Turkey's Customs Union with the European Union: A Framework for Evaluating the Impact of Economic Integration

Refik Erzan and Alpay Filiztekin and Unal Zenginobuz

4. October 2002

SUBMISSION
FOR
ERF'S NINTH ANNUAL CONFERENCE
(October 26-28 2002)

Research Area: Globalization, Trade, Integration and FDI

Turkey's Customs Union with the European Union: A Framework for Evaluating the Impact of Economic Integration

Refik Erzan
Bogazici University
Bebek, Istanbul
TURKEY 80815

erzan@boun.edu.tr

Alpay Filiztekin
Sabanci University
Orhanli, Tuzla, Istanbul
TURKEY 81474

alpayf@sabanciuniv.edu

Unal Zenginobuz
Bogazici University
Bebek, Istanbul
TURKEY 80815

zenginob@boun.edu.tr

October 4, 2002

Abstract

Turkey's customs union with the European Union in 1996 increased considerably import penetration in manufacturing while not significantly affecting the share of EU in Turkey's trade. The study analyzes whether this impetus had a marked impact on the productive and industrial structure of manufacturing in Turkey, and on its competitive behavior.

1. Introduction

Various forms of economic integration with the European Union (EU) are on the top of the agenda for the Southern and Eastern Mediterranean countries. By enacting a customs union (CU) with the EU in 1996, Turkey took a major step in that direction. Evaluating the impact of this CU for Turkey - and its policy implications - are therefore important both for Turkey and for the other Mediterranean countries that have various types of economic association with the EU.

Since the CU largely excludes agriculture, this study analyzes the impact of the CU on Turkish manufacturing industry - at the sectoral level. Only six years have elapsed since the CU (1996-2001), and the latest definitive data on the manufacturing industry pertain to 1999. The intention of the study is to set up a framework with which the anaysis can be updated periodically enabling a more accurate evaluation of the CU.

1.1 Trade liberalization and the Customs Union

Trade regime stood at the core of the reform process the Turkish economy has been undergoing since 1980. Vigorously followed export promotion policies, as well as more gradually introduced import liberalization policies, had a profound impact on the manufacturing industry. The State Institute of Statistics data reveal that the share of manufacturing in exports has gone up from 36% in 1980 to 79.1% in 1987 and stood at 91.4% in 2000.

Import penetration ratios in Turkish manufacturing, calculated as the ratio of imports to apparent consumption (domestic production plus imports minus exports), increased considerably since the 1980s. This has accelerated with the Customs Union (CU) with the EU. In addition to import penetration ratios, nominal protection rates are also important in judging the competitive pressures that industries face.

In the 1970 Additional Protocol to the Association Treaty of 1963, Turkish imports from the European Community were divided into two lists. There was a 12-year list for industrial products that Turkey was likely to reach international competitiveness relatively faster, and the rest of the manufactured goods were placed on a 22-year list. With the CU that went into effect in 1996 Turkey has reduced the nominal protection rates in trade with EU for all of the commodities in the 12- and 22- year lists. For commodities that were not included in the 12- and 22-year lists but covered under the European Coal and Steel Community agreement, a separate Free Trade Agreement

was signed in 1995 between Turkey and EU, which stipulated that trade of commodities covered under the agreement would be gradually liberalized over a period of three years. Thus, by 1999 the nominal protection rates for all industrial products when traded with EU have been reduced to zero. It has been calculated that while the average nominal protection rates with EU had been calculated as 10.22% as of 1994, they have fallen on average to 1.34% by 1999 (see, Togan 1997). Moreover, the EU-Turkey customs union agreement requires Turkey to adopt the Customs Union Tariff of EU against third country imports by January 1, 1996, and all of the preferential agreements EU has concluded with third countries by the year 2001.

Also, the enactment of Competition Law and the establishment of the Competition Authority have largely been due to Turkey's obligation under the Association Agreement. The Association Agreement required that the parties should apply the provisions of Rome Treaty for the harmonization of their laws, tax rules, and competition policies.

1.2 Trade Pattern and Ratios

Table 1. gives the export-output and import penetration (imports/apparent consumption) ratios in manufacturing for the relevant sub-periods following the trade liberalization of 1980. The share of imports from and exports to the EU in, respectively, total imports and exports are also depicted.

The only striking change in the trade pattern following the CU was the major increase in overall import penetration ratios. This ratio increased from 14% in the early 1990s to nearly 20% in the post-CU period. Remarkably, the share of EU imports in imports from all sources slightly declined from 54% to 51% in the two periods compared.

Given the relatively low level of the common external tariffs, and the large size of the EU, this observation is consistent with the intuitive prediction that trade creation would dominate trade diversion. Put differently, for Turkey, the multilateral liberalization aspect of the CU dominated over its preferential impact.

Following the CU, import penetration ratios doubled or nearly doubled in many sectors of manufacturing. It can be expected that such an impetus would have an important impact on the productive and industrial structure of manufacturing in Turkey, and on its competitive behavior.

INSERT TABLE 1

1.3 Previous Studies

Systematic empirical studies on the impact or probable impact of the CU on Turkish manufacturing industry are very sparse. Harrison, Rutherford and Tarr, using a computable general equilibrium (CGS) model, addressed the issue in 1996, analyzing the potential overall impact of the CU on welfare. CGE estimations and simulations of Bayar *et al.* (2000) provided some indication of the direction and magnitude of changes in major sectors of the economy. Kucukahmetoglu (2000) conducted a study based on changes in revealed comparative (RCA) advantage indices. Erzan and Filiztekin (1997) analysed the probable impact of the CU on the structure of manufacturing industry in terms of small, medium and large firms, using panel data techniques.

The CU has both liberalization (trade creation) and trade diversion aspects. There are earlier studies on the impact of trade liberalization. Krueger and Tuncer (1982) reported that productivity growth was faster during the periods of liberalization. Similarly, Nishimizu and Robinson (1984) find that for most industries, productivity growth was increasing with export expansion. Both of these studies cover the1963-1976 highly protectionist period. The paper by Levinsohn (1993) was the first one that exploited the reforms in 1980. However, the major concern of Levinsohn was to test imports as a market discipline hypothesis. His results showed that for majority of industries, removing barriers to import decreases market power. Foroutan (1996) as a part of a World Bank funded project, examined total factor productivity between years 1976-1985. She concluded that industries that were classified as exportables grew faster after 1980. She also reported that there was small but significant disciplining effect of trade on market power.

Filiztekin (2000) explored the impact of trade reforms on the growth performance of Turkish manufacturing industry in the 1970-1996 period. He also addressed whether the observed growth in value added was due to accumulation of factors of production or rather improvement in productivity, whether the growth phenomenon was uniform across industries and whether there were certain industries that led the rest. The relation between trade and productivity growth, especially the effects of export growth and changes in imports on productivity were also tested.

1.4 Data

The data are obtained from the Annual Surveys of Manufacturing Industry conducted by the State Institute of Statistics (SIS). The surveys defined 20 industries until 1973, and since then, the classification system has changed to identify 29 industries. Throughout the paper, we used a dual approach with respect to data. Where possible, we used the 28-industry classification (the food and beverage industry is collapsed in many other statistics, thus we had to consider these two industries as one) and the (consistently constructed) 20-industry classification otherwise. This was specifically the case in constructing the capital stock data.

The surveys cover establishments with ten or more persons engaged. The data differentiate public enterprises from private ones. The study pertains to private manufacturing industry because of the arbitrary decision making in the public enterprises. This differntiation reduced our number of sectors to 27 because of the mainly publicly owned oil refining industry.

The variables used in the rest of the report are defined as follows. Real value added and real gross output are calculated by dividing the nominal value added and nominal gross output by sectoral price deflators, respectively. Sectoral price deflators exist for the 1982-1997 period at a monthly frequency starting with 1981. For each industry, the sectoral deflator is extrapolated for the early years using the relation between each deflator and consumer price index, oil prices and a set of time related variables after 1982.

Labor input is total number of persons engaged. Man-hour data are available only after 1980 and they are not reported for some small establishments in several industries in particular years. None of the results related to post 1980 do change qualitatively if man-hour data are used instead of persons engaged. Furthermore, when wages are calculated, we used total number of workers instead of persons engaged, because they include owners or other family workers that re not paid any wages and salaries.

The surveys report current value investment figures for each industry. The finer distinction for newly purchased goods are not available. The nominal investment figures are deflated by an aggregate investment deflator. The deflator values for post 1980 period was taken from Treasury Department. Data on earlier years are from

OECD National Accounts. Treasury deflator was extrapolated using OECD data for years prior to 1980.

Given the series of real investment, the capital stock is a function of past investment flows. The choice of function is somewhat arbitrary, since information about asset types, asset lives and depreciation patterns across industries are not available. Two different functions are entertained in this paper, both yielding very close estimates. The first one is the perpetual inventory method. The initial level of capital stock is approximated by taking the ratio of investment value added in 1950 to the sum of investment value added ratio in the next ten years. Given positive depreciation rates and long investment series prior to the initial date, the perpetual inventory approach is fairly robust to the choice of capital stock estimate for the first year. Then investments are added to the capital stock by adjusting for depreciation in the existing stock.

The second approach is to construct the capital stock as a delayed linear scrapping rule. This method adds newly purchased capital good to the capital stock and after a period of *s* years. A constant proportion, *1/(m+1)*, is scrapped every year.

$$K_{it} = \sum_{n=1}^{s} I_{it-n} + \sum_{n=s+1}^{s+m} I_{it-n}\left[1 - \frac{n-s}{m+1}\right]$$

where K_{it} is the capital stock of industry *i* at time *t*, *I* is real investment. This is the formula used by the OECD in it's Intersectoral Database for international comparisons (OECD,1996). Following Harrigan (1999) *s* is chosen as 3 years and *m* as 7 years and the capital stock is calculated from 1960 onwards. The capital stock estimates reported in this paper use the delayed scrapping approach.

To analyze market structure, we use two different approaches. First we use three standard measures of concentration. The first two are four-firm and eight-firm concentration ratios and the third one is a Herfindahl index, $H_{it} = \sum_{n=1}^{N} s_{n,it}^2$, where *N* is total number of establishments in industry *i* at time *t*, and *s* is the output share of *n*th firm in that industry. These measures are taken from Gunes (1995).

Trade data are taken from the World Bank Trade and Production Database. The database contains imports and export data at the industry level by blocs of countries over the period 1980-1999. We were able to identify Turkey's imports and exports to European Union, United States of America and to the rest of the world.

2. Growth and Productivity

2.1 Growth

1980 was a decisive year in which the economy changed its orientation. Post 1980 period is divided into three sub-periods. The first one starts in 1981 and ends in 1988. The 1989-1995 period corresponds to two major changes in the economy. As a result of free elections after a period of political oppression, and the strong pressures by trade unions, real wages increased drastically in 1989, catching up their pre-1980 level. 1989 was also the year when the capital account was fully liberalized. The final sub-period, 1995-1999, captures the CU with the EU.

The first column in Table 2 provides annual average growth rate of value added in aggregate manufacturing. The growth rate during the last decade of import substituting industrialization, 1970-1980, was a mere 1.3% (as industry was paralyzed by 1977), which jumped to 10% as the economy was opened to trade.

The second column provides annual growth rates of employment. The annual employment growth was 4.5% during the 1970s. This should be viewed against the background of very high population growth rates (2.6% per annum) and mass migration from rural areas to urban centers (1.3% per annum). In the 1980s, with suppressed real wages, opening up of the economy increased annual employment growth to 4.9%. However, from 1989 onwards, as real wages were restored and the capital account opened, the average employment growth fell rapidly to 1.8%. In the post-CU era, annual employment growth recovered to 3.4%.

Table 2. Growth Performance of Manufacturing, 1970-1999 (%)

	Value Added	*Employment*	*Capital Stock*
1970-1980	1.32	4.48	13.84
1981-1988	9.69	4.91	2.86
1989-1995	10.32	1.80	6.90
1996-1999	10.20	3.43	10.75
1981-1999	10.03	3.45	6.01

The third column is growth in capital stock. In the 1970s, despite severe balance of payments crises, capital accumulation had a remarkable 13.8% average. Following the trade liberalization of 1980, capital accumulation slowed down considerably. After the wage hike and opening up of the capital account in1989, it picked up to 6.9%. With the CU, annual growth rate of capital accumulation reached 10.8%.

2.2 Productivity

Two measures of productivity are analyzed. The first one is labor productivity, simply the ratio of real value added to labor input. While it is a very simple and non-parametric measure of productivity, it measures the contribution of only one factor input, and hence cannot differentiate whether high productivity is a result of technical efficiency or due to increase in other inputs, particularly capital. The second measure of productivity is total factor productivity (TFP), defined as the residual after the contribution of accumulation of all factors is removed from output growth. More formally, suppose the value added is produced by using two inputs, labor and capital, and technology, *A*:

$$Y = F(A,K,L) \tag{1}$$

Differentiating this function will yield:

$$\frac{dY}{Y} = \frac{F_K K}{Y}\frac{dK}{K} + \frac{F_L L}{Y}\frac{dL}{L} + \frac{F_A A}{Y}\frac{dA}{A} \tag{2}$$

where F_J is partial derivative of production function, F, with respect to input J. Assuming that the elasticity of technology is unity (or simply assuming that technology is Hicks-neutral), with some manipulation one obtains:

$$\frac{dY}{Y} - \frac{dK}{K} = s_L\left(\frac{dL}{L} - \frac{dK}{K}\right) + (\mu - 1)s_L\left(\frac{dL}{L} - \frac{dK}{K}\right) + (\gamma - 1)\frac{dK}{K} + \frac{dA}{A} \tag{3}$$

where s_J is the share of Jth input total revenue, μ is the markup and γ is the returns to scale parameter.

Under the assumption of perfect competition and constant returns to scale, that is when $\mu = \gamma = 1 = s_K + s_L$, Equation (3) reduces to

$$\left(\frac{dA}{A}\right)^{SR} = \frac{dY}{Y} - s_K\frac{dK}{K} - s_L\frac{dL}{L} \tag{4}$$

The term $(dA/A)^{SR}$ is simply the residual growth of value added after the contribution of inputs are removed and is called the Solow residual. This is used as a measure of "total factor productivity" (TFP).

Table 3. Labor Productivity and Total Factor Productivity Growth, 1970-1999 (%)

	Labor Productivity	*TFP*
1970-1980	-3.16	-9.38
1981-1988	4.77	6.18
1989-1995	8.52	4.49
1996-1999	6.78	0.88
1981-1999	6.57	4.44

There was a significant gain in labor productivity after the economy opened to trade in 1980. A further improvement in labor productivity was observed after 1988 when real wages increased drastically. However, in the period following the CU with the EU in 1996, the annual average growth of labor productivity fell from 8.5% to 6.8%.

It was observed that TFP growth recovered after 1980, reaching the level as high as 6.2% per annum in the first phase of liberalization and dropping to 4.5% thereafter. The decline in the growth rate of TFP in the second sub-period was a consequence of the 1994 crisis. In fact, restricting the sample period to 1988-1993, the TFP growth was even faster, reaching 9.2% per year. The drastic increase in real wages forced firms to substitute capital for labor and increase efficiency and productivity of existing inputs.

A major decline was observed for years following the CU with the EU. In fact, the decline started in 1994 and persisted until 1996. A strong recovery in 1997 was then offset by a strong decline in 1998. In the last year of the sample there was another recovery of the TFP. Nevertheless, the average TPF growth in the post-CU years of the sample was only 0.9%. The boom-bust performance of the economy in the recent years may have dominated the erratic behavior of TFP rather than the impact of the CU.

2.3 Growth Accounting

Growth accounting is a decomposition of value added growth into its components obtained by re-arranging Equation (4). The purpose of the growth accounting exercise is to determine whether the source of growth is due to factor accumulation or technological improvement, represented by TFP growth. The results are reported in Table 4.

INSERT TABLE 4

Average annual value added growth in manufacturing was about 10% during the whole period under study. The increased labor input accounted for 12% of that in the first sub-period, 1981-1988, and considerably lower in the following sub-periods. The bulk of growth came from capital accumulation and technological improvement. However, the shares of the two factors changed drastically. The contribution of TFP declined first from 64% to 44%, then to 9% in the post-CU era. In this latter period, capital accumulation alone accounted for 86% of value added growth. Individually, in most sectors, TFP contribution was significantly negative, only compensated by capital accumulation.

3. The Impact of Trade on Industry Structure an Performance

Table 5 below presents the evolution of various market concentration indicators in Turkish manufacturing industries over the 1980-1998 period.

INSERT TABLE 5

Table 6 below shows the results of the regression relating foreign trade variables to market concentration. With a one-year lag, import penetration (IMPPEN) significantly affects market concentration as measured by CR4. The higher the import penetration in a manufacturing industry in a given year, the lower is the market concentration in the following year. Export/Output ratio (X/O), on the other hand, does not affect market concentration. Given that market concentration will typically mean more competition and, hence, lower prices, this result supports the imports-as-market-discipline hypothesis.

Table 6. Impact of Foreign Trade Variables on Market Concentration (CR4)

Regression with robust standard errors
No. of obs = 405
F(46, 358) = 341.97
Prob > F = 0.0000
R-squared = 0.9185
Root MSE = 0.05713

	Coef.	***Robust* Std. Err.**	**t**	**P > |t|**
$(X/O)_{-1}$	- 0.061	0.054	-1.11	0.267
$(X/0)_{-2}$	- 0.274	0.051	-0.53	0.594
$(X/O)_{-3}$	- 0.213	0.044	-0.48	0.632
$IMPPEN_{-1}$	- 0.309***	0.090	-3.43	0.001
$IMPPEN_{-2}$	- 0.026	0.110	-0.24	0.809
$IMPPEN_{-3}$	- 0.009	0.093	-0.10	0.917

Note: *, **, and *** indicate significance at 90%, 95%, and 99% confidence levels, respectively.

Table 7 below shows that including the share of EU in Turkish exports and imports does not alter the previous result that, among independent variables considered, import penetration with one year lag is the only significant determinant of market concentration in the manufacturing industry. Again, import penetration significantly reduces market concentration in the following year. (MEU denotes the share of EU in total imports in Turkish manufacturing industries, and XEU denotes share of exports to EU in total exports of Turkish manufacturing industries.)

Table 7. Impact of Trade With EU on Market Concentration (CR4)

Regression with robust standard errors
No. of obs = 405
F(52, 352) = 320.98
Prob > F = 0.0000
R-squared = 0.9205
Root MSE = 0.05691

	Coef.	*Robust* Std. Err.	t	$P > \|t\|$
$(X/O)_{-1}$	- 0.066	0.054	- 1.23	0.219
$(X/0)_{-2}$	- 0.031	0.051	- 0.61	0.540
$(X/O)_{-3}$	- 0.021	0.046	- 0.46	0.643
$IMPPEN_{-1}$	- 0.329***	0.092	- 3.56	0.000
$IMPPEN_{-2}$	- 0.041	0.108	- 0.38	0.701
$IMPPEN_{-3}$	0.014	0.093	0.16	0.876
MEU_{-1}	- 0.028	0.037	- 0.77	0.441
MEU_{-2}	- 0.021	0.041	- 0.53	0.594
MEU_{-3}	0.004	0.028	0.15	0.883
XEU_{-1}	0.038	0.032	1.18	0.240
XEU_{-2}	0.034	0.034	1.02	0.309
XEU_{-3}	- 0.036	0.030	-1.21	0.227

Note: *, **, and *** indicate significance at 90%, 95%, and 99% confidence levels, respectively.

Table 8 below presents the results of the regression that tests how market concentration affects the share of exports in output. The results indicate that an increase in market concentration leads to a decrease in exports with a one year lag. Presumably, a high market concentration is correlated with high markups and high profitability in the domestic market, which will reduce incentives for searching markets abroad. On the other hand, a decrease in market concentration will be expected to lower profitability and force firms to search for opportunities abroad. This result also indicates that large firms that are able to exercise market power do not search for export markets vigorously.

Table 8. Impact of Market Concentration (CR4) on Share of Exports in Output

Regression with robust standard errors
No. of obs = 459
F(52, 352) = 41.96
Prob > F = 0.0000
R-squared = 0.7570
Root MSE = 0.06212

	Coef.	***Robust* Std. Err.**	**T**	***P* > /*t*/**
$CR4_{-1}$	- 0.219***	0.093	-2.36	0.019
$CR4_{-2}$	0.253	0.179	1.42	0.157
$CR4_{-3}$	- 0.90	0.140	-0.65	0.518

Note: *, **, and *** indicate significance at 90%, 95%, and 99% confidence levels, respectively.

The impact of market concentration on import penetration is again negative and it filters through with a one-year lag. This result points at a situation where market concentration acts as an entry barrier against competition from imports.

Table 9. Impact of Market Concentration (CR4) on Import Penetration

Regression with robust standard errors
No. of obs = 459
F(52, 352) = 93.73
Prob > F = 0.0000
R-squared = 0.9154
Root MSE = 0.04933

	Coef.	***Robust* Std. Err.**	**T**	***P* > /*t*/**
$CR4_{-1}$	- 0.164**	0.077	-2.13	0.034
$CR4_{-2}$	0.022	0.094	0.24	0.810
$CR4_{-3}$	- 0.048	0.073	-0.66	0.509

Note: *, **, and *** indicate significance at 90%, 95%, and 99% confidence levels, respectively.

5. Conclusions

Turkey's CU with the EU in 1996 increased considerably import penetration in manufacturing while not significantly affecting the share of EU in Turkey's trade.

Given the relatively low level of the common external tariffs, and the large size of the EU, this observation is consistent with the intuitive prediction that trade creation

would dominate trade diversion. Put differently, for Turkey, the multilateral liberalization aspect of the CU dominated over its preferential impact.

Following the CU, import penetration ratios doubled or nearly doubled in many sectors of manufacturing. It can be expected that such an impetus would have an important impact on the productive and industrial structure of manufacturing in Turkey, and on its competitive behavior.

We first analyzed growth in value added, employment and capital accumulation. Annual average growth in manufacturing value added was about 10% throughout the whole period since 1980. Employment growth and capital accumulation, on the other hand, picked up considerably in the post-CU era from the depressed levels of 1989-1995. These improvements, however, were not reflected in productivity growth. Labor productivity somewhat declined, but most remarkably, annual average productivity growth that was attributable to technological improvement declined to a record level of below 1%. The source of growth in manufacturing industry was essentially due to capital accumulation in the post-CU era.

One probable explanation to this phenomenon is preemptive capacity building in anticipation of tougher competition and/or the incentive to exploit potential export opportunities. Another explanation is the structural disarray due to the impact of considerably higher levels of import penetration.

There was a two-way relation between industry concentration and import penetration. Higher concentration significantly reduced import penetration. However, once imports managed to penetrate, they significantly reduced industry concentration.

High industry concentration was not only resisting import penetration. High concentration was also hampering export growth. There was a significant negative relation between high concentration and export/output ratios in the following years.

The results indicate that imports work as market discipline, but have to be complemented with competition policy.

It should also be noted that the trade shares of the EU did not affect industry concentrations. It was import penetration from all sources that mattered. Hence, as a

result of the CU, imports did have a disciplining effect on Turkish manufacturing, but not the EU.

References

Arellano, M. and S. Bond (1991), "Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations," *Review of Economic Studie*s, Vol. 58, pp.277-297.

Bayar, A., H. Nuray and S. Reçberoğlu (2000), "The Effects of the Customs Union on the Turkish Economy: An Econometric Analysis of the Four Years' Implementation," *Economic Development Foundation*, No. 160, Istanbul.

Bernard, A. and C. Jones (1996), "Productivity and Convergence Across US States and Industries," *Empirical Economic*s, Vol. 21, pp.113-135.

Cameron, G., J. Proudman and S. Redding (1998), "Deconstructing Growth in UK Manufacturing" in (eds. Proudman and Redding) *Openness and Growt*h, Bank of England.

Connelly, M. (1998), "The Dual Nature of Trade: Measuring its Impact on Imitation and Growth," *Duke University Department of Economics Working Paper, No: 97/34.*

Dollar, D. (1992), "Outward-Oriented Developing Economies Really Do Grow More Rapidly: Evidence from 95 LDCs," *Economic Development and Cultural Change*, Vol. 40, pp. 523-44.

Edwards, S. (1998), "Opennes, Productivity and Growth: What Do We Really Know?" *Economic Journa*l, Vol. 108, July, pp 383-98.

Erzan, R., A. Filiztekin (1997), "Competitiveness of Turkish SMSEs in the Customs Union," *European Economic Review,* Vol. 41, pp. 881-892.

Feeney, J. (1999), "International Risk Sharing, Learning by Doing, and Growth," *Journal of Development Economic*s,. Vol. 58, pp 297-318.

Filiztekin, A. (2000), "Openness and Productivity Growth in Turkish Manufacturing," *mimeo.*

Foroutan, F. (1996), "Turkey 1976-85: Foreign Trade, Industrial Productivity and Competition," in *Industrial Evolution in Developing Countrie*s, eds. M. J. Roberts and J. R. Tybout, A World Bank Book, Washington.

Grossman, G. and E. Helpman (1991), *Innovation and Growth in the Global Economy*, MIT Press.

Harrigan J. (1999), "Estimation of Cross-Country Differences in Industry Production Functions," *Journal of International Economic*s, Vol. 47 pp. 267-93.

Harrison G. W., T .F. Rutherford and D. G. Tarr (1996), "Economic Implications for Turkey of a Customs Union with the European Union," *Policy Research Working Paper*, No. 1599, World Bank.

Holtz-Eakin, D, W. Newey and H. Rosen (1988), "Estimating Vector Autoregressions With Panel Data," *Econometric*a, Vol. 56 pp. 1371-95.

Hsieh, C (1997), "Measuring Technological Change," *University of California, Berkeley, Working Pape*r.

Katırcıoğlu, E., N. Engin and C. Akçay. (1995), ''The Impact of Trade Liberalization on the Turkish Manufacturing Industry: An Empirical Assessment'' in R. Erzan (ed.), *Policies for Competition and Competitiveness*. Pp. 33-51. Vienna: UNIDO.

Kim, E. (2000), "Trade Liberalization and Productivity Growth in Korean Manufacturing Industries: Price Protection, Market Power and Scale Efficiency," *Journal of Development Economic*s, Vol. 62 pp. 55-83.

Krueger, A. and B. Tuncer (1982), "Growth of Factor Productivity in Turkish Mnufacturing Industry," *Journal of Development Economic*s, Vol. 11 pp. 307-25.

Krugman, P. (1994), "The Myth of Asia's Miracle," *Foreign Affairs,* 73/6 December pp. 62-77.

Küçükahmetoğlu, O., (2000), "Türkiye-AB Gümrük Birliği'nin İktisadi Etkileri," *Iktisat Dergisi*, No. 408.

Levinsohn, J. (1993), "Testing the Imports-as-Market-Discipline Hypothesis," *Journal of International Economic*s, Vol. 35 pp. 1-22.

Nelson, R. and H. Pack (1999), "The Asian Miracle and Modern Growth Theory," *Economic Journa*l, Vol. 109, July, pp. 416-36.

Nishimizu, M and S. Robinson (1984), "Trade Policies and Productivity Change in Semi-industrialized Countries," *Journal of Development Economic*s, Vol. 16 pp. 177-206.

Metin-Ozcan, K, E. Voyvoda and E. Yeldan (1999), "Dynamics of Macroeconomic Adjustment in a Globalized Developing Economy: Growth, Accumulation and Distribution, Turkey 1969-1998", *Bilkent University Discussion Paper*s, No. 99-5

Metin-Özcan K., E. Voyvoda and E. Yeldan. (2000), "On the Patterns of Trade liberalization, Oligopolistic Concentration and Profitability: Reflections from post-1980 Turkish Manufacturing", Department of Economics Discussion Paper No: 00-12, Bilkent University, Ankara.

Öz, G. (1999), "Competition Law and Practice in Turkey." *European Competition Law Review*, Vol. 20-3: 149-158.

Rodrigues, F. and D. Rodrik (1999), "Trade Policy and Economic Growth: A Skeptic's Guide to the Cross-national Evidence," NBER Working Paper No.: 7081.

Rodrik, D. (1995), "Trade and Industrial Policy Reform," in *Handbook of Development Economic*s, eds. J. Behrman and T.N. Srinivasan, North Holland, Amsterdam.

Senses, F. (1994), *Recent industrialization experience of Turkey in a global contex*t. Contributions in Economics and Economic History, no. 155. Westport, Conn. and London: Greenwood Press, 1994.

Togan, S. (1994), *Foreign Trade Regime and Trade Liberalisation in Turkey during 1980's*. London: Avebury Press.

Togan, S. (undated), *1980'li Yillarda Turk Dis Ticaret Rejimi ve Dis Ticartein Liberlizasyon*u. Turk Eximbank Arastima Dizisi 1.

Togan, S. and Balasubramanyam (1996), *The Economy of Turkey Since Liberalizatio*n. New York: St. Martin's Press; London: Macmillan Press.

Weinhold, D. and J. Rauch (1997), "Openness, Specialization, and Productivity Growth in Less Developed Countries," *NBER Working Pape*r, No. 1997.

Yalçın, Cahit (2000), ''Price-Cost Margins and Trade Liberalization in Turkish Manufacturing Industry: A Panel Data Analysis'', Research Department Discussion Paper No. 37, Central Bank of the Republic of Turkey, Ankara.

Young A. (1998a), "Alternative Estimates of Productivity Growth in the NICs: A Comment on the Findings of Chang-Tai Hsieh," NBER Working Paper No.: 6657.

Young A. (1998b), "Paasche vs. Laspeyres: The Elasticity of Substitution and Bias in Measures of TFP Growth," NBER Working Paper No.: 6663. 37

Table 1. Trade Ratios and Trade Shares, 1981-1999 (%)

	Export-Output Ratio			*Import Penetration*			*Sh. Of Imp. from EU in Tot Imp*			*Sh. Of Exp. to EU in Tot Exp*		
	1981-1988	*1989-1995*	*1996-1999*	*1981-1988*	*1989-1995*	*1996-1999*	*1981-1988*	*1989-1995*	*1996-1999*	*1981-1988*	*1989-1995*	*1996-1999*
311*Food*	10,48	11,31	11,95	4,22	5,91	6,62	56,32	31,94	35,65	37,78	51,49	48,28
313*Beverage*	1,04	1,51	1,96	0,57	0,46	0,69	58,69	86,97	60,32	19,82	27,09	28,47
314*Tobacco*	13,09	1,29	2,84	3,68	7,20	7,89	15,79	4,83	6,32	18,04	13,51	20,58
321*Textiles*	19,15	20,09	25,61	2,80	6,42	11,65	46,09	31,84	42,25	70,01	69,77	60,52
322*Clothing*	59,31	42,39	45,89	0,52	0,51	3,62	61,22	73,30	71,89	81,67	76,93	66,81
323*Leather*	4,28	10,77	11,37	7,07	25,47	24,87	81,32	68,76	66,40	60,93	65,34	45,85
324*Footwear*	7,00	15,98	17,76	1,85	7,24	14,20	67,26	30,51	70,39	36,22	25,01	16,32
331*Wood*	7,18	4,23	5,83	2,81	3,42	8,67	59,61	53,17	48,39	18,79	27,07	22,84
332*Furniture*	17,07	6,31	8,21	3,91	6,20	12,40	83,77	87,15	83,65	10,20	30,52	43,96
341*Paper*	2,91	2,87	6,09	8,30	15,10	28,43	45,59	59,22	61,95	2,67	16,96	15,25
342*Printing*	1,28	0,58	1,09	2,01	3,12	3,16	79,56	81,27	80,73	48,84	45,44	30,44
351*Chemicals*	9,75	11,86	11,72	31,02	35,31	50,45	52,81	55,02	57,59	24,07	42,34	39,20
352*Other Chemicals*	2,74	4,37	6,51	9,48	12,02	18,18	61,90	72,04	72,60	31,55	18,22	12,06
354*Misc. Products of Petroleum*	0,26	0,26	0,45	1,16	2,01	4,66	61,84	64,03	47,88	39,51	59,41	28,45
355*Rubber*	4,62	13,01	17,69	4,43	8,64	14,43	59,21	63,81	67,15	24,89	35,51	59,02
356*Plastics*	3,73	3,23	6,68	2,35	6,99	10,90	71,93	77,86	70,38	11,03	27,04	19,41
361*Pottery*	3,42	3,53	10,02	1,11	2,08	5,31	62,61	59,17	66,22	55,27	78,23	75,30
362*Glass and Products*	14,76	15,40	18,81	3,03	6,35	11,50	73,24	70,84	68,92	38,94	52,73	45,05
369*Other non-metallic*	1,91	5,24	7,72	3,63	3,52	3,46	73,72	79,61	81,81	24,91	47,39	40,42
371*Iron & steel*	9,64	14,82	15,83	13,21	14,05	16,13	61,34	48,85	43,94	20,12	12,43	25,11
372*Non-ferr. Metals*	5,43	8,81	13,53	14,92	18,49	29,29	57,42	40,27	34,60	13,34	41,89	43,67
381*Fabricated Metal*	7,03	6,66	10,71	18,51	26,28	27,79	43,38	62,72	60,80	20,39	42,70	41,60
382*Machinery*	8,55	4,36	10,35	40,60	39,26	51,98	60,29	68,64	67,04	36,98	42,15	43,60
383*Electrical Machinery*	4,69	9,65	17,64	25,15	24,41	35,54	40,17	58,75	69,14	23,31	64,26	64,03
384*Motor Vehicles*	3,07	4,28	11,27	22,58	20,52	29,95	69,94	53,20	63,29	32,44	45,44	45,28
385*Prof&scientific equip.*	20,81	6,47	7,47	77,53	57,26	56,21	57,98	58,93	58,06	51,08	38,59	46,19
390*Others*	13,58	19,94	40,94	13,04	31,93	45,76	62,42	53,69	49,88	24,37	52,97	30,30
Total	9,16	10,34	13,50	12,22	14,20	19,94	55,25	55,49	59,61	49,78	54,12	50,75

Table 4. Growth Accounting, 1981-1999 (%)

	1981-1988				*1989-1995*				*1996-1999*			
	Value Added	***Labor***	***Capital***	***TFP***	***Value Added***	***Labor***	***Capital***	***TFP***	***Value Added***	***Labor***	***Capital***	***TFP***
Food	7.90	12.62	53.61	33.83	8.25	-0.04	60.03	40.06	3.61	14.16	280.81	-196.06
Beverage	7.18	9.45	152.08	-61.42	9.67	-4.38	-15.21	119.54	-5.18	1.70	296.26	-397.74
Tobacco	13.68	2.33	112.26	-14.60	24.88	0.71	106.80	-7.30	-8.39	-12.26	139.15	-227.56
Textiles	6.57	13.10	44.82	42.06	8.23	1.26	34.77	63.88	11.30	14.24	107.83	-22.19
Clothing incl. Footwear	27.96	17.64	24.70	57.59	10.17	12.40	161.84	-73.94	-6.00	-10.41	165.47	-255.33
Leather	7.12	20.84	-20.56	99.73	13.14	1.48	13.85	84.66	-10.42	-6.17	322.54	-416.80
Wood	4.01	9.49	-90.49	181.00	15.63	-1.80	72.92	28.64	1.59	51.14	765.52	-714.85
Furniture	18.43	10.76	14.00	75.25	5.78	16.53	137.64	-54.20	17.61	14.33	114.97	-29.29
Paper	13.56	10.27	46.60	43.14	9.62	6.40	12.27	81.23	20.89	-1.22	57.66	43.72
Printing	10.54	15.51	-2.37	86.83	-4.04	-6.10	344.34	-438.47	-1.69	17.05	305.55	-420.59
Chemicals	12.45	6.15	30.84	62.97	5.53	22.89	16.82	61.28	12.31	-19.88	59.11	60.07
Misc. Products of Petroleum	5.40	7.00	-84.18	177.18	2.85	-2.99	472.07	-369.66	-2.53	35.91	367.20	-503.50
Rubber	11.67	8.14	51.52	40.21	7.34	-13.93	132.85	-18.87	-4.63	8.38	98.44	-206.04
Pottery, Glass & Minerals	7.19	13.78	10.39	75.68	9.90	-4.45	91.54	13.22	2.49	39.62	257.63	-198.75
Iron & steel and Non-ferr. Metals	12.28	8.50	0.09	91.39	9.64	-3.94	24.91	79.08	9.15	3.08	63.57	33.53
Fabricated Metal	8.78	11.09	-4.28	92.98	10.76	-2.61	118.98	-16.25	18.72	8.63	5.87	85.52
Machinery	9.99	9.28	-48.16	138.92	9.57	-3.95	28.73	75.24	10.69	5.65	89.73	4.49
Electrical Machinery	11.25	9.52	44.76	45.54	18.51	-0.30	21.76	78.57	19.99	10.08	27.22	62.74
Motor Vehicles	13.57	11.06	48.34	40.65	13.77	5.70	49.56	44.69	-1.76	17.51	334.25	-451.25
Plastics nec., Instruments and Others	7.45	18.01	39.01	43.25	18.07	3.24	62.00	34.77	27.14	4.90	58.72	36.45
Total	9.69	11.93	24.22	63.82	10.32	2.30	54.27	43.48	10.20	5.23	86.08	8.58

Table 5. Industry Concentration in Manufacturing, 1980-1998

	CR4 (%)				CR8 **(%)**				***Herfindahl Index***			
	1980-1998	***1980-1988***	***1989-1995***	***1996-1998***	***1980-1998***	***1980-1988***	***1989-1995***	***1996-1998***	***1980-1998***	***1980-1988***	***1989-1995***	***1996-1998***
Food	12,26	11,40	13,44	12,09	18,72	17,95	19,93	18,17	0,85	0,78	0,94	0,82
Other Food	20,91	23,18	18,68	19,30	29,49	31,20	27,63	28,67	2,01	2,42	1,59	1,74
Beverage	40,38	46,71	33,06	38,48	57,43	63,34	50,36	56,23	6,90	8,62	4,98	6,20
Tobacco	61,43	62,41	61,53	58,22	77,98	77,94	78,34	77,28	12,43	13,06	11,90	11,80
Textiles	8,48	9,45	8,20	6,22	14,49	15,86	14,31	10,82	0,63	0,73	0,61	0,41
Clothing	12,34	19,40	5,65	6,77	18,09	26,62	9,93	11,55	1,21	2,11	0,38	0,45
Leather	21,88	18,66	26,69	20,36	34,05	29,47	40,50	32,70	2,37	1,95	3,00	2,17
Footwear	43,28	50,69	37,25	35,16	59,06	65,39	53,96	51,95	7,90	10,55	5,91	4,57
Wood	22,01	17,32	23,13	33,48	34,24	28,94	35,38	47,47	2,49	1,85	2,52	4,32
Furniture	44,82	46,14	43,83	43,20	58,50	58,60	59,34	56,24	7,87	9,24	6,38	7,21
Paper	30,39	38,13	24,91	19,96	46,33	54,62	41,64	32,43	4,16	5,59	3,17	2,18
Printing	46,13	38,11	53,24	53,62	58,64	53,11	62,82	65,51	7,66	5,12	9,31	11,43
Chemicals	47,41	41,83	52,74	51,74	64,90	61,18	68,69	67,24	8,59	6,85	10,45	9,49
Other Chemicals	21,82	22,37	22,33	18,99	35,17	36,01	35,83	31,09	2,44	2,45	2,57	2,12
Refineries	98,67	99,27	98,23	97,89	100,00	100,00	100,00	99,99	32,82	36,20	30,02	29,19
Misc. Products of Petroleum	68,98	67,09	73,68	63,68	86,60	87,25	88,65	79,87	18,11	15,95	22,56	14,21
Rubber	71,83	70,72	72,37	73,90	80,98	81,62	80,58	79,99	15,53	14,55	16,05	17,26
Plastics	20,42	21,40	20,40	17,52	31,24	31,94	30,84	30,07	1,92	2,01	1,89	1,72
Pottery	62,08	63,87	58,90	64,09	82,73	83,45	81,42	83,65	13,72	15,31	11,45	14,25
Glass and Products	56,53	62,19	53,40	46,83	78,76	83,03	77,66	68,49	10,57	12,38	9,56	7,48
Other non-metallic	18,68	18,33	19,62	17,56	31,38	30,17	33,69	29,64	2,00	1,99	2,11	1,81
Iron & steel	39,08	44,79	34,00	33,79	52,58	57,19	48,67	47,85	5,72	7,17	4,46	4,33
Non-ferr. Metals	46,48	48,79	46,01	40,66	62,78	66,43	61,54	54,72	7,21	7,78	7,09	5,79
Fabricated Metal	15,94	14,96	18,23	13,49	23,46	22,68	25,30	21,51	1,33	1,25	1,56	1,06
Machinery	40,00	37,57	44,42	37,01	53,58	49,92	58,70	52,61	5,62	4,62	7,33	4,63
Electrical Machinery	26,05	23,80	28,10	28,04	39,98	36,18	43,81	42,46	2,96	2,58	3,38	3,16
Motor Vehicles	39,88	35,64	46,58	36,92	56,82	53,90	60,16	57,79	5,73	4,72	7,33	5,03
Prof&scientific equip.	42,74	34,28	48,31	55,13	57,84	50,79	63,65	65,43	8,20	5,11	9,55	14,34
Others	32,90	38,34	29,61	24,25	45,80	49,02	43,97	40,38	5,06	6,82	3,69	3,01
Average	38,41	38,86	38,50	36,84	51,43	51,85	51,63	49,72	7,03	7,23	6,96	6,63