

The Custom Union with EU and Its Impact on Turkey's Economic Growth

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Introduction

In recent years there is a growing literature on the trade growth nexus. Within this context, there are some studies concentrating on the positive effects of trade liberalization and of regional economic integration on productivity.

Traditional economic integration theory mostly dealt with the static allocation effects of economic integration. While the traditional theory of integration places considerable emphasis on the potential growth effects of economic unions, the growth impact in question has nonetheless not been thoroughly studied, due to problems of empirical measurement, in particular. However, lately, one is able to see that the growth effects of external trade liberalization receive increasingly more attention, with the relationship between international trade and growth now more explicitly postulated. Firstly, Baldwin (1992) focused on the medium-term growth effects of economic integration that follows from the static allocation

effects. This increase in income following economic integration induces further capital formation by increasing savings and a higher marginal productivity of capital. Baldwin (1992) shows that capital stock increase following the efficiency gains increases the estimated GDP effect. However, this induced capital formation will eventually stop because of the decrease in the marginal productivity of capital.

Novel developments in growth theory, from the early Eighties onwards, more specifically, the endogenous growth theories, made it possible to identify mechanisms through which trade liberalization and regional integration may increase long-term growth rates by means of productivity gains. There are several studies illustrating the ways in which trade affects growth. Most studies have focused on two main channels namely technology and investment through which trade increases economic growth and productivity. As far as the technology channel is concerned, Grossman and Helpman (1990 and 1991), Rivera-Batiz and Romer (1991a and 1991b), Romer (1990) identify four different channels through which trade affects technology led growth in the context of research and development activities. Firstly, international market provides international spillover of knowledge by opening access to intermediate inputs; by expanding diffusion of knowledge, secondly, there are economies of scale in the research and development sector in other words, due to an increase in the market size following the free trade or economic integration there is an opportunity to reap economies of scale in the research and development sector. Thirdly, there is reduction in the replication of research and development efforts across countries. And finally, a large international market provides higher profits to innovators and the reallocation of resources in the R&D sector.

In addition to the effects related with the research and development activities, economies of scale effect of international trade may also cause productivity gains. Liberalization makes domestic firms produce for international markets and force small, inefficient firms out of the market. This leads to output increases and, under the assumption of increasing returns to scale, results in productivity gains. Moreover, increasing competition because of free import, force domestic firms to produce more efficiently.

There are also other studies which examining the effects of trade on growth via investment. The reasons of the positive effects of trade on investment can be listed as follows (1) the trade sector is more capital intensive than the nontraded sector; (2) the production of

investment goods uses imported intermediates; and (3) competition in the international market of machinery and capital equipment lowers the price of capital (Baldwin and Seghezza 1996a and 1996b). Investment booms in Ireland, Portugal and Spain during the time of their accession to the EU are the examples of investment led growth (Baldwin and Seghezza,1996c)

A large number of studies have examined the effects of trade liberalization on economic growth. Based on cross-country growth regressions, Dollar (1992), Edwards (1992 and 1993), Vamvakidis (1998) find evidence that international trade positively effect economic growth. Although openness variables in some studies are not significant in growth regressions that include investment over GDP as an independent variable, they are significant in regressions that have the investment share as the dependent variable (Vamvakidis, 1999)

In this respect, Levine and Renelt (1992), Baldwin and Seghezza (1996a) provide an evidence for trade-induced investment led growth namely in their study trade fosters growth through its positive impact on investment. Lee (1994) also shows that increase in ratio of imports in investment has a positive effect on growth.

On the other hand, using time series growth regressions, Coe and Helpman (1995) and Coe, Helpman, and Hoffmaister (1997) showed that trade affects growth via technological progress. Coe and Helpman (1995), by using total factor productivity as a proxy for country's stock of knowledge suggest that there is a positive relationship between total factor productivity and the country's major trading partners R&D activities which is an evidence for the knowledge spillovers. Therefore, by showing that a country's total factor productivity is not only determined by its own R&D stock, but also by that of its trade partners, they have provided a rationale for technology led growth. Similarly, Bayoumi, Coe and Helpman (1999) suggest that R&D, R&D spillovers and trade play an important roles in increasing growth both in industrial and developing countries. Within this context, Coe, Helpman, and Hoffmaister (1997) find that developing countries with limited R&D stock can increase productivity by trading with a more developed country that has a large stock of knowledge.

Ferreira and Rossi (2003) and Iscan (1998) by using industrial level data, found that tariff reductions and lower protection rates result in productivity gains. Similarly according to

results of Marwah and Tavakoli (2004) import as a factor of production, contributes to output growth in the Asian countries.

The results in Coe and Moghadam (1993) also suggest that trade and capital have a positive influence on growth in France and 0.3 percentage points of the French growth rate in the 1980s could be ascribed to the EU membership.

Concerning the growth effect of economic integration, it can be said that the results of the economic integration-growth relationship are mixed. Henrekson, Torstensson, and Torstensson (1997), found positively coefficient dummy for participation in the European Union in cross-country growth regressions and suggest that regional integration may not only affect resource allocation, but also long-run growth rates. Baldwin and Seghezza (1996c) also find that foreign R&D increases domestic total factor productivity of EU countries and therefore reached the conclusion that EU membership led to knowledge-led growth. Ben-David (1993) showed that trade agreements in Europe have caused convergence. In a recent study, Badinger (2005) also found positive temporary growth effect of European integration using a panel of fifteen EU member states over the period 1950-2000.

On the other hand, while Vamvadakis (2002) shows mixed evidence on the effects of economic integration on growth. De Melo et al. (1992) estimate a growth equation including dummy variables for each trade bloc and found no long-run growth effects of RI except Southern African Customs Union. Similarly, Vanhoudt (1999) found no growth effect of European Integration.

The aim of this study is to test the technology led growth induced by the CU with EU both directly and indirectly for Turkish economy. Direct test of technology led growth induced by Customs Union with EU will be performed by estimating total factor productivity and labor productivity equations at sectoral level. Indirect test of technology led growth will also be performed by estimating a sectoral production function with trade variable included. According to the focus of this paper the trade variable that we choose is import variable. The data set used for estimation is a panel of 12 manufacturing industry sub-sectors for the period 1994-2001.

The remainder of paper is organized as follows: Section II presents trade liberalization experience of Turkish economy, as well as Turkey EU relations. In section III, the findings of econometric estimates are introduced. The last section concludes the analysis.

II. Trade Liberalization, Import and Growth in Turkish Economy

1980 is a milestone in terms of trade strategies for the Turkish economy. Beginning in 1980, Turkey changed its development strategies from import substitution industrialization into export led growth. In this context quantitative restrictions on import were eliminated and consequently import tariff rates were reduced in various steps. As a result of trade liberalization, the economy wide nominal protection rate declined from 70.19 % in 1984 to 28.25% in 1991 (Togan, 1993:229). In spite of these liberalization efforts, before the arrangement of custom union with EU countries, the average nominal protection rate was still high. Togan (1997) calculated that it was equal to 10.22% in 1994 in trade with EU and 22.14% in trade with third countries. Custom union with EU countries is put into effect on January 1996. It can be regarded as the latest step of trade liberalization attempts. In 1996 according to new import regime, average 10% import tariff rate for the import of industrial goods from EU and EFTA countries was abolished. Other restrictions, especially the quantity controls are also lifted with this new regime. Tariffs on the processed agricultural goods import from EU countries were also eliminated gradually until 1999. Additionally, in the context of CU, in order to adjust common external tariff rates for third countries, average 16% industrial import tariff rate for third countries was decreased into 4.5 % in 2002.

As a result of these trade liberalization attempts after 1980 and custom union with EU countries after 1996, trends in foreign trade changed considerably. Import-to-GNP ratio increased from 11.3 % in 1980 to 17.7% in 1994 and to 27.2 in 2003 (SPO 2004). The share of EU countries in the total import increased from 44% in 1993 to 51.2% in 1997 and it became 48% in 2003 (SPO 2004). Average growth rate of total import and of import from EU countries between 1994 and 2005 were similar and approximately equal to 15 %.

Just after the trade liberalization efforts of 1980, growth rate increased considerably in Turkish economy. Average growth rate of 2.7 % between the periods 1975-1980 increased to 4.8 % between the periods 1981-1989. Between the periods 1989-1995 average growth rate did not changed considerably. It is equal to 4.3 on average. However, because of the economic crisis at the end of 2000 and at the beginning of 2001, average growth rate between the periods 1996-2001 decreased considerably and fell to 1.9 %. When we do not take into account the years of crisis, the average growth rate between the periods 1996-1998 is equal to average growth rate between the periods 2002 -2005, and is approximately equal to 8 %. According to calculations of Ismihan and Ozcan (2006), the fluctuations in total factor

productivity is the main determinants of ups and downs in the growth rate of Turkish economy. Especially the negative contribution of total factor productivity to total growth is responsible for the lower and negative growth rates in 1990s (Ismihan and Ozcan 2006). Ismihan and Ozcan (2006) indicate that contribution of labor productivity to growth accounting is more stable in Turkish economy.

Most studies exploring the economic effects on Turkey, of the Customs Union with the EU, concentrate on static resource allocation effects. There are also, studies investigating the relationship between foreign trade variables and economic growth, for the post-1980 era of trade liberalization (Bahmani-Oskooee and Domac 1995, Utkulu and Ozdemir 2003, Filiztekin 2001 Bayar 2002; Aydogus 1993; Gokcekus 1997). While Aydogus couldn't find positive effect of trade liberalization after 1980 on productivity, Bayar and Gokcekus shows favorable impacts of trade liberalization on productivity of industrial sectors. Similarly, Bahmani-Oskooee ve Domac (1995), Utkulu and Ozdemir (2003) and Filiztekin (2001) also found that international trade is one of the main determinants of economic growth of Turkey.

However, the studies cited above generally do not aim at unveiling the economic effects of the Customs Union with the EU, in terms of either the period under study, or the foreign trade variables used.

III. Model and Estimation Results

In this paper our main focus is to investigate effect of trade between EU countries and Turkey on the productivity of Turkish industrial sector especially after the Custom union with EU countries. By this mean we propose to see effects of custom union on productivity performance of Turkish manufacturing sector. In the literature some advantages of individual country studies over cross country studies have been stated. One explanation could be that the level of aggregation in cross country studies is too high to capture the effect of the international trade on productivity. Moreover, by examining data in one specific country, one could avoid the problem of influences on productivity growth from, e.g., differences in countries economic policies (Sjöholm 1999:706). Similarly, as stated by Srinivasan and Bhagwati (1999), cross country regressions are not in any event, the best tools for analyzing the linkage between trade and growth, because of institutional and country specific factors that are difficult to control. Also results may become sensitive to the sample of countries and time period covered in the analysis.

As an international trade variable we use import variable. In the literature, various studies use import variable as the determinant of productivity and growth (Marwah and Tavakoli 2004; Bayoumi, Coe and Helpman 1999; Sjöholm 1999; Levine and Renelt 1992; Lee 1994; Coe and Helpman 1995 Ferreria and Rossi 2003). The main reason for preferring import as trade variable is the rapid rise of ratio of import to GDP in Turkey for recent years. In the last few years import ratio has reached record levels repeatedly. Together with higher import ratios, in the last five years economic growth rates was also considerably high in Turkish economy. These empirical facts give rise to discussions about the relationship between import and growth in the Turkish economy. The common idea is the import dependency of Turkish manufacturing sector. To put it differently, it is argued that the rising import volume is the result of increasing growth rates in Turkish economy. The effect of import on growth is not regarded so much. For this reason we aim to clear out the effects of import on economic growth namely productivity. In this study, the import variable represents total import of 12 sectors of Turkish manufacturing industry from EU countries. We do not choose import of intermediate products or imports of capital equipment. By this mean we aim to obtain scale and competition effects of import in addition to its R&D spillover effects.

We prefer to obtain effects on the level of productivity, instead of the growth of productivity. In the literature it is argued that the growth rates of countries does not display considerable changes over the short and medium runs (Winters 2004). So when the relationship between trade and growth is examined the possibility of obtaining positive relation becomes weak. Moreover, according to Solowian growth models, if the level of productivity changes, it cause change in growth rate transitionally. Therefore examining the level effect means examining transitional dynamics namely growth.

Our data is panel data. In the estimation process the fixed effect specification of the panel data is used. Fixed effect specification is preferred so as to account for time-invariant unobservable heterogeneity among industries that is potentially correlated with the dependent variable. In so doing one also dispenses with the omitted-variable problems in the regressions, By means of capturing idiosyncratic factors that might have affected the dependent variable. The period which we deal with is 1994-2001. This period starts with just before custom union period. Although CU put into effect in 1996, most of the tariff reductions are implemented just before 1996. For this reason our period starts with two years before CU. The ending

period 2001 is chosen because of the data problems after this period. In spite of this imperfection, the time period in question is well suited to assess the impact of CU.

The cross-section units of our study are 12 manufacturing industry sectors of Turkish economy. The below is the list of sectors considered:

- 1) Food, beverages and tobacco;
- 2) Textile, wearing apparel and leather;
- 3) Wood and wood products;
- 4) Paper and pulp products, printing and publishing;
- 5) Chemical products;
- 6) Petroleum products;
- 7) Rubber products;
- 8) Non-metallic mineral products, excluding petroleum and coal;
- 9) Basic metal products;
- 10) Fabricated metal products;
- 11) Machinery; and
- 12) Transport equipment.

The main variables which we use in this study are sectoral real outputs (Q), sectoral real value added (VA), sectoral import with EU countries as a volume (MV) and as a share of consumption (MS), sectoral total factor productivity (TFP), sectoral labour productivity (LP), sectoral real research and development expenditures (RDE), sectoral research and development capital stocks (RDS), sectoral capital stocks (K) and sectoral total employment (L).

As a first step we tried to investigate the effects of import with EU countries on TFP especially after CU. For this purpose we estimated TFP using residuals from the estimation of Cobb-Douglas production function with the explanatory variables K and L. The estimation method is fixed effect model of panel data. We then estimated TFP equation with the explanatory variables import and research and development. Both volume and consumption share of import is statistically insignificant variable in TFP equation. Similarly research and development capital stock and real expenditure are not also significant variables. In the same context, the lagged values of these explanatory variables do not have statistically significant effect on TFP. The insignificance of explanatory variables may be resulted from errors in the estimation of TFP. When we first estimate TFP and then the effect of trade variable import on

it the errors of two sets of regression compound each other (Ferreira and Rossi 2003). The other limitation of TFP regressions is that business-cycle fluctuations that affect the behavior of output and factors may also effect the productivity measurement, although those fluctuations have no long-run impact on the productivity trend. For example in the recessionary periods although capital stock and capacity does not shrink output shrinks, in that case TFP may seem falling and TFP measures falls. In the recovery periods capacity utilization increases and without increase in especially capital input, output increases. Consequently, measured TFP also increases. During the period 1994-2001 there are severe ups and downs in Turkish economy. In 1994 and in 2001 output fell considerably in Turkish economy. In 1994 and in 2001 growth rates were -6.1 and -9.5 respectively. Therefore TFP measurements may not be reliable for the period considered in this study.

Because of these deficiencies in the TFP measurements we use alternative models and estimations in order to examine the productivity effect of sectoral import from EU countries after CU.

The first alternative model which we estimate to obtain the industrial sectors productivity effect of import from EU countries is Cobb-Douglas production function. We estimate double logarithmic form of Cobb-Douglas production function with fixed

Dependent Variable: LOG OUTPUT				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.007547	0.478586	-6.284232	0.0000
LOGK	0.597026	0.222702	2.680826	0.0100
LOGL	0.429138	0.192010	2.234982	0.0301
LOGRDE_{t-1}	0.089726	0.045115	1.988843	0.0524
LOGMV	0.452071	0.183736	2.460432	0.0175
AR(1)	0.343671	0.123391	2.785210	0.0076
Statistics				
Adjusted R-squared	0.734241	Mean dependent var	4.937548	
S.E. of regression	0.214296	S.D. dependent var	0.415691	
Sum squared resid	2.204290	F-statistic	12.05126	
Durbin-Watson stat	1.991889	Prob(F-statistic)	0.000000	

effect model of panel data. Our dependent variable is manufacturing sectors' output. Explanatory variables are capital stock (K), employment (L), research and development variable, and import variable. In our model we assume that, productivity is function of import and domestic research and development. Namely we start with a simple production function " $Y_{it}=A_{it}f(L_{it},K_{it})$ " where Y_{it} is output in sector i at time t , and A , L and K are level of total factor productivity, number of employees and capital stock. Taking logarithms and taking out

indexes for simplicity, one gets: $\log Y = \log A + \beta_1 \log L + \beta_2 \log K$. We want to examine if imports and domestic research and development increase productivity. We therefore assume that total factor productivity can be expressed as a function of import and domestic research and development. $A = f(\text{import}, \text{domestic research and development})$. Therefore our output equation becomes $\log Y = \beta_0 + \beta_1 \log L + \beta_2 \log K + \beta_3 \log \text{Import} + \beta_4 \log \text{Research \& Development}$

Table 1: Estimation of Production Function

White cross-section standard errors & covariance

Various measures of import and research&development are used in the estimation of production function. According to the estimation results of production function, import volume and one year lagged value of research and development expenditures are statistically significant variables with positive signs (Table 1). Since import share (MS) and stock of research and development (RDS) are insignificant variables they are not included in equation estimations. As a result one can argue that total manufacturing sector import from EU and previous year domestic research and development expenditure have increasing effect on the level of productivity of Turkish manufacturing sector. For the reason that the coefficient of import variable (0.452071) is bigger than the coefficient of research and development variable

(0.089726) we can say that the effect of import on productivity is larger than the effect of domestic research and development. Effectiveness of previous year's research and development expenditures instead of current year's expenditure is explainable when we consider it as investment expenditure. As expected, capital stock and employment has positive significant effect on sectorized manufacturing output (Table 1). The AR(1) term is also included in the equation because of the detected autocorrelation problem during the estimation process

The other alternative model which we used for investigating the impact of manufacturing sectors import from EU on the productivity of Turkish manufacturing industry is labor productivity equation. Our productivity measure is based on "total labor force employed in production". We calculated labor productivity by dividing total output with total labor force employed in production. The explanatory variables in this equation are import variable, domestic research and development variable, and value added (VA). The various measures of import and research and development variable are used for obtaining more reliable results. The value added is included into equation in order to capture scale effect. Under the assumptions of increasing returns to scale, output increases result in productivity gains.

Table 2: Labor Productivity Equation Estimation

Dependent Variable: Labour Productivity				
Variables	Coefficient	Std. Error	t-Statistic	Prob.
C	0.045676	0.065176	0.700817	0.4862
RDS	0.0000105	0.00000463	2.278137	0.0264
MV	0.000824	0.000486	1.694278	0.0955
VA	0.007951	0.000556	14.31027	0.0000
AR(1)	0.407810	0.219939	1.854197	0.0687
Statistics				
R-squared	0.972137	Mean dependent var	2.745102	
S.E. of regression	0.330282	S.D. dependent var	1.766789	
F-statistic	137.2357	Sum squared resid	6.436097	
Prob(F-statistic)	0.000000	Durbin-Watson stat	2.096076	

White cross-section standard errors & covariance

According to results of labor productivity equation estimation, import volume and research and development stock are significant variables with positive sign (Table 2).

However, the import share in consumption which is not included into equation is not significant variable in labor productivity equation. So, we can argue that volume of manufacturing industry import from EU countries, has labor productivity growing impact in Turkish manufacturing industry. Similarly, the results reported confirm the positive relationship between labor productivity and domestic research and development stock. Current year research and development expenditures variable gives similar results with research and development stock variable. We opted to present only the results of estimation that used research and development stock (Table 2). The coefficient of import variable (0.000824) is larger than the coefficient of research and development variable (0.0000105). Therefore one can argue that the positive impact of import on labor productivity is bigger than that of research and development in Turkish manufacturing industry. As expected, value added has positive impact on labor productivity confirming the increasing returns to scale in Turkish manufacturing industry. The AR(1) term is also included in the equation because of the detected autocorrelation problem during the estimation process.

Conclusion

In the literature recent studies claims that trade liberalizations and economic integration may cause productivity and growth gains as well as the level effects. It is claimed that long run growth effects are the results of technological changes. The mechanisms by which technological change achieved are: international spillover of knowledge, increased competitive pressure, embodiment in imports and scale effects.

Turkey has established a Custom Union with European Union in 1996. We employ panel data estimation methods to capture the effects of manufacturing industry imports from EU countries on productivity of manufacturing industry in Turkey. For this purpose we estimated three equations, first one is total factor productivity equation, the second one is output equation and third one is labor productivity equation.

Some conclusions can be made from the results of our estimations. Import variables do not show significant effect in total factor productivity equation estimation. Calculation problems may be the main deficiency of total factor productivity equation estimation. However, in the total output equation estimation import variable namely volume of import from EU countries implies positive effect. Therefore we can claim that we obtained

productivity improving effect of import indirectly by estimating production function with trade variable and directly by estimating labor productivity equations. To put it differently, it is observed that sectoral manufacturing import from EU countries cause total factor productivity increase in Turkish manufacturing industry. Similarly, according to the estimation results of labor productivity equation, import volume has positive significant effect on per capita output. Increasing sectoral manufacturing industry import volume from EU countries has enlarging effect on the labor productivity on Turkish manufacturing industry.

Domestic research and development variables have also significant and positive effects on both labor productivity and output in Turkish manufacturing industry. In both labor productivity and output equations, import variables have bigger coefficients than the coefficients of domestic research and development variables. Therefore, one can claim that import volume has bigger effect on productivity than the one domestic research and development has in Turkish manufacturing industry.

Overall, we can suggest that, although increasing import volume together with rising growth rates in Turkish economy is observed with current account deficits, productivity enlarging effects of rising import volumes should not be disregarded. In particular, productivity improving effects comes from the manufacturing imports from EU countries. This can be regarded as one of the positive effects of Custom Union on Turkish economy among the others.

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