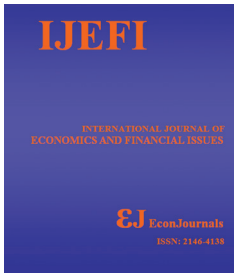

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Bilateral Trade in European Sports Industry: Linder versus Hecksher-Ohlin-Samuelson

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ABSTRACT

In recent years, sports industry became one of the diverse industries in the World. Its inter-industry and intra-industry trade potential revitalize the national economies, especially in Europe. Therefore, this paper examines the determinants of bilateral industrial sports sector trade in twenty-eight European countries. Following the relative endowment-based gravity model, the econometric estimates of the panel datasets show that bilateral trade increases with the size of domestic markets and the similarity of the country size. However, the trade volume is negatively affected by the transportation costs. According to simulation results, the appreciation of the domestic currency has a negative effect on trade volume except the inland Visegrad countries. The Linder hypothesis is validated only for countries with large market shares. So, most of the European countries improve their bilateral trade through factor endowment differences.

Keywords: Europe, Endowment-Based Gravity Model, Sports Industry Trade
JEL Classifications: F1, L83, O52

1. INTRODUCTION

According to 1992 European Sports Charter, sports includes organized or casual participation into physical activities. The cave paintings reveal the fact that origins of sports activities date back to prehistoric times. The social interest on sports started with the funeral games in Bronze age which later formed the origins of the sport festivals organized by Greeks. Since then, national sports competitions such as Olympic Games motivate the national cohesion through national pride and social inclusiveness. The social reflections of sports also attracted the researchers in the field of economics such as Rottenberg (1956). In economical perspective, sport is far more than the athletics. These activities create a composite industry by means of constant interaction with many industries. This relationship can be observed mainly in the apparel industry; the services sector and financial sector. Furthermore, at both national and international level, the broadcasts of sport events through televisions, radios and newspapers attract the public attention. So, substantial amounts of money are spent to acquire sporting goods and equipment for a variety of sports.

Since the early 1990s, sports industry became one of the important branch of economic activities because of the advances in its revenues through advertising, sponsorship and broadcasting rights. Today, the sports industry's economic potential created many public and private sectors which contributed the high scale turnover of the industry. Because of its dynamic structure many studies are conducted concerning the sports economics. The market structure is analyzed by preliminary studies of Rottenberg (1956), Topkis (1948), Gregory (1956), Neale (1964) and the first formal economic model of sports is introduced by El-Hodiri and Quirk (1971). After mid-1990s, consistent with the increasing revenue of the industry, the number of publications in the field of sport economics are expanded. In addition, by the establishment of the Committee for the Development of Sport (CDS) of the Council of Europe, more attention and support is given to the studies about sports and its implications. Another vital step is taken with the macro econometric modelling of the sports economy by Weber et al.. (1997).

With the process of globalization and the expansion of sports in 1990s, the trade volume of the sporting goods of the multinational

corporations such as Adidas, Nike, Reebok, and so on became more apparent in international trade. These corporations easily relocate their production to the low-cost countries of the South (Hanzl and Urban, 2000; Lipsey, 2006; Sage, 2000). This leads to a more polarized trade structure in sporting goods by forming major exporters such as China, South Korea, India, the United States and France, and major importers such as the United States, Japan, Germany, France, United Kingdom and Italy (Andreff and Andreff, 2007). In addition, the international sports competitions also contribute to the development of the trade through advertisements which implies the success depending on the quality of the equipment used. International trade in sports is analyzed by Harvey and Saint-Germain (2001), Meek (1997) and Andreff (1989; 1994). Harvey et al. examine the trade of the 28 countries for the 1974-1994 period. The study shows the geographic concentration and the regionalization in the sporting goods trade of the developed countries. Andreff (1994) report that some European countries have trade deficits related with the crowding out effect of the imported sporting goods. In his article Meek (1997) reports the high growth rates in international trade of the sports goods.

The limited literature about sporting goods trade is remained incapable of explaining the significance of the economic performances of the trading nations and the geographical gravity forces in action. The main purpose of this study is to analyze and figure out the major determinants of the European sports goods trade by using the endowment-based gravity model introduced by Linder (1961). Unlike the previous studies about sports economy, the sports industry's trade structure will be reviewed by not only considering the geographical influences such as transportation costs, but also economic performances of the trading partners with relative factor endowments (RFE). The rest of the paper is organized as follows. Section 2 provides a general overview of the sports industry. Section 3 introduces the endowment-based gravity model. Section 4 describes the data and the model. In Section 5 empirical results are given and analyzed. Section 6 provides conclusions.

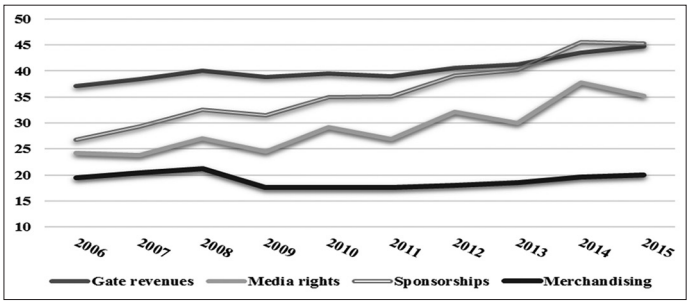
2. OVERVIEW OF THE SPORTS INDUSTRY

The share of the sports industry in the world economy is increasing since the end of World War II. Today, large sports organizations are attracting massive amounts both as active and passive participants. As a result, the sport industry is expanding by incurring positive externalities. This also offers unique opportunities for companies operating in conjunction with the sports industry. By initiating the industrial revolution and hosting about 50% of the world sporting events, today's dominating brands of sports industry are mainly originated from Europe. In this section, first, sports market will be evaluated by separating the sources of the revenues and then the trade structure of European sports market will be examined.

The Figure 1 displays the revenue sources of the global sports market. The interaction of the sports industry with other markets increases gradually as the revenue increases through gate payments, media rights and sponsorships. According to Figure 1, world sports market income increased by 35% between 2006 and 2015 and reached to a peak of $145 billion in 2015. From Figure 1 it is perceived that the gate revenues show a steady trend throughout the period. Since consumption habits of households exhibits consistent patterns over time, the financial crisis of 2008-2009 have very moderate effect on the gate revenues. The bankruptcy of the companies in 2008 crises leads to 3% decrease in sponsorship revenues. Implications of precautionary measures by the governments to soften the effects of the crises cause 44% increase in sponsorship revenues over 6 years of time. Although the revenues of media rights increase 45% on average, it displays a fluctuating pattern between 2006 and 2015 because of the periodic global games. In Figure 1, with a decrease of 17%, merchandising revenues are the most responsive revenue item to the crises of 2008-2009. Although, the merchandising revenues show 14% increase, the levels of revenues in 2009-2015 period are <2007 level. After 2013, global sports activities such as world cup and Olympic Games result in a slightly increasing trend.

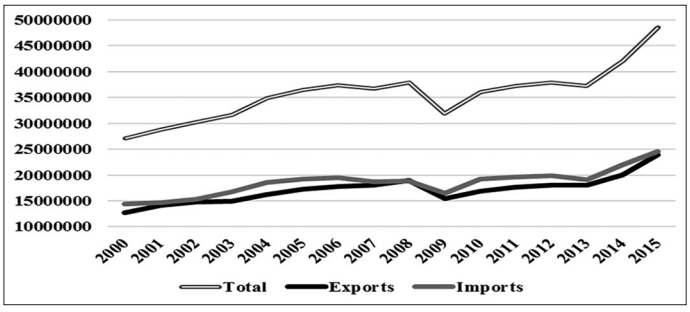
In Figure 2, the sports goods exports, imports and total trade volumes for European countries are given. As can be seen from the figure, European countries' sports goods trade increased by 79% between 2000 and 2015. After the enlargement of European Union (EU) in 2004, when the process of harmonization with the EU has been completed, European brands have moved their production to new participant countries in which the wages are relatively low. As this harmonization process was completed in 2006, from this year imports started to fall whereas exports continued to increase. Although total trade fell after the 2008 crisis due to unfavorable economic conditions around the world, the global sporting events has turned the trade back into its previous rising trend that has accelerated after 2013.

Figure 1: Global sports market revenue (millions, US $)



Source: PwC (2016)

Figure 2: The sports goods trade in European countries 2000-2015 (1000 euro)



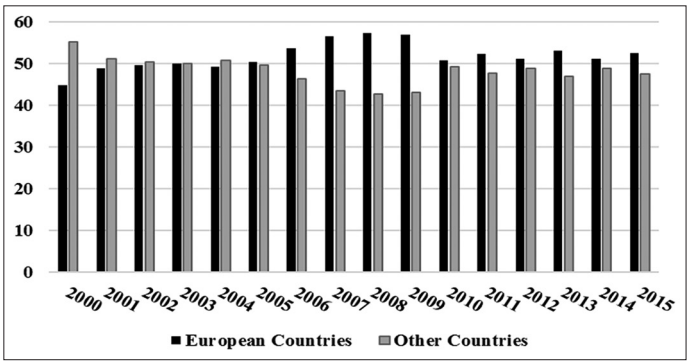
Source: Eurostat database

In Figure 3 percentage distributions of import volumes of sports industry are given. In the 2000s, developed countries have moved their production to places where raw materials and labor are cheaper due to global climate change and environmental concerns. So, they have to import the final sporting goods they need from the countries where they have shifted production. Accordingly, at the beginning of the 2000s the share of imports from non-European countries was greater. With the enlargement of the EU in 2004, some of the production centers have moved to Europe, and the import volume of sports goods within Europe have increased. The closure of firms during 2008-2009 crisis has disturbed the economic structure of the new member states that reduces the share of intra-Europe imports. In the post-crisis era, intra-European trade and non-European trade maintained their import shares which are very close to each other.

The percentage distribution of exports of European sporting goods are displayed in Figure 4. It is observed that about 60% of exports of sporting goods are made within Europe. Since the goods produced in Europe are generally high-quality and expensive products for elite sports, the most important share of market demand is created by European countries. Another reason for the high volume of exports in Europe is the fact that sports competitions are mainly held in this continent.

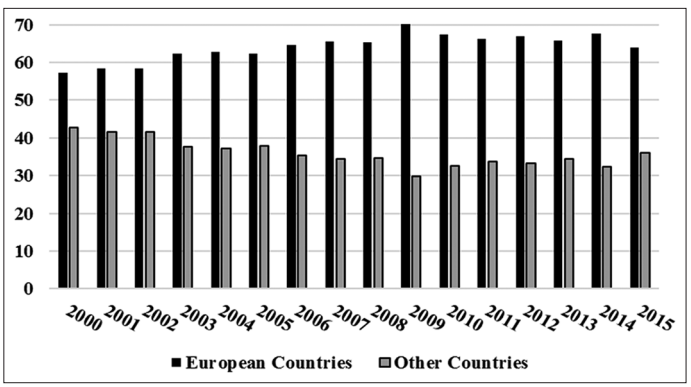
From the Figures 1-4, not only the revenue but also the trade volume of the sports market has grown significantly in recent years. In addition, worldwide government regulations about health and the environment has led to an increase in sports activities and expenditures in both the World and Europe. The export structure of European sporting goods mainly depends on the intra-EU trade. Since sporting goods production shifted to the cost-efficient regions, the share of imports has remained largely stable between Europe and other countries.

Figure 3: Percentage distribution of sports goods imports in European countries



Source: Eurostat database

Figure 4: Percentage distribution of sports goods exports in European countries



Source: Eurostat database

3. ENDOWMENT-BASED GRAVITY MODEL

In 1687, Isaac Newton introduced the Law of Universal Gravitation, which states that the power of gravity between two objects is positively related with their masses, whereas negatively related with the distance between these objects. Following Newton, gravity equation gained the interest of many researchers and many studies are conducted to interpret the spatial influences on the variables. The gravity equation developed by Newton's law applied to trade flows as well as non-trade flows such as migration, population and education (Glejser and Dramais, 1969). Linder (1961), Tinbergen (1962), Pöyhönen (1963) and Linnemann (1966) were the pioneers of theoretical gravity model of international trade. According to model the trade flows are proportional to the size of the economies and distance have an adverse effect on trade volume:

$$TF_{ij} = \alpha GDP_i GDP_j / D_{ij} \quad (1)$$

Where TF_{ij} is the bilateral trade flow from country i to j, gross domestic product (GDP_i) and GDP_j are the GDP of country i and j, D_{ij} is the distance between countries i and j, α is a gravitational constant.

The gravity models of trade are validated and improved technically by Anderson (1979), Bergstrand (1985), Helpman and Krugman (1985), Helpman (1987), Deardorff (1995), Eaton and Kortum (1997), and Anderson and Wincoop (2003) as they emphasized the role of the theoretical foundations of the trade theory. Following these studies, gravity equation is used to examine bilateral trade based on common borders (McCallum,1995; Wei, 1996; Helliwell, 1997; Nitsch, 2000; Anderson and Wincoop, 2003; Coughlin and Novy, 2012), international agreements (Baier and Bergstrand, 2007; Grant and Boys, 2011; Rose, 2004; Frazer and Van Biesebroeck, 2010; Dutt et al.., 2013; Subramanian and Wei, 2007; Tomz et al.., 2007; Liu, 2009; Herz and Wagner, 2011), tariffs (Cadot et al.., 2002; Augier et al.., 2004) and non-tariff barriers (Sunesen et al..,2009; Kee et al.., 2009; Bianco et al.., 2016).

Besides the literature given above, the theory of foreign trade is reconciled with demand and the endowment-based trade hypothesis was expressed by Linder in 1961. The Linder hypothesis suggests that international trade has been intensified between countries with similar levels of income and demand structures. The empirical studies express the Linder variable by the difference between per capita incomes of foreign trade countries. As the income disparity of the countries decreases, the increasing trade intensity of the countries supports the Linder hypothesis. Linder has reached three conclusions concerning the trade of countries with similar income levels: (1) As the level

of income per capita increases, better quality products often take on lesser quality products, (2) demand for final goods in the short run is greater than unit elasticity. However, when the final goods are classified according to their qualities, the income elasticity of those with higher quality will be more than one. (3) Export and import volume can be increased by applying an unbalanced income redistribution policy. Such a policy will lead to different income levels and the demand for different qualified products will increase. Following Linder, Gruber and Vernon (1970) have shown the difference between the consumption patterns by adding the absolute difference between the income levels. Accordingly, a negative coefficient supports the Linder hypothesis by indicating the countries that have similar per capita income have identical consumption patterns and the trade within these countries is positively affected. In 1977, the endowment-based theory of new trade gained significance with the work of Dixit and Stiglitz. According to Helpman and Krugman (1985), Helpman (1987) and Egger (2002) who follow this study, the magnitude of the bilateral trade is a function of factor incomes G, the similarity between the relative size of the countries SIM and the variations in RFE.

4. DATA AND THE MODEL

In our study, the validity of the Linder hypothesis for European countries' sports industry will be searched by considering intra-EU and extra-EU bilateral trade flows. The yearly data related with the bilateral trade flows for 2000-2014 are obtained from the Sport Statistics Database of the EUROSTAT. The income and real effective exchange rate data are taken from WDI, and the distance between the countries, are acquired from CEPII (Mayer and Zignago, 2011) dataset.

Consistent with the endowment-based gravity model studies, the general form of the estimation specification of the study can be given as follows:

$$\ln BTF_{ijt} = \beta_0 + \beta_1 \ln G_{ijt} + \beta_2 \ln SIM_{ijt} + \beta_3 \ln RFE_{ijt} + \beta_4 DIST_{ijt} + \beta_5 \ln \frac{RER_{it}}{RER_{jt}} + u_{ijt} \quad (2)$$

Here, the Hecksher-Ohlin-Samuelson (HOS) determinants are defined as follows:

$$G_{ijt} = \log\left(GDP_{it} + GDP_{jt}\right) \quad (3)$$

$$SIM_{ijt} = \log\left(1 - \left(\frac{GDP_{it}}{GDP_{it} + GDP_{jt}}\right)^2 - \left(\frac{GDP_{jt}}{GDP_{it} + GDP_{jt}}\right)^2\right) \quad (4)$$

$$RFE_{ijt} = \left|\log\left(\frac{GDP_{it}}{N_{it}}\right) - \log\left(\frac{GDP_{jt}}{N_{jt}}\right)\right| \quad (5)$$

Where i denotes the European home country and j denotes the host country, BTF_{ijt} measures the total trade between country i and country j in millions US dollars, G_{ijt} measures the total GDP of the trade partners converted to million dollars using purchasing power parity rates, SIM_{ijt} measures the economic similarity between the trading partners, RFE_{ijt} measures the differences in RFE, $DIST_{ijt}$ measures the distance between country i and j, RER_{it}/RER_{jt} is the ratio of the real effective exchange rate and u_t is the log-normally distributed disturbance term. Along with the gravity approach, we expect to have positive income coefficient for trading countries and negative coefficients related with the distance between countries. Since the RFE variable is used to understand the differences in relative factor contributions, obtaining a positive coefficient for RFE_{ijt} is consistent with the Heckscher-Ohlin-Samuelson approach and shows that there is a inter-industry trade structure. On the other hand, if a negative coefficient is obtained for the RFE_{ijt} variable, the Linder hypothesis is valid, since in this case the trade between the countries becomes lower as the countries diverge according to their RFE. The similarity measure SIM_{ijt}, that presents the contribution of intra-industry trade to total trade, is expected to have a positive coefficient contingent with the differentiated product trade theory. As home country's currency depreciation increases the export inflows, we expect that the ratio of real effective exchange rates to have a negative sign.

5. EMPIRICAL RESULTS

Table 1 shows the test results of the sports trade model for the European countries that has available data. According to test results, the trade volume of sport goods is positively affected by the increase in the income of the trading partners, as expected. In addition, consistent with the literature, the distance- a proxy variable for transportation costs- between the countries negatively related to the sports goods trade. The similarity measure explaining the trade structure, seems to have a positive value for all countries. Accordingly, the trade volume of sport goods increases among the trade partners with similar economic conditions. Real effective foreign exchange rates have negative coefficients in all countries except Czech Republic, Hungary and Slovakia. The increase in the ratio of effective exchange rate- relative price of trade- leads to the appreciation of the domestic currency. This causes a significant decrease in the exports of the country, while imports will increase as foreign sport goods become cheaper. In general, the impact on total trade will be negative because the decrease in exports will be greater than the increase in imports. The trade volume of market driven, medium skill industry such as sports goods for inland Visegrad countries (Czech Republic, Hungary and Slovenia) give a counter reaction to the appreciation of domestic currency. In these countries, an excessive change in sport goods imports end up with a positive coefficient. When the RFE are taken into consideration, the Linder hypothesis is valid only in countries that have largest market share in sports industry such as France, Italy, Germany, Spain, Turkey and England. These countries have an intra-industry production based sports goods trade. When RFE are evaluated for other European countries, the test results show that they have a positive coefficient which indicates the validity of the Heckscher-Ohlin-Samuelson hypothesis. The most important reason why these countries have positive coefficient of RFE is that there is inter-industry based free foreign trade in sport industry.

Table 1: Endowment-based gravity model results

Variables	lnGij		lnSIMij		lnRFEij		lnDISTij		Ln (RERi/RERj)		Constant		Observed	R-sq.
Austria	0.61***	(0.08)	0.19***	(0.02)	0. 0.97***	(0.19)	−0.89***	(0.05)	−0.12	(0.46)	−1.57	(2.87)	584	0.56
Belgium	0.74***	(0.11)	0.19***	(0.02)	0.87***	(0.25)	−0.75***	(0.05)	−3.24***	(0.58)	−7.16***	(4.07)	584	0.59
Bulgaria	0.26***	(0.02)	0.16***	(0.02)	1.63***	(0.16)	−1.43***	(0.08)	0.34	(0.46)	12.86***	(0.82)	579	0.55
Croatia	0.01	(0.03)	1.82***	(0.46)	3.32***	(0.19)	−1.23***	(0.07)	−1.58***	(0.57)	19.37***	(1.18)	575	0.58
Cyprus	0.05*	(0.03)	−1.39	(0.85)	2.07***	(0.20)	−0.52***	(0.12)	−2.59***	(0.66)	11.52***	(1.28)	552	0.41
Czech Rep.	1.20***	(0.16)	0.14***	(0.03)	0.09	(0.32)	−1.15***	(0.06)	0.88***	(0.43)	−23.14***	(6.03)	584	0.58
Denmark	0.40***	(0.08)	0.20***	(0.02)	1.34***	(0.19)	−0.92***	(0.06)	−2.23***	(0.48)	5.89**	(3.09)	584	0.61
Estonia	0.01	(0.02)	1.21*	(0.71)	2.54***	(0.19)	−1.38***	(0.08)	0.22	(0.57)	19.87***	(0.94)	575	0.55
Finland	0.30**	(0.14)	0.26***	(0.02)	1.74***	(0.28)	−1.28***	(0.06)	0.41	(0.49)	12.51**	(5.41)	583	0.60
France	1.09***	(0.12)	0.05***	(0.02)	−0.91***	(0.15)	−0.66***	(0.05)	−0.93**	(0.42)	−20.67***	(4.59)	584	0.56
Germany	0.34***	(0.06)	0.04***	(0.01)	−1.16***	(0.13)	−0.68***	(0.04)	−0.74**	(0.35)	9.87***	(2.31)	584	0.59
Greece	0.51***	(0.14)	0.22***	(0.03)	1.59***	(0.29)	−0.99***	(0.09)	−2.09***	(0.62)	1.68	(5.22)	580	0.44
Hungary	0.49***	(0.11)	0.24***	(0.02)	1.66***	(0.25)	−1.21***	(0.07)	1.26**	(0.54)	3.08	(4.02)	581	0.53
Ireland	−0.02	(0.14)	0.29***	(0.03)	2.37***	(0.29)	−1.19***	(0.09)	−2.49***	(0.62)	21.86***	(5.23)	566	0.56
Italy	0.71***	(0.07)	0.05***	(0.01)	−0.86***	(0.14)	−0.69***	(0.05)	−1.78***	(0.38)	−5.07*	(2.78)	584	0.49
Lithuania	0.09**	(0.04)	−1.02	(0.87)	2.74***	(0.23)	−1.98***	(0.10)	0.57	(0.73)	21.00***	(1.57)	540	0.47
Luxembourg	0.05	(0.05)	−1.37	(1.23)	2.72***	(0.29)	−1.64***	(0.09)	−4.49***	(0.99)	17.97***	(1.93)	491	0.52
Netherlands	0.81***	(0.06)	0.16***	(0.02)	0.39**	(0.17)	−0.73***	(0.04)	−0.99**	(0.39)	−10.08***	(2.34)	584	0.66
Norway	0.53***	(0.09)	0.16***	(0.02)	1.38***	(0.22)	−1.20***	(0.08)	−0.21	(0.59)	3.46	(3.27)	584	0.46
Poland	0.89***	(0.08)	0.14***	(0.02)	0.19	(0.24)	−1.19***	(0.07)	−1.39**	(0.71)	−11.05***	(2.81)	428	0.54
Portugal	0.46***	(0.10)	0.29***	(0.02)	1.60***	(0.24)	−1.59***	(0.09)	−3.90***	(0.58)	8.21**	(3.96)	579	0.67
Romania	1.07***	(0.15)	0.20***	(0.03)	0.82**	(0.34)	−1.53***	(0.11)	0.19	(0.69)	−16.64***	(5.78)	574	0.45
Slovakia	0.18***	(0.03)	0.18***	(0.02)	1.86***	(0.18)	−1.24***	(0.07)	3.34***	(0.55)	14.67***	(1.28	420	0.58
Spain	1.54***	(0.10)	0.03	(0.02)	−1.41***	(0.19)	−0.99***	(0.07)	−3.76***	(0.49)	−36.57***	(3.81)	584	0.63
Sweden	1.19***	(0.14)	0.14***	(0.03)	0.04	(0.28)	−1.25***	(0.07)	−0.30	(0.44)	−21.35***	(5.32)	584	0.56
Switzerland	1.37***	(0.15)	0.13***	(0.03)	−0.26	(0.31)	−0.87***	(0.07)	−0.48	(0.54)	−31.59***	(5.60)	583	0.57
Turkey	1.67***	(0.11)	0.06***	(0.02)	−0.63**	(0.25)	−0.54***	(0.09)	−2.63***	(0.48)	−47.72***	(4.21)	534	0.51
UK	0.65***	(0.09)	0.12***	(0.02)	−0.60***	(0.17)	−0.37***	(0.05)	−0.60*	(0.33)	−5.34	(3.68)	584	0.51

Robust, clustered standard errors are reported in parentheses. ***Denotes $P<0.01$, **denotes $P<0.05$, *denotes $P<0.1$. Trade flows are the total exports and imports between country i and country j. Gijt is the total GDP of the trade partners, SIMijt is the economic similarity measure, RFEijt shows the relative factor endowments, DISTijt is the distance between country i and j. RERit/RERjt is the ratio of the real effective exchange rate. GDP: Gross domestic product, RFE: Relative factor endowments

6. CONCLUSION

Sport industry has significant economic contributions by having intense interaction with many industries. From the last decade of 20th century, the industry's economic potential and the high scale of turnover caused extraordinary revenues. Multinational companies polarized the trade structure by causing major trade partners in the industry. So, industry's international trade structure is mainly shaped by not only the economic performances of the trading partners, but also the spatial forces. In addition, as Europe hosts foremost sporting events throughout history, the support of the CDS also reinforced her position as trade center of sporting goods.

In this paper, we analyzed the sports industry's trade patterns by using panel of bilateral sporting goods trade flows of the European countries over the period 2000-2014. We used the endowment-based gravity approach, bilateral country size, RFE, similarity in country size, the distance between trade partners. To address the impact of the inflationary effects of the relative prices of goods on trade, we extended the model by the ratio of the effective exchange rate. Consistent with the existing literature, our empirical results reveal the fact that bilateral trade flow is positively related to total income of the trading partners and similarity in country size, and is inversely related to transportation costs. The relative price of trade has negative influence on the sporting goods trade volume except the inland Visegrad countries. According to test results, the New Trade Theory and Linder's hypothesis is validated for only the countries that have the largest market share in the industry. On the contrary, the trade volume of the rest of the European countries continue to expand, in accordance with HOS theory. Therefore, these countries have much gain from different factor-endowments. Our outcomes also highlight the importance of reducing gaps in GDP of the trade partners to ensure the full benefit of the trade.

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