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Turkey's Current Account Deficit Problem and Integration into the Economic and Monetary Union of the European Union

Emre Ünal

Department of International Trade, Faculty of Economics, Administrative and Social Sciences, Istanbul Gelisim University, Turkey

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ABSTRACT

Most of the countries in the Economic and Monetary Union (EMU) of the European Union (EU) experienced currency overvaluation and high production costs between 2003 and 2011, which increased their current account deficits. Despite not being an EMU member, Turkey's current account deficit increased in parallel with those of most EMU countries. Although Turkey experienced technological upgrades that changed low- and medium-tech industries into medium- and high-tech industries, increasing exports relative to those of EU countries, it also experienced a high trade deficit, the highest unit labor cost growth in export goods, and one of the most overvalued currencies. Its high production costs, overvalued currency, and industrial policies in the transport equipment industry following technological change combined with insufficient investment in the promotion of low- and medium-tech industries worsened Turkey's trade deficit in the 2000s. Therefore, to increase its ability to compete with EU economies and reduce its trade deficit, Turkey must implement new institutional changes to fix its wage rate growth to the productivity growth of export goods and design new policies in those industries where the trade deficit was stimulated.

Keywords: EMU, technological upgrade, macroeconomic factors, institutional factors, industrial policies

JEL Codes: E2, F5, O4

Corresponding author: Department of International Trade, Faculty of Economics, Administrative and Social Sciences, Istanbul Gelisim University, Cihangir Mahallesi Şehit Piyade Onbaşı Murat Şengöz Sokak No:8 34310, Avcılar/ Istanbul, Turkey. E-mail: emunal@gelisim.edu.tr

1 Introduction

1.1 Integration into the Economic and Monetary Union under a compounding trade deficit

This paper was designed around research questions that are important for explaining Turkey's likely position in the Economic and Monetary Union (EMU) after its accession by considering its macroeconomic factors and industrial policies. First, what factors played a significant role in accelerating the trade deficit in the 2000s? Second, should Turkey become part of the European Union (EU) or EMU before producing new institutional changes to reshape the configuration of its current account deficit? Third, what kinds of precautions should Turkey take in terms of its institutional factors and industrial policies to eliminate the influence of the trade deficit problem? In this paper, the political implications of these questions are starkly revealed and the solutions explained under four policies that aim to reduce the trade deficit in Turkey: (1) the technological upgrading of industries, (2) the effects of increasing foreign direct investment (FDI) inflows, (3) the strategy of multinational automobile companies, and (4) currency overvaluation given the macroeconomic factors in Turkey.

During the 2000s, Turkey made institutional changes towards adhering to the EU's main ideas about functioning market economic policies under the Copenhagen Criteria, which are connected to the Maastricht Criteria that aim to prepare countries for EMU membership. After Turkey joined the EU Customs Union in the mid-1990s, EU membership became relatively less important, and the EMU became a process by which the country could implement the institutional changes required to reduce government debt and create an open and free market economy, thus eliminating the differences in macroeconomic factors that existed between Turkey and EMU countries. Although Turkey reduced its inflation to below 10% and lowered government debt in the 2000s,¹ its trade deficit and current account deficit were stimulated.

Turkey's institutional changes have integrated it more deeply with EU countries in terms of its economic and political development, even though it has not joined the EU. The European Commission intends that the EU should remain an important anchor for the Turkish economy and that Turkey should continue implementing free functioning economic policies.² While many political views of Turkish integration are available,³ this paper takes an economic perspective.

¹The International Monetary Fund (IMF) database country category is Emerging and Developing Europe and the statistical category is Government Finance in 2002. While the government deficit to GDP ratio was -14.4% in 2002, it was -1.8% in 2012. See <http://www.imf.org/external/pubs/ft/weo/2014/01/weodata/weoselgr.aspx> (last accessed on February 15, 2016).

²For additional information, see *Turkey Progress Report of 2014* of the European Commission. See http://ec.europa.eu/enlargement/pdf/key_documents/2014/20141008-turkey-progress-report_en.pdf (last accessed on February 15, 2016).

³From the European Commission report *Indicative Strategy Paper for Turkey (2014–2020)* on its accession to the EU. For additional information, see <http://ec.europa.eu/enlargement/pdf/>

1.2 Configuration of bilateral trade between Turkey and the EU

The Turkish economy is analyzed by considering three institutional factors: (i) the exchange rate system, (ii) wage–labor relations related to wages, productivity, and purchasing power parity (PPP),⁴ and, most importantly, (iii) international insertion, related to the EU Customs Union and configuration of bilateral trade, which has increased the importance of macroeconomic factors. Turkey can stabilize its macroeconomic factors, unlike in the era before the 2000–2001 economic crisis, because the volatility of the lira has decreased and inflation has fallen significantly. However, after Turkey joined the Customs Union, it became a new market for EU countries, which stimulated its current account deficit in the 2000s because of unfavorable macroeconomic factors and industrial policies.

This work considers the relevant macroeconomic factors to be the productivity growth of non-tradable goods and export goods, wage growth, inflation, the exchange rate, PPP, and the current account balance. In addition, Turkey's trade balance with EU countries is examined in low- and medium-tech industries and medium- and high-tech industries to isolate what caused the principle problem in industrial policies. This reveals that Turkey experienced a technological upgrade but that its trade deficit was accelerated by low- and medium-tech industries and the transport equipment industry. These changes help define what should be the new industrial policies of Turkey.

The remainder of this paper is organized as follows. In Section 2, Turkey's trade balance is considered by using several country groups separated by the largest investor and other EU countries during the 2000s. Furthermore, the configuration of bilateral trade between Turkey and EU countries is examined by taking into account intermediate goods and final goods. In Section 3, the causes of Turkey's increasing trade deficit are explained in terms of the technological upgrading of industries followed by the increasing import dependency, the effects of increased FDI, the strategy of multinational automobile companies that made subsequent industrial policies visible to discuss, and currency overvaluation relative to EU countries. By examining the period from 2003 to 2011, it is clear that nations with deepening problems with their current account deficit experienced wage rate growth that surpassed the productivity growth of export goods, while the euro

key_documents/2014/20140919-csp-turkey.pdf (last accessed on February 15, 2016). Another recent work is Tocci (2014), whose political view is that Turkey and the EU have a complex relationship but are on the same journey. Eralp (2014) discussed the accession of Turkey to the EU in political terms by pointing out that Turkey is a strategic partner rather than an accession partner of the EU.

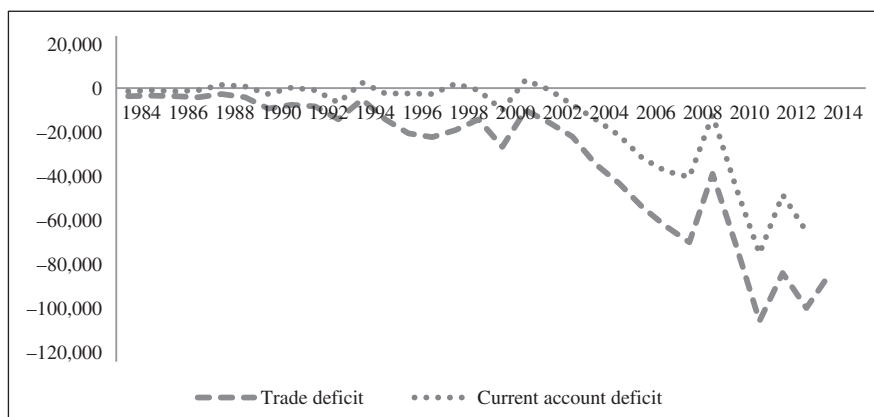
⁴PPP = *export price of Germany* / *export price of Turkey*. The export price comprises the mark-up rate, unit labor cost (ULC), and imported material cost. This condition was considered following the unit labor cost parity (ULCP) approach for constant mark-up rates. The ULCP is defined as the natural exchange rate, real exchange rate, or PPP (Uni, 2007, 2012). For the PPP, see Cassel (1918) and Dornbusch (1985). The PPP allows us to determine the over or undervaluation of a nation's currency. If the PPP's appreciation is higher than that of the exchange rate, it means that the national currency is undervalued. For additional information, see Ünal (2016a).

became overvalued under the fixed exchange rate system. In addition, although Turkey was not part of the EMU, its current account deficit was stimulated in parallel with those of most EMU countries. Hence, institutional factors were behind the current account deficits related to the Customs Union agreement and wage rate growth problem that led to high production costs, an overvalued currency, and reduced competitiveness, which increased Turkey's current account deficit. In Section 4, the conditions of Turkey's integration into the EMU are explained. Finally, possible institutional changes are discussed by considering macroeconomic factors and industrial policies that can increase Turkey's competitiveness and reduce its trade deficit are highlighted.

2 Composition of the trade deficit in Turkey

Turkey has experienced a trade deficit since its agricultural growth period of the 1950s. During the 1950s, Turkey implemented liberal economic policies in accordance with the newly elected Democrat Party's program. Given that the country's manufacturing industries were undeveloped, agricultural growth was predominant, and this sector needed production machinery to meet increasing demand. It therefore became necessary for Turkey to import to maintain its agricultural production. The country thus suffered a substantial trade deficit, which became chronic in the subsequent years.⁵

Figure 1. Trade deficit and current account deficit in Turkey (million US dollars)



Source: Author's calculations. The trade deficit was derived from TurkStat (foreign trade statistics) and the current account balance was derived from the OECD.

⁵In the 1930s and 1940s, the trade balance was under the control of the government and its configuration was a surplus. Source: TurkStat (foreign trade statistics).

To eliminate the trade deficit and enable industrialization, import substitution policies were implemented in the 1960s and 1970s under a series of five-year development plans. However, these policies could not reduce the problem and Turkey experienced a new transformation at the beginning of the 1980s following unprecedented deregulation and export growth strategies. The economic policies of Turkey attempted to compensate for imports by stimulating exports from partly developed manufacturing industries. Nevertheless, these policies failed because of an unstable, overvalued national currency and high production costs, which caused chronic inflation in the economy. Although Turkey had experienced a trade deficit since the 1950s, this grew massively in the 2000s and 2010s. This marks the period when the trade deficit became a major problem in Turkey's current account balance.

The 1980s heralded important institutional changes for export growth as Turkey began implementing open economic strategies alongside privatization and a weakening of trade unions. However, these changes did not accelerate the current account deficit compared with the 2000s. As shown in Figure 1, a sharp decrease in the trade deficit occurred after 2002 when these new institutional changes took root and affected the Turkish economy following the economic crisis of 2000–2001. The trade deficit further stimulated a current account deficit, and the two moved in parallel thereafter. This figure thus demonstrates that if Turkey has problems with its trade deficit, it cannot reduce its current account deficit. Furthermore, if Turkey could avoid a trade deficit, that would become an important factor in eliminating its current account deficit. Hence, in the following sections, Turkey's trade deficit and its connection with industry are analyzed in view of possible integration with the EMU. Analyzing the trade deficit problem in Turkey is important not only for the EU, but also for international trade.

2.1 Turkey's trade balance with country groups

Table 1 shows the top five countries by current account deficit in 2013. Turkey was fourth and it had the highest deficit in terms of GDP. In 2013, its current account deficit was approximately USD 65 billion, higher than that of any EU country except the United Kingdom. Its current account balance as a proportion of GDP was -7.9% .

Table 1. Top five countries by their current account deficits in 2013 (billion US dollars)

Category	United States	United Kingdom	Brazil	Turkey	Canada
Volume	-400 (-2.4)	-120 (-4.3)	-81 (-3.6)	-65 (-7.9)	-54 (-3.0)

Source: The World Bank (current account balance). Parentheses show the current account balance as a percentage of GDP.

The largest proportion of the current account deficit was caused by Turkey's trade deficit.⁶ Tables 2 and 3 consider two country groups to show the clear difference in Turkey's trade deficit in intermediate goods and final goods with EU countries. The first group comprises Turkey's large investor partners in terms of FDI inflows: Austria (6.1%), Belgium (4.4%), Finland (5.5%), France (8.4%), Germany (11.7%), Greece (3.3%), Italy (3.6%), Luxembourg (6.3%), the Netherlands (26.4%), Spain (4.7%), and the United Kingdom (9.2%). The numbers in parentheses show each country's investment as a percentage of the total FDI inflows to Turkey. Between 2000 and 2014, FDI inflows from EU countries constituted 80% of the total FDI inflows to Turkey. Approximately 4% of this FDI inflow came from Russia (for energy industries) and the rest came from other countries (see Table 6A in the appendix for FDI targets by number of firms).⁷

During the analyzed period, large investor countries mainly invested in manufacturing industries. The transport equipment industry attracted 21.9% of the total FDI inflows from 2000 to 2014. The chemical and chemical products industry attracted 11.4% and the electrical and optical equipment industry attracted 10.5% of the total FDI inflows. These three industries attracted the largest share of FDI inflows. The machinery industry received 3.4% of the total FDI inflows, whereas the textile and textile products industry and the leather, leather, and footwear industry attracted only 1.2%, the lowest percentage among all other industries.⁸

The second group comprises other EU countries: the Czech Republic, Estonia, Hungary, Ireland, Poland, Portugal, Slovakia, Slovenia, and Sweden. While these countries did not produce a significant amount of FDI inflows, they became important causes of Turkey's trade deficit, particularly the Czech Republic, Hungary, and Poland, which have close economic relationships with Turkey.

In Tables 2 and 3, the industries are classified into two categories: low- and medium-tech industries and medium- and high-tech industries. The latter include the chemical and chemical products industry, machinery industry, electrical and optical equipment industry, and transport equipment industry. The remaining sectors are classified as low- and medium-tech industries.⁹

Table 2 shows Turkey's trade balance with its large investor countries in the EU. In 1995, Turkey had a small trade deficit in intermediate goods in low- and medium-tech industries relative to later years (USD -417.8 million). From 1995 to 2011, however, the trade deficit increased to USD -3,106.5 million because of significant

⁶Since 1990, China's exports to Turkey have increased consistently. However, the trade deficit caused by China is not the only problem in Turkey. Turkey's trade deficit with EU countries has increased as well.

⁷The author's own calculations. FDI inflows were derived from the Central Bank of the Republic of Turkey (CBRT, international investment position).

⁸The author's own calculations. The FDI inflows were derived from the CBRT (international investment position).

⁹Under the OECD classification, chemical and chemical products, machinery, electrical and optical equipment, and transport equipment are considered to be medium- and high-tech, while the other industries are considered to be low- and medium-tech. For additional information, see the OECD (2011) <http://www.oecd.org/sti/ind/48350231.pdf> (last accessed on February 15, 2016).

Table 2. Turkey's trade balance with large investor countries in the EU (million US dollars)

Industry	Trade balance of intermediate goods			Trade balance of final goods		
	1995	2003	2011	1995	2003	2011
Agriculture, hunting, forestry, and fishing	201.2	-4.6	-191.4	1051.1	1038.2	1680.6
Mining and quarrying	166.7	22.1	304.5	-1.68	-0.7	10.8
Food, beverages, and tobacco	-140.0	-216.9	-380.8	1094.9	964.1	1829.1
Textile and textile products	410.9	499.1	-1313.0	6196.9	8143.9	1992.3
Leather, leather and footwear	-120.2	-65.9	-47.3	114.9	29.7	3.7
Wood and products of wood, and cork	-13.5	-52.0	-159.8	-3.4	0.27	5.0
Pulp, paper, printing and publishing	-272.0	-693.6	-194.3	-14.7	-56.9	48.4
Coke, refined petroleum and nuclear fuel	-59.5	-239.6	-761.2	32.5	20.2	-116.5
Rubber and plastics	-149.6	-114.7	339.9	-58.2	-49.7	68.0
Other non-metallic minerals	91.7	422.4	-1478.0	32.7	80.2	148.8
Basic metals and fabricated metals	-590.6	-826.8	534.5	-157.1	30.7	265.3
Manufacturing, Nec; recycling	57.0	-26.1	240.5	-70.7	159.1	-209.2
Sub-total of low-and medium-tech	-417.8	-1296.6	-3106.5	8217.3	10359.0	5726.8

(continued)

Table 2. Continued						
Industry	Trade balance of intermediate goods			Trade balance of final goods		
	1995	2003	2011	1995	2003	2011
Chemical and chemical products	-1922.3	-3598.9	-371.9	-305.1	-1322.4	-81.4
Machinery	-640.7	-559.6	901.2	-3036.9	-2612.8	-230.6
Electrical and optical equipment	-426.0	-268.2	1155.2	-838.5	-983.9	285.2
Transport equipment	-932.6	-975.0	-1744.4	-619.6	-503.8	-6198.1
Sub-total of medium-and high-tech	-3921.6	-5401.7	-59.8	-4800.4	-5423.0	-6224.8
Total	-4339.4	-6698.3	-3166.4	3416.8	4936.0	-498.0

Source: Author's own calculations.
Note: Gray cells show the two years, from 2003 to 2011, whose difference with each other exceeded one billion US dollars.^a

^aCalculations were made by using the WIOD international input-output tables, which were derived from http://www.wiod.org/new_site/database/wiods.htm (last accessed on February 15, 2016). For the gray cells, for instance, in the trade balance of intermediate goods, the machinery industry experienced a USD 1,460.8 million change from 2003 to 2011.

Table 3. Turkey's trade balance with other EU countries (million US dollars)

Industry	Trade balance of intermediate goods				Trade balance of final goods			
	1995		2003		1995		2003	
	1995	2003	1995	2003	1995	2003	1995	2003
Agriculture, hunting, forestry, and fishing	-4.7	21.4	-113.4	11.1	74.2	18.9		
Mining and quarrying	-9.6	-39.8	-138.6	-0.2	0.1	1.8		
Food, beverages and tobacco	-26.8	-29.1	-35.6	56.7	23.3	-240.6		
Textile and textile products	18.7	181.8	161.1	94.6	422.8	81.4		
Leather, leather and footwear	0.6	-2.7	3.6	7.8	11.8	4.5		
Wood and products of wood, and cork	-2.0	-12.5	-39.0	0.0	0.6	-3.3		
Pulp, paper, printing and publishing	-50.2	-150.1	-139.9	-10.8	-50.3	-39.8		
Coke, refined petroleum and nuclear fuel	-7.5	-9.5	-17.9	-0.6	3.5	-1.2		
Rubber and plastics	10.4	15.9	-14.7	-1.7	0.8	-70.5		
Other non-metallic minerals	8.4	72.4	-185.6	2.5	11.1	-15.0		
Basic metals and fabricated metals	-40.8	-28.3	266.6	-2.6	-1.4	1.1		
Manufacturing, Nec; recycling	4.1	-0.1	-0.8	5.2	43.3	-129.4		
Sub-total of low- and medium-tech	-99.5	19.1	-254.5	162.4	540.2	-392.2		

(continued)

Industry	Table 3. Continued					
	Trade balance of intermediate goods			Trade balance of final goods		
	1995	2003	2011	1995	2003	2011
Chemical and chemical products	-101.6	-248.3	-11.7	2.2	-108.4	12.3
Machinery	-17.0	-3.9	176.1	-89.5	-6.7	75.3
Electrical and optical equipment	-30.7	-176.8	123.0	-203.6	-437.4	-1138.3
Transport equipment	-11.1	199.6	-558.7	-181.9	506.1	-1020.8
Sub-total of medium- and high-tech	-160.5	-229.5	-271.3	-472.9	-46.5	-2071.5
Total	-260.0	-210.4	-525.8	-310.5	493.6	-2463.7
Source: See Table 2.						

changes in volume. For instance, the trade balance in the textile and textile products industry fell from a surplus of USD 499.1 million to a deficit of USD -1,313.0 million. Similarly, the trade surplus in final goods including the textile and textile products industry decreased from USD 10,359.0 million to USD 5,726.8 million.

As Table 2 shows, Turkey's trade balance of intermediate goods in medium- and high-tech industries was USD -3,921.6 million in 1995 and USD -5,401.7 million in 2003. Because of investment in and the promotion of those industries, Turkey improved its trade balance to approximately USD -59.8 million by 2011. Three medium- and high-tech industries contributed to decreasing the trade deficit. The trade balance in the chemical and chemical products industry changed from USD -3,598.9 million to USD -371.9 million. The trade balance in the machinery industry was USD -559.6 million in 2003 and USD 901.2 million in 2011. Similarly, the trade balance in the electrical and optical equipment industry changed from a deficit of USD -268.2 million to a surplus of USD 1,155.2 million. The final goods in these three industries therefore had a positive effect on the trade balance. Conversely, the trade balance in the transport equipment industry worsened, from USD -975.0 million to USD -1,744.4 million for intermediate goods and from USD -503.8 million to USD -6,198.1 million for final goods.

Although the figures are similar to those in Table 2, the trade balances in Table 3 are generally smaller. However, the only industry with a change greater than one billion US dollars is the transport equipment industry, the trade balance of which worsened from USD 506.1 million to USD -1,020.8 million in terms of final goods.

2.2 Turkey's trade balance with EU countries

Table 4 shows Turkey's trade balance with EU countries by country group.¹⁰ In 1995, Turkey's trade deficit in intermediate goods with large investor countries was USD -4,339.4 million; in 2003, this increased to USD -6,698.3 million, but it then decreased to USD -3,166.4 million in 2011. By contrast, in terms of final goods the trade balance changed from a USD 4,936.0 million surplus to a USD -498.0 million deficit between 2003 and 2011. As discussed earlier, the trade deficit was largely accelerated by low- and medium-tech industries and the transport equipment industry. Compared with other EU countries, Turkey's trade balance in final goods decreased from USD 493.6 million to USD -2,463.7 million, as with large investor countries.

Germany, Italy, Spain, Poland, and the United Kingdom strongly influenced Turkey's trade balance (see Table 4). These countries caused significant changes between 2003 and 2011. As shown in the table, Turkey had a decreasing trade deficit in intermediate goods between 2003 and 2011, but experienced the contrary situation in terms of final goods in same period.

¹⁰For the trade deficit among industries in 2011, see the appendix. For 1995 and 2003, our calculations use the WIOD's international input-output tables.

Country	Turkey's trade balance with EU countries (million US dollars)					
	Trade balance of total intermediate goods			Trade balance of total final goods		
	1995	2003	2011	1995	2003	2011
Austria	-75.3	-135.3	-72.3	198.1	-8.9	189.6
Belgium	-373.9	-328.4	406.6	-129.9	-0.8	622.2
Finland	-126.4	-208.2	-338.5	-62.4	10.4	-52.1
France	-869.6	-1394.3	-808.5	278.7	541.3	1051.2
Germany	-1551.1	-1994.5	-706.8	3516.8	1851.8	-33.6
Greece	102.6	377.2	629.2	44.5	431.0	907.0
Luxembourg	2.8	-239.5	-112.4	2.6	-5.9	10.7
Italy	-720.3	-1093.1	-699.0	-804.7	-355.0	-3294.8
Netherlands	-323.0	-505.4	-391.1	216.8	228.6	117.6
Spain	-149.4	-176.9	-2568.6	94.6	227.2	-1696.3
United Kingdom	-255.7	-999.6	1495.5	62.1	2016.2	1630.3
Sub-total of large investor countries	-4339.4	-6698.3	-3166.4	3416.8	4936.0	-498.0

Czech R.	-15.8	-71.9	-270.0	-15.9	70.5	-32.2
Estonia	-17.0	12.3	33.8	1.4	27.0	22.4
Hungary	-17.7	-31.2	-35.0	2.1	23.9	-618.2
Ireland	-12.4	-93.1	116.3	-69.5	-62.2	15.2
Poland	-48.7	78.7	-72.1	32.8	366.1	-1447.7
Portugal	3.4	133.2	-123.4	14.7	41.6	-337.1
Slovakia	-26.0	-84.7	19.5	18.4	18.5	-331.3
Slovenia	-6.5	36.0	28.5	8.1	22.9	63.4
Sweden	-119.1	-189.8	-223.4	-302.7	-14.9	201.7
Sub-total of other EU countries	-260.0	-210.4	-525.8	-310.5	493.6	-2463.7
Total	-4599.4	-6908.7	-3692.3	3106.3	5429.7	-2961.7
Source: See Table 2.						

3 Causes of the increasing trade deficit in Turkey

3.1 Technological upgrading of industries

As shown in Tables 2 and 3, Turkey lost its dominance in low- and medium-tech industries for both country groups (i.e., large investor countries and other EU countries) for several important reasons. The first reason is that Turkey's competitive position against these country groups was weak because it had the highest ULC growth in export goods and one of the most overvalued currencies (see Section 3.4). Thus, countries with lower production costs than Turkey became dominant in low- and medium-tech industries.

The second reason is low investment. The textile and textile products industry was fundamental for contributing to Turkey's economic growth; however, FDI inflows into that industry were among lowest and the industry did not take part in the government's investment and promotions, which were targeted at the industries of the Turkish economy that needed technological upgrades.¹¹ For instance, the trade balance in intermediate goods with the United Kingdom changed greatly because of the development of Turkey's medium- and high-tech industries. Moreover, Turkey experienced an increasing trade surplus in its chemical and chemical products industry, machinery industry, and electrical and optical equipment industry. Nevertheless, a slight decrease for final goods occurred because of the lower trade surplus in the textile and textile products industry that dropped from USD 2,036.2 million to USD 706.6 million between 2003 and 2011.¹² A significant decrease relative to the textile and textile products industries in Italy and Spain was also noted. This industry stimulated a trade deficit because Turkey withdrew its promotions. In 1995, the ratio of exported textile and textile products to Turkey's total output was 40% but this decreased to 20.8% by 2011.¹³ Further, this industry attracted low FDI inflows and was composed of few companies (see Table 6A in the appendix).

The third important reason is the so-called "flying geese theory,"¹⁴ which posits that high-tech industries move from developed countries to countries with low-tech industries; these may then change from low- and medium-tech industries to medium- and high-tech industries with upgraded products via technological transformation. The flying geese theory is clearly at work between Germany and Turkey where the trade balance for intermediate goods in the textile and textile products industry was USD 413.0 million in 2003 and USD 127.7 million in 2011. In the chemical and chemical products industry, the trade balance was USD -1,147.5 million in 2003 and just USD -253.7 million by 2011. The same influences were

¹¹ See the list of industries the government promoted, which were investment priorities, <http://www.invest.gov.tr/en-US/sectors/Pages/Sectors.aspx> (last accessed on February 15, 2016).

¹² Appendix for 2011 (Table 3A). The trade balance for 2003 was calculated as explained in Table 2.

¹³ The author's own calculation using the WIOD (national input-output tables).

¹⁴ For additional information, see Akamatsu (1962).

seen in the machinery industry and electrical and optical equipment industry with trade balances changing from USD -268.1 million to USD 206.7 million and from USD 5.2 million to USD 144.0 million, respectively, between 2003 and 2011. Final goods displayed the same features in medium- and high-tech industries. For example, in the machinery industry, the trade deficit decreased from USD -1,159.4 million to USD -283.0 million.¹⁵

The fourth reason is the competitiveness of Asian countries, particularly China, which followed an export-led growth strategy using its low ULC growth and undervalued currency.¹⁶ Turkey therefore lost its position in low- and medium-tech industries and focused on medium- and high-tech industries through large investment and promotions, which brought about technological upgrades.

However, technological upgrades create a heavy import dependency for intermediate goods. If a country cannot produce the necessary intermediate goods domestically, it must import them. Increasing the import dependency may deepen trade deficit problems, weaken domestic industries, and increase the country's vulnerability to currency devaluations and economic uncertainties. This import dependency can be deepened through problems such as high production costs, overvalued currency, FDI inflows, and a lack of investment. Table 5 shows the extent of the import dependency based on the amount of imported intermediate goods directly and indirectly required to produce one US dollar of product (i.e., the vertically integrated imported intermediate goods cost in one US dollar unit of product). In Table 5, the increases in this cost indicate the increasing import dependency in both non-tradable and export goods.

A large part of Turkey's trade deficit was caused by the trade in imported intermediate goods, as shown in Table 2. Approximately 42.1% of imported intermediate goods came from EU countries, which caused 23.5% of Turkey's trade deficit in intermediate goods.¹⁷ Therefore, Turkey's economic relationship with the EU became more important because of its dependency on intermediate goods from EU countries.

Table 5 also shows that Turkey's import dependency for export goods was higher than was that for non-tradable goods because the economy was driven mainly by export growth between 1995 and 2011. The import dependency increased significantly in the 2000s, reflecting technological upgrades in the Turkish economy. Such technological upgrades entail more complicated and detailed production processes, for which multiple complex intermediate goods are needed. In 1995,

¹⁵Appendix for 2011. The trade balance for 2003 was calculated as explained in Table 2.

¹⁶For instance, between 2003 and 2011, China increased its exports of textile and textile products in intermediate goods by 19.7%, but Turkey increased such exports to Germany by 2.8% (the author's own calculations; see the WIOD international input-output tables).

¹⁷The author's own calculations using the WIOD international input-output tables. The rates are for 16 industries. However, if 35 industries are considered, 47.7% of intermediate goods came from the EU, and the EU countries shown in the tables caused 29.0% of the trade deficit in intermediate goods in 2011.

Table 5. Imported intermediate goods directly and indirectly necessary for producing one US dollar of product

Year	Non-tradable goods	Export goods
1995	USD 0.057	USD 0.110
1999	USD 0.046	USD 0.096
2003	USD 0.072	USD 0.154
2007	USD 0.193	USD 0.433
2011	USD 0.236	USD 0.501

Source: Author's own calculations (for the method, see the appendix). The import dependency in non-tradable goods and export goods was calculated by using the WIOD input-output tables.

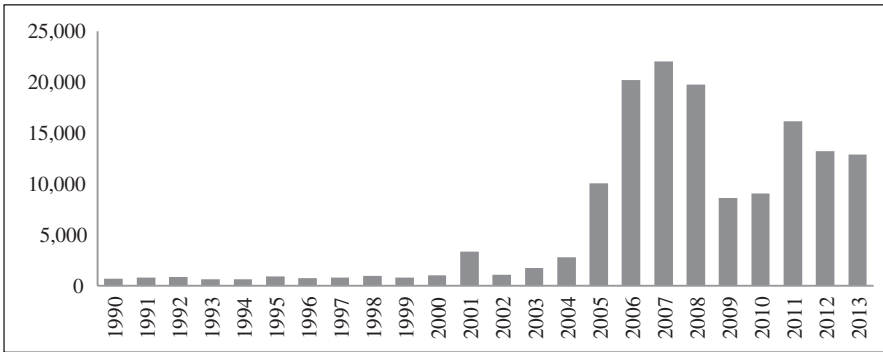
for example, producing one US dollar of product in non-tradable goods and export goods required USD 0.057 and USD 0.110 of vertically integrated imported intermediate goods, respectively. In 2003, producing one US dollar of product in non-tradable and export goods cost Turkey USD 0.072 and USD 0.154, respectively. In 2007 and 2011, however, Turkey's import dependency increased significantly. In 2007, producing one US dollar of product entailed an import dependency of USD 0.193 in non-tradable goods and USD 0.433 in export goods. In 2011, the same costs were USD 0.236 and USD 0.501, respectively.

Thus, Turkey experienced technological shifts to produce more complicated medium- and high-tech products for exporting. However, this stimulated a trade deficit and increased Turkey's vulnerability to devaluation (see Section 4).

3.2 Effects of increasing FDI

The growing Turkish economy experienced parallel developments in its economic configuration via favorable macroeconomic factors, institutional changes, FDI inflows, and technological upgrades after the economic crisis of 2000–2001. For countries such as Turkey that cannot develop their medium- and high-tech industries sufficiently to compete internationally, FDI inflows become crucial for obtaining the investment needed to catch up to the technological upgrades of developed countries.

FDI inflows can affect an economy through both exports and imports under several assumptions. Under the first assumption, FDI inflows can stimulate imports by concentrating on domestic consumption inside an economy by importing intermediate goods for production from developed countries to which nothing is returned

Figure 2. FDI inflows to Turkey (million US dollars)

Source: UNCTAD, FDI statistics.

as exports to cover the trade deficit. Under the second assumption, FDI inflows can aim to provide products for consumption and for exports to cover the trade deficit. In this condition, the country does not need to import intermediate goods or final goods from developed countries and can export its own products to cover the trade deficit. Under the third assumption, FDI inflows focus only on exports, and domestic needs should be met by imports from other countries. Hence, if exports are slower than imports, the trade deficit increases. Therefore, under the second and third assumptions, the strategies of multinational companies, macroeconomic factors, and institutional factors all significantly affect export growth.

If FDI inflows are based on export growth as discussed in the second and third assumptions, they will develop medium- and high-tech industries. For the third assumption, FDI inflows can increase exports in parallel with imports where the intermediate goods necessary for production come from developed countries. This kind of investment can develop export industries and influence the direction of exports, causing technological shifts from developed investor countries to developing countries, which then become a production area for investor countries and others. As Table 4 shows, Turkey's trade deficit with Germany significantly decreased, from USD -1,994.5 million to USD -706.8 million, between 2003 and 2011 because of substantial FDI in medium- and high-tech industries (see Table 6A in the appendix).

Large investor countries mainly targeted medium- and high-tech industries during the period analyzed. For instance, 70 chemical and chemical products firms were owned by German investors. Turkey's trade deficit decreased significantly in the chemical and chemical products industry, machinery industry, and electrical and optical equipment industry, whereas the transport equipment industry suffered a large trade deficit with Germany for both intermediate goods and final goods. The trade balance in final goods decreased from a surplus of USD 1,851.8 million to a deficit of USD -33.6 million, as shown in Table 4. The difference between

the trade deficit in intermediate goods and final goods was caused by the transport equipment industry and Turkey's position in low- and medium-tech industries, particularly the textile and textile products industry.¹⁸

FDI inflows influenced the Turkish economy indirectly as well. As Table 4 shows, Turkey's trade deficit with Poland became distinctive in terms of final goods. In 2003, its trade balance was USD 366.1 million, but this decreased dramatically to USD -1,447.7 million by 2011. The trade deficit caused by the transport equipment industry was USD -863.3 million in final goods in 2011 (see Table 5A in the appendix). As Poland was not a large investor, the extent to which it caused a large trade deficit in 2011 is an important issue. The Polish economy is similar to that of Turkey in terms of attracting FDI inflows. Turkey's large investor countries were also Poland's (i.e., Germany, the Netherlands, and France) and FDI inflows targeted medium- and high-tech industries.¹⁹ This influenced Turkey's trade deficit in terms of the transport equipment industry because the Turkish economy was weakly competitiveness against the Polish economy.

As shown in Figure 2, FDI inflows to Turkey were very low in the 1990s. By contrast, following institutional changes after the economic crisis of 2000–2001, Turkey attracted large FDI inflows from developed EU countries and experienced technological shifts. Therefore, Turkey's exports were stimulated in parallel with imports, and Turkey began to largely focus on medium- and high-tech industries in the 2000s. FDI inflows had two effects on the Turkish economy. First, as discussed in the second assumption, they developed domestic industries and contributed to export growth. Second, they were an important cause of the dramatic increase in imports, as discussed in the third assumption. As shown in Table 2, in 1995 and 2003, Turkey had a trade deficit in the chemical and chemical products industry, machinery industry, electrical and optical equipment industry, and transport equipment industry; in 2011, however, the transport equipment industry was the only industry reflecting the third assumption with a significantly worsened trade deficit.

3.3 Strategy of multinational automobile companies

Two main macroeconomic concepts shape the strategy of multinational companies. The first is the purpose of production, which determines whether multinational companies produce for the domestic market or for exporting. The second is the target of production in international trade that determines the countries to which the companies sell their products. As shown in Tables 2 and 3, the chemical and chemical products, machinery, and electrical and optical equipment industries

¹⁸Bosch, the German company, is Turkey's largest supplier of automotive production by revenue. For additional information, see the Investment Support and Promotion Agency <http://www.invest.gov.tr/en-US/infocenter/publications/Documents/AUTOMOTIVE.INDUSTRY.pdf> (last accessed on February 15, 2016).

¹⁹The National Bank of Poland (Zagraniczne inwestycje bezpośrednie w Polsce) <http://www.nbp.pl/home.aspx?f=/publikacje/zib/zib.html> (last accessed on February 15, 2016).

Table 6. Trade deficit in Turkey's transport equipment industry (million US dollars)

Category	EU		East Asia		World	
	2003	2011	2003	2011	2003	2011
	Passenger cars	-405.4	-2300.6	-154.5	-1553.7	-22.2
Other automobiles (buses, trucks, etc.)	118.4	2094.2	-117.5	-70.8	449.5	2794.6
Ships	127.6	43.4	-9.0	-981.9	265.1	-228.1
Sporting boats	20.6	132.0	-1.2	-1.8	27.2	199.7
Trains, etc.	-105.2	-356.0	-15.6	-293.1	-84.7	-526.7
Aircraft	96.9	-1228.6	-0.1	-37.1	337.7	-3630.6
Motorcycles	-2.8	-22.7	-9.2	-121.1	-7.5	-128.8
Bicycles	11.0	21.6	-26.8	-116.0	-13.3	-97.4
Other vehicles	-1.2	-7.2	-158.4	-6.8	8.6	416.0
Parts of automobiles	-1584.2	-4252.2	-635.4	-1001.3	-1604.9	-4224.6
Parts of other transport equipment	3.5	-102.5	-26.6	-233.7	14.6	-557.8

Source: Author's own calculations. Data were derived from TurkStat (foreign trade statistics).

Note: Parts of automobiles and other transport equipment were not classified as intermediate goods or final goods. Gray cells show the two years, from 2003 to 2011, whose difference with each other exceeded one billion US dollars.

contributed to Turkey's export growth and trade surplus. Unlike these three industries, the transport equipment industry became an important reason behind Turkey's large trade deficit. The most important reason is that multinational automobile companies do not produce for the domestic market but rather for exporting. Thus, Turkey must import what it needs from other countries for domestic consumption. In 1995, the ratio of the total exports of transport equipment goods to total output was 11.7. Amid intensified FDI inflows from multinational automobile companies, the ratio was 97.3 in 2007 and 79.8 in 2011. However, the ratio was much lower in the machinery industry, 10.5 in 1995 and 42.8 in 2011,²⁰ which had almost the same output as did the transport equipment industry.

The targets of production were EU countries where the highest share in the transport equipment for trade volume emerged in the automobile industry. In 2011, Turkey exported USD 8,969.4 million to EU countries and imported USD 12,988.1 million from EU countries. Although its trade volume with East Asian countries was lower, Turkey had a high trade deficit.²¹ In 2011, Turkey's export volume was just USD 35.2 million with East Asian countries, whereas its import volume was USD 3,064.3 million.²² In 2011, the exports of the automobile industry represented 81% of the total exports of transport equipment, with passenger cars having the highest share. Between 2003 and 2011, passenger cars represented 62.8% of total exports. In addition, of the total exports to EU countries, this industry accounted for 79.7% of exported automobiles.

To understand which industry caused the sharp decline in transport equipment goods, Table 6 presents the exports of transport equipment to EU nations, East Asian nations, and the world. According to TurkStat, passenger cars and aircraft became important drivers of the trade deficit in the Turkish economy. Turkey imported a large number of aircraft from the United States. The parts of automobile not classified as intermediate or final goods caused a significant decline in the transport equipment industry, which shows that the automobile industry became an important reason behind the overall trade deficit.

Turkey's trade deficit in the transport equipment industry is linked to two main problems: the purpose of production and target of production. First, the purpose of production was exporting, which boosted Turkey's demand for final goods from other countries. Second, the target of production was the group of largest economies in the EU: Germany, France, Italy, and the United Kingdom. Therefore, although Turkey had an important position relative to the rest of the world, Turkey's exports to EU countries remained relatively low. In 2014, Turkey was the 17th largest motor vehicle producer in the world and the 6th largest in the EU.²³ While

²⁰The author's own calculations. Data were derived from the WIOD (national input-output tables).

²¹The East Asian countries are China, South Korea, Japan, and Taiwan.

²²This includes separated engines as well. Without engines, which were not among the products, Turkey could export USD 8,966.2 million to EU countries.

²³See the OICA, <http://www.oica.net/category/production-statistics/> for 2104 (last accessed on February 15, 2016).

Table 7. Turkey's trade deficit in passenger cars with EU countries (million US dollars)

Category	Import	Export	Deficit	Import	Export	Deficit
	2003	2003	2003	2011	2011	2011
North EMU	1323.3	1038.1	-285.2	3838.4	2178.5	-1659.9
East EMU	31.2	9.2	-21.9	125.6	132.7	7.1
South EMU	422.2	371.6	-50.6	1392.2	1338.7	-53.5
Non-EMU	226.8	179.1	-47.7	1244.0	651.4	-592.6

Source: Author's own calculations.^aData were derived from TurkStat (foreign trade statistics).

^aFor the country groups, see Table 12.

Turkey's production capacity generally exceeded that of the former communist countries, its trade deficit was worsened by EU countries, particularly in passenger cars. As shown in Table 7, the trade deficit caused by EU countries was lower in 2003 than in 2011. In particular, north EMU and non-EMU countries caused an important trade deficit in passenger cars in 2011, which is directly related to domestic consumption.

Multinational automobile companies focused on export growth in the Turkish economy for several reasons. First, high production costs made the Turkish domestic economy less attractive. Turkey had large import volumes from Germany and East Asian countries because these countries designed their macroeconomic factors to lower production costs compared with those in other developed countries such as France and Italy, which did not accelerate Turkey's trade deficit in passenger cars.²⁴ Therefore, high production costs prevent multinational companies from competing in the domestic economy against Germany and East Asian countries.

Second, Turkey attracts FDI inflows consistently because of its proximity to Europe, Russia, the Middle East, and North Africa. Unlike neighboring countries, it does not have problems with economic crises, it is part of the EU Customs Union, and it is free of political turmoil and war, which makes it a safe area for investment. Therefore, FDI inflows use Turkey to reach its neighbors. During the study period, Turkey's promotions were based on export growth instead of domestic consumption

²⁴Between 2003 and 2011, the productivity growth of export goods was 4.3% in Japan, 5.3% in South Korea, and 12.9% in China. Wage rate growth was 1.4% in Japan, 4.9% in South Korea, and 12.8% in China.

Table 8. Registered and second-hand automobiles in Turkey (thousand)

Year	Total motor vehicles	Registered automobiles	Registered passenger cars	Second-hand automobiles	Second-hand passenger cars
2005	11,145.8	716.9	406.8	3,858.0	2,631.7
2014	18,828.7	796.2	585.8	5,134.1	3,857.0
Change (unit: %)	5.8	1.1	4.0	9.0	9.5
Source: Author's own calculations. Data were derived from TurkStat (transportation statistics). ^a					

^aThe data for second-hand cars are only available between 2010 and 2014 in TurkStat (transportation statistics).

for multinational companies. For instance, free zones were established to exempt multinational companies from corporate income tax, special consumption tax, value added tax, and customs duties, making exports more profitable and attractive.

Third, Turkey's high percentage of changes in second-hand automobiles, surpassing the number of registered automobiles,²⁵ made its domestic economy less attractive. In Turkey, the change in the number of registered automobiles was lower than that in the number of second-hand automobiles. Between 2005 and 2014, the rate of change was 1.1% of total registered automobiles and 4.0% in registered passenger cars, while, between 2010 and 2014, the change in second-hand vehicles was 9.0% for automobiles and 9.5% for passenger cars, as shown in Table 8.

In general, other factors make domestic consumption less attractive. The number of motor vehicles per thousand residents is lower in Turkey than in the former communist countries. Turkey also has one of the lowest growth rates in motor vehicles per thousand residents at 3.8% compared with 5.8% in Poland and Slovakia. Moreover, its difference between two years was one of the lowest, after Hungary, as shown in Table 9. Furthermore, although Turkey is close to oil-rich countries, it has some of the most expensive oil and gas in the world; between 2003 and 2011, prices increased on average by 10.5% for petrol, 12.0% for diesel, and 17.7% for motor oil. In addition, in 2012, Turkey's consumption tax as a percentage of total taxes was 43.2% higher than the average in the OECD (30.9%). This percentage was 35.0% in Poland, 32.0% in the Czech Republic, 42.6% in Hungary, 32.7% Slovakia, and 36.0% in Slovenia.²⁶ The high cost caused by consumption tax thus makes the domestic market unattractive for new cars.

As shown in Table 6, passenger cars stimulated a trade deficit, but other automobiles (buses, trucks, etc.) moved counter to that. Several important reasons should be discussed as to why other automobiles create a trade surplus in the Turkish economy. First, Turkey developed its other automobiles industries during the period of import substitution industrialization. That means that it was much easier for these industries, such as Tofaş, Otosan, and Anadolu, to furnish domestic needs in the economy, and they became ready for collaboration under promotions, unlike passenger cars, where investment lagged. Moreover, national companies such as Temsa, Otokar, Karsan, B.M.C, Türk Traktör, and Hattat Tarım focused on domestic consumption; as shown in Table 10, their ratios of exports to production were below 40%.

Second, the local capital share in other automobiles industries was greater than that in the passenger cars industry in general. As shown in Table 10, of the largest passenger car companies, the foreign capital share was 100% in Toyota, 100% in Honda, 89.3% in Hyundai, 51% in Renault, and 37.9% in Fiat. In other automobiles,

²⁵ A second-hand car means a previously owned (used) car; not a new car. Table 8 shows the number of second-hand cars sold each year. "Registered automobiles" means the number of new automobiles registered by the national traffic authority each year.

²⁶ Source: OECD (Consumption Tax Trends 2014, DOI:10.1787/ctt-2014-en), last accessed on June 12, 2016.

Table 9. Motor vehicles per thousand residents in Turkey and the former communist countries

Year	Turkey ^a	Poland	Czech R.	Hungary	Slovakia	Slovenia
2004	184	357	414	316	256	492
2010	242	537	485	345	363	566
Difference	58	180	71	29	107	74
Change (unit: %)	3.8	5.8	2.6	1.2	5.8	2.0

Source: Author's own calculations. Turkish data were derived from TurkStat (transportation statistics and population); data for other countries were derived from World Bank (motor vehicles per 1000 people).

^aFor Turkey, between 2007 and 2014 was considered because Turkey used to compile population statistics every five years. Since 2006, it has published population data every year. Between 2000 and 2007, the growth rate was 4.8%.

the foreign capital share was 29.7% in Isuzu, 40% in Ford, 85% in Mercedes-Benz, 99.9% in Man; in the other companies, Temsa, Otokar, Karsan, B.M.C, Türk Traktör, and Hattat Tarım, the foreign capital share was 0%. This shows that the collaboration with local capital remained greater for other automobiles than for passenger cars. These numbers show that FDI moved into both passenger cars and other automobiles, but that the local capital share in other automobiles was larger than that in passenger cars in general. Whereas passenger car producers such as Renault, Toyota, and Hyundai Assan directly focused on exports, other automobiles industries such as Mercedes-Benz, Fiat-Tofaş, and Isuzu-Anadolu considered the domestic market as well. Nevertheless, as shown in Table 10, compared with national origin local producers, foreign origin multinational companies concentrated more on exports.

Further, in addition to the multinational companies mentioned above, the local capital share was low among top ranking suppliers. Turkey had 47 local automotive suppliers, whereas Poland had 53, the Czech Republic had 68, and Hungary had 37 in 2012. Turkey had a significant number of local suppliers, but foreign origin companies, which had the largest amount of revenue, did not collaborate with local producers and focused intensively on exports. For instance, the foreign capital share was 100% in Bosch, Delphi, Autoliv, Yazaki, and Toyota and 99.9% in Standard Profile. Local capital represented 100% in CMS and Hema and 50% in Federal-Mogul. These companies were among the top 10 industries in terms of sales revenue. For instance, the ratio of exports to total production was 99.5% in Bosch (ranked first by sales revenue), 77.1% in Delphi (ranked second), and 68.0% in Yazaki in 2010.²⁷ This low collaboration of local producers with foreign producers causes a high import dependency in intermediate goods to enable production processes to be continued. Therefore, exports stimulate the imports of intermediate goods. This investment issue is shaped by industrial policies, which need to change to increase collaborations for local suppliers.

Third, promotions in the other automobile industries create a noticeable difference compared with that in the passenger cars industry. As shown in Table 11, special consumption tax remained the same in the bus, midibus, and minibus industries, which were 1%, 4%, and 9%, respectively, between 2004 and 2014. Moreover, the truck, etc. industry's special consumption tax did not change, remaining lower than that of passenger cars. By contrast, this tax increased significantly from 30% to 45% for an engine capacity of less than 1600cm³, from 52% to 90% for an engine capacity of 1600–2000cm³, and from 75% to 145% for an engine capacity of more than 2000cm³ in passenger cars between 2004 and 2014. That means that investment in the passenger cars industry producing for domestic needs lost its

²⁷For additional information, see the Investment Support and Promotion Agency <http://www.invest.gov.tr/en-US/infocenter/publications/Documents/AUTOMOTIVE.INDUSTRY.pdf> (last accessed on June 27, 2016). For additional information about the foreign and local capital shares and the ratio of exports to total production, see the 2013 report of the Istanbul Chamber of Industry (*Türkiye'nin 500 Büyük Sanayi Kuruluşu İçinde Otomotiv Sanayi*).

Table 10. Foreign capital share and the ratio of exports to total production in the largest automobile companies in Turkey

Company	Product(s)	Foreign capital share	Exports/ total production
Renault–Oyak	Passenger cars	51%	80.3%
Fiat–Tofaş	Passenger cars and pick-up	37.9%	65.5%
Toyota	Passenger cars	100%	85%
Honda	Passenger cars	100%	48.6%
Hyundai Assan	Passenger cars	89.3%	84%
Ford–Otosan	Minibus, truck, and pick-up	40%	74.4%
Man	Bus	99.9%	75.5%
Mercedes-Benz	Bus and truck	85%	27.5%
Isuzu–Anadolu	Bus, midibus, and light truck	29.7%	15.6%
Temsa	Bus, midibus, and light truck	0%	22.7%
Otokar	Bus, minibus, midibus, light truck, and pick-up	0%	12.8%
Karsan	Bus, minibus, truck, light truck, and pick-up	0%	38.4%
B.M.C	Bus, minibus, truck, light truck, and pick-up	0%	9.9%
Türk Traktör	Tractor, etc.	0%	37.5%
Hattat Tarım	Tractor, etc.	0%	28.3%

Source: Author's own calculation. Data were derived from the 2013 report of the Istanbul Chamber of Industry (Türkiye'nin 500 Büyük Sanayi Kuruluşu İçinde Otomotiv Sanayi) and the Automotive Manufacturers Association of Turkey (OSD) (Automotive Industry Monthly Report, December 2013). The statistics on Man, Honda, M.Benz, Karsan, and B.M.C were calculated from the amount of US dollars from the Istanbul Chamber of Industry in 2011 and the rest was calculated from the number of units produced and exported from the OSD in 2013.

Note: The main products of companies were structured according to OSD data (December 2013). For B.M.C products, the company's website was considered.

Table 11. Special consumption tax in the automobile industry in Turkey

Category	Type	Special consumption tax	
		2004	2014
Passenger cars	engine<1600cm ³	30%	45%
	1600cm ³ <engine<2000cm ³	52%	90%
	2000cm ³ <engine	75%	145%
Truck, etc.	engine<3000cm ³	10%	10%
	3000cm ³ <engine<4000cm ³	52%	52%
	4000cm ³ <engine	75%	75%
	Others	4%	4–10%
Bus, etc.	Bus	1%	1%
	Midibus	4%	4%
	Minibus	9%	9%

Source: Data were derived from the Revenue Administration of Turkey.

Note: Value added tax is 18% for all products in Turkey. In the table, 2004 was considered because it has more detailed information than 2003.

attractiveness for foreign capital. Thus, because of the high cost of buying a new car and lack of collaboration in the country, domestic consumption focuses on second-hand cars and imports. To prevent the consumption of passenger cars, government imposes high taxation. However, since domestic needs are not compensated and wage growth remains greater than productivity growth, domestic consumption becomes a significant influence on the importing of passenger cars.

The three main reasons discussed above are important issues to understand the difference between the passenger cars industry and other automobiles industries. The import dependency of the Turkish economy is heightened because of the low amount of collaboration with local producers for both intermediate goods and final goods. That calls into question the government's policies, which offer significant export promotions for multinational companies, while local producers remain at a disadvantage under the prevailing high taxes. The government provides promotions for export companies because its policies are shaped around the idea that if exports increase, this can compensate for imports and reduce the trade deficit. Conversely, this policy became a significant factor in increasing the trade deficit in Turkey.

3.4 Overvaluation of currency in Turkey

This section compares Turkey with a number of EU countries to identify what caused the great differences in macroeconomic factors between them from 2003 to 2011. Here, countries were considered after 2003 because most joined the EMU by adopting the euro at the end of 2001. Moreover, the period between 2003 and 2011 is chosen because the main institutional changes took root in Turkey after 2002 and the nation experienced a large deficit in its current account in the 2000s. For the countries that joined the EMU in the late 2000s, their own currencies were used against the euro.

To compare countries, the value of the euro is considered to estimate undervalued currencies among EU countries and Turkey based on their PPPs. The rate of change in the PPP and exchange rate provide information with which to describe competitiveness. In general, an accumulative trade surplus emerges through export-led growth strategies, where the appreciation rate of the PPP is higher than that of the exchange rate under suppressed wage growth towards the productivity growth of non-tradable goods. However, the condition of the central country, Germany, should be considered. Thus, the macroeconomic factors of the countries compared with those of Germany help describe their competitiveness.

Table 12 is divided into five categories: north EMU, east EMU, south EMU, non-EMU countries (i.e., the Czech Republic, Hungary, Poland, Sweden, and the United Kingdom), and Turkey. Most of these countries joined the EMU in 2001 and began using the euro immediately as the common currency. However, this economic progress reduced the competitiveness of EMU countries and influenced the countries that had not joined the EMU such as Turkey. EMU member countries lost their independent monetary policies and united under one currency.

Among north EMU nations, Germany differs from the other countries because it followed an export-led growth strategy. Between 2003 and 2011, the wage rate growth in Germany was 1.2%, the productivity growth of export goods was 2.1%, and the productivity growth of non-tradable goods was 0.3%. Under the fixed exchange rate system, the German economy had an undervalued currency that helped its current account surplus to GDP ratio increase from 1.4 to 6.1. However, other north EMU nations had overvalued currencies and high ULC growth in export goods relative to Germany's. The only country that increased its current account surplus to GDP ratio was the Netherlands, which kept its wage rate growth fixed to the productivity growth of export goods.²⁸

In 2011, north EMU countries stimulated trade deficits in intermediate goods with Turkey in low- and medium-tech industries and the transport equipment industry. The trade surplus generally decreased in low- and medium-tech industries (see Tables 2 and 4), while the trade deficit in the transport equipment industry

²⁸The Netherlands, compared with the period from 1995 to 2003, could decrease its wage rate growth to the productivity growth of export goods. Between 1995 and 2003, its wage rate growth was 3.8% and the productivity growth of export goods was 2.9% (see Table 12).

increased significantly. For instance, Germany caused a USD -900.7 million deficit in intermediate goods and a USD -4,831.5 million deficit in final goods in the transport equipment industry. Turkey had a trade surplus in the machinery industry and electrical and optical equipment industry and a relatively small trade deficit in the chemical and chemical products industry. However, its weak competitiveness and unfavorable policies in the transport equipment industry worsened its trade deficit (see Tables 2A and 3A in the appendix).

East EMU countries had high production costs and excessively overvalued currencies.²⁹ These former communist countries had high inflation because of the large disparity between their wage rate growth and the productivity growth of non-tradable goods, while they also experienced high ULC growth in export goods. These three countries did not cause a significant trade deficit with Turkey.

South EMU countries experienced excessively overvalued currencies against Germany under the fixed exchange rate system and had high production costs. Therefore, their current account deficits rose. The conditions in Greece and Italy were notable. Greece had a low productivity growth of export goods (-1.2%) and an overvalued currency with a -3.2% rate of change in its PPP. Thus, its current account deficit to GDP ratio increased from approximately -6.5% to -10.0%. In Italy, the wage rate growth was 2.5% and the productivity growth of export goods was 0.7%; the euro was overvalued relative to its PPP, which had a -2.0% rate of change, and its current account deficit to GDP ratio increased from -0.8% to approximately -3.1%.

South EMU countries did not cause a great change in the trade deficit through FDI inflows to Turkey. For instance, in the transport equipment industry, Turkey had a USD 52.9 million trade surplus in intermediate goods and a USD 49.1 million trade surplus in final goods with Italy, although its number of medium- and high-tech firms grew. The sharp decline in Turkey's trade balance with south EMU countries was largely caused by low- and medium-tech industries (see the appendix).

Non-EMU countries experienced low current account deficit to GDP ratios compared with Turkey. Sweden's wage rate growth was closely linked to its productivity growth of export goods and the United Kingdom experienced low productivity growth rates. The Czech Republic, Hungary, and Poland caused a trade deficit in Turkey's medium- and high-tech industries. For example, for intermediate and final goods in the transport equipment industry, Poland caused USD -417.6 million and USD -863.3 million trade deficits, respectively (see Tables 4A and 5A in the appendix). The commonality between these countries is that they had lower ULC growth in export goods and that their exchange rates and PPPs did not show large disparities relative to Turkey. Thus, they became more competitive and had low current account deficit to GDP ratios relative to Turkey. Turkey's current account deficit to GDP ratio was stimulated dramatically, increasing from -2.5% to -9.6%.

²⁹The euro was adopted by Estonia in 2011, by Slovakia in 2009, and by Slovenia in 2007.

Table 12. Macroeconomic factors in Turkey and EU countries (annual rate, 2003–2011, unit: %)

Country	Productivity growth of non-tradable goods	Productivity growth of export goods	Wage rate growth	Inflation rate	Rate of change in currency against the euro	Rate of change in PPP against Germany	Current account balance/GDP (annual ratio)	
							2003	2011
Austria	0.9	1.6	2.5	2.0	0.0	-1.9	1.6	1.5
Belgium	0.5	2.3	2.5	2.2	0.0	-2.4	3.5	-1.2
Finland	1.2	2.6	3.3	1.6	0.0	-1.0	4.6	-1.8
France	1.2	2.2	2.9	1.7	0.0	-1.5	0.7	-1.7
Germany	0.3	2.1	1.2	1.6	0.0	1.4	1.4	6.1
Ireland	-0.1	2.6	3.2	2.0	0.0	-0.7	0.5	-2.7
Luxembourg	0.8	1.2	3.3	2.3	0.0	-4.7	8.2	6.5
Netherlands	0.8	2.3	2.1	1.7	0.0	-2.2	5.3	8.4
Estonia	1.1	1.9	8.6	4.2	3.9	-4.4	-12.9	1.3
Slovakia	2.5	3.4	5.7	4.1	3.3	-2.6	-5.8	-3.7
Slovenia	1.1	2.7	4.8	3.1	-0.3	-2.4	-0.8	0.2
Greece	-1.9	-1.2	2.3	3.3	0.0	-3.2	-6.5	-10.0
Italy	0.0	0.7	2.5	2.1	0.0	-2.0	-0.8	-3.1
Portugal	0.8	1.5	3.2	2.2	0.0	-2.1	-6.3	-6.8
Spain	1.7	2.0	3.2	2.7	0.0	-2.6	-3.4	-3.6

Czech R.	2.0	6.6	5.5	2.3	3.1	-0.6	-5.7	-2.6
Hungary	1.3	6.1	7.3	5.1	-1.3	-3.6	-8.0	0.8
Poland	4.9	4.4	4.8	2.8	0.3	-3.8	-2.5	-4.9
Sweden	1.5	3.2	2.6	1.5	0.0	-1.4	6.6	6.9
United K.	0.2	0.1	2.9	2.5	-3.1	-3.3	-1.6	-1.4
Turkey	2.7	3.7	11.2	10.6	-4.4	-10.4	-2.5	-9.6

Source: Author's own calculations (see the appendix for the calculations of productivity growth and PPP).^a The productivity growth rates were calculated by using the WIOD (national input-output tables) and wages were derived from the WIOD (socio economic accounts, compensation of employees). For the exchange rates, see footnote.^b The current account balance to GDP ratios were derived from the OECD.^c Inflation rates were derived from the World Bank (inflation, consumer price). Gray cells show export-led growth strategies.

^aThe calculations were made for productivity growth by using $LN(Data2003/Data2011)/8$. The negative value of the rate of change in currency against the euro means depreciation against the euro. $ULC\ Growth = Wage\ Rate\ Growth - Productivity\ Growth$. Each country had proportional wage rate growth and their imported material cost was negligible, but they did not have a constant mark-up rate.

^bFor Turkey, the euro was calculated by using the CBRT (Electronic Data Delivery System). For the Czech Republic, Hungary, Poland, Sweden, and the United Kingdom, the exchange rate against the US dollar was determined from the OECD (Monthly Monetary and Financial Statistics). It was then determined the value of the euro against the US dollar. National currencies were converted from the US dollar base into the euro base. The euro against the US dollar was derived from the Board of Governors of the Federal Reserve System (foreign exchange rates). For Estonia, Slovakia, and Slovenia, the Federal Reserve Bank of St. Louis (exchange rate to the US dollar) was used.

^cFor Austria, Luxembourg, and Poland, the total current account balance (US dollars) was derived from the Federal Reserve Bank of St. Louis, GDP (US dollars) was derived from the World Bank, and the ratios were then calculated. For the Netherlands and Portugal between 2003 and 2011 as well as Slovakia, Spain, and Turkey, the current account balance to GDP ratio was derived from the Federal Reserve Bank of St. Louis (total current account balance).

As shown in Table 12, the reasons that made Turkey different and weakened its competitiveness against EU countries were largely related to macroeconomic factors. Turkey had one of the largest gaps between the rates of change in its PPP and currency, and hence one of the most overvalued currencies against EU countries. The rate of change in the lira was -4.4% and the PPP was -10.4% . In addition, Turkey had the highest ULC growth in export goods; its wage rate growth was 11.2% and the productivity growth of export goods was 3.7% . A commonality between Turkey and south EMU countries was related to the current account deficit problem; Turkey's was the second highest after that of Greece. Thus, if Turkey were part of the EMU, it would be among the PIGS (Portugal, Italy, Greece, and Spain) given its macroeconomic factors.

The institutional approach was previously neglected not only by researchers but also by governments in Turkey, although it was recognized in the 1970s that economic development cannot occur through macroeconomic factors alone.³⁰ Three institutional factors are considered in this section: wage–labor relations relevant to high wage growth that causes high ULC growth in export goods, the exchange rate system, and international insertion relevant to the Customs Union and the current account deficit in connection with the trade deficit.³¹

During the 2000s, wage growth remained above the productivity growth of export goods, which became an effective factor behind the increasing current account deficit in Turkey. Turkey suffered because of its wage growth, which did not fall below 10% and remained above the productivity growth of export goods. This shows that wage growth does not have the flexibility to be reduced even in crisis years or unexpected economic situations. Therefore, wage growth became an obstacle to eliminating the current account deficit because high wage growth (i.e., above the productivity growth of export goods) means a high ULC and thus high export prices and a trade deficit. Turkey had a wide disparity between the rates of change in its currency and the PPP, which reduced its competitiveness relative to EU countries. If Turkey joins the EMU, the euro will be too overvalued for the Turkish economy, accelerating the country's current account deficit.

A number of factors drove the overvalued lira in Turkey given the institutional changes in the CBRT after the devastating economic crisis of 2000–2001. First, after the institutional change in the exchange rate system, when the CBRT adopted a floating exchange rate system instead of a managed exchange rate system, the lira began fluctuating according to the economic conditions. Second, the Maastricht Criteria forced the CBRT to accept a policy of price stability, minimizing the

³⁰The French *régulation* approach was created by Aglietta (1979). For Jessop (2006), the 1970s was the era of Keynesian crisis as well as the crisis of Fordism. The main institutional changes emerge directly or indirectly under the wage–labor relations, banks–credit relations, mode of competition, mode of international insertion, and the role of government (Boyer, 1990:38–39; Boyer and Hollingsworth, 1997:49–54; Boyer and Saillard, 2002:44).

³¹In Turkey, although institutional changes emerged from the government, other organizations also influenced key policies, such as the IMF, the World Bank, and the EU, which supported deregulation.

fluctuation of the lira; hence, the CBRT emphasized that its main purpose is to maintain price stability. The interest rate became the main tool by which the CBRT wanted to keep exchange rates and prices stable. Third, the current account deficit increased pressure on the CBRT to control fluctuation in the lira to prevent the deficit problem from deepening. Fourth, the inflation targeting system increased pressure on the CBRT to keep interest rates high against inflation. These factors caused a large disparity between the change rates in the lira and the PPP.

Turkey joined the Customs Union in the mid-1990s, and bilateral trade between the EU and Turkey increased significantly. Although Turkey was not part of the EU, joining the Customs Union was an important part of its integration process. Countries that want to join the EU attempt to increase trade volume by benefiting from the EU's large markets. Under the Customs Union, which took root in the 2000s, Turkey and the EU agreed to reduce all customs duties, quantitative restrictions, and charges. To reduce the effects of the economic crisis of 2000–2001, institutional changes occurred in the economy through deregulation policies and a free market ideology. Nevertheless, high production costs and an overvalued currency combined with the Customs Union agreement stimulated the trade deficit in the 2000s.

Thus, if Turkey decreases its wage rate growth to the productivity growth of export goods, it could decrease the disparity between the rate of change in the lira and the PPP. However, the lack of institutional compromise in Turkey's income policies makes it difficult to create a flexible wage rate growth policy (Ünal, 2016b).³² The power balance among the government, trade unions, and employer unions is also lacking, with trade unions increasing pressure for wage rate growth on the government and employers. The government can influence wages through its own policies, whereas employer unions do not have the same effect on wage policies. Income policies should be changed to eliminate the excessive rights of trade unions and power of governments to implement tripartism negotiations with employer unions to decrease wage rate growth to match the productivity growth of export goods. In other words, Turkey must implement this “mathematical base social contract,” which can create stability between the lira and euro and decrease the ULC growth in export goods (Ünal, 2016b).

4 Policies for solving the deficit problem in Turkey

In the 1980s, as neoliberal policies took root, protectionism lost favor and Turkey shifted to a relatively open and free market economy. Its economic strategies were transformed into export growth strategies. During the 1990s, the Turkish economy suffered because of the trade deficit and inflation. In 2000–2001, Turkey experienced a severe crisis that shrank the economy and forced the government to implement necessary institutional changes. Being an EU candidate in 1999 influenced

³²The income policies of Turkey are discussed in detail by Ünal (2016b).

the direction of the reforms, which became more compatible with those of EU countries. Wage growth decreased and inflation was kept to single digits. The new government accelerated its privatization efforts as part of a policy of reducing the problems in unproductive public industries, which caused debt to rise markedly,³³ and promoted FDI.

Given the facts in Section 3.4, why Turkey should not become part of the EU and EMU is discussed next. First, being part of the EU also brings the responsibility to become part of the EMU, which means that to a certain extent Turkey could lose its independence in monetary policy as part of the integration process. This is inconsistent with its income policies and could cause a large depreciation in the PPP. For instance, to adopt the euro, Turkey must begin implementing Exchange Rate Mechanism (ERM II) policies to repress the volatility of its currency under conditions where wage rate growth is greater than the productivity growth of export goods. For this reason, the overvaluation of the lira is a problem when implementing a fixed or managed exchange rate system because it does not show consistency with the hypothetical exchange rate. If Turkey does not follow income policies to decrease its wage rate growth to the level of the productivity growth of export goods, institutional complementarity cannot be established under the EMU.

Second, Turkey's wage rate growth is the highest in the EU region and the gap between this and the productivity growth of export goods is the largest. Therefore, integration into the EMU with the highest ULC growth of export goods means low competitiveness compared with other member countries.

Third, Turkey's industrial policies are not well structured to compensate domestic consumption. Turkey has failed to promote low- and medium-tech industries, which have lost competitiveness. Moreover, it has not developed favorable policies for the transport equipment industry to meet the needs of local producers and eliminate domestic needs in terms of intermediate and final goods. Hence, integration into the EMU, combined with contemporary industrial policies and macroeconomic factors in Turkey, could accelerate its trade deficit and current account deficit.

Fourth, EU policies are based on neoliberal policies geared towards uniting the countries under a single functioning free market. Hence, some countries such as Germany have followed deregulation policies that have reduced the power of trade unions and caused deflation in the economies. This has pulled wage rate growth towards or under the productivity growth of export goods, helping maintain their competitiveness and stimulating their current account surpluses. Thus, the single trade market has become unfavorable to some, with export-led growth policies that have widened inequality in terms of competitiveness across the EMU; southern EMU countries have experienced increasing current account deficits (see Table 12).

Furthermore, countries such as the Czech Republic and Hungary have considerably decreased their wage rate growth since becoming members, but that has

³³For additional information, see the CBRT report *Strengthening the Turkish Economy: Turkey's Transition Program* (<http://www.tcmb.gov.tr/>).

caused deflation. In 2015, inflation was 0.2% in Germany, 0.3% in the Czech Republic, and -0.1% in Hungary.³⁴ If Turkey becomes an EU member state following the EMU, its economic configuration could be divided into two development paths that diverge from the explanation in this article. One is that Turkey could implement strict neoliberal policies, such as in the Czech Republic and Hungary, resulting in deflation and an economy incompatible with those of other countries. Another is that Turkey could continue with its current macroeconomic factors and face an increasing current account deficit and low competitiveness as in southern EMU countries. Based upon these two assumptions, Turkey needs to follow a different path, one based not on neoliberal policies, but on the institutional approach. In other words, as explained in Section 3.4, its income policies must be revised. Hence, Turkey must implement new institutional changes for the mathematical base social contract under tripartism. In the 2000s, the government made institutional changes related to the EU. Although such free market economic policies stimulated productivity growth, it also deepened the current account deficit problem.

How, then, can Turkey solve its trade deficit and current account deficit problem? Turkey needs to make new institutional changes in its industrial policies. First, support for low- and medium-tech industries has been neglected; these industries were not included in the promotion given to FDI inflows because the main industrial policy in the 2000s was shaped around medium- and high-tech industries to increase the export of goods from Turkey and lessen its trade deficit. However, although Turkey experienced technological upgrades in industries, which contributed to export growth as discussed in previous sections, failing to promote low- and medium-tech industries accounted for a huge trade deficit in a short period of time, and this problem cannot be overlooked. Moreover, according to the flying geese theory, although the transformation from low- and medium-tech industries to medium- and high-tech industries is a natural one, caused by intensifying FDI inflows in developing countries, Turkey experienced a significant decrease in the trade surplus of low- and medium-tech products when measured against both developed and developing countries in the EU, whereas the trade surplus of medium- and high-tech industries continued to slowly increase. For instance, Turkey was a dominant country in the textile and textile products industry, which shaped its base industrial production, but it lost its prominent position therein because of insufficient investment and promotion. This is one of the reasons for the increase in Turkey's trade deficit. The promotion of low- and medium-tech industries should be structured similarly to those of medium- and high-tech industries, with new policies. In particular, the textile and textile products industry becomes significant for promotions because this industry still constitutes an important proportion of both sales and employment as well as accounts for a significant proportion of Turkey's exports. Furthermore, low- and medium-tech industries are becoming creative and innovative, and these can contribute yet more to exports.

³⁴ Source: World Bank (inflation, consumer price (annual %)).

Second, while the purpose of production was designed in accordance with the export policies of multinational automobile companies, the domestic needs of the economy were neglected. It was thought that increasing exports by multinational companies could stimulate economic growth and compensate for imports; however, the trade deficit increased significantly and exports remained low. Structuring the promotions of multinational automobile companies only for exports was a huge factor in making the domestic market less attractive. Thus, new policies must be implemented to make the domestic market attractive for multinational automobile companies as well.

Third, the lack of the availability of domestic passenger cars accelerated the trade deficit in the transport equipment industry. Hence, subsequent institutional changes should be developed to enable collaborations between foreign-owned, multinational passenger car producers, and local producers. This policy has been successfully implemented in other automobile industries where the local capital share has generally remained greater than the foreign capital share, as shown in Table 10, and these industries have contributed to a trade surplus. In the case of other automobile industries, local producers played important roles because of their share of capital, which focused on both the domestic and the export markets, whereas passenger car producers concentrated on exports.

Fourth, domestic and export sales of passenger cars must be balanced by the government, and multinational automobile companies (both suppliers and final producers) should aim to eliminate any trade deficit by making institutional changes in industrial policies (e.g., by exempting local producers from additional costs such as special consumption tax or income tax, as is the case for exports).

Finally, the government should lower tax for consumers. Turkey has one of the highest proportions of consumption tax to total taxes among OECD countries (see Section 3.3). High taxes on cars increase the cost for customers and make the domestic market unattractive for new cars compared with second-hand cars. Therefore, Turkey should lower taxes for consumers to enable local producers to develop, contribute to the domestic market, lessen the imports of passenger cars, and play an important role in reducing the trade deficit.

On the macroeconomic factors discussed in Section 3.4, Turkey needs to implement new institutional changes directly connected to the support industrial policies discussed above. First, the technological upgrades in the Turkish economy increased the vertically imported intermediate goods directly and indirectly necessary to produce one US dollar of product in the 2000s. A high import dependency can increase imported intermediate goods and the export of goods. However, slow export growth deepens the trade deficit problem. Therefore, it is possible to eliminate the effect of import dependency on the trade deficit by improving the competitiveness of the Turkish economy. Here, macroeconomic and institutional factors become more important. Although decreasing ULC growth in export goods by linking wage rate growth to the productivity growth of export goods may be insufficient to solve all of the trade deficit problems with export-led growth countries, it will help Turkey strengthen its competitiveness in the EU against most member countries.

In terms of the import dependency, overvaluation is also important because it can stimulate a trade deficit. The dependency on intermediate goods increases the vulnerability of the Turkish economy to unexpected devaluations in the lira. It is expected that devaluations increase the trade deficit by raising import prices, which increases pressure on the CBRT to keep interest rates high to contain fluctuations in the lira by attracting short-term capital. The disparity between the rate of change in the lira and the PPP causes high volatility in the exchange rate (see Table 12).

Second, the problem of intermediate goods related to the effects of FDI inflows is another important factor. Turkey needs to import intermediate goods for exports, and competitive countries as well as countries with medium- and high-tech industries such as the transport equipment industry usually accelerate the import of intermediate goods. By increasing FDI inflows, Turkey has abandoned its policies for low- and medium-tech industries, and the dynamism of medium- and high-tech industries has led to greater export growth. However, the FDI inflows into the transport equipment industry were shaped considerably by that export growth. Therefore, the lower cost of production is an important factor to increase competitiveness in Turkey. One country that increased its trade surplus was Germany, because of its low wage rate growth, which created an undervalued currency and low ULC growth in export goods related to its income policies.³⁵ Non-EMU countries, including the Czech Republic, Hungary, and Poland, decreased their ULC growth in export goods in the 2000s, which increased their competitiveness and led to low current account deficit to GDP ratios compared with Turkey.

Third, the strategy of multinational automobile companies and domestic consumption, which increased significantly in the 2000s, became an important reason behind the trade deficit. Turkey saw dramatic changes in its industries and, although medium- and high-tech industries (excluding the transport equipment industry) contributed to its trade balance, the trade deficit worsened in other industries. Domestic consumption increased in low- and medium-tech industries connected to the textile and textile products industry (from which Turkey withdrew its promotions) and the transport equipment industry. The trade deficit in the final goods of the transport equipment industry with Germany and East Asian economies, which had low production costs compared with Turkey, climbed to a significant level. Turkey therefore needs to reduce the imports stimulated by domestic consumption by increasing its export growth. Slow export growth compared with import growth became clear in the 2000s, as reflected in the widening gap between exports and imports. Wage rate growth above the productivity growth of non-tradable goods increases demand

³⁵ Germany's income policy was shaped by collective bargaining between trade unions and employer unions. German trade unions consider average productivity growth for wage increases. Table 12 shows that the wage rate growth of Germany is close to the average productivity growth (non-tradable and export goods), which increases its competitive power against other EU countries, and the inflation rate is compatible between the average wage rate growth and productivity growth of non-tradable goods. Germany's income policy was confirmed for the largest trade union in Germany and Europe, IG Metall, on December 3, 2015, through an interview between the author and Martin Kramer, representative of IG Metall.

for imports from EU countries. It also causes slow export growth, which than cannot compensate for import growth. Hence, decreasing wage rate growth can cut domestic consumption and slow imports, thus supporting export growth.

Fourth, to increase its competitiveness, Turkey should implement new institutional changes to support industrial policies in international trade. The mathematical base social contract, the tripartism relationship among the government, trade unions, and employer unions, should be established to support Turkey's competitiveness to reduce its current account deficit.

Implementing institutional changes to establish the mathematical base social contract fixes wage rate growth to the productivity growth of export goods and reduces the disparity between the rates of change in the PPP and the lira in Turkey. Moreover, the mathematical base social contract cuts domestic consumption due to high wage rate growth, which increases the imports of final goods, slows import growth, eliminates sharp devaluations and their influence on import prices, helps export growth become compatible with that of EU countries, decreases ULC growth in export goods, and eliminates the current account deficit by increasing Turkey's competitiveness.

5 Conclusion

Turkey becoming a member of the Customs Union was the first step in its economic integration under the free trade agreement, and integration into the EU became an anchor for the Turkish economy and politics. However, the integration process deepened the current account deficit owing to the poor macroeconomic factors and industrial policies in Turkey. Indeed, these macroeconomic factors are unfavorable for Turkey's competitiveness against EU countries. Becoming a member of the EU will carry the responsibility of becoming a part of the EMU under functioning free market economic policies. The euro will remain an overvalued currency, which will accelerate the current account deficit.

As shown in Table 12, if Turkey were part of the EMU, the rate of change in the PPP would be approximately -10.4% and the euro would stay excessively overvalued. Currency overvaluation must be eliminated. The large disparity between the rate of change in the lira and the PPP was caused because of the large gap between wage rate growth and the productivity growth of export goods, which decreased the competitiveness of Turkey and worsened its current account deficit.

Turkey's trade deficit was stimulated by technological upgrades, the effects of increasing FDI, the strategy of multinational companies, and currency overvaluation related to macroeconomic factors. The first three increased the export of goods in medium- and high-tech industries. However, export growth lagged behind import growth because of the prevailing industrial policies. Turkey therefore needs to implement new institutional changes in industrial policies to make the domestic market more attractive. This action could decrease demand for the imports of transport equipment. Moreover, the promotion of low- and medium-tech industries should be developed similarly to those of medium- and high-tech

industries. Further, the promotions given for exports should be structured for the domestic market in terms of multinational automobile companies, and the government should formulate a new policy for suppliers and final producers by combining foreign capital with local capital to contribute to domestic consumption.

Even if Turkey does not join the EMU, macroeconomic factors will still be problematic, causing its economic fragility in the Customs Union. Hence, if Turkey wants to increase its competitiveness and be better equipped to stand against the market economies of the EU, new institutional changes should be implemented in wage–labor relations. Turkey must increase the flexibility of its wage policies by decreasing wage rate growth to the productivity growth of export goods by using the mathematical base social contract, which can also eliminate the large disparity between the rate of change in the lira and the PPP. Finally, these political implications could help create institutional complementarity between subsequent industrial policies and macroeconomic factors under new institutional changes.

Appendix

1A How to calculate the PPP

To calculate the PPP, the prices of export goods were taken into account. p_e shows the export price, v_e illustrates the vertically integrated labor input coefficient of export goods, and q_e is the productivity of export goods (see Appendix 2A). The mark-up rate is m_e , w is the nominal wage rate, and the import material cost is c_{im} as follows:

$$p_e = (1 + m_e)(wv_e + c_{im}) = (1 + m_e)(w/q_e + c_{im}) \quad (1)$$

By considering the export price, the PPP of a country, shown by A and based on a partner country shown with B , can be calculated as follows:

$$PPP^A(p_e^A) = (p_e^B) \quad (2)$$

Equation (2) can be described as follows:

$$PPP^A(1 + m_e^A)(w^A v_e^A + c_{im}^A) = (1 + m_e^B)(w^B v_e^B + c_{im}^B) \quad (3)$$

If the imported material costs are negligible in both countries, Equation (4) shows the rate of change in the PPP. The circumflex ($\hat{}$) defines the rate of change:

$$P\hat{P}^A = [(1 + \hat{m}_e^B) + \hat{w}^B - \hat{q}_e^B] - [(1 + \hat{m}_e^A) + \hat{w}^A - \hat{q}_e^A] \quad (4)$$

In Table 12, the countries had proportional nominal wage rate growth and a negligible import material cost.³⁶

³⁶For additional information about the PPP and the method to calculate proportional nominal wage rate growth and negligible import material cost, see Ünal (2016a).

2A Productivity growth of non-tradable goods and export goods

To determine the productivity growth of non-tradable goods and export goods, the equations were selected by using input–output methods. The productivity growth rates of the non-tradable goods and export goods were calculated by using input–output tables, and the ULCP or PPP for Turkey was determined by these calculations. The following system of equations can be written as

$$Ax + y = x \quad (5)$$

In this equation, A is the technological coefficients' matrix, y represents the vector of final demand, and x is a vector that shows the level of output. This form can be written by using the I unit matrix as follows:

$$\begin{aligned} y &= x - Ax \\ x &= (I - A)^{-1} y \end{aligned} \quad (6)$$

Thus, in the equation, the Leontief inverse matrix $(I - A)^{-1}$ is used to calculate the labor required to directly and indirectly produce one unit of each commodity. To measure the productivity growth of non-tradable goods and export goods, the equation below is used:

$$\begin{aligned} y &= (I - A) x \\ \phi x &= L \end{aligned} \quad (7)$$

In this equation, x is a column vector that shows the total output for each commodity, while A is the input coefficient matrix, which shows the domestic commodities used by the industry to obtain one unit of output. Furthermore, ϕ is a row vector that shows the amount of labor directly used to produce one unit of output in each industry. Finally, L is a scalar that shows total labor in the input–output table:

$$\phi (I - A)^{-1} = v \quad (8)$$

where v is a row vector whose elements show the labor directly and indirectly required to produce one physical unit of each commodity:

$$vy = v(N + E) = L \quad (9)$$

Domestic final demand is indicated by N and total exports is indicated by E . Furthermore, the shares of each commodity in this total are indicated as column vectors n and e , respectively:

$$v_n = \sum_{k=1} v_k n_k \quad \text{and} \quad v_e = \sum_{k=1} v_k e_k \quad (10)$$

In the equation, v_n and v_e are the vertically integrated labor input coefficients of non-tradable goods and export goods, respectively. Labor productivity is calculated by means of the vertically integrated labor input coefficients in each factor in both non-tradable and export

goods.³⁷ These coefficients were multiplied by price deflators.³⁸ If the coefficients decrease, the productivity growth of non-tradable goods and export goods increases.

3A Calculating the import dependency in non-tradable and export goods

The Leontief inverse matrix $(I - A)^{-1}$ is used to calculate the imported intermediate goods required to directly and indirectly produce one unit of each commodity. To find the import dependency in non-tradable and export goods, the following equation is used:

$$\begin{aligned} y &= (I - A) x \\ A^m x &= Q \end{aligned} \quad (11)$$

A^m refers to the input coefficient matrix of imported intermediate goods. Q is a scalar that shows total imported intermediate goods in the input-output tables:

$$A^m(I - A)^{-1} = \lambda \quad (12)$$

λ is a matrix that shows the imported intermediate goods directly and indirectly required to produce one physical unit of each commodity. The import dependency was calculated as follows:

$$\lambda_j = \sum_{i=1} \lambda_{ij} \quad (j = 1, 2, 3, \dots, a) = c \quad (13)$$

c is a row vector, which is derived by the sum of each industries' columns of λ . j represents the industries in the column and i indicates the industries in the row. c shows the imported intermediate goods directly and indirectly required to produce one unit of product in each commodity:

$$c y = c(N + E) = Q \quad (14)$$

Domestic final demand is N and total exports are given by E . The superscripts n and e indicate non-tradable goods and export goods, respectively; these are the shares of each commodity of this total:

$$c^n = \sum_{k=1} c_k n_k \quad \text{and} \quad c^e = \sum_{k=1} c_k e_k \quad (15)$$

³⁷For additional information on vertical integration, see Uni (2012) and Pasinetti (1993).

³⁸EU countries' deflators were derived and calculated from the UN database using the "national accounts estimates of main aggregates" and "GDP by type of expenditure" categories. Turkey's deflators were derived and calculated from TurkStat (GDP in chain linked volume, 2009=100) by converting the national currency into US dollars. The v_e deflator was calculated from exports at current prices (US dollars) divided by exports at constant prices (US dollars). The v_n deflator was calculated from domestic demand at current prices (US dollars) divided by domestic demand at constant prices (US dollars). The following equation was used: *Domestic demand = GDP - export + import*.

In the equation, c^n and c^e are the vertically integrated imported intermediate goods coefficients of non-tradable and export goods, respectively. The import dependency is calculated by using the vertically integrated imported intermediate goods input coefficients in both non-tradable goods and export goods. These coefficients were multiplied by price deflators to obtain the amount of directly and indirectly required imported intermediate goods to produce one US dollar of product.³⁹

4A Tables for the trade balance of intermediate goods and final goods, and number of foreign firms

Table 1A. Industries in the analysis	
1 Agriculture, hunting, forestry and fishing	9 Chemical and chemical products
2 Mining and quarrying	10 Rubber and plastics
3 Food, beverages, and tobacco	11 Other non-metallic minerals
4 Textile and textile products	12 Basic metals and fabricated metals
5 Leather, leather, and footwear	13 Machinery
6 Wood and products of wood, and cork	14 Electrical and optical equipment
7 Pulp, paper, printing, and publishing	15 Transport equipment
8 Coke, refined petroleum, and nuclear fuel	16 Manufacturing, Nec; recycling
Source: WIOD.	

³⁹The vertical integrated of imported intermediate goods directly and indirectly necessary for producing one physical unit of final product is calculated. By using a price deflator of non-tradable goods and export goods, one monetary unit of final product is converted into one physical unit of final product; by using the import deflator, one unit of imported intermediate goods is converted into one physical unit of imported intermediate goods. For the import deflator, imports at current prices (US dollars) divided by imports at constant prices (US dollars). For the price deflators of non-tradable goods and export goods, see the previous footnote.

Table 2A. Trade balance of the intermediate goods of Turkey with large investor countries in the EU in 2011 (million US dollars)

	Austria	Belgium	Finland	France	Germany	Italy	Netherlands	Spain	UK
1	-44.1	13.3	-2.9	-125.4	-47.1	23.9	54.9	1.8	-10.8
2	44.8	37.2	49.0	19.6	87.3	66.1	-5.9	33.1	-46.3
3	2.8	9.3	0.5	-37.4	-59.1	-20.7	-93.2	-151.8	-19.4
4	15.4	71.4	-164.7	-28.5	127.7	-820.2	35.0	-614.0	70.1
5	0.4	0.4	-0.1	-1.2	-3.6	-47.4	0.6	-2.7	6.1
6	-10.0	-7.7	-13.8	6.8	-118.3	-18.2	0.1	-7.2	1.0
7	-21.4	-2.5	-119.4	-9.6	-159.2	-16.7	-4.4	-35.2	98.8
8	-3.6	15.4	23.8	-6.3	-26.9	-359.6	-80.0	-208.5	-25.4
9	-29.4	-47.3	-11.9	-78.0	-253.7	119.6	-152.1	-1.3	20.5
10	24.7	43.2	-1.8	-37.0	106.5	-13.5	49.9	-4.8	122.8
11	-103.5	-98.5	-16.1	-250.9	-481.4	-309.1	-5.2	-255.9	14.0
12	10.8	-57.3	-89.4	-459.1	244.2	928.2	-136.5	-688.0	542.5
13	18.6	38.6	-5.9	183.6	206.7	-75.6	37.4	43.2	374.9
14	8.9	187.8	7.8	133.5	144.0	-56.5	13.3	5.7	661.4
15	-5.1	225.3	6.4	-112.3	-900.7	52.9	-109.1	-657.5	-287.7

(continued)

Table 2A. Continued

	Austria	Belgium	Finland	France	Germany	Italy	Netherlands	Spain	UK
16	18.9	-22.1	0.3	-6.2	426.8	-151.9	4.1	-25.0	-27.1
T	-72.3	406.6	-338.5	-808.8	-706.8	-699.0	-391.1	-2568	1495.5

Source: Author's own calculations.^a
Note: Gray cells show the surplus in trade balance. **T** indicates total.

^aCalculations were made through the WIOD international input-output tables derived from http://www.wiod.org/new_site/database/wiots.htm (last accessed February 15, 2016).

Table 3A. Trade balance of the final goods of Turkey with large investor countries in the EU in 2011 (million US dollars)

	Austria	Belgium	Finland	France	Germany	Italy	Netherlands	Spain	UK
1	19.3	67.7	2.5	140.9	811.4	312.8	7.8	61.4	279.0
2	-0.3	0.8	0.1	2.5	4.1	0.3	-0.5	1.1	1.8
3	71.6	123.3	38.3	92.3	1010.1	95.0	87.5	48.9	202.7
4	151.1	79.9	30.5	586.0	2341.6	-1494.9	206.3	-827.5	706.6
5	2.1	1.9	0.2	2.3	35.4	-73.6	5.8	-16.2	35.8
6	0.1	0.5	0.11	4.6	17.2	-26.1	2.1	0.8	2.3
7	-0.5	-0.7	-0.4	6.3	7.4	-6.8	4.1	0.5	8.1
8	1.2	8.4	8.8	4.3	-0.2	5.5	-27.5	-68.8	-8.0
9	-4.6	0.4	-4.9	-85.1	70.4	-53.4	-11.7	-17.6	14.8
10	4.4	-0.7	-0.9	-14.3	89.8	-56.2	18.4	-2.8	35.1
11	4.0	9.5	0.5	3.6	46.7	15.7	5.4	21.4	202.8
12	-8.8	-5.6	-2.9	45.2	53.7	-80.9	22.9	-2.5	318.4
13	-8.9	-4.2	-48.0	207.8	-283.0	-705.3	-14.0	122.5	409.9
14	-7.5	68.2	-116.2	54.7	-106.1	-76.3	-3.5	41.4	-492.0
15	-50.0	252.2	35.2	-68.8	-4831.5	49.1	-296.7	-960.0	-15.1
16	16.4	20.1	4.8	68.3	698.8	-1199.5	111.1	-98.9	28.9
T	189.6	622.2	-52.2	1051.2	-33.6	-3294.8	117.6	-1696.2	1680.3

Source: See Table 2A.

Table 4A. Trade balance of the intermediate goods of Turkey with other EU countries in 2011 (million US dollars)

	Czech R.	Estonia	Hungary	Ireland	Poland	Portugal	Slovakia	Slovenia	Sweden
1	9.0	-6.2	-163.3	7.7	35.2	2.9	-0.4	0.0	1.5
2	2.3	-0.02	0.8	13.1	-9.3	-1.2	6.1	0.0	-150.5
3	0.0	0.0	-6.3	-28.0	-1.4	0.0	0.5	-0.4	0.0
4	-163.4	12.5	29.6	22.1	219.9	-28.4	30.5	18.0	20.1
5	2.5	-0.1	0.4	0.1	0.4	0.1	0.2	-0.3	0.1
6	-1.0	-3.9	-1.1	-0.7	-20.8	-4.0	-3.3	-3.4	-0.4
7	-2.9	0.0	5.6	-4.4	-11.9	-30.4	-4.9	-8.8	-82.2
8	0.7	0.1	-4.3	-3.3	-11.3	-9.0	-0.1	23.9	-14.5
9	13.3	1.7	-10.7	-14.4	10.0	-12.4	5.7	9.8	-14.7
10	-41.8	5.9	-3.6	25.1	24.0	-10.7	-19.1	-10.3	16.0
11	-65.4	2.8	-25.1	9.9	-58.3	-22.4	-3.7	-8.2	-15.0
12	128.0	14.2	84.5	32.2	106.5	27.4	-43.4	-15.7	-67.0
13	0.1	2.8	51.2	17.9	76.0	-2.2	6.0	8.5	15.4
14	-33.2	-0.4	20.4	26.6	10.1	-20.8	31.4	4.0	85.0
15	-136.4	0.6	-15.9	9.0	-417.6	-7.7	19.0	9.8	-19.5
16	18.2	3.5	2.8	3.1	-23.4	-4.2	-4.7	1.6	2.2
T	-270.0	33.8	-35.0	116.3	-72.1	-123.4	19.5	28.5	-223.4

Source: See Table 2A.

Table 5A. Trade balance of the final goods of Turkey with other EU countries in 2011 (million US dollars)

	Czech R.	Estonia	Hungary	Ireland	Poland	Portugal	Slovakia	Slovenia	Sweden
1	41.5	-2.7	-117.6	2.3	67.6	-6.3	7.7	5.2	21.3
2	0.2	0.0	0.2	0.9	-0.1	0.0	0.0	0.1	0.4
3	70.9	2.8	-8.7	-33.7	-318.8	-10.0	5.4	2.2	49.3
4	120.7	14.5	-11.1	47.7	92.0	-241.8	-99.1	-1.4	159.9
5	4.4	1.8	-2.0	0.5	4.6	-4.8	-0.2	-0.6	0.8
6	0.4	0.1	0.3	0.0	-4.3	-0.3	0.1	-0.2	0.6
7	-0.4	0.1	-0.4	-33.5	-3.9	0.2	0.4	0.2	-2.3
8	0.5	0.0	-1.1	-13.1	-5.3	-2.9	0.1	24.5	-3.9
9	12.8	1.2	-0.2	-20.0	15.4	3.9	6.4	8.1	-15.3
10	-6.4	0.3	-12.3	1.4	-43.0	-6.3	-1.9	-1.7	-0.5
11	0.7	0.1	0.5	1.1	-15.5	-11.1	0.5	0.3	8.2
12	-3.4	1.2	15.9	1.8	-20.9	-7.2	1.6	6.1	6.0
13	-9.6	2.7	6.2	9.4	76.8	-2.7	-8.5	8.4	-7.4
14	-94.5	-8.4	-456.0	-1.6	-305.1	-28.3	-166.4	-6.4	-71.3
15	-176.9	1.8	-52.7	46.9	-863.3	-7.8	-60.2	18.6	72.9
16	6.7	6.6	21.0	4.9	-123.8	-11.1	-17.1	0.1	-16.9
T	-32.2	22.4	-618.2	15.2	-1447.7	-337.1	-331.3	63.5	201.8

Source: See Table 2A.

Table 6A. Number of foreign firms in Turkey by country										
	Austria	Belgium	Finland	France	Germany	Italy	Netherlands	Spain	UK	
1	0	0	0	1	2	1	0	1	1	
2	1	8	2	7	6	6	4	19	5	
3	0	0	0	0	0	0	1	0	0	
4	2	10	0	14	11	9	23	1	5	
5	0	0	0	1	3	2	2	0	0	
6	1	0	0	1	2	1	0	0	2	
7	12	6	1	5	6	4	15	7	10	
8	6	0	0	2	5	1	3	0	3	
9	7	5	0	20	70	17	42	8	9	
10	15	8	1	18	33	19	25	2	5	
11	3	5	0	14	28	11	8	25	4	
12	17	10	6	13	66	29	22	18	20	
13	5	4	0	17	49	36	16	3	6	
14	1	2	1	14	30	19	43	6	4	
15	1	4	1	24	49	24	10	7	4	
16	0	0	0	1	7	0	3	0	1	

Source: Author's own calculations. The numbers were calculated from the list of the Union of Chambers and Commodity Exchanges of Turkey in the category of foreign investment (in Turkish, yabancı sermaye üretici firmalar).

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