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TRADE IN SERVICES:

The elasticity approach for the case of Turkey

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Abstract

This study includes the analysis of global trade in the services and service sector in Turkey, and estimates the elasticity of trade in services to real exchange rates and income. There is an increasing role of the service sector in the Turkish economy; however, a decreasing trend of trade in services is taking place. The commitments of the GATS were found to be ineffective, at least in the case of Turkey. The empirical findings suggest that the real exchange rate is not a significant determinant for the trade in services. We found an inelastic real exchange rate and income elasticities in trade demand functions. However, the value of income elasticity significantly exceeds the value of real exchange rate elasticity.

JEL Classification Codes: C32, C52, F14, F41

Keywords: trade in service, trade elasticity, cointegration, vector error correction.

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1. Introduction

Services play a facilitating role in all aspects of economic activity. In general, the service sector is expanding faster (with attendant job creation) than other sectors such as agriculture or manufacturing. Services, particularly the financing and transportation of goods, have played an important role in world trade for centuries. The parameters for modern service sectors and the services trade were influenced early by the types of political relationships that evolved. In the past 40 years, the focus of services trade has shifted away from facilitating the trade in goods. Especially, international organisations promote trade in services with the General Agreements on Trade in Services (GATS), aiming to establish a system of international trade rules for the service sector. More recently, the integration of telecommunications and computer technologies has made virtually all services tradable across borders. However, members failed in the initial commitments for the liberalisation of services trade for the reason that ‘GATS was a new instrument... and governments wished to proceed with caution’ (Jara et al., 2006, 114).

The service sector has been important for Turkey since the 1980s liberalisation, both in terms of its role in total production and its share in total trade. Our study shows that the potential of the trade in services in Turkey deserves more attention, where the high risk of current account deficit has made the economy more fragile and susceptible to foreign shocks especially since 2003. Our analysis is composed of two aspects including, first, outlining major developments and the rules for global trade in services and recent trends in the Turkish service trade. This might help to answer the question of whether these international rules have become effective for the Turkish economy. Secondly, the empirical analysis is based on the export and import demand functions for trade in services, called trade elasticities in the service sector. The analysis includes the behaviours of the major service sectors such as transportation, tourism, construction, financial services, public services and other services along side the behaviour of total services. The empirical part of the analysis might help to measure the relative price and income elasticities in the trade in services.

Thus, our analysis starts with the international trade in services that provides the general outlines for international rules for trade in services, mainly focusing on the GATS and its final decisions. Then, in section 3 we will study the service sector and the trade in services in Turkey. Section 4 includes the econometric analysis of trade in services in Turkey by using elasticity approach and finally, section 5 gives some concluding remarks about the trade in services in Turkey.

2. International Trade in Services

Services make up a major portion of world economies, including developing countries, ranging from 39% of gross domestic production (GDP) in a country like Nigeria, to 89% in economies such as Hong Kong (China). In 2001, the share of services in the EU was around 70%. Service industries are already increasing in importance in most developing countries and particularly in least developed countries (LDCs), and usually contribute to at least 45% of the GDP³. In general, the service sector is expanding faster (with attendant job creation) than other sectors such as agriculture or manufacturing. The service sector covers a heterogeneous range of intangible products and activities that are difficult to encapsulate within a simple definition.

The creation of the General Agreement on Trade in Services (GATS) was one of the landmark achievements of the Uruguay Round of trade negotiations, from 1986 to 1993, the results of which were signed in Marrakech on 15 April 1994 and entered into force in January 1995. This was almost half a century after the entry into force of the General Agreement on Tariffs and Trade (GATT) of 1947, the GATS' counterpart in merchandise trade. The definition of services trade under the GATS depends on the territorial presence of the supplier and the consumer at the time of the transaction. It clearly defines four modes of supply in GATS (article 1), following Bhagwati (1984) and Sampson and Snape (1985) as follows:

- Mode 1: Cross-border trade, where the trade takes place from one country into another. Only the service itself crosses the border (e.g., banking or architectural services transmitted via telecommunications or mail);
- Mode 2: Consumption abroad, where the customer travels to the country in which the service is supplied (e.g., tourists or patients);
- Mode 3: Commercial presence, where the supplier establishes a commercial presence abroad (e.g., domestic subsidiaries of foreign insurance companies or hotel chains); and
- Mode 4: Movement of natural persons, where the provider of the service crosses the border (e.g., accountants, doctors or teachers).

Any of the four modes above constitute "trade" *as long as a local firm is being paid by a foreign firm ("non-resident")*, no matter where the service is actually provided. In 2005, modes 1 and 2 constituted 30% of total trade in services, mode 3 constituted around 66% and

³ Statistics are based on the international statistical departments such as the WTO and Eurostat.

mode 4 only 4% of total trade (Hufbauer and Stephenson, 2007, based on Table 1 on p. 607)⁴. Furthermore, the GATS was inspired by the same objectives as GATT. These objectives are as follows:

- Creating a credible and reliable system of international trade rules;
- Ensuring fair and equitable treatment of all participants (the principle of non-discrimination);
- Stimulating economic activity through guaranteed policy bindings; and
- Promoting trade and development through progressive liberalisation⁵.

All members of the WTO are signatories of the GATS and are required to assume the resulting obligations. Even though services account for over 60% of global production and employment, according to WTO statistics, they represent no more than 20% of total trade (BOP basis). However, this modest share should not be underestimated as many services that have long been considered genuine domestic activities increasingly have become internationally mobile. The trend is likely to continue and most of the battle will be at service trade talks. Nevertheless, the dynamics that are important in increasing the “tradability” of services are:

- The introduction of new transmission technologies (e.g., electronic banking, tele-health or tele-education service);
- The breaking up in many countries of long-entrenched monopolies (e.g., voice telephony and postal services);
- Regulatory reforms in hitherto tightly regulated sectors such as transport;
- Changing consumer preferences, such as technical and regulatory innovations.

The GATS applies in principle to all service sectors, which in particular includes 150 types of services in 12 different service sectors. However, there are two exemptions. Firstly, Article I(3) of the GATS excludes “services supplied in the exercise of governmental authority”. These are services that are supplied neither on a commercial basis nor in competition with other suppliers. Cases in point are social security schemes and any other public service, such as health and education, which are provided in non-market conditions. The latter is the Annex on Air Transport Services, which exempts from coverage measures affecting air traffic rights and services directly related to the exercise of such rights. The differences between the GATS and GATT are as follows:

⁴ See Hufbauer and Stephenson (2007) for further criticism about the definitions of these modes of services.

⁵ Robinson et al. (1999) suggested that the welfare gain for the world as a whole from a 50% cut of protection in service sectors is 5 times larger than that from non-service sector trade liberalisation. Another recent study by Stern (2005) calculated that free trade in services could result in a global welfare gain of \$1.7 trillion.

- The agreement includes not only services, but also service suppliers;
- The focus of liberalisation depends not on the abolition or reduction of custom duties, but on focusing on domestic arrangements preventing trade flow;
- Proposals of liberalisation are not about the service in general, but about four categories of service supplier;
- While quota-free entry (market access) and national treatment are generally applicable obligations under GATT, they apply under the GATS on a sector-by-sector basis and only to the extent that no qualifications (limitations) have been scheduled.

The export of services is challenging because services are intangible and the service actually is not created until it is delivered, it is critical for service providers to develop profile and credibility in new markets. Furthermore, many of the GATS provisions are ‘very loosely defined and broad in terminology, and thus subject to discretionary interpretation’ (Chanda, 2003). The GATS includes trade in services, but nothing about privatisation. Additionally, applications in public services such as education and health are rather difficult. For example, by using the exemptions a country may decide not to allow the doctors to work. The Transition period is 10 years. However, these exemptions have tended to become permanent features of the GATS system (Hufbauer et al., 2007, 611). So, barriers such as licensing requirements, investment restrictions, and quotas along side other entry barriers such as legislated telecommunications monopolies and other legal practices such as cartels or other protection rackets limit trade in services.

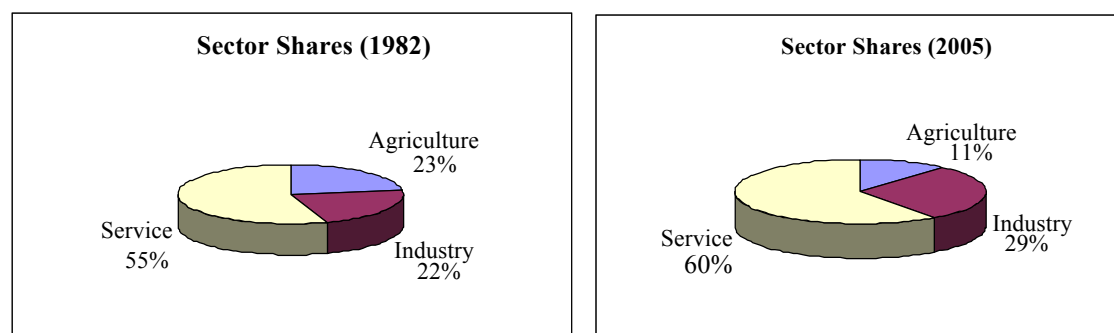
3. Trade in Services in Turkey

Turkey is a founding member of the WTO and the final act of the Uruguay Round trade negotiations discussions was approved by the National Assembly on the 25 February 1995. Turkey assumes the resulting obligations of the GATS and therefore it is important to analyse the service sector in Turkey before studying the trade in services.

The service sector has been important for Turkey since the 1980s liberalisation. Figure 1 shows the composition of the Turkish economy by kind of economic activities in 1982 and 2005. One significant outcome is that the share of agriculture in the overall economy decreased significantly from 23% in 1982 to 11% in 2005. The shares of services and industry increased. Yet, the share of services dominated the economy, increasing from 55% in 1982 to 60% in 2005. Alternatively, Table 1 shows the growth rates of the overall economy and different sectors in the economy. As we exclude periods of crisis such as the 1994, 1999 and

2001 financial crises, growth rates in the service sector generally were greater than the growth rate of the overall economy. For example, the service sector grew by 12.7% in 1987 when the economy grew only by 9.5%. Since 2003, the service sector has grown at a rate faster than that of the overall economy.

Figure 1. Gross Domestic Product by kind of economic activity (1987 at constant prices)



Source: Turkstat

Table 1. Growth rates by sectors (%)

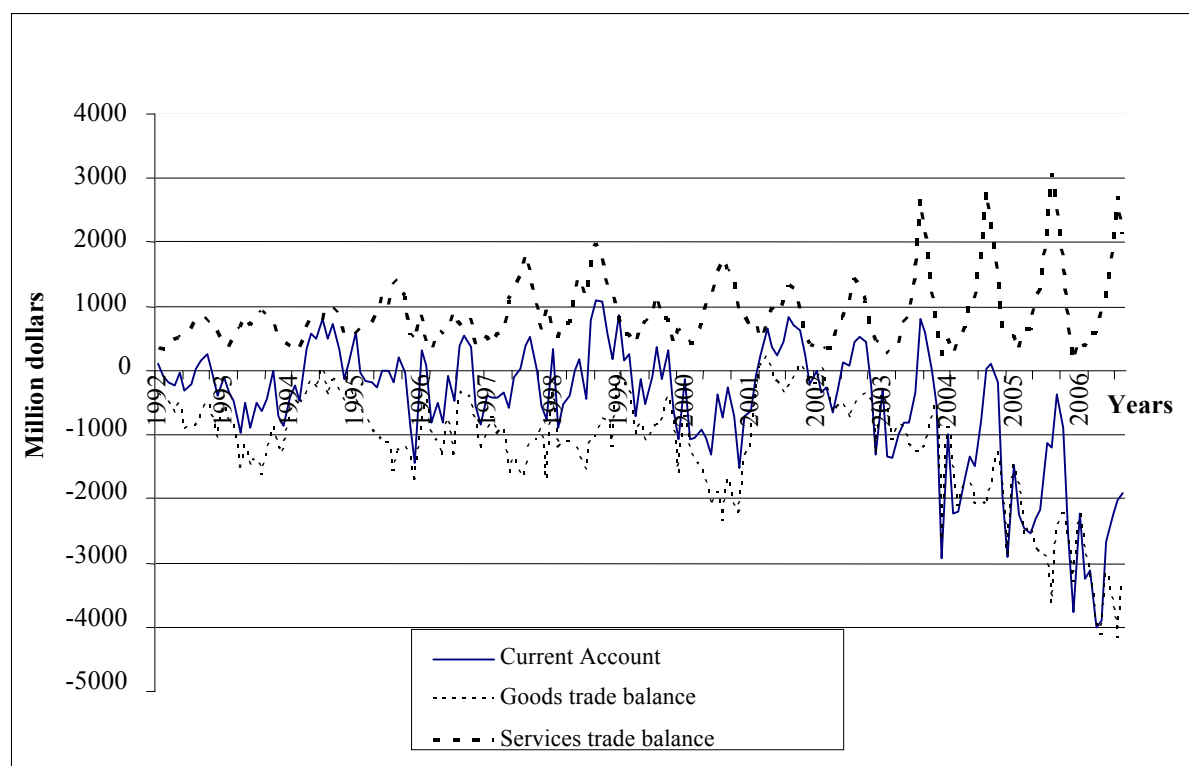
Year	GDP	Agriculture	Industry	Services	Year	GDP	Agriculture	Industry	Services
1986	7.0	3.6	13.1	5.6	1996	7.0	4.6	6.8	7.7
1987	9.5	0.4	9.2	12.7	1997	7.5	-2.2	10.2	8.6
1988	2.1	8.0	2.1	0.4	1998	3.1	9.6	1.8	2.3
1989	0.3	-7.7	4.9	0.7	1999	-4.7	-5.6	-5.1	-4.3
1990	9.3	7.0	9.3	9.9	2000	7.4	3.8	6.2	8.8
1991	0.9	-0.6	2.9	0.5	2001	-7.5	-6.0	-7.4	-7.9
1992	6.0	4.3	6.2	6.3	2002	7.9	7.5	9.1	7.5
1993	8.0	-0.8	8.3	10.4	2003	5.8	-2.4	7.8	6.7
1994	-5.5	-0.6	-5.7	-6.6	2004	8.9	2.0	9.4	10.2
1995	7.2	1.3	12.5	6.3	2005	7.4	5.7	6.6	8.1

Source: Turkstat

Figure 2 shows the current account and the trade balance for goods and services, separately. The current account does not provide a sustainable trend in some years and gives deficit and or surplus in other years. Ongan (2008) proposes that the only way to maintain the sustainability of the current account is to keep increasing tourism receipts in Turkey. However, from 2004 the current account deficit grew significantly, breaking the records and reaching 32.8 billion dollars in 2007. From the 1980s, the trade balance for goods gave deficit. For example, 8.1 billion dollars of the trade deficit in 1992 increased to 14 billion dollars in 2003 and, breaking the record, reached 42.1 billion dollars in 2007. On the other hand, in the same time period, the service trade balance gave surplus from the early 1980s.

For example, the service sector was 5.8 billion dollars in 1992, reaching 10.5 billion dollars in 2003 and 13.8 billion dollars in 2007.

Figure 2. Current account and trade balances.



Source: Central Bank of Turkey

Table 2. The share of trade in services (%)

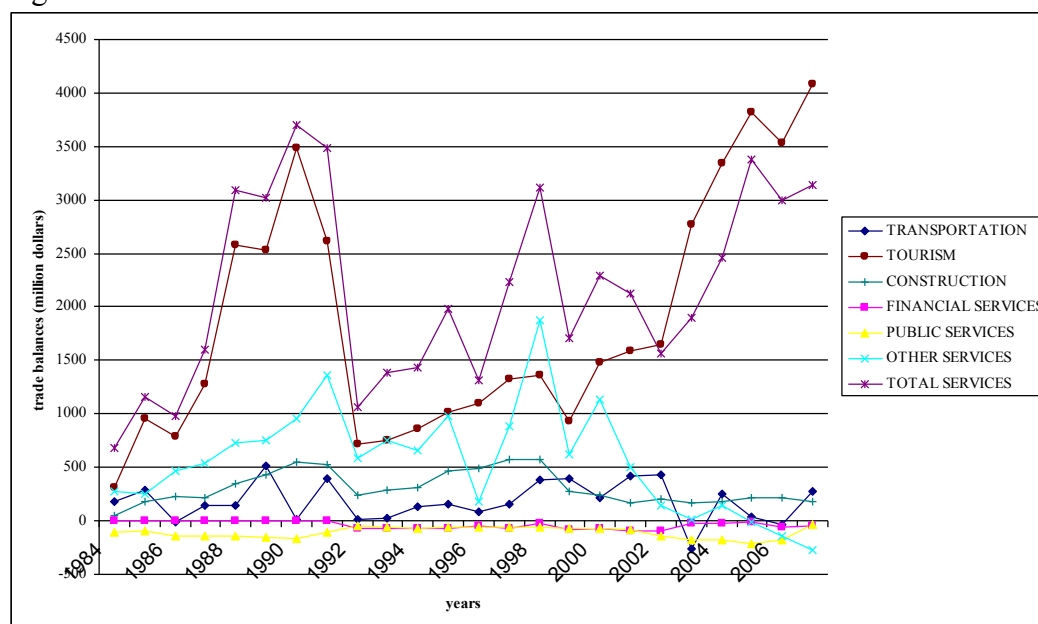
Years	Share of service trade in total trade	Share of service exports in total trade	Share of service imports in total trade	Share of service exports in total exports	Share of service imports in total imports
1990	25.54	17.45	8.08	38.87	14.66
1991	26.92	18.35	8.57	38.78	16.25
1992	25.98	18.56	7.42	38.87	14.19
1993	25.09	18.11	6.98	41.35	12.45
1994	27.25	19.96	7.28	37.72	15.37
1995	26.40	19.46	6.94	40.53	13.32
1996	20.70	13.89	6.81	28.91	13.11
1997	25.59	17.75	7.83	36.84	15.06
1998	30.18	21.25	8.93	42.58	17.76
1999	27.21	17.64	9.57	36.22	18.70
2000	24.73	17.34	7.38	38.27	13.45
2001	22.55	16.10	6.45	30.36	13.71
2002	18.53	12.78	5.76	25.32	11.57
2003	17.40	12.14	5.26	24.61	10.23
2004	16.98	11.68	5.30	24.60	10.00
2005	16.61	11.56	5.05	24.95	9.33
2006	13.44	9.17	4.27	20.41	7.70

Source: Central Bank of Turkey

Table 2 shows the share of trade in services that are based on balance of payment. The first column in the table shows the share of service exports and service imports in the total exports and imports of goods and services. From 1998, the share of trade in services in total trade reduced significantly. In 1998, the share of service trade was reduced from 30% in 1998 to 13% in 2006. The share of service exports in total exports decreased from 41.4% in 1993 to 25.3% in 2002 and to 20.4% in 2007. The share of service import in total imports decreased to 12.5% in 1993, to 11.6% in 2002, and to 7.7% in 2007.

The previous tables and figures show that the service sector had an important and increasing role in total economic activity in the period under study. Additionally, although trade in services gave surplus from the 1980s, the share of trade in services in total trade was a decreasing trend. Therefore, it is an advantage for Turkey, which is suffering from high levels of current account deficits, to direct its resources to promote trade in services. Thus, our intention is to analyse the service sector in more detail by studying sub-sectors that are specified in the balance of payments such as transportation (including the transportation of goods, passengers and luggage), tourism, construction, financial services, public services (including diplomatic payments) and other services (such as insurance, postal services, telecommunication, payments on intellectual and property rights and services regarding special privileges).

Figure 3. Trade in services



Source: Central Bank of Turkey

Figure 3 shows trade balances for these sub-sectors of trade in services. All sectors other than public services and financial services give trade surplus. Recent figures show that the trade balance of all services other than tourism shows a decreasing trend. For example, since the late 1990s, there has been a considerable reduction in construction and other services. On the other hand, since 2003, the trade balance of the tourism sector is greater than the trade balance of total services. This brings the conclusion that tourism is the major sector for trade in services, and tourism and transportation together account nearly more than 60% of trade in services both in exports and imports (see appendix 1).

4. The Econometric Analysis of Trade in Services in Turkey: the elasticity approach

4.1. Literature Review

In the literature, one way to investigate the determinants of trade flows is the elasticities approach, which estimates the import and export demand functions. In most studies, export (import) demand volumes are regressed on exchange rates, relative export (import) price and world (domestic) real income⁶. Furthermore, there has been growing interest in the price and income elasticities in the trade of goods for different countries and economic regions⁷.

Studies have been conducted on the trade elasticity of imports and exports of goods for the Turkish economy. The relationship between Turkey's export and exchange rates is controversial. For example, studies like that of Celasun and Rodrick (1988) found little support for establishing a relationship between export and exchange rate policy, whereas studies like Arslan and Wijnbergen (1993) found a positive relationship between the exports and domestic depreciation of the currency. Nevertheless, there are studies showing that the Marshal–Lerner condition holds as the absolute values of estimated price elasticities for imports and exports of goods sum up to more than unity (Simsek and Kadilar, 2004; Togan and Berument, 2007).

For the income elasticity of goods exports, Aydin et al. (2004) found a positive relation, with elastic income in the long run and inelastic income in the short run. Ozkale and Karaman (2006) showed that Turkey's import demand is income elastic and price inelastic. However, Ozkale et al. (2006) found inelastic income elasticity for the period after the

⁶ See, for example, Tadesse (2009), Marquez (2005), Bahmani-Oskoe and Hegerty (2009) and others.

⁷ See, for example, IMF (2006), Bahmani-Oskoe and Kara. (2005), Barhoumi (2005a,b), Kee et al. (2004), Caporale et al. (1999), Hooper et al. (1998), Goldberg et al. (1997).

establishment of the customs union between Turkey and the EU (for the period between 1996 and 2004), with negative sign for income elasticity coefficient. Simsek and Kadilar (2004) found that there is a long-term relationship between the export or import of goods and price and income. Aydin et al. (2004) and another recent study by Togan and Berument (2007) found elastic foreign demand for exports of goods with a positive sign.

However, little attention in the literature has been given to studying the service sector empirically. Firstly, Marquez (2005) studied the elasticities for the US trade in services. He concluded that estimated elasticities vary across different types of services and also the income elasticity for U.S. exports of services was significantly greater than the income elasticity for U.S. imports of services. In another study, El Khoury and Savvides (2006) examined the relationship between openness in services trade (telecommunication and financial) and economic growth. Trade in services in Turkey is an area that has not been studied much empirically. However, sectors such as tourism and construction have been popular, since these sectors are important in terms of their contribution to total production, employment and trade (see appendix 1 for the share of these sectors in total exports or imports). For example, Tosun (2000) studied the factors that emerged as challenges to sustainable tourism development.

4.2. Theoretical Framework

The effect of income and the real exchange rate on international trade is well recognised in the literature. To examine to what extent movements in the balance of trade of services are explained by change in relative prices, income and exchange rate we employ the imperfect substitute model (Goldstein and Khan, 1985) for the export and import demand function, where we assume that foreign and domestic products are imperfect substitutes.

$$X_{it} = f(P_{xit}, P_t^*, Y_t^*) \quad (1)$$

Where t denotes the time period of estimation, X_{it} is the export value of i th type of service in Turkey, P_{xi} is the export price of i th type of service in Turkish Lira, P^* denotes the foreign price deflator in Turkish Lira, and Y^* is foreign real GDP expressed in New Turkish Lira. If we divide right-hand side of equation (1) by foreign prices P_t^* , due to the linearity of demand functions the export demand is not going to change (Goldstein and Khan, 1985). Therefore, the logarithmic form of the export demand function is as follows:

$$\ln X_{it} = c_0 + c_1 \ln(P_{xit}/P_t^*) + c_2 \ln(Y_t^*) + \varepsilon_t \quad (2)$$

Where LnX_{it} is the natural log of export value for i th service, $Ln(P_{xit}/P_t^*)$ is the natural log of relative export prices for considered service categories and $Ln(Y_t^*)$ is the natural log of the foreign income. Finally, ε_t is the error term.

However, this approach used in equation 2 is not feasible because import and export prices are not available for services. An alternative approach used in the literature is to specify a direct relation between export value and the real exchange rate in one equation and import value and real exchange rate in another. Studies such as those by Bahmani-Oskooee and Economidou (2005), Bahmani-Oskooee and Ratha (2008), Irandoust et al. (2006), and Kwack et al. (2007) used real exchange rates in their studies to calculate the exchange rate elasticity. Therefore, the alternative log-linear form of the export demand function can be written as follows:

$$LnX_{it} = \alpha_0 + \alpha_1 Ln(E_t) + \alpha_2 Ln(Y_t^*) + \varepsilon_t \quad (2a)$$

Where E_t is the real exchange rate calculated by $(ER.P^*)/P$, ER is the nominal exchange rate represented in domestic currency per foreign currency. We followed Irandoust et al. (2006) and Kwack et al. (2007) and used GDP deflator both for domestic and foreign price (see appendix 2 for data description). Variables are in natural log forms.

We expect the coefficient of relative export price c_1 and α_1 in equation 2 and 2a to be negatively related to export volume as an increase in domestic prices will decrease demand for export while a foreign price increase will raise demand for export. It is difficult to define the sign of income elasticity c_2 and α_2 as it can have different signs. From one side, increase in the foreign income can raise demand for Turkish export. However, if foreign services are highly competitive with Turkish export foreign income in this case can have a negative effect on the export volume from Turkey.

The standard form of the import demand function can be expressed by the following equation:

$$M_{it} = f(P_{mit}, P_t, Y_t) \quad (3)$$

Where M_{it} is the import value of i th type of service in Turkey, P_{mit} denotes the import price of each type of service in New Turkish Lira, P_t denotes domestic price deflator and Y_t is domestic real GDP. Following the analysis made in export demand function extraction we can divide the right-hand side of equation (3) by domestic prices P_t . As a result, the estimated import demand function is as follows:

$$LnM_{it} = \gamma_0 + \gamma_1 Ln(P_{mit}/P_t) + \gamma_2 Ln(Y_t) + u_t \quad (4)$$

Where LnM_{it} is the natural log of import value for i th category of service, $Ln(P_{mit}/P_t)$ is the natural log of relative import prices, and $Ln(Y_t)$ is the natural log of the domestic income. Finally u_t is the error term.

For import demand we applied the same method to export demand function and used real exchange rate in the equation. Then, the alternative log-linear form of the import demand function can be written as follows:

$$LnM_{it} = \beta_0 + \beta_1 Ln(E_t) + \beta_2 Ln(Y_t) + u_t \quad (4a)$$

Where E_t is the real exchange rate and Y is the domestic output. We assume that the relative import prices coefficients γ_1 and β_1 will be negatively related to the import quantity as according to the demand theory, an increase in the import price will reduce the import demand while an increase in domestic prices will raise demand for import. However, income coefficients γ_2 and β_2 can have a positive as well as negative effect on the import demand. If there are no any alternatives for imported goods in the domestic production, income will have a positive effect on the import volume. However, the opposite effect was also found in some studies. Thus Sinha (2001) found that income has negative effect on import demand in India and Sri Lanka. Therefore, there is no certain expected sign for income elasticity.

4.3. Unit Root Results

Firstly we need to investigate the integration properties of the variables necessary for estimation of export and import demand models (see appendix 3). The variables investigated for the unit root are total services, transportation, tourism, construction, finance, public services and other services. These variables are considered for export and for import demands separately X_{it} and M_{it} . Additionally, we used real exchange rate, E_t , domestic GDP, Y_t and foreign GDP, Y_t^* .

In order to test the integration properties of variables, we used the Dickey and Fuller (1979), Augmented Dickey-Fuller (ADF) test, the Phillips-Perron (1988) test, the Kwiatkowski, Phillips, Schmidt, and Shin (1992) KPSS test, and finally the Elliott, Rothenberg, and Stock (1996) DF-GLS unit root tests. The ADF test constructs a parametric correction for higher-order correlation. The lag length for the ADF tests was selected to ensure that the residuals were white noise. Testing for the integration properties of variables the Phillips-Perron test proposes a nonparametric method of controlling for serial correlation. This method estimates the non-augmented Dickey-Fuller test. In the DF-GLS test, the simple modification of the ADF test is proposed where data are de-trended in order to maximize

power. The main difference of the KPSS test from the other tests described above is that the series are assumed to be stationary (no unit root) under the null hypothesis, while the null hypothesis of the tests described above assumes the non-stationarity of series.

The tests for the individual time series are presented in appendix 3, while the empirical results for their first differences are not presented here due to considerations of space. Every test includes results of estimations with constant or with constant and trend together. Stationarity columns (S) show the level of integration of series, where $I(0)$ denotes the stationarity of a variable or absence of the unit root, and $I(1)$ indicates the non-stationarity of a variable or existence of the unit root.

It is obvious that at conventional levels of significance almost none of the variables represent a stationary process when they are in levels. However, differencing these series produces stationarity. One variable requests special attention; that is the *total services* for export. The non-stationarity of these series is rejected by the majority of tests and stationarity is accepted by the KPSS test in both cases. Therefore, we conclude that all considered variables except *total services* and *relative prices* series are integrated in order 1 or $I(1)$, and found evidence of unit root. Since we established that *total services* are found stationary, therefore their deviations from any linear combination of variables in the export and import demand models are going to be stationary. For this reason we can not continue to consider *total services* in the cointegration procedure.

4.4. Cointegration Test Results

We used different estimation procedures such as the Engle and Yoo (1987) Ordinary Least Square (OLS) test, the Phillips and Hansen (1990) fully modified OLS – the FM-OLS test, the Saikkonen (1991), the Stock and Watson (1993), the dynamic OLS (DOLS) test, the Autoregressive Distributed Lag (ARDL) and the multivariate maximum likelihood procedure of Johansen (1988, 1991) JOH-ML to test the cointegration relation between exchange rates and monetary variables. Each method has different advantages and disadvantages. For example, the OLS estimates provide consistent coefficients of the long-run model, but standard errors are unreliable, whereas the long-run model estimates suffer from small-sample bias. Therefore, the OLS estimators showed little evidence of efficiency. In the DOLS estimates, however, leads and lags eliminate asymptotically any possible bias due to endogeneity or serial correlation. Therefore, they are asymptotically efficient in Saikkonen's (1991) and Stock and Watson's (1993) sense, having an asymptotic distribution that is a

random mixture of normals. Additionally, the ARDL and JOH-ML estimates are also asymptotically efficient and yield covariance matrices appropriate for inference. However, the JOH-ML method is sensitive to the number of lags included and this method does not perform very well in small samples.

a. Cointegration Coefficient Estimates

The stationarity of the linear combination of a group of non-stationary series is defined by the cointegration test. In order to find the long-run equilibrium relationship among variables, the linear combination of the non-stationary time series has to be stationary. The cointegrating coefficients are estimated by using different estimation procedures such as the OLS, DOLS, ARDL and JOH-ML. It is common in the literature to include two lags and two leads in DOLS estimates (Stock and Watson, 1993). In ARDL, we decided the appropriate the autoregressive order by using the Akaike Information Criterion (AIC)⁸. In JOH-ML estimates, one important thing is the selection of lag order. We focus mainly on two selection criteria that are commonly used in the literature: the Sims (1980) sequential modified likelihood ratio (LR) test and the Schwarz criterion (SC). We used a maximum lag order of 11, and modified LR. It selects eleven lags for import of tourism and eight lags for export of tourism, while seven lags were chosen for import of public services. Six lags were preferred for import of transportation services, other services and total services for export of transportation service. Five lags were chosen for exports of construction, public services and others services. We rely on modified LR for the reason that there is no evidence for heteroskedasticity and no serial autocorrelation⁹ for these lag orders.

Table 3. Cointegration coefficient estimates

Export	Coefficients	OLS	FM-OLS	DOLS	ARDL	JOH-ML
Transport	α_1	-0.001	-0.001*	-0.001	-0.001**	0.008***
	α_2	0.122***	0.113***	0.111***	0.134***	-0.095***
Tourism	α_1	-0.003***	-0.002**	-0.005***	-0.001***	0.009***
	α_2	0.030	0.014	-0.043**	0.069**	0.051***
Construction	α_1	-0.003***	-0.003***	-0.003***	-0.001	0.012***
	α_2	-0.029*	-0.022**	-0.009	-0.112*	-0.027
Finance	α_1	-0.001	-0.001	-0.003**	-0.001*	-0.003

⁸ Also, we followed the traditional method and used AIC for determining the appropriate autoregressive lag order in cointegration tests (to see whether the residuals are stationary).

⁹ We tested autocorrelation by using the Lagrange Multiplier (LM) for lags up to six and tested for White heteroskedasticity.

	α_2	0.165***	0.146***	0.249***	0.169***	-0.006
Public services	α_1	-0.005***	-0.005***	-0.007***	-0.002*	0.015***
	α_2	-0.033*	-0.041*	-0.083***	0.023	0.095**
Other services	α_1	-0.002***	-0.002***	-0.003***	-0.001	0.010***
	α_2	-0.095***	-0.079***	-0.063***	-0.120	0.058*
Import						
Transport	β_1	-0.005***	-0.005***	-0.007***	-0.001	0.011***
	β_2	0.749***	0.659***	1.119***	0.223***	-0.663**
Tourism	β_1	-0.002***	-0.002***	-0.003***	-0.001**	0.012***
	β_2	0.485***	0.242**	0.374**	0.028	0.838***
Finance	β_1	-0.002**	-0.001	-0.003*	-0.002***	0.103***
	β_2	0.812***	0.799***	2.209***	0.167	30.460***
Public services	β_1	-0.003***	-0.002***	-0.004***	-0.002**	0.009***
	β_2	0.409***	0.191*	0.070	0.702***	0.589*
Other services	β_1	-0.001*	-0.001	-0.001	-0.001***	0.004**
	β_2	-0.092	-0.095	-0.431**	0.106*	1.108***
Total services	β_1	-0.002***	-0.002***	-0.003***	-0.001*	0.005***
	β_2	0.299***	0.192**	0.189*	0.175*	0.155

*, **, *** indicate significance at 10%, 5% and 1% levels, respectively; standard errors for the coefficient estimate are given in parenthesis.

α_1 and β_1 are elasticities of exchange rates for export and import respectively from equations 2a and 4a

α_2 and β_2 are elasticities of income for export and import respectively from equations 2a and 4a

Table 3 reports coefficient estimates for chosen cointegration tests which represent long-run elasticities of exchange rate and income. We assumed that α_1 and β_1 which are exchange rate coefficients of export and import, respectively, are negatively related to trade flow of services. From the table we can see that exchange rate elasticities of almost of all reported services produced negative sign and the majority of estimates show significance at 1% level, which confirm negative relations between the exchange rate and trade flows of services. Only JOH-ML provided opposite results for all service categories except import for commercial services showing high significance level for all estimates. However, as discussed above, especially the JOH-ML test is very sensitive to lags choice and may not be reliable in small samples. Analysing the values of statistically significant elasticity estimates, we have enough evidence to conclude that the long-run exchange rate elasticities of both the export and import of considered service categories are inelastic and in addition they came out to be nearly zero. In most of the estimations, exchange rate coefficients gave similar results for the different estimation techniques used in this study. This is consistent with the results of Ozkale et al. (2006), where they concluded that price is inelastic and the sign of the real exchange rate is negative for the export demand function for goods trade. Another recent study by Togan and Berument (2007) also found that the CPI-based real exchange rate for the export demand function is inelastic but positive in sign. Yet, they also found that the real exchange rate is elastic for the import demand function for goods with a negative sign. Aydin et al. (2004), on the other hand, found that the exchange rate is inelastic for goods but positive in sign. Thus,

for the exports or imports of goods, exchange rate elasticity might give different results and might show conflicting relations. In our study, we found no evidence to assume that in Turkey the appreciation or devaluation of exchange rate seriously might affect the trade flow of considered services in the long run.

For income coefficients α_2 and β_2 of export and import, respectively, we did not define certain positive or negative relation on services trade flow. So, we may assume that when there is an increase in foreign income then we may expect an increase in Turkish exports, giving positive sign of elasticities. In consideration of import demand it can be assumed that an increase in the domestic level of income is expected to increase the demand for imports. However, in the case of Turkey, where it is the competitive producer of imported services, then the relation between domestic income and services imported can be expected to have a negative sign. Our findings show that we have enough evidence to assume a positive relationship between income and foreign trade, since estimations of transport and trade that accounts for the majority of trade in services give a positive sign (appendix 1). However, in some sectors, such as the construction and other services, the estimations of income coefficients provide a negative sign. So, it is important to analyse each category of services separately.

All coefficient estimates of income for transportation service for both export and import were found to be statistically significant at the 1% level. The signs of these coefficients are positive for OLS, FM-OLS, DOLS and ARDL test, while JOH-ML estimates performed a negative sign for export as well as for import trade flows. The positive sign of income elasticity for both export and import shows that with an increase in income, Turkey and the considered foreign countries have higher preferences for imported transport service than for a domestic one. The estimations show that the long-run income elasticity of transport service export is close to 0.1 or inelastic. Therefore, the Turkish export of transport service in the long run is not significantly affected by the changes in foreign income. The values of statistically significant income elasticities for the import of transport service vary through all tests, having the same positive sign except JOH-ML. It varies from 0.2 to its highest value of 1.1. It is obvious that income elasticities for the import are much higher than for the export of transportation service, even if they are still inelastic or close to unitary elasticity. Therefore, there is enough evidence to conclude that the import of transportation service is more positively responsible for the changes in domestic income than the export to the changes in foreign income.

The long-run income elasticities for tourism show a positive sign in both export and import demand functions, except for the DOLS test, where the income elasticity of export demand appeared negative with 5% significance. The income elasticity of export for tourism in Turkey is found to be around 0.05, which is the long-run inelasticity of income for export demand in Turkey. It means that in the long run changes in foreign income do not affect the changes in the export of tourism in Turkey. However, if we look at the import of tourism service, we see stronger evidence for the significance of long-term income elasticity. In the dependence of cointegration tests, the income elasticity of import is changing from 0.2 to 0.8. These results again indicate the inelastic income elasticity in the import demand of tourism service in Turkey. However, these figures are much higher than the income elasticities of export demand in the tourism sector and even they approach unitary elasticity. Therefore, it can be concluded that the import of tourism service in Turkey is more sensitive to changes in domestic income than the export of tourism service in Turkey to changes in foreign income. With increase in income, Turkish customers prefer to increase their travel abroad, while the increase in the income of considered foreign countries does not affect their decisions for travel to Turkey.

As mentioned above, the construction service in this study is considered only for export, because there is no official data in Turkey for the import of construction services. All cointegration tests indicate a negative relationship between changes in foreign income and changes in the export of the commercial services of Turkey. It means with an increase of income in foreign countries the export of construction service of Turkey tends to fall. However, the significance of income coefficients does not provide enough evidence in results to make any conclusion. The case of construction can be considered separately in further studies as Turkey mainly exports its construction service to Eastern European countries, while the group of foreign countries considered in this study does not include enough eastern countries to make a full conclusion about the elasticity of income for the export of the construction services of Turkey.

The cointegration coefficient estimates for the export of public services presented different signs. The OLS, FM-OLS and DOLS tests revealed a negative relationship between foreign income and export demand, while the ARDL and JOH-ML tests indicated positive relationships. Therefore, we do not have enough evidence for the long-run income elasticity for the export of public services in Turkey. However cointegration coefficients for the income in the import of public services are more consistent with each other. All of the β_2 coefficients of imports for public services presented positive sign. In addition the 1% statistical

significance of these coefficients for the OLS and ARDL tests allow us to conclude that the long-run income elasticity of public services of import demand is inelastic, but close to unitary elasticity 0.7 (the ARDL test). An increase in domestic income leads to a slighter increase in the import of public services.

The majority of income cointegration coefficients for the export of other services produced negative signs in the considered tests, except for the JOH-ML. The high level of statistical significance, 1%, allows us to conclude that the long-run income elasticity of the export of other services is inelastic and that any increase in foreign income leads to no significant diminishing changes of the export of other services of Turkey. However, it is difficult to conclude anything about the long-run income elasticity of the import of other services as signs of coefficient estimates appeared to be heterogeneous in different cointegration tests. The OLS, FM-OLS and DOLS tests produced negative signs, while the ARDL and JOH-ML tests performed positive sign.

As was mentioned above, we tested the cointegration of total services only for imports, due to the stationarity of the total services series for export (see Table 1). All income coefficients of the import for total services β_2 came out homogenous in sign as well as in value. A positive relationship was found between domestic income and the import of total services with an elasticity value of about 0.2-0.3. The statistical significance of coefficient estimates provides enough evidence to conclude that the long-run income elasticity of the total services import is inelastic; however, we can see that increase in domestic income induces a slight increase of total services' import.

In general, we found that the long-run exchange rate elasticities have negative signs for all of the service categories of export and import demand functions and that they are inelastic. In another words, the fluctuations of exchange rate do not affect the trade flow of services in Turkey in the long run. We found strong evidence of positive values for income elasticities. Additionally, in contrast to Marquez (2005), we found that income elasticity for imports is significantly greater than income elasticity for exports for different categories of services. Furthermore, transportation and tourism are two major groups and income elasticities for the import and export of transportation were found to be inelastic; however, income elasticity for the imports of transportation was greater than the income elasticity for the exports of transportation. Income elasticity for imports of tourism was found inelastic with positive sign. In addition, we found that the long-run income elasticity of imports for total services is inelastic, which means that the increase in domestic income slightly affects the increase in imports of total services.

b. Cointegration Test

In this section, we report the cointegration test results for the selected service categories in order to find whether the residuals of the tested variables are stationary. Export of total services is not included in the cointegration test as these series were found to be stationary (see appendix 3).

Table 4. Cointegration test results

Export	OLS^a	FM-OLS^a	DOLS^a	ARDL^a	JOH^b
Transport	-0.20	-0.35**	-0.25*	-0.90***	33.52** (1)
Tourism	-0.17	-1.07***	-0.99***	-0.83*	84.50*** (3)
Construction	-0.13	-0.33***	-0.26	-0.94*	48.61*** (3)
Finance	-0.21	-0.22	-0.49**	-0.61	60.37*** (2)
Public services	-0.34**	-0.34**	-0.30**	-1.16**	44.73*** (1)
Other services	-0.14	-0.34**	-0.32	-0.93**	45.17*** (1)
Import					
Transport	-0.20	-0.27*	-0.19	-1.02***	33.10** (1)
Tourism	-0.24	-0.31**	-0.31	-0.80**	144.26*** (2)
Finance	-0.20	-0.22	-0.28	-1.44**	36.69*** (1)
Public services	-0.24	-0.38***	-0.26	-0.52	36.61*** (1)
Other services	-0.21**	-0.15	-0.16	-0.93***	27.35* (0)
Total services	-0.23*	-0.20	-0.21	-1.07***	39.53*** (1)

*, **, *** indicate significance at 10%, 5% and 1% levels, respectively; standard errors for the coefficient estimate are given in parenthesis.

^a OLS, FM-OLS, DOLS and ARDL tests of H_0 : No cointegration, significance based on MacKinnon (1991)

^b Johansen one-sided upper-tail test of H_0 : No cointegration; 10, 5, and 1% critical values equal -27.07, -29.8, and -35.46 respectively. Numbers of cointegration equation(s) at the 5% significance level are shown in parenthesis. Number of lags are shown in Table 5.

Table 4 presents the cointegration test results by using the OLS, FM-OLS, DOLS, ARDL and Johansen tests, as discussed earlier. We used alternative tests to find cointegrating relationships in order to control their results and to maximize the power of the found evidence. We reject the hypothesis of no-cointegration for a selected series if three or more tests presented its cointegration.

Based on the results represented in Table 5, we found strong evidence of the cointegrating relationship in the following export categories of services: transport, tourism, construction, public services and other services with varying levels of significance. On the other hand, we found weak evidence for cointegration where only two tests, the DOLS and JOH, confirmed cointegration with 5 and 10% significance levels, respectively. Therefore, it

can be concluded that there is strong support for a long term relationship between export, exchange rate and income in selected service categories other than finance.

Testing service import categories only for tourism series, existence of cointegration can be confirmed with 1 and 5% significance level. There is enough evidence to assume that there is cointegration in sectors such as transport, other services and total services with 10, 5 and 1% significance levels. However, in the public services series with a 1% significance level, only in two (FM-OLS and JOH) out of five considered tests and only 2 tests confirmed cointegration in finance. Therefore, we can conclude that import demand functions for finance and public services are a short-run phenomenon and there are no long-run relationships exist for these series.

c. Error Correction Model

The vector error correction model is designed only for cointegrated series. The vector error correction model specifies the short-run adjustment dynamics that play an important role in the long-run relationships of variables. The deviations from long-run equilibrium are gradually adjusted by defined short-run dynamics. In previous part we did not find support for a cointegration relationship in the export and import series of financial services, or the import series of public services. Therefore, these series can not be included in the vector error correction model.

Table 5 presents the results for vector error correction model estimates. Error correction terms of λ_1 for the export and μ_1 for the import of services were not found statistically significant in any service category. At the same time, the exchange rate error correction terms λ_2 and μ_2 were found to be highly statistically significant almost in all service categories for both export and import, respectively. In addition to these, the signs of the error term for exchange rates were consistent with the negative sign of the long-run exchange rate elasticity found in Table 3. We found strong support for concluding that in the short-run exchange rate plays a very important role in the long-term behaviour of import and export demands. Thus, it was found that in all categories, more than 100% of the disequilibrium of the export and import of selected services each quarter is corrected by exchange rate. About 26% of disequilibrium in the export of tourism service is adjusted by foreign income, while 45% of disequilibrium in the import of tourism service is adjusted by domestic income each quarter. In other words, when deviations from the long-run equilibrium occur in the exports and imports of selected service categories, except for the import of other services, it is

primarily the exchange rate that adjusts to restore long-run equilibrium each quarter, rather than foreign or domestic income.

Table 5. Vector error correction

Export	k	λ_1	λ_2	λ_3	Import	k	μ_1	μ_2	μ_3
Transportation	6	-0.03 (0.06)	-40.78*** (9.39)	-0.06 (0.02)	Transportation	6	0.04 (0.06)	-35.67** (8.80)	-0.01 (0.05)
Tourism	8	-0.13 (0.17)	-118.60*** (20.74)	-0.26*** (0.04)	Tourism	11	0.04 (0.12)	-55.48*** (10.46)	-0.45*** (0.04)
Construction	5	-0.03 (0.06)	-37.93 (7.63)***	-0.02 (0.02)	Other services	6	-0.09 (0.01)	-25.23*** (2.60)	-0.09** (0.02)
Public services	5	-0.23*** (0.07)	-22.09*** (6.41)	-0.03** (0.01)	Total	6	-0.13 (0.07)	-49.83** (12.51)	-0.08 (0.06)
Other services	5	-0.07 (0.07)	-31.64** (7.83)	-0.02 (0.02)					

*, **, *** indicate significance at 10, 5, and 1% levels, respectively (Banerjee, A., Dolado, J.J. and R. Mestre (1992)).

Standard errors in parenthesis.

k – lag, chosen according to modified LR test results.

$\lambda_1, \lambda_2, \lambda_3$ measure the speed of adjustment of the export of selected service categories, exchange rate and foreign income, respectively towards the equilibrium,

μ_1, μ_2, μ_3 measure the speed of adjustment of the import of selected service categories, exchange rate and domestic income, respectively towards the equilibrium.

5. Conclusion

This study determined the major concepts behind trade in services including the global trends and recent developments in Turkey. There has been an increasing role of the service sector and its contribution in economic activity, especially in emerging markets. The GATS rules, however, were found to be ineffective in the case of Turkey, despite the decrease in their implementation share of the service trade in the last decade. Recent figures show that the trade in services in the Turkish economy has shown a downward trend even though its share in the contribution has increased significantly. Additionally, this study estimated the export and import demands of Turkey using the empirical framework of Goldstein and Khan (1985). The results for cointegration coefficient estimates are broadly consistent across alternative estimators with some exceptions. The long-run exchange rate elasticities of almost all of the selected service categories reported negative sign with a high statistical significance level and indicated inelasticity almost close to 0. So, we can conclude that exchange rate is considered as an insignificant factor in determining the export and import demand for services, which is also consistent with the literature regarding the trade elasticities of goods. The long-run

income elasticities for both the export and import series were found to be higher than the exchange rate elasticities. At the same time, the long-run income elasticities for the import of various service categories were found to be higher than the income elasticities for export elasticities in bounds of unitary elasticity.

We found strong evidence of a long-term relationship in the export demand of the transport, tourism, public services and other services and in the import demand of the tourism service. Weak evidence of a long-term relationship was found in the export demand of construction and in the import demand of the transport, public services, other services and total services, while there is no support indicated for a long-term relationship in the import of public services. The error correction model presented interesting results. While the long-run exchange rate and income elasticities were found inelastic, we found proof of a high exchange rate effect on export and import disequilibrium. We found that more than 100% of the disequilibrium of export and import in Turkey are adjusted by exchange rate every quarter.

Even though in the long run in both cases exchange rate and income elasticities were found inelastic, the effect of income elasticity on the export and import of services is much higher than effect of exchange rate elasticity. The ineffectiveness of the GATS rules in the case of Turkey due to the country-specific social, political or institutional factors may slow down the effect of any measures for promoting trade in services. However, based on the results, Turkey has to follow the trends of changes in consumer preferences that can help the tradability of services in Turkey and abroad.

For further study, the analysis may be extended by including other emerging economies to analyse the determinants of import and export demand in services. Moreover, export supply with other variables such as labour costs may be introduced in the model. Furthermore, the focus of the analysis may be on the estimation of the elasticities at the bilateral trade level (even though we are aware of the lack of availability in the services trade data). Alternatively, other price measures may be used for relative prices in the model for the reason that there is no official price measure either for the domestic service sector or the export/import prices for services in Turkey. Other econometric techniques may be used for a country-by-country analysis or a panel analysis.

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Appendix 1: Share of different types of services in total services trade (%)

3.a. Exports

	Transport.	Tourism	Construction	Financial	Public	Others
1992	12.46	36.39	9.95	1.40	1.61	38.19
1993	11.75	34.48	10.80	1.15	1.26	40.56
1994	11.33	36.96	11.77	0.92	0.75	38.27
1995	11.83	31.17	12.86	1.04	0.90	42.20
1996	13.63	41.52	15.18	2.25	1.25	26.18
1997	12.07	34.14	12.47	1.67	0.99	38.67
1998	13.94	29.79	10.24	2.20	0.73	43.09
1999	17.84	30.95	6.80	1.98	1.35	41.08
2000	15.74	36.87	5.12	1.96	1.45	38.85
2001	19.41	50.36	4.66	2.36	1.01	22.22
2002	21.62	57.13	6.46	1.79	0.56	12.43
2003	14.80	68.24	4.62	2.00	0.67	9.66
2004	15.60	65.80	3.54	1.49	1.25	12.33
2005	19.66	64.28	3.59	1.48	1.52	9.47
2006	18.48	65.68	4.11	1.30	1.44	8.99
2007	22.82	61.86	3.27	1.43	2.12	8.48

3.b. Imports

	Transport	Tourism	Construction	Financial	Public	Others
1992	26.06	19.95	0.00	10.75	9.06	34.18
1993	28.53	22.20	0.00	9.96	8.64	30.67
1994	23.61	21.89	0.00	8.85	8.99	36.66
1995	26.55	17.32	0.00	7.98	7.10	41.05
1996	27.29	19.61	0.00	7.53	6.11	39.46
1997	22.41	20.52	0.00	7.29	5.01	44.76
1998	24.41	18.17	0.00	6.08	4.35	47.00
1999	23.75	16.17	0.00	7.12	5.65	47.31
2000	30.98	20.87	0.00	8.56	6.65	32.93
2001	33.09	27.83	0.00	11.87	8.10	19.10
2002	31.67	30.29	0.00	10.26	10.24	17.54
2003	36.53	28.55	0.00	5.06	10.58	19.28
2004	42.58	25.18	0.00	3.79	9.06	19.39
2005	41.76	25.34	0.00	3.42	10.16	19.30
2006	38.67	24.64	0.00	4.78	9.08	22.83
2007	43.37	22.89	0.00	4.19	5.84	23.70

Appendix 2: Data sources and description

The data sample includes disaggregated data for services in their six categories: transport, tourism, construction, commercial services; public services; and other services. All of these categories represent the export and import demands for Turkey, except the construction category, which is used only for the export demand due to lack of data for the import demand for construction services in Turkey. The quarterly data used in this research

includes the period between 1984Q1 and 2007Q3. This study includes nine countries as a representative of foreign country. These countries are: Belgium, Canada, France, Germany, Italy, Netherlands, Spain, the United Kingdom and the United States of America. They are selected according to the highest bilateral trade values between Turkey and its trading partners. However, bilateral trade values are available only for the trade of goods, not for services. Our decision in selecting countries is based on the bilateral trade values of goods. The real gross domestic products (GDP) are used for income variables (2000 as the base year) and obtained from the official site of the Organisation for Economic Co-operation and Development (OECD). The GDP deflators of selected countries are used in calculating real exchange rates and are obtained from the OECD site as well. The real GDP and GDP deflator of Turkey is used for income variable and as a proxy of domestic relative price variable, respectively. Furthermore, the foreign GDP deflator for each country is calculated by taking into account the time-varying share of that country in the Turkish bilateral export of goods to all countries. Finally, domestic data was obtained from the Turkish Statistical Institute (TURKSTAT). The nominal exchange rates are the national currencies per new Turkish lira obtained from the central bank of Turkey. All variables are measured in log levels.

Appendix 3: Unit root test results

Export	ADF(a)				Phillips-Perron(a)				KPSS(b)				DF GLS(a)			
	<i>c</i>	<i>S</i>	<i>c,t</i>	<i>S</i>	<i>c</i>	<i>S</i>	<i>c,t</i>	<i>S</i>	<i>c</i>	<i>S</i>	<i>c,t</i>	<i>S</i>	<i>c</i>	<i>S</i>	<i>c,t</i>	<i>S</i>
Total services	-2.95	<i>I</i> (0)	-3.13	<i>I</i> (1)	-5.38	<i>I</i> (0)	-5.70	<i>I</i> (0)	0.30	<i>I</i> (0)	0.10	<i>I</i> (0)	-0.92	<i>I</i> (1)	-2.29	<i>I</i> (1)
Transport	-1.35	<i>I</i> (1)	-3.18	<i>I</i> (1)	-0.91	<i>I</i> (1)	-3.06	<i>I</i> (1)	1.01	<i>I</i> (1)	0.13	<i>I</i> (0)	-0.87	<i>I</i> (1)	-3.15	<i>I</i> (0)
Tourism	-2.03	<i>I</i> (1)	-2.33	<i>I</i> (1)	-6.63	<i>I</i> (0)	-6.83	<i>I</i> (0)	0.47	<i>I</i> (1)	0.18	<i>I</i> (1)	-0.41	<i>I</i> (1)	-1.90	<i>I</i> (1)
Construction	-2.39	<i>I</i> (1)	-2.81	<i>I</i> (1)	-3.80	<i>I</i> (0)	-3.69	<i>I</i> (0)	0.25	<i>I</i> (0)	0.26	<i>I</i> (1)	-0.77	<i>I</i> (1)	-1.04	<i>I</i> (1)
Finance	-2.29	<i>I</i> (1)	-3.06	<i>I</i> (1)	-1.95	<i>I</i> (1)	-2.98	<i>I</i> (1)	0.54	<i>I</i> (1)	0.18	<i>I</i> (1)	-1.48	<i>I</i> (1)	-3.11	<i>I</i> (1)
Public services	-2.50	<i>I</i> (1)	-2.58	<i>I</i> (1)	-2.55	<i>I</i> (1)	-2.63	<i>I</i> (1)	0.11	<i>I</i> (0)	0.09	<i>I</i> (0)	-2.19	<i>I</i> (0)	-2.62	<i>I</i> (1)
Other services	-2.70	<i>I</i> (1)	-3.22	<i>I</i> (1)	-2.58	<i>I</i> (1)	-3.13	<i>I</i> (1)	0.44	<i>I</i> (0)	0.20	<i>I</i> (1)	-2.43	<i>I</i> (0)	-2.68	<i>I</i> (1)
Import																
Total services	-2.55	<i>I</i> (1)	-2.66	<i>I</i> (1)	-2.62	<i>I</i> (1)	-2.60	<i>I</i> (1)	0.18	<i>I</i> (0)	0.12	<i>I</i> (0)	-2.14	<i>I</i> (0)	-2.69	<i>I</i> (1)
Transport	-1.34	<i>I</i> (1)	-3.22	<i>I</i> (1)	-0.85	<i>I</i> (1)	-3.20	<i>I</i> (1)	1.05	<i>I</i> (1)	0.17	<i>I</i> (1)	-0.58	<i>I</i> (1)	-3.27	<i>I</i> (0)
Tourism	-1.83	<i>I</i> (1)	-1.85	<i>I</i> (1)	-5.21	<i>I</i> (0)	-5.24	<i>I</i> (0)	0.23	<i>I</i> (0)	0.20	<i>I</i> (1)	-1.26	<i>I</i> (1)	-1.93	<i>I</i> (1)
Finance	-2.68	<i>I</i> (1)	-2.67	<i>I</i> (1)	-4.71	<i>I</i> (0)	-4.71	<i>I</i> (0)	0.225	<i>I</i> (0)	0.186	<i>I</i> (1)	-1.61	<i>I</i> (1)	-2.35	<i>I</i> (1)
Public services	-1.98	<i>I</i> (1)	-1.96	<i>I</i> (1)	-5.29	<i>I</i> (0)	-5.09	<i>I</i> (0)	0.20	<i>I</i> (0)	0.19	<i>I</i> (1)	-1.38	<i>I</i> (1)	-1.80	<i>I</i> (1)
Other services	-2.19	<i>I</i> (1)	-2.16	<i>I</i> (1)	-2.48	<i>I</i> (1)	-2.47	<i>I</i> (1)	0.11	<i>I</i> (0)	0.05	<i>I</i> (0)	-2.15	<i>I</i> (0)	-2.15	<i>I</i> (1)
Other Variables																
Real Exchange Rate	-2.86	<i>I</i> (1)	-3.32	<i>I</i> (1)	-2.60	<i>I</i> (1)	-3.29	<i>I</i> (1)	0.60	<i>I</i> (1)	0.12	<i>I</i> (0)	-1.37	<i>I</i> (1)	-3.02	<i>I</i> (1)
Domestic Income	-2.76	<i>I</i> (1)	-4.31	<i>I</i> (0)	-4.38	<i>I</i> (0)	-4.17	<i>I</i> (0)	0.23	<i>I</i> (0)	0.21	<i>I</i> (1)	-1.91	<i>I</i> (1)	-2.25	<i>I</i> (1)
Foreign Income	-1.69	<i>I</i> (1)	0.64	<i>I</i> (1)	-1.74	<i>I</i> (1)	0.88	<i>I</i> (1)	1.27	<i>I</i> (1)	0.21	<i>I</i> (1)	1.31	<i>I</i> (1)	-0.29	<i>I</i> (1)

Critical values are used from MacKinnon (1996) one-sided p-values.

c- intercept includes constant, *ct*- constant with trend

(a) Null of non-stationarity (unit root), (b) Null of stationarity

S- Stationarity defines the level of integration where *I*(0) shows stationary series (no unit root), *I*(1)- nonstationary series (unit root).