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Market Concentration and Competition Policy - Note by Hiroyuki Odagiri

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Market Concentration and Competition Policy: General Issues with an Application to Japan

By Hiroyuki Odagiri*

1. Introduction

1. The rise in concentration ratios in the US has been noted by a number of authors[1]. To understand if such a trend is real and worrisome and if it is universal, I intend to discuss three questions in this paper. First, are the commonly employed statistics on market concentration appropriate measures of the lack of competition? Second, is there an increasing trend in Japan similarly to the US? Third, if the increasing trend is real, does it cause social harm and is there anything that competition authorities should or can do? Let me start by explaining the two statistics on concentration available in Japan and then argue that both of these statistics, and in fact any measure of concentration in any country, have many deficiencies.

2. Two Concentration Ratio Statistics in Japan

2. Two statistics on concentration ratio have been published in Japan, which I call the JFTC data and the Census data.

2.1. The JFTC data

3. The JFTC data is the one the Japan Fair Trade Commission (JFTC) collected and published since 1975. The most recent data is available for 2014. The main purpose for collecting this data is whether there are firms that satisfy the conditions for "monopolistic situation" as defined by the Anti-Monopoly Act (AMA), Japan's competition law.

4. Article 8-4(1) of AMA stipulates that if there is a firm considered to be in a monopolistic situation, JFTC may take necessary measures necessary to restore competition, for instance by ordering the divestiture of a part of the business[2].

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[1] See the background paper prepared by the Secretariat for this Hearing.

[2] "Whenever a monopolistic situation exists, the Fair Trade Commission may order the relevant enterprise, pursuant to the procedures as provided in Section 2 of Chapter VIII, to transfer a part of its business or to take any other measures necessary to restore competition with respect to the relevant goods or services; provided, however, that this does not apply if it is found that such measures may, in relation to said enterprise, reduce the scale of business to such an extent that the expenses required for the supply of goods or services said that the enterprise supplies will rise extremely, undermine its financial position, or make it difficult to maintain its international competitiveness, or if alternative measures that are found to be sufficient for restoring competition with respect to the relevant goods or services can be taken." (AMA, Article 8-4(1))

5. To define monopolistic situation, AMA lists conditions related to the value of sales, market concentration, difficulty of entry, price movement, profit rate, and selling and general administrative expenses. As for concentration, it requires that the share of a single enterprise exceeds one half or the combined share of two enterprises exceeds three fourths[3], that is, the 1-firm concentration ratio (CR1) exceeds 50% or the 2-firm concentration ratio (CR2) exceeds 75%. This condition, I hasten to add, is a necessary condition but by no means a sufficient condition for monopolistic situation. In fact, since 1977 when the regulation on monopolistic situation was introduced with an AMA amendment, there has not been a case that the JFTC took an action, even though CR1 exceeded 50% or CR2 exceeded 75% in some industries.

6. Still, JFTC needs to keep watching if any industry satisfies the conditions and thus collects and publishes the data on concentration ratio. Accordingly, the JFTC data does not fully cover the industries but is biased to high-concentration industries in its coverage. Also, its industrial classification does not follow the Standard Industry Classification (SIC) and is detailed in some of the concentrated industries but coarse in others. Also, it tends to be insufficient in non-manufacturing industries and in new markets.

2.2. The Census Data

7. In terms of coverage, the Census data is superior as it covers all 6-digit SIC in manufacturing. The Census of Manufactures itself has a long history as it started in 1909. The Ministry of Economy, Industry and Trade (METI) sends questionnaires to establishments (plants, factories, etc.) and aggregates the numbers at the industry level. They also aggregate at the enterprise level and thus can calculate concentration ratios. Disappointingly, however, they have published the statistics on concentration ratios just for two years, 2008 and 2010.

3. Problems with Concentration Ratio Statistics

8. As this discussion indicates, both of these concentration ratio statistics face at least three problems and, in fact, so do any such statistics in any country.

9. The first concerns the definition of market or industry. Although, as in the Census data of Japan, many concentration ratio statistics collects data in accordance with SIC, it is not always an adequate “market” or “a particular field of trade” (as in AMA) for the purpose of competition policy. Also, the relevant market may vary over time because, for instance, new markets may appear or the products considered to be unrelated may become close substitutes owing to changes of taste or technological innovation. In fact,

[3] “A single enterprise's share of a field of business (meaning, out of the aggregate volume (if calculation in terms of volume is not appropriate, out of the aggregate value; hereinafter the same applies in this item) of the particular goods and any other goods with an extremely similar function and utility that are supplied in Japan (excluding those exported), or out of the aggregate volume of the services that are supplied in Japan, the ratio of particular goods and any other goods with an extremely similar function and utility or services that are supplied by the enterprise; hereinafter the same applies in this item) exceeding one-half or two enterprises' combined share of a field of business exceeding three-fourths during the relevant one-year period.” (AMA, Article 2(7)(i)).

"market" as usually defined may not be a good unit to measure competition or dominance in rapidly changing industries and in service sectors such as the platform-related industries.

10. The second is the imperfectness of coverage. The Census data supposedly covers all the manufacturing industries but not the non-manufacturing sector, such as service industries. The JFTC data covers some of the non-manufacturing industries, for instance, mobile telecommunication, office software, social games, trucking services, credit cards, and life insurances. However, they are hardly comprehensive. Besides, market definition is much more difficult for these industries than in the manufacturing sector. For instance, what should be included as social games? Should it be separated from board games or from other game-like net services?

11. The third is the definition of a firm. Particularly when there is partial ownership or common ownership, what should be regarded as a firm, company, or enterprise for the purpose of concentration statistics? Everyone would agree that if company B is a wholly-owned subsidiary of company A, that is, if A owns 100 percent share of B, A and B combined should be the unit. How about if A owns 51 percent of B? 50 percent? 30 percent? If A owns 50 percent of B and C owns the other 50 percent of B, what should we do? As partial ownership and common ownership are prevalent in many countries, the boundary of the firm is blurred and so is the unit to be used in calculating the concentration ratio.

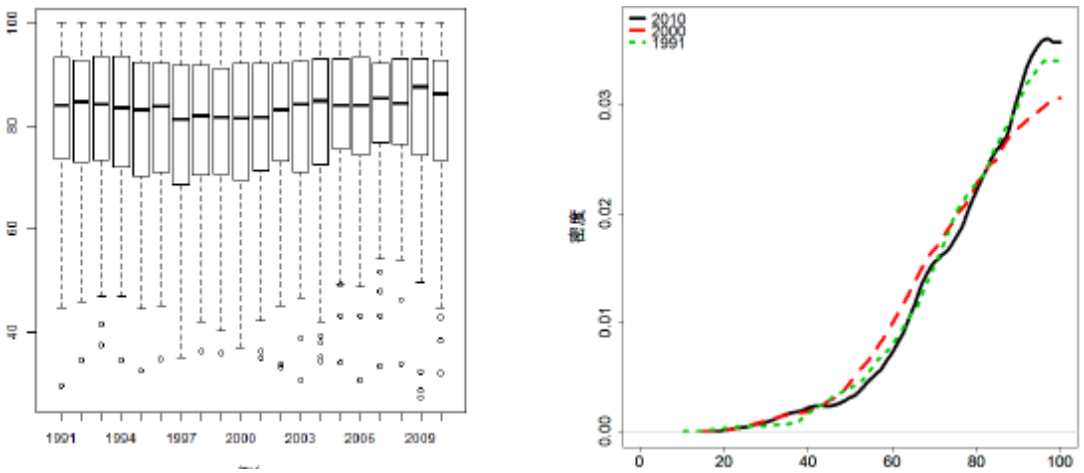
4. Has Concentration Ratio Increased in Japan?

12. With these problems in mind, let us look at the two Japanese statistics to examine if the concentration ratio has increased there.

13. Comparing the Census data of 2008 and 2010, I found that the three-firm concentration ratio (CR3) increased in 1026 industries, stayed the same in 82 industries (mostly from 100% to 100%), and decreased in 686 industries. Therefore, there are more increases than decreases; however, it is just between two years and whether it is a part of a long-run trend is unknown. Besides, looking at some industries in detail, I found some dubious numbers. For instance, it is very difficult to believe that the shipment of electric iron increased by 161% during the two years!

14. As for the JFTC data, I cite from the study by Doi, Honjo and Kudo. The box diagram in Figure 1 shows the trend of CR3 from 1991 to 2010. The bold horizontal line in the box for each year shows the median. It appears to have somewhat declined from 1991 to 2000 but then slightly increased from 2000 to 2010. The same tendency can be found in the distribution of CR3 shown in the right-hand side of Figure 1. There is a slight leftward shift from 1991 to 2000 and a rightward shift from 2000 to 2010.

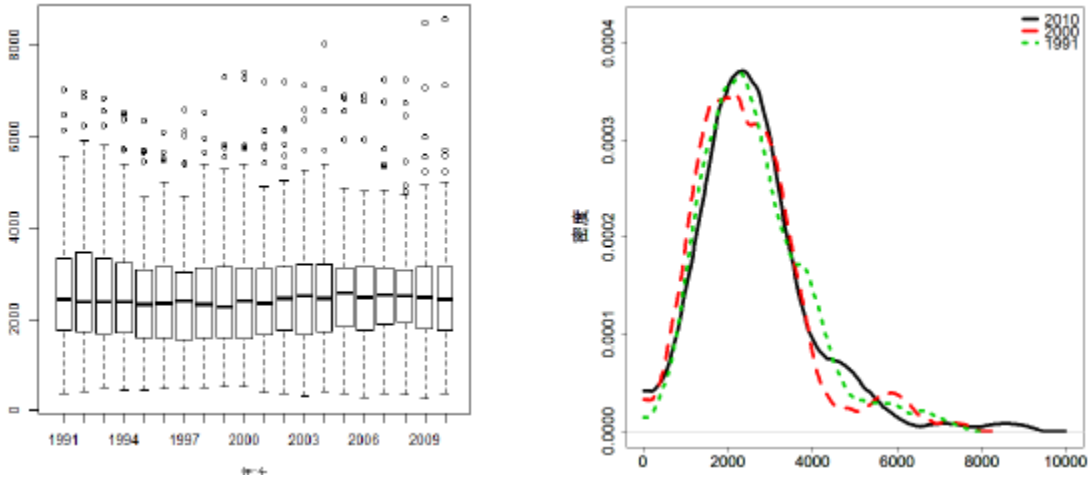
Figure 1. CR4: The Box Diagram and the Distribution, Japan, 1991-2010



Source: N. Doi, Y. Honjo and Y. Kudo "Consideration on Changes of Market Structure of Major Industries in Japan by the Use of Mobility Index, and the Applicability to the Competition Policy: An Analysis Based on the Degree of Concentration of Production and Shipment," JFTC, Competition Policy Research Center Report CR01-14, 2014, Figure 4-1-4 (1).

15. The same tendency can be observed as regards Herfindahl-Hirshman Index (HHI) shown in Figure 2.

Figure 2. HHI: The Box Diagram and the Distribution, Japan, 1991-2010



Source: Doi, Honjo and Kudo, ibid, Figure 4-1-4 (2).

16. One may be thus tempted to say that, since around 2000, there has been a gradual increasing trend. However, the study by Doi, Honjo and Kudo covers only 109 markets (99 manufacturing and 10 service industries) for which the concentration ratio data is continuously available during the 20-year period. Besides, as discussed earlier, the coverage of JFTC data is biased to high-concentration industries. Therefore, whether the same trend is present economy-wide remains an unsolved question.

5. Other Measures of Competition

17. In the same paper, Doi, Honjo and Kudo also studied the mobility (or instability or volatility) of ranking and market share, that is, how much ranking of top firms or their market shares changed from a year to the next. They tried ten indices of mobility and found that, in nine out of the ten, the mobility on average increased in the 2001-2010 period than in the 1991-2000 period. Thus, mobility, which supposedly captures an aspect of competition, does not appear to have lessened in the more recent decade than in the decade earlier. However, the sample is the same 109 and is hardly large enough.

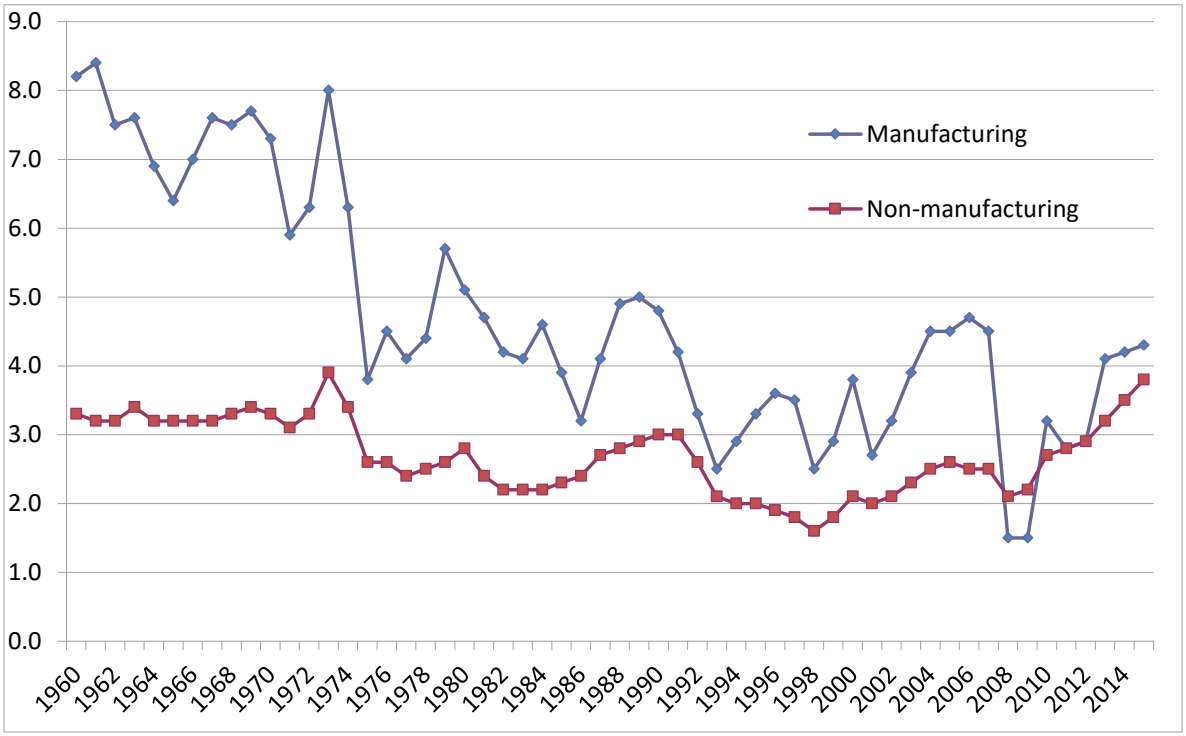
18. In another paper, the same three authors expanded the sample and concentrated on the mobility of the top three firms[4]. They found that (1) the mobility for the top firm, that is, the probability that the No. 1 firm changes from a year to the next, was 0.121, (2) the mobility for the top two firms, that is, the probability that at least one of No. 1 and No. 2 changes from a year to the next, was 0.263, and (3) the mobility for the top three firms, that is, the probability that at least one of No. 1, No. 2, or No. 3 changes from a year to the next, was 0.395. That is, roughly speaking, 12 percent of the top firm lost its position in the next year. Also, in 40 percent of the cases, one or more of the top three firms lost their positions from a year to the next (including the case where the list of the three firms stayed the same but their ranking changed, such as the case where No. 1 and No. 2 changed their positions). Although it is difficult to say if these probabilities are sufficiently high or low, one can at least say that the force of competition that disrupts the order among the top firms is far from absent.

19. Also, with panel regressions using the data for 1991 to 2000, they found that the effect of industry growth on the mobility of market leaders is U-shaped, that is, the mobility is higher (i.e., market leaders are more likely replaced) in growing industries and declining industries than in stable or stagnant industries, and in R&D intensive industries. The number of industries varies from 219 to 396 by year, partly because they excluded the industry-years in which major mergers took place.

20. Some researchers use price-cost margin (PCM) as a measure of the lack of competition following the concept of Lerner index. Because PCM resembles profit rates on sales if marginal cost can be approximated by average cost, I show in Figure 3 the movement of the ratio of profit (before interest and tax) to sales of Japanese firms during the last 55 years. There is a clear downward trend up to 2008 when the financial crisis took place. This trend is present both in the manufacturing sector and the non-manufacturing sector but is more prominent in the manufacturing sector. Since 2008, there is an upward trend owing, presumably, to the recovery from the 2008 crisis and the economic boost caused by Abenomics.

[4] Y. Honjo, N. Doi and Y. Kudo, "The Turnover of Market Leaders in Growing and Declining Industries: Evidence from Japan," *Journal of Industry, Competition and Trade*, published online: 9 June 2017.

Figure 3. Profit Rates on Sales, Japan, 1960-2015



Source: Ministry of Finance, Financial Statement Statistics of Corporations.

21. Therefore, in view of the profit movement too, I find no evidence of lessening competition in Japan, at least until 2008.

6. Horizontal Mergers and Concentration Ratio

22. Of course horizontal mergers (including acquisitions, etc., and called business combinations by JFTC) increase concentration ratios. Some examples are shown in Table 1. For instance, in the cement industry, five major mergers took place during the 1990s, which increased CR3 from 44.4 percent of 1993 to 79.6 percent of 1999. Similarly, CR3 increased after mergers in the other five examples. In all of these cases, at least one of the merging firms was among the top three. Therefore, if the merger was between No. 1 and No. 3 for instance, No. 4 would become No. 3 after the merger, increasing the CR3 by the addition of their share *ceteris paribus*. Or, if the merger was between No. 1 and No. 4, CR3 would increase by the share of this No. 4. Table 1 in fact shows that CR3 increased for this reason right after the mergers.

Table 1. Increases in CR3 after Horizontal Mergers

Industry	Merger	CR3 before merger	CR3 after merger	CR3 in 2014
Cement	5 major mergers in the 1990s	44.4 (1993)	79.6 (1999)	68.6 (63.5)
Paper (for IT use)	Nippon Paper & Daishowa Paper	66.3 (2001)	75.1 (2003)	74.4 (74.4)
Chemical (polypropylene)	2 business integrations	64.7 (2002)	77.8 (2003)	86.9 (78.6)
Gasoline	Shin Nihon Sekiyu & Shin Nikko	56.4 (2009)	64.2 (2010)	63.5 (62.3)
Lead-acid battery	Yuasa & Nippon Battery	71.6 (2004)	85.0 (2005)	83.2 (72.6)
Lithium-ion battery	Panasonic & Sanyo	89.6 (2008)	95.2 (2009)	80.4 (69.2)

Note: CR3 is from the JFTC data at the production level not including imports. In parentheses in 2014 are CR3 at the shipment level including imports. In parentheses in the columns "CR3 before merger" and "CR3 after merger" are the years.
Source: JFTC "Major Business Combination Cases" and Concentration Ratio Data, various years.

23. Perhaps a more interesting question is whether this increase was permanent. At the far-right column of the table is the CR3 in 2014, the most recent year for which the JFTC data is available. It shows that, except polypropylene, CR3 decreased from the post-merger year to 2014 though the extent of this decrease varies across cases partly because the number of years after the merger varies from 15 years (cement) to 4 years (gasoline). The decrease was more than ten-percent point in cement and lithium-ion battery. It is also noted that, except paper and gasoline, presumably the two industries with high shipping costs, CR3 drops by more than five percent point if imports are taken into account (see the parentheses in the far-right column). Thus suggested is the presence of competition from imports.

24. By contrast, CR3 increased in polypropylene. In this industry, I found that CR4 was 89 percent in 2003 but 100 percent in 2014. Therefore, exit took place, which increased CR3. Also, CR3 at the shipment level in 2014 is 8 percent point lower than CR3 at the production level, again suggesting the presence of competition from imports.

25. I am therefore inclined to conclude that horizontal mergers of course increase concentration ratio in the short run but in the long run, competitive forces remain in the form of competition from rivals or imports. Of course, one needs to expand the cases to give a more conclusive conclusion.

7. Are Mergers and Increasing Concentration Always Bad?

26. The answer to this question is "yes" if we can assume a Cournot model in a homogeneous market with no entry because PCM is positively related to HHI in the equilibrium, meaning that the discrepancy between price and marginal cost is larger in an industry with a higher HHI. Also, Dansby and Willig have shown that the industry

performance gradient index, a measure of the extent that welfare can be improved through intervention, is positively associated with HHI[5].

27. Otherwise, that is, if firms do no behave *a la* Cournot, if products are differentiated, or if entry can take place, then, the relationship between concentration and price and/or welfare is not straightforward. Particularly, the relationship may differ significantly between declining industries with excess capacity and growing industries.

8. Declining Industries

28. In declining industries, mergers may give more incentives for the firms to scrap excess capacity, thereby reducing costs and increasing social surplus, even if the prices increase, hurting the consumers' surplus.

29. This is mainly for two reasons. First, a larger firm size may make a room for scrapping a part of the capacity without causing a shortage of capacity to meet the demand. And second, a larger market share means that the firm can internalize more of the benefits from reduction of the industry capacity. This latter effect was called the "internalization of business-stealing effects" by Nishiwaki who studied the cement industry in Japan and confirmed a positive impact of mergers on social welfare[6].

30. Besides, concentration may increase with or without mergers in declining industries as failing companies will exit and entry of new firms is unlikely.

31. Certainly, competition authority needs to watch lest collusive behavior become prevalent in these industries. Probably there are two opposing forces. On the one hand, the presence of excess capacity may reduce the stability of a collusive state. On the other hand, however, old industries tend to have a stable list of firms and may have nurtured a communication network among them, fostering cooperative behavior. A cursory look suggests that the latter effect is at work in a number of real cartel cases. Thus, competition authority certainly needs to be watchful.

9. Growing Industries

32. In growing industries, by contrast, entry is likely to occur, which is expected to bring in not just competition but also new products and new business models to the benefit of consumers. If incumbent firms take any entry-deterring behavior, it is harmful to competition and economic growth and has to be scrutinized by competition authority.

33. How shall we evaluate the acquisition by incumbents of new entrants? If such acquisition hampers future competition as argued by Shapiro for instance[7], they may have to be blocked. In practice, however, there are many difficulties. First, new firms are

[5] R. E. Dansby and R. D. Willig, "Industry Performance Gradient Index," *American Economic Review*, 69, 1979, 249-260.

[6] M. Nishiwaki, "Horizontal Mergers and Divestment Dynamics in a Sunset Industry," *Rand Journal of Economics*, 47, 2016, 961-997.

[7] C. Shapiro, "Antitrust in a Time of Populism," forthcoming in *International Journal of Industrial Organization*. Available at http://faculty.haas.berkeley.edu/shapiro/antitrustpopulism.pdf

likely too small for notification to be required. Second, the increase in HHI is limited and the safe-harbor criterion will be satisfied. Third, often, particularly in the digital and platform industries, the new firms enter with new business models, and the combination may be regarded as non-horizontal, which leads to the question of whether the conventional "market definition" is still useful in such industries.

34. Furthermore, these acquisitions may actually promote new firm creation because to be acquired is usually a profitable exit for entrepreneurs. If so, its prohibition may discourage new firm creation. Also, acquisitions may create efficiency by creating synergy, by introducing managerial and technological capabilities of the acquirer to the acquired, and through the realization of scale and network effects.

35. That is, a difficult dilemma may be there for competition authorities and a case-by-case approach will be needed.

10. Conclusion

36. To conclude, even though the trend of increasing concentration has been discussed widely in the US, the trend is hardly evident in Japan. There may have been a gradual increase in concentration since the turn of the century. However, mobility among the top firms may have rather increased and the competition from import has occurred in some industries.

37. I have also argued that the statistics on concentration ratio in Japan and in other countries are bound to be an imperfect measure of competition or the lack of it. Horizontal mergers increase market concentration almost by definition. Whether this increase is undesirable from the society's or consumers' viewpoint is a moot question. The effect is likely different between a declining industry and a growing industry and competition authority needs to take a case-by-case approach.