

REVEALED COMPARATIVE ADVANTAGE AND COMPETITIVENESS IN THE EU-28 AND THE USA¹

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Odhalené komparatívne výhody a konkurencieschopnosť ekonomík EÚ-28 a USA

Abstract: *This paper examines revealed comparative advantage (RCA) in the EU and USA as sectoral comparative analysis between the mentioned trade partners. In the midst of preparations for the potential Transatlantic Trade and Investment Partnership (TTIP), it is necessary to examine the sectoral competitiveness of the EU in relation with its trade partner – the USA. For this aim in our analysis we have used Balassa's index of RCA. Meanwhile, this approach for our purpose is frequently used in literature although we aware that this index has some empirical drawbacks, but it give us a feature of gross sectoral competitiveness of examined country or group of countries. According to our empirical analyses, we found that though the EU-28 have comparative advantages, according to RCA index in the global level, in less groups of commodities (32 groups of two digits SITC commodities) than the USA (40 groups of two digits SITC commodities).*

Keywords: *comparative advantage, competitiveness, EU, USA*

JEL Classification: F 10, F 11, F 14

1 Introduction

Although the European Union has become the largest trade player in the world, it faces many challenges to maintain its magnitude, especially in the last decade where many large economies in the world have registered more dynamical economic growth and export performance, such as China and the USA. As a common market, the European Union, passed through several

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stages of integration until it has reached the high level of economic integration reached today, starting from the European Coal and Steel Community by six founders, which begins to unite European countries economically and politically in order to secure lasting peace, to a nowadays Economic Union consisting from 28 countries.

In the light of an increasingly competitive international environment, it is useful to examine where EU's comparative advantage lies. Comparative advantage is the term used to describe the tendency for countries to export those commodities that they are relatively adept at producing, *vis-à-vis* the rest of the world. In other words, if a country can produce a good at a lower relative cost than other countries, then within international trade, that country should devote more of its scarce resources to the production of the good, Addison-Smyth [1]. Through trade that the country can obtain other goods at a lower price (opportunity cost), in exchange for the good in which it has a comparative advantage.

Comparative advantage is a widely used concept in international trade since Ricardian classical theory of trade. Thus, according to the mentioned Ricardian theory, we can say that the stronger comparative advantage lead to larger gains from trade. In the same spirit, with some simplification of variables Bella Balassa [2] has come with new term called Revealed comparative advantage.

The main objective of this paper is to examine revealed comparative advantage (RCA) in the EU and USA as a sectoral comparative analyses between the mentioned trade partners. The significance of this paper is in the assessment of the level of comparative advantage of the EU in comparison with the USA, especially in the time of intensive preparation of the TTIP agreement between the mentioned trade partners.

This paper is divided to three sections, the first section is focus on literature review, which have concerned in the more or less similar issues as our examined topic. The second section is about the methodology, methods and data used in our analysis, and finally, the empirical findings are presented in the third section.

2 Literature Review

To quantifying comparative advantage or competitiveness of country, there are many techniques and methods. However, Balassa's index of "revealed

comparative advantage” Balassa, B. [2] is widely used in scientific economic papers and studies for more than five decades. According to Laursen [8], this measure “has been applied in numerous reports (e.g. UNIDO 1986; World Bank 1994; OECD 2011) and academic publications (e.g., Aquino 1981; Crafts and Thomas 1986; van Hulst et al. 1991; De Benedictis et al. 2008; Amighini et al. 2011), to measure international trade specialization, to gauge technological specialization based on patent data (e.g., Soete and Wyatt 1983; Cantwell 1995; D’Agostino et al. 2013; Liegsalz and Wagner 2013), and to capture production specialization, e.g., Iapadre 2001; Laursen and Salter [8]. However, although the previous work has examined the properties of this measure in detail (e.g., Yeats 1985; Vollrath 1991; Hinloopen and van Marrewijk 2008), not enough is known about the effects of it being asymmetric around its neutral value, and moreover, it is not clear how the Balassa index compares to other measures of international specialization” (Laursen, [8]).

The Balassa index was used also in some other papers and studies to measure a country’s Revealed Comparative Advantage and Competitiveness vis á vis other trade partners or trade blocks, (see for example Utkulu, U. and Seymen, D [21], Obadi, S. M. [14], [15] and [16], and Startienė, G. and Remeikienė, R. (2014)), and to measure the country’s revealed comparative advantage as a whole and its internal regions (see for example, Yue, C. and Hua, P. [22] and Clark, D. P. et al. [5]).

This measure has been used with some modification by Balassa B., and Noland M., [3] in their paper “*revealed comparative advantage in Japan and the USA*” where they examined the changing comparative advantage of Japan and the USA. RCA in their paper has been derived for 57 primary and 167 manufactured product categories and has further been aggregated for 20 commodity groups. The authors found that the Japanese pattern of specialization during the period 1967–1983 changed dramatically with Japanese shifting from specialization in unskilled labour intensive goods to human capital intensive products while its comparative advantage increased in natural resources intensive products. The USA maintained its specialization in physical and human capital intensive goods, while increasing its comparative advantage in natural resources intensive products. Both countries increased their comparative advantage in high technology products.

The RCA index has been used also in other papers for quantifying a comparative advantages of the specific commodities, by such as Bhattacharyya, R. [4], which tried to quantify the extent to which India has a comparative

advantage in vegetable, fruits and flower trade in the Asian, EU and North American (USA & Canada) markets as compared to selected other South East Asian countries. For the same purpose, Serin, V. & Civan, A. [19], who tried to quantify the extent to which Turkey has a comparative advantage in the tomato, olive oil, and fruit juice industries, and how this has changed over the period 1995–2005 in the EU market. Also FERTŐ, I. and HUBBARD, L. J. [7], who examined the competitiveness of the Hungarian agriculture in relation to that of the EU, employing four indices of revealed comparative advantage, for the period 1992 to 1998. In the same direction, Muendler, M. A. [11] has constructed a series of comparative advantage measures for the Brazilian agriculture, mining and manufacturing sectors between 1986 and 200, and applied a correlation between the comparative advantage series and trade-related variables.

Although the Balassa Index is widely used for identification of international trade specialization or sectoral competitiveness, it is a subject of critics. Therefore, there are many other alternative indices and methods used for the same purpose in the literature.

To the critics of the Balassa Index, have joined in the last years some authors, such as Leromain, E. and Orefice, G. [9], who tried to construct a “New Revealed Comparative Advantage Index”. They recognized that “Balassa Index [2] is widely used in the literature to measure country-sector Revealed Comparative Advantage. However, being computed on observed trade flows, it mixes up all the factors influencing trade flows. In particular, Balassa Index cannot isolate exporter-sector (ex-ante) specific factors, which are the source of comparative advantage in the spirit of the traditional trade model. Furthermore, the Balassa Index suffers some empirical distribution weaknesses, mainly time instability and poor ordinal ranking property (Yeats 1985; Hinloopen and Van Marrewijk 2001). They have built up on their paper, and presented “a data set providing a new econometric based measure for Ricardian RCA”.

Many of the above mentioned authors have used RCA index as a measure of international specialization and others as a measure of competitiveness or competitive advantage. However, the issue of competitiveness is a wider term than international specialization. At least the competitiveness would be conceived in the context of firm as it is conceived by Zorkóciová, O., Ďuranová, L. [23] or competitive advantage of nations as it is conceived by Porter, M. E. [18] and others. Also, Pavlickova [17] has used the RCA as one

of other methods for measuring the competitiveness of foreign trade of the Slovak economy during the period 1999–2011.

3 Methodology and Data

Data

From the United Nations COMTRADE Database, it is possible to get a detailed breakdown of the country's merchandise exports and imports by SITC (United Nations' Standard International Trade Classification), which is the means by which exports are classified according to commodity type. There are ten headline SITC categories as shown in the box below.

Box: Standard International Trade Classification, SITC Description

1 - Beverages and tobacco

2 - Crude materials, inedible, except fuels

3 - Mineral fuels, lubricants and related materials

4 - Animal and vegetable oils, fats and waxes

5 - Chemicals and related products n.e.s.

6 - Manufactured goods classified chiefly by material

7 - Machinery and transport equipment

8 - Miscellaneous manufactured articles

9 - Commodities and transactions not classified elsewhere

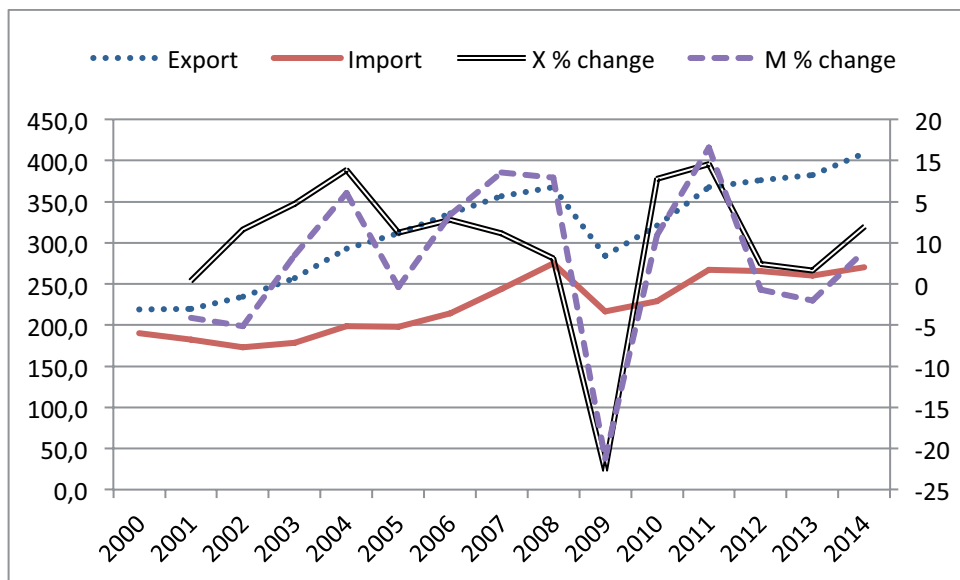
*It is possible to further subdivide these categories into their subcomponents
In our paper, we have used 2-digit codes of SITC, 3rd version.*

These more detailed breakdowns are important, as there are a number of quite diverse categories within each broad SITC heading. In our analyses we will just use the two-digit SITC for selected four years (2000, 2006, 2008 and 2014). Using this classification, it is possible to examine EU and USA trade patterns across a range of commodity types. For trade data for the rest of the world, the UN COMTRADE database was used, with detailed data available up to 2014.

Before analyzing the magnitude of the RCA, it is useful to see the real development of export and import of the EU with the USA, in nominal terms; of course, not for comparing with the RCA but to have a feature of trade flows of the mentioned trade partners.

Figure 1

The development of trade flows of the Eu with USA, in billion USD (annual change in per cent)



X % change = percentage annual growth of export and M % change = percentage annual change of import.

Source: Author's calculation based on Comtrade database, UN, 2016.

The above figure shows the increasing trend of trade flows between the EU and the USA during the period 2000–2014. It is clear also that the EU has had during the examined period a surplus of trade balance in nominal term, which indicate a competitive advantage of the EU's international trade against the USA, but from the above figure we cannot see in detail in which industries or commodities the EU have comparative advantage in comparison with the USA. This feature can be seen by analysing the RCA index.

Revealed Comparative Advantage

Comparative advantage is a very much dynamic concept in the sense that a country's ability to produce certain goods changes through time, in response to a variety of endogenous and exogenous factors such as changes in factor endowments, including technology and human capital, Obadi, [16].

There are a number of ways to examine whether or not a country has a comparative advantage. One common method is to determine how specialized the country is in the production of a good through constructing the Balassa index (1965). This examines the proportion of a good produced or exported,

or the numbers employed in each industry, relative to other countries Addison-Smyth, [1]. Although this is a widely accepted approach to analyzing trade data and comparative advantage, the definition and empirical adaptation of RCA are subject to controversies and thus some alternative measures now exist. Since we are interested in the revealed comparative advantage of the EU and the USA, we measure RCA of the EU and the USA on the global level as the comparator.

In simple terms, a country that has a comparative advantage in the production of a good should be found to export a higher proportion of that good relative to other countries. Therefore, this study seeks to determine EU's revealed comparative advantage by using international trade data to compare exports in particular industries with the rest of the world and particularly with the USA.

The formula to measure a country's revealed comparative advantage (RCA) is given by:

$$RCA_{ij} = (X_{ij} / \sum X_{ij}) / (X_{iw} / \sum \sum X_{iw}) \quad (1)$$

Where:

RCA_i = revealed comparative advantage for good i and country j .

X_{ij} = exports of good i by country j

$\sum X_{ij}$ = total exports by country j

X_{iw} = world exports of good i

$\sum X_{iw}$ = total world exports

If $RCA_i > 1$, then country has a comparative advantage in good i .

If $RCA_i < 1$, then country has a comparative disadvantage in good i .

Through applying the above formula to the EU, the USA and world trade data, it is possible to identify the sectors and industries in which both the EU and the USA have a comparative advantage and competitiveness and have a potential to increase their exports not only between them but also to the rest of countries in the world.

4 Empirical Findings

Following the contributions by Balassa, the present empirical analysis is based on the measurement of RCA. Since we are interested in the competitiveness of the EU in the world markets, we calculated an index of RCA presented in the earlier section as the comparator both on global and bilateral levels. On the global level, the global competitiveness of the EU and the USA are compared assuming that both

the EU and the USA are exporting to and importing from the world. On the bilateral level, however, trade between the EU and the USA are taken into account only.

In order to calculate RCA index in the sense of global competitiveness of the EU and the USA, we used annual two-digit SITC Rev. 3 data (66 product groups) covering exports of the EU and the USA on the world level for selected years of the period 2000 – 2014 from the United Nations COMTRADE Database.

The following two tables illustrate RCA index of the EU and the USA on the global level and for selected years during the period 2000–2014. However, in those tables there are presented only the product groups in which both trade partners have at least in one of the selected years a comparative advantage, and the index is more than or equal to 1.

Table 1

RCA index of the EU with respect to the World in selected years

SITC code	Description of the commodity	RCA index			
		2000	2006	2008	2014
02	DAIRY PRODUCTS, BIRD EGGS	1.38	1.04	1.09	1.16
06	SUGAR, SUGR. PREPTNS, HONEY	1.13	0.92	0.51	0.50
09	MISC. EDIBLE PRODUCTS ETC	1.43	1.54	1.42	1.54
11	BEVERAGES	2.48	2.53	2.38	2.44
21	HIDES, SKINS, FURSKINS, RAW	1.10	1.57	1.68	1.70
29	CRUDE ANIMAL, VEG. MATERL.	1.01	1.06	1.16	0.97
35	ELECTRIC CURRENT	1.04	1.25	0.88	0.73
51	ORGANIC CHEMICALS	1.58	1.33	1.25	1.14
52	INORGANIC CHEMICALS	0.92	1.01	0.88	0.94
53	DYES, COLOURING MATERIALS	1.34	1.45	1.57	1.48
54	MEDICINAL, PHARM. PRODUCTS	2.26	2.12	2.16	2.19
55	ESSENTL. OILS, PERFUME, ETC	1.71	1.80	1.78	1.75
58	PLASTIC, NON-PRIMARY FORM	0.98	1.04	1.09	0.97
59	CHEMICAL MATERIALS NES	1.41	1.42	1.34	1.32
61	LEATHER, LEATHER GOODS	1.36	1.16	1.32	1.11
63	CORK, WOOD MANUFACTURES	0.81	0.93	1.08	0.91
64	PAPER, PAPERBOARD, ETC.	1.05	1.26	1.27	1.10
66	NON-METAL. MINERAL MANFCT	1.81	1.50	1.35	1.07
69	METALS MANUFACTURES, NES	1.05	1.11	1.18	1.09
71	POWER GENERATNG. MACHINES	1.66	1.57	1.85	1.91
72	SPECIAL.INDUST.MACHINERY	1.87	2.05	2.15	1.92
73	METALWORKING MACHINERY	1.39	1.83	2.04	1.95

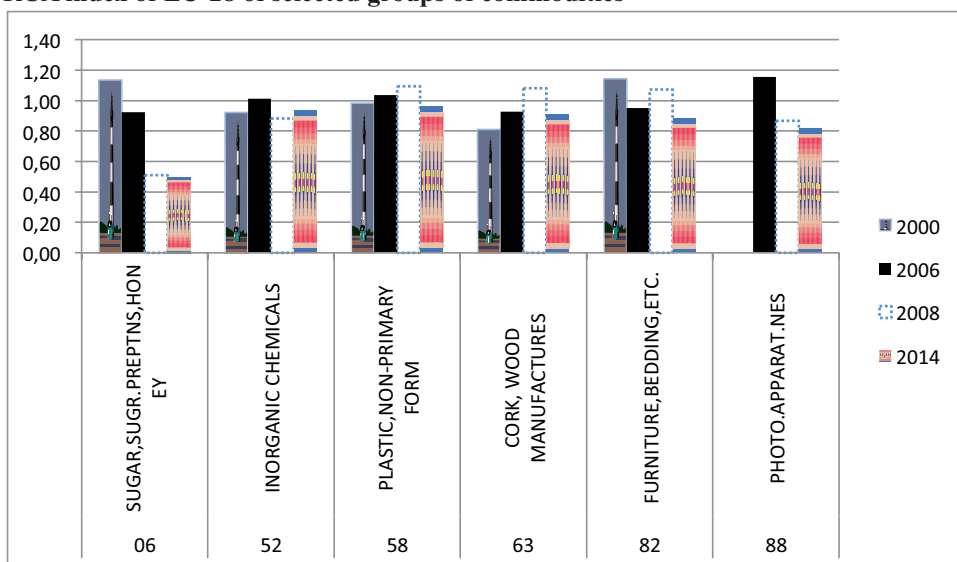
74	GENERAL INDUSTL. MACH.NES	1.52	1.72	1.87	1.72
78	ROAD VEHICLES	0.96	1.07	1.20	1.35
79	OTHR.TRANSPORT EQUIPMENT	2.09	1.93	1.62	2.14
81	PREFAB BUILDGS,FTTNG ETC	1.07	1.19	1.38	0.86
82	FURNITURE,BEDDING,ETC.	1.14	0.95	1.07	0.89
83	TRAVEL GOODS,HANDBGS ETC	1.14	1.36	1.35	1.26
87	SCIENTIFIC EQUIPMENT NES	1.41	1.39	1.44	1.35
88	PHOTO.APPARAT.NES	Na	1.16	0.87	0.82
89	MISC MANUFCTRD GOODS NES	1.08	1.09	1.04	0.91
93	SPEC.TRANSACTION NOT CLASSD	1.45	1.73	1.23	1.63

Source: Author's calculation based on UN COMTRADE Database, [19].

Looking at the above table and according to the empirical analysis, the EU-28 has at least in one of the selected years a comparative advantage on the global level in 32 commodities, which means that there is a tendency for the EU-28 to export those products or commodities that it is relatively adept at producing, *vis-à-vis* the rest of the world. However, in four groups of commodities, the USA has comparative advantage only in one year from the selected years (SITC 88, SITC 63, SITC 52, and SITC 06); it means that the EU-28, in the other years of the examined period and in the four groups of commodities, has comparative disadvantages. Furthermore, in the rest of the groups of commodities (which are 34) have had the comparative disadvantages in the selected period.

Figure 2

RCA index of EU-28 of selected groups of commodities



Source: Author's calculations based on Table 1.

The EU-28 has reached the highest level of RCA coefficient (more than 2), on global level in Beverages (11 SITC), Medicinal, pharmaceutical products (54 SITC), and Other transport equipment (79 SITC). This result is not so adequate with the export specialization of many member states of the EU-28.

When we compare the above RCA results for EU-28 with the same results for the USA, we find that the USA has reached a comparative advantage in more groups of commodities than the EU-28 in the examined period.

Table 2

RCA index of the USA with respect to the World in selected years

SITC code	Description of the commodity 2000	RCA index			
		2000	2006	2008	2014
01	MEAT, MEAT PREPARATIONS	1.32	1.04	1.32	1.40
04	CEREALS, CEREAL PREPRTNS.	1.76	2.23	2.52	1.67
05	VEGETABLES AND FRUIT	0.94	1.10	1.13	1.21
08	ANIMAL FEED STUFF	1.58	1.60	1.72	1.71
09	MISC.EDIBLE PRODUCTS ETC	1.23	1.37	1.22	1.20
12	TOBACCO, TOBACCO MANUFACT	1.92	1.06	0.75	0.48
21	HIDES,SKINS, FURSKINS, RAW	2.03	2.59	2.78	2.35
22	OIL SEED, OLEAGINUS FRUIT	3.18	3.64	3.80	3.40
23	CRUDE RUBBER	1.17	1.11	1.02	0.98
24	CORK AND WOOD	0.97	0.95	0.97	1.23
25	PULP AND WASTE PAPER	1.51	2.19	2.30	2.15
26	TEXTILE FIBRES	1.29	2.60	2.67	1.93
27	CRUDE FERTILIZER, MINERAL	1.05	1.02	0.80	0.90
28	METALLIFEROUS ORE, SCRAP	0.69	1.11	1.42	0.87
41	ANIMAL OILS AND FATS	2.09	2.18	2.53	1.52
51	ORGANIC CHEMICALS	1.11	1.28	1.29	1.23
52	INORGANIC CHEMICALS	1.29	1.65	1.51	1.38
53	DYES,COLOURING MATERIALS	0.98	1.13	1.17	1.17
54	MEDICINAL, PHARM.PRODUCTS	0.96	1.05	1.09	0.98
55	ESSENTL.OILS, PERFUME, ETC	0.99	1.18	1.21	1.15
56	FERTILIZER, EXCEPT GRP272	0.00	0.00	1.24	0.89
57	PLASTICS IN PRIMARY FORM	1.21	1.45	1.56	1.44
58	PLASTIC, NON-PRIMARY FORM	1.19	1.20	1.15	1.13
59	CHEMICAL MATERIALS NES	1.54	1.75	1.80	1.62
64	PAPER,PAPERBOARD, ETC.	0.88	1.00	1.04	1.00
66	NON-METAL. MINERAL MANFCT	0.68	0.97	1.09	1.12
69	METALS MANUFACTURES, NES	1.05	0.93	0.85	0.87

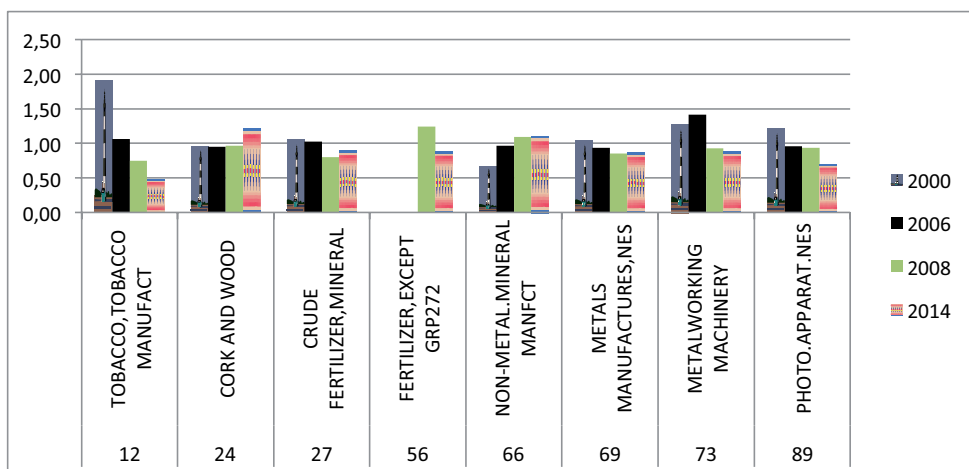
71	POWER GENERATNG. MACHINES	1.69	1.84	1.87	1.18
72	SPECIAL.INDUST. MACHINERY	1.51	1.52	1.59	1.40
73	METALWORKING MACHINERY	1.28	1.41	0.93	0.89
74	GENERAL INDUSTL. MACH.NES	1.24	1.24	1.18	1.26
75	OFFICE MACHINES, ADP MACH	1.28	1.05	1.01	0.93
77	ELEC MCH APPAR, PARTS,NES	1.41	1.30	1.17	0.90
78	ROAD VEHICLES	0.85	1.02	1.05	1.06
79	OTHR.TRANSPORT EQUIPMENT	2.29	3.06	2.56	0.56
87	SCIENTIFIC EQUIPMENT NES	2.18	2.14	2.02	1.70
89	PHOTO. APPARAT.NES	1.23	0.96	0.94	0.70
91	MISC MANUFCTRD GOODS NES	0.00	1.44	1.43	1.16
96	COIN NONGOLD NONCURRENT	68.34	0.78	1.18	1.25
97	GOLD, NONMONTRY EXCL ORES	2.02	1.65	2.15	0.80

Source: Author's calculation based on UN COMTRADE Database, [19].

It is clear from the results of the empirical analysis that in the selected years, the USA reached at least in one year of the examined period a revealed comparative advantage with respect to the World in 40 commodities from about 66 groups of commodities of the USA export. At the same time, we found that the USA in the selected period has a comparative disadvantage in 26 groups of commodities. However, in four groups of commodities the USA has comparative advantage only in one year from the selected years; it means that the USA, in the rest of years of the examined period had a comparative disadvantage.

Figure 2

RCA index of the USA of selected groups of commodities



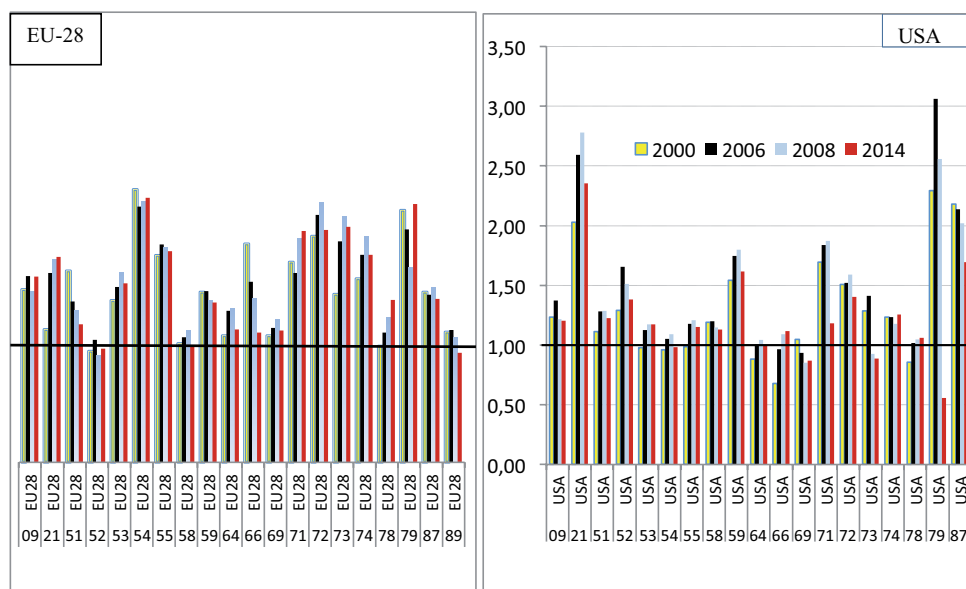
Source: Author's based on Table 2.

It is worthy to emphasize that the RCA index (See table No. 2) has deteriorated after the international financial crisis in some of these commodities such as photo. apparat. Nes (SITC 89), Metal working machinery (SITC 73), Metals manufactures, nes (SITC 69), Crude fertilizer, mineral (SITC 12), but in some of others, such as Cork and wood (SITC 24), Fertilizer, except GRP272 (SITC 56), Non-metal. mineral manufact (SITC 66), etc., the RCA index has been improved.

While the USA has a comparative advantage in eight groups of commodities more than the EU-28 has reached in the examined period, the EU-28 has a higher RCA coefficients in more groups of SITC commodities than the USA have among the common groups of SITC commodities, in which both examined trade partners have reached a comparative advantage against the rest of world.

Figure 3

RCA index of the EU-28 and USA of selected groups of SITC commodities



Source: Author’s calculation based on UN COMTRADE Database, [19].

5 Conclusion

In the increasingly globally competitive environment, all countries and trade groups face this challenge to retain their competitiveness and improve their position in international trade. As a result of the above mentioned environment, many advanced industrial countries have been reached and

replaced by others from emerging economies in the top 10 of the most export countries.

According to our comparative analyses achieved in this paper using Balassa index of revealed comparative advantage we found that, though the EU-28 is the largest trade player in the world, it has, according to the results of RCA index in the global level, a comparative advantage in less groups of commodities (32 groups of two digits SITC commodities) than the USA have reached in the examined period (40 groups of two digits SITC commodities). It means that the EU-28 has comparative disadvantages in eight groups of commodities against the USA and in 34 groups of commodities *vis-a-vis* the rest of the world. Meanwhile, the USA has a comparative disadvantage in 29 groups of commodities against the rest of the world.

So, from the results of our empirical analyses, we found also that while the USA has a comparative advantage in eight groups of commodities more than the EU-28 has, the EU-28 has a higher RCA coefficients in more groups of SITC commodities than the USA has in the common groups of SITC commodities in which the USA reached a comparative advantage on the global level.

Our findings show that, though there are about 21 “*common*” groups of commodities, in which both the EU-28 and the USA have reached a comparative advantage; there are also about 30 “*different*” groups of commodities, of which 19 for the USA and 11 for the EU-28 as well as each examined trade partner have a comparative advantage.

Appendix 1

Table 3

RCA index of the EU-28 and USA with respect to the world in selected years

SITC code	Description of the commodity	EU				USA			
		2000	2006	2008	2014	2000	2006	2008	2014
00	LIVE ANIMALS	0.84	0.65	0.75	0.86	0.76	0.59	0.59	0.46
01	MEAT, MEAT PREPARATIONS	0.70	0.50	0.56	0.58	1.32	1.04	1.32	1.40
02	DAIRY PRODUCTS, BIRD EGGS	1.38	1.04	1.09	1.16	0.23	0.37	0.55	0.71
03	FISH, CRUSTACEANS, MOLLUSC	0.27	0.31	0.36	0.31	0.47	0.62	0.56	0.47
04	CEREALS, CEREAL PREPRTNS.	0.89	0.70	0.79	0.83	1.76	2.23	2.52	1.67
05	VEGETABLES AND FRUIT	0.46	0.50	0.56	0.52	0.94	1.10	1.13	1.21
06	SUGAR, SUGR. PREPTNS, HONEY	1.13	0.92	0.51	0.50	0.39	0.40	0.48	0.54

07	COFFEE,TEA,COCOA,SPICES	0.61	0.72	0.72	0.72	0.30	0.39	0.38	0.40
08	ANIMAL FEED STUFF	0.50	0.55	0.53	0.55	1.58	1.60	1.72	1.71
09	MISC.EDIBLE PRODUCTS ETC	1.43	1.54	1.42	1.54	1.23	1.37	1.22	1.20
11	BEVERAGES	2.48	2.53	2.38	2.44	0.35	0.46	0.48	0.59
12	TOBACCO,TOBACCO MANUFACT	0.77	0.87	0.95	0.97	1.92	1.06	0.75	0.48
21	HIDES, SKINS, FURSKINS, RAW	1.10	1.57	1.68	1.70	2.03	2.59	2.78	2.35
22	OIL SEED,OLEAGINUS FRUIT	0.14	0.13	0.11	0.10	3.18	3.64	3.80	3.40
23	CRUDE RUBBER	0.40	0.45	0.43	0.60	1.17	1.11	1.02	0.98
24	CORK AND WOOD	0.65	0.71	0.81	0.87	0.97	0.95	0.97	1.23
25	PULP AND WASTE PAPER	0.33	0.63	0.71	0.71	1.51	2.19	2.30	2.15
26	TEXTILE FIBRES	0.52	0.68	0.64	0.69	1.29	2.60	2.67	1.93
27	CRUDE FERTILIZER,MINERAL	0.85	0.92	0.75	0.80	1.05	1.02	0.80	0.90
28	METALLIFEROUS ORE, SCRAP	0.48	0.51	0.51	0.43	0.69	1.11	1.42	0.87
29	CRUDE ANIMAL, VEG.MATERL.	1.01	1.06	1.16	0.97	0.70	0.84	0.93	0.76
32	COAL, COKE, BRIQUETTES	0.06	0.09	0.08	0.07	0.86	0.71	0.90	0.90
33	PETROLEUM, PETROL. PRODUCT	0.36	0.40	0.41	0.52	0.14	0.22	0.34	0.77
34	GAS, NATURAL, MANUFACTURED	0.08	0.08	0.05	0.10	0.13	0.18	0.23	0.47
35	ELECTRIC CURRENT	1.04	1.25	0.88	0.73	0.32	0.39	0.43	0.19
41	ANIMAL OILS AND FATS	0.72	1.07	1.17	0.88	2.09	2.18	2.53	1.52
42	FIXED VEG. FATS AND OILS	0.93	0.56	0.39	0.48	0.44	0.40	0.47	0.26
43	ANIMAL,VEG. FATS, OILS, NES	0.68	0.45	0.32	0.36	0.60	0.57	0.65	0.56
51	ORGANIC CHEMICALS	1.58	1.33	1.25	1.14	1.11	1.28	1.29	1.23
52	INORGANIC CHEMICALS	0.92	1.01	0.88	0.94	1.29	1.65	1.51	1.38
53	DYES,COLOURING MATERIALS	1.34	1.45	1.57	1.48	0.98	1.13	1.17	1.17
54	MEDICINAL, PHARM. PRODUCTS	2.26	2.12	2.16	2.19	0.96	1.05	1.09	0.98
55	ESSENTL.OILS,PERFUME, ETC.	1.71	1.80	1.78	1.75	0.99	1.18	1.21	1.15
56	FERTILIZER, EXCEPT GRP272	0.51	0.62	0.40	0.43	0.00	0.00	1.24	0.89
57	PLASTICS IN PRIMARY FORM	0.71	0.84	0.85	0.89	1.21	1.45	1.56	1.44
58	PLASTIC, NON-PRIMARY FORM	0.98	1.04	1.09	0.97	1.19	1.20	1.15	1.13
59	CHEMICAL MATERIALS NES	1.41	1.42	1.34	1.32	1.54	1.75	1.80	1.62
61	LEATHER, LEATHER GOODS	1.36	1.16	1.32	1.11	0.48	0.56	0.50	0.56
62	RUBBER MANUFACTURES, NES	0.85	0.82	0.87	0.86	0.98	0.90	0.88	0.87
63	CORK, WOOD MANUFACTURES	0.81	0.93	1.08	0.91	0.48	0.43	0.48	0.37
64	PAPER,PAPERBOARD, ETC.	1.05	1.26	1.27	1.10	0.88	1.00	1.04	1.00
65	TEXTILE YARN, FABRIC, ETC.	0.79	0.75	0.78	0.58	0.56	0.65	0.60	0.51
66	NON-METAL.MINERAL MANFCT	1.81	1.50	1.35	1.07	0.68	0.97	1.09	1.12
67	IRON AND STEEL	0.93	0.91	0.87	0.81	0.36	0.40	0.43	0.48

68	NON-FERROUS METALS	0.68	0.61	0.72	0.70	0.58	0.65	0.61	0.61
69	METALS MANUFACTURES, NES	1.05	1.11	1.18	1.09	1.05	0.93	0.85	0.87
71	POWER GENERATING MACHINES	1.66	1.57	1.85	1.91	1.69	1.84	1.87	1.18
72	SPECIAL INDUST. MACHINERY	1.87	2.05	2.15	1.92	1.51	1.52	1.59	1.40
73	METALWORKING MACHINERY	1.39	1.83	2.04	1.95	1.28	1.41	0.93	0.89
74	GENERAL INDUSTRIAL MACH. NES	1.52	1.72	1.87	1.72	1.24	1.24	1.18	1.26
75	OFFICE MACHINES, ADP MACH	0.58	0.54	0.55	0.42	1.28	1.05	1.01	0.93
76	TELECOMM. SOUND EQUIP ETC	0.95	0.70	0.71	0.43	0.88	0.68	0.77	0.76
77	ELECTRICAL MACH APPAR, PARTS, NES	0.78	0.82	0.92	0.71	1.41	1.30	1.17	0.90
78	ROAD VEHICLES	0.96	1.07	1.20	1.35	0.85	1.02	1.05	1.06
79	OTHER TRANSPORT EQUIPMENT	2.09	1.93	1.62	2.14	2.29	3.06	2.56	0.56
81	PREFAB BUILDINGS, FTTNG ETC.	1.07	1.19	1.38	0.86	0.55	0.58	0.62	0.51
82	FURNITURE, BEDDING, ETC.	1.14	0.95	1.07	0.89	0.68	0.60	0.56	0.51
83	TRAVEL GOODS, HANDBAGS ETC.	1.14	1.36	1.35	1.26	0.20	0.27	0.24	0.21
84	CLOTHING AND ACCESSORIES	0.52	0.50	0.59	0.53	0.34	0.17	0.14	0.15
85	FOOTWEAR	0.89	0.70	0.75	0.61	0.15	0.13	0.14	0.12
87	SCIENTIFIC EQUIPMENT NES	1.41	1.39	1.44	1.35	2.18	2.14	2.02	1.70
88	PHOTO. APPARAT. NES	na	1.16	0.87	0.82	1.23	0.96	0.94	0.70
89	MISC MANUFACTURED GOODS NES	1.08	1.09	1.04	0.91	0.00	1.44	1.43	1.16
93	SPEC. TRANSACTIONS NOT CLASSIFIED	1.45	1.73	1.23	1.63	0.00	0.94	0.73	2.57
96	COIN NON-GOLD NON-CURRENT	0.37	4.76	3.54	2.32	68.34	0.78	1.18	1.25
97	GOLD, NON-MONETARY EXCL ORES	na	0.49	0.22	1.19	2.02	1.65	2.15	0.80

Key: na= No data.

Source: Author's calculation based on UN COMTRADE Database, 2016.

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