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THE COMPARATIVE ADVANTAGE OF NORTH CYPRUS IN THE GREEN LINE TRADE: EMPIRICAL ANALYSIS DURING PERIODS OF 2005- 2013

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ABSTRACT

Aim (Background): The aim of the study is to analyse and find out the comparative advantage of the NC in the Green Line Trade (GLT). Trade is one of the most important sector for NC as other small economies. However, limited trade volume because of embargoes has a negative impact on the NC economy. GLT is an important achievement to improve trade volume and stimulate Economic growth. It is essential to know the comparative advantage of a country to increase efficiency and prevent inefficient use of resources. This study will be the first academic study on comparative advantage of NC in GLT.

Materials and Methods: Balassa's Revealed Comparative Advantage (RCA) and Vollrath's three indices which are relative trade advantage (VRC1), relative export advantage (VRC2) and revealed competitiveness (VRC3), used to measure the comparative advantage of the NC in the Green Line Trade.

Results: NC has comparative advantage in plastic products, articles of stone, vegetable products, base metals and articles, miscellaneous products and textile and textile articles in Green Line Trade. On the other hand, the NC has comparative disadvantage in chemical products, prepared foodstuff machinery and mechanical appliances and wood and articles of wood in the Green Line Trade.

Conclusion: To increase trade volume of NC the products have comparative advantage should be produced more and limitations on GLT has to be removed.

KEYWORDS

competitiveness, green line trade, revealed comparative advantage, vollrath indices balassa index.

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1. INTRODUCTION

Cyprus is a small island and North Cyprus (NC) is the only unrecognized part of the island which South Cyprus (SC) represents the whole island known as Cyprus Republic. Unrecognized North Cyprus has been struggling with Economic embargoes for more than 40 years. This political problem is the main restriction on trade and Green Line Trade agreement with South can be seen as an important achievement for the North economy. *Green Line Regulation* came into force on 1 May 2004 and the implementation of Green Line Trade from North to South has started on 20 August 2004 (Adaoğlu, 2005: 17-19) and trade of goods from South to North has started in May 2005 (Hatay et. al., 2008: 19). The products which were produced in whole Cyprus was under "preferential tariff" for Europe from 1972 to 1994. Nevertheless, European Court of Justice decided to restrict its imports from North Cyprus in 1994. This decision changed the NC's direction of trade from Europe to Turkey and to different countries. Therefore, after Green Line Regulation, South Cyprus has become the third trade partner for NC after Turkey and England (Kuzey Kıbrıs Türk Cumhuriyeti'nde Sürdürülebilir Ekonomik Büyüme, 2015: 132-134).

Small states have a fragile Economic structure and they depend relatively on few sectors. Trade is very important for those economies as they have small market and high production costs. Therefore, external trade takes an important role for small countries (Katircioglu & Katircioglu, 2011: 281). Openness of small countries will help to minimize the cost of trade and to improve their economies; however, embargoes prevented NC to increase its trade volume. As a small country NC can compete with other countries only on the products that can be produced cheaper. In other words, NC should export the products that are comparatively advantageous. Another reality makes this situation very difficult; many countries, besides Economic embargoes, also apply trade barriers on the products that they import from NC. As a main trade partner of NC, Turkey does not apply embargoes to NC but because Turkey is a member of CU (Custom Union) since 1996 they import products from NC under the CU regulation that includes many trade barriers to non-member countries. In March 2016 tons of NC potatoes returned from Turkey because of "low" quality. Standards and quality are widely used methods of trade barriers under EU law. Under these circumstances trade with South Cyprus has become a very important alternative for NC. SC is a EU member since 2004 and they have the chance to trade freely with EU member states. After this brief explanation it can be understood that Green Line Regulation proposed by EU with the membership of SC to EU as an apology to North Cypriots after leaving them out of the EU membership. This reality does not make GLT less valuable for NC.

The study will try to find out the main sectors that have comparative advantage on GLT as there is no similar study in the literature for NC, but there are limited studies that analysis the importance of GLT for Cyprus. There are some political discussions but Economic studies are very limited. One of the Green Line Trade study was carried by Gokcekus et.al. (2012). There is not any study to introduce the comparative advantage of the NC in GLT by using RCA model in the literature. However, it is important to know that comparative advantage of NC to be ready and more powerful in the competitive world after the solution of Cyprus problem. After the settlement of the peace process of Cyprus, NC can be recognized by other world countries.

The aim of the paper is to analyze and interpret the comparative advantage of NC in Green Line Trade under Economic and political embargoes. Comparative advantage is one of the most widely used methods to show the sectors and products that a country has advantage in trade. By this way each country can maximize its benefit by focusing on the right products that they have advantage. And at the same time this would result with efficient use of scarce resources. This reality makes this study important for NC with its limited export volume it is essential to know the products that has comparative advantage. By this way efficiency and gain from trade will increase. South Cyprus is not the only trade partner of NC but because cross border trade plays an important role for closed economies comparative advantage of North Cyprus in Green Line Trade has become very important. This enable the study to indicate if NC creates comparative advantage or disadvantage by employing only or substantially its domestic factors of production.

The study will continue with theoretical framework and literature review. Theoretical framework will focus on comparative advantage theory. As there are limited studies on NC the literature part will include mainly the worldwide studies related with the topic and the model which is used in the study. The third section will try to explain the methodology and the analysis of the study. Section four will illustrate the empirical findings of the study and the findings of the study will be discussed in discussion part. The last part will be the conclusion of the study.

2. THEORETICAL FRAMEWORK

There are two important theories on trade. First one is the comparative advantage theory and the second one is absolute advantage theory. This study will use comparative advantage theory to analyse and find out which products have comparative advantage in GLT for NC. The theoretical framework does not include absolute advantage theory as it is not used in the study.

Comparative advantage theory states that a country can produce efficiently produced products by utilizing its abundant resources and export it, while a country cannot produce products which are inefficiently produced due to the lack of resources and hence, it will import it from foreign countries. The factor abundance is based on labour-abundant or capital-abundant. Therefore, a labour-abundant country produces labour-abundant goods efficiently while the capital-abundant countries produce capital-abundant products efficiently. Hence, Leisner (1958:215) first put forward an idea to determine factor intensities of countries by observing their exports. Bela Balassa (1965: 99-100) further developed this idea and invented the Balassa Index which reveals the comparative advantage of nations using post-trade data. Then, Vollrath (1987: 1-2; 1989: 4-5), developed three indices which are *relative trade advantage* (VRC1), *relative export advantage* (VRC2) and *revealed competitiveness* (VRC3) to determine the comparative advantage of nations. These three indices eliminate the double counting effects by indicating the differences between all commodities and specific commodity. Fortunately, as the Vollrath indices are consistent with the neoclassical theory; the results of three indices by Vollrath are close to real comparative advantage of a nation (Vollrath, 1991:276).

The comparative advantage theory was even stated as static terms by Ricardo, but the comparative advantage theory is a dynamic concept in the real world. The changes in the resource endowments demand patterns, technology, government policies and business practices explain the shifts in the comparative advantage of a nation. Exporting similar products due to the similar patterns expresses broad part of intra- industry trade among industrialized nations. Hence, the domestic firms continuously provide resources and promote development for their production to become more competitive in the international market. Domestic firms would specialize themselves within the industries that have comparative advantage, firms would like to be stronger in the world market therefore, firms reach competitive advantage in producing differentiated products than other firms within the industry (intra-industry trade). Thus the technological differences, demand patterns, resources and trade enhancing policies are playing important roles in determining the comparative advantage. Trading with developed and developing countries differ from each other. Trade among developing countries is based on intra- industry trade and competitive advantage of nations prevail the market. In other words, the firm level qualifications are more dominant than country level qualifications. Trade among developed and developing countries is based on the comparative advantages of nations, hence inter-industry trade prevails the market, and country level qualifications are more dominant than the firm level qualifications (Guptan, 2009: 7-8).

There are different methods in the theory to measure the comparative advantage of a country. This study will use Ballassa's Revealed Comparative Advantage and Vollrath's Revealed Comparative Advantage methods that are widely used in the literature.

2.1. Ballassa's Revealed Comparative Advantage (RCA)

The comparative/ competitive advantage of the nations is determined by the revealed comparative advantage method (Altay & Gurpinar, 2008: 262). In spite of confronting with post- trade prices as in the real world, the comparative advantage theory expresses the pre-trade prices (Hillman, 1980: 315). Hence, it is difficult to calculate the comparative advantage of nations with Ricardo and Heckscher – Ohlin theories. If the pre-trade prices are not known, the post-trade prices are used to determine the comparative advantage of a nation (Utkulu, 2005: 14). The analysis of export is based on the same industry in the group of reference countries. The calculation of the Balassa Index (Balassa, 1965: 106) is as follows:

$$BI^A(RCA_{iJ}) = (X_{iJ}^A / X_{iJ}^{REF}) / (X_{iJ}^{REF} / X_{iJ}^{REF}) \quad (1)$$

According to formula 1; 'J' is the industry of specific good, T is a set of industries, A is a country, 'X_{iJ}^A' is country A's amount of export value of industry. 'REF' is a group of reference country (ies), X_{iJ}^{REF} is the export value reference country (ies) of industry J. BI^A is country A's Balassa's revealed comparative advantage coefficient. The result of the BI^A can be explained in a short statement as; if the BI^A exceeds 1 country A has comparative advantage in the production of industry J, if the BI^A is smaller than 1, country A does not have comparative advantage in production of industry J. (Hinloopen & Marrewijk, 2000:4). Comparisons between countries can be difficult. Therefore, the Balassa Index is divided in four classes to make it easier to interpret (Erkan, 2012: 3);

Classification 1: 0 < RCA ≤ 1: Without Comparative Advantage

Classification 2: 1 < RCA ≤ 2: Weak Comparative Advantage

Classification 3: 2 < RCA ≤ 3: Medium Level Comparative Advantage

Classification 4: 4 < RCA: Strong Comparative Advantage

Balassa Index determines the export specialization level of a country (Stangaciu & Eugenia, 2013: 587). The limitations among countries reveal which countries have comparative advantage and which are not within a specific sector. On the other hand, the sector which has a specific degree of comparative advantage helps to determine the cross- sector and cross – country rankings for each country (Beneditis & Tamperi, 2001: 6).

2.2. Vollrath's Revealed Comparative Advantage (VRC)

The Ballassa and Vollrath Indices are not the same concepts, and they cannot be easily compared. The big difference between the Ballassa and Vollrath indices is that Vollrath's Revealed Export Advantage (RXA) is different from the original Ballassa's RCA because Vollrath's RXA is eliminating the double accounting affects while practicing indices. Fortunately, it prevents problematic results while analyzing aggregated products of the Green Line Trade. The results of the three Vollrath indices can be interpreted as follows: the positive results of the Vollrath indices mean country has revealed comparative advantage which reveals comparative advantage of the country. On the other hand, the negative results of the Vollrath indices mean that the country has revealed comparative disadvantage which reveals comparative disadvantage (Utkulu & Seymen, 2004: 9-10).

Vollrath (1991: 275) examined international competitiveness, "revealed comparative advantage" by representing three alternative definitions about revealed comparative or competitive advantage which are; *relative trade advantage* (VRC₁), *relative export advantage* (VRC₂) and *revealed competitiveness* (VRC₃);

$$VRC_1 = RXA - RMA \quad (2)$$

Where;

$$RXA = (X_{AJ} / X_{AT}) / (X_{T}^{REF} / X_{T}^{REF}) \quad (3)$$

$$RMA = (M_{AJ} / M_{AT}) / (M_{T}^{REF} / M_{T}^{REF}) \quad (4)$$

$$VRC_2 = Ln (RXA) \quad (5)$$

$$VRC_3 = Ln (RXA) - Ln(RMA) \quad (6)$$

Where;

RXA= Relative Export Advantage

RMA= Relative Import Advantage

X_{AJ}= Export value of Country A of Industry J

X_{AT}= Total Export value of Country A

M_{AJ}= Import value of Country A of Industry J

M_{AT}= Total Import value of Country A

3. LITERATURE REVIEW

Several studies have been done in the literature about revealed comparative advantage of countries. The revealed comparative advantage theory was used by Wolf (2000) to explain the trade between 14 OECD (Organization for Economic Co-operation and Development) countries. The study covered 33 types of products between the periods from 1970 to 1997. The future prospect of specialization rate of Canada and USA was predicted by this study. By the way, the results of this study proved that USA is specialized in production on aircraft, professional goods, and petroleum and coal products. On the other hand, Canada is specialized in the production of transport equipment, railroad equipment, motor vehicles, non-ferrous metals and wood products. According to Ferto and Hubbard (2002), the Hungarian agri-food sector was analyzed for the period from 1992 to 1998 using the revealed comparative advantage theory. The study covered 22 types of products and Hungary has comparative advantage of 11 types of products out of 22. These products are livestock, meat, cereals, vegetables, fruit, sugar, beverages, oilseeds, cork, wood, animal and vegetable materials, oils and fats. Utkulu and Seymen (2004) in their research they compared Turkey with EU-15 countries on sectoral levels using RCA indices. Serin and Civan (2008) analyzed the comparative advantage between Turkey and the EU using revealed comparative advantage theory. This study covered trade between Turkey and the EU from 1995 to 2005. According to the study findings Turkey has comparative advantage in production of tomatoes, olive oil and fruit juice. Kosekahyaoglu and Ozdamar (2009) examined the competitiveness of Turkey in the EU market using Balassa Index from 1991 to 2005. The results of the study prove that Turkey has comparative advantage of SITC 6 and SITC 8 and has comparative disadvantage in the other product groups. The wage rate and size of the domestic market of Turkey are the advantages of the country. One study which evaluated both inter and intra trade competitiveness between Turkey and EU-15 was calculated by RCA index and it proved that Turkey has comparative advantage of low value added goods (Altay et al., 2009). Turkey's competitiveness in the EU market was also analyzed by Simsek, Seymen and Utkulu (2010) with RCA indices, Vollrath's Revealed Competitiveness Index. This study emphasized the comparison of the Turkish industry competitiveness in the EU market from 1993 to 2008, and explained the intra-industry and inter-industry trade between Turkey and the EU.

This results of the study showed that Turkey has comparative advantage in raw materials and labour intensive goods and it has comparative disadvantage in the research intensive goods. There are other studies which analyzed the competitiveness of Turkey with other countries. The study that analyzed the competitiveness of Turkey, China and India using Balassa Index found that Turkey has comparative disadvantage in labour intensive goods and easy-to-imitate goods compared with China. At the same time, Turkey has comparative advantage in capital intensive goods and it has comparative disadvantage in raw materials intensive goods compared with India (Kosekahyaoglu & Ozdamar, 2011). The cross border trade between Turkey and Syria has been explained by Erkan (2012) using Balassa Index, which showed that Turkey has strongly comparative advantage against Syria except the group of food and livestock and dairy products, birds and eggs. The comparison of Turkey with selected Middle East countries was also done from 1999 to 2009. According to the results, Turkey should work with the capital intensive goods to increase the competitiveness of this field (Cestepe, 2011). The revealed comparative advantage of Sub-Saharan Africa and South Asia is assessed by Beyene (2014). The international trade commonly occurs between high income countries and this prevents Sub-Saharan Africa and South Asia to integrate with the other countries. This study shows; Sub-Saharan Africa has higher and robust comparative advantage than South Asia for the merchandise products which are food, agricultural raw materials, fuels, ores and metals. Stariene and Remiekiene (2014) investigated the revealed comparative advantage of Lithuanian industry during the periods of 2007 to 2011. Lithuanian industry has robust revealed comparative advantage on food, chemicals, wood and textile products in the world market. Sarker and Ratnasena (2014) assessed the competitiveness of Canadian wheat, beef and pork sector during the periods of 1961 to 2011. The results state that Canada has only competitive advantage in wheat sector. Mzumara et al. (2012) investigated the intra-regional trade competitiveness among North American Free Trade Agreement (NAFTA) member states. USA is found as the most competitive country and Canada is the second and Mexico is the least competitive member state of NAFTA. Although, Mexico is the least competitive country interestingly it benefitted most, where US benefitted least from intra-regional trade. There are several studies that have been done in the literature about the trade of NC. Katircioglu (2010) analyzed the relationship between trade and Economic growth of NC. This study concludes that NC has export oriented Economic growth but its Economic growth is not affected by its imports. Katircioglu and Katircioglu (2011) also analyzed the import oriented growth of NC. The cointegration analysis concludes that there is long term relationship between imports and growth in the income of NC. On the other hand, the causality test concludes that there is no causal relationship between imports and growth in the income of NC.

Gokcekus et al. (2012) analyzed the impediments to trade across the Green Line in Cyprus. The analysis of the trade was based on the gravity model and the study showed that there is an observable gap between actual and potential volumes of trade. The reasons of the gap between potential and actual volumes of trade were analyzed and interpreted. The results of the study showed that only 10% of trade has reached its potential, the other factors are 35% of missing trade, the extra transportation costs at 5% and immeasurable subjective barriers such as personal perspective or social-psychological barriers are between at 48% - 60%. Hatay et al. (2008) emphasized consumer perception about the Green Line Trade. The consumer perception about the Green Line Trade was affected from the events occurred between 1963 and 1974. The obstacles, oppositions and psychological barriers of the customers are defined. The results showed that the identical barriers, permission of the narrow product range in the GLT, additional taxation, checks on persons and transport, and difficulties in telecommunications between the two nations decreased the potential volume of the Green Line Trade and crossings.

4. MATERIALS AND METHODS

The empirical analysis of the study is based on the Balassa and Vollrath contributions. It was aimed to find out the comparative/competitive (dis) advantage of the NC in the Green Line Trade. Balassa's RCA index and three of Vollrath indices are used which are explained in the theoretical framework.

All statistical data about the Green Line Trade was taken from the Turkish Cypriot Chamber of Commerce (TCCoC), and product groups are listed similar to what TCCoC has already done. All product groups are given in detail the appendix section. On the other hand, the product intensity classification is important for the results of the study in order to clarify and explain the results. Hence, the Standard International Trade Classification (SITC) Revision 3 product classification determines material intensity of products in trade. The determination of the digit level is difficult while adopting TCCoC classification to SITC Revision 3 because some of products are 2 digit level and some of them are 3 digit levels in accordance with TCCoC classification compared to SITC Rev. 3. The electricity trade was excluded from the TCCoC statistical data.

All classifications are given in the appendix section. 20 product groups are listed, hence one¹ of the product groups is excluded and 19 product groups are used for analysis between 2005 -2013. The basis of Balassa and Vollrath indices are different from each other. Therefore, they cannot be compared directly (Utkulu, 2005: 5).

5. EMPIRICAL FINDINGS

5.1 RESULTS OF BALASSA INDEX (RCA)

Table 1 illustrates the results of revealed comparative advantage (RCA) of the NC in the Green Line Trade using Balassa Index. The measurement of Balassa Index was conducted for 19 product groups from 2005 to 2013. The red highlighted areas show the comparative advantage of the NC, which are revealed by the Balassa Index for each product group and each year. Bilateral trade did not exist in the specific years and specific products. Hence, Balassa Index cannot be measured mathematically, for the areas which are indicated as "none" on the table.

¹Product group of "Transportation Vehicles" is excluded from the calculation of indices. It does not show the real comparative advantage of NC. Neither the NC nor the SC supplies cars or any other transportation vehicles domestically.

TABLE 1: RESULTS OF THE NC RCA INDEX

PRODUCT GROUPS	2005	2006	2007	2008	2009	2010	2011	2012	2013
1. Livestock&Animal Products	0,00	0,00	None	None	None	1,78	0,38	0,78	None
2. Vegetable Products	8,68	17,35	1,79	1,71	7,31	1,33	0,17	2,79	0,61
3. Animal or Vegetable Fats	None	None	None	None	None	None	None	None	None
4. Prepared Foodstuff	None	0,00	None	0,00	0,07	0,59	0,03	0,01	0,05
5. Mineral Products	None	1,54	1,16	2,50	0,00	0,57	3,84	4,76	0,00
6. Chemical Products	0,12	0,51	0,31	0,26	0,27	0,16	0,03	0,01	0,00
7. Plastic Products	2,40	8,25	2,09	2,34	13,14	46,86	1,10	6,41	14,38
8. Wood& Articles of Wood	0,09	0,28	0,00	None	None	None	0,09	4,97	0,53
9. Paper & Paper board	5,19	1,45	0,26	0,18	0,03	0,10	0,02	0,09	0,43
10. Textile& Textile Articles	8,99	1,39	None	None	None	None	None	None	None
11. Articles of Stone	3,75	1,58	2,12	1,11	1,45	1,34	0,24	0,50	0,38
12. Base Metals & Articles	0,79	9,85	16,95	10,45	12,67	13,32	2,64	3,31	4,69
13. Machinery&Mechanical Appliances	0,09	0,17	0,05	0,00	0,00	0,01	0,00	0,07	0,29
14. Miscallenous Manufactured Articles	2,59	0,00	31,72	None	None	None	0,06	None	None
15. Works of Art	None	None	None	None	None	None	None	None	None
16. Furniture	None	26,63	None	None	None	None	None	None	None
17. Saddlery& Harness	None	None	None	0,15	None	None	None	None	None
18. Optical Appliances	None	None	0,00	0,00	None	None	None	None	None
19. Handicraft Products	None	None	None	None	None	None	None	None	None

5.2 RESULTS OF VRC1

Table 2 illustrates the results of one of the Vollrath indices which indicated “relative trade advantage” of the NC in the Green Line Trade. The relative trade advantage was abbreviated as “VRC1” to make it easy for readers to understand. The calculation of VRC1 was applied to 19 specific product groups and from 2005 to 2013. The NC has revealed comparative advantage in the red highlighted areas in Table 2. Bilateral trade did not exist in some years for the specific product groups. Hence, the calculation of the VRC1 cannot be measured mathematically which is indicated as “none” on the table.

TABLE 2: RESULTS OF THE NC VRC1 INDEX

Product Groups	2005	2006	2007	2008	2009	2010	2011	2012	2013
1. Livestock &Animal Products	None	None	None	None	None	1,21	-2,28	-0,50	None
2. Vegetable Products	8,56	16,77	1,24	1,13	7,17	0,58	-5,69	2,44	-1,01
3. Animal or Vegetable Fats	None	None	None	None	None	None	None	None	None
4. Prepared Foodstuff	None	-344,76	None	-1372,65	-14,80	-16,84	-31,57	-140,83	-20,97
5. Mineral Products	None	0,89	0,31	2,10	None	-1,18	3,58	4,55	-648,47
6. Chemical Products	-8,21	-1,47	-2,92	-3,57	-3,50	-6,19	-29,80	-117,09	-1935,78
7. Plastic Products	1,98	8,12	1,61	1,91	13,06	46,84	0,18	6,25	14,31
8. Wood & Articles of Wood	-11,31	-3,33	None	None	None	None	-11,02	4,77	-1,34
9. Paper & Paper board	5,00	0,77	-3,61	-5,49	-36,46	-9,80	-42,13	-11,24	-1,90
10. Textile & Textile Articles	8,88	0,67	None	None	None	None	None	None	None
11. Articles of Stone	3,49	0,95	1,65	0,20	0,76	0,59	-3,94	-1,49	-2,28
12. Base Metals & Articles	-0,47	9,75	16,90	10,35	12,59	13,24	2,26	3,01	4,47
13. Machinery & Mechanical Appliances	-10,70	-5,79	-19,82	-501,94	None	-109,02	None	-15,16	-3,22
14. Miscallenous Manufactured Articles	2,20	None	31,69	None	None	None	-17,40	None	None
15. Works of Art	None	None	None	None	None	None	None	None	None
16. Furniture	0,00	26,59	None	None	None	None	None	None	None
17. Saddlery & Harness	0,00	None	None	-6,65	None	None	None	None	None
18. Optical Appliances	None	None	None	None	None	None	None	None	None
19. Handicraft Products	0,00	None	None	None	None	None	None	None	None

5.3 RESULTS OF VRC2

Table 3 illustrates the results of one of the Vollrath indices which indicated “relative export advantage” of the NC in the Green Line Trade. The relative trade advantage was abbreviated as “VRC2” to make it easy for readers to understand. The calculation of VRC2 was applied to 19 specific product groups from 2005 to 2013. The NC has revealed comparative advantage in the red highlighted areas in Table 3. Bilateral trade did not exist in some years for specific product groups. Hence, the calculation of the VRC2 cannot be measured mathematically which is indicated as “none” in the table.

TABLE 3: RESULTS OF THE NC VRC2 INDEX

Product Groups	2005	2006	2007	2008	2009	2010	2011	2012	2013
1. Livestock & Animal Products	None	None	None	None	None	0,57	-0,98	-0,25	None
2. Vegetable Products	2,16	2,85	0,58	0,54	1,99	0,29	-1,77	1,03	-0,49
3. Animal or Vegetable Fats	None	None	None	None	None	None	None	None	None
4. Prepared Foodstuff	None	-5,84	None	-7,22	-2,70	-2,83	-3,45	-4,95	-3,05
5. Mineral Products	None	0,43	0,15	0,92	None	-0,56	1,34	1,56	-6,47
6. Chemical Products	-2,12	-0,68	-1,17	-1,34	-1,32	-1,85	-3,40	-4,76	-7,57
7. Plastic Products	0,87	2,11	0,74	0,85	2,58	3,85	0,09	1,86	2,67
8. Wood & Articles of Wood	-2,43	-1,28	None	None	None	None	-2,41	1,60	-0,63
9. Paper & Paper board	1,65	0,37	-1,35	-1,73	-3,60	-2,93	-3,74	-2,43	-0,85
10. Textile & Textile Articles	2,20	0,33	None	None	None	None	None	None	None
11. Articles of Stone	1,32	0,46	0,75	0,10	0,37	0,29	-1,43	-0,69	-0,98
12. Base Metals & Articles	-0,23	2,29	2,83	2,35	2,54	2,59	0,97	1,20	1,54
13. Machinery & Mechanical Appliances	-2,38	-1,78	-2,99	-6,22	None	-4,69	None	-2,72	-1,25
14. Miscallenous Manufactured Articles	0,95	None	3,46	None	None	None	-2,86	None	None
15. Works of Art	None	None	None	None	None	None	None	None	None
16. Furniture	None	3,28	None	None	None	None	None	None	None
17. Saddlery & Harness	None	None	None	-1,92	None	None	None	None	None
18. Optical Appliances	None	None	None	None	None	None	None	None	None
19. Handicraft Products	None	None	None	None	None	None	None	None	None

5.4 RESULTS OF VRC3

Table 4 illustrates the results of one of the Vollrath indices which indicated “revealed competitiveness” of the NC in the Green Line Trade. The relative trade advantage was abbreviated as “VRC3” to make it easy for readers to understand. The calculation of VRC1 was applied to 19 specific product groups and from 2005 to 2013. The NC has revealed comparative advantage in the red highlighted areas in Table 4. Bilateral trade did not exist in some years for specific product groups. Hence, the calculation of the VRC1 cannot be measured mathematically which is indicated as “none” on the table.

TABLE 4: RESULTS OF THE NC VRC3 INDEX

Product Groups	2005	2006	2007	2008	2009	2010	2011	2012	2013
1. Livestock & Animal Products	None	None	None	None	None	1,15	-1,96	-0,50	None
2. Vegetable Products	4,32	3,40	1,17	1,08	3,98	0,57	-3,54	2,05	-0,98
3. Animal or Vegetable Fats	None	None	None	None	None	None	None	None	None
4. Prepared Foodstuff	None	-11,69	None	-14,45	-5,40	-5,65	-6,91	-9,90	-6,09
5. Mineral Products	None	0,86	0,30	1,83	None	-1,12	2,69	3,12	-12,95
6. Chemical Products	-4,24	-1,36	-2,35	-2,68	-2,65	-3,70	-6,79	-9,53	-15,14
7. Plastic Products	1,75	4,22	1,47	1,70	5,15	7,69	0,18	3,72	5,33
8. Wood & Articles of Wood	-4,87	-2,57	None	None	None	None	-4,82	3,21	-1,25
9. Paper & Paper board	3,29	0,75	-2,70	-3,47	-7,19	-4,59	-7,48	-4,86	-1,69
10. Textile & Textile Articles	4,39	0,66	None	None	None	None	None	None	None
11. Articles of Stone	2,65	0,92	1,50	0,20	0,75	0,58	-2,86	-1,38	-1,95
12. Base Metals & Articles	-0,47	4,57	5,66	4,69	5,08	5,18	1,94	2,39	3,09
13. Machinery & Mechanical Appliances	-4,76	-3,57	-5,98	-12,44	None	-9,38	None	-5,45	-2,51
14. Miscellaneous Manufactured Articles	1,90	None	6,91	None	None	None	-5,72	None	None
15. Works of Art	None	None	None	None	None	None	None	None	None
16. Furniture	None	6,56	None	None	None	None	None	None	None
17. Saddlery & Harness	None	None	None	-3,83	None	None	None	None	None
18. Optical Appliances	None	None	None	None	None	None	None	None	None
19. Handicraft Products	None	None	None	None	None	None	None	None	None

Four theoretical models are used in this study which are the Ballasa's Revealed Comparative Advantage Index and the others are the Vollrath's three indices. The results of the study will state the importance of the NC in the Green Line Trade and the comparative (dis)advantage of the NC based on its factor intensities. All results of RCA, VRC1, VRC2, and VRC3 support each other and give the same results. All bold areas in the table show comparative advantages of the NC.

6. DISCUSSION

As many other small economies NC depends on trade. Green Line Trade is a kind of free trade agreement between NC and SC and this makes SC a special trade partner. This is why the study focused only to understand the comparative advantage of NC on GLT. It is important to know the products that have comparative advantage on GLT. This will allow using resources efficiently and increasing trade volume.

According to the results obtained from the analysis, NC had comparative advantage in plastic products from 2005 to 2013, which is easy to imitate research intensive goods. The results show that the NC had comparative advantage in articles of stone from 2005 to 2010, which is a labour intensive good. The Economic crisis slowed down the construction sector in SC and this led to decline in the sales of the articles of stone (Commission of European Communities, 2012:7). Cyprus stone is a natural resource and it is available in NC with a lower price. It is not sustainable export product and it should not be taken as a comparative advantage as it is disadvantage for a country which does not have alternatives other than selling its limited natural resources. There isn't any law or regulation to restrict that kind of export in NC but a possible EU membership of the NC will terminate the illegal use of natural resources within the north part of the island. On the other hand, every natural resource is limited and comparative advantage of NC in articles of stone is limited by its capacity of natural resources. NC had comparative advantage in base metals & articles of metals from 2006 to 2013, which are capital intensive goods. The comparative advantage in mineral products existed from 2006 to 2008 and from 2011 to 2012, of which product group covered both labour intensive and raw material intensive goods². NC had comparative advantage in vegetable products from 2005 to 2010 and in 2012, which are classified as raw material intensive goods. The decline in the sales of potatoes also affected the volume of vegetable products in the Green Line Trade. Potato sale across the Green Line represented 30% of the Green Line Trade until 2010, however after SC has increased its local potato production potato sales declined to less than 1% of overall Green Line Trade (Commission of European Communities, 2012:7). This affected the comparative advantage of NC in the Green Line Trade and it transformed into comparative disadvantage. Furniture trade only existed in 2006 and the NC had comparative advantage in furniture which is a labour intensive product. IKEA a multinational furniture company opened its first store in SC by 2007 and it became impossible for NC furniture companies to compete with IKEA. Miscellaneous manufactured articles group is generally composed of prefabricated building goods traded from NS to SC. The NC had comparative advantage in miscellaneous manufactured articles in 2005 and in 2007 which are labour intensive products. In textile & textile articles which are labour intensive products, NC had comparative advantage in 2005 and 2006. In paper & paperboard products NC had comparative advantage in 2005 & 2006 and it had comparative disadvantage from 2007 to 2013 which are labour intensive goods. The comparative advantage in wood and articles of wood only existed in 2012, and had disadvantage in other years, which are raw material intensive goods. In livestock and animal products, NC had comparative advantage only in 2010, and had comparative disadvantage in other years which were raw material intensive goods.

NC had comparative advantage in prepared foodstuff³, which were raw material intensive goods and capital intensive goods from 2005 to 2013. Yet, the NC did not have comparative advantage in chemical products which are easy to imitate research intensive goods from 2005 to 2013. NC had comparative disadvantage in machinery and mechanical appliances which are difficult to imitate research intensive goods from 2005 to 2013 and optical appliances which are difficult to imitate research goods in 2008. The NC had comparative disadvantage in livestock and animal products which are raw materials intensive goods from 2005 to 2006 and from 2011 to 2012 and in saddlery and harness which are labour intensive goods in 2008.

According to Mzumara et.al. (2012), the weak country gains more from trade even it does not have comparative advantage in most of the product lines in border trade. We can conclude that NC also benefitted from trade without taking into consideration of trade balances of NC because, when trade introduced to closed economy it necessarily gains from trade. However, the degree of the gains from trade is not within the scope of this study. Additionally, there is an important point that differentiates this paper is the comparative advantage of cross border trade in closed economy is investigated. On the other hand, the free trade between each community of the island is limited by the Green Line Trade regulations. Thus, this study can also conclude most reliable results if the free trade among SC and NC is allowed a GLT can be able to reach its potential.

² According to SITC REV. 3 classification, the mineral oils and salt, sulphur, lime cement etc. belong to different product groups: mineral oils belong to raw material intensive goods and salt, sulphur, lime, cement belong to labour -intensive good classification. Hence, in accordance with the TCCoC product classification the mineral product group covered both of them.

³ According to SITC Revision 3 classification the beverages belongs to the capital intensive goods and the pastry cook's products, jams, fruit jellies etc. belong to the raw material intensive goods. Hence, in accordance with TCCoC product classification the prepared foodstuff product group is covered both of them.

There were difficulties faced during the study. Turkish Chamber of Commerce product lines are categorized different than SITC Rev. 3 product lines. Therefore, the product classification is converted similar to SITC Rev. 3 with small differences (see Appendix 1, 2). In addition, bilateral trade did not exist and indices could not be calculated in most of the product groups of GLT. The absence of bilateral trade or unwillingness of trading among each community is related with some barriers which are assessed by Hatay et.al (2008) and Gokcekus et.al. (2012). The barriers that need to remove by each community are indicated as Economic, legal and psycho-social barriers. A solution of these barriers increases the potential volume of GLT and increases the competitiveness of each community in GLT.

7. CONCLUSION

In this study, the comparative advantage of NC in the Green Line Trade was measured using the Ballassa's Revealed Comparative Advantage Index and Vollrath's three indices. The observation of the Green Line Trade between the northern and the southern part of Cyprus showed that the fluctuations in the flow of the goods from the Green Line Trade limited the measurement of the competitiveness of all product groups.

On the other hand, all indices are based on post trade data and these indices are easily affected by government interventions which mean according to the Green Line Regulation, any custom duties and any other related barriers should not be imposed on the sales of goods across the borders.

The results show that NC has comparative advantage in plastic products, vegetable products, base metals & articles and miscellaneous products, textile & textile articles and furniture in the Green Line Trade.

The results of the indices may change if the negative effects on the Green Line Trade are eliminated. The Green Line Trade is limited by two reasons. The first one is psychological reasons which are based on each nation's identity. SC do not want to buy products which are produced in NC. At the same time, the products of the NC are branded as it is in SC market and this is a big discouragement to the SC producers who sold their products to the SC. On the other hand, the SC is afraid of being pilloried in the SC market. Hence, the events of 1963-1974 continue to affect both communities of the island psychologically. The other effects on the Green Line Trade are the EU limitations on the Green Line Trade. The accompanying document should be taken from TCCoC (for NC) and CCCI (for SC) for each product being sold in GLT. Additionally, photo sanity and veterinary certificates are needed. On the other hand, some of the products are prohibited in the Green Line Trade by EU regulations. EU only allows the trade of selected products in the GLT. All of these limit the potential volume of the Green Line Trade. These barriers should be eliminated between both community and all of the limitations which are imposed by the EU should be removed to achieve the real potential volume of the Green Line Trade.

There are many problems waiting for solution which many of them are directly related with political problems. However, this study showed that NC has comparative advantage on few products and NC has to increase its trade volume by increasing the export of these products. As GLT is an important advantage for NC that suffers from embargoes, researches has to be done to understand how NC could gain comparative advantage for other processed products. NC has specific characteristic differences than other small economies but the importance of trade is common for all small economies. 11% trade volume as a share of the GDP can be increased by increasing the GLT to SC.

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APPENDIX

APPENDIX 1: PRODUCT GROUPS

1. Articles of Stone	Building stone, articles of cement, of concentrate or artificial stone, glass & glassware, ceramic products/ refractory products, roof tile, pavement products, asphalt products
2. Mineral Products	Salt, sulphur, earths and stone; plastering materials; lime and cement, sand, raw marble, LPG Gas.
3. Base Metals & Articles	Aluminum products, articles of metal, iron & steel products, miscellaneous articles of base metals, diggers, anchors & rakes, signboards
4. Chemical Products	Miscellaneous chemical products, backfilling plastering material, cosmetic products, washing up materials, detergent raw material, calcium carbide, raw materials of dye, chemical products, resinated paste, cement based adhesive, water softener products.
5. Machinery & Mechanical Appliances: Electrical Equipment	Electrical machinery & equipment & parts thereof, machinery & mechanical appliances, packaging machine and its assemblies, industry machines, salvage accumulator, motors, heat machines, spraying machines, probing machines, dairy machines and appliances, hay machines, parts and pieces, printing machines, diggers, anchors, rakes, pumps, cash register machine, generator, solar Energy Systems
6. Furniture	Wooden furniture & parts, other furniture & parts, articles of bedding and similar furnishing.
7. Livestock/Animal Products	Fish, (frozen) fish filets
8. Miscellaneous Manufactured Articles	Miscellaneous manufactured articles, prefabricated buildings, fisher products, bolls.
9. Paper & Paperboard	Articles of paper & paperboard, printed books, newspapers, pictures and other products of printing industry, hygienic buffers, paper tissue and towel, etiquette
10. Plastic Products	Plastic and articles, raw plastic, plastic pipes, sponges, external tires of bus and truck, silicon, plastic connection pieces, plastic kitchen products, plastic construction products, polythene and its products, other plastic articles.
11. Prepared Foodstuff	Beverages, sprits & vinegar, pastry cook's products, residues and waste from food industries, jams, fruit jellies, marmalades, fruit or nut puree and fruit or nut pastes, obtained by cooking, whether or not containing added sugar or other sweetening matter, whisky, vine, brandy, other alcohol products, fishmeal, animal food additive products.
12. Saddlery and Harness	Saddlery & harness
13. Textile & Textile Articles	Articles of apparel and clothing accessories, other textile articles
14. Vegetable Products	Live plants, vegetables, fruits, miscellaneous grains, seeds and fruits.
15. Animal or Vegetable Fats and Oils and their Cleavage Products	Animal or vegetable fats and oils and their cleavage products
16. Wood and Articles of Wood	Manufactures of straw, wood and articles of wood, builders' joinery and carpentry of wood, charcoal, wood construction products.
17. Works of Art, Collector Pieces & Antiques	Works of art
18. Optical Instruments & Appliances	Medical appliances, other instruments and appliances
19. Transportation Vehicles (excluded)	Agricultural tractor, vehicle parts, fisher ships, Jeep, Land Rovers, Hyundai, Renault, Dorse

Sources: Own study based on TCCoC

APPENDIX 2: THE CLASSIFICATION OF SITC REVISE 3

Raw Materials Intensive Goods	
SITC 0	Food & Livestock
SITC 2 (Except 26)	Crude Materials, inedible, except fuels
SITC 3 (Except 35)	Mineral Fuels, lubricants & related materials
SITC 4	Animal and vegetable oils & related materials
SITC 56	Fertilizers
Labour Intensive Goods	
SITC 26	Textile Fibres
SITC 6 (Except 62,67, 68)	Manufactured Goods Classified Chiefly by Material
SITC 8	Miscellaneous Manufactured Goods
Capital Intensive Goods	
SITC 1	Beverages & Tobacco
SITC 35	Electric Current
SITC 53	Dyeing, Tanning & Coloring Materials
SITC 55	Essential Oil & Resinoids and Perfume Materials
SITC 62	Rubber Manufactures
SITC 67	Iron & Steel
SITC 68	Non- Ferrous Metals
SITC 78	Road Vehicles
Easy-to-imitate Research Intensive Goods	
SITC 51	Organic Chemicals
SITC 52	Inorganic Chemicals
SITC 54	Medicinal & Pharmaceutical Products
SITC 58	Plastics in Non- Primary Forms
SITC 59	Chemical Metals & Products
SITC 75	Office Machines & Automatic Data Processing Machines
SITC 76	Telecommunications & Sound-Recording
Difficult –to- Imitate Research Intensive Goods	
SITC 57	Plastics in Primary Forms
SITC 7 (except 75,76,78)	Machinery & Transport Equipment
SITC 87	Professional, Scientific & Controlling Instruments
SITC 88	Photographic Apparatus, Equipment & Supplies

Source: (Erkan, 2012: 215).

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