

Turkey's Free Trade Agreements' Effects on the Turkish Electrical and Electronics Sector

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ABSTRACT: *Free trade agreements are the most common economic integration type and have become one of the most preferred commercial policy tool especially with globalization and liberalization of the world with the primary aim of expanding market reach of exporters. Turkey, in parallel with global developments, has begun to liberalize its trade policy since the 1980s and established a Customs Union with European Union, and signed free trade agreements to increase its trade volume as well as aligning its trade policy with EU. Today, Turkey, an export-oriented country, has 21 free trade agreements in force with countries from different regions of the world with different economic sizes and structures. While the main aim of a free trade agreement is to expand the market reach, it may have varying outcomes for different sectors of the economy.*

This paper examines the static effects of Turkey's free trade agreements on the Turkish electrical and electronics sector which is the 5th largest exporter sector of Turkey in terms of trade creation and trade diversion. To that aim, bilateral and sectoral trade data is retrieved from ITC Trademap database based on 6-digit HS codes of the sector. Then the export import coverage ratios for the sector's overall and bilateral trade are calculated for selected years and an index of export import coverage ratios is constructed to make comparisons and determine if the free trade agreement has a trade creation or trade diversion effect on the Turkish electrical and electronics sector.

KEY WORD: *free trade agreement, economic integration, Turkey, export import coverage ratio*

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I. INTRODUCTION AND LITERATURE REVIEW

Economic liberalization efforts in the global scale, pioneered by GATT and later proceeded by rounds of World Trade Organization mark the importance of international trade, which has been the most robust fuel for globalization and multilateral trade system. Since the 1930s custom tariff liberalization and elimination of other barriers to trade have been the main focus of the international trade system and in this context bilateral and regional trade arrangements as well as multilateral liberalization efforts have gained momentum and acquired great importance as useful tools of commercial diplomacy. However as the international competition has become harsher while customs tariff liberalization has grown into a more complex structure, countries prefer to be involved in bilateral and/or regional trade integrations especially with the 1980s. Additionally Doha Round deadlock has contributed to the tendency towards economic integrations.

Economic integration refers to the process of merging economies of sovereign states through tariff cutting, lowering other barriers to trade, adopting a common trade policy against third parties, freedom of movement for factors of production, aligning national economic policies, common currency, adopting common monetary and fiscal policies, establishing supranational bodies Adıgüzel (2011). Balassa (1961), argues that economic integration is basically abolishment of barriers before trade among countries and identifies 5 different forms of economic integration: free trade area, customs union, common market, economic union and complete economic integration. On the other hand, Viner (1950), tries to determine the effects of economic integration in this book *The Customs Union Issue* and elaborates trade creation and trade diversion effects. According to Viner (Viner, 1950), trade creation enhances welfare by increasing consumer surplus. If elimination of tariff barriers leads to a shift from high cost producer to a low cost producer, it will lower the prices and increase the consumer surplus. Trade diversion, on the other hand decreases welfare as it creates a shift from a low cost producer to a high cost producer because of tariff reduction.

In parallel with the global developments, Turkey has abandoned import substitution policies and began to liberalize its trade policy since the 1980s. The most notable development in Turkey's trade liberalization efforts is the customs union established between Turkey and EU in 1995. According to the Decision no 1/95 of

EC-Turkey Association Council, Turkey is liable at aligning its trade policy with European Union, and negotiate and sign free trade agreements with the countries that EU has free trade agreements. In this context, Turkey has 21 free trade agreements in force today with EFTA, Israel, Macedonia, Bosnia & Herzegovina, Palestine, Tunisia, Morocco, Egypt, Albania, Georgia, Montenegro, Serbia, Chile, Mauritius, Republic of Korea, Malaysia, Moldova, Faroe Islands, Singapore, Kosovo and Venezuela (Turkish Ministry of Trade, 2020).

As well as being the 5th largest exporter sector of Turkey and 34th in the world, considering that electrical and electronics (EE) sector is a crucial industry that transforms other industries, production techniques and consumer preferences due to its innovative structure and its close link with digital technologies, the sector requires more emphasis. Therefore, the aim of the paper is to evaluate static effects of Turkey's FTAs on the Turkish electrical and electronics sector in terms of trade creation and trade diversion effects of integration theories.

Table 1. Top Electrical and Electronics Exporters, 2019, billion USD

No	Country	Exports	Share (%)
1	China	1.018	25,5
2	Hong Kong	377	9,5
3	USA	311	7,8
4	Germany	259	6,5
5	South Korea	191	4,8
6	Taiwan	183	4,6
7	Japan	167	4,2
8	Singapore	164	4,1
9	Netherlands	125	3,1
10	Mexico	124	3,1
34	Turkey	13	0,3
	World Total	3.987	100

Source: ITC Trademap, 2020

Table 2. Top Electrical and Electronics Importers, 2019, billion USD

No	Country	Exports	Share (%)
1	China	665	15,8
2	USA	590	14,0
3	Hong Kong	377	9,0
4	Germany	225	5,3
5	Japan	152	3,6
6	Singapore	131	3,1
7	South Korea	129	3,1
8	Mexico	127	3,0
9	Netherlands	122	2,9
10	Taiwan	118	2,8
34	Turkey	21	0,5
	World Total ¹	4.199	100

Source: ITC Trademap, 2020

Within this framework, export import coverage ratio is used to assess the performance of the sector. Bilateral trade data for Turkey and the countries that Turkey have free trade agreements is retrieved from the ITC Trademap database based on 6-digit HS codes of the electrical and electronics sector. Then the year before the FTA entered into force is selected as base year and export import coverage ratio indexes are constructed for each FTA accordingly.

1.2 Research Objectives

The objective of the research is to determine whether Turkey's FTAs have trade creation or trade diversion effect on the Turkish electrical and electronics sector.

1.3 Research Methodology and Data Analysis

Export import coverage ratio is a simple and significant tool for evaluating a country's or a sector's trade performance in different time periods. In order to determine the effects of Turkey's FTAs on the Turkish electrical and electronics sector, export import coverage ratios of Turkey and the partner country for each FTA are calculated and an index of export import coverage ratio is constructed while the year before the FTA entered into force is selected as base year. Bilateral trade data for Turkey and the countries that Turkey have free trade agreements is retrieved from the ITC Trademap database based on 6-digit HS codes of the electrical and electronics sector.² Since the latest available data on the ITC Trademap database belongs to 2001, it is accepted as base year for EFTA, Israel and Macedonia FTA which entered into force in the 1990s. Moreover, Venezuela, Kosovo, Montenegro, Palestine and Faroe Islands are not included in the analysis because lack of trade data or low trade volume.

¹ World export and import values are not equal mostly because of different measurement and recording methods as well as differences in exchange rates and processing errors. Exports are usually recorded with FOB values while imports are recorded with CIF values.

² A list of HS codes of electrical and electronics sector is attached. See Appendix 1: List of HS Codes of Electrical and Electronics Sector.

EFTA: The Free Trade Agreement between Turkey and EFTA was signed in 1992 and entered into force in 1992. According to the agreement EFTA abolished all tariffs upon entry into force of the agreement, while Turkey abolished all tariffs until 1999 gradually (Turkish Ministry of Trade, 2020).

Table 3. Turkey – EFTA Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to EFTA	TR EE Imports from EFTA	TR Total Exp/Imp	TR-EFTA Exp/Imp	TR Total Index Value	TR-EFTA Index Value
2001	1.403	3.795	9,2	63,3	37	12	100	100
2005	3.764	10.391	23,7	149,9	36	13	98	109
2008	10.712	19.213	84,7	275,7	56	24	151	205
2011	12.234	23.802	91,2	327,5	51	21	139	181
2014	13.824	26.675	147,2	345,9	52	41	140	353
2017	12.124	28.251	80,1	321,8	43	21	116	183
2018	13.125	22.592	94,6	309,0	58	25	157	214
2019	13.209	20.590	101,3	322,1	64	27	174	230

Source: ITC Trademap, 2020 and the authors' calculations

As shown in Table 3, Turkey's electrical and electronics exports and imports followed an upward trend despite some fluctuations in specific years, and export import coverage ratio increased from 37% to 64% from 2001 to 2019. On the other hand bilateral electrical and electronics trade between Turkey and EFTA also showed a similar trend and export import coverage ratio increased from 12% to 27% from 2001 to 2019. When the index values of export import ratios are calculated while 2001 is accepted as base year, it can be clearly seen that the sector's bilateral trade with EFTA outperformed the sector's total. While there is a 74 points rise in the index value of sector's general performance, the index value of sector's bilateral trade with EFTA export import showed a 130 points rise from 2001 to 2019 which refers to the trade creation effect of Turkey-EFTA Free Trade Agreement.

Israel: The Free Trade Agreement between Turkey and Israel was signed in 1996 and entered into force in 1997. According to the agreement both parties abolished all tariffs as of January, 2000 (Turkish Ministry of Trade, 2020).

Table 4. Turkey – Israel Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Israel	TR EE Imports from Israel	TR Total Exp/Imp	TR-Israel Exp/Imp	TR Total Index Value	TR-Israel Index Value
2001	1.403	3.795	35,2	20,5	37	172	100	100
2005	3.764	10.391	65,0	68,2	36	95	98	55
2008	10.712	19.213	205,4	120,7	56	170	151	99
2011	12.234	23.802	262,2	114,9	51	228	139	133
2014	13.824	26.675	278,4	176,3	52	158	140	92
2017	12.124	28.251	289,5	149,0	43	194	116	113
2018	13.125	22.592	277,1	159,4	58	174	157	101
2019	13.209	20.590	286,7	90,7	64	316	174	184

Source: ITC Trademap, 2020 and the authors' calculations

Table 4 shows that exports of Turkish electrical and electronics sector to Israel increased from 35,2 million USD in 2001 to 286,7 million USD in 2019. Although the sector's imports from Israel followed an uneven course and underperformed exports, it increased from 20.5 million USD in 2001 to 90,7 million USD in 2019. In this vein, the sector's export import coverage ratio also increased to 316 points in 2019. When the index values are calculated it is seen that the sector's bilateral trade performed better than the sector's total as of 2019. 74 points rise in the index value of the sector's total as opposed to 84 points rise in the index value of bilateral trade with Israel indicates that the FTA has a trade creation effect on the Turkish electrical and electronics sector.

Macedonia: The Free Trade Agreement between Turkey and Macedonia was signed in 1999 and entered into force in 2000. Turkey abolished all tariffs as of 2003 while Macedonia abolished all tariffs as of 2008 (Turkish Ministry of Trade, 2020).

Table 5. Turkey – Macedonia Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Macedonia	TR EE Imports from Macedonia	TR Total Exp/Imp	TR-Macedonia Exp/Imp	TR Total Index Value	TR-Macedonia Index Value
2001	1.403	3.795	3,8	0,4	37	880	100	100
2005	3.764	10.391	7,9	0,6	36	1.326	98	151
2008	10.712	19.213	30,1	0,5	56	5.496	151	624
2011	12.234	23.802	34,6	1,2	51	2.966	139	337
2014	13.824	26.675	43,6	4,9	52	890	140	101
2017	12.124	28.251	42,0	12,0	43	350	116	40
2018	13.125	22.592	44,5	9,9	58	450	157	51
2019	13.209	20.590	38,5	11,1	64	348	174	40

Source: ITC Trademap, 2020 and the authors' calculations

As shown in Table 5, the sector's exports to Macedonia increased from 3,8 million USD in 2001 to 38,5 million USD in 2019 while the imports reached up to 11,1 million USD in 2019 from 0,4 million USD in 2001. Although the export import coverage ratio of the sector's bilateral trade with Macedonia spiked after the agreement, it started to decrease substantially after 2011 and went down to 348% in 2019. On the other hand, the export import coverage ratio of the sector's total increased from 37% to 64% from 2001 to 2019. When the index values examined it is obvious that the sector's bilateral trade followed an opposite direction than the sector's total. In this regard 60 points decrease in the index value of the sector's bilateral trade with Macedonia as opposed to 74 points rise in the sector's total reflects the trade diversion effect of the free trade agreement between Macedonia and Turkey.

Bosnia-Herzegovina: The Free Trade Agreement between Turkey and Macedonia was signed in 2002 and entered into force in 2003. Turkey abolished all tariffs as the agreement entered into force while Bosnia-Herzegovina abolished all tariffs gradually until 2007 (Turkish Ministry of Trade, 2020).

Table 6. Turkey – Bosnia-Herzegovina Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Bosnia	TR EE Imports from Bosnia	TR EE Total Exp/Imp	TR-Bosnia Exp/Imp	TR EE Total Index Value	TR-Bosnia Index Value
2002	1.699	4.876	3,5	1,26	35	281	100	100
2005	3.764	10.391	16,0	0,15	36	10.837	104	3.857
2008	10.712	19.213	48,8	0,05	56	106.046	160	37.743
2011	12.234	23.802	36,4	2,65	51	1.372	148	488
2014	13.824	26.675	39,9	0,92	52	4.319	149	1.537
2017	12.124	28.251	35,9	1,45	43	2.481	123	883
2018	13.125	22.592	43,7	3,39	58	1.289	167	459
2019	13.209	20.590	39,8	4,29	64	927	184	330

Source: ITC Trademap, 2020 and the authors' calculations

As it is evident in Table 6, the sector's exports to Bosnia-Herzegovina increased 3,5 million USD to 39,8 million USD from 2002 to 2019 despite some fluctuations. However imports of the sector from Bosnia-Herzegovina increased within the same period yet not as much as the exports. On the other hand, the export import coverage ratio of the sector's bilateral trade followed a tremendously volatile course and ended up 927% in 2019 while it was 281% in 2002. Accordingly the index value of the sector's bilateral trade with Bosnia-Herzegovina spiked after the agreement but it started to diminish afterwards and went down to 330 points. However 230 points rise in the index value of sector's bilateral trade as opposed to 84 points rise in the index value of the sector's total indicates that the free trade agreement has a trade creation effect for the Turkish electrical and electronics sector.

Tunisia: The Free Trade Agreement between Turkey and Tunisia was signed in 2004 and entered into force in 2005. Turkey abolished all tariffs as the agreement entered into force while Tunisia abolished all tariffs gradually until 2014 (Turkish Ministry of Trade, 2020).

Table 7. Turkey – Tunisia Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Tunisia	TR EE Imports from Tunisia	TR EE Total Exp/Imp	TR-Tunisia Exp/Imp	TR EE Total Index Value	TR-Tunisia Index Value
2004	3.100	8.509	17,1	0,4	36	4.830	100	100
2005	3.764	10.391	27,4	0,7	36	4.138	99	86
2008	10.712	19.213	35,1	10,1	56	348	153	7
2011	12.234	23.802	50,3	11,0	51	455	141	9
2014	13.824	26.675	58,9	31,8	52	186	142	4
2017	12.124	28.251	59,1	28,3	43	209	118	4
2018	13.125	22.592	60,2	30,7	58	196	159	4
2019	13.209	20.590	45,4	23,0	64	197	176	4

Source: ITC Trademap, 2020 and the authors' calculations

As shown in Table 7, the sectors bilateral trade with Tunisia followed an upward trend despite some fluctuations. However the export import coverage ratio of the sector's bilateral trade with Tunisia decreased substantially after the agreement since the increase ratio of imports is significantly higher than increase ratio of exports. Similarly the index value of the sector's bilateral trade with Tunisia decreased tremendously and went down to 4 points in 2019. It is evident that 96 points decrease in the index value of the sector's bilateral trade with Tunisia in return for 76 points rise in the index value of the sector's total from 2004 to 2019 refers to a trade diversion effect of the Turkey-Tunisia free trade agreement.

Morocco: The Free Trade Agreement between Turkey and Morocco was signed in 2004 and entered into force in 2006. Turkey abolished all tariffs as the agreement entered into force while Morocco abolished all tariffs gradually until 2015 (Turkish Ministry of Trade, 2020).

Table 8. Turkey – Tunisia Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Morocco	TR EE Imports from Morocco	TR EE Total Exp/Imp	TR-Morocco Exp/Imp	TR EE Total Index Value	TR-Morocco Index Value
2005	3.764	10.391	15,06	5,22	36	289	100	100
2006	4.903	11.675	18,60	5,45	42	341	116	118
2008	10.712	19.213	52,71	4,66	56	1.130	154	391
2011	12.234	23.802	68,06	2,93	51	2.321	142	804
2014	13.824	26.675	104,05	3,05	52	3.414	143	1.182
2017	12.124	28.251	121,70	3,18	43	3.828	118	1.326
2018	13.125	22.592	148,80	3,73	58	3.993	160	1.383
2019	13.209	20.590	154,72	2,71	64	5.703	177	1.975

Source: ITC Trademap, 2020 and the authors' calculations

As it can be clearly seen from Table 8, the sector's exports to Morocco increased steadily from 2005 to 2019 while the sector's import from Morocco followed an opposite direction and decreased considerably. Therefore, the export import coverage ratio of the sector's bilateral trade with Morocco increased from 289% in 2005 to 5.703% in 2019. Accordingly the index value of the sector's bilateral trade with Morocco also increased up to 1.975 points in 2019 whereas the index value of the sector's total increased to 177 points in 2019 which refers to a trade creation effect of the free trade agreement between Turkey and Tunisia.

Egypt: The Free Trade Agreement between Turkey and Egypt was signed in 2005 and entered into force in 2007. Turkey abolished all tariffs as the agreement entered into force while Egypt abolished all tariffs gradually until 2020 (Turkish Ministry of Trade, 2020).

Table 9. Turkey – Egypt Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Egypt	TR EE Imports from Egypt	TR EE Total Exp/Imp	TR-Egypt Exp/Imp	TR EE Total Index Value	TR-Egypt Index Value
2006	4.903	11.675	32,9	3,9	42	855	100	100
2007	10.104	18.333	61,9	4,7	55	1.306	131	153
2008	10.712	19.213	73,4	4,7	56	1.575	133	184
2011	12.234	23.802	112,4	10,3	51	1.093	122	128

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2014	13.824	26.675	174,0	2,5	52	6.874	123	804
2017	12.124	28.251	202,6	22,4	43	904	102	106
2018	13.125	22.592	223,7	52,7	58	425	138	50
2019	13.209	20.590	209,7	60,8	64	345	153	40

Source: ITC Trademap, 2020 and the authors' calculations

As shown in Table 9, the sector's exports to Egypt increased substantially after the agreement. Additionally, the sector's import from Egypt increased more substantially despite some fluctuations. Accordingly, the export import coverage ratio of the sector's bilateral trade with Egypt also followed an uneven trajectory but in the end it decreased from 855% in 2006 to 345% in 2019. Therefore, the index value of the sector's bilateral trade with Egypt decreased to 40 points while the index value of the sector's total increased to 153 points. In this context, it is clear that the free trade agreement between Turkey and Egypt has a trade diversion effect for the Turkish electrical and electronics sector.

Albania: The Free Trade Agreement between Turkey and Albania was signed in 2006 and entered into force in 2008. Turkey abolished all tariffs as the agreement entered into force while Albania abolished all tariffs gradually until 2013 (Turkish Ministry of Trade, 2020).

Table 10. Turkey – Albania Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Albania	TR EE Imports from Albania	TR EE Total Exp/Imp	TR-Albania Exp/Imp	TR EE Total Index Value	TR-Albania Index Value
2007	10.104	18.333	26,0	0,05	55	57.731	100	100
2008	9.433	19.213	26,8	0,11	49	23.474	89	41
2010	10.638	20.636	25,1	0,50	52	4.995	94	9
2011	12.234	23.802	29,8	0,11	51	26.841	93	46
2014	13.824	26.675	27,5	2,41	52	1.143	94	2
2017	12.124	28.251	37,8	2,42	43	1.564	78	3
2018	13.125	22.592	33,9	2,12	58	1.595	105	3
2019	13.209	20.590	32,6	2,71	64	1.204	116	2

Source: ITC Trademap, 2020 and the authors' calculations

As shown in Table 10, the sector's exports to Albania increased mildly while imports followed a better trajectory from 2007 to 2019. In this regard, the export import coverage ratio of the sector's bilateral trade with Albania decreased substantially within the same period and the index value also tanked to 2 in 2019. In this regard, 98 points decrease in the index value of the sector's bilateral trade with Albania as opposed to 16 points rise in the index value of the sector's total refers to a trade diversion effect of the free trade agreement between Albania and Turkey.

Georgia: The Free Trade Agreement between Turkey and Georgia was signed in 2007 and entered into force in 2008. According to the agreement both parties abolished all tariffs as the agreement entered into force (Turkish Ministry of Trade, 2020).

Table 11. Turkey – Georgia Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Georgia	TR EE Imports from Georgia	TR EE Total Exp/Imp	TR-Georgia Exp/Imp	TR EE Total Index Value	TR-Georgia Index Value
2007*	10.104	18.333	69,2	0,1	55	121.330	100	100
2008	9.433	19.213	82,5	1,2	49	6.868	89	6
2010	10.638	20.636	79,3	2,8	52	2.822	94	2
2011	12.234	23.802	121,8	15,9	51	764	93	1
2014	13.824	26.675	168,3	17,5	52	962	94	1
2017	12.124	28.251	118,3	10,0	43	1.187	78	1
2018	13.125	22.592	129,1	8,8	58	1.463	105	1
2019	13.209	20.590	143,3	6,6	64	2.183	116	2

Source: ITC Trademap, 2020 and the authors' calculations

It is evident in Table 11 that the sector's exports to Georgia increased steadily after the agreement and reached up to 143,3 million USD in 2019. On the other hand, the imports of the sector from Georgia increased until 2017 but it started to decrease afterwards and went down to 6,6 million USD in 2019. In this regard, at first

the export import coverage ratio of the sector decreased substantially until 2017 and then it started to increase again. Correspondingly the index value of the sector's bilateral trade with Georgia decrease to 2 points in 2019 while the index value of the sector's total increased to 116 points in 2019. In this context it is clear that the free trade agreement between Georgia and Turkey has a trade diversion effect on the Turkish electrical and electronics sector.

Serbia: The Free Trade Agreement between Turkey and Serbia was signed in 2009 and entered into force in 2010. According to the agreement Turkey abolished all tariffs as the agreement entered into force while Serbia abolished all tariffs gradually until 2015 (Turkish Ministry of Trade, 2020).

Table 12. Turkey – Serbia Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Serbia	TR EE Imports from Serbia	TR EE Total Exp/Imp	TR-Serbia Exp/Imp	TR EE Total Index Value	TR-Serbia Index Value
2009	10.712	17.000	37,2	1,1	63	3.349	100	100
2010	10.638	20.636	39,7	2,3	52	1.762	82	53
2012	13.101	23.622	72,4	4,9	55	1.490	88	44
2014	13.824	26.675	89,1	2,7	52	3.267	82	98
2016	11.449	27.019	92,9	5,8	42	1.608	67	48
2017	12.124	28.251	112,6	13,5	43	833	68	25
2018	13.125	22.592	145,4	27,9	58	522	92	16
2019	13.209	20.590	140,0	36,9	64	379	102	11

Source: ITC Trademap, 2020 and the authors' calculations

Table 12 shows that exports of the Turkish electrical and electronics sector to Serbia increased steadily while import of the sector from Serbia performed better than exports. Therefore, the export import coverage ratio of the sectors' bilateral trade with Serbia decreased from 3.349% in 2009 to 379% in 2019. Similarly, the index value of the sector's bilateral trade with Serbia decreased to 11 points. In this context, 89 points decrease in the index value of the sector's bilateral trade with Serbia in return for 2 points rise in the index value of the sector's total indicates a trade diversion effect of the free trade agreement between Turkey and Serbia.

Chile: The Free Trade Agreement between Turkey and Chile was signed in 2009 and entered into force in 2011. According to the agreement Turkey abolished all tariffs as the agreement entered into force while Chile abolished all tariffs gradually until 2015 (Turkish Ministry of Trade, 2020).

Table 13. Turkey – Chile Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Chile	TR EE Imports from Chile	TR EE Total Exp/Imp	TR-Chile Exp/Imp	TR EE Total Index Value	TR-Chile Index Value
2010	10.638	20.636	4,0	0,02	52	26.733	100	100
2011	12.234	23.802	12,0	0,01	51	240.660	100	900
2012	13.101	23.622	5,2	0,04	55	11.877	108	44
2014	13.824	26.675	6,7	0,05	52	13.871	101	52
2016	11.449	27.019	9,9	0,00	42	#SAYI/0!	82	#SAYI/0!
2017	12.124	28.251	11,9	0,05	43	24.369	83	91
2018	13.125	22.592	10,3	0,01	58	128.775	113	482
2019	13.209	20.590	15,3	0,01	64	254.983	124	954

Source: ITC Trademap, 2020 and the authors' calculations

It is evident in Table 13 that Turkey's electrical and electronics exports to Chile increased from 4 million USD in 2010 to 15,3 million USD in 2019 despite some fluctuations. Nonetheless, the sector's imports from Chile remained insignificant even after the agreement and the export import coverage ratio of the sector's trade with Chile increased substantially. Accordingly the index value of the sector's bilateral trade with Chile increased to 954 points. In this regard, 854 points rise in the index value of the sector's bilateral trade with Chile as opposed to 24 points increase in the index value of the sector's total indicates a trade creation effect of the free trade agreement between Chile and Turkey.

Mauritius: The Free Trade Agreement between Turkey and Mauritius was signed in 2011 and entered into force in 2013. According to the agreement Turkey abolished all tariffs except for some textile products as the agreement entered into force while Mauritius will abolish all tariffs gradually until 2022 (Turkish Ministry of Trade, 2020).

Table 14. Turkey – Mauritius Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Mauritius	TR EE Imports from Mauritius	TR EE Total Exp/Imp	TR-Mauritius Exp/Imp	TR EE Total Index Value	TR-Mauritius Index Value
2012	13.101	23.622	7,24	0,13	55	5.788	100	100
2013	13.286	26.146	5,75	0,11	51	5.274	92	91
2014	13.824	26.675	7,79	0,08	52	9.738	93	168
2015	11.953	25.225	6,56	0,10	47	6.629	85	115
2016	11.449	27.019	6,68	0,09	42	7.594	76	131
2017	12.124	28.251	18,74	0,11	43	16.882	77	292
2018	13.125	22.592	9,89	0,29	58	3.459	105	60
2019	13.209	20.590	10,44	0,07	64	14.105	116	244

Source: ITC Trademap, 2020 and the authors' calculations

As shown in Table 14, Turkey's electrical and electronics exports to Mauritius increased to 10,44 million USD in 2019 although it followed an uneven course from 2012 to 2019. On the other hand, the imports from Mauritius followed an opposite direction and fell back to nearly 70 thousand USD in 2019. Accordingly the export import coverage ratio of the sector's bilateral trade with Mauritius increased tremendously and, the index value increased to 244 points. In this context, 144 points rise in the index value of the sector's bilateral trade with Mauritius in return for 16 points rise in the sector's total indicates a trade creation effect of the free trade agreement between Turkey and Mauritius.

South Korea: The Free Trade Agreement between Turkey and South Korea was signed in 2012 and entered into force in 2013. South Korea abolished 85% of custom tariffs while Turkey abolished 65% of custom tariffs as the agreement entered into force. Parties agreed to eliminate 90% of all tariffs until January 2023(Turkish Ministry of Trade, 2020).

Table 15. Turkey – South Korea Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to S.Korea	TR EE Imports from S.Korea	TR EE Total Exp/Imp	TR-S.Korea Exp/Imp	TR EE Total Index Value	TR-S.Korea Index Value
2012	13.101	23.622	20	1.416	55	1	100	100
2013	13.286	26.146	23	1.567	51	1	92	102
2014	13.824	26.675	18	2.145	52	1	93	61
2015	11.953	25.225	23	1.861	47	1	85	89
2016	11.449	27.019	44	1.271	42	3	76	245
2017	12.124	28.251	29	916	43	3	77	223
2018	13.125	22.592	21	707	58	3	105	213
2019	13.209	20.590	18	453	64	4	116	285

Source: ITC Trademap, 2020 and the authors' calculations

It is evident in Table 15 that both exports and imports of Turkey from South Korea decreased substantially especially after 2016. Since the decrease in imports of the sector from South Korea is higher than exports, the export import coverage ratio of bilateral trade increased 4% in 2019 from 1% in 2012. Accordingly, the index value of the sector's bilateral trade with South Korea increased to 285 points in 2019. In this context 185 points rise in the index value of the sector's bilateral trade with South Korea in return for 16 points rise in the sector's total indicates a trade creation effect of the free trade agreement between South Korea and Turkey.

Malaysia: The Free Trade Agreement between Turkey and Malaysia was signed in 2014 and entered into force in 2015. According to the agreement parties agreed to abolish 70% of custom tariffs bilaterally as the agreement entered into force and after 8 years of transition period is stipulated for the remaining tariffs (Turkish Ministry of Trade, 2020).

Table 16. Turkey – Malaysia Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Malaysia	TR EE Imports from Malaysia	TR EE Total Exp/Imp	TR-Malaysia Exp/Imp	TR EE Total Index Value	TR-Malaysia Index Value
2014	13.824	26.675	12,0	270,6	52	4,4	100	100
2015	11.953	25.225	12,0	227,1	47	5,3	91	119

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2016	11.449	27.019	10,4	484,7	42	2,1	82	49
2017	12.124	28.251	13,6	957,9	43	1,4	83	32
2018	13.125	22.592	12,9	336,0	58	3,8	112	87
2019	13.209	20.590	12,8	329,4	64	3,9	124	88

Source: ITC Trademap, 2020 and the authors' calculations

As shown in Table 16, Turkey's electrical and electronics exports to Malaysia remained stable while the imports increased from 2014 to 2019. The export import coverage ratio of the sector's bilateral trade with Malaysia also decreased mildly within the same period. Accordingly the index value of the bilateral trade with Malaysia decreased to 88 points. In this regard, 12 points decrease in the index value of the sector's bilateral trade with Malaysia in return for 24 points rise in the sector's total reflects a trade diversion effect of Turkey-Malaysia free trade agreement.

Moldova: The Free Trade Agreement between Turkey and Moldova was signed in 2014 and entered into force in 2016. According to the agreement Turkey abolished all tariffs as the agreement entered into force Moldova abolished all tariffs gradually until November 2020 (Turkish Ministry of Trade, 2020).

Table 17. Turkey – Moldova Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Moldova	TR EE Imports from Moldova	TR EE Total Exp/Imp	TR-Moldova Exp/Imp	TR EE Total Index Value	TR-Moldova Index Value
2015	11.953	25.225	11,63	0,03	47	38.780	100	100
2016	11.449	27.019	10,45	0,03	42	41.804	89	108
2017	12.124	28.251	11,91	0,03	43	47.632	91	123
2018	13.125	22.592	14,60	0,09	58	16.779	123	43
2019	13.209	20.590	17,24	0,07	64	25.357	135	65

Source: ITC Trademap, 2020 and the authors' calculations

As shown in Table 17, Turkey's electrical and electronics exports to Moldova increased slightly while imports from Moldova also increased but remained insignificant despite the agreement. On the other hand the export import coverage ratio of the sector's bilateral trade with Moldova decreased substantially. Accordingly the index value of the sector's bilateral trade with Moldova decreased to 65 points. In this context 35 points decrease in the index value of the bilateral trade with Moldova as opposed to 35 points rise in the index value of the sector's total indicates a trade diversion effect of the free trade agreement between Moldova and Turkey.

Singapore: The Free Trade Agreement between Turkey and Singapore was signed in 2015 and entered into force in 2017. According to the agreement Turkey abolished 80% of custom tariffs as the agreement entered into force and in 10 years it will go up to 95% while Singapore abolished all custom tariffs upon entry into force (Turkish Ministry of Trade, 2020).

Table 18. Turkey – Singapore Electrical and Electronics Sector Trade Data, million USD

Years	TR EE Total Exports	TR EE Total Imports	TR EE Exports to Singapore	TR EE Imports from Singapore	TR EE Total Exp/Imp	TR-Singapore Exp/Imp	TR EE Total Index Value	TR-Singapore Index Value
2016	11.449	27.019	25,6	124,5	42	21	100	100
2017	12.124	28.251	21,6	122,3	43	18	101	86
2018	13.125	22.592	24,6	94,1	58	26	137	127
2019	13.209	20.590	24,8	69,0	64	36	151	175

Source: ITC Trademap, 2020 and the authors' calculations

It is evident in Table 18 that Turkey's electrical and electronics exports to Singapore decrease slightly after the free trade agreement while imports decreased substantially from 2016 to 2019. Therefore, the export import coverage ratio of the sector's bilateral trade with Singapore increased from 21% to 36%. Similarly, the index value of the bilateral trade increased to 175 points in 2019. In this context 75 points rise in the index value of the sector's bilateral trade with Singapore in return for 51 points rise in the sector's total indicates a trade creation effect of the free trade agreement between Turkey and Singapore.

Cables	Telecommunication Cables	854449
	Medium and High Voltage Energy Cables	854460
	Enameled Winding Wire	854411, 854419
	Coaxial Cables	854420
	Conductors Fitted with Connectors	854442
	Fiber Optic Cables	854470
Electricity Production and Distribution Equipment	Electricity Energy	271600
	Transformers and Inductors	850410, 850421, 850422, 850423, 850431, 850432, 850433, 850434, 850440, 850450, 850490
	Generators and Converters	850211, 850212, 850213, 850220, 850231, 850239, 850240
	Electric Motors and Alternators	850110, 850120, 850131, 850132, 850133, 850134, 850140, 850151, 850152, 850153, 850161, 850162, 850163, 850164
	Accumulators, Cells and Batteries	850610, 850630, 850640, 850650, 850660, 850680, 850690, 850710, 850720, 850730, 850740, 850750, 850760, 850780, 850790
	Circuit Breakers, Relays and Fuses	853510, 853521, 853529, 853530, 853540, 853590, 853610, 853620, 853630, 853641, 853649, 853650, 853661, 853669, 853670, 853690
	Panels	853710, 853720, 853810, 853890
	Lighting Equipment	851310, 851390, 853910, 853921, 853922, 853929, 853931, 853932, 853939, 853941, 853949, 853990, 940510, 940520, 940530, 940540, 940550, 940560, 940591, 940592, 940599
Consumer Electronics	TV Receivers	852872
	LCD Panel	853120
	Electric heaters	851631, 851633, 851680, 851690
	Small Household Appliances	850811, 850819, 850860, 850870, 850940, 850980, 850990, 851010, 851020, 851030, 851090, 851610, 851632, 851640, 851671, 851672, 851679
	Measuring Devices and Instruments	901410, 901420, 901480, 901490, 901510, 901520, 901530, 901540, 901580, 901590, 901600, 901720, 901730, 901780, 901790, 902480, 902490, 902511, 902519, 902580, 902590, 902610, 902620, 902680, 902710, 902720, 902730, 902750, 902780, 902790, 902810, 902820, 902830, 902890, 902910, 902990, 903010, 903020, 903031, 903032, 903033, 903039, 903040, 903082, 903084, 903089, 903090, 903110, 903120, 903141, 903149, 903180, 903190, 903210, 903220, 903281, 903289, 903290
	Data Processing Machines and Units	844332, 847130, 847141, 847149, 847150, 847160, 847170, 847180, 847190, 847330, 852842, 852852, 852862
	Medical Equipment and Devices	901811, 901812, 901813, 901814, 901819, 901820, 901832, 901839, 901841, 901849, 901850, 901890, 901910, 901920, 902140, 902150, 902190, 902212, 902213, 902214, 902219, 902221, 902229, 902230, 902290
	Telephone Apparatus and Stations	844331, 851711, 851712, 851718, 851761, 851762, 851769
	Sound and Video Apparatus and Stripes	851810, 851821, 851822, 851829, 851830, 851840, 851850, 851890, 851920, 851930, 851950, 851981, 851989, 852110, 852190, 852321, 852329, 852341, 852349, 852351, 852359, 852380, 852712, 852713, 852719, 852721, 852729, 852791, 852792, 852799
	Typewriters, Calculating Machines and Office Machines	846900, 847010, 847021, 847029, 847030, 847050, 847290, 847321, 847329, 847340, 847350
Other Durable Goods	852550, 852560, 852580, 852610, 852691, 852692, 854370, 910211, 910212, 910219, 910221, 910229, 910291, 910299, 910310, 910390, 910511, 910519, 910521, 910529, 910591, 910599, 910610, 910690, 910700, 910811, 910812, 910819, 910820, 910890, 910910, 910990, 911011, 911012, 911019, 911090, 911110, 911120, 911180, 911190, 911220, 911290, 911390, 911410, 911430, 911440, 911490	

	Other Electrical and Electronics Equipment	844339, 844399, 845090, 848620, 848630, 848640, 848690, 850300, 851230, 851770, 852210, 852290, 852352, 852849, 852859, 852869, 852871, 852873, 852910, 852990, 853080, 853090, 853110, 853180, 853190, 853210, 853221, 853222, 853223, 853224, 853225, 853229, 853230, 853290, 853310, 853321, 853329, 853331, 853339, 853340, 853390, 853400, 853950, 854011, 854012, 854020, 854040, 854060, 854071, 854079, 854081, 854089, 854091, 854099, 854110, 854121, 854129, 854130, 854140, 854150, 854160, 854190, 854231, 854232, 854233, 854239, 854290, 854310, 854320, 854330, 854390, 854511, 854519, 854520, 854590, 854610, 854620, 854690, 854710, 854720, 854790, 854810, 854890, 900110, 900211, 900219, 900220, 900290, 900510, 900580, 900590, 900630, 900640, 900651, 900652, 900653, 900659, 900661, 900669, 900691, 900699, 900710, 900720, 900791, 900792, 900850, 900890, 901010, 901050, 901060, 901090, 901110, 901120, 901180, 901190, 901210, 901290, 901310, 901320, 901380, 901390, 903300, 920710, 920790, 920994, 950300, 950430, 950450, 950490, 960390, 962000
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