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CARTEL SCREENING IN PUBLIC TENDERS OF ROADWAY GUARDRAIL

Assoc. Prof. Aydın ÇELEN *

ABSTRACT

The Competition Board has opened an investigation with the decision of 27.04.2017 on the seven guardrail producers and their association (TOD). The Board has alleged that these producers restricted the competition in the guardrail tenders by determining jointly their bids (price quotations) in these tenders under TOD. In this article, it was analyzed whether a competition infringement occurred or not by using a wide range of data on guardrail tenders. The results showed that the ratios between price quotations of producers and the approximate costs announced by the Administration (bid / approximate cost) have increased in 2016 as claimed by the Board. However, this increase did not arise from the fact that TOD members who are parties to the investigation are in a cooperation restricting the competition. Instead, the reason for this increase is that the actual costs incurred by the producers increased while the approximate costs announced by the Administration in 2016 fell.

Key Words: *Guardrail, Competition, Public Tender, General Directorate of Highways.*

JEL Classification: *L13, L40, D43*

OTOKORKULUK İHALELERİNDE KARTEL TARAMASI

ÖZ

Rekabet Kurulu 27.04.2017 tarihli kararında yedi otokorkuluk üreticisine ve bu üreticilerin kurmuş olduğu sektör derneğine (TOD) soruşturma başlatmıştır. Kurul, bu üreticilerin otokorkuluk ihalelerinde verdikleri fiyatları TOD çatısı altında birlikte belirlemek suretiyle aralarındaki rekabeti kısıtladıklarını iddia etmiştir. Bu makalede, otokorkuluk ihalelerine ilişkin geniş bir veriseti kullanılarak rekabet ihlalinin oluşup oluşmadığı analiz edilecektir. Sonuçlar, Kurul tarafından iddia edildiği gibi fiyat teklifleri ile İdare tarafından açıklanan yaklaşık maliyetlerin oranlanmasından oluşan teklif oranlarının (teklif/yaklaşık maliyet) 2016 yılında arttığını göstermektedir. Ancak, bu artış soruşturmaya taraf olan teşebbüslerin rekabeti kısıtlamalarından kaynaklanmamaktadır. Artışın nedeni, 2016 yılında bir yandan üreticilerin katlandıkları maliyetler artarken diğer yandan İdare'nin yaklaşık maliyeti düşürmesidir.

Anahtar Kelimeler: *Otokorkuluk, Rekabet, Kamu İhalesi, Karayolları Genel Müdürlüğü.*

* Istanbul Commerce University, Faculty of Business, Department of Economics, e-mail: acelen@ticaret.edu.tr

JEL Sınıflandırması: *L13, L40, D43*

1. INTRODUCTION

The Competition Board has initiated an inquiry into the seven guardrail producers (Alka, Çepaş, Kıraç, Kisan, Şa-Ra, Yimtaş and Antakya Galvaniz) and their sectoral association named Steel Guardrail and Road Restraint Systems Organization (TOD), with a decision taken on 27.04.2017. The Board's claim is that these producers attempt to determine their bids (price quotations) at the guardrail tenders under the TOD, thereby restricting the competition in the tenders.

Guardrails have been mostly bought by the public institutions, especially General Directorate of Highways via tenders (auctions). The Competition Board examined and compared the bids submitted by the guardrails producers in the tenders and the approximate costs announced by the relevant institution. Using these two values, it created a ratio "bid / approximate cost" for each bid submitted. Then it detected that "bid / approximate cost" ratios are 64% and 68% in the years 2014 and 2015 respectively, but it jumped to above 90% in 2016. This increase in the ratio has been used as the only evidence to support the claim of competition infringement.

In this article, the guardrails tenders opened by public institutions between 2014 and 2017 will be examined. The aim is to determine whether changes in the rates of "bid / approximate cost" occurred in these tenders could indicate a breach of competition rules as alleged.

The structure of the study is as follows: In Section 2, the information regarding the competition law applications in Turkey will be presented. Section 3 explains the roadway guardrails sector while sections 4 present the methodology applied and data used. Section 5 will be devoted for the application of the methodology. And finally, we conclude the study in Section 6.

2. COMPETITION LAW IN TURKEY

In the market economy, all players behave self-interestedly: Individuals act to maximize their benefits while undertakings aim to maximize their profits. However, consequently all these self-centered motivations of the players in the pursuit of their own interests help to maximize social welfare. The basis of a market economy is obviously free competition. Competition may be defined as the rivalry between agents in a market to obtain more customers, thus increasing their sales of goods and services, and therefore, their profits. The competition protects the independence of the decisions of agents, while also warranting social justice, economic efficiency and technological development (TCA, 2018a).

However, the rivals generally tempt to prevent competition by entering collaborations with negative effects on social welfare and economic development, or by using their economic power by abusive or exclusionary practices. For this reason, the markets cannot be left unattended, and thus the government involvement is inescapable. The governments may eliminate the abovementioned risk of

prevention of competition by supporting the economic system. Its most efficient way is to adopt a competition law and to found an authority to apply that law.

Differently from most of the other countries, Turkish Constitution has provisions related with the preservation of competition in markets: Article 167 of the Turkish Constitution gives a specific obligation to state in order to take "measures to ensure and promote the sound, orderly functioning of the money, credit, capital, goods and services markets" and to prevent "the formation, in practice or by agreement, of monopolies and cartels in the markets". To fulfill this responsibility, the Competition Act numbered 4054 was adopted and put into effect in 1994.

The Competition Act has mainly three different provisions to prevent competition: Firstly, it forbids the agreements (cartels) distorting the competition. Secondly, the Act prohibits the abuse of dominant position by a firm which has market power. And lastly, it monitors and controls merger and acquisition transactions to prevent the creation or strengthening of the dominant positions. With the enforcement of the Competition Act in 1994, Competition Authority was established to prevent practices of undertakings which distort efficient competitive conditions. To protect competition, the Competition Authority has been equipped with the right to penalize undertakings which prevent competition in the market, through investigation procedures like dawn raids.

Competition Authority finalized a total of 320 cases during the year of 2017, while the total amount of administrative fine for the infringements amounted to 206.5 million Turkish liras approximately. As for the year of 2016, the corresponding figures were 324 and 133.7 million Turkish liras respectively (TCA, 2018b). In 2017, the Competition Authority initiated 26 different investigations since either the claims put forward in the applications or its findings during the preliminary inquiries are serious enough. One of these investigations was on the motorway guardrail producers.

3. ROADWAY GUARDRAILS MARKET

Traffic accidents are important problems of the most counties over the world. Because of traffic accidents, each year almost 1.2 million people die and between 20 and 50 million people are injured worldwide (WHO, 2004). Turkey, like other countries suffers from traffic accidents. During the year 2016 in Turkey, in the wake of 185,128 traffic accidents, 3,493 persons died at accident scene and 3,807 persons who got injured at the accident and were sent to hospitals died too within the 30 days after the accident due to impacts of the accidents (Turkstat, 2018).

Governments all over the world try to take some measures to stop the traffic accidents. The counter-measures may take the form of accident deterrence and mitigation programs that involve the analysis of roadside features or of severe investments to increase the quality of the road infrastructures. Roadside features contribute to undesirable crash outcomes, particularly the severe injuries and frequent

deaths that result from collisions between opposite-direction vehicles. One of the preventive measures for head-on crashes and rollovers is to divide roads with barriers like guardrails (Zou et al., 2014).

In using the guardrails on the roadsides, the first aim is to reduce the severity of head-on collisions and rollovers. To achieve this, the guardrails should provide an efficient absorption of the impact in the accident. For this reason, they are manufactured from high-strength steel. The most common highway guardrail is the galvanized W-Beam, which is an effective and economical solution to roadside safety (Yin et al., 2017). Numerous crash tests are carried on guardrails and each component of guardrails are examined in order to construct them optimally (Soltani et al., 2013). In addition to the shape of the guardrails, the layer of the guardrails is of greater importance in protecting the base metal from being eroded, and greatly extending the life of the guardrails. For coating of the guardrails, the hot-dip galvanized technology has been preferred mostly due to its advantage related with appearance, quality, corrosion resistance and cost (Peng et al., 2013).

In literature, most of the studies aiming to measure the effect of the guardrails on the accident have been based solely on reported accidents. According to the results of such studies, from 50 to 60% of guardrail accidents involve an occupant injury or a mortality (Gabler et al., 2006). From this, several studies have claimed that themselves of the guardrails create roadside risk and should be installed only when absolutely necessary (Michie and Bronstad, 1994). For example, Elvik (1995) and Zou and Tarko (2016) suggest that guardrails should be used only where the results of crashing the guardrail are unquestionably less serious than the results of crashing the guarded object or than the rollover.

However, Michie and Bronstad (1994) revisited this topic by using not only reported accidents, but also unreported ones (this value is approximately 90 percent of all accidents). Their estimates shows that severe injuries and fatalities happen only in 2 to 3% of the accidents if the guardrails are properly installed. This finding is completely in contrast with the erroneous 50 to 60% based on only reported accidents. Similarly, Zou et.al. (2016) shows that striking a barrier involves lower risk of injury than a high-hazard event (head-on collisions, rollovers, etc.). According to their results, a guardrail should be preferred over a concrete wall and a cable barrier should be preferred over a guardrail as long as the road and traffic conditions are suitable.

Likewise, Ben-Bassat and Shinar (2011) shows that guardrails do not only reduce the severity of the accidents, but also reduce the frequency of the accidents at the very beginning. In short, they can serve both as a post-crash injury reduction measure and as a crash prevention device too. One possible reason for guardrails' effectiveness in reducing accident frequencies may be that guardrails influence driving behavior: The drivers may perceive the existence of guardrails as a roadside hazard and therefore tend to drive more safely in the roads installed with guardrails (Ben-Bassat and Shinar , 2011). The main conclusion of the relevant literature is that correctly installed and maintained guardrails play a major role in saving the lives of people involved in many of traffic accidents.

In Turkey, General Directorate of Highways is a public entity responsible for planning, design, construction, maintenance and operation of motorways, state and provincial roads. It has special budget financing under the Ministry of Transport, Maritime Affairs and Communication. Total roads and motorways in Turkey reached nearly 67,161 km as of 2017 from 62,764 km in 2000. Increase in total roads and highways stayed limited because of the fact that the Government has given its priority to the transformation of the existing roads into divided roads. As a result of this strategy, the share of the divided roads increased significantly: Total divided roads increased from 5,537 km in 2000 to 23,831 km in 2017 which increased the divided roads ratio in state roads to 35% in 2017 from 9% in 2000. Total divided roads are further targeted to reach 37,000 km by 2023, and the divided road investments of the Government is expected to exceed USD 10 billion until 2023 (KGM, 2018).

With the impact of the focus of the Government on divided road investments, guardrail market in Turkey has witnessed a significant growth within the last decades. Today almost 20 firms produce more than 100 different guardrail goods in Turkey. Seven of these guardrail producers are the member of the sector association named Steel Guardrail and Road Restraint Systems Organization (TOD).[1] Almost 80% of the guardrails produced in Turkey have been sold to the General Directorate of Highways in the tenders opened by the regional directorates of the General Directorate of Highways.

4. METHODOLOGY AND DATA SET

Statistical analyzes have been carried out in order to demonstrate whether the manufacturers of guardrails reduce competition in the auctions. In the statistical studies based on the sample data, hypothesis tests are used to decide whether the differences between the two groups are coincidental or not.[2] These differences may be, for example in our study, the differences between the ratios of the "bid / approximate cost" occurred in the tenders in 2016 and bid ratios in the tenders outside of this year; or between "bid / approximate cost" ratios of the bids proposed individually or collectively. However, since it is very difficult to prove the validity of something, the hypothesis tests are falsified: The inverse of the hypothesis named research or assertion hypothesis (also called zero/null hypothesis and denoted by H_0) is tested and if this null hypothesis is rejected, the opposite hypothesis (shown by H_1) the hypothesis is accepted.

The "t-test" is the most commonly used method in hypothesis testing. The t-test is used to compare the mean of the two groups and it is decided whether the difference is coincidental or statistically significant. The t distribution, also known as the small sampling theory, provides great convenience in practice, since it allows working with small samples. The t-test analyzes whether there is a difference

[1] In this study, these seven producers are referred as "TOD members" while the rest will be named as "non-TOD members" in short.
[2] Comparison of means arises in many different formats like comparison of a single observed mean with some hypothesized value, comparison of two means arising from paired data, and comparison of two means from unpaired data (Whitley and Ball, 2002). Among them, the last case is valid in our study since we have unpaired data of the independent groups.

between the two independent groups in terms of a variable being examined by using the t distribution in cases where the sample size is small and standard deviations of the populations are unknown.

In the context of these explanations, we performed a number of t-tests, as can be seen in the following section of the article. All statistical tests were performed in the STATA program. It is useful to explain some of the variables used in the analysis before going into the explanations and results of these tests.

A total of 794 price quotations, which were observed at the tenders opened by the General Directorate of Highways and other institutions during the period of 2014-2017, were examined. The data was obtained from the Electronic Public Procurement Platform (EKAP). The variables used in the analysis are as follows:

oran: The most important decision variable in the analysis. This variable shows the ratio (in percent) between bids (price quotations) of the undertakings in the tenders and the approximate cost announced by the Contracting Entity, mostly by General Directorate of Highways. In short, *oran* is the "bid / approximate cost" rate, which is alleged to be increased as the result of competition violation, and will be referred to as the rate or bid rate in this study.

ihlal: The dummy variable used to indicate the case of the alleged violation by the Board in the year 2016 If the tender is held in 2016, *ihlal* dummy variable takes the value of 1. For the tenders held in other years, its value is 0.

ort: The category variable indicating the type of partnership which the producers form while entering into the tenders. It has a value between 1 and 5: If one of the TOD members is offering the bid alone, then this variable has the value 1 (TOD member). If more than one TOD member jointly offer price in a tender (TOD member + TOD member), it takes the value of 2 (TOD member + TOD member). If one TOD member enters into the tender with a producer which is not the member of TOD (non-TOD member), the value of this category variable is 3 (TOD member + non-TOD member). If a producer which is not member of TOD offers a price by alone in a tender, its value is 4 (non-TOD member). And finally, if the bid is offered by the non-TOD members collectively, this categorical variable takes the value of 5 (non-TOD member + non-TOD member).

5. APPLICATION

5.1. The Analysis of the Actual Costs of the Producers and Approximate Costs Announced by the Contracting Entities (Administration)

As will be explained in the following section, in the year 2016, price quotations approached to the approximate costs, thus the observation about the upward movement of the rates (bid / approximate cost) in 2016 is correct. However, from this upward movement, it is not possible to directly reach a

conclusion that TOD members are distorting the competition in the tenders. Because, this ratio depends not only on the price quotations given by the producers of the guardrails (nominator of the ratio) but also on the approximate costs determined by the Administration (denominator of the ratio). Therefore, even if there is no change in the price quotations given by the producers and even if there are declines in them, the "bid / approximate cost" ratios may increase and approach 100% as a result of the reduction in the approximate costs. This is precisely the reason for the increase in the bid rates in 2016: The Administration determines and announces its approximate costs over the unit prices at the beginning of each year. Approximate guardrail system costs announced by General Directorate of Highways for the last three years are presented in Table-1. As can be seen from this table, unit prices increased in 2015 by about 9% compared to 2014. In 2016, unit prices have fallen by about 17% compared to 2015 and have fallen even below the level of 2014. As the General Directorate of Highways determined the approximate costs by using these lower unit prices in 2016, the "bid / approximate cost" ratios of the producers entering the tenders naturally increased.

Table 1. Guardrail System Prices (TL/m)

	2014	**2015**	**2016**	**2017**
ESP 2.0 (Single Sided Guardrail)	61.45	66.94	55.89	83.30
EDSP (Single Sided Guardrail with	71.38	77.71	64.58	96.30

Note: The guardrail system costs are calculated by using the unit prices announced by General Directorate of Highways.

Another reason for the rise in the "bid / approximate cost" ratios observed in 2016 is the increase in production costs of guardrail production: About 60% of the production cost of guardrail production is made up of the costs of the sheet metal, 15% zinc, 5% connectors and the remaining 20% is the labor cost. As can be seen from Table-2, during January-February when the unit prices of 2016 are determined, both sheet and zinc prices are at the lowest level in the last three years. However, in the following months of 2016, prices of both raw materials have increased and reached the highest level of the last three years. This is why the quotations given by the producers and thus the "bid / approximate cost" ratios increased.

Table 2. Raw Material Costs (TL/ton)

Period	**Sheet**	**Zinc**	**Period**	**Sheet**	**Zinc**	**Period**	**Sheet**	**Zinc**
Jan.14	1341	5210	*Jan.15*	1234	5288	*Jan.16*	977	4919
Feb.14	1317	5083	*Feb.15*	1301	5897	*Feb.16*	956	5490
Mar.14	1320	4970	*Mar.15*	1292	5814	*Mar.16*	1215	5555
Apr.14	1234	4857	*Apr.15*	1231	6438	*Apr.16*	1361	5678
May.1	1234	4882	*May.1*	1230	6576	*May.1*	1727	5918
Jun.14	1248	4915	*Jun.15*	1229	6088	*Jun.16*	1429	6251
Jul.14	1271	5434	*Jul.15*	1226	5947	*Jul.16*	1242	6935
Aug.14	1306	5504	*Aug.15*	1238	5654	*Aug.16*	1230	7025
Sep.14	1333	5553	*Sep.15*	1306	5678	*Sep.16*	1228	7279
Oct.14	1366	5691	*Oct.15*	1143	5742	*Oct.16*	1381	7320
Nov.14	1295	5646	*Nov.15*	1062	5036	*Nov.16*	1715	8825

Dec.14	1327	5545	*Dec.15*	1065	4857	*Dec.16*	1954	10257

Note: The source of the cost information is the London Metal Exchange (LME) and Erdemir. All USD values are converted to TL by using buying exchange rate of USD.

In 2016, due to both low determined approximate costs and increased input costs, the upper movement in the "bid / approximate cost" ratios was inevitable and many tenders had to be canceled by the Administration due to higher bids in comparison to the approximate costs.[3] Taking into consideration the increases in costs, the Administration increased the unit prices of the year 2017 by 49% compared to 2016, so the low unit price problem of 2016 has ceased to exist. As a result, the economic and rational reason for the increases observed in the "bid / approximate cost" ratios in 2016 is the lowered approximate costs by the Administration and increased input costs. Therefore, the fact that the price quotations given by the producers of guardrails approached to the approximate costs determined by the Administration does not indicate that there is a verbal / written agreement or concerted practice among the producers to prevent competition.

5.2. Statistical Analysis

In this section, we analyze the increases in the "bid / approximate cost" ratios due to the low approximate cost values set by the Administration in 2016. For this aim, we use a detailed data on the tenders of the guardrails opened between 2014 and 2017.

Table-3 and Table-4 present the results of the t-test conducted to see whether the bid rates (bid / approximate cost) have changed between 2016, which is allegedly a violation year, and the other years. According to this, while the bid rate was 86.8 in the case of no violation, this ratio increased to 110.2 in the alleged violation period. The difference is 23.4 and this difference is statistically significant.

Table 3. Summary Statistics of Bid Rates in Alleged-Violation and No-Violation Periods

ihlal	mean	sd	cv	N	min	max
0	86.74887	22.80944	.2629365	512	30.85875	230.9469
1	110.1738	25.94177	.2354623	282	58.53125	239.8581
Total	95.06856	26.4491	.2782108	794	30.85875	239.8581

Note: As for the *ihlal* variable, the value of 0 indicates the period when there is no alleged violation, and 1 indicates the period when the alleged violation occurred.

In summary, Table 3 and Table 4 witness that the bid rates showed a statistically significant increase in 2016, in which allegedly the competition rules were violated. However, not only TOD members who are party to the competition investigation but also other producers who are not TOD members submitted price quotations in the tenders we analyzed. It is therefore necessary to make a more

[3] While the Administration cancelled 11 guardrail tenders in 2015, this figure rose to 32 in 2016.

comprehensive statistical analysis by taking into account whether the owner of any bid is a TOD member, as well as whether the bid is proposed jointly or individually by TOD members or other producers. The necessary analyzes will be made below.

Table 4. Statistical Comparison of Bid Rates in Alleged-Violation and No-Violation Periods

Comparison of oran by ihlal
(Bonferroni)

Row Mean- Col Mean	0
1	23.4249 0.000

Note: As for the *ihlal* variable, the value of 0 indicates the period when there is no alleged violation, and 1 indicates the period when the alleged violation occurred.

First, it has been analyzed whether the overall result of the above "Bid ratios are higher in the alleged violation period (2016) than no violation period" has changed depending on whether the bidder is a TOD member or not, and on whether the bid is joint bid or not. As explained above, the category variable named *ort* is used for this purpose. The statistical analysis results are presented in Table-5 and Table-6.

According to the results in Table-5, the conclusion that "Bid ratios are higher in the alleged violation period than no violation period" applies to all forms of partnership. For example, in the bids offered by the TOD members on their own (*ort* = 1), the bid rates rose from 87.7 to 115.0 when it was allegedly infringed year, 2016. Likewise, in the case of bids offered by non-TOD member producers (*ort* = 4), the bid rates increased to 107.9 in the year 2016 from 84.5 in no violation period. For these two analyzes in Table 6, the respective p-values are equal to zero; this indicates that the bid rates in the period allegedly infringement occurred are statistically and significantly increased both by the TOD members and by the non-TOD members. Therefore, if the increases in the bid rates during the alleged violation period (2016) are to be used as an indication of infringement of competition, it is expected that they would be used not only for TOD members but also for non-TOD members who are acting in the same manner, and these undertakings were expected to be included in the investigation.

Table-5 and Table-6 also show some important conclusions about the price quotations jointly proposed by the TOD members and/or non-TOD members. First of all, if we consider the quotations submitted by the TOD members together (*ort*=2), the bid rate, which was 83.6 in the non-infringing period, rose to 93.8 in the alleged violation period (in 2016). However, as shown by the p-value (0.126) in Table-6, the difference of 10.2 is not statistically significant at 1%, 5% and 10% significance levels. A similar situation exists in the bids that the TOD members and non-TOD members have jointly offered (*ort*=3): Bid rate of 94.7 has risen to 106.7 from the non-infringing period to the alleged violation period and the difference of 11.9 is not statistically significant at 1% and 5% significance levels (the corresponding p-value in Table-6 is 0.062). In summary, between the non-infringing period and the alleged violation period, bid rates did not increase significantly in the bid quotations proposed by

partnerships that TOD members have formed with each other or with non-TOD members. The situation is entirely different in the bid quotations offered jointly by the non-TOD members (*ort*=5): The bid rate, which was 78.2 in the period in which there was no violation, rose to 99.2 in the alleged violation period and the difference of 21.0 was statistically significant. In other words, the joint bid rates offered by the non-TOD producers were significantly increased in the period in which it was claimed that there was a violation of competition.

Table 5. Summary Statistics of Bid Rates in Alleged-Violation and No-Violation Periods for Different Partnership Types

-> ort = 1

Summary for variables: oran
by categories of: ihlal

ihlal	mean	sd	cv	N	min	max
0	87.67028	21.52853	.2455625	319	38.7077	163.7491
1	115.0325	26.91827	.2340057	154	70.86282	239.8581
Total	96.57892	26.68112	.2762623	473	38.7077	239.8581

-> ort = 2

Summary for variables: oran
by categories of: ihlal

ihlal	mean	sd	cv	N	min	max
0	83.60558	23.56672	.2818797	8	58.08563	124.7473
1	93.79403	8.918457	.0950856	17	81.62739	119.2193
Total	90.53373	15.44486	.1705979	25	58.08563	124.7473

-> ort = 3

Summary for variables: oran
by categories of: ihlal

ihlal	mean	sd	cv	N	min	max
0	94.7234	21.53338	.2273291	36	46.67211	165.1684
1	106.6793	19.04078	.1784861	16	87.79306	146.4868
Total	98.40214	21.35171	.2169842	52	46.67211	165.1684

-> ort = 4

Summary for variables: oran
by categories of: ihlal

ihlal	mean	sd	cv	N	min	max
0	84.54564	25.67948	.3037351	113	30.85875	230.9469
1	107.921	28.24858	.2617525	72	58.53125	183.2308
Total	93.64306	28.98121	.3094859	185	30.85875	230.9469

-> ort = 5

Summary for variables: oran
by categories of: ihlal

ihlal	mean	sd	cv	N	min	max
0	78.22383	23.11138	.2954519	36	34.7879	146.2321
1	99.23154	12.3666	.1246236	23	76.04871	118.8718
Total	86.41327	22.07072	.2554089	59	34.7879	146.2321

Notes: (a) As for the *ihlal* variable, the value of 0 indicates the period when there is no alleged violation, and 1 indicates the period when the alleged violation occurred.

(b) Partnership types are defined using the following values for the *ort* variable: 1 "TOD member"; 2 "TOD member + TOD member"; 3 "TOD member + non-TOD member", 4 "non-TOD member" ve 5 "non-TOD member + non-TOD member".

Table 6. Statistical Comparison of Bid Rates in Alleged-Violation and No-Violation Periods for Different Partnership Types

```
-------------------------------------------------------------------------------
-> ort = 1

                        Comparison of oran by ihlal
                                (Bonferroni)
Row Mean-|
Col Mean |          0
---------+----------
       1 |    27.3623
         |      0.000

-------------------------------------------------------------------------------
-> ort = 2

                        Comparison of oran by ihlal
                                (Bonferroni)
Row Mean-|
Col Mean |          0
---------+----------
       1 |    10.1884
         |      0.126

-------------------------------------------------------------------------------
-> ort = 3

                        Comparison of oran by ihlal
                                (Bonferroni)
Row Mean-|
Col Mean |          0
---------+----------
       1 |    11.9559
         |      0.062

-------------------------------------------------------------------------------
-> ort = 4

                        Comparison of oran by ihlal
                                (Bonferroni)
Row Mean-|
Col Mean |          0
---------+----------
       1 |    23.3753
         |      0.000

-------------------------------------------------------------------------------
-> ort = 5

                        Comparison of oran by ihlal
                                (Bonferroni)
Row Mean-|
Col Mean |          0
---------+----------
       1 |    21.0077
         |      0.000
```

Notes: (a) As for the *ihlal* variable, the value of 0 indicates the period when there is no alleged violation, and 1 indicates the period when the alleged violation occurred.

(b) Partnership types are defined using the following values for the *ort* variable: 1 "TOD member"; 2 "TOD member + TOD member"; 3 "TOD member + non-TOD member", 4 "non-TOD member" ve 5 "non-TOD member + non-TOD member".

We may summarize the above-mentioned results of the bid quotations jointly issued by TOD members and non-TOD members as follows: The increase in the quotations jointly proposed by the TOD members together with other TOD members or non-TOD members is less than the increase in other types of the partnerships. That is why the bids offered jointly by the TOD members have been lower than those in other proposal types, so the number of the tenders won jointly by the TOD members has increased in 2016. This increase cannot be the result of competition-restrictive partnerships, but rather the result of the cooperations increasing the competition. If we look at the bid rates offered jointly by non-TOD members, we can see that these producers have increased their bid rates considerably

during the alleged violation period. Therefore, if there was a relationship among the joint bidding, the change in the bid rates and the finding of a competition violation, these results indicate that non-TOD members should be investigated instead of TOD members.

The change in the bid rates that guardrails have given in the tenders over the years can also have very important consequences for allegations of infringement. The results of the analysis for this purpose are presented in Table-7 and Table-8.

Infringement claims are brought for the year 2016. If, as explained above, the increase in the bid rates in 2016 is due to lowered approximate costs of that year by the Administration and the increase in the actual costs, the realization of two different observations will eliminate the claim of competition infringement:

First, the upward movement in the bid rates due to decrease in approximate costs and increase in actual costs in 2016 must be observable for all guardrail manufacturers, whether they are TOD members or not. If the increases in the bid rates in 2016 were experienced only in the bid proposals of the TOD members, one would not present the decrease in approximate costs and the increase in actual costs as the reason behind the increase in the bid ratios. On the contrary, if the increases in the bid rates in 2016 are observed not only for the TOD members but also for the non-TOD members, the explanation that the bid rates increased due to the decreases in the approximate costs and increases in the actual costs will be valid and thus the competition infringement will not be mentioned.

As can be seen from Table-7 and Table-8, when the years 2015 and 2016 are compared, not only TOD members' offers but also bid rates of non-TOD members increased in 2016. In other words, it appears that the reasons for the increases in the bid rates in 2016 are reductions in approximate costs and increases in actual costs. Any other comment will bring the question of why non-TOD members are not included into the competition investigation. It can be seen that TOD member enterprises offer more competitive bids than non-TOD member undertakings in terms of proposals they give together (*ort*=2 and *ort*=5), while they exhibit similar behaviors in terms of proposals given individually: The bid rates in the quotations jointly given by TOD members (*ort*=2) has not increased at all in 2016. The number of proposals granted by the partnerships established by TOD-affiliated enterprises has increased in 2016.[4] However, in these joint proposals, TOD members maintained their bid rates at the level of 2015 (approx. 93.8) and thus we cannot see the increase in the bid rates observed in all other types of partnerships.

[4] As can be seen from Table 5, the increase in the number of bids observed in 2016 occurred not only in TOD's members' joint proposals but also in all other proposal types.

Table 7. Summary Statistics of Bid Rates Over the Years for Different Partnership Types

-> ort = 1

Summary for variables: oran
by categories of: yil (yil)

yil	mean	sd	cv	N	min	max
2014	80.99059	20.55879	.2538417	150	38.7077	135.7682
2015	88.33926	19.9865	.2262471	112	47.76552	163.7491
2016	116.8911	27.43746	.2347267	136	70.86282	239.8581
2017	103.2274	17.85127	.1729315	75	62.35086	162.1732
Total	96.57892	26.68112	.2762623	473	38.7077	239.8581

-> ort = 2

Summary for variables: oran
by categories of: yil (yil)

yil	mean	sd	cv	N	min	max
2014	63.81721	5.85945	.0918161	3	58.08563	69.79666
2015	93.76828	17.64091	.188133	4	81.62739	119.2193
2016	93.80195	5.315177	.0566638	13	83.15993	99.56373
2017	95.47861	22.01978	.2306252	5	69.5492	124.7473
Total	90.53373	15.44486	.1705979	25	58.08563	124.7473

-> ort = 3

Summary for variables: oran
by categories of: yil (yil)

yil	mean	sd	cv	N	min	max
2014	88.89384	24.93	.2804468	6	67.34748	136.821
2015	75.58447	16.37968	.2167069	6	46.67211	90.87332
2016	106.6793	19.04078	.1784861	16	87.79306	146.4868
2017	100.9655	19.15975	.1897652	24	79.64052	165.1684
Total	98.40214	21.35171	.2169842	52	46.67211	165.1684

-> ort = 4

Summary for variables: oran
by categories of: yil (yil)

yil	mean	sd	cv	N	min	max
2014	79.79045	30.75335	.3854264	53	30.85875	230.9469
2015	89.44939	21.3892	.2391207	48	57.31646	164.4326
2016	111.2317	28.962	.2603753	61	58.53125	183.2308
2017	87.66808	11.33495	.1292939	23	65.76733	112.4229
Total	93.64306	28.98121	.3094859	185	30.85875	230.9469

-> ort = 5

Summary for variables: oran
by categories of: yil (yil)

yil	mean	sd	cv	N	min	max
2014	60.34025	17.36338	.2877579	12	34.7879	84.41603
2015	80.72239	9.157591	.1134455	14	68.35581	104.8489
2016	100.1781	11.77403	.117531	22	76.04871	118.8718
2017	94.56992	27.24668	.2881115	11	58.39059	146.2321
Total	86.41327	22.07072	.2554089	59	34.7879	146.2321

Note: Partnership types are defined using the following values for the *ort* variable: 1 "TOD member"; 2 "TOD member + TOD member"; 3 "TOD member + non-TOD member", 4 "non-TOD member"; 5 "non-TOD member + non-TOD member".

Table 8. Statistical Comparison of Bid Rates Over the Years for Different Partnership Types

```
-> ort = 1

                        Comparison of oran by yil
                              (Bonferroni)
Row Mean-|
Col Mean |       2014       2015       2016
---------+---------------------------------
    2015 |    7.34868
         |      0.051
         |
    2016 |    35.9005    28.5518
         |      0.000      0.000
         |
    2017 |    22.2368    14.8881   -13.6637
         |      0.000      0.000      0.000

-> ort = 2

                        Comparison of oran by yil
                              (Bonferroni)
Row Mean-|
Col Mean |       2014       2015       2016
---------+---------------------------------
    2015 |    29.9511
         |      0.030
         |
    2016 |    29.9847    .033671
         |      0.007      1.000
         |
    2017 |    31.6614    1.71033    1.67666
         |      0.014      1.000      1.000

-> ort = 3

                        Comparison of oran by yil
                              (Bonferroni)
Row Mean-|
Col Mean |       2014       2015       2016
---------+---------------------------------
    2015 |   -13.3094
         |      1.000
         |
    2016 |    17.7855    31.0949
         |      0.380      0.010
         |
    2017 |    12.0717     25.381   -5.71381
         |      1.000      0.039      1.000

-> ort = 4

                        Comparison of oran by yil
                              (Bonferroni)
Row Mean-|
Col Mean |       2014       2015       2016
---------+---------------------------------
    2015 |    9.65895
         |      0.393
         |
    2016 |    31.4413    21.7823
         |      0.000      0.000
         |
    2017 |    7.87763   -1.78131   -23.5637
         |      1.000      1.000      0.002

-> ort = 5

                        Comparison of oran by yil
                              (Bonferroni)
Row Mean-|
Col Mean |       2014       2015       2016
---------+---------------------------------
    2015 |    20.3821
         |      0.015
         |
    2016 |    39.8378    19.4557
         |      0.000      0.006
         |
    2017 |    34.2297    13.8475   -5.60815
         |      0.000      0.242      1.000
```

Note: Partnership types are defined using the following values for the *ort* variable: 1 "TOD member"; 2 "TOD member + TOD member"; 3 "TOD member + non-TOD member", 4 "non-TOD member" ve 5 "non-TOD member + non-TOD member".

Comparing the years 2016 and 2017, we may reach the second observation supporting the view that the high levels in the bid rates in 2016 are due to the decreases in the approximate costs and increases in the actual costs: One may expect that the bid rates in 2017 would decrease again as a result of the increases in the approximate costs by the Administration. This is exactly what happened in the sector in 2017: In all the forms of partnership, except for the joint offers that TOD members form together, the bid rates decreased in 2017. The reason for the slight increase in 2017 for the joint offers of the TOD

members is that the increase occurred in the other categories in 2016 was not experienced in this category and the bid rate levels are already low in 2016.

To summarize, if we examine the bid rates that all TOD members or non-TOD members have offered on their own or jointly, we can say that 2016 is an exceptional year and the only reason for the high bid rates observed in this year is the decline in approximate costs and increases in the actual costs.

6. CONCLUSION

The Competition Board has opened an investigation with the decision of 27.04.2017 on the seven guardrail producers and their association (TOD). In this article, it was analyzed whether a competition infringement occurred or not by using a wide range of data on guardrail market. The results obtained are as follows:

In 2016, the ratios between price quotations of producers and the approximate costs announced by the Administration (bid / approximate cost) have increased. However, this increase did not arise from the fact that TOD members who are parties to the investigation are in a cooperation restricting the competition between them. The reason for this increase is that the actual costs incurred by the producers increased while the approximate costs announced by the Administration in 2016 fell.

Two other events happened in the sector show very clearly that the increase in the bid rates in 2016 is not due to the fact that the TOD members prevented the competition: First, guardrail producers who are not members of TOD were also affected similarly by the developments in 2016 and as a result their bid ratios have increased accordingly. Secondly, the bid ratios of all undertakings operating in the sector decreased after the Administration increased the approximate costs in 2017.

The number of proposals jointly awarded by TOD members increased in 2016. However, these joint proposals increased the competition in the tenders: In all other types of proposals, there was a significant increase in the bid rates in 2016 compared to the year 2015, while the rates offered by the TOD members were not significantly increased and thus the number of the auctions won by the TOD members increased.

Improvements in total market share of the TOD members witness the intense competition introduced by them: During the period under investigation, TOD members increased their total market share. Considering that the most advantageous proposal wins the tenders and other producers that are not member of TOD could enter individually or jointly into these tenders, one may expect that the total market share of TOD members would decrease if the competition between TOD members was restricted. However, completely the opposite has been observed in the sector.

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