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### ECONOMIC ANALYSIS IN MERGER INVESTIGATIONS – Contribution from Korea

- Session III -

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This contribution is submitted by Korea under Session III of the Global Forum on Competition to be held on 7-10 December 2020.

More documentation related to this discussion can be found at: [oe.cd/mergerinv](https://oe.cd/mergerinv).

Please contact Mr James Mancini if you have questions about this document [[James.Mancini@oecd.org](mailto:James.Mancini@oecd.org)].

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## *Economic Analysis in Merger Investigations*

### **- Contribution from Korea -**

#### **1. Introduction**

1. Economic analysis in merger investigations is to forecast potential situation resulting from a merger and determine whether the merging parties' post-merger conducts would cause anti-competitive effects or not. In order to predict post-merger market circumstances, various economic analyses are used.
2. This report describes the KFTC's personnel related to economic analysis, cases where economic analysis was conducted, roles of economic analysis experts in merger reviews, methods used in economic analysis and the use of external economists.

#### **2. KFTC's personnel related to economic analysis and their accomplishments**

3. In order to increase expertise and reliability of competition law enforcement, the KFTC established Economic Analysis Team (currently called Economic Analysis Division) in Dec. 2005. The Economic Analysis Team has been in charge of economic analysis and built up capabilities in the area by securing economic experts with doctoral degrees. As of Oct. 2020, a total of 10 experts are performing economic analysis. Five of them belong to the Economic Analysis Division<sup>1</sup> lead by a chief economist of the Commission. The other five are assigned to case handling divisions that need economic analysis.
4. Economic analysis in merger reviews is being conducted by the Economic Analysis Division. The number of mergers that carried out economic analysis from 2017 to Jun. 2020 is 10 cases (2.5 cases a year on average).<sup>2</sup> During the same period, the KFTC reviewed 2,556 merger cases, and ordered remedies in 14 cases.
5. When a merger case is notified, the Directors of M&A Division and Economic Analysis Division discuss whether economic analysis would be needed. Although there are no specific guidelines regarding provision of economic analysis, generally economic analysis is considered to be needed ① when a merger is expected to require remedies or to be banned due to its significant anti-competitive concerns (a merger between pay-TV businesses), ② when a merger involves certain industries, such as the platform market, which require new economic theories and empirical evidence for market definition and assessment of anti-competitiveness (a merger between app-based delivery service providers), and ③ when economic analysis and qualitative information submitted by merging parties are not enough to define markets and analyze anti-competitiveness (a merger between suppliers of eyeglasses lenses).

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<sup>1</sup> As of Oct. 2020, eight persons in total are working in the Economic Analysis Division.

<sup>2</sup> Between 2017 and Sep. 2020, the number of economic analysis the KFTC conducted is 63 in total. Most of them were related to the abuse of market dominance and cartel. To be specific, they consist of the abuse of market dominance (18 cases, 28.6%), cartel (13 cases, 20.6%), mergers (10 cases, 15.9%), illegal internal transactions (7 cases, 11.1%), and others (15 cases, 23.8%).

### 3. How economists involve in merger investigations

6. The KFTC has been operating the ‘Regular Meeting for Economic Analysis’ since Jul. 2017 in which the Economic Analysis Division and case handling divisions participate. This meeting was established to identify a case in which economic analysis should be considered, and to find a significant case that needs economic analysis starting from the early stage. At the meeting, Directors and case handlers of the Economic Analysis Division and case handling divisions discuss whether economic analysis is needed, limits of economic analysis and necessary data for economic analysis, etc.

7. Although economic analysis for merger reviews is also discussed at the meeting, as the M&A Division and Economic Analysis Division belong to the same bureau, they can consult each other more closely and frequently compared to other kinds of cases. Economic analysis experts involve in every stage of a merger review including review of merger notification report, request for data necessary for economic analysis, review of economic analysis submitted by experts from merging parties, market definition and assessment of anti-competitiveness based on economic analysis and design of remedies.

### 4. Methods used in economic analysis

8. In merger reviews, both theoretical and empirical approaches are used. When it comes to mergers in emerging industries such as the platform market, in particular, theoretical models can be used to assess anti-competitiveness and identify appropriate remedies. For quantitative analysis, traditional economic analysis techniques such as Critical Loss Analysis (CLA), Aggregate Diversion Analysis (ADR), Upward Pricing Pressure (UPP), Compensating Marginal Cost Reduction (CMCR), and merger simulation analysis are employed. In order to select specific analysis methods, ① characteristics of products and services markets (homogenous market vs. differentiated market, one-sided market vs. two-sided market, etc.), ② past cases in which economic analysis was applied, ③ whether the analysis technique is academically and practically approved, ④ simplicity and clarity of the analysis technique, etc. are considered.

**Table 1. Merger cases where quantitative economic analysis was conducted**

Merging parties	Year	Analysis technique
Hoya Corporation-Daemyung Optical Company	2017	UPP test
Korean Air-Delta Airlines	2017	Merger simulation
LG Uplus-CJ Hello	2019	UPP test
SK Broadband-Tbroad	2019	UPP test
Binggrae-Haitai Icecream	2019	UPP test
Borealis-DYM Solution	2020	Cournot CMCR test
Delivery Hero-Woowa Brothers	2020	CLA, ADR, UPP test

**Box 1. Cases where UPP test was used: two merger cases between pay-TV businesses (2019)**

LG Uplus-CJ Hello: A merger between LG Uplus, the 3rd largest IPTV operator in Korea (3rd place in the pay-TV market), and CJ Hello, the largest cable TV provider in Korea (4th place in the pay-TV market)

SK Broadband-Tbroad: A merger between SK Broadband, the 2nd largest IPTV business in Korea (2nd place in the pay-TV market), and Tbroad, the 2nd largest cable TV services operator (5th place in the pay-TV market)

Considering the characteristics of the market, the UPP formula was modified. First of all, users in the market tend to consume pay-TV services and high-speed internet at the same time, so this consumption behavior had to be reflected in the economic analysis. Therefore, cable TV subscribers were categorized into several groups depending on their high-speed internet consumption behaviors.

**Table 2. Groups of cable TV subscribers and their diversion effects**

Category	High-speed internet consumption behavior	Actual purchase diversion effects from the merging parties' perspectives
Group I	Do not use high-speed internet	Cable TV only ? IPTV only
Group II	Use high-speed internet provided by the cable TV operator	Cable TV + high-speed internet bundles ? IPTV + high-speed internet bundles
Group III	Use high-speed internet of another provider other than the cable TV operator	Cable TV only ? IPTV + high-speed internet bundles (But, in terms of the existing users of high-speed internet provided by the merging parties (IPTV), cable TV only ? IPTV only)

As each group would have different results of sales losses and profit increases after the purchase diversion, the UPP formula had to be modified.

In addition, the cable TV operators were providing two types of products (digital cable TV and 8VSB cable TV<sup>3</sup>) at the same time. Therefore, the diversion from one product to the other in a case where the price of one of the two products increases had to be considered as well.

By reflecting these two factors, the existing UPP formula,  $\frac{UPP_1}{P_1} \left( = D_{12} M_2 \frac{P_2}{P_1} - E(1 - M_1) \right)$ , was modified as follows:

$$\left[ \alpha D_{24}^I M_4 \frac{P_4}{P_2} + \beta D_{24}^{II} M_{4+5} \frac{(P_4 + P_5)}{(P_2 + P_3)} + (1 - \alpha - \beta) D_{24}^{III} \left\{ M_{4+5} \frac{(P_4 + P_5)}{P_2} - \lambda_2 M_5 \frac{P_5}{P_2} \right\} \right] + D_{21} E(1 - M_1) \frac{P_1}{P_2} - E(1 - M_2)$$

<sup>3</sup> The 8VSB (8-level vestigial sideband) is the modulation method used for digital broadcast. Subscribers to analogue broadcast can also watch digital broadcast by converting the signal as long as they have digital TVs. In this case, they can enjoy the digital broadcast under the existing contract even without a set-top box.

The subscripts 1 to 3 respectively refer to 8VSB cable TV, digital cable TV, and high-speed internet of the cable TV operator. The subscripts 4 and 5 respectively refer to IPTV and high-speed internet of the IPTV operator of the merging parties. The superscript I refers to a cable TV user group that does not use high-speed internet, II refers to a cable TV user group that uses high-speed internet provided by the cable TV operator, and III refers to those who use high-speed internet provided by another company other than the cable TV operator (merging parties). The proportions of the group I, II and III are denoted as  $\alpha$ ,  $\beta$ , and  $1 - \alpha - \beta$ . Of cable TV subscribers who diverted their purchases to the merging parties' IPTV services, those who were already using the merging parties' high-speed internet services were denoted as  $\lambda$ .

The diversion ratios were derived from surveys conducted by the merging parties. The merging parties asked subscribers of the two types of cable TV services of the merging parties whether they would divert to IPTV of the merging parties in response to a 10 percent price increase. Price data were derived from the ARPU (average revenue per user) which is widely used in the broadcasting and communications industries. Margin ratios were obtained from accounting data submitted by the merging parties.

In conclusion, in the LG Uplus-CJ Hello case, concerns over price increases were found in the 8VSB cable TV market, and in the SK Broadband-Tbroad case, concerns over price increases were expected in the digital cable TV and 8VSB cable TV markets. In order to address these concerns, the KFTC imposed remedies that limit the price increase.

## 5. Use of external experts

9. In merger cases, big law firms, agents of merging parties, eagerly make use of external experts. With sufficient resources, they can ask renowned economists for economic analysis and submit the analysis results to the KFTC and courts. This means the KFTC would also have to respond with thorough economic analysis. In principle, economic analysis at the KFTC is conducted by the Commission's internal experts. However, in order to obtain objectivity and brace for merging parties' meticulous economic analysis, the KFTC also actively uses external experts through consultation or entrustment of research services.

10. Consultation is used usually when the KFTC wants to hear opinions of external experts on KFTC's economic analysis in order to examine the validity of the economic analysis and the adequacy of quantitative economic analysis, etc. Entrustment is to utilize new economic analysis techniques, complement the Division's analysis and enhance objectivity of analysis. Cooperation with outside experts has played a significant role in increasing efficiency of economic analysis.<sup>4</sup>

<sup>4</sup> From 2016 to Sep. 2020, two merger cases received consultation from external experts for economic analysis, and two other merger cases were entrusted to external experts for economic analysis.

**Table 3. Use of external experts for economic analysis in merger investigations**

Category	Merging parties	Year	Economic analysis
Consultation	Hoya Corporation-Daemyung Optical Company	2017	Design an appropriate survey to analyze diversion ratios in the market of vertically differentiated products
	Delivery Hero-Woowa Brothers	2020	Review the validity and reliability of quantitative economic analysis models submitted by the merging parties
Entrustment	LAM-KLA Tencor	2016	Assess anti-competitiveness of the vertical merger using economic analysis techniques such as GUPPI
	Delivery Hero-Woowa Brothers	2020	Develop theoretical models necessary for market definition and analysis of anti-competitiveness of two-sided markets

### Box 2. Use of GUPPI test: Hoya Corporation-Daemyung Optical Company (2017)

Hoya Corporation-Daemyung Optical Company: A merger between Hoya Corporation (“Hoya”), the largest progressive addition lenses (“PAL”<sup>5</sup>) provider in Korea, and Daemyung Optical Company (“Daemyung”), the 3<sup>rd</sup> largest eyeglasses lenses supplier in Korea

When it comes to eyeglasses lenses, their product differentiation is big depending on their prices and whether lenses are domestic or imported ones. Product quality is also important and each supplier’s market segments with specialty are different. Therefore, in addition to market definition and market share analysis, the Gross Upward Pricing Pressure Index (“GUPPI”) was conducted for the merger review.

In order to get diversion ratios<sup>6</sup> necessary for the GUPPI analysis, surveys were used but the KFTC and merging parties had different views on how to compose questions of the survey (“survey design”). In this regard, the Commission had consultation with external economic experts to identify problems of a survey designed by the merging party, and established more appropriate way of surveying. Based on the survey results, the KFTC conducted the GUPPI test and used it to analyze anti-competitiveness of the merger.

#### 1. Problems of the survey designed by the merging party

(1) Questions to calculate diversion ratios (shut-down vs. price increase)

For the survey needed to calculate diversion ratios and GUPPI value, Hoya used the shut-down method instead of price increase method in order to minimize bias stemming from the complexity of questions.<sup>7</sup>

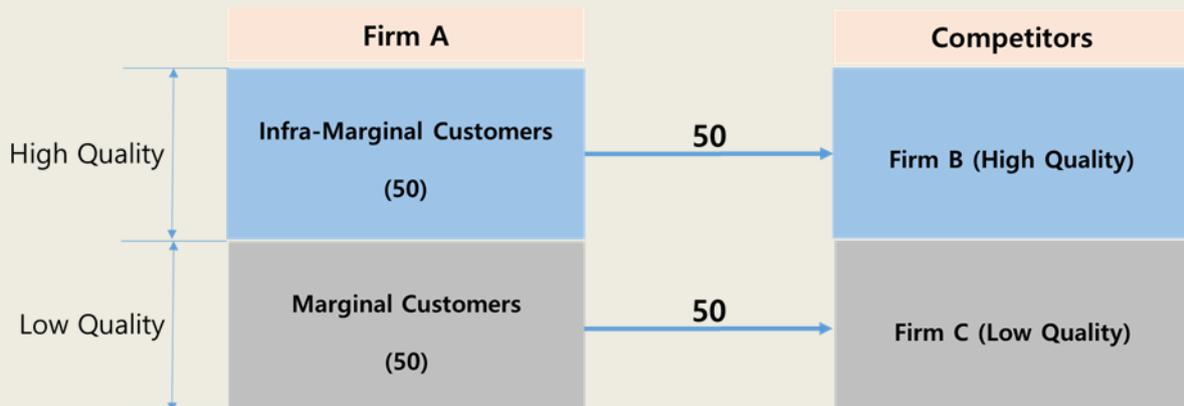
<sup>5</sup> Progressive lenses or varifocal lenses are corrective lenses used in eyeglasses to correct far-sightedness with the top part and short-sightedness with the bottom part.

<sup>6</sup> In the 2010 U.S. Horizontal Merger Guidelines, the GUPPI is calculated using diversion ratio from product 1 to product 2, percentage margin of product 2 and price ratio of product 2 to product 1. Therefore, in order to calculate GUPPI, the diversion ratio from product 1 to product 2 should be calculated first.

<sup>7</sup> The shut-down method asks consumers how much purchases (or money) they would divert from Hoya to other brands if Hoya stops supplying PAL. In contrast, the price increase method first asks consumers how they would respond (keep using the product, stop using the product, divert some of purchases [or money] to other brands) if Hoya increases prices of PAL (by 5%-10%), and then provides next questions to only those who answer that they would divert some of their purchases to other brands. The next question is how much purchases (or money) they would divert.

However, the price range of PAL was wide starting from USD 100 to 2,000 (vertically differentiated goods) and specialties of Hoya (high quality, high price) and Daemyung (middle and low quality, middle and low price) were different. Therefore, the diversion ratios calculated from the shut-down method survey would have systematic errors. For this reason, the KFTC concluded that the price increase method would be more appropriate than the shut-down method for the survey.

\* Eg. The diversion ratio from company A to company C in the table below is 100% (50 people/50 people) when using the price increase method while the ratio becomes 50% (50 people/100 people) when using the shut-down method.



## (2) Market segmentation for PAL

Hoya argued that if GUPPI test is conducted without considering price differences, GUPPI test results could have a significant bias because of differences in relative price ratios. Therefore, Hoya suggested that products be classified into several groups by their prices for the calculation of diversion ratios, and then total diversion ratios can be found using weighted average of the each group's diversion ratios. However, the KFTC argued that as the prices of PAL are on continual spectrum without being grouped, an ex-ante price classification could be inappropriate. In addition, the KFTC raised concerns over overestimation and underestimation due to relative price differences between products, and argued that the concerns can be addressed by focusing on revenue diversion ratios instead of customer diversion ratios. The Commission suggested that surveying revenue diversion ratios rather than purchase quantity diversion ratios without classifying products by prices would be more appropriate.

## 2. Analysis results and insights

Under the Hoya's analysis method, the diversion ratio from Hoya to Daemyung was half of diversion ratio derived from the KFTC's analysis method. However, GUPPI value was less than 5% either under KFTC's method or Hoya's method. Therefore, the Commission determined that post-merger anti-competitive concerns in the PAL market would not be very significant.

The insights the KFTC could earn from the economic analysis are that if characteristics of a market are not properly embedded in survey design, then diversion ratio estimations can differ significantly. This will have to be considered when conducting GUPPI analysis for merger reviews in the future.

When it comes to PAL market concentration, on the other hand, its market concentration was quite high (about 50%) but the GUPPI analysis showed that there would be no significant anti-competitive concerns. It was because of product differentiation between high-priced Hoya products and middle- and low-priced Daemyung products. Moreover, the GUPPI analysis showed that upward pricing pressure is low in the market. This merger case can be seen as a meaningful example that shows the usefulness of GUPPI analysis for markets with differentiated products.

Lastly, the consultation with external experts made clear the differences between the KFTC's methods and merging parties methods, and helped find more reasonable and appropriate methods. The use of outside experts has played an important role in improving objectivity of analysis as well as utilizing their expertise.