

ARE TURKEY'S INCREASING EXPORTS OVERVALUED?

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Abstract

Turkey's exports are gradually increasing in the last three decades which can be seen in the increasing export values announced by the Turkish Statistical Institute. The increases in the export value have three sources: changes in the quantity of exports; changes in export prices; changes in export product composition. But this last component is generally disregarded in the calculation of export price and quantity indices.

The aim of this study is to calculate an export product composition index for Turkey. In the calculations the index developed by Tello (2009) is used. With the help of this index it will be possible to decompose the changes in the current export value into price changes, quantity changes and product composition changes. The study covers the 2003-2011 period and the data is from the Turkish Statistical Institute.

Keywords: Export price index; Export quantity index; Export product composition index; Turkey.

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1. Introduction

Turkey as a developing country started to apply an export-led growth strategy in 1980 with the initiative of IMF and since then Turkey's exports are increasing gradually. Share of exports in GDP was only 5 percent in 1980 but it increased to 13 percent in 1990 and to 21 percent in 2011. In 2011 Turkey's exports amounted to 143.457 Million US\$. Besides the increase in the export value, also the structure of Turkey's exports is changing. While Turkey was exporting mainly agricultural products at the 1980's, in the last decade manufactured products have the highest share in total exports².

What type of products a country exports, matter for economic growth. The related empirical literature indicates that increasing variety of a country's exports positively affects its growth rate. Funke and Ruhwedel (2005) empirically tested the effects of export variety on economic growth for 14 European transition countries. The results of the study reveal that as the variety of a country's exports increase, the more it grows. In another study, Saviotti and Frenken (2008) analyzed the same relation for the OECD countries and found out that variety within sectors increases economic growth, but variety between sectors causes economic growth with a time-lag. The findings presented in Al-Marhubi (2000) also supports that export diversification promotes economic growth.

Kang (2009) developed a new model of export price index which controls for the changes in export variety. Then the author tested this model for Korea and found out that the fall in the Korean export prices in 1984-2000 period has been offset by export variety.

Tello (2009) also discussed that export composition is important for a country's export value and economic growth and therefore proposed a new index which is called the Export Product Composition Index to measure the effects of export variety on export value. Tello (2009) applied this index to Peruvian export data and concluded that export product diversification contributed about 6 percent to total export value in the analyzed period.

The aim of this study is to apply the new "export product composition index" developed by Tello (2009) to Turkish export data to see whether the changes in the export composition affects the export value or not. The study covers the 2003-2011 period and the data is from the Turkish Statistical Institute. This paper is expected to contribute to the literature because, to the author's knowledge, this is the first study to analyze the effects of export composition on export value for Turkey.

² Export compositions of Turkey in 2003 and 2011 are presented in Appendix 1.

2. Export Product Composition Index

The export value of a country is decomposed into price and quantity components, and accordingly export price and export quantity indices are calculated. However, Tello (2009) asserts that the increases in the export value have three sources: changes in the prices, changes in the quantities and, changes in the export composition. The author then discusses that the last component is not considered in the official calculations, therefore the index numbers might be misleading. Therefore Tello (2009) proposes a new index which is called the Export Product Composition Index (*kn*).

In order to calculate this new index, two factors are needed: quantity product composition (kq_t) and price product composition (kp_t). The two factors are defined as follows (Tello, 2009: 85):

$$kpt = \left\{ \frac{[(\sum_{nt} p_t \cdot qm) / (\sum_{nt} pm \cdot qm)] \cdot [(\sum_{nt} p_o \cdot q_t) / (\sum_{nt} pm \cdot q_t)]}{[(\sum_{no} q_o \cdot pm) / (\sum_{nt} q_o \cdot p_t)] \cdot [(\sum_{no} pm \cdot qm) / (\sum_{no} qm \cdot p_o)]} \right\}^{1/2} \quad (1)$$

$$kqt = \left\{ \frac{[(\sum_{nt} q_t \cdot pm) / (\sum_{nt} qm \cdot pm)] \cdot [(\sum_{nt} q_o \cdot p_t) / (\sum_{nt} qm \cdot p_t)]}{[(\sum_{no} p_o \cdot qm) / (\sum_{nt} p_o \cdot q_t)] \cdot [(\sum_{no} qm \cdot pm) / (\sum_{no} pm \cdot q_o)]} \right\}^{1/2} \quad (2)$$

where, p and q represent price and quantity respectively, nt is the number of product categories in year t , no is the number of product categories in the base year and, $pm_i = \sum_t^T p_{it} / T$ and $qm_i = \sum_t^T q_{it} / T$. T is the total number of years analyzed.

By using these two factors export product composition index (*kn*) is calculated as follows:

$$kn = (kp_t \cdot kq_t)^{-1} \quad (3)$$

By using these two factors, also Adjusted Fischer's Ideal Index (Iap_t and Iaq_t) can be calculated:

$$Iap_t = Ip_t \cdot kp_t \quad (4)$$

$$Iaq_t = Iq_t \cdot kq_t \quad (5)$$

where, Ip_t and Iq_t are Fischer's ideal price and quantity indices respectively³.

³ The definitions of Fischer's price and quantity indexes are presented in Appendix 2.

3. Data

As mentioned in the introduction part of the study, export value of Turkey is increasing in the last three decades and the increase in exports can also be followed from the export quantity indexes announced by the Turkish Statistical Institute (TUIK). In the recent index calculations 2003 is taken as the base year by TUIK, and in 2011 the export quantity index increased to 174,8.

In order to see whether the export composition contributed to this increase, the export product composition index developed by Tello (2009) is applied to the Turkish export data for the period 2003-2011. The base year chosen for the calculations is 2003. Turkish Statistical Institute (TUIK) also uses the same base year, so it will be possible to make reliable comparisons⁴.

The data used in the calculations is obtained from the Turkish Statistical Institute and it is at Harmonized 6 digit tariff line system. The data set includes 5461 product categories.

4. Results

The calculated product composition indices are presented in Table 1. When Table 1 is analyzed it can be seen that export product composition of Turkey is not stable and the index value fluctuates. During the recent global economic crises years, the index value increased indicating that the falling export prices were partly compensated by increasing variety of exports. However the number of 6 digit categories that Turkey exports did not change much throughout the period analyzed. The number of exported good categories increased slowly except the year 2007.

⁴ TUIK uses chained Fischer method in index calculations.

Table 1: Product Composition Index (*kn*) for Turkey, 2003-2011 (Base Year: 2003)

Year	<i>kn</i>	Rate of Change (%)	Number of 6 Digit Categories	Rate of Change (%)
2003	100	-	4668	-
2004	104,32	0,04	4710	0,01
2005	77,16	-0,26	4737	0,01
2006	100,16	0,30	4743	0,00
2007	80,83	-0,19	4639	-0,02
2008	64,22	-0,21	4647	0,00
2009	72,56	0,13	4652	0,00
2010	139,90	0,93	4681	0,01
2011	66,35	-0,53	4686	0,00

Source: Author's own calculations by using data from TUIK.

The Adjusted Fischer Export Quantity and Price Indices are also calculated for Turkey and the calculated index values are presented in Table 2. The calculated index values reveal that the quantity of Turkey's exports is increasing except two years, 2005 and 2009. However, the prices of Turkey's exports are declining in the most of the years analyzed. In the last three years (which are the years following the global economic crises) the price index is decreasing continuously revealing that Turkey's exports are negatively affected from the crises. The only year that quantity and price indices decline simultaneously is 2009.

Table 2: Adjusted Fischer Export Quantity (*Iaq*) and Price (*Iap*) Indices, 2003-2011 (Base Year: 2003)

Year	<i>Iaq</i>	Rate of Change (%)	<i>Iap</i>	Rate of Change (%)
2003	100	-	100	-
2004	109,07	0,09	164,31	0,64
2005	100,53	-0,08	303,56	0,85
2006	109,14	0,09	284,17	-0,06
2007	109,91	0,01	277,87	-0,02
2008	116,74	0,06	533,07	0,92
2009	114,86	-0,02	299,65	-0,44
2010	126,76	0,10	231,66	-0,23
2011	216,30	0,71	145,67	-0,37

Source: Author's own calculations by using data from TUIK.

5. Conclusion

The export value of a country is expected to reflect two things: price changes and quantity changes. However Tello (2009) proposed that there is a third component which has to be considered: export composition changes. If the changes in the export product compositions

are not taken into account, the export price and quantity indices and therefore export growth rates would be misleading. Therefore he proposed new indices which take into account also the export composition changes

The aim of this study is to apply the new indices developed by Tello (2009) to Turkish export data to see whether export composition changes affect Turkey's export performance or not. The study covers the 2003-2011 period.

The findings of the study reveal that Turkey's export composition is very volatile so it does not contribute much to the Turkish export growth. Only in some years the fall in export prices are partly compensated by increasing export variety. However in a future research the new indices must be calculated for a larger time period, to see what happened in Turkish economy during the early liberalization years of 1980's.

References

Al-Marhubi, F. (2000). Export Diversification and Growth: An Empirical Investigation. *Applied Economics Letters*, 7 (9), 559-562.

Funke, M. & R. Ruhwedel, (2005). Export Variety and Economic Growth in East European Transition Economies. *The Economics of Transition, The European Bank for Reconstruction and Development*, 13(1), 25-50.

Kang, K. (2009). The Export Price Index with the Effect of Variety and an Empirical Analysis. *Economic Modelling*, 26(2), 385–391.

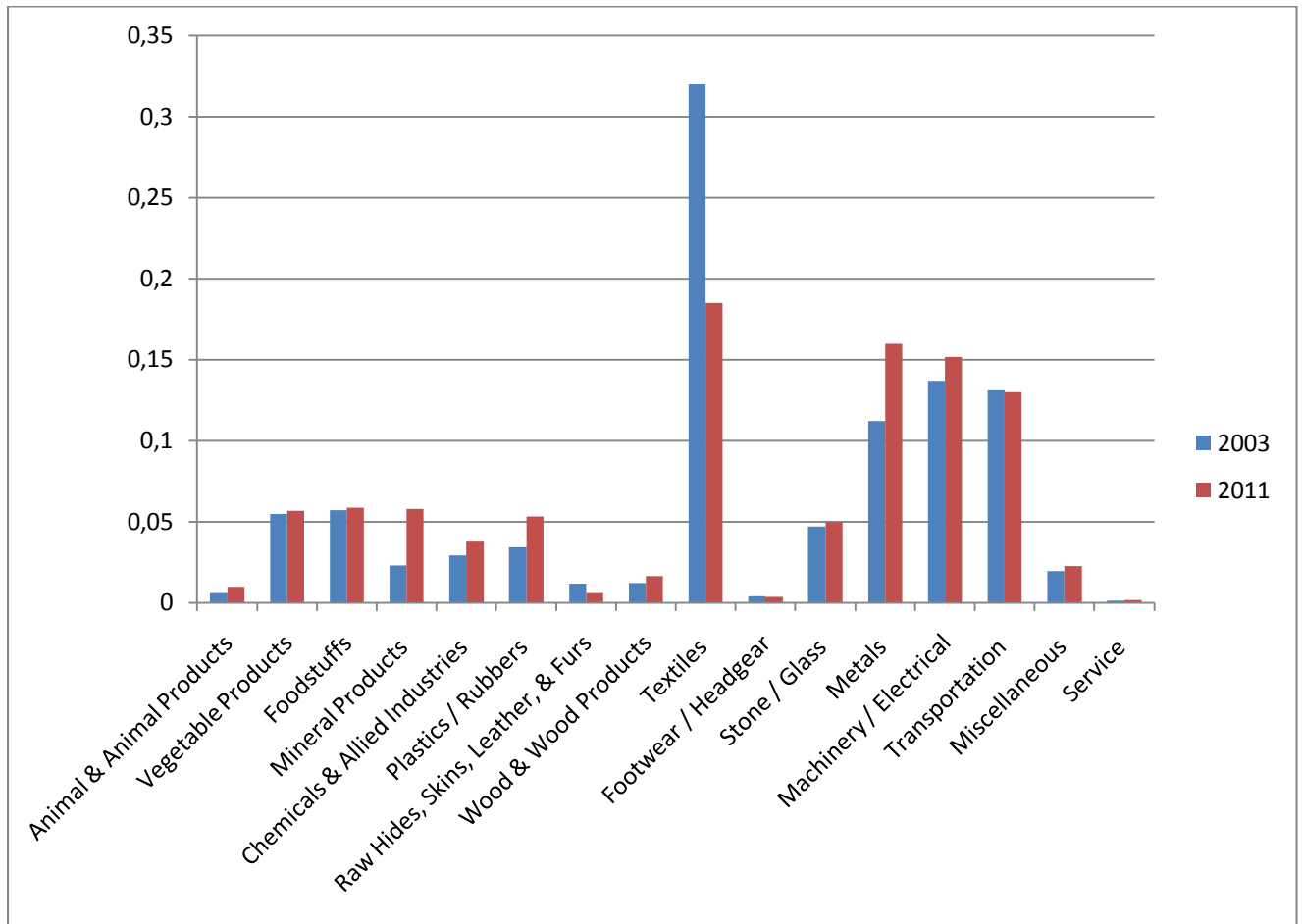
Saviotti, P.P. & K. Frenken (2008). Export Variety and the Economic Performance of Countries. *Journal of Evolutionary Economics*, 18(2), 201-218.

Tello, M.D. (2009). Export Product Composition Indexes in Developing Countries: The Case of Peru, 1993-2004. *The International Trade Journal*, 23(1), 78-106.

www.foreign-trade.com

www.tuik.gov.tr

Appendix 1: Export Composition of Turkey according to major categories in Harmonized System, 2003 and 2011



Source: TUIK

Appendix 2: Definition of Price and Quantity Indices

Laspeyres Index:

$$Lp_t = \frac{\sum_{i=1}^n P_i^{t+1} Q_i^t}{\sum_{i=1}^n P_i^t Q_i^t}$$

$$Lq_t = \frac{\sum_{i=1}^n P_i^t Q_i^{t+1}}{\sum_{i=1}^n P_i^t Q_i^t}$$

Paasche Index:

$$Pp_t = \frac{\sum_{i=1}^n P_i^{t+1} Q_i^{t+1}}{\sum_{i=1}^n P_i^t Q_i^{t+1}}$$

$$Pq_t = \frac{\sum_{i=1}^n P_i^{t+1} Q_i^{t+1}}{\sum_{i=1}^n P_i^{t+1} Q_i^t}$$

Fischer Index:

$$Ip_t = \sqrt{(\text{Laspeyres Price Index})(\text{Paasche Price Index})}$$

$$Iq_t = \sqrt{(\text{Laspeyres Quantity Index})(\text{Paasche Quantity Index})}$$