

8th International Strategic Management Conference

Trends in Turkey's terms of trade from 1982 to 2011

Birgöl Cambazoğlu^{a*}, Hacer Simay Karaalp^b

^a*Haliç University, Istanbul, 34420, Turkey*

^b*Pamukkale University, Denizli, 20070, Turkey*

Abstract

This study analyzes the trends in Turkey's terms of trade over the thirty-year period from 1982 to 2011. Accordingly the structure of Turkish international trade is first analyzed according to different product groups, and the results reveal that Turkey is both an exporter and importer of intermediate goods. Second, we assess whether the terms have turned against Turkey (as argued in the Prebisch-Singer thesis) in light of the findings on the net barter terms of trade, gross barter terms of trade and income terms of trade for the post-1980 period (1982 to 2011). Consequently, we find that the Prebisch-Singer thesis is not valid for Turkey for the 1982-2011 period. International trade is in Turkey's favor. Moreover, after the relationship between the real import and export volume indices is tested by employing a vector auto-regression (VAR) model, we find that Turkish exports are affected by imports, which indicates the import dependency of Turkish exports.

Keywords: International trade; Terms of trade; Prebisch-Singer thesis; Granger causality; VAR model; Turkey

© 2012 Published by Elsevier Ltd. Selection and/or peer-review under responsibility of the 8th International Strategic Management Conference. Open access under [CC BY-NC-ND license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

1. Introduction

Among open economies, international trade directly or indirectly affects a wide range of economic and social activities including production, consumption, investment, job creation, labor market mobility, wages, environment, international relations and the fight against poverty (Love and Lattimore, 2009). A country's gains from international trade depend on the changes in the volume and product composition of its trade and changes in the relative prices of its tradable goods (Erten, 2011). In this context, 'the terms of trade' is an important tool that has been used to analyze international trade. The terms of trade – the ratio of export prices to import prices – is an important economic indicator

* Corresponding author. Tel. +90-212-297-25 60- 164; fax. +90-212- 297- 31 44
Email addresses: cambirgul@yahoo.com, birgulcanbazoglu@halic.edu.tr

of economic development, increased welfare, and the benefits of international trade in terms of the development processes of countries. Accordingly, movements and trends in the terms of trade affect a country's macroeconomic management through consumer spending, investment, economic growth and inflation (Commonwealth Treasury, 2002).

The terms of trade can be calculated using the index of export prices divided by the index of import prices ($\times 100$). It represents the relationship between the price a country receives for its exported goods and the price it pays for imported items. An increase in the terms of trade enables the country (in this case, Turkey) to buy more imports for a given quantity of exports and thereby increases real income. An upward trend in the terms of trade indicates that international trade is in the favor of the country (Turkey) in question. In other words, an upward trend indicates a rising price of exports relative to imports that may result in higher net export revenue as long as the volume effects of this relative price change are low. Thus, improving the terms of trade would increase net export earnings as long as the price elasticities of exports and imports are low (Erten, 2011). Conversely, the deterioration of a country's terms of trade – relatively low gains from trade – is possible. In this case, the low gains from trade might cause declines in real income if the negative impact of the deterioration in the terms of trade outweighs the positive impact from the increased volume of exports (Erten, 2011). Consequently, the gains from trade depend on movements and trends in the terms of trade and changes in export/import volumes.

In this study, we aim to analyze trends in the terms of trade over the thirty-year period from 1982 to 2011, which is a reasonably long time period and comprises Turkey's post trade liberalization period. Our analysis includes three parts. First, we analyze the evolution of Turkey's international trade using data from 1996 to 2012 (for reasons of data availability) on broad economic categories (BEC), the main product groups classified by ISIC Rev.3, and country groups from 1996 to 2012 due to the availability of the data. Second, we calculate Turkey's terms of trade according to net barter terms of trade, gross barter terms of trade, and income terms of trade. Considering these findings, we evaluate whether the terms of trade have turned against Turkey (as argued in the Prebisch-Singer thesis). As the main objective is to assess trends in the terms of trade over the period in question, we extended the study after discovering that Turkey is both an exporter and importer of the same product groups. Next, we examine the relationship between the real import volume index and real export volume index by using the vector auto-regression (VAR) model for the 1982 to 2011 period. This study differs in three ways from existing empirical studies that analyze Turkey's terms of trade. First, we analyze the evolution of Turkey's international trade and then focus on the trends in Turkey's terms of trade vis-à-vis the rest of the world for the post-1980 period and test the validity of Prebisch-Singer thesis for Turkey. According to the results of previous findings, we employ a VAR model for the analysis. The remainder of the paper is structured as follows. Beginning with a review of the literature on the terms of trade debate, we highlight the controversy over international terms of trade in the literature. The second section provides an analysis of Turkey's international trade according to different product categories. The findings on Turkey's terms of trade and a test of the Prebisch-Singer thesis will be given in the third section. Section four describes the variables and discusses the empirical model. The concluding section presents a brief summary of the study's findings.

2. Literature Review on the Terms of Trade Controversy

Movements and trends in the terms of trade of developing countries are important indicators to analyze the gains of developing economies from international trade and openness. Because developing countries' dependency on international trade is greater than that of developed countries, the terms of trade are an essential indicator for those developing countries. Indeed, developing countries have to import necessary raw materials and capital goods during their development processes. In this case, a deterioration of the terms of trade reduces the import capacities of these countries and, therefore, may hamper the development process and dissuade foreign capital inflows (Aslan and Yörük, 2008). In this context, the question of 'who gains from international trade?' with respect to the terms of trade has been discussed for centuries. Many empirical studies and theoretical discussions have analyzed trends in the terms of trade between developing countries (as exporters of primary and agricultural products) and developed countries (as exporters of manufactured goods). The first aspect of this debate concerns conventional economic theories. Conventional economic theories suggest that international trade should benefit all countries, including developing nations (Ram, 2004). Diakosavvas and Scandizzo (1991) classify the principle studies according to the variety of theses on trends in the terms of trade. They find that the primary reasons that the terms of trade improve for developing countries are based on diminishing returns in agriculture and the extractive industries and the predictions of econometric models (demand and supply conditions will turn against developed countries). In this context, according to David Ricardo (1871), due to the law of diminishing marginal utility in agricultural production, the prices

of agricultural products will increase more than the prices of industrial products, the production of which may be increased of which may be increased more easily. Therefore, the terms of trade will improve for developing countries. John Stuart Mill's (1848) contributions to this debate are based on the law of reciprocal demand. The demand intensity for developing countries' agricultural products on the part of developed countries leads to price increases for agricultural products that are greater than those of industrial products. This phenomenon causes the terms of trade in developing countries to increase (Hepaktan and Karakayalı, 2009). Moreover, Diakosavvas and Scandizzo (1991) summarize the primary argument that changes in the terms of trade will be in favor of developing countries.

Conversely, the second aspect of the debate regarding the terms of trade suggests that the terms of trade will improve for developed countries. This view was discussed by Prebisch (1950) and Singer (1950) and forms the so-called Prebisch-Singer thesis. They argued that developing countries' terms of trade have a tendency to deteriorate (Erten, 2011) and suggest two specific reasons related to this tendency: demand factors (commodity specific factors) and supply factors (country-specific factors). The first explanation for declining terms of trade for developing countries is the lower income elasticity of demand for products from developing countries (here, primary and agricultural products) compared to that of commodities that have a greater degree of technological content. According to the Engel's Law, as income rises, expenditures on primary goods or agricultural products fall. The second explanation given by Prebisch and Singer is the lower price elasticity of demand for primary products. Both of these explanations imply that the total export earnings of developing countries will decrease. Third, developed countries produce synthetic versions of primary products that reduce demand for the latter. The final explanation is that the low barriers to entry for developing country markets restrict profit margins. Moreover, according to Prebisch and Singer, there are a number of factors that are country-specific such as labor market differences between developed and developing countries. Powerful trade unions have made real prices higher in developed countries. Developed countries have protected their domestic primary sectors against foreign competition. Technological improvements increase the supply of agricultural products and hence decrease export prices (Hepaktan and Karakayalı, 2009; Erten, 2011). In this context, a more detailed review of the most important studies that found declining terms of trade for less developed (developing) countries and/or primary products is available in Diakosavvas and Scandizzo (1991).

The above studies focus on the relationship between the commodity terms of trade of the primary or agricultural products exported by developing countries and the commodity terms of trade of the manufactures exported by developed countries. Additionally, some studies concern the commodity terms of trade of manufactures exported by developing countries relative to those exported by developed countries because the trade patterns of countries have changed over time. While manufactured goods exports have increased in some developing countries, some developed industrial countries also continue to export primary products. Therefore, the terms of trade between developing countries and developed countries is no longer as closely related to the net barter terms of trade for primary or agricultural products compared to that for manufactured goods (Bloch and Sapsford, 2000). In this context, Sarkar and Singer (1991) note that it is not enough to limit an analysis of the terms of trade between primary products and manufactures to understand trends in the terms of trade of developing countries relative to developed countries because developing countries also export manufactures. Kaplinsky (2006) and Ocampo and Vos (2008) present evidence in support of Sarkar and Singer's results. According to these studies, the reason for the decline in developing countries' terms of trade in manufactures is global competition (Ram, 2004; Erten, 2011).

There are also a vast number of empirical studies that analyze trends in Turkey's terms of trade such Derviş and Robinson (1980), Serin (1981), Boysal (1982), Celasun (1986), Bilginsoy (1997), Balıkcıoğlu (1988), Dülger (1994), Aydoğuş and Diler (2006), Aslan and Yörük (2008), and Hepaktan and Karakayalı (2009). Previously, studies have analyzed the effect of the terms of trade on income, and some earlier studies focus on the analysis of agricultural terms of trade in Turkey. Serin (1981) analyzes Turkish terms of trade for the period of 1950 – 1967 and finds negative effects of terms of trade on income. Boysal (1982) analyzes the income effect of terms of trade between 1968 and 1980 and finds different results by when using different deflators. Balıkcıoğlu (1988) and Dülger (1994) find negative effects of the terms of trade on income for the periods of 1970 – 1985 and 1970 – 1990. Other studies that focus on the agricultural terms of trade reveal a reductionist approach and attribute changes in the terms of trade to agricultural price supports and do not explain the behavior of industrial prices (Derviş and Robinson, 1980; Mutlu, 1990b). Mutlu (1990a, 1990b) concludes that the deterioration of the terms of trade has substantially contributed to rural-urban migration, especially after 1985. Celasun (1986) finds negative effects of terms of trade between 1978 and 1983. Bilginsoy (1997) shows that the agricultural terms of trade in Turkey were affected by changes in nominal demand, the exchange rate and devaluations for the 1952-1990 period. Aydoğuş and Diler (2006) find positive effects of the terms of trade on income over the 1994 – 2004 period. Aslan and Yörük (2008) conclude that the deterioration of the

terms of trade in developing countries will become a contradiction in terms because it is not possible to develop in the absence of foreign trade in this globalized world. Hepaktan and Karakayalı (2009) find a deterioration of the terms of trade for the 1980-2008 period but that it has been compensated for by an increase in the income terms of trade.

3. Analysis of Turkish International Trade

After the Turkish economy experienced an economic downturn alongside the rest of the world economy during the second oil crisis in 1970s, the need for changes in the Turkish economy became unavoidable. In this context, 1980 was a crucial turning point for Turkey's economy and international trade policies. Within the framework of 24th of January Decisions, Turkey changed its economic development strategy from an import substitution (or inward-looking) development strategy that had been followed for two decades (1960s and 1970s) to an export-oriented growth strategy in 1980 and began to implement trade liberalization policies. In this framework, designed to accelerate Turkey's export performance by curtailing domestic production, the Turkish Lira was devaluated by 32.7% relative to the US Dollar. The aim of this strategy is to ensure that the economy functions according to the rules of the free market and integrate the Turkish economy into the world economy. Due to international expansion, Turkey's exports and imports boomed during the 1980s, but during the interim period (1990s), both the export and import growth rates slowed (Aydın, et. al, 2007). During the 1980s, the Turkish economy underwent a series of trade reforms, and bureaucratic obstacles were substantially reduced. In lieu of quantity restrictions, tariffs were applied and the protection rate was reduced gradually. The export approval, registration, and licensing requirements were repealed through changes to export regime's regulations. In addition to legal arrangements, some monetary and fiscal incentives such as tax refunds, income exemptions, exchange allocations, customs exemptions for raw materials imports, and export credits were provided to exporters to increase Turkey's exports. Moreover, exporters were supported financially through the Resource Utilization Support Fund and the Support and Price Stability Fund. In the second half of the 1980s, the cash incentives were gradually removed, and exports began to be supported through credit and insurance. In the middle of the 1980s, free zones were established in Turkey to support the increasing trends in international trade, attract foreign capital, transfer technological improvements, and increase the exports of final products. Turkey also continued its liberalization attempts in the 1990s. In August 1989, Turkey liberalized capital movements to become more attractive and competitive. Moreover, dated 1989, Decree No. 32 regarding the "Protection of the Value of the Turkish Currency" in accordance with law no.1567 of 1930 constituted the basis of the exchange regime. Restrictions on the importation of foreign currencies were released after the amendments were issued. The convertibility of the Turkish Lira was strengthened, and exports and imports in Turkish Lira were deregulated with the amendment of Decree No. 32.

Accordingly, since the 1980s, Turkey's international trade has occurred within the framework of two main paradigms: trade liberalization and export orientation (Yıldıran, 2010). Moreover, import incentives have also been implemented in Turkey on the condition of exports. As shown in Table 1 and Table 2, Turkey imports intermediate goods and raw materials that are used to produce final industrial products. Export incentives contribute to the development of industrial sectors, but making exports dependent on imports creates a disadvantage for Turkey. The shares of primary goods' exports and imports of Turkey's total exports and imports are given in Table 1. Intermediate goods constitute a crucial share of Turkey's international trade. The average shares of intermediate goods in exports and imports are 44.4% and 70.4%, respectively, for the period of 1996-2012. One can see that from 1996 to 2012, Turkey is a significant importer of intermediate goods. Following intermediate goods, the second most important imported goods are capital goods, comprising 17.8% on average. Moreover, consumption goods, 46% of the total on average, constitute an important share of Turkey's exports. The time period in question also comprises two economic crises: that of 2001 and that of 2008. In this context, the imports of consumption goods decreased by 28% and 3% relative to the previous years due to the effects of the 2001 crisis and the most recent financial crisis (which started at the end of 2007 and accelerated in 2008), respectively. Exports of consumption goods decreased by 3% and 12% relative to the previous years during the same period due to the effects of 2001 and 2008 crises, respectively. Imports and exports of intermediate goods decreased by 6% and 5% in 2009, respectively. Due to the 2001 crisis, imports of capital goods decreased by 20% relative to the previous year. Moreover, in 2008, imports and exports of capital goods decreased by 13% and 1%, respectively, compared with the previous year.

Throughout the period in question, one can see a slight convergence between the exports and imports of capital goods. The gap between two indicators was broader during the 1990s. However, the exports and imports of intermediate goods have been increasing since the 1990s. Moreover, exports of consumption goods are far larger than imports.

Table 1. Distribution of International Trade (by BEC^b, %)

Year	Capital Goods				Intermediate Goods				Consumption Goods				Others			
	Import		Export		Import		Export		Import		Export		Import		Export	
	Share	Change	Share	Change	Share	Change	Share	Change	Share	Change	Share	Change	Share	Change	Share	Change
1996	23.503	-	4.821	-	66.735	-	42.056	-	9.216	-	53.039	-	0.547	-	0.084	-
1997	22.875	-2.671	4.858	0.750	66.146	-0.881	42.268	0.505	10.404	12.890	52.781	-0.487	0.575	-5.147	0.093	11.415
1998	23.215	1.486	4.977	2.448	65.126	-1.543	41.712	-1.316	10.899	4.764	53.255	0.900	0.760	32.176	0.056	-40.150
1999	21.457	-7.571	6.846	37.575	66.027	1.384	40.857	-2.050	11.852	8.741	52.090	-2.189	0.663	-12.710	0.207	270.457
2000	20.853	-2.818	7.833	14.414	66.069	0.063	41.639	1.913	12.712	7.256	50.357	-3.325	0.366	-44.806	0.171	-17.538
2001	16.765	-19.604	8.484	8.300	73.192	10.781	42.665	2.464	9.211	-27.539	48.706	-3.280	0.832	127.340	0.146	-14.334
2002	16.293	-2.815	7.738	-8.790	73.042	-0.205	40.648	-4.727	9.501	3.149	51.207	5.136	1.164	39.913	0.407	178.364
2003	16.334	0.252	9.193	18.809	71.726	-1.801	39.139	-3.712	11.268	18.595	51.056	-0.296	0.672	-42.299	0.612	50.288
2004	17.836	9.197	10.339	12.464	69.253	-3.448	41.075	4.944	12.405	10.093	48.288	-5.422	0.505	-24.803	0.299	-51.123
2005	17.438	-2.232	10.885	5.278	70.108	1.235	41.224	0.363	11.968	-3.528	47.410	-1.817	0.486	-3.800	0.481	60.965
2006	16.727	-4.075	11.017	1.216	71.362	1.789	44.179	7.168	11.547	-3.519	44.181	-6.810	0.364	-25.143	0.623	29.406
2007	15.909	-4.896	12.822	16.385	72.702	1.878	46.054	4.245	10.992	-4.800	40.734	-7.803	0.397	9.074	0.390	-37.365
2008	13.874	-12.788	12.668	-1.201	75.136	3.347	51.303	11.397	10.640	-3.205	35.657	-12.463	0.350	-11.808	0.372	-4.620
2009	15.230	9.770	10.884	-14.086	70.610	-6.023	48.691	-5.092	13.688	28.641	39.879	11.839	0.473	35.095	0.547	47.058
2010	15.532	1.984	10.336	-5.031	70.843	0.330	49.507	1.677	13.331	-2.605	39.796	-0.208	0.294	-37.768	0.361	-34.029
2011	15.474	-0.370	10.520	1.784	71.890	1.478	50.359	1.719	12.329	-7.519	38.710	-2.728	0.307	4.264	0.411	13.871
2012 ^c	13.818	-10.703	9.724	-7.575	76.428	6.312	51.207	1.685	9.177	-25.560	38.745	0.091	0.576	87.903	0.324	-21.114

Notes: a the data were obtained from TurkStat and re-calculated by the authors.

b BEC: Broad economic categories.

c 2012 data only covers the month of January.

The percentage distribution of Turkey's imports and exports across the primary categories of economic activity are given in Table 2. The manufacturing sector accounted for an important share of Turkey's exports (92.4%) and imports (79.5%) between 1996 and 2012. Both imports (6%) and exports (1%) in manufacturing decreased in 2008 with the economic crisis, and this downward trend continued in 2009. Turkey's exports in agricultural and forestry products are less than in manufacturing. While Turkey's exports heavily relied on labor-, agriculture-, and raw materials-intensive products during the 1980s, the export pattern of Turkey has changed dramatically since the 1990s and even more so since the second half of the 1920s. Aydın et al. (2007), regarding technological competitiveness, note that the overall research and development (high and leading-edge technology) intensity in manufacturing exports in Turkey tripled from the 1980s to 2000s, while the shares of raw material- and agriculture-intensive sectors declined substantially.

Table 2. Distribution of Import and Export (by ISIC, Rev. 3, %)

Years	Agriculture & Forestry		Fishing		Mining & Quarrying		Manufacturing		Electricity, Gas and Water supply Electricity & Gas & Water Supply		Wholesale & Retail Trade		Other Business Activities		Social & Personal Activities	
	Import	Export	Import	Export	Import	Export	Import	Export	Import	Export	Import	Export	Import	Export	Import	Export
1996	4.964	9.269	0.004	0.114	11.649	1.587	80.701	88.380	0.027	0.067	2.622	0.579	0.004	0.000	0.029	0.004
1997	4.977	8.963	0.004	0.126	10.560	1.539	81.967	88.773	0.173	0.042	2.303	0.550	0.002	0.004	0.014	0.002
1998	4.628	8.740	0.002	0.064	8.161	1.348	84.982	89.214	0.249	0.055	1.965	0.560	0.001	0.002	0.011	0.017
1999	4.053	7.739	0.003	0.143	10.439	1.448	83.439	90.110	0.200	0.054	1.843	0.503	0.002	0.001	0.020	0.003
2000	3.896	5.973	0.003	0.088	13.021	1.441	81.097	91.873	0.242	0.073	1.522	0.491	0.010	0.001	0.209	0.059
2001	3.404	6.308	0.002	0.095	15.886	1.113	78.954	91.995	0.392	0.065	1.311	0.407	0.020	0.004	0.030	0.013
2002	3.303	4.865	0.002	0.143	13.951	1.074	80.272	93.462	0.249	0.044	2.209	0.408	0.005	0.000	0.011	0.004
2003	3.657	4.488	0.004	0.171	13.009	0.993	80.314	93.917	0.063	0.043	2.942	0.387	0.002	0.000	0.010	0.002
2004	2.827	4.024	0.008	0.163	11.258	1.028	82.476	94.320	0.016	0.095	3.404	0.365	0.001	0.002	0.010	0.003
2005	2.399	4.530	0.021	0.190	13.977	1.103	80.676	93.654	0.016	0.141	2.894	0.381	0.005	0.000	0.013	0.001
2006	2.079	4.069	0.023	0.153	15.786	1.340	79.081	93.817	0.013	0.144	3.005	0.474	0.001	0.000	0.010	0.002
2007	2.729	3.473	0.018	0.148	14.885	1.548	78.758	94.230	0.013	0.157	3.579	0.442	0.001	0.001	0.017	0.001
2008	3.165	2.982	0.020	0.182	17.652	1.632	74.396	94.820	0.008	0.056	4.743	0.326	0.001	0.001	0.016	0.001
2009	3.260	4.256	0.022	0.185	14.635	1.648	78.785	93.447	0.012	0.137	3.270	0.324	0.001	0.001	0.015	0.002
2010	3.480	4.333	0.018	0.137	13.976	2.360	78.346	92.610	0.011	0.159	4.152	0.397	0.001	0.002	0.015	0.003
2011	3.693	3.829	0.020	0.138	15.501	2.079	76.369	93.371	0.036	0.110	4.358	0.468	0.002	0.000	0.020	0.004
2012 ^b	4.159	4.228	0.022	0.241	20.386	2.102	71.241	92.676	0.103	0.308	4.068	0.441	0.000	0.000	0.021	0.002

Notes: a the data were obtained from TurkStat and re-calculated by the authors.

b 2012 data only covers the month of January.

Looking at Table 1 and Table 2, one can see that from 1996 to 2012, Turkey tends to produce manufacturing goods but a exports exhibit a substantial import dependency that affects domestic intermediate goods producers negatively, creates a trade deficit and increases Turkey's fragility. Turkey has suffered from high trade deficits and current account problems since the early 1980s. The 2001 crisis was followed by rapid economic growth and widening trade deficits (Aydın et. al, 2007). After a decrease in the 2008 economic crisis, the trade deficit reached 105 million US Dollars (TurkStat, 2012).

The distribution of Turkey’s exports and imports by country group are given in Table 3. The European Union has been Turkey’s largest trading partner since the 1980 trade liberalization and especially after a customs union agreement was concluded with the EU in 1995. For this reason, Turkey’s international trade partners are primarily European Union countries. Between 1996 and 2012, Turkey’s share of imports from the EU was 46% on average and its share of exports to the EU was 53% on average. Germany is Turkey’s largest trading partner. Following the European Union countries, Turkey’s second largest group of trading partners is countries in the Near and Middle East. Exports to countries in the Near and Middle East accounted for 11% of Turkey’s exports in 1996 and increased to 20% in 2012. Among these countries, Iraq accounts for the largest share of Turkey’s exports. Therefore, one can conclude that Turkey’s international market is primarily composed of countries from nearby regions, which also indicates the importance of proximity in Turkey’s international trade.

Table 3. Distribution of Exports and Imports by Country Groups (%)

Years	Countries					
	E.U Countries (27 Country)		Free Zones in Turkey		Other Countries	
	Import	Export	Import	Export	Import	Export
1996	55.747	54.095	0.680	1.925	43.573	43.980
1997	53.788	51.158	0.743	2.326	45.469	46.515
1998	55.055	54.902	0.909	3.080	44.035	42.018
1999	55.395	58.014	1.249	2.936	43.356	39.051
2000	52.340	56.398	0.910	3.224	46.750	40.378
2001	47.884	55.995	0.732	2.980	51.384	41.025
2002	49.829	56.616	1.114	3.989	49.056	39.395
2003	50.678	57.973	0.849	4.081	48.472	37.947
2004	49.309	57.911	0.832	4.058	49.859	38.030
2005	45.126	56.297	0.651	4.047	54.223	39.657
2006	42.548	56.041	0.676	3.469	56.775	40.490
2007	40.217	56.304	0.720	2.743	59.063	40.952
2008	36.842	48.013	0.661	2.278	62.497	49.708
2009	40.098	46.027	0.685	1.916	59.217	52.057
2010	38.902	46.263	0.473	1.830	60.625	51.908
2011	37.837	46.213	0.431	1.885	61.732	51.902
2012 ^b	34.699	43.491	0.459	1.845	64.842	54.664

Notes: a the data were obtained from TurkStat and re-calculated by the authors.

b 2012 data only covers the month of January.

The principle products that Turkey exports to the EU countries, other European countries, the USA, and countries in the Near and Middle East are mostly capital goods. Road vehicles, knitwear, and machinery and equipment are the major products that Turkey exports to the EU countries. Turkey exports road vehicles and machinery and equipment to other European countries, road vehicles and iron and steel to the USA, and iron and steel and machinery and equipment to countries in the Near and Middle East. The primary countries receiving Turkish exports are mostly developed countries such as the EU countries (Germany, UK, France, and Italy) and, the USA, Russia, the United Arab Emirates, and Switzerland. The most important developing countries for Turkey’s exports are Iraq, Iran, Romania, and Egypt. The main products Turkey exports to both developed and developing countries are capital goods. Turkey primarily exports road vehicles, iron and steel, and clothing products to the developed countries. Turkey only uses its comparative advantage in wages in its exports of clothing to Germany and the UK, the primary export category for these countries. Instead of labor-intensive products, Turkey primarily exports capital-intensive products to developing countries such as iron and steel, road vehicles, refined petroleum, and machines. Turkey’s imports chiefly come from developed countries such as Russia, Germany, China, the USA, and Italy and neighboring Iran. Turkey primarily imported capital-intensive intermediate goods from these countries (TurkStat, 2011).

4. Terms of Trade of Turkey between 1982 and 2011

The concept of terms of trade, which is based on the exchange of goods and is also known as commodity terms of trade, has three different versions: Net barter terms of trade, Gross barter terms of trade and Income terms of trade. The trends in the terms of trade, which always refers to the ‘net barter terms of trade’ unless otherwise stated, play a crucial role in determining the distribution of the gains from trade between trading partners (Hepaktan and Karakayalı, 2009; Erten, 2011). In this study, the terms of trade are calculated as the ratio of the export unit value index to the import unit value index. The unit value indices are calculated using international trade statistics. In addition to real price changes, products with different properties under the same tariff regime also take place in the unit value index. Moreover, the unit value indices may change because while inexpensive products may represent the bulk of

international trade in a period, more expensive products may be traded in the next period or vice-versa (TurkStat, 2008). Therefore, the unit value indices may provide more realistic results than price indices. For this reason, in this study, unit value indices are used to calculate the terms of trade (net barter terms of trade). The gross terms of trade are calculated as the ratio of the export volume index to the import volume index. Foreign trade volume indices measure the changes in foreign trade when prices are given as data. Income terms of trade are calculated by multiplying the terms of trade (net barter terms of trade) by the export volume index. In this section, three different forms of the terms of trade indicators that are based on commodity terms of trade are calculated for the period from 1982 to 2011. The monthly data are taken from TurkStat (Turkish Statistical Institute) and the base year is 2003. The results of the calculations are given in figures 1 to 3. The export volume index, calculated by taking the average value of one year, decreased by 6% in 1989 and 8% in 2009 relative to the previous years. Generally, the export volume index exhibited an upward trend between 1982 and 2011. However, the import volume index decreased by 26% in 1994 compared to the previous year because of the high rate of devaluation in 1994 (the official exchange rate to the US Dollar increased 38.9%) and economic policies. Due to the 2001 and 2008 crises, import volumes decreased 25% and 12.9% respectively. Therefore, the overall export and import volume indices increased during the 1982-2011 period. The export unit value index, calculated by taking the average value for one year, decreased between 1993 and 1994 and began to rise again in 1994. While the downward trend in the export unit value index continued between 1995 and 2003, the export volume index increased continuously and significantly between these periods. The reason for this relationship between volume and price for the 1995-2003 period is provided by Hepaktan and Karakayalı (2009). According to these authors, although Turkey exported more goods, the increase in exports reduced unit prices and reduced sales revenues. The export unit value index decreased by 16% in 2009 relative to the previous year. Hence, the appreciation of the US Dollar, due to the 2008 financial crisis, had a negative effect on the export unit value index. There was a downward trend in the import unit value index during the 1991-1993 and 1997-2002 periods, in 2009 the import unit value index decreased by 20%, again relative to the previous year.

In general, it is important to calculate the terms of trade, also known as commodity terms of trade, to analyze a country's trends in the international economy and international trade. If the final result of a country's terms of trade exceeds 100, international trade is considered to be in country's favor. The economy is considered to be healthy. Moreover, the international trade is considered to be more in a country's favor when the price of exports exceeds the price of imports. The results of the terms of trade rise when the country sells goods for more than it did in the base year and buys them for less (TurkStat, 2008). Conversely, if the final result of a country's terms of trade is found to be below 100, international trade is considered to be against the country. The results indicate that more currency flows out of the economy than in. As shown in Figure 1, the net barter terms of trade fell below 100 in 1982, 1984, 1985, 1994, and between 2005 and 2011. Although the indicator did not drop under 100 between 2001 and 2002, it decreased by approximately 3% compared to the previous years. However, when we analyze the results as a whole, the net barter terms of trade are found to be 104.7 on the average from 1982 to 2011. The results indicate that international trade was generally in Turkey's favor throughout the period in question.

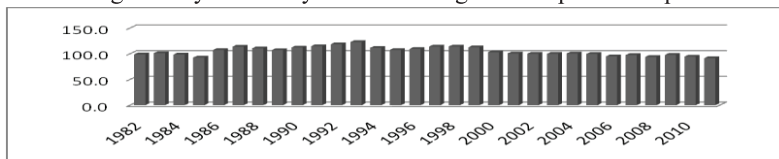


Fig 1. Net Barter Terms of Trade in Turkey (1982-2011)

As shown in Figure 2, the results of the gross terms of trade are found to be above 100. The gross terms of trade decreased 36%, 38%, and 7% during the 1994, 2001, and 2008 crises relative to the previous years, respectively. This downward trend also continued in 2009. With regard to the rate of change, the gross terms of trade were affected by domestic crisis more than the other indicators. Turkey's gross terms of trade is found to be 119.7 for the 1982-2011 period, indicating that international trade is generally in Turkey's favor.

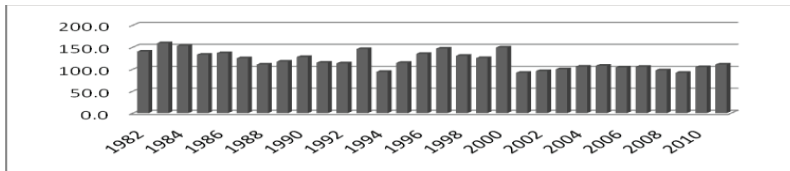


Fig 2. Gross Barter Terms of Trade in Turkey (1982-2011)

Figure 3 shows that the income terms of trade in Turkey increased persistently from 1982 to 2011. Although international trade was not in Turkey’s favor due to an average income terms of trade of 68.3, throughout the period, a positive change can be found during the period because the increases in all of the indicators have exceeded 100 since 2003. Turkey’s exports increased considerably after 2003, except in 2009, and this also lead to an increase Turkey’s gains from international trade.

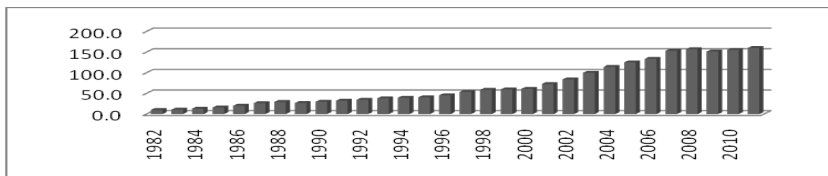


Fig 3. Income Terms of Trade in Turkey (1982-2011)

4.1. Testing Turkish Terms of Trade within the Framework of the Prebisch-Singer Thesis

The Prebisch-Singer thesis is also defined as ‘trade pessimism’ with respect to the terms of trade. Prebisch (1950) and Singer (1950) suggested that international trade earnings would flow to developed countries because the terms of trade for developing or underdeveloped countries had a tendency to deteriorate. Consequently, international trade is considered not to be in favor of developing or underdeveloped countries. They also argued that primary or agricultural goods constitute merchandise exports for developing countries. The primary export products in Turkey are processed materials incidental to industry (69%), according to the classification of BEC given in Table 1. This indicates that Turkey has become a producer of processed industrial goods rather than a producer of primary goods. Furthermore, looking at Table 2, Turkey’s production structure is predominantly based on manufactured goods. Turkey primarily exports manufactured goods rather than agriculture and forestry goods and raw materials. In this context, the Prebisch-Singer Thesis will not hold, if Turkey is considered to be a primary goods exporting developing country in this analysis. As is shown in Figure 1, that Turkey’s average terms of trade was above 100 during the 1982-2002 period indicates that Turkey’s terms of trade does not have a tendency to deteriorate. In other words, Turkey is not adversely affected by international trade in the long run. Only the net barter terms of trade fell below 100 after 2005. Hepaktan and Karakayalı (2009) supported the view that a country's efficient use of production factors, an increase in production volume and technological improvements to production cause these types of results in an economy. Increasing returns and diminishing costs can be explained by the downward trend in the net barter terms of trade after 2005 in Turkey. According to the trends in Turkey’s terms of trade from 1982 to 2011, the results generally seem to fail to support the Prebisch-Singer thesis. This supports the view that today Turkey is no longer a primary products exporting developing country with deteriorating terms of trade.

5. Empirical Analysis

This section examines the relationship between the real import volume index and the real export volume index from 1982 to 2011 by employing a VAR model. Greene (1993) suggests that the VAR model is the most suitable and effective model to investigate the dynamic relationship between variables. According to Sims (1980), if there is a simultaneous relationship between the variables used in the economic model, all of the variables used in the model should be considered to be endogenous. This means that each equation’s reduced form will consist of the same set of explanatory variables. Therefore, the researcher is not concerned with whether the variables included in the model are endogenous (internal) or exogenous (external) and this facilitates prediction (Asteriou and Hall, 2007: 279-280).

In this study, the structure of Turkey's foreign trade has simplified variable selection in this study. Tables 1 and 2 show, Turkey is an exporter and importer in the same product groups. These findings demand an investigation of the degree to which Turkish export volume is affected by imports and the direction of the relationship between exports and imports. The variables used in the model are as follows: *imvoi* denotes the real import volume index (2003=100), and *exvoi* denotes the real export volume index (2003=100). Mendoza (1995) and Yamak and Korkmaz (2006) deflated the volume indices using the import unit value index and import price index, respectively. In this study, we deflate the volume indices using import unit value. Initially, all series should be processed for the VAR analysis. First, the logarithms of all of the variables were taken to make them independent of unit values (to bring them to the same level). Next, all of the variables were tested to determine whether seasonality effects exist. No seasonality effects were found for the variables. In the third step, the *exvoi* and *imvoi* variables were tested for whether they were stationary using the augmented Dickey-Fuller (ADF) test because all variables must be stationary in VAR models. Because the variables were found to contain unit roots and were not level-stationary, we took their first differences, and all of the variables were found to be stationary in their first differences $I(1)$.

5.1. VAR Estimation

First, in the VAR model, the directions of the relationships between the variables were examined using the Granger-Causality Test. In the bivariate model, including variables such as Y_t and Z_t , the direction of the relationship was analyzed under the assumption that the variables affected each other through their distributed lags (Asteriou and Hall, 2007: 28). According to Granger (1969), if a variable Z_t is correctly estimated using the lagged value of the variable Y_t , the Y_t variable is the cause of the Z_t variable. Within this framework, a unidirectional causal relationship was found between *imvoi* and *exvoi*, running from the real import volume index (*imvoi*) to the real export volume index (*exvoi*), $imvoi \rightarrow exvoi$. However, the timeframe of this study includes many domestic and international economic and financial crises that impacted the Turkish economy. The effects of the economic crises were also detected using graphs of outlier variables. In this case, the major crises in 1994, 2000, 2001, and 2008 were included in the VAR model as exogenous variables. Before estimating a VAR model, it is essential to determine the optimal lag length of the model. The Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criteria (AIC), and Hannan-Quinn (HQ) tests were used to determine the optimal (appropriate) lag length. According to the test results, the optimal lag length for the model was determined to be "1". The model, with lag length one, was also confirmed on the basis of the 5% significance level found in five diagnostic tests: The Breusch-Godfrey Serial Correlation LM Test, Autoregressive Conditional Heteroskedasticity (ARCH LM) Test, White Heteroskedasticity Test, Normality Test, and Ramsey Reset Test. The variance decomposition method was used to overcome the obstacles to the interpretation of the parameters in the VAR model and to determine the sources of the changes in the variables. According to the results of the variance decomposition for 24 periods obtained from a 1-lag VAR model, the main source of the *imvoi* variable's variance is explained by its own shocks. Although this condition did not change in medium and long terms, the *exvoi* variable explained only 1% of the *imvoi* variable. The main sources of the long term variance of the *exvoi* variable were found to be itself (72%) and the *imvoi* variable (28%). In other words, while the most important part of the *exvoi* variable is explained by the *imvoi* variable in the medium and long terms, the *exvoi* variable cannot explain changes in the *imvoi* variable. This result also verifies the unidirectional relationship between *imvoi* and *exvoi* and conforms to the Granger-Causality test results. In this context, the responses of the *exvoi* variable to one standard deviation shock to the *imvoi* variable obtained from a 1-lag VAR model for twenty-four periods is reported in Figure 4.

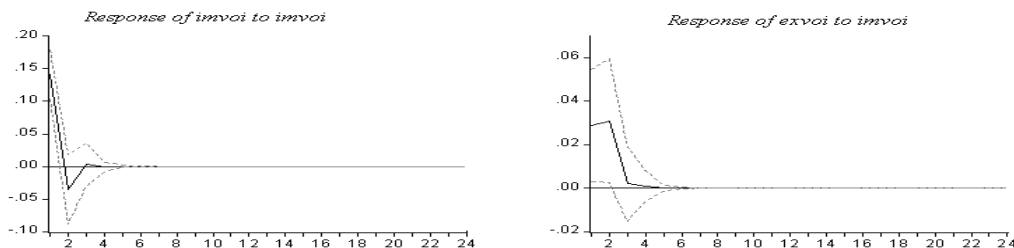


Fig. 4. Impulse-Response Functions of Variables

As Figure 4 shows, the response of the *exvoi* variable to the *imvoi* shock was lagged. In other words, the real response of the *exvoi* variable emerged in the second period and disappeared in the fifth period. These findings are

considered to be normal in connection with the variance decomposition results because the reason for the non-simultaneous response of the *exvoi* variable to the changes in the *imvoi* variable is also related to the other variables that affect exports.

6. Conclusion

This study analyzes the evolution of Turkey's terms of trade vis-à-vis the rest of the world for the 1982-2011 period. The analyses of Turkey's international trade became significant in the post-1980 period because 1980 was a milestone for the Turkish economy and international trade through the 24th January Decisions. After the liberalization of the Turkish economy in 1980, Turkey implemented an export-oriented growth strategy instead of an import substitution development strategy. In this context, this study primarily consists of three parts. First, Turkey's international trade is analyzed according to product groups, economic activities and country groups for the 1996-2012 period by re-calculating the data obtained from TurkStat. Due to these calculations and with respect to the different product groups, Turkey is found to be both an exporter and importer of intermediate goods. Concerning economic activities, manufacturing is Turkey's exports and imports group for the 1996-2012 period. Moreover, Turkey's major international trade markets are found to be the EU countries, Near and Middle East countries for the same period. In the second part of the study, to analyze Turkish terms of trade, the net barter terms of trade, gross barter terms of trade and Income terms of trade were calculated for the post-1980 period (from 1982 to 2011). After taking the averages of the results for the entire period, the terms of trade in Turkey were found above 100. According to these results, international trade is considered to be in Turkey's favor. Subsequently, the controversy over international terms of trade in the literature was investigated for Turkey and the validity of these findings is considered within the framework of the Prebisch-Singer thesis, also known as trade pessimism. The findings revealed that Prebisch-Singer thesis is not valid for Turkey for the 1982-2011 period. According to the previous findings that Turkey is both an exporter and an importer with the same product groups, the effect of import volume to the export volume was investigated. The results indicate that 28% of the changes in export volume are explained by import volume. In other words, one of the reasons for the change in the volume of exports is import volume. However, a lagged response of export volume to the change in imports volume is found. For this reason, it is thought that with the addition of other variables to the model more concrete results can be obtained.

Acknowledgements

This research was funded through a grant by Pamukkale University Scientific Research Unit under contract number 1074 (Hacer Simay Karaalp).

References

- Aslan, N., & Yörük, D. (2008). Teoride ve uygulamada dış ticaret hadleri ve kalkınma ilişkisi. *Marmara Üniversitesi İİBF Dergisi*, 25, 33-69.
- Aydın F., Saygılı, H., & Saygılı, M. (2007). Empirical analysis of structural change in Turkish exports. The Central Bank of the Republic of Turkey, *Research and Monetary Policy Department Working Paper*, No: 07/08, Ankara.
- Aydoğuş, İ., & Diler, H. G. (2006). Dış ticaret hadlerinin gelir etkisi: Türkiye üzerine bir uygulama. *Afyon Kocatepe Üniversitesi, İİBF Dergisi*, 8, 89-102.
- Asteriou, D., & Stephen, G. H. (2007). *Applied econometric* (Revised Edition), Palgrave Macmillian: New York.
- Balıkçioğlu, F. (1988). Türkiye'de dış ticaret hadleri değişmelerinin gelir etkisi: 1970 – 1985, *İGEME Yayını*, Ankara.
- Bilginsoy, C. (1997). A macroeconomic analysis of agricultural terms of trade in Turkey, 1952–90. *Journal of Development Studies*, 33, 797-819.
- Bloch, H., & Sapsford, D. (2000). Whither the terms of trade? An elaboration of the Prebisch-Singer hypothesis? *Cambridge Journal of Economics*, 24, 461-481.
- Boysal, H. (1982). Milli gelirin sabit fiyatlarla hazırlanmasında dış alem kalemlerine ilişkin sorunlar. *ODTÜ Gelişme Dergisi*, 9, 49-73
- Celasun, M. (1986). Income distribution and domestic terms of trade in Turkey 1978-1983. *METU Studies in Development*, 13, 193-216.
- Commonwealth Treasury, (2002). Statement 4: Australia's terms of trade - stronger and less volatile. Budget Paper No:1, Budget Strategy and Outlook 2002-03, AusInfo, Canberra.
- Dervis, K., & Robinson, S. (1980). The sources and structure of income inequality in Turkey (1950-73). In E. Özbudun & A. Ulusan (Eds.), *The Political Economy of Income Distribution in Turkey*, New York: Holmes & Meier.

- Diakosavvas, D., & Scandizzo, P. L. (1991). Trends in the terms of trade of primary commodities, 1900-1982: The controversy and its origins. *Economic Development and Cultural Change*, 39, 231-264
- Dölger, F. (1994). Dış ticaretin gelir etkisi: Türkiye için bir deneme 1970-90. *ODTÜ Gelişme Dergisi*, 21, 501-520.
- Erten, B. (2011). North–south terms-of-trade trends from 1960 to 2006. *International Review of Applied Economics*, 25, 171-184.
- Greene, W. H. (1993). *Econometric analysis*. (2nd. ed.). New Jersey: Prentice-Hall.
- Hepaktan, E., & Karakayalı, H. (2009). 1980-2008 döneminde Türkiye'nin dış ticaret hadlerinin analizi. *CBÜ Sosyal Bilimler Dergisi*, 2, 181-210.
- Granger, C. W. J. (1969). Investigating causal relations by econometrics models and cross spectral methods. *Econometrica*, 37, 424- 438.
- Kaplinsky, R. (2006). Revisiting the revisited terms of trade: will China make a difference?. *World Development*, 34, 981–95.
- Love, P., & Lattimore, R. (2009) *International trade: Free, fair and open?*, OECD Insights, OECD , Paris.
- Mendoza, E. G. (1995). The terms of trade, the real exchange rate, and economic fluctuations. *International Economic Review*, 36, 101-137.
- Mill, J.S. (1848). *Principles of political economy*. London: John W. Parker.
- Mutlu, S. 1990a, Bölgesel İç ticaret hadleri, kırsal refah ve iç göçler, *Ekonomi ve İdari Bilimler Dergisi*, 4, 69-87.
- Mutlu, S. 1990b, Price scissors in Turkish agriculture, *METU Studies in Development*, 17, 163-212.
- Ocampo, J.A., & Vos, R. (2008). *Uneven economic development*. London and New York: Zed Books.
- Prebisch, R. (1950) . *The economic development of Latin America and its principal problems*. New York: United Nations.
- Ram R. (2004). Trends in developing countries' commodity terms-of-trade since 1970. *Review of Radical Political Economics*, 36, 241-253.
- Ricardo, D. (1817). *Principles of political economy and taxation*. London: John Murray.
- Sarkar, P.,&Singer.H.W.(1991).Manufactured exports of developing countries and their terms-of-trade since 1965. *World Development*,19,333-340.
- Serin, N. (1981). *Kalkınma ve dış ticaret; Az gelişmiş ülkeler ve Türkiye yönünden*, A.Ü.S.B.F. Yayınları, Ankara.
- Singer H. W. (1950). The distribution of gains between investing and borrowing countries. *The American Economic Review*, Vol. 40, No. 2, Papers and Proceedings of the Sixty-second Annual Meeting of the American Economic Association, 473-485.
- Sims, C. A. (1980). Macroeconomics and reality. *Econometrica*, 48, 1-48.
- TurkStat, Turkish Statistical Institute. (2008). *Dış ticaret istatistikleri ve endeksleri*. Ankara: Turkish Statistical Institute Publishing.
- TurkStat, Turkish Statistical Institute (2011), Foreign trade statistics. http://www.tuik.gov.tr/MetaVeri.do?tb_id=13&ust_id=4, [Accessed 01.03.12]
- TurkStat, Turkish Statistical Institute (2012), Foreign trade statistics. http://www.tuik.gov.tr/MetaVeri.do?tb_id=13&ust_id=4, [Accessed 01.03.12]
- Yamak, R., & Korkmaz, A. (2006). Prebisch-Singer hipotezi ve küçük açık ekonomi varsayımı. *Selçuk Üniv. Karaman İ.I.B.F Dergisi*, 10, 128-142.
- Yıldırım, M. (2010), Türkiye'nin hayat alanındaki dış ticaret stratejisi: Doğudan yükselen pazarlar ve yeni yönelimlerin ekonomi politikası, *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, C.15, S.1 s.313-338.