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Summary of Discussion of the Hearing on Methodologies to Measure Market Competition

Annex to the Summary Record of the 135th meeting of the Competition Committee

11 June 2021

This document prepared by the OECD Secretariat is a detailed summary of the discussion of the Hearing on Methodologies to Measure Market Competition, held by the Competition Committee on 11 June 2021.

More documents related to this discussion can be found at https://www.oecd.org/daf/competition/methodologies-to-measure-market-competition.htm

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Summary of the Discussion of the Hearing on Methodologies to Measure Market Competition

On 11 June 2021, the competition committee held a discussion on methodologies to measure market competition chaired by Professor Frédéric Jenny.

The Chair introduced the topic and explained that market competition measurement is part of competition authorities' day-to-day work, as it may help prioritise cases, support competition advocacy efforts, and play a part in merger review and merger remedy effectiveness assessment. In addition, it may be relevant when authorities participate in broader macroeconomic policy debates. However, market competition measurement is challenging because competition is a complex notion and is not directly observable; moreover, there are several concepts of competition (e.g., static, and dynamic competition), whose assessment may require different methods. Among the practical challenges are those concerning available data and methodologies for combining structural and performance indicators.

The Chair introduced the expert speakers who took part in the discussion: **Tomaso Duso**, Head of Department in the Firms and Markets Department, Deutsches Institut für Wirtschaftsforschung (DIW Berlin); **Camila Cabral Pires-Alves**, Professor at Institute of Economics at Federal University of Rio de Janeiro (UFRJ) and coordinator at the Research Group on Law, Economics, and Competition (Gdec/UFRJ); **Mike Walker**, Chief Economic Adviser, UK Competition and Markets Authority (CMA); and **John Small**, Commissioner at the New Zealand Commerce Commission. The discussion focused, first, on the benefits and challenges of competition measurement, and second, on its practical use by competition authorities. The Chair asked the secretariat to introduce the main elements of its background paper.

The Secretariat explained that to overcome the challenge of competition not being directly observable, measurement methodologies aim to capture observable causes and effects of the competitive process. Such methods usually employ structural, performance or dynamic measures, or evaluate consumers and businesses perceptions of competition. Each methodology has its advantages and limitations, and competition authorities should consider, first, the purpose of the measurement as this could influence their choices. Second, since neither methodology is unequivocally superior, competition authorities should employ several methodologies. Third, data aggregation level is a major consideration; for example, readily available sector level data is likely unsuitable for measurement of competition in narrowly defined markets. Fourth, market dynamics should be accounted for. And finally, contrary to the common practice of focusing only on domestic firms, any analysis should consider the role of international trade and firms.

While current methodologies cannot provide definite conclusions, they may still provide relevant information for prioritisation purposes. Among other things, a better conceptualisation of the dynamic process of competition will contribute to the improvement of current methodologies, which are usually based on the static concept of competition.

The Chair asked Camila Cabral Pires-Alves to present her view on the benefits and challenges of monitoring competition measures at the industry level over time.

Camila Cabral Pires-Alves focused on methodologies to measure competition on the inter-industry level for the purposes of competition advocacy. The challenges associated

with competition enforcement cases are relevant also in the context of the implementation of economy-wide measurement methods, and, among other things, it is important to understand how competition works and the direction of causality between conduct, performance, and structure. Valuable lessons can also be learned from past experience with structure-performance measurement through cross-section models.

Differences between sectors should be considered for the purpose of industry ranking. Sectors may be classified by their level of homogeneity or differentiation, their technological intensity, etc. These classifications are likely to be country specific, as demonstrated by studies of the Brazilian economy which classify industries by patterns of competition and distinguish between industrial commodities, agricultural commodities, technologically intensive, and traditional sectors. To illustrate, traditional firms are characterised by low productivity, size heterogeneity, low concentration, low margins, production being dedicated to domestic consumption, and low barriers in terms of minimum scale, while firms in the agricultural sectors are relatively efficient, highly profitable, innovative, focused on export, and more likely operate in concentrated markets. This comparison demonstrates that the typology of sectors is country specific, that it may inform the choice of variables and interpretation of measurement results, and that it can help understand differences in patterns over time and the economy's reaction to shocks.

Another useful example concerns innovation. The importance of innovation, the role it plays in competitive dynamics, and the measures of its success, differ across industries and inform the classification of innovation patterns. For example, in the digital services and biotech industries innovation is usually driven by new entrepreneurs and firms which challenge incumbents, whereas in industries such the automotive industry, innovation flows continuously and is usually the product of the routine operation of large firms' R&D department. The nature of the competitive process, i.e., whether competition takes place within or for the market, is also relevant in this respect. Such classifications of innovation patterns inform expectations regarding firm size and concentration, firm entry, and exit, etc. Among other things, correct analysis and interpretation should account for the appropriability of innovation gains, the importance of tacit knowledge in the industry, and the industry's expected dynamics and product cycles.

In practice, competition authorities should have access to reliable and comparable data spanning over time, including data collected by statistic institutions and internal data provided by firms. It is important to stress that the issues concerning the limitations of data provided by statistic institutions covered in the background note may be sector specific and may vary over time. The implementation of such methods can forge a connection between competition and other types of economic policies, help competition authorities set priorities and select industries that appear to require closer monitoring, and produce reliable data which can be further analysed internally or externally. A cost-benefit analysis is however unavoidable.

The Chair then asked Tomaso Duso to present his work on the measurement of competition in antitrust markets.

Tomaso Duso noted that the OECD has been very active in the discussion on competition measurement, which is fuelled by the worldwide increase in concentration levels, and evidence that profit margins are growing, while the share of labour is decreasing. This discussion is usually informed by an analysis of local industry-wide data, which does not correspond with the measurement of concentration in properly defined antitrust markets.

Tomaso Duso and his colleagues' research, which endeavours to assess if and where concentration levels are rising and to identify potential correlations with concentration, is based on analysis of thousands of merger decisions from the years 1995-2014 published on

the European Commission's merger database, which provide information on market definitions and market shares in at least one market. Despite its limitations, HHI is used as a measure of concentration because it is widely used by competition authorities; there is also some new research supporting the use of this measure to assess competitive harm from unilateral conduct. The data from the EC database was coupled with data from EU KLEMS and Worldscope to create a database of over 21 000 observations on markets with data on merging parties' market shares, of which around 10 000 include data on at least one major competitor's market share. The statistics show that the mean market share of merging parties is 36% and of rivals is 18%, and the HHI calculated based on these numbers is around 3 000 – between three to ten times higher than estimated in industry-wide studies. The data also indicates that while there is significant variation in the level of concentration in observed markets, there is a general trend towards increased concentration. Trends vary, however, when market size (national, EU or worldwide) and industry classification are accounted for, and it appears the average trend driven mainly by increased concentration in services.

The most important contribution of this work is an econometric analysis of HHI levels based on a regression that controls for characteristics of markets and industries over time, such as entry barriers (which are reported in the EC database), past merger and merger control activity in the industry and intangible asset intensity (which is considered an important driver of efficiency). The entry barriers variable is the only variable that is strongly correlated with concentration across all worldwide, EU and national subsamples, whereas other variables are correlated with concentration in only some subsamples. Interestingly, intangible asset intensity is positively correlated with concentration in broad markets. This exercise demonstrates that while industry-level analysis misses the level of concentration, it may be capturing some of the dynamic, i.e., that on average concentration is indeed on the rise, but that there is significant heterogeneity. More importantly, the link between entry barriers and concentration may inform the debate on whether the rise in concentration is a positive or a negative development. The correlations between intangibles and concentration indicates that efficiencies may also be important, especially in service industries.

While the compilation of the database used for this research contributes to the discussion, the database is not perfect for various reasons (e.g., it does not contain panel dimensions, and market definitions may be problematic especially in the most relevant markets such as digital markets), and work is being done to extend it.

Finally, these methods can be used not only to monitor the evolution of markets but also to assess the quality of competition policy. For example, Tomaso Duso and his co-authors are now employing the same methods to measure the quality of merger control decisions.

The Chair asked whether the rise in concentration is driven by entry barriers which are characteristic of digital markets whose importance is on the rise, or whether the same correlation can be found in traditional industries as well.

Tomaso Duso replied that their regression analysis demonstrates that this correlation exists in all markets. Work is now being done to try to classify entry barriers reported by the EC, and especially to determine whether they are endogenous or exogenous, and whether they are strategically erected or a natural aspect of the functioning of a given market.

The Chair gave the floor to Colombia.

Colombia asked Tomaso Duso if there was an explanation for the correlation between merger enforcement and the concentration level in the worldwide subsample.

Tomaso Duso explained that the reason for this may be related to the limitations of the database, such as variation in the geographic dimensions of markets in which merger enforcement action took place, and in the process of classifications of markets by industries.

The Chair gave the floor to Chile.

Chile asked whether, given the nature of the database, the results are limited to industries where mergers are more likely to be subject to control, and if there is a difference in trends between industries were mergers were permitted versus those where mergers were blocked.

Tomaso Duso's response to the first question was that the "selection issue" is indeed important and while it is addressed in the current version of the paper, it will always remain a caveat. As for the second question, decisions to block mergers are quite rare; there is therefore insufficient data to draw conclusions.

The Chair asked Mexico to discuss the Instituto Federal de Telecomunicaciones' (IFT) instrument for monitoring the telecom and broadcasting sectors.

Mexico explained that the IFT acts both as a sector regulator and competition authority, and therefore has the advantage of being able to focus its efforts on a limited number of markets. Another advantage is the IFT's broad powers to request data from market participants. Various tools are used to analyse data, including tools that can monitor developments in different product markets (e.g., mobile and fixed telecom, internet services, etc.) in over 2,500 municipal markets. Performance is measured based on data from market participants, information from the Mexican National Institute of Statistics and Geography and from other countries. This tool is used both for advocacy and enforcement, and in a recent case, the IFT made a declaration of substantial market power in the pay TV market, which was based on data from around 200 local markets.

The Chair asked why Mexico decided to base its declaration on structural evidence, rather than on direct evidence on prices, profit margins, etc.

Mexico replied that it would be impractical to collect and reliably measure prices and margins across many markets.

The Chair noted that the Ukraine is developing a methodology to calculate the competitive environment monitoring index and asked the Ukraine whether it was able to persuade the statistical institute to provide better data for this purpose.

The Ukraine noted that it aims to use this tool for policy assessment, case prioritization, and advocacy. The Ukraine has had to tackle many challenges related to data (e.g., market definition, confidentiality, ownership links between firms, etc.), and the Ministry of the Economy and the State Statistics Office lent their support to overcome them. The relevant government bodies have agreed to cooperate on determining which industries to monitor, developing new models for the calculation of concentration indicators by the Statistics Office, improving the register of statistical units to facilitate the identification of enterprises comprised of linked firms, and developing means for collecting data for the measuring of market competition. This cooperation coupled with the competition authority's use of its own internal data will hopefully allow the implementation of the index.

The Chair noted that Korea monitors almost 500 markets in the mining and manufacturing sectors based on data provided by Statistics Korea and asked Korea whether this data matches market definitions. The Chair also referred to Korea's market study of the highly concentrated market for online music and noted that Korea interpreted the modest advertising ratio and capital intensity as indications that entry barriers were low. The Chair asked Korea whether these variables, which are good proxies for barriers to entry in

manufacturing services, provide the same indication in online services markets, and whether different variables would have revealed the existence of entry barriers in that sector (e.g., network effects).

Korea agreed that its monitoring tool is not useful for monitoring specific markets, but it does provide information on trends in the economy. As for the second question, Korea believes that there are no significant entry barriers to the online music sector, that network effects are relatively weak. Korea noted that there are over 20 online music provides, and that market entry is significant.

Korea then shared its experience with market competition monitoring methodologies. Korea employs a mix of structural and performance indicators, such as HHI, market barriers (e.g., regulations, advertising, and capital intensity, etc.), the market share variation fluctuation index, the compared ranking variation projection index, prices, profits, and other related variables. The market structure of the mining and manufacturing industries are thus analysed every two years, and the situation appears to be gradually improving. In addition, the structure of up to five concentrated markets is analysed every year. The online music service was found to be very concentrated, with a CR_1 of 43.9%, but no significant entry barriers were found. Interestingly, profit levels were low across the market, including those of the market leader, the likely reason being the homogeneity of services. Korea however remained suspicious because market shares were stagnant, and several firms were ultimately fined for price-fixing. Another investigation concerned the dominant player's bundling strategy, which strengthened its position in the mobile telecommunications business.

The Chair called on Chinese Taipei to describe its study of the soybean market and its methods for overcoming the scarcity of data.

Chinese Taipei explained that given that data on marginal cost and profit margins are seldom available, indirect measurements such as CR_4 and HHI are used to assess competition levels. The Lerner Index and profit margin analysis can also be useful.

Soybean consumption largely relies on imports, and importers often apply for exemptions to allow the joint purchase and shipping of bulk soybeans. In this context the Johansen co-integration test was applied, and the results show that the three sets of prices analysed (CIF prices paid by international traders, average import prices for domestic companies, and domestic wholesale prices) shared the same long-term trends and were co-integrated. It was therefore concluded that previous agreements between importers did not affect competition.

The marketing margin analysis approach is based on the price difference between vertical markets (e.g., soybean oil and meal prices). To determine whether the marketing margin in the soy processing market was abnormal, local prices were compared with those in the United States, whose market appears to be more competitive than the one in Chinese Taipei. Importantly, these two methods for measuring the state of market competition require only price data which is relatively easy to collect.

The Chair then moved the discussion to the part focused on the use of competition measurement for advocacy and enforcement purposes. He asked John Small to share details about New Zealand's extensive use of competition measurement tools.

John Small explained that New Zealand measures competition at a broad, economy-wide level. In recent years, the Commerce Commission has been charged by the Government to be more proactive, and such measurements can help identify markets that require scrutiny. Available data dictates the methodologies used. The Commerce Commission has access to extensive firm-level data which is collected by Statistics New Zealand and the tax

department and is then consolidated. Strict measures are in place to protect the confidentiality of the data, so the Commission is only able to use the results of the analysis. The analysis focuses on conduct indicators, in particular the Lerner Index and profit elasticity, rather than on structural indicators, because firms are classified by sectors, and not antitrust markets; Tomaso Duso's presentation, which highlighted the bias of industry-wide concentration level analysis, vindicates this approach.

Calculation of the Lerner Index is based on average prices and on variable costs, rather than on marginal costs, which are generally lower; accordingly, and as firms reporting methods vary, results should be interpreted cautiously. This methodology has been in use since 2001 and it will hopefully be updated soon. Profit elasticity, i.e., the change in profit resulting from an increase in variable cost, is a useful measure because it also captures firm entry and exit. Putting the two measures together is problematic because there are essentially two observations (given that the sample period was split into two parts). This kind of analysis provides an overview of trends in the level of competition across many industries.

Naturally, if all measures point at the same direction this can serve as a strong indicator of trends. However, since none of them are completely reliable, these measures serve merely as a screening tool, which helps prioritise resource allocation, identify problematic trends and assess the effects of competition enforcement.

The Chair then turned to Mike Walker to share the UK's experience with competition measurement.

Mike Walker noted there are essentially four reasons for measuring competition at the economy or sector level: first, it enables the tracking of trends over time, for example in order to inform competition authorities' positions in the debate concerning growing profit margins; second, it helps with prioritisation by highlighting trends that may require attention; third, it can help improve the understanding of the relationships between concentration and market outcomes, which in reality is not straightforward; and fourth, it can help improve the understanding of the link between competition metrics and productivity.

As for the CMA's experience, one project in 2014 focused only on structural measures to identify concentrated sectors, but the report was not published because the study was very vast and because the sector classification codes did not correspond to antitrust markets. In 2015, the CMA explored the relationship between productivity and competition, but the results were not robust, and therefore no report was issued.

The "State of Competition" report published in November 2020 found an increase in concentration levels in the UK in the past 20 years. Interestingly, there was a spike in concentration between 2007-2010 following the economic crisis. Since 2010 concentration has slowly declined, although it remains higher than pre-crisis levels. This is concerning if one expects the Covid-19 pandemic to lead to a similar rise in concentration. The report also found a decrease in churn rates, i.e., the extent to which the top ten firms within in an industry remain the same, particularly since the crisis. Excluding several sectors, partial ownership of one firm over another had no significant effect.

The methods covered above are not new. The Office of Fair Trade attempted to implement similar methods, and its experience actually highlights the importance of considering complaints data, which was not discussed thus far. As for the usefulness of these tools, there are many caveats concerning concentration measures and trade statistics, and any inferences may be affected by political developments which may lead to the decline of competitive pressure from outside the UK. However, these tools will likely be used for the analysis of the economic impact of competition policy. In particular, the CMA intends to explore whether profit margins and concentration levels in essential industries differ from

those in other industries, and to continue exploring the relationship between concentration and productivity.

The Chair asked the European Union to share its experience with competition measurement.

The European Union focused on two of the multitude of competition measures it employs, which are not related directly to the ones typically used in enforcement cases. One is the analysis of concentration and profitability based on industry-level data, which shows a moderate increase in concentration across many industries over the last 20 years. There appears to be a trend towards oligopolistic structures, and not necessarily towards monopolisation. Aggregate profitability is also increasing, but profitability should be distinguished from mark-up and care should be exercised when interpreting this measure. Beyond the issues associated with the use of industry-level data, there are problems such as the need to classify firms' sales by industry and to provide measures of market sizes. A paper and policy brief that deal with some of these methodological issues will be published soon.

The second method is designed to evaluate the strength of competition policy enforcement by measuring the number of interventions and their importance, which depends on the size of the affected markets, the intervention's price effect and its duration. This method demonstrates how competition enforcement impacts macroeconomic outcomes such as consumption, productivity, and GDP.

Finally, while in theory there are multiple measures of competition that could be implemented at the micro-economic level, the choice of method depends on the characteristics of the market and is essentially dictated by available data. Another challenge is the discrepancy between these methods and the indicators used to measure competition at an industry or economy-wide level.

The Chair asked Greece to discuss the methodology it developed to measure competition in vertical contexts.

Greece presented a simple indicator based on the concept of "betweenness centrality", which was developed to measure firms' bargain or market power in the supermarket sector. A given firm's power is assessed based on the extent it depends on other firms, and the extent other firms depend on it and firms' market shares are used as measures of this dependency. For example, in a simplified case involving a monopoly and a monopsony, both firms are equally powerful, but when a second buyer is added to the model, the monopoly becomes relatively less dependant on each buyer separately and is therefore considered relatively more powerful.

The data for this measure can be collected relatively easily and calculated simply. Another advantage of this measure is that it considers both seller and buyer market shares as well as the value of the entire ecosystem or network of sales, and not only a given seller's power vis-à-vis its own buyers and vice versa. The indications this measure provides are therefore more robust compared to those based on simple market shares. For example, a study of the Greek supermarket sector showed that certain market players' market share does not provide a good indication of their buying or selling power, given their dependence on their suppliers or buyers.

The Chair whether Greece has clear indications that firms' position in the centre of a network of exchange is correlated with economic power.

Greece replied that this indicator is a somewhat refined type of structural indicator, and that results should always be judged against other indications (e.g., supplier discounts).

This is not an ultimate measure, and conclusions should be based on a combination of methods.

The Chair gave the floor to Brazil to discuss how qualitative and quantitative measures can complement one another.

Brazil employs various quantitative measures, such as HHI, gross upward price pressure index (GUPPI) coordinated price pressure index (CPPI), and merger simulations, which complement qualitative analysis. For example, in the case of the Ultragas-Liquigas merger, the qualitative analysis of the competition level and the effects of the merger in terms of efficiencies incentives for coordination, was complemented by quantitative analysis based on measures such as those mentioned above.

The Chair noted that Turkey analyses cement prices in an attempt to determine whether pricing is more likely the result of oligopolistic competition or coordination, and that its methods combine both macroeconomic structural data and performance data. The Chair gave the floor to Turkey.

Turkey conducted a price-cost-demand analysis and joint pricing behaviour simulations in order to assess the intensity of competition in the Turkish cement market. The analysis was based on transaction data sets (prices, quantities, costs, types of products, buyer identities etc.) obtained from firms in the industry, which included a total of around 5.8 million observations. Simulations were run to determine which assumptions better explain actual prices in the market for the period in question. The results indicate that in most regions of the country, collusive behaviour was more likely and more common than oligopolistic competition. This study contributed to the understanding of the structure and intensity of competition in the cement sector, provided insight as to the steps that should be take in order to promote competition, and led to the opening of several investigations. Following its experience with the study of the cement industry, Turkey is currently developing its own algorithm to be used for risk detection and prioritisation purposes.

The Chair then asked the expert speakers to share their final comments.

John Small was impressed by the diversity of approaches and by the fact that everyone appears to be grappling with similar issues, namely, how to use data and information to tackle competition problems and how to deal with the constraints of the analysis.

Mike Walker noted he was impressed with the theory behind the methodology presented by Greece and stressed the importance of getting the data right first, because the analysis and interpretations are ultimately based upon that.

Tomaso Duso agrees with John Small that everyone is facing similar issues. One issue is the tension between micro and macro, and the challenges associated with defining narrow markets, understanding business models etc. Another conceptual issue concerns the definition of competition. The OECD could contribute significantly to this area by promoting cooperation and standardising of data collection.

Camila Cabral Pires-Alves agreed with Tomaso Duso and believes that additional progress should be made. The discussion highlighted a several ways to deal with the challenges, e.g., dealing with external sources, building solid relationships with statistics bodies, and compiling internal databases. Tomaso Duso and his colleagues' work is an example of opportunities that may be opened if agencies take such steps. Going forward, more consideration should be given to the specificities of sectors and their impact on the interpretation of measures, and to the weakness of the measuring methodologies themselves.

The Chair noted that competition measurement methods have multiple uses and can be very helpful but stressed that competition authorities cannot rely on one method and should instead seek to implement several complementary methods. However, caution should be exercised as data will always remain imperfect and as there is always a risk that inferences based on such measures may be erroneous. Moreover, it is important to ensure measures are properly adapted to the specifics of markets if competition is to be measured at the market level. Finally, it appears there is a lot of interest in this issue, and cooperation between authorities, academia etc. could be beneficial. The Chair thanked the expert speaker, the secretariat and the participants and concluded the discussion.