Effects of Customs Union with European Union on the Market Structure and Pricing Behaviour of Turkish Manufacturing Industry

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Abstract

Turkey established a customs union with European Union in 1996 in accordance with the Association Agreement signed in 1963. The main aim of this study is to analyse the effect of that customs union on the market structure and pricing behaviour in the Turkish manufacturing industry for the period 1994-2000. In other words, this study intends to test the pro-competitive effect of the trade liberalization initiated by the customs union. For this purpose the price-cost margin equation of 12 manufacturing sub-sectors are estimated using import and export ratios with European Union countries and control variables. A second equation is estimated for concentration ratio index using trade ratios with EU countries as explanatory variables. The estimation method is panel data covering 8 years and 12 cross section units

The estimation results show that the export and import ratios of trade with EU countries have a negative effect on the price-cost margin in the manufacturing sector. It is concluded that trade with union countries created a beneficial wealth and efficiency effect in Turkish manufacturing industry due to falling price-cost margins. Similarly, Herfindahl index equation estimation results indicate that increasing imports with union countries caused a decline in the concentration ratio for manufacturing industry during the considered period. Therefore, it can be argued that increasing competition through raising trade volume with EU countries has had a significant effect on the changing market structure and pricing behaviour of the manufacturing industry.

1. Introduction

The new theoretical literature on international trade suggests that under conditions of imperfect conditions, trade liberalization generates substantial welfare increases as a result of greater competitive pressure. The so-called pro-competitive effect of trade liberalization indicates that trade affects the degree of competition which decreases firms' price cost mark-ups and increases the production scale. On the other hand, new empirical literature has also developed within the field of industrial organization theory that tests the effects of trade on the market structure and the profitability of firms within the context of the Structure-Conduct-Performance (SPC) paradigm. The application of the welfare results of these new theories to customs union theory has broadened the scope of gains from regional economic integration beyond that suggested by standard customs union theory based on perfect competition and constant returns to scale. Despite the fact that this new literature points out the additional welfare gains stemming from economic integration based on imperfect

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competition, most ex post empirical studies assess the impact of customs union with the EU on Turkish industry based on traditional integration theories which assume perfect competition. Therefore, in accordance with the new theories this study aims to analyze the effects of customs union with the EU on the market structure and profitability of the Turkish manufacturing industry sectors for the period 1996-2000.

The remainder of this paper is organized as follows. Part 2 briefly summarizes the theoretical framework of the relationship between trade liberalization, market structure and profitability. Part 3 presents a review of the empirical studies on the impact of trade liberalization on the concentration and profitability of the Turkish manufacturing industry sectors. It also provides some background information on the trade liberalization history of the Turkish economy as well as EU-Turkey relations.

In Part 4, the results of the econometric estimates are presented. In this part, a recursive model with two equations is estimated in line with SCP in order to gauge the impacts of Turkey's customs union with EU on manufacturing industry sector mark-ups and concentration. Following our concluding analysis in Part 5, the Appendix presents the date sources and construction of all the variables used in the econometric model of part 4.

2. Trade Liberalization, Market Structure and Profitability: Theoretical Framework

2.1 Trade Liberalization and Profitability

The new theoretical literature on international trade suggests additional sources of gains from trade different from that proposed by classical and neo-classical trade theories. Among these, the pro-competitive effect of trade liberalization emphasizes the expansion in market size and a change in the number of firms. Accordingly, the pro-competitive effect suggests that trade influences the degree of competition, firms' price cost mark-ups, their scale and production.

The new theoretical literature on international trade has had an impact on the regional economic integration theory. The application of the welfare results the new theory to the regional economic integration theory has broadened the scope of gains from regional integration beyond that suggested by standard customs union theory based on perfect competition and constant returns to scale. As a result, one of

important issues that customs union theory now focuses on is the effect of economic integration on the market structure and the profitability of firms. Therefore customs union theory is no longer thought of as following the classical Vinerian concepts of trade creation and trade diversion.

It is argued that pro-competitive effect of trade liberalization is valid both under the assumption of monopolistic competition and oligopolistic market structure. Based on the assumption of monopolistic competition, it is shown that trade liberalization, by increasing the elasticity of demand, leads to an increase in firms scale and decrease in average cost and prices (Helpman 1981; Krugman 1979). Similarly, under the assumption of oligopolistic interaction between firms trade liberalization also causes a decrease in price cost mark-ups and an increase in the firm scale by affecting the market power of the firm in home market (Dixit and Norman 1980; Brander 1981; Venables 1985; Baldwin and Venables 1995).

With respect to the pro-competitive effect in the case of economic integration, Baldwin and Venables (1995) emphasize the importance of the pro-competitive effect as one of the gains of economic integration and suggests that regional as opposed global integration will normally amplify the pro-competitive effect. That is, due to the production shifting effect, the number of firms will increase in the integrated area which in turn reduces the home market shares of firms in the integrating countries.

On the other hand, the new empirical literature has also developed in industrial organization theory which tests the effects of trade on market structure and profitability. As far as import liberalization is concerned, the "import discipline hypothesis" within the context of the SCP paradigm is being tested. In other words, industrial organization theory also investigates the effect of imports on price-cost margins. Accordingly, the increase in imports as a result of trade liberalization causes a decline in the price-cost margin by reducing the market power of domestic firms via increase in competition. Similarly, since competing imports will increase, the number of substitutes available to home consumers will rise and may increase the demand elasticity and hence decrease the price-cost margins. (Katrak 1980; Cowling and Waterson 1976; Geroski and Jacquemin 1981; Jacquemin 1982; Urata 1984; Melo and Urata 1986). [2]

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[2] Under certain conditions there might be positive relation between import and price cost mark-ups. For details see Geroski and Jacquemin (1981), Urata (1984) and Markusen, Rutherford and Hunter (1995).

Studies which investigate the relationship between export increase and price cost mark-ups within the context of industrial organization theory point out that the theoretical links between them are not simple in the sense that the effect of exports on price cost mark-ups are unclear and depend on the ability of firms to price discriminate between domestic and foreign markets. If there is no price discrimination between domestic and foreign markets, there is a negative relation between exports and profitability, as in the case of import. On the contrary, in the case of discrimination there is no presumption about the direction of the change of price-cost margins that is a weighted average of the margins on domestic and export sales (Puguel 1980; Caves 1985).

2.2 Trade Liberalization and Market Structure

In addition to the import discipline hypothesis, industrial organization theory also examines the effect of import increases on market structure. However, the direction of the effect of import increases on concentration is ambiguous. One group of studies points out that the impact of imports on producer concentration is positive. One of the likely reasons of the increase in producer concentration ratio is the exit of inefficient firms as a result of import liberalization. The other possible reason is the increase in mergers of domestic firms as a result of import threats (Melo and Urata 1986). Besides if imports are close substitutes for domestic production, sectors that have high import share may be expected to be characterized by a high degree of defensive concentration (Jacquemin, Ghellinck ve Huveneers 1980). On the other hand, it is also likely that imports would reduce concentration if producers were induced to improve efficiency and in turn increase the number of efficient firms (Melo and Urata 1986).

Similarly, the effect of the increase in exports on producer concentration is also ambiguous. There is a positive relationship between export increases and concentration if an increase in exports reduces average cost because of scale economies from increased market size, and as a result producers engaged in exporting activities should be able to increase their market share. Because a larger market size resulting from export opportunities can support more producers, a negative relationship is more likely if the economies of scale in production or distribution are not significant (Melo and Urata 1986).

Paralleling these theoretical developments in the industrial organization and international trade theory, there are a number of empirical studies examining the effects of trade liberalization on the price-cost margins. The result of the studies point out that an import increase has a negative impact on the price cost mark-ups of highly concentrated industries (Jacquemin, Ghellinck ve Huveneers 1980; Caves 1985; Puguel 1980; Melo ve Urata 1986; Katics ve Petersen 1994; Krishna ve Mitra 1998). Thompson (2002) is an exception to these studies because it suggests that there is no systematic evidence of the import discipline hypothesis for the Canadian economy. As regards the pro-competitive effect of economic integration, Bottasso and Sembenelli (2001) and Siotis (2003) confirm the view that economic integration reduces the price cost mark-ups for Italy and Spain.

3. Trade Liberalization, Concentration and Profitability in Turkish Manufacturing Industry Sectors

3.1 Trade Reforms in Turkey

Before 1980 Turkey followed an import substitution development strategy for 25 years. In accordance with this strategy, during the 1960s and 1970s imports into Turkey were regulated by annual import programs and a varying mix of trade restrictions such as tariffs, tariff-like taxes and surcharges, import bans, quotas and foreign exchange controls. Due to periodic balance of payments crises, import substitution policies reached their limit at the end of 1970s and major liberalization reforms were introduced in 1980. Exports promotion and import liberalization were some the key elements of the trade liberalization reforms. The first step in the trade liberalization process was the elimination of quantitative restrictions on imports and that was followed by a major policy reforms introduced in January 1984. As a result of these policy reforms, all imports were classified into three lists: "the prohibited lists", "imports subject to permission" and "liberalized list". Trade liberalization continued with the reduction in import tariff rates in 1986 and 1988 and 1990. The customs union between Turkey and EU which came into effect on January 1, 1996 constitutes the latest step in the trade liberalization policy.

Turkey applied for associate membership with the European Economic Community (EEC) in 1959. As a result an Association Agreement was signed in 1963. According to this agreement, the association was to be implemented in three

stages: a preparatory stage, a transitional stage and a final stage. The Additional Protocol of 1970 ensured the establishment of a customs union. In accordance with the Additional protocol, in 1971 the EU abolished all the customs duties and quantitative restrictions on industrial imports from Turkey with the exception of certain sensitive products. Turkey was granted a longer time period to remove customs duties on industrial imports from the EC based on two separate lists with different time spans; the twelve-years list and twenty-two years list. Finally, the customs union between Turkey and EU came into effect on January 1, 1996 as an outcome of the above mentioned process. The Customs Union initially covers industrial and processed agricultural products. Traditional agricultural products will be included in the Customs Union (CU) only after Turkey's adaptation to the Community's Common Agricultural Policy. In this regard, Turkey eliminated the customs duties and charges having equivalent effect applied to imports of industrial products from the EU and adopted of the EU's common external tariff for imports from third countries. Turkey was also required to adopt all the preferential agreements the EU concluded by the year 2001.

Turkey's weighted average rates of protection through customs duties including the Mass Housing Fund Levy on industrial imports from the EU and EFTA countries dropped from approximately 10% to 0. For products imported from the third countries, these rates declined from approximately 16% to 4.2% in 2004. (http://www.dtm.gov.tr/ab/ingilizce/gbnot.htm).

3.2 Trade Liberalization, Concentration and Profitability: Review of Empirical Studies and Turkish Experience

Contrary to the recent empirical studies focusing on the effects of economic integration within the context of new trade and regional economic integration theories, the majority of the Turkish studies analyzing the effects of CU with EU are still based on the traditional theories. In other words, the primary focus of most of the ex post empirical studies has been to analyze the static resource allocation effects; namely trade diversion and trade creation together with the effects of CU on trade volume (Hartler and Laird 1999, Neyaptı, Taşkın and Üngör 2003).

On the other hand, there are some studies testing the import discipline hypothesis for Turkish manufacturing industry particularly with respect to trade

liberalization after 1980. The results of those studies are mixed. Katırcıoğlu (1990) concluded that trade liberalization decreased the profitability of the manufacturing industry for the period 1980-85. Similarly, Levinsohn (1993) concluded that the import discipline hypothesis held true in the years 1985 and 1986. Studies which make a distinction between the private and public sector reached the conclusion that an import increase reduced the price-cost margins in the private sector but not in the public sector (Yalçın 2000 and Foroutan 1991). On the other hand, despite these studies supporting import discipline hypothesis, there are also other studies showing the opposite result (Engin, Katırcıoğlu and Akçay 1995; Yeldan, Metin-Özcan and Voyvoda 2000; Filiztekin 2003). As far as the relationship between export and price-cost margins is concerned, Yalçın (2000) has suggested that increases in exports reduced the price-cost margins in the public sector but not in the private sector.

Although some studies investigating the effect of the increase in total import on manufacturing industry profitability exist, there is no study which specifically analyzes the effects of the customs union with the EU for the relevant time period. Besides not focusing on the right time frame for the customs union, the above mentioned studies neither take into account the effect of trade liberalization on market structure nor the import increase from the EU by itself. Therefore this study aims to analyze specifically the effects of customs union with the EU on both the concentration and profitability of the Turkish manufacturing industry sectors.

With this aim, data from 12 manufacturing industry sectors for the period 1996-2000 are evaluated. The time period considered is well suited to assess the impact of the CU on Turkish manufacturing industry sectors. The following sectors are considered:

1) Manufacture of food, beverages and tobacco 2) Textile, wearing apparel and leather industries 3) Manufacture of wood and wood products 4) Manufacture of paper and paper products, printing and publishing 5) Manufacture of chemical products 6) Manufacture of petroleum products, 7) Manufacture of rubber products 8) Manufacture of non-metallic mineral products, excluding petroleum and coal 9) Manufacture of basic metal products 10) Manufacture of fabricated metal products 11) Manufacture of machinery 12) Manufacture of transport equipment

The basic trends for import and export ratio, concentration ratio as well as price-cost margins for the above mentioned 12 sectors are given in the Table 1.

Table 1: Sectoral Developments in Import Ratio, Export Ratio, Concentration Ratio and Price Cost Mark-Ups

Percentage changes from 1994-1995 period to 1996-2000 period			
Sector number	**Import Ratio**	**Export Ratio**	**Concentration Ratio** **Price Cost mark-ups**

Sector number	Import Ratio	Export Ratio	Concentration Ratio	Price Cost mark-ups
1	-19,4117	-22,4651	0,890729	-10,6932
2	89,86653	13,32686	-14,6861	-10,5195
3	16,70977	5,725761	-9,78297	18,25547
4	34,16687	9,199511	-9,16355	-20,1633
5	33,69358	5,952994	-12,2692	-14,0034
6	66,88206	-32,675	-27,7942	-68,9308
7	10,11983	151,9842	-11,235	-14,1876
8	32,208	24,01023	8,287234	-11,4026
9	20,30539	79,58462	1,543456	-15,1032
10	3,768206	22,17493	-6,5022	-5,95501
11	26,77346	48,8029	6,117081	-12,5231
12	44,90187	26,97166	-14,5668	-10,838

Source: Data sources and construction of all the variables are given in the Appendix.

Table 1 indicates that the average import ratio calculated based on imports from EU has increased for 11 industries out of 12 for the period 1996-2000 compared to 1994-1995. Similarly, the average export ratio calculated based on export to EU has also increased for the same time period. As far as the manufacturing industry sectors' mark-ups are concerned, the last column of Table 1 shows the average price cost mark-ups of 11 sectors have reduced after the establishment of CU with EU. Table 1 also points out the fact that the average concentration ratio has decreased for 8 industries out of 12 for the period 1996-2000 compared to 1994-1995. Some of these sectors like paper and paper products, printing and publishing, chemical products, petroleum products and transport equipment had very high concentration ratios before the establishment of the CU.

Although Table 1 clearly indicates an increase in export and import shares as well as a decline in industry sectors' mark-ups and concentration ratios in the post CU period, empirical analysis is required to test whether there is a causality between trade variables, mark-ups and concentration ratios.

4. Theoretical Model and Estimation Method

In order to analyze quantitatively the effects of the custom union with EU countries on the pricing behaviour and market structure of Turkish industrial sector, the price cost margin and Herfindahl concentration ratio equations are estimated. The data set for estimation is a panel of 12 manufacturing industry sub sectors for the period 1994-2000. The panel data method of fixed effect model is preferred in both regression estimations.

Accordingly we estimate the following two recursive equations for price cost margin (PCM) and Herfindahl concentration ratio (HERF).

$$PCM = \alpha_0 + \alpha_1 HERF + \alpha_2 M + \alpha_3 X + \alpha_4 KQ \qquad .... (1)$$

$$HERF = \beta_0 + \beta_1 VA + \beta_2 M + \beta_3 X \qquad .... (2)$$

In the first equation the foreign trade variables import ratio (M) and export ratio (X) are chosen as basic explanatory variables to obtain both the effect of import and export on dependent variable price cost margin separately. The other explanatory variables, Herfindahl concentration ratio (HERF) and capital output ratio (KQ), represent control variables.

In the case of market discipline effects of foreign trade, the expected sign of foreign trade variables import (M) and export (X) ratios are negative on industrial profitability. Therefore the expected sign of coefficient of the explanatory variables import (M) and export (X) ratios are negative in the first equation estimation. The likely effect of the Herfindahl concentration ratio (HERF) parameter is positive in the estimation result of the first equation. It is hypothesized that an increasing/decreasing concentration ratio in any industry may cause an increase/ decrease in profitability or price cost margin of an industry. The higher the concentration ratio in any industry the lower will be the threat of competition. As a result, a rising concentration ratio may lead to higher price cost margins. For the parameter of the other explanatory variable capital output ratio (KQ), we expect a positive sign. In general, capital output ratio represents return of capital. Therefore it can be proxy for the cost of capital. In the price cost margin calculations, the cost of capital can't be directly included because of the calculation problems involved. In this study, as with the previous studies of Katrak (1980), De Melo and Urata (1986) and Günalp (1997), capital output ratio

(KQ) is considered as an explanatory variable in the PCM equation estimation, instead of using it as a cost component in the price cost margin calculations. Because it is a negative component in the calculations of right hand side variable PCM, the expected sign for the parameter of KQ is positive as a left hand side explanatory variable in the first equation estimations.

The second estimation equation is Herfindahl concentration ratio (HERF) equation. The dependent variable HERF is chosen as a representative of the market structure of industrial sector. The main explanatory variables are again trade variables namely export and import ratios. For the second equation estimation the control variable is the amount of value added of the industry (VA).

Given that there is no theoretical consensus on the effect of foreign trade on the market structure of any industry, the sign for the parameter of the trade variables in the Herfindahl concentration ratio equation estimation is ambiguous. In other words, a negative or positive sign for parameter of import and export ratio variables can be theoretically justified in the concentration ratio equation. The expected sign for the parameter of explanatory variable value added (VA) is negative in the Herfindahl concentration ratio equation. Industrial value added is chosen as a proxy for the market size of the industry. It is assumed that the bigger is the market size the higher will be the value added of industry. When the market size becomes large, the increase in the number of efficient firms turns out be possible for the industry. Therefore, theoretically there is a negative relation between the value added of the industry and concentration ratio of the   industry.

In the estimation process, the fixed effect specification of the panel data is mainly used for both equations. Fixed effect specification is preferred so as to account for time-invariant unobservable heterogeneity among industries which is potentially correlated with the dependent variable. In so doing we also get rid of omitted-variable problems in the regressions capturing idiosyncratic factors that might have affected the market structure and pricing behaviour of industrial sectors.

 As we mentioned before, the analysis period is 1994-2000. In order to gauge the effect of the customs union on the Turkish economy that estimation period is preferred in light of the fact that CU was established 1996. Twelve cross section units of estimation data is obtained by aggregating manufacturing industry sub sectors in twelve sectors given above.

4.1 Results of Price Cost Margin Equation Estimate

Table 2 gives the fixed effect estimation results of the Price Cost Margin equation.[3] According to estimation results all of the explanatory variables are statistically significant. This means that concentration ratio, import and export ratio and capital output ratio do all affect the pricing behaviour of Turkish manufacturing industry.

As expected, estimation results show that import ratio variable parameter has a negative sign. That indicates negative correlation between the import variable and price cost margin variable. Therefore we can claim that the increasing import volume with EU countries, for the years in which the custom union has been in force, creates a diminishing effect on the price cost margin of Turkish manufacturing industry. In this context, estimation outcomes support the argument that, the custom union with the EU generated an increase in competitiveness of the Turkish manufacturing sector as a result of an increase in import. The estimator for the parameter of the export ratio also has a negative sign indicating a negative relation between price cost margin and export volume for the Turkish manufacturing industry. That also supports to the idea that increasing exports to EU countries creates a pro-competitive effect on the Turkish manufacturing industry.

According to the price cost margin equation estimate, the parameter of Herfindahl concentration ratio has a positive sign. This positive sign is theoretically expected. If the concentration ratio is considered as proxy for competitiveness of any industry, in other words if the rising concentration ratio means decreasing competitiveness, the positive relation between the concentration ratio and price cost margin becomes clear. Therefore, the positive parameter of the Herfindahl concentration ratio can be interpreted as a rising concentration ratio which then gives impetus for higher price cost margins in the Turkish manufacturing industry.

In addition, the first equation estimation results show that the parameter estimate of the capital output ratio has, as expected, a positive sign. The AR(1) term is also included in the equation estimation because of the detected autocorrelation problem during the estimation process. The autocorrelation problem vanished due to the AR(1) term.

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[3] Before fixed effect model estimation, to test the behavioural difference among sectors F test is implemented. F test results supported sectoral differences. Accordingly fixed effect model estimation realized by assuming time invariant differences among cross section units in terms of intercept .

Table 2: Results of Price Cost Margin Equation Estimation[*]

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M	-0.035465	0.015443	-2.296	0.0243
X	-0.073913	0.012185	-6.066063	0.0000
HERF	0.112942	0.018705	6.038090	0.0000
KQ	0.090343	0.024162	3.739048	0.0003
AR(1)	0.238780	0.085988	2.806287	0.0063
Adjusted R^2	0.991765	*Mean dependent var*		208.1638
S.E of regression	15.50755	*S.D. dependent var*		170.8925
F-statistic	2141.800	*Sum squared resid*		13226.62
Prob(F-statistic)	0.000000	*Durbin-Watson stat*		2.075760

* Estimation method is GLS(cross section weights); standard errors and t-statistics of coefficients are computed using White's heteroscedasticity consistent variance-covariance estimator. Industry specific fixed effects (constant terms) are not reported.

To sum up, the results are consistent with the theoretical expectations and point out the beneficial effects of custom union and increasing trade volume with EU countries. They suggest that an increase in trade volume with EU countries during the custom union period creates efficiency and thereby welfare by depressing the price cost margins in Turkish manufacturing industries.

In addition to examining quantitatively the relation between trade with EU countries and price cost margin of Turkish manufacturing industry for the custom union period, we also looked to elucidate the effects of trade with EU countries on the market structure of Turkish manufacturing industry. For this purpose the Herfindahl concentration ratio equation is estimated for Turkish manufacturing industries for the 1994-2000 period.

4.2 Results of Concentration Ratio Equation Estimate

Table 3 gives the fixed effects estimation results of the Herfindahl concentration ratio equation.[4] According to estimation results the only statistically significant explanatory

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[4] Before fixed effect model estimation, to test the behavioural difference among sectors F test is implemented. F test results supported sectoral differences. Accordingly fixed effect model estimation realized by assuming time invariant differences among cross section units in terms of intercept

variable is the import ratio variable. Therefore in this equation, the import variable is the only variable among the other explanatory variables which has effect on the concentration ratio. The relation between the value added of industry and concentration ratio of industry is considerably weak and significant only to the 16.5 percentage level. Estimation results also show no correlation between the export variable and the concentration ratio for the Turkish manufacturing industry. In spite of the insignificance of the two explanatory variable in estimation results of concentration ratio equation, the explanatory power of the estimation is considerably high (R^2=0.91). This result confirms that most of the concentration ratio variation is due to time invariant industry specific effects that are captured by fixed effect terms.

Estimation results also show that the parameter estimate of the only significant variable import ratio has a negative sign. It indicates that there is an inverse relation between the import ratio and the concentration ratio for the Turkish manufacturing industry during the period including the custom union era. Why, we may ask, should a higher volume of import be linked with a lower concentration ratio? If rising import volume causes efficiency and falling costs in the production process, the number of firms may rise and the concentration ratio may fall in the industry. This might be the case for Turkish manufacturing industry.

Although the significance of the value added variable is considerably weak in the estimation results of the Herfindahl concentration ratio equation, the parameter estimate of value added has, as theoretically expected, a negative sign. This implies lowering the effects of rising market shares and rising value addeds on the concentration ratio of manufacturing industry. The export variable is a statistically insignificant variable in Herfindahl concentration ratio equation and has a positive sign. This positive relation might be the result of falling average costs and rising market shares of exporting firms because of scale economies.

Table 3: Results of Concentration Ratio Equation Estimation[*]

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M	-0.112540	0.031737	-3.545993	0.0006
X	0.008856	0.010396	0.851849	0.3965
VA	-0.01711	0.012232	-1.399557	0.1650
Adjusted R^2	0.913224	*Mean dependent var*		114.1237
S.E of regression	13.07879	*S.D. dependent var*		44.39843
F-statistic	443.7424	*Sum squared resid*		11802.78
Prob(F-statistic)	0.000000	*Durbin-Watson stat*		1.997053

* Estimation method is GLS(cross section weights); standard errors and t-statistics of coefficients are computed using White's heteroscedasticity consistent variance-covariance estimator. Industry specific fixed effects (constant terms) are not reported.

In sum, not all the results of the concentration ratio equation are consistent with expectations either in terms of sign or statistical significance. Surprisingly only the import variable and unobserved time invariant industry specific factors have explanatory power when it comes to accounting for variations in Herfindahl concentration ratio of Turkish manufacturing sector for the period 1994-2000. The import variable has negative signed parameter estimates, in contrast to the genera expectations. However, this result further reinforces the view that rising import volume from EU countries causes a change in market structure of Turkish Manufacturing industry in favour of competition.

5. Conclusion

One of the main hypotheses of new trade theories and industrial organization theories concerns the competitive effects of trade liberalization on the market structure and pricing behaviour of industries. Under the conditions of imperfect competition, the higher the volume of trade the lower will be price cost margins and market power of industries. Therefore trade liberalization will cause production and welfare gains. This literature on trade liberalization brings forward debates about the impacts of custom union and increasing trade volume on the market structure and price cost margins of industries.

When we examine the related indicators of Turkish economy after the establishment of custom union namely between 1996 and 2000, it is observed that volume of the manufacturing industry trade with EU countries increased on average. Moreover, the sectoral price cost margins and concentration ratios of manufacturing industry declined on average for the same period. This paper attempts to examine the existence of causal relationship between rising trade volume with EU countries and falling price cost margins and concentration ratios of manufacturing industry sectors. For this purpose the price cost margin and concentration ratio equations were using trade ratios with EU countries as explanatory variables.

The estimation results presented in this paper indicate the pro-competitive effect of rising trade volume with EU countries. Price cost margin equation estimates show an inverse relation between import ratio and margins. That implies that increasing imports with EU countries after the establishment of custom union created competitive effects and caused a fall in price cost margins of the manufacturing industry. Estimation results also indicate the negative impact of the export variable on mark ups for the manufacturing industry. This negative relation supports the argument that increasing trade and thereby exports with EU countries forced manufacturing industry firms to adhere to lower price cost margins. In sum, it can be maintained that the establishment of the custom union and the increase in trade volume with EU countries appears to have increased competitive pressure which led to falling price cost margins in the Turkish manufacturing industry.

For the Turkish manufacturing industry, the pro-competitive impacts of liberalizing trade after the establishment of custom union is also evidenced with the

estimation results for the concentration ratio equation. A negative strong correlation is found between import variable and the Herfindahl concentration ratio. That suggests that increasing imports from EU countries reduced the sectoral concentration ratio and thereby sectoral market power in Turkish manufacturing industry. According to estimation results it seems that there is no relation between the export variable and the concentration ratio for the manufacturing industry. Moreover, the concentration ratio equation estimate points out the fact that unobserved time invariant sector specific factors are also responsible for the variations in sectoral concentration ratios.

Overall, according to estimation results, it can be argued that increasing trade volume with EU countries during the custom union period created beneficial effects on Turkish economy especially by means of increasing competitive pressure for falling mark-ups and market power. Hence, it is clear that there are welfare impacts as a result of such changes in the pricing behaviour and market structure of the Turkish manufacturing industry.

Appendix: Data Sources and Definition of Variables

Capital-Output Ratio (KQ): One of the difficulties relating to the data set of this study was to obtain data for sectoral capital stock of manufacturing industry. The unique study on this subject belongs to Maraşlıoğlu and Tıktık (1991). They calculated sectoral capital stock for the period 1968-1998.   Given that our study period is 1994-2000 we could not use Maraşlıoğlu and Tıktık's data directly. Therefore we estimated sectoral capital stock for the period 1994-2000. Estimation is based on Maraşlıoğlu and Tıktık's (1991) and Griches' (1980) method. The following equation is used for estimating sectoral capital stock:

$$K_{i,t} = (1-\delta)K_{i,t-1} + I_{i,t} \quad .... (1) \qquad t=1994\text{-}2000$$
$$i=1\text{-}12 \quad \text{sectors}$$

1) Manufacture of food, beverages and tobacco 2) Textile, wearing apparel and leather industries 3) Manufacture of wood and wood products 4) Manufacture of paper and paper products, printing and publishing 5) Manufacture of chemical products 6) Manufacture of petroleum products, 7) Manufacture of rubber products 8) Manufacture of non-metallic mineral products, excluding petroleum and coal 9) Manufacture of basic metal products 10) Manufacture of fabricated metal products 11) Manufacture of machinery 12) Manufacture of transport equipment

$K_{i,t}$: capital stock for i^{th} sector and t^{th} year

$I_{i,t}$: investment for i^{th} sector and t^{th} year

δ: yearly depreciation rate

By using equation (1) and capital stock calculations of Maraşlıoğlu and Tıktık (1991), capital stocks for the period 1994-2000 were calculated. As for Maraşlıoğlu and Tıktık (1991), the assumed depreciation rate is 0.0563.

Yearly investment data obtained from various issues of UNIDO Industrial statistics.

Sectoral output data obtained from SIS (State Institute of Statistics) with ISIC 2 classification.

Capital output ratio was obtained by using sectoral capital stock and output.

Value Added (VA): Sectoral value added data was obtained from SIS (State Institute of Statistics) with ISIC 2 classification. This data aggregated according to the

classification of our model. Value added data deflated with sectoral WPI (whole sale price index)

Import and Export Ratio (M, X): Import ratio variable is calculated using the equation "import/ [output- export+import]"; export ratio variable calculated using the equation "export/output". Data of import from and export to EU countries obtained from the Undersecretariat of Turkish Foreign Trade with ISIC 3 classifications. This data was aggregated according to the classification of our model.

Concentration Ratio (HERF): Data of concentration ratio variable used in the model is the Herfindahl concentration ratio data obtained from SIS (State Institute of Statistics) with ISIC 2 classification. This data aggregated was according to the classification of our model.

Price-Cost Margin (PCM): Price-cost margin variable was calculated with the equation "PCM = (VA-W)/ Q". VA: sectoral value added, W: sectoral total wage payments, Q: sectoral output. Sources of "VA" and "Q" explained above. "W" data obtained from SIS (State Institute of Statistics) with ISIC 2 classification. This data was aggregated according to the classification of our model.

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