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DIRECTORATE FOR FINANCIAL AND ENTERPRISE AFFAIRS
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Working Party No. 3 on Co-operation and Enforcement

ECONOMIC EVIDENCE IN MERGER ANALYSIS

-- Turkey --

15 February 2011

The attached document is submitted to Working Party No. 3 of the Competition Committee FOR DISCUSSION under item III of the agenda at its forthcoming meeting on 15 February 2011.

Please contact Mr. Antonio Capobianco if you have any questions regarding this document [phone number: +33 1 45 24 98 08 -- E-mail address: antonio.capobianco@oecd.org].

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1.   Introduction

1.   Turkey's current merger control policy is based on the criterion of creation or strengthening of dominant position in a particular relevant market. According to the Act no 4054 on the Protection of Competition (Competition Act) mergers, that would result in significant lessening of competition in a market for goods or services within the whole or a part of the country with a view to creating a dominant position or strengthening a dominant position, are illegal and prohibited. The draft law, which is currently in the Parliament, to amend the Competition Act is expected to widen the scope of the criterion for merger control in parallel with the developments in the competition policy of EU. The draft law does not exclude the dominance criterion but additionally empowers the Competition Board, the decision making body of the Turkish Competition Authority (TCA), to prohibit mergers that lessen competition significantly without making the creation and/or strengthening of dominance a necessary condition for prohibition.

2.   In this respect, currently economic analysis of mergers is based on the structural approach which depends on the definition of the relevant market and the assessment of the structural parameters such as market shares, level of concentration, entry conditions and degree of vertical integration. As a natural consequence of the structural approach adopted by TCA, the quantitative evidence that has used so far in merger analysis was related to the relevant market delineation and the price-concentration analysis.

3.   The number of cases in which the quantitative evidence has been used is far less than those in which qualitative evidence has played a decisive role.

4.   TCA does not have any document that describes the best practices in the economic analysis of mergers except the *Guidelines on the Definition of Relevant Market (Guidelines),* adopted in 2008, which set the principles that TCA and the relevant parties should follow in defining the relevant market. The *Guidelines* are generally in line with the guidance in the EU described in *Notice on the Definition of Relevant Market[1]* and emphasize the importance of considering the notions of demand and supply substitution among products and regions in defining relevant markets.

5.   In almost every horizontal merger case, the TCA uses concentration measures like CR4 (concentration ratio four) and HHI (Herfindahl-Hirschman Index) which are calculated following the relevant market definition. The HHI levels and the change in HHI are evaluated by making reference to the thresholds indicated in the *US Horizontal Merger Guidelines[2]* or EU's *Guidelines on the assessment of horizontal mergers[3]*.

6.   The quantitative techniques, which are used in the merger cases of the TCA to define the relevant markets, are price correlation, shipment test (Elzinga-Hogarty test) and hypothetical monopolist test (SSNIP). In the assessment stage, only in one particular case, a price-concentration and diversion ratio analyses have been used. The summary of these analyses is given below.

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[1]   Commission Notice on the definition of relevant market for the purposes of Community competition law, OJ C 372 , 09/12/1997 P. 5 – 13.

[2]   Horizontal Merger Guidelines, issued on 9th of August, 2010.

[3]   Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings, OJ C 31, 5.2.2004, p. 5–18.

2. Examples of Economic Evidence used in Merger Cases

2.1 Price Correlation

7. The price correlation method was used in defining the relevant market in *Cadbury Schweppes/Intergum[4]* merger case. The weak correlation between prices of different types of chewing gums was considered as supportive evidence to the qualitative assessment about the relevant market definition discussed in the case. As a result, it was decided that the product types like "chewing gum with sugar", "sugar-free chewing gum" and "chewing gum with sweetener" are in different relevant product markets.

2.2 Elzinga-Hogarty Test

8. The Elzinga-Hogarty test was used by the TCA in 11 horizontal merger cases so far. Ten of those cases were about mergers in the cement industry.[5] The remaining one concerned the durable consumer goods markets.[6]

9. The Elzinga-Hogarty test assesses whether significant product flows are present between two regions. In particular, the Elzinga-Hogarty test states that a certain region can constitute a distinct geographic market if a significant proportion of the consumption in that region is provided locally and a significant proportion of the production in that region is consumed locally. TCA generally used 80% as the threshold for what constitutes "the significant proportion". In practice, LIFO (little in from outside) and LOFI (little out from inside) values are calculated for evaluating the importance of the product flows between regions. These measures are calculated as follows: $LIFO = 1 - \dfrac{C}{M}$ and $LOFI = 1 - \dfrac{X}{P}$, where C, M, X and P stand for consumption, import, export and production levels for the candidate regions. Regions whose LIFO and LOFI values are higher than 80% are considered as distinct geographic markets.

10. In implementing the Elzinga-Hogarty test, the TCA started from the city where the target firm is located as the initial region to be tested. Other cities are added to that city if either of LIFO or LOFI values is below 80%.

11. The TCA has not been clear in its decisions about the rule in choosing the city to be added to the candidate region if a larger region is indicated by the Elzinga-Hogarty test. Among the cement cases, in one case[7], the city which is the largest importer for the candidate region was chosen as the next city to be added, whereas in other cases the choice criterion is not explicitly expressed.

12. Although in most of the cases the geographic market was defined exactly as the result of the Elzinga-Hogarty test indicated, in one particular case[8] an additional city has been added to the geographic market that was suggested by the Elzinga-Hogarty test by taking into account other demand and supply

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[4]   Decision of the Competition Board on the case is dated 23.8.2007 and numbered 07-67/836-314.

[5]   Dates and numbers of the decisions of the Competition Board on the relevant cases are as follows:

06.12.2007, 07-89/1130-441; 22.03.2007, 07-27/252-87; 28.04.2006, 06-31/379-96; 20.12.2005, 05-86/1190-342; 20.12.2005, 05-86/1192-344; 20.12.2005, 05-86/1194-346; 20.12.2005, 05-86/1189-341; 20.12.2005, 05-86/1188-340; 20.12.2005, 05-86/1187-339; 20.12.2005, 05-86/1191-343.

[6]   The decision of the Competition Board on the case is dated 28.05.2002 and numbered 02-32/367-153.

[7]   The decision of the Competition Board on the case is dated 06.12.2007 and numbered 07-89/1130-441.

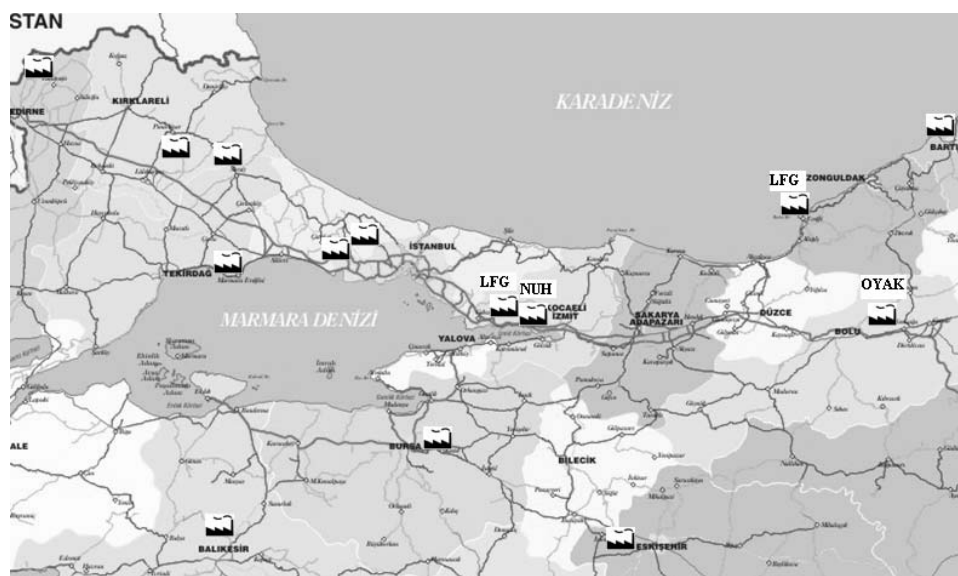[8]   The decision of the Competition Board on the case is dated 20.12.2005 and numbered 05-86/1187-339.

conditions related to the case. In that case, it was considered that the distance between the target firm and the additional city, which the Elzinga-Hogarty test did not include in the market, was approximately same as the distance between the target firm and other cities. Therefore, target firm has had similar transportation cost for that city compared to the other cities indicated by the Elzinga-Hogarty test. In addition, it was argued that firms located in that city were able to sell their products to the same regions that the target firm was selling.

2.3 *Small but Significant Non-transitory Increase in Prices (SSNIP)*

13.   The TCA has used the SSNIP test for defining the geographic market in another horizontal merger[9] in the cement industry. The SSNIP test seeks to find the smallest market within which a 'hypothetical monopolist' can raise the price of a product by 5%-10% for at least one year without customers switching to substitutes (i.e. the product market) or without customers switching to similar products in a different location.

14.   In this case, *Oyak Çimento,* a cement producer located in city *Bolu* aimed to acquire two plants of its rival undertaking *Lafarge.* One of target plants is situated in city *Izmit* which is 151 km to the east of *Bolu*. In *Izmit*, there is also an independent and powerful cement producer, *Nuh Çimento*. Between *Bolu* and *Izmit*, there exist two other cities in which there is not any cement producer. The other plant of Lafarge is located in *Ereğli* which is 159 km to the northwest of *Bolu* and is a part of city *Zonguldak*. These plants are shown in the map below.

Map: Cement plants and their locations

15.   As a prior step to implement the SSNIP test, the own and cross demand elasticities of the products of these producers have been estimated econometrically. Then, the hypothetical monopolist test has been implemented separately for three regions using the estimated demand elasticities and predicted average costs of the plants.

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9   The decision of the Competition Board on the case is dated 18.11.2009 and numbered 09-56/1338-341.

16.   The nested logit demand model proposed by Steven Berry (1994)[10] has been used to estimate the demand elasticities. In this model, the bulk cement products are grouped into three nests according to their degrees of strength. In this approach, cement products are assumed to be differentiated by their degrees of strength. On the other hand, products having a particular degree of strength are assumed to be homogenous. Therefore, for every plant, different items having a particular strength degree have been considered as a distinct "product". As a technical requirement of the nested logit model, a separate category of "other goods" has been defined as the "packaged cement". Data on other cement producers located in cities around the merging plants are also included in the model.

17.   Using data for every city/month pair, the relative market share of a particular "product" of a plant to the market share of "other goods" is regressed to the average price of this particular product and to the market share of that product in the nest to which it belongs. In addition to these explanatory variables; the plant, city and month fixed effects, the distance between the plant and the city marketed and its square are also included as regressors. Cost of labor and energy and two-period lagged prices were used as instrumental variables in order to overcome the endogeneity problem that might be caused by correlation between price and unobserved demand shocks. The Sargan test showed that the instruments were valid. The demand elasticities of every product of a particular plant at each city/month pair have been calculated using data on market shares, prices and the coefficients estimated in the nested logit model.

18.   After this step the following method has been followed for implementing the SSNIP test. An initial region that will be subject to SSNIP test has been chosen for each of the three merging plants. Since the acquirer *OYAK Çimento*'s plant is located in *Bolu*, the initial region included *Bolu* and the city situated immediately to the west of it, *Düzce*, where there does not exist a cement producer. Similarly, for Lafarge plant, which is located in city *Izmit*, the cities *Izmit* and *Sakarya* (the city located immediately to east of Izmit) are included in the initial region to be tested. Therefore, the two cities which are located between the merging plants without having any cement producers in their own territory, namely cities *Düzce* and *Sakarya*, have been considered in the hinterland of one or the other of the merging plants. The initial region for the third merging plant located in *Ereğli* is chosen as the whole city of *Zonguldak* which also includes *Ereğli*. Then, profits of the hypothetical monopolists operating in those initial regions were calculated before and after 10% price increase. In calculating these profits, the plants located in the same initial region were assumed to be belonging to the same hypothetical monopolist. In addition, the average variable costs of the hypothetical monopolists were assumed to be constant before and after the SSNIP. The price increases were applied to all products that the hypothetical monopolists produce. Therefore, in calculating the effect of price increase, in addition to the own-price elasticity, the cross-price elasticities of demand within nest and between nests are also taken into account. Finally, the SSNIP for every three hypothetical monopolist resulted in increase in profits. This result suggested that the initial regions described above constitute relevant geographic markets for every three merging plant.

19.   The quantitative evidence for this merger case stopped at this stage and the quantitative assessment has been done conventionally depending on parameters of market structures such as market shares, number of undertakings, HHI levels, entry and demand conditions. The merger was allowed along with a divestiture commitment which excludes the plant of Lafarge in *Ereğli* from the scope of the transaction.

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[10]   Berry, S.T., 1994, Estimating Discrete-Choice Models of Product Differentiation, *RAND Journal of Economics*, vol. 25(2), Summer, 242-262.
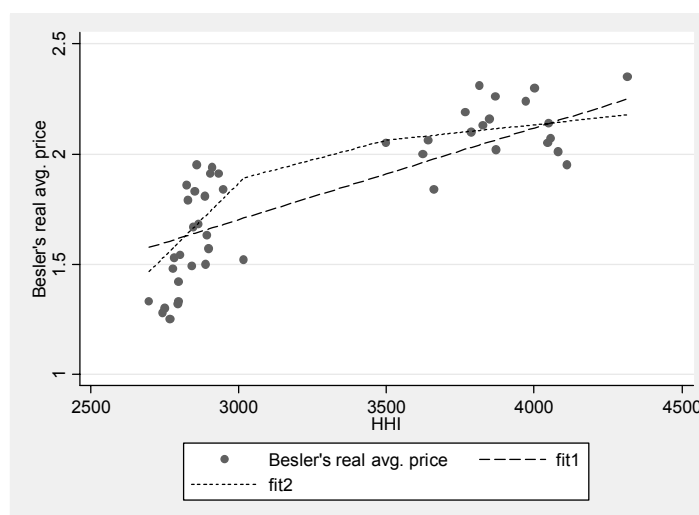
2.4   Price-Concentration Analysis

20.   A price-concentration analysis has been conducted in assessing the effects of a horizontal merger in industrial margarine market, namely *Besler/Turyağ* merger.[11] Prior to the merger, there were three major players in the market: *Besler* and its subsidiary *Marsan* with a total market share above 50%, *Unilever* with a market share close to 30% and *Turyağ* with market share above 13%. The latter was a joint venture controlled by *Besler* and *Uğur* family and *Çallı* family, each having 33% of equities. *Besler*, wanted to increase his equities from 33% to 49% in *Turyağ* by acquiring some of the shares of *Çallı* family. On the other hand, a member of *Uğur* family was holding 10% equities of *Besler* and was a member of board of directors in *Besler*.

21.   The TCA considered that HHI will increase from 3864 to 5220 after the transaction. In order to see the effects of the increase in HHI to prices, the deflated average price of *Besler* has been regressed on the HHI level and the deflated average variable cost of *Besler* using monthly data over 45 periods between January 2006 and September 2009. Using the estimates of this regression, it has been predicted that the change in HHI will increase the price of *Besler* by 22%. However, the economists of the parties objected to this analysis by arguing that the regression model has not taken into account a structural break that took place nearly 1,5 years ago in the market. The TCA first investigated the possible reason of the structural break and it concluded that a previous horizontal merger between *Marsan* and *Gıdasa* in March 2008 increased prices and HHI significantly. The TCA revised the regression by taking into account this structural break by including dummy variables both for the intercept and for the slope term of the HHI. According to the estimates of the revised regression, it has been seen that any increase in HHI beyond 3864 will not have a significant effect on price statistically. This interesting result has been interpreted by some of the TCA's professional staff as the result of a situation where a monopoly power has already emerged in the market because of the merger in March 2008. According to this view, a monopoly power that emerged at that time has increased prices to its maximum and there is no place for prices to rise further. This hypothesis could not be tested during the investigation of the merger at hand but has left as a research topic to the Directorate of Economic Research which is still in progress.

22.   The graph below shows data, the fitted lines and the structural break in data.

Graph: Regression lines and data in Besler/Turyağ merger

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[11]   The decision of the Competition Board on the case is dated 12.10.2010 and numbered 10-64/1355-498.

2.5   Diversion Ratio Analysis

23.   In addition to the regression analysis done in *Besler*/*Turyağ* merger described above, the TCA also conducted a Diversion Ratio Analysis to predict the possible price increase after this merger. The diversion ratio between *Besler* and *Turyağ* was calculated by the formula $d_{BT} = \dfrac{s_T}{1-s_B}$, where s_T and s_B represent market shares of *Besler* and *Turyağ* respectively. Then, using the price-cost margins of firms and the formulas provided by Shapiro[12] the price effects of the merger were calculated as 3.86% if the demand curve is assumed to be linear and 11.3% if the demand curve is assumed to have constant elasticity. Parties objected to this analysis by arguing that TCA calculated the price effects without showing any evidence on the shape of the demand curve.

3.   Data Collection

24.   All of the data used in those analyses have been collected from the parties involved in merger and the third parties. In general, data requests are fulfilled timely, however, it is observed that data are sent in different formats and it takes time to reorganize them to be used in the analysis.

4.   Capacity

25.   The quantitative analysis that has been introduced in merger cases so far has been conducted by the professional staff of the TCA working in case teams and no outside economists have been commissioned although there is no legal or financial barrier for outsourcing. As to the steps undertaken to improve the TCA's general economic expertise, approximately 20 of the professional staff have been financed by the TCA for their master studies in economics in universities in Europe and the USA. Nearly ten of them are following a PhD program in economics in Turkish universities along with their professional work load. Two of the professional staff of the TCA have already obtained their PhD degrees in 2010 in economics. In addition to the capacity of economic analysis to be carried out by the professional staff in case teams, the Department of Research is under a process of restructuring since October 2010 in order to give support to case teams. In this process, a new head of department was appointed. Along with him, one of the senior professional staff having PhD degree was appointed as the head of the Directorate of Economic Research, which is organized under the Department of Research. Two economists of the Directorate are currently enrolled in MSc programs in Europe. In addition to them, there is one MSc economist and three statisticians in the Directorate. A draft notice describing the procedure how the economic support to be given by the Directorate will be integrated into the analyses of case teams and the decision making process has been prepared and is currently under review. According to the draft notice, the Directorate is expected to prepare an independent opinion related to the case for which a support is asked by the case team. The opinion will be distributed to the case team and also to the Competition Board to be taken into account in the decision making process.

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[12]   Shapiro, C. 1996, Mergers with Differentiated Products, *Antitrust*, Spring, p.26.