Tradable and Nontradable Expenditure and Aggregate Demand for Import in an Emerging Market Economy

Guncavdi, Oner and Ulengin, Burc

Istanbul Technical University - Faculty of Management

23 June 2008

23 June 2008

Tradable and Nontradable Expenditure and Aggregate Demand for Imports in an Emerging Market Economy

Öner GÜNÇAVDI[1,2§] and Burç ÜLENGİN[2]

[1]Economic and Social Research Centre (ESCR) and Faculty of Management Istanbul Technical University

[2] Faculty of Management Istanbul Technical University

Abstract: *The Turkish economy has recently showed a remarkable performance in economic growth. This performance is particularly meaningful because it has occurred just after the worst economic crisis of the economy. Among other factors, the availability of high liquidity in international markets has played an important role in the easy access to foreign savings, and also increased domestic expenditure in the Turkish economy. This paper examines the importance of international liquidity usage in financing domestic aggregate expenditure. In this regard, we divide this expenditure into nontradable and tradable expenditure in terms of their income generation capability in different currencies. Nontradable expenditure generates income in local currency whereas tradable expenditure has the capability to generate income in foreign currency through trade. This division of the domestic expenditure components is particularly important if domestic expenditure is increasingly financed from capital inflow and if the nontradable component in domestic expenditure rises. Since nontradable expenditure creates income in local currency, and as its importance in Turkey has recently become high, the dependency of the economy on foreign exchange earning has also increased. This is shown by estimating the import demand function which includes the effects of disaggregated domestic expenditure. Empirically we found that nontradable expenditure is as crucial as tradable expenditure in generating import demand in the short run. This empirical finding makes us particularly sceptical regarding the positive effects of capital inflows which are closely related to the use of these inflows in tradable economic activities.*

Key words: Import demand function, tradable and nontradable expenditure, Turkey, capital inflows.
JEL Classification: F14, F43, O11, O24.

I. INTRODUCTION

In the last couple of years the Turkish economy has shown a remarkable performance in economic growth. Following a 7.5 percent contraction due to the economic crises in 2001, the Turkish economy grew 7.1 percent on average in the period of 2002-2006 (*see* www.tcmb.gov.tr). According to international observers there were a number of factors, at both national and international levels, that played an important role in this success. The first was the high international

§ Corresponding author. *Öner Günçavdı*, Economic and Social Research Centre, Faculty of Management, Istanbul Technical University, Süleyman Seba cd., No. 2, 34367 Maçka – Istanbul/Turkey; Fax: +90-212-2407260; email: guncavdi@itu.edu.tr.

liquidity in this period that enabled Turkey to have easy access to international financial sources at relatively low cost. The second is the presence of a single-party government which implies political stability and reduced uncertainty in macroeconomic policies for international lenders and investors.[1] The beginning of accession talks with the EU in 2005 constituted the third factor which helped the facilitation of easy access to international capital. Sound macroeconomic policies and a fiscal stance which has been guided by a number of standby agreements with the IMF were the last factors playing important role in explaining this exceptional performance of the Turkish economy in recent years.[2] All these favourable conditions have allowed Turkey to access international liquidity easily, and also to expend its domestic expenditure.

Turkey has, however, not been the only country benefiting from the availability of international liquidity in recent years. Other emerging market economies also performed with distinction in the same period. Despite regional variations, economic growth in emerging market economies in general surged around 7 percent in 2003-2007 (*see* BIS, 2007; *pp.* 34-35). In addition to country-specific factors, liberalisation in capital accounts helped these economies benefit from the availability of high international liquidity, which is a fundamental requirement of countries with high growth ambitions and large resource gaps. Nevertheless this liberalisation effort has exposed the emerging market economies to capital in- and out-flows. As international capital inflows have an important role in financing resources gaps in emerging markets, the relationship between these forms of capital and their usage has largely been ignored. In this paper one channel of this missing link is put forward and is empirically examined. In what follows it is indicated that the usage of international liquidity in domestic economies plays an important role in explaining the balance of payment difficulties.

Domestic expenditure in any economy comprises of two distinct components, namely expenditure on tradable goods and expenditure on nontradable goods and services. These componants are indeed interrelated. This interrelationship stems from the fact that some of tradable and nontradable expenditure items could be either substitutes for, or complements to, others in

[1] The presence of a single-party government in Turkey is an unusual experience in the Turkish political history, and there have been two exceptional cases before the present government. The first one was Democrat Party government in the 1950s, whereas the second was the Motherland Party government in the 1980s.

[2] In the same period, international liquidity has also been abundant at the worldwide due to continuing large US current account deficits and surpluses in the current accounts of oil and natural gas exporting countries, Chine and some South Asian countries.

consumers' budgets.[3] More importantly, some nontradable expenditure may posess tradable expenditure components, and any disproportional increase in total expenditure in favour of nontradable goods can be expected to stimulate tradable expenditure. Especially in a period when the domestic currency is overvalued, it is more likely that this disproportional increase in nontradable expenditure would disproportionally raise demand for imports as well as the need for foreign currency which would, in turn, be necessary to finance the imported component of the tradable expenditure. This has interestingly become evident in the recent experiences of the Turkish economy.

With easy access to international liquidity, the expenditure structure of the Turkish economy has also evidently changed, and domestic expenditure and the share of the nontradable expenditure within the economy has drastically increased (*see* Table 1 and Figure 2). This however constitutes a serious concern when it is examined together with the increased current account deficits of the country.[4] This concern is based on the belief that an expansion in domestic expenditure is a crucial determinant of demand for aggregate imports and current account deficits.[5] Previous studies for Turkey consistently showed that Turkish import demand is highly responsive to changes in domestic expenditure with an elasticity greater than its unity (*see* Togan and Olgun, 1987; Günçavdı and Ülengin 2006 and 2008). However all of these studies follow the traditional literature of import demand functions and implicitly ignore the very important distinction between tradable and nontradable expenditures, and again implicitly assume that they are *separable*[6],

[3] However some nontradable expenditure may have domestic and imported tradable goods components, and any increase in such nontradable expenditure inevitably stimulate expenditure on tradable goods. The distribution of the demand for tradable goods between domestic and imported goods will be dependent on the relative price of domestic and imported goods. For example, expenditure on construction sector productions would require imported and/or domestically produced intermediate goods. Another example, which would be relevant for the Turkish economy is the expansion in domestic retail-and-wholesale-trade sectors, which becomes more evident in big metropolitan areas such as Istanbul with an increased number of shopping centres. Such nontradable economic activities will also inevitably require imported and domestically produced tradable goods as domestic trade in these centre flourishes.

[4] Unlike ours, this concern is usual for a country having expansion in its expenditure, and as expected arises in the case of Turkey from the fact that exports have increasingly become dependent on imported inputs (see Günçavdı and Küçükçifçi, 2001 and 2006; Günçavdı *et al.* 2008). This, along with an increase in exports leads to a rise in imports and consequently causes a deterioration in the current account balance of the Turkish economy. This concern has recently found echoes among the business community in Turkey, and some prominent Turkish businessmen have advised the current government to take some appropriate measures to increase the value of Turkish exports, and to correct current account imbalances by doing so.

[5] As a developing country Turkey has occasionally experienced a number of economic crises, all of which were initiated by payment difficulties that the economy encountered to finance unsustainable levels of current account deficits (*see* Celasun and Rodrik, 1989).

[6] The separability assumption in our context here means that tradable and nontradable expenditure in consumers' budget are independent of each other. According to this assumption, expenditure in the preferences of a representative consumer can be partitioned into groups (such as tradable and nontradable expenditure) so that preferences (or demands) within groups can be described independently of the quantities in other groups (Deaton and Muellbauer, 1980).

and import demand as a component of tradable expenditure is assumed to be independent of other components of domestic expenditure.[7] This distinction is particularly become important for emerging market economies such as Turkey, because they have recently been exposed to large capital inflows and had a challenge of finding where to use these relatively easy funding in the recent international environment. Some countries like Turkey have found it relatively easy to direct these funds, *to a large extent*, towards financing nontradable goods expenditure, which is local in nature and possesses an income creation capability largely in national currency.[8] In this regard, using international funds in foreign currency for financing domestic nontradable expenditure, which stipulates an income-generation process in national currency, may cause a *mismatch* problem in international payments, and therefore financing income-generating economic activities in local currency with the use of international liquidity could account for the main reason for our concern about the sustainability of financing large and successive amounts of current account deficits. In particular, in the case where nontradable expenditure possesses high import contents, the distortion of domestic expenditure largely in favour of its nontradable component would disproportionally increase the need of foreign currency income and inevitably exacerbate the international payment problem. Keeping this in mind, unlike the traditional approach we believe that both expenditure components might possess significantly different impacts on import demand, and macroeconomic policies to curb current account deficits should accordingly differ. For this purpose the responses of import demand to each expenditure component should be taken into consideration separately in empirical studies examining import demand behaviour.

The importance of this distinction in domestic expenditure arises from its possible detrimental role in current account imbalances. In particular, as nontradable expenditure is principally made in domestic currency and has little capability to generate foreign exchange for the economy, this nontradable expenditure with the certain import content will encourage expenditure on imported goods especially in an economy where its domestic currency becomes overvalued against the international currency. In this respect an increase in nontradable expenditure will ultimate stimulate imports and country's need for

[7] To the knowledge of authors, in the traditional import demand literature this distinction between the tradable and nontradable expenditure components has drawn very little attention. The only exception has been Goldstein *et al.* (1980), which examined the role of prices of tradable and nontradable goods in import demand. However this paper, like those in the traditional literature, also ignores the distinction between the elasticities of tradable and nontradable expenditure.

[8] Large capital inflows, which are experienced together with a restrictive monetary policy (the inflation targeting policy in the case of Turkey) also create excess demand for national currency and cause its appreciation. This overvaluation of domestic currency will in turn constitute significant stimuli for nontradable expenditure.

foreign currency, which could be obtained by export earnings and/or capital inflows through foreign borrowing and foreign direct investment. Therefore, it would be reasonable to assume that both expenditures are separable in consumers' budget, and to examine the responsiveness of aggregate import demand to these expenditure components.

Following this introductory section, the remainder of the paper is organized as follows. We begin with the discussion of the recent changes in the expenditure structure of the Turkish economy in Section II. The model used in the empirical section of the paper is presented in Section III. Together with the data and the empirical methods the results derived from empirical investigation is discussed in Section IV. Finally, Section V includes a short summary and our concluding remarks.

II. RECENT CHANGES IN TURKISH EXPENDITURE STRUCTURE

Following the economic crises in 2001, the Turkish economy witnessed two important structural changes. The first one occurred in the world economy, as international liquidity drastically increased and become accessible for financing high economic growth in developing countries. The second one happened in Turkey and regards macroeconomic stance and priorities in the usage of economic resources. Accordingly various economic and political reforms took place in the economy with the help from the IMF and other international institutions, and the dedication of successive Turkish governments after 2001 has increased the confidence of international investors and has also helped the government to attract the international liquidity which would be required to finance domestic expenditure.

(*Table 1 about here*)

In accordance with our concern in this paper, the expenditure structure of the Turkish economy has considerably changed in two ways. The first change occurred in the conventional components of expenditure (such as consumption, investment, public expenditure and net export). This change can easily be seen in Table 1. According to the figures in this table, investment expenditure constitutes the largest share in total after consumption. However its share noticeably increased after 2002 and reached its historically highest level. In particular the share of investment expenditure was almost 38% of the total in 2007 whereas the same figure was 24% in 2002. This can be viewed as clear evidence of where

economic resources have recently been used in the Turkish economy.[9] The resource gap of the economy, which can be noted by net exports, show that the need of foreign resources by the Turkish economy rose form 4.6% in 2002 to 8.4% in 2007. This is the main reason for serious concern among economist and policy makers about the sustainability of these gaps. Naturally this sustainability is closely related to the availability of financial liquidity in international markets, and until recently there had been no difficulty for the Turkish economy to obtain the liquidity that is required to finance the country's expenditure.

(*Figure 1 about here*)

We can observe another crucial change in the current expenditure structure of the Turkish economy when we decompose total expenditure into its tradable and nontradable components. In assessing the vulnerability of the Turkish economy to recent high current account deficits, we find that this decomposition of expenditure is even more worrying in this respect than in our earlier point. This is mainly due to the fact that, as a result of easy access to international liquidity, nontradable expenditure may eventually take up a relatively larger share in total expenditure and may possess high import components.[10] Especially in the case where foreign exchange rate and monetary policies at work encourage international liquidity to be used to finance nontradable expenditure; this expenditure would stimulate economic activities generating income largely in domestic currency, rather than in foreign currency. In terms of the usage of foreign exchange resources in income generating activities, the country would eventually accrue a serious risk of having mismatch payment problems and non-performing foreign exchange liabilities in the future.

Figure 1 shows the cycles in the shares of tradable and nontradable expenditure in total domestic expenditure for the period of 1987-2007. The figure is based on the annual data, which is seasonally adjusted. The dashed curve represents the cycle in the share of tradable expenditure which shows a declining trend from 1994. The nontradable expenditure which is represented by the bold curve, on the other hand, exhibits an interesting pattern with a persistently

[9] Further examination of the same data reveals that investment expenditure in recent years took place as replacement investment. We reach this conclusion from the highly detailed investment data. This data indicates that investment expenditure in machinery increased more than construction investment. This replacement investment had been postponed for some many years mainly because of the lack of confidence and instability in the Turkish economy. Following the reconstitution of this confidence, replacement investment first took place. Additionally TFP….

[10] Basing on the calculations from the various input-output tables of Turkey, the nontradable components of total expenditure appears to have taken up an increasing share in a unit import demand. While 20 percent of a unit import demand in 1985 was generated by nontradable expenditure, this figure increased to 31 percent in 1998.

increasing trend after 1994. However, the expansion of nontradable expenditure seems to be extremely high after 2001 in comparison with its values in previous years. As we discussed earlier, good macroeconomic policies together with accession talks with the EU, and favourable international conditions, allowed for the single-party Turkish government to expand domestic expenditure easily. Given the difficulties of having the same expenditure expansion in tradable goods sector (due to the presence of intense competition in international tradable commodity markets), the Turkish government's ambition of achieving high economic growth in a short period of time seems to have no option apart from directing expenditure largely towards nontradable goods sectors, and to provide desired level of economic growth through the expansion in the production level in this sector.[11]

III. THE MODEL

The traditional approach to modelling aggregate import demand is based on the allocation of tradable goods expenditure between domestically produced and imported tradable goods on the basis of their relative prices. This approach ignores the presence of nontradable goods expenditure, which is a competitor in consumers' budgets for already given level of real income. Accordingly this approach implicitly assumes that tradable and nontradable expenditures are separable in the sense that tradable expenditure is independent of neither nontradable expenditure itself, nor of the relative prices of the tradable imported goods and nontradable goods. This result indeed involves the presence of a two stage, and separable expenditure behaviour of consumers. In the first stage, they allocate their expenditure between tradable and nontradable goods on the basis of their prices. In the second stage, they take a decision about allocating tradable expenditure (given from the first stage) between imports and domestic tradable goods. As a consequence of this separable expenditure assumption, aggregate import demand becomes a function of the importing country's level of real income (or real expenditure) and the relative prices of imported and domestically produced

[11] Economic growth in a country can be generated through an increase in production levels of tradable and nontradable goods. Due to a desire of attaining high growth rates in the short run, governments usually prefer policies encouraging production in the nontradable sector. This is mainly because the policies designed for this purpose would require financial resources in domestic currency. Moreover these financial resources can easily be raised from domestic sources. However, economic growth driven by an increase in output in tradable sector is largely determined by the competitive power of the domestic tradable sector in international markets. Besides, any expenditure expansion largely towards the tradable sector would certainly require foreign exchange resources, which could be obtained from international market through exportation and/or foreign borrowing. The competitive power of the tradable sector is expectedly provided by the *total factor productivity* of the economy, and any increase in this competitive power would require some time to achieve, and would require long-run investment in development of the infrastructure and human capital.

goods (Houthakker and Magee, 1969; Bahmani-Oskooee, 1998, Asseery and Peel, 1991). However the real income (or real expenditure) in the import demand function should be viewed to be total income of consumers, which is also available for the consumption of nontradable goods, and therefore the level of nontradable expenditure as well as the price of nontradable goods should also be included in the import demand function as a competitor for income. The presence of nontradable expenditure in consumers' budget will enable us to consider inevitable competition effect between tradable and nontradable expenditure for the level of income available for each expenditure component.

Intuitively, nontradable expenditure should also be included into the import demand function, as a determinant of import demand, due to its imported goods components, and any change in nontradable goods expenditure will respectively invoke the demand for the imported tradable goods, and constitutes a positive effect on import demand.

According to the traditional approach, a standard demand function of aggregate demand is given as function of real expenditure (or real income) and the (relative) prices of imported and domestically produced goods as follows:

$$M_t^* = f\left(Y_t, P_t^m / P_t^d\right), \qquad \partial M_t^* / \partial Y > 0,\ \partial M_t^* / \partial P_t^d > 0,\ \partial M_t^* / \partial P_t^m < 0 \tag{1}$$

where the variables are defined as follows:[12]

M^* : Desired quantity of imports demanded,
Y : Real expenditure (or income),
P^m : Price of imports,
P^d : Price of domestic goods.

In equation (1) $\partial M_t^* / \partial Y > 0$ assumes that an increase in real total expenditure is expected to increase tradable import demand. In empirical studies equation (1) is traditionally written in logarithmic form as follows:[13]

$$\ln M_t^* = \alpha_0 + \alpha_1 \ln Y_t + \alpha_2 \ln\left(P_t^m / P_t^d\right), \quad \alpha_1 > 0, \quad \alpha_2 < 0 \tag{2}$$

[12] Traditional modelling includes the relative price variable in (1) under the assumption of unit homogeneity in prices. In other words, (1) implicitly assumes that there exists the illusion of money. Another assumption of the traditional modelling of import demand is that on the supply side, the price elasticity of import supply is infinite; i.e. the supply of imported goods is given. Therefore the supply-and-demand equality in the imported goods market can be reduced to an equation such as (1) in equilibrium.

[13] Economic theory does not provide any specific suggestion on the best functional form and the most appropriate measure of variable in concern. Khan and Ross (1977) and Boyland *et al.* (1980) suggested log-linear forms purely on the basis of statistical testing. Additionally conventional import demand equations have mostly been specified in double-log-linerar form due to it convenience and ease of interpretation.

Following the discussion above, the aggregate real expenditure in equation (2) can now be divided into two components, namely tradable and nontradable expenditures, and such division of expenditure is also followed by a split of relative prices of imported goods, domestic tradable goods and nontradable goods. Hence the import demand function which considers the distinction between the effects of tradable and nontradable expenditures can easily be written as follows:

$$\ln M_t^* = \alpha_0 + \alpha_{11} \ln Y_t^T + \alpha_{12} \ln Y_t^N + \alpha_{21} \ln\left(P_t^m / P_t^N\right) + \alpha_{22} \ln\left(P_t^m / P_t^T\right) \quad (3)$$

$$\alpha_{11}>0, \quad \alpha_{12}>0, \quad \alpha_{21}<0, \quad \alpha_{22}<0 \quad (4)$$

where the variables are defined as follows:

Y_t^T : Real level of tradable expenditure
Y_t^N : Real level of nontradable expenditure
P_t^N : Price of nontradable goods
P_t^T : Price of tradable goods.

The price of tradable goods is assumed to be a weighted average of tradable export and import prices; i.e. $P_t^T = \beta P_t^m + (1-\beta) P_t^x$ where β implies the share of importable goods in the tradable goods bundle of the country; P_t^x is the price of exportable goods. Upon substituting this definition of the price of tradable goods in (3), the following can be derived:

$$\ln M_t^* = \alpha_0 + \alpha_{11} \ln Y_t^T + \alpha_{12} \ln Y_t^N + \alpha_{21} \ln\left(P_t^m / P_t^N\right) + \alpha_{22} \ln\left[P_t^m / \left(\beta P_t^m + (1-\beta) P_t^x\right)\right] \quad (5)$$

After modifying the last term on the right-hand side of equation (5) we can also write the following:

$$\ln M_t^* = \alpha_0 + \alpha_{11} \ln Y_t^T + \alpha_{12} \ln Y_t^N + \alpha_{21} \ln\left(P_t^m / P_t^N\right) + \alpha_{22} \ln\left\{1 / \left[\beta + (1-\beta)\left(P_t^x / P_t^m\right)\right]\right\} \quad (6)$$

Since $\left(P_t^x / P_t^m\right)$ is known as *the terms of trade* and noted by the variable *T*, equation (6) can also be written as follows:

$$\ln M_t^* = \alpha_0 + \alpha_{11} \ln Y_t^T + \alpha_{12} \ln Y_t^N + \alpha_{21} \ln\left(P_t^m / P_t^N\right) + \alpha_{22} \ln 1 - \alpha_{22} \ln(1+\delta T) \quad (7)$$

where $\delta = (1-\beta)/\beta$, ln1=0.

$$\ln M_t^* = \alpha_0 + \alpha_{11} \ln Y_t^T + \alpha_{12} \ln Y_t^N + \alpha_{21} \ln\left(P_t^m / P_t^N\right) + \alpha_{22}' \ln(1+\delta T) \quad (7')$$

$$\alpha_{22}' > 0 \quad (8)$$

The presence of the last term with the terms of trade variable with the positive coefficient in (7) is novel in the empirical import demand literature and possesses an interesting economic intuition. The terms of trade accordingly indicate the benefit (or loss) of a country from unit international trade. In the case of *T* greater than unity for example, the country benefits from this unit trade and it is able to earn positive international liquidity from trade, which would then be used to finance import expenditure, vice versa. Therefore the terms of the trade variable in equation (7) can be viewed as a means to restrict the effects of international liquidity constraints that would be imposed by the existing structure of foreign trade of the country. With respect to equation (7), any increase in *T* would reduce the stringency of this liquidity restriction and would enable the country to increase its import capacity without requiring the international liquidity that could only have been obtained through borrowing otherwise.[14]

Another interesting variable in (7) is the relative price of the imported goods and nontradable goods, which is the third term on the right-hand side. This term appears to be similar to the definition of the real exchange rate, which is in general defined as the relative price of tradable and nontradable goods. This third term differs from the standard definition of the real exchange rate only with the presence of import prices, not the price of tradable goods, at its nominator. However this term can be interpreted as real-exchange-rate-alike variable.

An equation such as (1) and (7) in the empirical foreign trade literature can be considered as an equilibrium relationship, and is assumed to hold in the long run. However, an equilibrium condition such as (7) does not hold in the short run because of various imperfections generally generated by the presence of delivery lags and adjustment costs (see Marston, 1971). In other words, imports will not always remain at their long-run equilibrium level as described in equation (7).

Short-run dynamics of the model

Although the theory says nothing about how to incorporate the short-run dynamic behaviour of import demand, we can suppose that the short-run import demand is

[14] Foreign trade provides the international liquidity that a country requires for financing tradable expenditure in foreign currency in the world economy. This liquidity can then be considered as trade-related-liquidity. The importance of this way of "earning" international liquidity is that it does not induce the total financial liability of the country in foreign currency. However this is not the only way for the country to obtain international liquidity. Foreign borrowing, which creates financial liability for the country, is the second way of obtaining international liquidity which could be used to finance import expenditure. This second source of international liquidity becomes crucial, particularly when the terms of trade from foreign trade works against the country. In other words, T is lower than unity. In this case the country is unable to raise all necessary international liquidity from foreign trade and becomes dependent on foreign borrowing.

in disequilibrium, which creates extra costs for the economy. This assumption helps us in justifying and deriving the dynamic behaviour of import demand in the short run. Hence disequilibrium gives rise to the following penalty function describing the total cost of being disequilibrium:

$$E\left\{\sum_{s=0}^{\infty}\beta^{s}\left[\theta_1\left(m_{t+s}-m_{t+s}^{*}\right)^2+\Delta m_{t+s}^2-2\theta_2\Delta m_{t+s}\Delta m_{t+s}^{*}\middle|\Omega_t\right]\right\},\ \theta_1,\theta_2\geq 0 \qquad (9)$$

where small cases in equation (9) indicates the logarithm of all relevant variables; m_{t+s}, for example implies the logarithm of M_{t+s}. Equation (9) represents the total costs that the country encounters due to the short-run import demand being in disequilibrium (Nickell, 1985). This penalty is assumed to be minimised by choice of m_{t+s} $(s=0,\ldots,\infty)$ where Ω_t is the information set at time t; β $(0\leq\beta\leq 1)$ is the discount factor; m_{t+s}^{*} is the equilibrium level of imports for period (t+s) as described in equation (1); θ_1 and θ_2 are parameters. The first term in the square brackets represents the cost of being away from the long-run equilibrium level of imports. The second term reflects the costs of changing the rate of imports, whereas the last term indicates that the loss is attenuated if the firm moves in the right direction (towards the equilibrium rate of imports); this last term will go to zero if the equilibrium level of imports remain constant.

Minimising equation (2) with respect to m_{t+s} yields a second order difference equation. Using only the stable root, λ, of its characteristic equation ($\lambda<1$), and assuming that the expected future level of import demand follows a random course with drift (μ), the following familiar error-correction representation can be derived as the dynamic function describing the short-run behaviour of import demand:

$$\Delta m_t=a_0+a_1\Delta m_t^{*}+a_2\left(m_{t-1}^{*}-m_{t-1}\right) \qquad (10)$$

where $\alpha_0=(1-\lambda)(1-\theta_2)\beta\lambda\mu/(1-\beta\lambda)$, $\alpha_1=[1-(1-\theta_2\lambda)]$, $\alpha_2=(1-\lambda)$. Equation ( ) shows the dynamics of short-run import demand. The unobservable, desired level of import demand is given by (7) as a cointegration relationship. The unobservable Δm_t^{*} is replaced by the first-differences in the independent variables in equation (7). Therefore the estimating import demand function becomes:

$$\Delta m_t = \phi_0 + \phi_1(L)\Delta y_t^T + \phi_2(L)\Delta y_t^N + \phi_3(L)\Delta\left(p_t^m / p_t^N\right) + \phi_4(L)\ln(1+\delta T)$$

$$+ \phi_5(L)\Delta m_{t-1} + \xi\left(m_{t-1}^* - m_{t-1}\right) \quad (11)$$

$$\sum\phi_1(L) > 0\,,\ \sum\phi_2(L) > 0\,,\ \sum\phi_3(L) < 0\,,\ \sum\phi_4(L) > 0\,,\ \xi > 0$$

where L is the lag operator, and $\phi_i(L)$ indicates the lag polynomials of the relevant variable. Equation (11) is an autoregressive distributed lag (*ADL*) specification of an appropriate lag order. We now turn to estimate this model as suggested by appropriate statistical techniques.

IV. DATA AND EMPIRICAL RESULTS

In this section the import demand function derived as in equation (11) is estimated by using quarterly data from the Turkish economy over the sample period 1987:1-2006:4. Before reporting econometric results, the derivation of some variables deserves special attention. Among others, the nontradable goods prices are not readily available for such an empirical investigation and must be derived from the domestic price index, which is composed of certain portions of tradable and nontradable goods. This aggregate price data is available at the macroeconomic level, but must be decomposed. In this research, we employ the consumer price index to represent the domestic price level. In Turkey, this index includes seven major commodity groups, four of which are nontradable goods. Respectively, expenditure on health and personal care, transportation and communication, cultural expenditure and entertainment, education, and finally housing are grouped as nontradable expenditure and their prices are calculated from the aggregate index.[15] This demanding decomposition was made with the monthly data and then converted to the quarterly frequencies. Figure 2 shows the general trends of the prices under examination, and reveals that nontradable prices drifted away from their tradable counterparts starting from 2002, indicating disproportionate expansion of domestic demand towards nontradable expenditure.

(*Figure 2 about here*)

[15] The authors thank *Fuat Erdal* of Adnan Menderes Üniversity for doing this demanding decomposition and for providing his price indicies of tradable and nontradable goods to us. In this decomposition, foods, bevarages and tobacoo, clothing and footwear, and finally other goods are taken as tradable goods in the sample.

Another crucial decomposition was made for total aggregate expenditure. Aggregate expenditure from income accounting data in Turkey is available from expenditure groups at the macroeconomic level (*see* www.turkstat.gov.tr). Using this disaggregated data we are able to decompose total expenditure into its tradable and nontradable components.[16]

For our empirical estimation another variable in (7) and (11) deserves further explanation. This variable is the terms-of-trade variable, which appears in our theoretical equations in a non-linear form. This variable is in fact a composite variable of the terms of trade and the parameter δ. The parameter δ is, on the other hand, the ratio of the shares of importable and exportable goods in Turkey's international trade. In this regard our estimation involves an iterative estimation procedure which is repeated for the different values of δ. The final equation is then decided on the bases of the parameter δ which yields the maximum value for the log-likelihood function.

(*Table 2 about here*)

It is now well-known that most time series variables are non-stationary, and any regression running between them is likely to render spurious correlation (Granger and Newbold, 1974). We accordingly start our empirical investigation with the determination of the statistical properties of the macroeconomic variables in equation (11). Traditionally the Augmented Dickey-Fuller (ADF) unit root test is first used to check for the non-stationarity of the variables (see Charemza and Deadman, 1992). As seen in Table 2, all variables appear to have a unit root, and require differentiation in order to achieve their stationarity.

Having determined the statistical properties of macroeconomic variables, we are now able to move to testing the presence of a cointegration relationship between the variables in equation (7). The two-stage Engle and Granger testing method is used for this purpose (Engle and Granger, 1987), and the robustness of the presence of this relationship(s) is tested by employing the Johanson multivariate cointegration test method (Johansen, 1988; Johansen and Juselius, 1990).

The Engle and Granger test starts with estimating an equilibrium relationship between non-stationary variables such as in equation (7). The test is based on checking the stationarity of the residuals which is obtained from the

[16] The data on domestic expenditure is available for Turkey on a quarterly basis starting from 1987. This data is also available at a further disaggregation level so that we are able to groupd them with respect to their scopes in trade. Accordingly expenditure on food and clothing durable goods, investment expenditure in mechinery are considered as tradable expenditure, whereas expenditure on energy, transportation, communication, banking, housing, services, construction, wage and salary payments and stocks are classified as nontradable expenditure.

estimation of the equilibrium relationship. Respectively we estimated equation (7), and applied the *ADL* unit root test to the residuals. The results are reported in equation (12). The *ADL* result for residual yields the value of -9.17, indicating the stationarity of the residuals of the equilibrium relationship. Therefore, the relationship described in equation (7) can be viewed as the cointegration relationship. These residuals from equation (7) were then employed in equation (11) in order to capture the effects of dynamic adjustment behaviour in the short-run import demand function. However, the existence of a unique cointegration relationship between these variables was also tested with the multivariate Johanson cointegration test. The test results are reported in Table 3, and also confirm the presence of one cointegration relationship between the variables in (12).

$$m_t = \underset{(-13.526)}{-27.398} + \underset{(14.372)^*}{1.331}\, y_t^T + \underset{(10.364)^*}{0.885}\, y_t^N - \underset{(-3.114)^*}{0.031}\left(p_t^m / p_t^N\right) + \underset{(1.326)}{0.231}\ln(1+\delta T_t)$$

$$+ \underset{(7.732)^*}{0.278}\, D1 + \underset{(4.326)^*}{0.117}\, D2 - \underset{(-13.537)^*}{0.454}\, D3 + res_t \qquad (12)$$

ADL (res_t) =-9.170; Wald Test: $\chi^2(1)=12.227$ (*p-value*=0.0005).

Notes: Figures in parentheses show *t-statistics*. *, ** and *** indicate significant coefficients at 1%, 5% and 10% respectively.

According to the estimation result in equation (12), all variables, except the terms of trade variable, are statistically significant and have the expected values. The terms of trade variable appears to be insignificant, allowing the postulation that international liquidity obtained from unit international trade does not constitute a significant constraint on import expenditure in Turkey in the long run. In particular, the availability of other financing options in the international markets, such as direct foreign borrowing and/or capital inflows in the forms of foreign direct investment, have recently enabled developing countries, including Turkey, to obtain the international liquidity necessary for financing their import expenditure. Therefore it could be the reason for a country with easy access to international liquidity that the terms of trade variable representing the stringency level of financial constraint would become insignificant. The equality of coefficients of tradable and nontradable expenditure variable in (12) was also tested with the Wald test, and at the 1% significance level, the null hypothesis of equality of these coefficients was rejected on the basis of the estimated test value of 12.227 (*p-value*=0.0005).

(*Table 3 about here*)

The estimate of the equilibrium relationship in (12) also implies that there exists a significant difference between the long-run elasticities of tradable and nontradable expenditures, with the value of 1.33 for the former and 0.89 for the latter. In addition, this result implies that import demand in Turkey possesses reasonably very high responsiveness to changes in nontradable expenditure with a significant positive sign postulating that higher nontradable expenditure generates higher import demand in the long run.

The relative price of imported and domestic nontradable goods is also significant and indicates the presence of the "expenditure-switching" effect between imported and domestically produced tradable goods. Accordingly this variable shows that any increase in the price of nontradable goods for a given level of imported goods price will reduce the relative prices and will provide stimuli for importers to increase their expenditure. In order words, when we consider this relative price as a real-exchange rate-alike variable, then any decline in this relative price variable could be interpreted as to decline the real exchange rate and the overvaluation of national currency. This type of movement in the relative price can naturally be viewed as a stimulus that encourages import expenditure.

$$\begin{aligned}\Delta m_t = {} & \underset{(2.735)^*}{0.180} + \underset{(5.176)^*}{0.959}\,\Delta y_t^T + \underset{(2.436)^{**}}{0.355}\,\Delta y_{t-1}^T + \underset{(9.619)^*}{0.714}\,\Delta y_t^N + \underset{(3.091)^{**}}{0.291}\,\Delta y_{t-1}^N + \underset{(0.747)}{0.138}\,\Delta\left(p_t^m / p_t^N\right) \\ & - \underset{(-1.205)}{0.215}\,\Delta\left(p_{t-1}^m / p_{t-1}^n\right) + \underset{(1.536)}{0.431}\,\Delta\ln(1+\delta T)_t - \underset{(-0.819)}{0.231}\,\Delta\ln(1+\delta T)_{t-1} \\ & + \underset{(1.279)}{0.121}\,D1 - \underset{(-1.835)^{**}}{0.180}\,D2 - \underset{(-6.932)^*}{0.694}\,D3 - \underset{(-3.041)^{**}}{0.436}\,res_{t-1} \end{aligned} \tag{13}$$

R^2-*adj*.= 0.683; Serial correlation: $\chi^2(4)$ = 0.049; Functional form: F(1, 77)=0,784 (*p-value*=0,672); Normality: $\chi^2(2)$=1,236 (*p-value*=0,539); Heteroscedasticity: $\chi^2(1)$= 0.692; ARCH: $\chi^2(4)$=0.450; Wald test: $\chi^2(1)$=1.132 (*p-value*=0.287).

Notes: Figures in parentheses show *t-statistics*. *, ** and *** indicate significant coefficients at 1%, 5% and 10% respectively.

The estimation results of the dynamic import demand function is reported in equation (13). According to the conventional statistical test for the goodness-of fit, the short run estimated equation appears to fit the Turkish data quite well. Adjusted R^2 is reasonable high for this kind of dynamic model, and postulates that the existing variables in (13) explains almost 68% of total variation in import demand. The CUSUM stability test in Figure 3 additionally indicates that the estimated coefficients in (13) exhibit stability over the sample period.

The short run dynamic behaviour is represented by the presence of the lag value of the residual variable which is obtained from the first stage of the Engle-and-

Granger method. According to the estimation result in (13), the adjustment coefficient is 0.436 with the expected negative sign which indicates an adjustment towards equilibrium. However, the pace of this adjustment seems to be relatively slow. This then implies that the adjustment of import expenditure in Turkey is to be very sluggish after a policy change which aims to correct current account imbalances. This result could be due to both the high dependency level of the domestic production on importation and supply constraint on the domestic production that possibly substitutes importation.

In the short run model tradable and nontradable expenditure variables continue to be statistically significant and possess the expected signs. However the short-run responsiveness of import demand to nontradable expenditure is higher than its corresponding value in the long-run estimation in (12). Whereas the elasticity of nontradable expenditure is smaller than unity in (12), the short-run elasticity turns up to be unity. This indicates that Turkish demand for import expenditure become relatively more responsive to variations in the level of nontradable expenditure in the short run. The short-run elasticity of tradable expenditure, on the other hand, shows almost no difference from its corresponding value in the long run. The same model in (13) was also re-estimated by imposing the equality restriction of the elasticities of tradable and nontradable expenditure, and the Wald test appears to be 1.132 (*p-value*=0.287), implying that the restriction *cannot be rejected* at any significance level. Therefore we are able to conclude that there exists no significant difference between the elasticities of tradable and nontradable expenditure, and import demand indeed responds to each component of expenditure equally in the short run. This also confirms that nontradable expenditure is equally important determinant of the short run import demand, and any macroeconomic policy in an attempt to curbing import expenditure should seriously involve some measures controlling nontradable expenditure as much as controlling tradable expenditure.

(*Figure 3 and 4 about here*)

Surprisingly the relative price variable, together with the terms of trade variable, appears to be statistically insignificant at any significance level. As a consequence of these empirical results, we can easily conclude that variations in expenditure components are the main determinants explaining the short-run variation in real import expenditure. In particular nontradable expenditure seems to gain more importance in the short run than in the long run.

Regarding the theoretical model, the long-run and short-run import demand model include the relative price of imported and nontradable goods, and appear to

be statistically insignificant in explaining the short run dynamic behaviour of import demand in Turkey. This variable is considered as a real exchange-rate-alike variable and viewed as to capture the expenditure-switching effect of relative prices. According to some economists in economic literature the real exchange rate is defined as the relative price of tradable with respect to nontradable goods (*see* Edwards, 1988). The relative price variable in (12) and (13), on the other hand, is slightly different from this definition in the sense that the price of tradable goods, not the price of imported goods, is used in the nominator of the real exchange rate definition. However the price of tradable goods is constructed as the weighted average of import and export prices, and as import expenditure alone takes up a larger proportion of tradable expenditure, these can be regarded as the dominant components in this composite tradable price. Therefore the price of imported goods can be considered as being used as a proxy for the price of tradable goods, and the relative price of imported goods with respect to nontradable goods can thus viewed as the real exchange rate.

Due to the poor performance of the relative price of imported goods with respect to nontradable goods in the short run dynamic model, we substitute the effective real exchange rate variable for this variable, and repeated the same estimation exercise for the long and short run models. The effective real exchange rate data is readily available on the website of the Turkish Central Bank (www.tcmb.gov.tr). The results of our estimation are reported in (14) and (15). This new variable is expected to have a positive sign in our estimations; in other words, an increase in the effective real exchange rate variable, ($rexch_t$), indicates an overvaluation of the domestic currency, which would encourage import expenditure.

(*Table 4 about here*)

The results appear to be quite similar to those reported in (12) and (13). The long run estimation in (14) shows that all variables, except the terms of trade variable, is statistically significant with the expected signs. The magnitudes of the long run coefficients of expenditure variables seem to be slightly higher in (14) than in (12), whereas the coefficient of the real effective exchange rate is significantly higher than the coefficient of the relative price of imported and nontradable goods. The ADL test result with the value of -5.596 for the residual derived from (14) confirms the presence of the cointegration relationship between variables in the model. The multivariate cointegration test was also applied to this model and the results are presented in Table 4, which ensured the presence of one cointegration relationship between the variables in (13). The restriction of equality between the tradable and nontradable expenditure elasticities is rejected for the long-run import

demand function at any significance level based on the Wald test value of 12.039 (*p-value*=0.0005).

$$m_t = \underset{(-29.426)^*}{-31.497} + \underset{(17.884)^*}{1.426}\, y_t^T + \underset{(12.870)^*}{0.973}\, y_t^N + \underset{(2.544)^{**}}{0.233}\, rexch_t - \underset{(-0.461)}{0.075}\, \ln(1+\delta T_t)$$

$$+ \underset{(10.915)^*}{0.325}\, D1 + \underset{(5.719)^*}{0.147}\, D2 - \underset{(-14.935)^*}{0.475}\, D3 + res_t \qquad (14)$$

ADL (res_t) =-5.595; Wald test: $\chi^2(1)$=12.039 (*p-value*=0.0005).

Notes: Figures in parentheses show *t-statistics*. *, ** and *** indicate significant coefficients at 1%, 5% and 10% respectively.

Short estimation results also show a great similarity with those in (12). However, the real exchange rate variable appears to be statistically significant this time. Respectively, the short-run elasticity of real import expenditure is 0.49, which implies a reasonable high responsiveness level for import expenditure to changes in the real valuation in domestic currency. The speed of adjustment towards equilibrium, 0.503, (given by the coefficient of the residual in the dynamic model) indicates a slightly faster adjustment in comparison with the earlier one in (13). From (15), two demand components as well as the effective real exchange rate variable are statistically significant determinants of import expenditure in Turkey, and any macroeconomic policy which aims to curb import expenditure and current account deficits should be designed while considering the relative effects of these determinants.

$$\Delta m_t = \underset{(3.374)}{0.214} + \underset{(5.566)^*}{0.963}\, \Delta y_t^T + \underset{(2.064)^{**}}{0.278}\, \Delta y_{t-1}^T + \underset{(8.736)^*}{0.656}\, \Delta y_t^N + \underset{(1.781)^{***}}{0.162}\, \Delta y_{t-1}^N - \underset{(-0.338)}{0.081}\, \ln(1+\delta T)_t$$

$$+ \underset{(2.847)^*}{0.297}\, \Delta rexch_t + \underset{(1.729)^{***}}{0.192}\, \Delta rexch_{t-1} - \underset{(-0.323)}{0.079}\, \Delta \ln(1+\delta T)_t$$

$$- \underset{(-0.679)}{0.061}\, D1 - \underset{(0-2.386)^{**}}{0.234}\, D2 - \underset{(-4.652)^*}{0.680}\, D3 \underset{(-4.588)^*}{-0.503}\, res_{t-1} \qquad (15)$$

R^2-*adj*.= 0.738; Serial correlation: $\chi^2(4)$ = 0.606; Functional form: F(1, 78)=3,17 (*p-value*-0,084); Normality: $\chi^2(2)$= 5,08 (*p-value*=0,0837); Heteroscedasticity: $\chi^2(1)$= 0.799; ARCH: $\chi^2(4)$=0.488; Wald test: $\chi^2(1)$=2.730 (*p-value*=0.099).

Notes: Figures in parentheses show *t-statistics*. *, ** and *** indicate significant coefficients at 1%, 5% and 10% respectively.

The short run import demand function in (15) was re-estimated with an equality restriction imposed on the short-run elasticities of tradable and nontradable expenditure, which revealed the Wald test value of 2.730 (*p-value*=0.99). Although this test value suggests that this restriction cannot be rejected, it should be noted

that the calculated test statistics failed the critical value just at the 10 percent significance level.

According to both results, tradable and nontradable expenditure in Turkey appear to have very significant impacts on the short-run fluctuations of import expenditure. Any macroeconomic policy attempting to curb current account imbalances should obviously contain measures to slow down not only tradable expenditure but also nontradable expenditure. Additionally adjustment of either relative prices or the real exchange rate would generate the expected impact on current account imbalances, and these effects seem to have very limited effects in comparison with those of tradable and nontradable expenditure.

Our empirical examination also reveals that on the basis of high short- and long-run elasticities, nontradable expenditure possesses a capability of generating high import expenditure, which is in foreign currency. This is very important for a country with a high current account deficit over successive years because nontradable expenditure is local in nature and able to generate income in the domestic currency. With the high import generation capacity of nontradable expenditure, high economic growth which relies on expansion of domestic expenditure in nontradable expenditure would constitute serious concern about the sustainability of these deficits in current account terms.

Our empirical findings also contribute to our understanding of the effectiveness of exchange rate adjustment in controlling import and current account deficits. Given the expenditure switching effect of the foreign exchange adjustment, depreciations in the domestic currency is likely to reduce domestic tradable expenditure in favour of exportation, and hence raises the foreign exchange earning capacity of the economy. The same depreciation would only have a discouraging effect on nontradable expenditure, and would reduce the foreign exchange spending of the economy through the reduction in the import component of this expenditure. However, these expenditure switching effects of currency depreciation would likely hold total tradable expenditure by accommodating the loss of domestic tradable expenditure with foreign tradable expenditure, whereas the reduction in nontradable expenditure would only have a depressing impact on economic growth.

V. CONCLUSION

Following capital account liberalisation, there has been increasing reliance on the usage of external capital to finance domestic expenditure in emerging market economies (Eichengreen, 2003). It is important to acknowledge that capital flows

can seriously be considered as a source of financing saving gaps of these countries. Together with the availability of high liquidity in international capital markets, this increased reliance has recently been a great help for emerging markets to attain high economic growth. It is even more important to accept that this reliance on external financial resources has also increased the vulnerability of these economies to capital in- and out-flows. In this paper we pay a particular attention to one likely source of this vulnerability. Accordingly we indicate that the use of external resource in order to finance nontradable expenditure, rather than tradable expenditure, would be one reason for the vulnerability.

From the recent experience of the Turkish economy, the easy access to international liquidity seems to have expanded nontradable expenditure which generates income in terms of local currency. Using foreign exchange financial resources to finance economic activities that generate income in national currency could cause mismatch problems in international payments. This problem particularly deteriorates if the foreign exchange requirement of nontradable expenditure is high. It is therefore become important to examine the import (foreign exchange requirement) generation capability of domestic expenditure and its components.

The aim of this paper is to extent the traditional import demand approach by considering the effects of different expenditure component, and also to show how significant to taken into account of these separate expenditure effects on the basis of an empirical examination of Turkish import demand behaviour. In particular we are concerned about the responsiveness of import demand to nontradable expenditure. As a result of our empirical examination, the response of Turkish import demand to different demand components differs in the short and long run. Whereas the elasticity of import demand with respect to tradable expenditure is high and greater than unity in both time horizons, its elasticity with respect to nontradable expenditure is lower than unity in the long run. More interestingly, import elasticities, with respect to both expenditure components, differ from each other in the short run. This finding is particularly important for policy consideration because nontradable expenditure possesses the same elasticity, and higher than unity, as tradable expenditure, and has a capability of generating as much foreign exchange requirement as tradable expenditure. Based on this finding, we can conclude that emerging market economies should pay particular attention to the way of using foreign capital inflows, and should direct them to great extent to economic activities with a high capability to generate foreign exchange income, rather than income in local currency. However we find that with the high foreign exchange expenditure

generation capability of nontradable expenditure, our finding in this paper is sufficient to make us sceptical regarding the positive effects of recent capital inflows in the medium and long run.

REFERENCES

Asseery, A. and D.A. Peel (1991), "Estimates of a Traditional Aggregate Import Demand Model for Five Countries", *Economics Letters*, April: 435-439.

Bahmani-Oskooee, M. (1998), "Cointegration Approach to Estimating the Long-Run Trade Elasticies in LDCs", *International Economic Journal* **12** (3): 89-96.

Bank for International Settlement (2007), "Chapter III – Emerging Market Economies", *77th Annual Report*, June, Basel.

Boylan, T.A., M.P. Cuddy, and I. O'Muircheataigh (1980), "The Functional Form of the Aggregate Import Demand Equations", *Journal of International Economics*, November: 561-566.

Celasun, M. ve D. Rodrik (1989), "Debt, Adjustment and Growth: Turkey", in J.D. Sachs and S.M. Collins (eds.), *Developing Country Debt and Economic Performance: Country Studies-Indonesia, Korea, Philippines, Turkey*, (Chicago: The University of Chicago Press).

Charemza, W.W. and D.F. Deadman (1992), *New Directions in Econometric Practice*, (Cambridge: Edward Edgar).

Deaton, A. and J. Muellbauer (1980), *Economics and Consumer Behaviour*, (Cambridge: Cambridge University Press).

Edwards, S. (1988), *Exchange Rate Misalignment in Developing Countries*, World Bank Occasional Paper, Number 2, (Washington: The John Hopkins University Press).

Eichengreen, B. (2003), *Capital Flows and Crises*, (Cambridge, Massachusetts: The MIT Press).

Engle, R. and C. Granger (1987), "Co-integration and error correction: representation, estimation and testing", *Econometrica* **55**: 251-276.

Granger, C. and P. Newbold (1974), "Spurious Regression in Econometrics*", Journal of Econometrics* **35**: 143-159.

Günçavdı, Ö. and B. Ülengin (2008), "Aggregate Imports and Expenditure Components in Turkey: Theoretical and Empirical Assessment", the Middle East Economic Association 7th International Conference, May 29-31 2008 in Famagusta, North Cyprus**.**

Günçavdı, Ö. and B. Ülengin (2006), "On the Determinants of the Monthly Demand for Imports in Turkey: A VECM Approach", *Yapı Kredi Economic Review*, Volume: 17, Number: 2, pp. 3-15.

Günçavdı, Ö., and S. Küçükçifçi (2006), "Türkiye Ekonomisinde Büyümenin Kaynakları ve İstihdam Etkileri", Bilin Neyaptı (ed.), *Ekonominin Dinamikleri ve İstihdam – Kaynaklar ve Etkiler*, Ankara: Türkiye Ekonomi Kurumu.

Günçavdı, Ö. and S. Küçükçifçi (2001), "Foreign Trade, Factor Intensity in an Open Developing Country: An Input-Output Analysis for Turkey", *Russian & East European Finance and Trade* **37** (1): 75-88.

Günçavdı, Ö., S. Küçükçifçi and M. Üngör (2008), "Current Account Deficits and the Increasing Need of Foreign Exchange in Turkish Economy", Forthcoming in *Uluslararası Ekonomi ve Dış Ticaret Politikası* (International Economics and Foreign Trade Policy Journal). (in Turkish).

Günçavdı, Ö., S. Küçükçifçi and A. McKay (2003), "Adjustment, Stabilisation and the Analysis of the Employment Structure in Turkey: An Input-Output Approach", *Economics of Planning* **36**: 315-331.

Goldstein, M., M.S. Khan and L.H. Officer (1980), "Prices of Tradable and Nontradable Goods in the Demand for Total Imports", *Review of Economic and Statistics*, Vol. LXII (2), pp. 190-199.

Goldstein, M. and M.S. Khan (1985), "Income and Price Effects in Foreign Trade", in R.W. Jones and P.B. Kennen (eds.), *Handbook of International Economics*, vol. II, (Amsterdam: North Holland).

Johansen, S. (1988), "Statistical analysis of cointegration vectors", *Journal of Economic Dynamics and Control* **12**: 231-254.

Johansen, S. and Juselius, K. (1990), "Maximum likelihood estimation and inference on cointegration with application to the demand for money", *Oxford Bulletin of Economics and Statistics* **52**: 169-209.

Khan, M.S. and K.Z. Ross (1977), "The Functional Form of the Aggregate Import Demand Equation", *Journal of International Economics*, May: 149-160.

Marston, R. (1971), "Income Effects and Delivery Lags in British Import Demand 1955-1967", *Journal of International Economics* **1**: 375-399.

Tansel, A. and H. Olgun (1987), "Price and Income Effects in Turkish Foreign Trade", *Weltwirtschaftliches Archiv* **123** (3): 521-534.

Table 1 - The shares of macroeconomic expenditure components (%)

YEAR	Consumption	Public expenditure	Investment	Net exports
1987	68,56	7,86	25,77	-2,19
1988	67,82	7,59	23,12	1,47
1989	66,92	7,64	25,17	0,27
1990	69,28	7,55	27,78	-4,61
1991	70,10	7,83	24,98	-2,91
1992	68,95	7,74	26,38	-3,06
1993	69,45	7,58	31,63	-8,66
1994	68,98	7,67	23,29	0,05
1995	67,55	7,58	29,26	-4,39
1996	68,24	7,67	28,72	-4,63
1997	68,76	7,42	29,87	-6,04
1998	67,03	7,75	28,59	-3,37
1999	68,49	8,66	27,34	-4,49
2000	67,79	8,65	30,52	-6,97
2001	66,53	8,55	19,12	5,80
2002	62,98	8,36	24,09	4,57
2003	63,49	7,71	27,43	1,37
2004	64,11	7,11	32,05	-3,27
2005	64,94	6,78	32,92	-4,64
2006	64,37	7,00	32,72	-4,10
2007	63,64	6,57	38,21	-8,41

Source: Central Bank of Turkey, http://evds.tcmb.gov.tr/

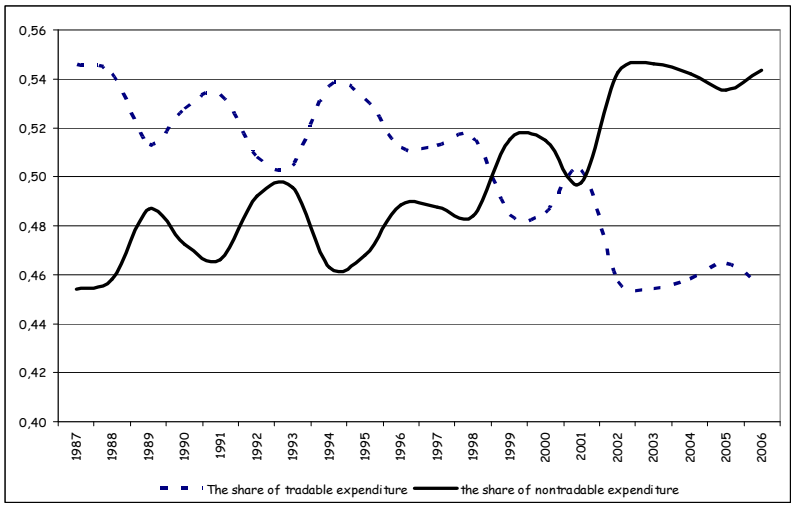

Figure 1 – The Shares of tradable and nontradable expenditure in the Turkish economy (1987-2006)
(Source: Turkish statistics Institute website: www.turkstat.gov.tr).

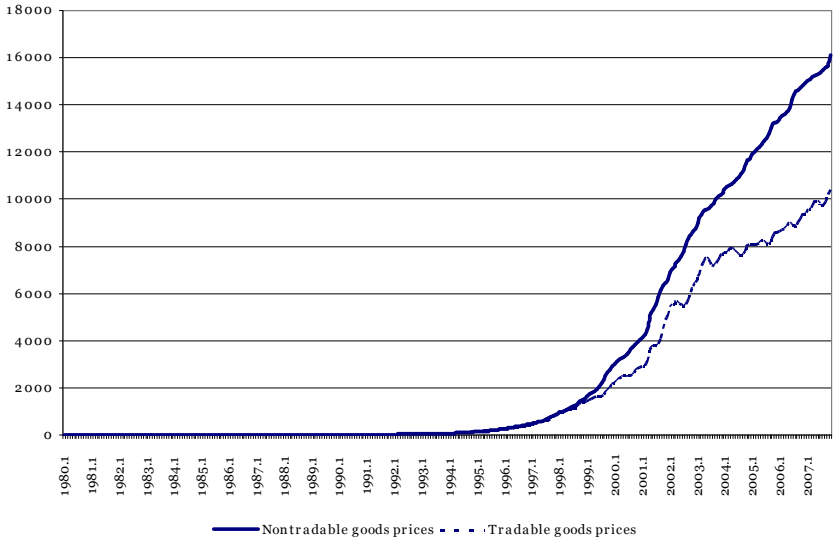

Figure 2 – The prices of tradable and nontradable goods (1980:1 – 2007:11)

Table 2
Units Root tests of the Variables[a]

Variables	ADF	Lag-Length
m	-1.044	0
y^T	-2.796	4
Y^N	-2.352	7
p^m/p^N	1.740	1
T	-2.596	0
$rexch$	-3.345	0
$\Delta\, m$	-5.514	4
$\Delta\, y^T$	-5.138	6
$\Delta\, y^N$	-7.598	6
$\Delta\, p^m/p^N$	-5.551	0
$\Delta\, rexch$	-9.028	0
$\Delta\, T$	-9.808	1

Note: [a]) All variables are in logarithm.

Table 3 – Multivariate cointegration test for equation (12)

(a) Unrestricted Cointegration Rank Test (Trace)

Null hypothesis	Eigenvalue	Trace Statistics	95% critical value	Prob.
r = 0*	0.356	50.023	47.856	0.031
r <= 1	0.115	16.17	29.797	0.700
r <= 2	0.053	6.733	15.494	0.609
r <= 3	0.032	2.539	3.3841	0.111

Note: The critical values are taken from MacKinnon-Haug-Michelis (1999)
r: the number of cointegrating vector.

(b) Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Null hypothesis	Eigenvalue	Max-Eigen. Satistics	95% critical value	Prob.
r = 0*	0.356	33.852	27.584	0.007
r <= 1	0.115	9.437	21.132	0.796
r <= 2	0.053	4.194	14.264	0.838
r <= 3	0.032	2.539	3.841	0.111

Note: The critical values are taken from MacKinnon-Haug-Michelis (1999)
r: the number of cointegrating vector.

Table 4 - Multivariate cointegration test for equation (14)

(a) Unrestricted Cointegration Rank Test (Trace)

Null hypothesis	Eigenvalue	Trace Statistics	95% critical value	Prob.
r = 0*	0.313	49.510	47.856	0.039
r <= 1	0.123	16.159	29.797	0.701
r <= 2	0.072	6.017	15.494	0.694
r <= 3	0.003	0.247	3.842	0.619

Note: The critical values are taken from MacKinnon-Haug-Michelis (1999)
r: the number of cointegrating vector.

(b) Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Null hypothesis	Eigenvalue	Max-Eigen. Satistics	95% critical value	Prob.
r = 0	0.313	28.951	27.584	0.033
r <= 1	0.123	10.142	21.132	0.731
r <= 2	0.072	5.770	14.264	0.643
r <= 3	0.003	0.2472	3.841	0.612

Note: The critical values are taken from MacKinnon-Haug-Michelis (1999)
r: the number of cointegrating vector.

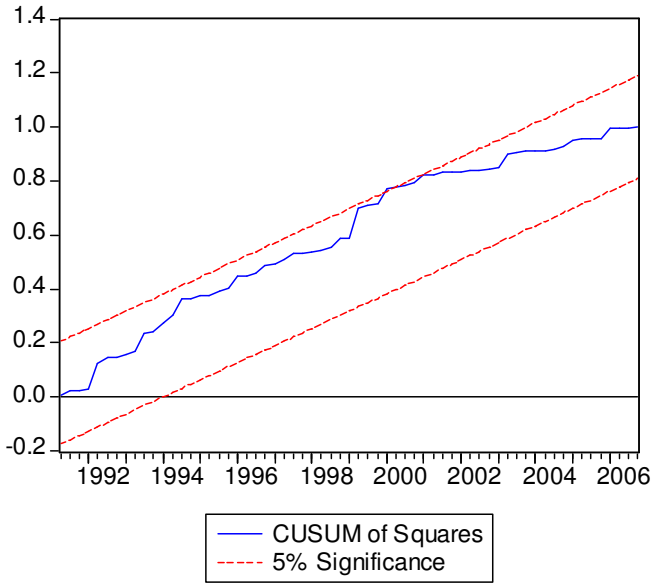

Figure 3 - CUSUM stability test for equation (13)

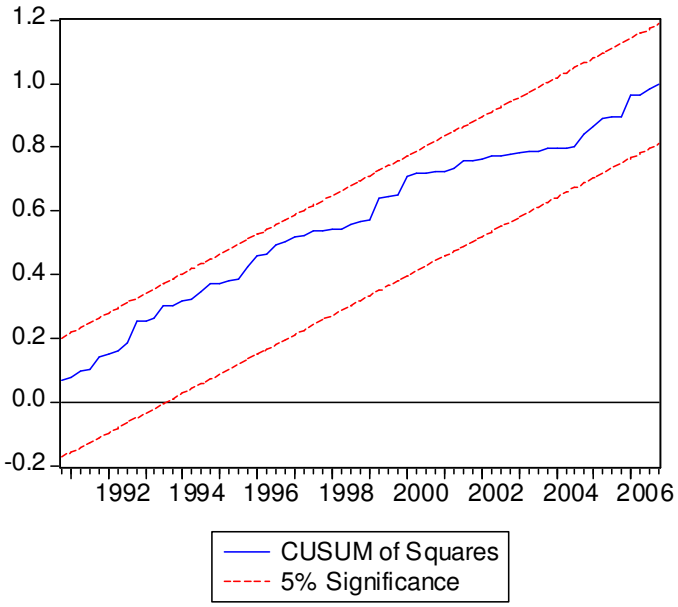

Figure 4 - CUSUM stability test for equation (15)