COMPARATIVE ADVANTAGE OF TURKEY WITH REGARD TO THE EU

TÜRKİYE'NİN AVRUPA BİRLİĞİ KARŞISINDAKİ REKABET GÜCÜ

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ABSTRACT

'Comparative advantage' is an important concept to the international economy literature and it is widely used and discussed theoretically. However, as it is hard to collect data for pre-trade (autarky) prices and costs of a country, empirical researchers felt it necessary to use a different concept called 'Revealed Comparative Advantage' which can be estimated more easily. Therefore, in this study we analyze the comparative advantage of Turkey with regard to the EU (European Union) at sectoral level by using 'Revealed Comparative Advantage' approach and examine whether there has been a change in comparative advantage of Turkey over the period after 1980 in which Turkey followed a liberal foreign trade policy. The main motivation of this study is to shed some light on investigation of possible effects of Turkey's full membership to the EU.

ÖZET

''Karşılaştırmalı Üstünlük'' kavramı uluslararası iktisat literatüründe teorik olarak çok sık olarak kullanılan ve tartışılan bir kavramdır. Ancak, bir ülkenin dış ticarete açılmadan önceki (otarşi durumundaki) fiyat ve maliyet yapısına ilişkin veri bulmanın mümkün olmaması nedeniyle, ampirik çalışmalarda hesaplanması daha kolay olan ''Açıklanmış Karşılaştırmalı Üstünlük'' (Revealed Comparative Advantage) kavramının kullanılması bir zorunluluk haline gelmiştir. Dolayısıyla, bu çalışmada Açıklanmış Karşılaştırmalı Üstünlükler yaklaşımı kullanılarak Türkiye'nin Avrupa Birliği karşısındaki karşılaştırmalı üstünlüğü sektörel olarak analiz edilmiş ve 1980 sonrası serbest ticaret döneminde bir değişiklik olup olmadığı incelenmiştir. Çalışmanın gerisindeki temel motivasyon Türkiye'nin muhtemel AB üyeliğinin olası etkilerinin analizine ışık tutmaktır.

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INTRODUCTION

There have been remarkable changes in Turkey's foreign trade, especially with the EU, in terms of both the magnitude and the commodity structure of trade following implementation of the 1980 liberalisation program. In order to examine the characteristics of these changes in Turkey's foreign trade with EU this paper looks at the factor endowment of Turkey and its role in explaining Turkey-EU trade as the international differences in "factor endowments" are mostly seen as one of the key factors in explaining comparative advantage and international trade flows.

The paper is organised as follows. Section 1 briefly summarises the theoretical arguments on measuring comparative advantage. The methodology used in this work, namely Balassa's Revealed Comparative Advantage (RCA) approach, is introduced in Section 2. Section 3 evaluates the comparative advantage of Turkey with respect to EU using Balassa's RCA indices presuming that the revealed comparative advantage is a good guide to the actual one. A short comparison of our results with other studies is also given in this final section.

1. THEORETICAL ASSESSMENT ON COMPARATIVE ADVANTAGE

The task of quantifying comparative advantage empirically is not a trivial attempt because economic theory imposes severe restrictions and because country and commodity aggregations necessarily entail conceptual compromise. One problem is that the theoretical concept of comparative advantage is usually specified in terms of *pre-trade* (autarky) relative prices in a distortions world where markets function perfectly. Unfortunately, researchers are confronted with data generated by trade-flows in *post-trade* equilibria[1].

Balassa (1965) outlined these difficulties and shortcomings of the classical doctrine in determining comparative advantage and suggested that revealed comparative advantage can be indicated by the trade performance of individual countries in the sense that the commodity pattern of trade reflects relative costs as well as differences in non-price factors[2]. When introducing

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[1] Difficulties also arise when applied economists depart from the simplified neo-classical world to incorporate characteristics of the multi-dimensional real world where many commodities flow across national boundaries and where many countries trade the same commodities and have different trading partners.

[2] Many applied economists have attempted to approximate comparative advantage using indicators derived from real world post-trade observations. Hillman (1980); Bowen (1983;1985;1986); Ballence et al.(1985;1986); Yeats (1985) and Marchese and Nadal De Simone (1989) have analysed the properties of various indexes proposed to approximate actual comparative advantage. Ballence et al.(1987) examined the consistency of alternative RCA measures and found considerable incoherence.

the notion of RCA, Balassa (1965) proposed two measures; one based on export-import ratios, the other on relative exports shares. He argues that "Comparative advantages appear to be the outcome of a number of factors, some measurable, others not, some easily pinned down, others less so. One wonders, therefore, whether more could not be gained if, instead of enunciating general principals and trying to apply these to explain actual trade flows, one took the observed pattern of trade as a point of departure..."

2. ANALYSIS OF TURKEY'S RCA RELATIVE TO THE EU12 BY INDUSTRY LEVEL

2.1. Theoretical Discussion On Quantifying Comparative Advantage

This section briefly summarises the theoretical arguments on measuring comparative advantage and introduces Balassa's "revealed comparative advantage" (RCA) method which will be used in this work later in order to asses Turkey's comparative advantage relative to EU12 by industry level.

Liesner (1958) was the first to use *post-trade* data in order to quantify comparative advantage. He devised indexes of relative export performance as proxies for comparative costs in an effort to assess the effects of an entry into the European Common Market on British industry. The indexes he used can be written as follows;

$$RCA1_a^i = (X_a^i \ / \ X_e^i) / (X_d^i / X_e^i) = X_a^i / X_d^i \tag{1}$$

where RCA_a^i denotes the revealed comparative advantage of country a in commodity i, X_a^i equals export value of country a in commodity i, d and e point, respectively, to any of the specified European countries, and to the seven specified developed countries.

Balassa (1965), who first coined the term 'revealed comparative advantage' (RCA), adjusted Liesner's methodology in an attempt to identify the enduring effects of trade liberalisation resulting from the Kennedy Round of GATT. The essence of his *normalised* relative export measure was obtained by "dividing a country's share in the export of a given commodity by the combined exports of manufactured goods of 10 industrial countries under consideration"[3]. Balassa formulated his index as:

$$RCA2_a^i = (X_a^i / X_a^t) / (X_w^i / X_w^t) \tag{2}$$

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[3]   These countries include the following developed countries: Belgium, France, Italy, Luxembourg, Netherlands, Sweden and West Germany.

where X_a^i denotes exports of country a in commodity i, X_a^t denotes total exports of country a, X_w^i denotes world exports of commodity i, and X_w^t is world's total exports[4].

Balassa (1965) also experimented with a simple, relative export-import measure which can be written as:

$$RCA3_a^i = (X_a^i / X_a^t) / (M_a^i / M_a^t) \qquad (3)$$

where M refers to imports and all the other notation denote the same as in equation (2).

Balassa is, however, concerned about the heterogeneous incidence of subsidies, quotas, and special arrangements since they raise justifiable questions on whether reported observations on imports should be used in calculations of revealed comparative advantage.

Taking into account the growing importance of intra-industry trade, Balance et al (1987) introduced two other indexes of comparative advantage, one of the UNIDO type (RCA4) and the other of the Donges and Riedel type (RCA5):

$$RCA4_a^i = (X_a^i - M_a^i) / (X_a^i + M_a^i) \qquad (4)$$

$$RCA5_a^i = [((X_a^i - M_a^i) / (X_a^i + M_a^i)) / ((X_a^w - M_a^w) / (X_a^w + M_a^w)) -1]. [\text{ sign} (X_a^w - M_a^w)] \qquad (5)$$

where X_a^i (M_a^i) denotes exports (imports) of country a in commodity $i,$ and X_a^w (M_a^w) denotes world exports (imports) of commodity i.

Vollrath (1991) argues that actually RCA4 and RCA5 are indicators of "inter and/or intra-industry trade", thus they are not measures of comparative advantage. The reason for that is that they both focus on a single commodity and, therefore, do not fulfil the contrasting dimensions inherent in the principle of comparative advantage.

Bowen (1983) makes a very serious allegation indicting previously defined global RCA measures, namely that " a trade intensity above (below) unity cannot be used to infer a country's relative advantage (disadvantage) in

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[4]   In some applications, Liesner and Balassa altered their basic measures to include trend factors. Liesner modified the core RCA1 as follows:
$mRCA1_a^i = (RCA1_a^i) (g_a^i / g_d^i) / 2 + RCA1_a^i$
where m is world exports of i and g is an index of export growth. In 1965, Balassa used the following weighting scheme;
$mRCA2_a^i = ½ [(RCA2_a^i)_t + (RCA2_a^i)_t (RCA2_a^i)_t / (RCA2_a^i)_{t-1}]$
where t refers to any specific time period.

any given commodity". He especially criticises Balassa's intensity index, pointing out that it treats "exports and imports separately when comparative advantage is properly a net trade concept". To avoid this problem, he develops an alternative measure of revealed comparative advantage (RCA6) using two indices called the *net trade intensity index* (NI) and the *production intensity index* (PI) which are based upon the relationship between a country's production, consumption and trade in a commodity relative what would occur in a hypothetical neutral comparative advantage world.

$$RCA6_a^i = NI_a^i = (PI_a^i - 1) \text{ , where}$$
$$NI_a^i = T_a^i / (Y^I / Y^w) Q_a^w \quad \text{and} \quad PI_a^i = Q_a^I / (Y^I / Y^w) Q_a^w, \tag{6}$$

where (Y) refers to gross national product and where net trade (T_a^i) is equivalent to domestic production (Q_a^i) minus domestic consumption (C_a^i).

However, Balllance et all (1985) questioned the validity of Bowen's alternative index because it is dependent on the assumption of identical and homothetic preferences. They reject RCA6 on the basis of cross-country regression results covering 13 commodities which showed this assumption about demand to be inappropriate.

3. EMPIRICAL RESULTS

3.1. Turkey's RCA Relative To The EU

Among the different approaches which were summarised in previous section to determine a country's comparative advantage, Balassa's RCA indexes, (the relative export measure; RCA2 and the relative export – import measure; RCA3) are most commonly used[5] indicators in the literature though there are still questions about their appropriateness. Following Kucukahmetoglu (1996), I shall employ Balassa's relative export-import measure (RCA3) to assess Turkey's RCA against the EU in the industry level.

Table 1 below presents the estimated relative export-import indexes for both pre-liberalisation (1978-1980) and post-liberalisation (1988-1990) periods by using Balassa's relative export-import measure (RCA3). Considering the fluctuations in trade flows, following Kucukahmetoglu (1996), the average export and import values of three years are used for each period. In interpreting Balassa's RCA indexes, an index value greater (smaller) than unity indicates comparative advantage (disadvantage) in the industry.

Table 1 firstly indicates that, consistent with previous results based on Neven&Roller's framework, Turkey has a comparative advantage especially in labour intensive industries while it has comparative disadvantage in capital and human capital intensive industries.

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[5]   Recently, Andreosso O'Callaghan and Noonan (1996) use Balassa's RCA indices in a study of intra-industry trade in Central and Eastern Europe.

Among the industries considered, Turkey seems to have comparative advantage   (indicated by a RCA index value greater than 1) in 14 industries during the first period (1978-1980) while it had comparative advantage in only 12 industries during the second period (1988-1990). Over the two periods considered, it appears that Turkey has lost its comparative advantage particularly in metal products, and leather as well as wood while it has become more competitive in some capital intensive goods, e.g., glass.

Table 1: Change in revealed comparative advantage of Turkey against EU12[1]

	Period 1 1978-1980	Period 2 1988-1990
1-Natural Resources		
Food Stuff	**11.6**	**3.6**
Wood	**5.5**	0.4
2-Average Lab-Capital		
Rubber	**9.8**	**1.4**
Metallic Products	**1.4**	0.5
Leather	**2.9**	0.3
Textile	**15.7**	**6.4**
Non-ferrous Products	0.02	0.51
Wood Furniture	**13.6**	**1.7**
Printing	0.69	0.13
3-Labour Intensive		
Ceramic	**745.3**	**1.9**
Clothing	**2048**	**418.3**
Shoes	**14**	**4.8**
4-Capital Intensive		
Beverage	**43.1**	**1.5**
Plastics	0.004	0.195
Paper	0.018	0.049
Mineral Products	**2.9**	**5.7**
Cement	0.0005	0.0027
Pottery	**137.3**	**2.5**
Glass	0.4	**2.2**
Steel	0.204	0.040
5-Human Capital Intensive.		
Chemicals	0.0165	0.225
Pharmaceuticals	0.179	0.290
Pharmaceuticals	0.039	0.048
Mechanical Machinery	0.015	0.039
Electrical Machinery	0.036	0.142
Transport Equipment	0.023	0.179
Optical Equip.	0.064	0.132
Medical Equip.	0.00004	0.036

[1] The RCA index values that greater than 1 are indicated in bold.
Source: Calculated by using Balassa's relative export-import measure (RCA3).

Table 1 interestingly reveals that Turkey's comparative advantage in many average labour capital intensive and labour intensive goods has become weaker in the second period. This suggests that following trade liberalisation program in 1980, some traditional Turkish export industries lost their competitiveness.

Despite having a comparative disadvantage in both periods, it appears that Turkey has become more competitive in some physical capital intensive goods such as plastics, paper, cement, as well as all human capital intensive goods in the second period. This finding is consistent with our previous observation on the notable increase in the share of such goods in Turkey's total exports to EU12 after the 1980s (see Table 1).

3.2. Comparison Our Results With Other Studies

Using the same methodology, Kucukahmetoglu (1996) examines Turkey's RCA relative to the EU for 260 industries (at three-digit SITC) for the period (1991-1993) and finds that Turkey has a revealed comparative advantage in only 74 of those industries. He applies the same approach to Turkey's total trade for two periods, [(1984-1986) and (1991-1993)] and finds that, out of 233 industries, Turkey didn't have comparative advantage in 147 industries in both periods and that it has comparative advantage in 46 industries in both periods. Between these two periods, 22 industrie lost their competitiveness while 15 industries became competitive. He concludes that the effect of tariff reductions during the two periods considered had little effect on overall competitiveness of Turkey's industry since there was no significant change in majority of industries.

4. CONCLUDING REMARKS

This paper examines comparative advantage of Turkey with regard to the EU by using Balassa's Revealed Comparative Advantage indices for both pre-and- post liberalisation periods in Turkey. Our aim is to test whether Turkey's resource allocation is fully reconcilable with the factor endowment of the country, which is considered highly influential in determining the direction of trade flows. We also hope that the study will shed some light on effects of Turkey's potential full membership to the EU.

In this paper we interestingly show that the degree of Turkey's competitiveness in some of its "traditional" labour intensive industries has become lower after the implementation liberalisation program in the 1980s. This may simply be a result of a rise in wages in these traditional labour intensive industries due to increase in labour demand.

The policy implication of the analysis in this paper is that Turkey should make every effort to promote not only the physical and human capital intensive (medium and high-tech) industries in which Turkey has a

comparative disadvantage but also the "traditional" labour intensive (low-tech) industries in order to maintain its current export markets and to create new markets for industrial goods.

Finally, it is useful to note that in interpreting the given results on 'revealed' comparative advantage indices one should be cautious as these results crucially depend on the categorisation of the industries under consideration. Therefore, our results will provide insight into the effect of trade liberalisation only to the extent that the revealed comparative advantage is a fair guide to the actual comparative advantage and only if the five categories we used represent the factor intensity of the industries equally in all countries.

APPENDIX

Table A1: Classification of industries according to factor intensities

1. Natural Resources	2. Average Capital and Average Labour intensity	3. High Labour intensity	4. High Capital intensity	5. High Human Capital intensity
Foodstuff	Metallic Products	Clothing	Plastics	Chemicals
Wood	Printing	Shoes	Glass	Pharmaceuticals
	Leather	Ceramic	Other mineral pro.	Mechanical machinery
	Wood furniture		Beverage	Electrical machinery
	Non-ferrous products		Paper	Transportation equipment
	Rubber		Steel	Medical/Optical instruments
	Textile			

Source: Neven and Roller (1991)

Table A2: Structural change in Turkey's trade with EU, 1980-1990 %

Share in exports to the EU	1980	1990
Industrial products	41.4	82.7
Agricultural products	51.1	15.2
Mining	7.5	2.1
Total	100.0	100.0
Share in imports from the EU	**1980**	**1990**
Industrial products	98.7	96.2
Agricultural products	0.8	3.5
Mining	0.5	0.3
Total	100.0	100.0

Source : Undersecretary of Treasury and Foreign Trade of Turkey.

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