37	3,18	2,19	1,82	2,65	2,56	1,55	1,19
2005	Other vegetables prepared or preserved otherwise than by vinegar or acetic acid, not frozen ...	9,59	9,24	9,44	8,62	4,77	4,81	5,01	4,65
'3917	Tubes, pipes and hoses, and fittings therefor, e.g. joints, elbows, flanges, of plastics	7,66	5,59	4,61	4,01	5,53	3,48	2,43	1,72
'6104	Women's or girls' suits, ensembles, jackets, blazers, dresses, skirts, divided skirts, trousers, ...	2,72	3,26	2,56	2,52	2,34	2,93	2,28	2,18
'6106	Women's or girls' blouses, shirts and shirt-blouses, knitted or crocheted (excluding T-shirts ...	30,36	24,11	20,79	17,28	28,48	22,50	19,74	16,47
'0808	Apples, pears and quinces, fresh	6,81	6,29	7,39	8,16	6,69	6,11	7,21	7,97
'6211	Tracksuits, ski suits, swimwear and other garments, n.e.s. (excluding knitted or crocheted)	12,98	9,99	7,96	6,52	12,36	9,36	7,29	5,79
'7321	Stoves, ranges, grates, cookers, incl. those with subsidiary boilers for central heating, barbecues, ...	9,05	7,58	7,92	8,78	6,11	5,22	5,57	6,40
'6109	T-shirts, singlets and other vests, knitted or crocheted	3,58	3,08	2,08	1,62	3,06	2,58	1,63	1,08
'2608	Zinc ores and concentrates	17,07	14,23	13,36	8,72	17,07	14,23	13,36	8,72
'1512	Sunflower-seed, safflower or cotton- seed oil and fractions thereof, whether or not refined, ...	3,62	4,20	8,22	6,56	-9,53	-4,93	-3,48	-4,09
'8607	Parts of railway or tramway locomotives or rolling stock, n.e.s.	4,49	5,21	5,79	6,12	3,72	4,42	5,17	2,46
'0709	Other vegetables, fresh or chilled (excluding potatoes, tomatoes, alliaceous vegetables, edible ...	5,36	6,58	5,37	4,81	5,27	6,43	5,22	4,67
'2515	Marble, travertine, ecaussine and other calcareous monumental or building stone of an apparent ...	29,81	32,57	30,96	30,10	29,23	32,19	30,74	29,78

'7308	Structures and parts of structures "e.g., bridges and bridge-sections, lock-gates, towers, ...	0,93	1,04	1,01	1,32	-0,77	-0,77	-0,55	-0,82
'0704	Cabbages, cauliflowers, kohlrabi, kale and similar edible brassicas, fresh or chilled	23,51	25,32	18,28	20,29	23,42	25,08	18,15	20,21
'6406	Parts of footwear, incl. uppers whether or not attached to soles other than outer soles; removable ...	11,48	9,54	6,84	6,96	7,78	5,70	3,22	3,89
'0806	Grapes, fresh or dried	8,26	5,56	6,29	5,66	8,04	5,39	6,14	5,49
'6302	Bedlinen, table linen, toilet linen and kitchen linen of all types of textile materials (excluding ...	3,99	3,74	3,38	2,72	3,64	3,30	2,80	2,21
'9404	Mattress supports (excluding spring interiors for seats); articles of bedding and similar furnishing, ...	4,12	4,08	3,96	3,45	3,07	3,15	3,14	2,55
2001	Vegetables, fruit, nuts and other edible parts of plants, prepared or preserved by vinegar ...	35,84	32,84	30,83	25,12	35,58	32,62	30,57	24,87
'6202	Women's or girls' overcoats, car coats, capes, cloaks, anoraks, incl. ski jackets, windcheaters, ...	3,52	2,53	2,48	2,91	3,14	2,19	2,08	2,46
'8532	Electrical capacitors, fixed, variable or adjustable "pre-set"; parts thereof	1,16	1,62	1,36	1,98	0,71	1,20	1,00	1,68
'9403	Furniture and parts thereof, n.e.s. (excluding seats and medical, surgical, dental or veterinary ...	0,66	0,62	0,55	0,57	-0,19	-0,27	-0,26	-0,21
'0204	Meat of sheep or goats, fresh, chilled or frozen	11,22	9,53	7,96	7,97	11,16	9,53	7,95	7,97
'0702	Tomatoes, fresh or chilled	7,72	6,59	5,14	4,99	7,37	6,11	4,61	4,43
'2402	Cigars, cheroots, cigarillos and cigarettes of tobacco or of tobacco substitutes	4,68	2,53	1,74	1,81	2,96	0,24	-0,17	0,07
'2523	Cement, incl. cement clinkers, whether or not coloured	4,21	3,27	3,72	4,36	0,71	-0,64	-0,50	0,65
	Slag, ash and residues containing metals, arsenic or their compounds								

'2620	(excluding those from ...	12,19	11,93	10,43	14,92	11,68	11,47	9,77	14,92
'8479	Machines and mechanical appliances having individual functions, not specified or included elsewhere ...	0,26	0,37	0,44	0,60	-0,78	-0,49	-0,36	-0,12
'8534	Printed circuits	0,47	0,57	0,59	0,92	-0,15	0,01	-0,04	0,65
'0710	Vegetables, uncooked or cooked by steaming or boiling in water, frozen	6,81	5,82	8,11	6,66	5,89	4,93	7,02	5,61
'3923	Articles for the conveyance or packaging of goods, of plastics; stoppers, lids, caps and other ...	0,99	0,88	0,83	0,79	-0,96	-0,93	-0,89	-0,92
'2106	Food preparations, n.e.s.	1,37	1,14	0,99	1,06	-1,85	-1,72	-1,62	-1,45
'7204	Ferrous waste and scrap; remelting scrap ingots of iron or steel (excluding slag, scale and ...	2,29	1,77	1,68	1,57	1,12	-1,33	-0,19	-0,36
'6405	Footwear with outer soles of rubber or plastics, with uppers other than rubber, plastics, leather ...	9,10	9,41	10,15	10,27	6,32	6,67	7,99	7,81
'8516	Electric instantaneous or storage water heaters and immersion heaters; electric space-heating ...	1,21	0,96	0,86	0,88	-0,05	-0,15	-0,25	-0,27
'3214	Glaziers' putty, grafting putty, resin cements, caulking compounds and other mastics; painters' ...	7,06	5,88	5,39	4,82	2,32	1,38	0,55	-0,27
'1806	Chocolate and other food preparations containing cocoa	1,66	1,54	1,47	1,34	-2,22	-1,92	-1,98	-1,96
'9018	Instruments and appliances used in medical, surgical, dental or veterinary sciences, incl. ...	0,44	0,42	0,37	0,31	-0,19	-0,21	-0,10	-0,19
'7301	Sheet piling of iron or steel, whether or not drilled, punched or made from assembled elements; ...	6,45	8,89	10,72	19,15	6,03	8,66	10,46	19,00
'0602	Live plants incl. their roots, cuttings and slips; mushroom spawn (excluding bulbs, tubers, ...	2,32	2,01	2,40	4,10	0,53	-0,30	0,20	2,15

'6809	Articles of plaster or of compositions based on plaster (excluding plaster bandages for straightening ...	22,51	18,84	16,76	17,41	21,08	17,32	15,26	15,74
'7214	Bars and rods, of iron or non-alloy steel, not further worked than forged, hot-rolled, hot-drawn ...	3,84	2,07	2,80	2,54	-2,73	-3,50	-2,94	-4,79
'2716	Electrical energy	0,81	1,24	1,45	1,23	-14,02	-14,29	-11,08	-7,90
'0809	Apricots, cherries, peaches incl. nectarines, plums and sloes, fresh	10,91	8,98	7,35	5,17	10,89	8,82	7,28	4,97
'6115	Pantyhose, tights, stockings, socks and other hosiery, incl. graduated compression hosiery ...	2,82	3,28	2,73	2,39	1,97	2,46	1,95	1,50
'5211	Woven fabrics of cotton, containing predominantly, but < 85% cotton by weight, mixed principally ...	11,42	9,89	8,57	7,84	-17,97	-13,90	-11,54	-8,30
'1704	Sugar confectionery not containing cocoa, incl. white chocolate	3,95	3,25	2,92	2,57	2,28	1,72	1,51	1,22
'3925	Builders' ware of plastics, n.e.s.	3,59	2,95	2,83	2,73	0,96	0,39	0,39	0,33
'6201	Men's or boys' overcoats, car coats, capes, cloaks, anoraks, incl. ski jackets, windcheaters, ...	2,55	2,74	2,94	2,06	2,10	2,36	2,52	1,53
'7404	Waste and scrap, of copper (excluding ingots or other similar unwrought shapes, of remelted ...	2,50	2,22	1,97	1,94	2,50	2,22	1,97	1,94
'3920	Plates, sheets, film, foil and strip, of non-cellular plastics, not reinforced, laminated, ...	0,67	0,49	0,48	0,53	-1,04	-1,11	-1,03	-0,95
'8302	Base metal mountings, fittings and similar articles suitable for furniture, doors, staircases, ...	0,08	0,24	0,87	0,95	-1,11	-0,92	-0,28	-0,24
'6110	Jerseys, pullovers, cardigans, waistcoats and similar articles, knitted or crocheted (excluding ...	0,46	0,32	0,38	0,54	0,18	0,07	0,03	0,16
'7019	Glass fibres, incl. glass wool, and articles thereof (excluding mineral wools and articles ...	0,06	0,03	0,39	2,28	-1,08	-0,82	-1,10	0,75

'7209	Flat-rolled products of iron or non-alloy steel, of a width of >= 600 mm, cold-rolled "cold-reduced", ...	1,27	0,69	1,17	1,98	0,09	-0,57	-0,30	0,68
'1601	Sausages and similar products, of meat, offal or blood; food preparations based on these products	13,17	9,89	7,02	5,47	7,39	3,86	0,13	-1,16
'4009	Tubes, pipes and hoses, of vulcanised rubber other than hard rubber, with or without their ...	1,25	1,56	2,47	2,73	0,53	0,70	1,50	1,72
'6902	Refractory bricks, blocks, tiles and similar refractory ceramic constructional goods (excluding ...	11,18	9,79	7,93	7,42	8,11	7,55	6,79	6,42
'2202	Waters, incl. mineral waters and aerated waters, containing added sugar or other sweetening ...	2,34	1,18	0,96	1,21	-1,30	-1,96	-2,04	-1,49
'0712	Dried vegetables, whole, cut, sliced, broken or in powder, but not further prepared	6,97	9,73	5,69	4,71	5,76	8,26	4,29	3,72
'1904	Prepared foods obtained by the swelling or roasting of cereals or cereal products, e.g. corn ...	4,40	4,47	3,94	3,71	3,27	3,22	2,82	2,48
'7616	Articles of aluminium, n.e.s.	0,40	1,64	1,49	1,33	-0,73	0,53	0,27	0,11
'8536	Electrical apparatus for switching or protecting electrical circuits, or for making connections ...	0,22	0,20	0,19	0,22	-0,38	-0,89	-1,46	-1,87
'3921	Plates, sheets, film, foil and strip, of plastics, reinforced, laminated, supported or similarly ...	0,71	0,50	0,36	0,83	-1,72	-1,88	-2,15	-1,45
'7403	Copper, refined, and copper alloys, unwrought (excluding copper alloys of heading 7405)	0,86	0,58	0,93	0,38	0,86	0,57	0,93	0,38
'6305	Sacks and bags, of a kind used for the packing of goods, of all types of textile materials	4,46	3,49	3,33	3,41	2,94	2,09	2,40	2,33
'8517	Telephone sets, incl. telephones for cellular networks or for other wireless networks; other ...	0,04	0,06	0,10	0,03	-0,41	-0,41	-0,30	-0,42

4819	Cartons, boxes, cases, bags and other packing containers, of paper, paperboard, cellulose wadding ...	0,85	0,75	0,67	0,77	-2,91	-2,43	-2,16	-1,85
0707	Cucumbers and gherkins, fresh or chilled	13,57	13,50	11,04	6,80	12,91	12,73	9,85	5,41
5603	Nonwovens, whether or not impregnated, coated, covered or laminated, n.e.s.	0,95	0,48	1,03	1,16	-1,28	-1,57	-0,91	-0,68
7314	Cloth, incl. endless bands, grill, netting and fencing, of iron or steel wire, expanded metal ...	7,91	5,98	5,28	4,19	6,11	4,19	3,74	3,17
2102	Yeasts, active or inactive; other dead single-cell micro-organisms, prepared baking powders ...	12,93	10,27	8,91	7,80	10,05	8,35	7,34	5,93
8413	Pumps for liquids, whether or not fitted with a measuring device (excluding ceramic pumps and ...	0,06	0,07	0,28	0,28	-0,40	-0,31	-0,13	-0,20
4707	Recovered "waste and scrap" paper or paperboard (excluding paper wool)	1,75	1,63	1,47	1,75	1,72	1,60	1,43	1,67
8419	Machinery, plant or laboratory equipment whether or not electrically heated (excluding furnaces, ...	0,51	0,47	0,33	0,42	-0,78	-0,11	-0,32	-0,10
6905	Roofing tiles, chimney pots, cowls, chimney liners, architectural ornaments and other ceramic ...	21,83	19,75	22,95	22,27	8,79	7,70	9,16	8,32
0811	Fruit and nuts, uncooked or cooked by steaming or boiling in water, frozen, whether or not ...	9,20	6,11	4,02	3,53	8,98	5,92	3,74	3,35
2105	Ice cream and other edible ice, whether or not containing cocoa	3,70	3,75	5,67	4,25	-2,62	-1,32	0,44	-0,64
3904	Polymers of vinyl chloride or of other halogenated olefins, in primary forms	1,30	0,91	0,94	0,87	0,14	-0,11	-0,24	-0,19
7217	Wire of iron or non-alloy steel, in coils (excluding bars and rods)	4,21	2,85	2,66	2,57	1,31	0,87	0,45	-0,05
0807	Melons, incl. watermelons, and papaws (papayas), fresh	8,98	5,44	4,43	4,14	8,77	5,33	4,23	3,93



'5207	Cotton yarn put up for retail sale (excluding sewing thread)	78,95	83,63	53,91	56,93	78,05	82,84	53,39	56,54
'6006	Fabrics, knitted or crocheted, of a width of > 30 cm (excluding warp knit fabrics "incl. those ...	1,46	1,13	0,88	0,85	-9,81	-9,66	-7,48	-6,51
'3916	Monofilament of which any cross-sectional dimension > 1 mm, rods, sticks and profile shapes, ...	2,54	2,69	3,18	2,77	-9,64	-9,76	-9,96	-9,87
'7112	Waste and scrap of precious metal or of metal clad with precious metal; other waste and scrap ...	0,77	0,81	0,44	0,84	0,77	0,81	0,44	0,84
'7216	Angles, shapes and sections of iron or non-alloy steel, n.e.s.	1,11	1,02	1,06	1,27	-0,84	-1,16	-0,83	-0,87
'1006	Rice	0,94	0,32	0,40	0,62	0,91	0,26	0,37	0,59
'3304	Beauty or make-up preparations and preparations for the care of the skin, incl. sunscreen or ...	0,63	0,44	0,39	0,30	-0,45	-0,50	-0,46	-0,48
'9503	Tricycles, scooters, pedal cars and similar wheeled toys; dolls' carriages; dolls; other toys; ...	0,33	0,32	0,33	0,33	-0,10	-0,11	-0,05	-0,04
'6802	Monumental or building stone, natural (excluding slate), worked, and articles; mosaic cubes ...	1,79	1,43	0,88	0,95	-1,01	-0,29	-0,81	-0,70
'6105	Men's or boys' shirts, knitted or crocheted (excluding nightshirts, T- shirts, singlets and ...	0,44	0,55	0,78	1,50	0,21	0,32	0,59	1,25
'8428	Lifting, handling, loading or unloading machinery, e.g. lifts, escalators, conveyors, teleferics ...	0,45	0,30	0,44	0,47	-0,80	-0,47	-0,22	-0,71
'8471	Automatic data-processing machines and units thereof; magnetic or optical readers, machines ...	0,03	0,03	0,04	0,04	-0,34	-0,34	-0,30	-0,28
'2009	Fruit juices, incl. grape must, and vegetable juices, unfermented, not containing added spirit, ...	0,40	0,36	0,38	0,84	-0,38	-0,35	-0,29	0,17
'7317	Nails, tacks, drawing pins, corrugated nails, staples and similar articles of iron or steel, ...	8,30	6,70	5,50	5,00	7,96	6,31	5,23	4,65

6210	Garments made up of felt or nonwovens, whether or not impregnated, coated, covered or laminated; ...	1,10	0,76	1,18	1,19	0,77	0,50	0,91	0,95
1602	Prepared or preserved meat, offal or blood (excluding sausages and similar products, and meat ...	0,78	0,87	0,59	0,83	-2,20	-1,66	-1,84	-1,58
2713	Petroleum coke, petroleum bitumen and other residues of petroleum oil or of oil obtained from ...	2,28	2,19	0,13	1,07	-2,04	-1,78	-2,52	-2,65
2203	Beer made from malt	1,44	1,22	1,08	0,83	0,07	0,35	0,29	0,16
6107	Men's or boys' underpants, briefs, nightshirts, pyjamas, bathrobes, dressing gowns and similar ...	3,80	3,16	2,30	1,54	3,59	2,85	2,06	1,25
7602	Waste and scrap, of aluminium (excluding slags, scale and the like from iron and steel production, ...	1,46	1,17	1,11	1,05	1,16	0,94	0,96	1,03
4901	Printed books, brochures and similar printed matter, whether or not in single sheets (excluding ...	0,65	0,61	0,30	0,66	-0,23	-0,14	-0,51	-0,27
5109	Yarn of wool or fine animal hair, put up for retail sale	4,72	7,87	21,92	33,57	4,54	7,64	21,85	33,45
2811	Inorganic acids and inorganic oxygen compounds of non-metals (excluding hydrogen chloride "hydrochloric ...	3,18	2,66	2,68	2,51	3,03	2,53	2,50	2,37
8431	Parts suitable for use solely or principally with the machinery of heading 8425 to 8430, n.e.s.	0,09	0,10	0,17	0,20	-0,23	-0,17	-0,10	-0,06
2804	Hydrogen, rare gases and other non- metals	2,31	1,39	1,02	0,92	1,99	1,11	0,72	0,70
0401	Milk and cream, not concentrated nor containing added sugar or other sweetening matter	0,94	1,07	1,06	1,25	-2,79	-2,28	-3,09	-2,33
7326	Articles of iron or steel, n.e.s. (excluding cast articles)	0,21	0,15	0,17	0,22	-0,57	-0,56	-0,55	-0,43
3915	Waste, parings and scrap, of plastics	2,35	1,92	1,71	1,75	0,44	0,39	0,86	1,25

'2008	Fruits, nuts and other edible parts of plants, prepared or preserved, whether or not containing ...	1,39	0,97	0,71	0,59	0,67	0,33	0,13	0,04
'8701	Tractors (other than tractors of heading 8709)	0,15	0,18	0,12	0,18	-1,74	-2,01	-2,13	-2,82
'4101	Raw hides and skins of bovine "incl. buffalo" or equine animals, fresh, or salted, dried, limed, ...	2,42	2,02	1,89	1,79	2,18	1,70	1,75	1,77
'8547	Insulating fittings for electrical machines, appliances or equipment, being fittings wholly ...	1,36	1,61	1,64	1,50	-2,92	-18,23	-16,40	-15,32
'3926	Articles of plastics and articles of other materials of heading 3901 to 3914, n.e.s.	0,11	0,10	0,10	0,12	-0,58	-0,95	-1,00	-1,11
'0601	Bulbs, tubers, tuberous roots, corms, crowns and rhizomes, dormant, in growth or in flower, ...	0,03	-	5,48	4,58	-0,09	-	3,98	4,06
'5407	Woven fabrics of synthetic filament yarn, incl. monofilament of $\geq 67$ decitex and with a cross ...	0,53	0,40	0,35	0,32	-5,43	-5,49	-4,31	-3,99
'2711	Petroleum gas and other gaseous hydrocarbons	0,05	0,02	0,03	0,04	-0,64	-0,65	-0,68	-0,73
'9619	Sanitary towels (pads) and tampons, napkins and napkin liners for babies, and similar articles, ...	0,33	0,41	0,51	0,51	-3,79	-3,05	-2,77	-3,07
'5511	Yarn of man-made staple fibres, put up for retail sale (excluding sewing thread)	49,34	17,28	22,75	21,45	49,17	17,19	22,46	20,62
'3907	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, ...	0,22	0,16	0,17	0,16	-0,64	-0,47	-0,58	-0,32
'3901	Polymers of ethylene, in primary forms	0,16	0,12	0,13	0,11	-1,51	-1,11	-1,23	-1,26
'0406	Cheese and curd	0,54	0,57	0,84	0,27	-0,84	-0,80	-0,56	-1,27
'0901	Coffee, whether or not roasted or decaffeinated; coffee husks and skins; coffee substitutes ...	0,22	0,17	0,15	0,24	-2,25	-1,69	-1,73	-1,50

7311	Containers of iron or steel, for compressed or liquefied gas (excluding containers specifically ...	3,20	3,03	2,51	2,26	1,40	0,85	0,99	0,88
6001	Pile fabrics, incl. "long pile" fabrics and terry fabrics, knitted or crocheted	0,80	0,61	0,52	1,68	-1,09	-1,88	-1,50	-0,12

Sources: Calculated by the author using Trade Map Macedonia

#### 4. CONCLUSION

According to Balassa (1965) and Vollrath (1991), it was found out that some sectors maintained their competitiveness while some of them dropped behind during analysis period even though they had a strong comparative advantage, and that the country developed new RCA's in some product groups in Macedonia during 2013-2016. While the comparative advantages of such products as motor vehicles, cable and wire, centrifuges, footwear with outer soles of rubber, plastics, flat-rolled products of iron or non-alloy steel, roofing tiles, chimney pots, wool, flower and plant tulips increasingly continued, the competition advantages of tobacco products with high RCA decreased during 2013-2016. In addition, similar results were obtained for RCA values of male and female textile products. It was observed that the ongoing competition advantage started to decrease in the analysis period. Another product with a high RCA whose competitiveness decreased was ferro alloys. Decrease was also seen in paste types that had a strong RCA. On the other hand, RCA increases were observed in bedding industry, electric accumulators, electronic capacitors, parts and accessories for tractors, motor vehicles, parts of railway or tramway locomotives, fresh fruit, sunflower seeds and the live plants, seeds and mushroom sectors. During this period, it was also observed that comparative advantage increased slowly in fruit and vegetable juice sector. Macedonia's high competition advantage continues in ice-cream and ice food sector. While competitiveness is still weak in cement industry which is one of the sectors with low RCA value, it has increased to some extent. Competitiveness has also increased in mechanical devices and electric energy RCA values. It was also seen that the weak RCA values of such product groups as glassfiber, glasswool and rubber pipes increased to moderate RCA values.

To sum up, it was concluded that Macedonia has a comparative advantage in such product groups as textile and chemical products, minerals, food products and foot wear and that the country developed new RCA's as its comparative advantages tended to move towards capital intensive products as years passed. While the country remained within European supply chain during 2000's, it fell behind the levels of West Balkan States in terms of goods that were subject to export, which explains its decline in some of the sectors where it used to be strong. The maintenance of the policies that will support investment in trade sectors, the increase in HH Market Concentration Index values through tax and currency policies and international

integrations will increase the success of growth policies that will be supported by the export of Macedonia.

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