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ECONOMIC ANALYSIS IN DANISH MERGER INVESTIGATIONS

A merger investigation may use a wide variety of different economic methods. How does the Danish Competition and Consumer Authority decide upon the most appropriate approach?

Economic models quantify the likely effects of a merger under certain assumptions. More sophisticated models reduce the uncertainty of such quantification at the cost of time and effort spent collecting and analysing more detailed data.

Given the tight time constraints in merger investigations, the Competition and Consumer Authority carefully balances the costs of collecting more data with the benefits of a deeper

investigation. This is done on a case-by-case basis, and the choice of methodology depends on the availability of data and how pivotal more advanced quantitative analyses are to the overall assessment of the merger.

1. Introduction

This article outlines the considerations taken by the Danish Competition and Consumer Authority (the DCCA) when deciding upon which economic methodologies to apply in a given merger investigation. The DCCA's toolbox range from largely qualitative analysis supported by a limited set of quantitative indicators to more advanced merger simulations based on econometrically estimated parameters. The level of sophistication depends on the specific circumstances of the case, including access to relevant data, how pertinent more elaborate analysis is to the assessment of the merger, and the resource costs – to the DCCA as well as to external parties – of gathering and analysing the data.

The empirical strategy rests on two pillars: First, while quantitative economic analysis is surely a valuable part of merger assessments, such analysis cannot by itself deliver

the conclusive answer to whether or not a merger is likely to significantly impede effective competition. Every merger investigation involves an overall assessment and balancing of all the qualitative and quantitative evidence.

Secondly, the DCCA chooses economic methodology by considering the expected benefits and costs of applying more advanced methods. Depending on the specifics of the case, more advanced methods may provide more solid evidence of the likely effects of a merger, e.g. by reducing the uncertainty related to the size of the likely increase in prices, which in some cases may make a significant contribution to the overall assessment. On the cost side, more advanced methods typically require more detailed data and greater technical skills, which raise the resource costs of the merger investigation for the authority as well as the merging parties and possibly third parties to the merger.

Box 1: Merger Control in Denmark

Merger control was introduced in Denmark in 2000, and the assessment and procedural steps follow those taken by the EU Commission with minor variations. All mergers between firms with a turnover exceeding certain thresholds¹ must be notified to the DCCA before implementation. Most of the notified mergers are considered unproblematic and follow a simplified procedure, which does not require extensive economic analysis. Around 50 mergers are notified to the DCCA each year², out of which 5-10 are slated for a full screening with the rest undergoing a simplified procedure.

The DCCA encourages the merging parties to contact the authority for pre-notification discussions well in advance of the submission of the merger notification. For the mergers undergoing a full review, it may take several months before the merging parties have provided all the information needed for the DCCA to be able to consider the merger notification complete. When the merger notification is complete, the merger review enters Phase I of the merger investigation. During this screening phase lasting no more than 25 working days, the DCCA decides whether the merger can be cleared (possibly subject to remedies), or whether the merger review shall enter Phase II for an in-depth investigation. Generally, 3-4 mergers each year undergo a Phase II investigation, for which the DCCA has an additional 90 working days, cf. Table 1.

1 Most importantly, mergers between firms with a combined turnover exceeding DKK 900 million (about EUR 120 million) and individual turnover (for at least two participating firms) of at least DKK 100 million (roughly EUR 13 million) are subject to merger review. A few additional criteria are detailed in §12 of the Danish Competition Law, <https://www.en.kfst.dk/media/50102/en-gelsk-oversaettelse-af-lovbkg-155-2018.pdf>

2 Relatively few mergers were notified in 2020, possibly owing to the COVID-19 situation.

Table 1: No. of merger decisions the DCCA 2017-2020

	2017	2018	2019	2020
No. of merger decisions				
...of which:				
- Phase I approvals (including simplified review)	46	48	46	32
- Phase II approvals	3	4	2	0
- Prohibitions	0	0	0	0
Of Phase I + II approvals, subject to remedies	2	2	1	1
Withdrawn notifications	2	0	0	1

In all full merger investigations, the DCCA establishes a case team of economists and law-professionals in roughly equal proportions. The DCCA is organised into several units, including a division dedicated to merger investigations, industry-specific divisions, an economics division and a legal division. The merger division is responsible for all reviews, and the core of the case teams are made up of professionals from this unit. In most full merger investigations additional members from the relevant sector divisions and the economics division are included as an integrated part of the case team. In complex Phase II investigations, the case team can sometimes include 7-8 team members.

Economists are involved in all parts of a full merger investigation, from the pre-notification phase, through Phase I screening and Phase II in-depth analysis to assessing offered remedies and writing the final decision. The DCCA finds economic analytical skills indispensable in the analysis of qualitative as well as quantitative evidence. While the team

members supplied by the economics division play an important role in developing and applying advanced economic methods, the economic analytical expertise is not limited to the economics division. On the contrary, economists residing with the specialized merger division provide analytical skills related to merger analysis, and team members from the industry-specific divisions bring in-depth knowledge of the sector, in which the proposed merger is to take place.

2. The analytical toolbox

The DCCA has a wide and expanding toolbox of different economic analytical methods used for merger investigations. For several years, the DCCA has prioritised the strengthening of the Authority's economic analytical capacity, by hiring Ph.D.s and other highly skilled economic analysts, by devoting resources to the exploration and development of relevant economic theories and methods, and by emphasising the dissemination and upgrading of analytical skills through all units of the Authority.³

Presently, the DCCA's quantitative toolbox contains the standard techniques for analysing unilateral effects of horizontal mergers, which are widely applied by the European Commission and many other authorities, including market definition, Critical Loss Analysis (CLA) and the evaluation of HHI, calculation of indicators for Upward Pricing Pressure (UPP), Compensating Marginal Cost Requirements (CMCR) and Illustrative Price Rise (IPR) and full simulation of mergers, in some cases also including high-level econometrics. So far, the horizontal mergers notified to the DCCA, which have required in-depth investigations, have all involved differentiated products, for which the main assumptions underpinning the UPP/CMCR/IPR methodology are appropriate.⁴

The DCCA explores the potential for broadening the toolbox to include quantitative methods for analysing coordinated effects as well as the effects of vertical and conglomerate mergers, but the Authority has not yet had the opportunity to apply these techniques in a merger case.

3 The investments in upgrading the economic expertise of the Authority is part of a broader drive towards a greater analytical capacity, which also includes e.g. the hiring of a team of data scientists and the establishment of a new division devoted to the enforcement of competition on digital markets.

4 The merger between SEAS-NVE and Ørsted subsidiaries involved the sale of power and natural gas, which are by their nature often viewed as homogeneous products. However, the merger concerned the retail stage of the value chain, and it was the DCCA's assessment that consumers viewed the power/natural gas sold by different suppliers as differentiated products, e.g. due to the local affiliation of a supplier, or because a supplier had developed a particularly green brand (see the Competition Council's decision of 24 June 2020, "SEAS-NVE's køb af Ørsted selskaber", <https://www.kfst.dk/media/bg1newkn/20200624-fusion-seasnve-c3-b8rsted.pdf> (in Danish)). The DCCA has not yet conducted an in-depth investigation into a merger involving strictly homogeneous products, in which the Bertrand-Edgeworth model may be more appropriate.

The DCCA tends to apply different methodologies during Phase I of the investigation (the screening phase) compared to Phase II (more in-depth analysis).

Box 2: Standard methods in merger control

Over the past 30 years, academics and practitioners have developed and refined a range of standard methods, which are consistent with economic theory and practical to use within the limited timeframe of merger cases.

The Critical Loss Analysis (CLA) method is a quantification of the Hypothetical Monopolist Test, which is the theoretical definition of a relevant market in competition economics.⁵

The Upwards Pricing Pressure (UPP), Compensating Marginal Cost Reductions (CMCR), Illustrative Price Rise (IPR) indicators as well as the full merger simulation seek to quantify the incentives of the merged firm to raise prices in response to the elimination of the competitive pressures between the merging parties.⁶ These indicators express the risk of anticompetitive effects of mergers in terms of an increase in price, but they can also be interpreted to indicate the risk of other types of effects, such as reduced product quality and variety or level of service.

These methods are widely used in merger investigations by competition authorities all over the world, including the EU Commission, the US authorities and other national competition authorities.

Screening phase

In the screening phase, the DCCA typically focuses on evaluating the merger's impact on market shares and HHI⁷ based on a tentative market definition or a set of plausible market definitions. Data on sales and market shares are at this stage usually obtained from the merging parties, but in some cases, the DCCA may also be able to retrieve data on sales and revenues from other sources, such as publically available data or early market surveys among the competitors of the merging firms.

In some cases, the DCCA has been able to collect detailed data on consumer switching behaviour, which enables the Authority to calculate Diversion Ratios and tentative UPP, CMCR and IPR indicators already in the screening phase. One example of this was the investigation of the merger bet-

5 See e.g. Meyer, Christine and Yijia Wang (2012), "A Comprehensive Look at the Critical Loss Analysis in a Differentiated Product Market", *Journal of Competition Law & Economics*, vol 8(4): 863 – 879 for an overview of different implementations of the CLA.

6 See e.g. Farrell, Joseph and Carl Shapiro (2010), "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition", *The B.E. Journal of Theoretical Economics*, vol 10(1), article 9.

7 EU Commission's "Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings" (2004/C 31/03), section III, [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52004XC0205\(02\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52004XC0205(02)&from=EN).

ween Tryg and Alka on the insurance market.⁸ To facilitate switching of insurance from one provider to another, insurance companies typically offer new customers to cancel their old insurance policies on the customers' behalf – an offer accepted by almost all customers. In doing so, insurance companies are able to register, which provider their new customers are switching from. The DCCA obtained similar data on consumer switching behaviour in its investigation of SEAS-NVE's purchase of a number of divisions and subsidiaries from Ørsted on the retail markets for electricity and natural gas.⁹ In this case, however, the data was provided by a central regulated data hub.

When the preliminary screening of a merger suggests that a more in-depth assessment of the case is warranted, the investigation moves into Phase II, in which the DCCA considers a wider set of more advanced economic methods. The standard quantitative techniques used to analyse the unilateral effects of horizontal mergers span a continuum of increasingly advanced methods ranging from the calculation of UPP/CMCR indicators, over IPR to the completion of full calibrated or estimated merger simulations.

UPP/CMCR

Calculation of UPP/CMCR indicators is usually the first step during in-depth investigations of horizontal mergers (or, occasionally, as part of the initial screening if the necessary data input is readily available, as exemplified above).¹⁰ The methods are well documented in the literature and established in case law, and the indicators are not technically difficult to calculate. The main challenges consist of obtaining reliable data for calculating the diversion ratios, and of assessing the most appropriate approximations to operating margins (or marginal costs) as well as expected efficiency gains. If data on consumer switching behaviour is not available, the DCCA typically conducts elaborate market surveys to extract information on consumers' second choice preferences. Similarly, the DCCA approximates operating margins based on accounting information requested from the merging parties. The DCCA's experiences with market surveys and accounting data are briefly discussed in the next section.

⁸ The Competition Council's decision of 5 November 2018, "Tryg's køb af Alka", <https://www.kfst.dk/media/53414/20181122-trygs-koeb-af-alka.pdf> (in Danish)

⁹ The Competition Council's decision of 24 June 2020, "SEAS-NVE's køb af Ørsted selskaber", <https://www.kfst.dk/media/bg1newkn/20200624-fusion-seasnve-c3-b8rsted.pdf> (in Danish)

¹⁰ See e.g. the Competition Council's decisions of 27 september 2017, "SE's køb af Boxer", <https://www.kfst.dk/media/47326/20172709-se-boxer.pdf> (in Danish); of 27 February 2019, "Royal Unibrews køb af Cult", <https://www.kfst.dk/media/k14ene4k/20190227-afgoerelse-royal-unibrew-cult.pdf> (in Danish); of 16 August 2017, "Imerco Holding A/S' erhvervelse af enekontrol over Inspiration A/S", <https://www.kfst.dk/media/47066/20170816-imerco-inspiration-16-august-2017.pdf> (in Danish); and decision of 24 June 2020, "SEAS-NVE's køb af Ørsted selskaber", <https://www.kfst.dk/media/bg1newkn/20200624-fusion-seasnve-c3-b8rsted.pdf> (in Danish).

Box 3: Adapting the tools to the specifics of the case

While the textbook version of the UPP/CMCR indicators are relatively straightforward to derive and calculate given the necessary input, the specifics of the case occasionally complicate the analysis. For instance, in the Tryg/Alka merger¹¹, the insurance providers sold portfolios of different insurance products (such as car insurance, home and liability insurance, accident insurance, etc.) implying that the pricing incentives of each insurance product depended on demand patterns related to the entire portfolio. The DCCA had to consider whether to calculate UPP/CMCR at the level of each individual product or the entire portfolio and how to interpret the indicators correctly. Similarly, in 2016, the DCCA launched an investigation into the proposed merger between JP/Politiken and Børsen, two large Danish newspapers. In this case it was appropriate to use the two-sided market version of the UPP/CMCR indicators. Unfortunately this work is not publicly available since the merger was withdrawn before the final decision.

IPR

Technically, calculation of IPR is not much harder than UPP or CMCR, given that the method uses the same data input as UPP/CMCR, and that relatively simple versions of the indicators have been derived in the literature.¹² Once the DCCA has obtained the data necessary to calculate UPP/CMCR, the IPR indicators are literally just a push of a button away.¹³

The IPR indicator is, however, in terms of content more advanced than the simple UPP/CMCR. While UPP/CMCR are marginal indicators, meaning that they only describe the merged firms incentives regarding each single price in isolation, IPR accounts for how the optimal pricing of one product affects the merged firms incentives for pricing other products in its portfolio (including, importantly, the products previously marketed by the individual merging parties). Furthermore, IPR more clearly quantifies the impact from the merger in the form of price increases consistent with the calculations of the price pressures arising from the merger.

¹¹ The Competition Council's decision of 5 November 2018, "Tryg's køb af Alka", <https://www.kfst.dk/media/53414/20181122-trygs-koeb-af-alka.pdf> (in Danish)

¹² See e.g. Shapiro, Carl (2010), "Unilateral Effects Calculations", October 2010, <https://faculty.haas.berkeley.edu/shapiro/unilateral.pdf>; Hausman, Jerry, Serge Moresi and Mark Rainey (2011), "Unilateral effects of mergers with general linear demand", *Economics Letters* 111(2): 119-121.

¹³ The DCCA has in several cases used the Antitrust package in R, developed by Charles Taragin and Michael Sandfort, the US Department of Justice and the US Federal Trade Commission, <https://cran.r-project.org/web/packages/antitrust/index.html>. The Antitrust package includes functions for calculating UPP, CMCR, merger simulations and much more. Both linear and log-linear versions of IPR can be calculated by completing a linear or log-linear merger simulation using data for only the merging parties.

The more comprehensive analysis comes at a cost of greater complexity. Whereas UPP can be calculated “on the back of an envelope”, the calculation of IPR typically requires the assistance of a computer, and tracing the results back to the constituent inputs involves a more elaborate analysis. As a result, the IPR can in some cases be seen as a less transparent indicator than UPP/CMCR.

Box 4: The shape of demand matters

IPR sheds light on an uncertainty related to quantification of merger effects: The calculated increase in price following a merger depends on the shape of the demand curve, in particular how key price elasticities may depend on the price level, which is typically unknown.¹⁴ It is widely recognised that linear demand tends to produce the smallest price increases for a given price pressure, while e.g. assuming log-linear demand generates substantially larger price increases. To more explicitly clarify this uncertainty, the DCCA will when relevant report indicators of IPR based on both linear and log-linear demand, representing respectively a lower and upper bound of likely price increases.¹⁵

Merger simulation

A **full merger simulation** is effectively an IPR extended to the whole market. Whereas the IPR accounts for the interactions of pricing incentives among the products sold by the merged firm alone, a merger simulation also incorporates the responses of competitors to the merged firm’s price changes, as well as the merged firm’s responses to the competitor’s responses.

A merger simulation is a further step from an IPR towards a more advanced analysis involving greater complexity. The results of a merger simulation depends on model parameters representing customer responses to changes in prices (the price elasticity) and where customers go to in response to price changes (cross-price elasticities or diversion ratios). As these parameters cannot be directly observed, they have to be either *calibrated* from observable indicators such as approximated margins calculated from accounting data or *estimated econometrically* from suitable data on demand and prices.

The benefits of a **calibrated merger simulation** in terms of higher precision compared to an IPR depend on the specifics of the case. In relatively concentrated oligopolistic

markets with few competitors, or where rivals are particularly close competitors to the merged firm, accounting for the reactions of rivals can have a substantial impact on the quantified merger effects. Conversely, if there are many competitors, their simulated reactions to the merged firm’s pricing decision, and hence the difference in the results between an IPR and a calibrated merger simulation, tend to be relatively small. In such cases, the DCCA often views the IPR as a good approximation to a more elaborate calibrated merger simulation. It is not much more technically difficult to carry out a calibrated merger simulation compared to an IPR¹⁶, but the merger simulation requires more (accounting) information and data from the competitors of the merged firm.

It is a greater step to advance from a calibrated merger simulation to an **estimated merger simulation**, both in terms of analytical depth and resource costs. In past merger cases, the DCCA assessed that the parameters calibrated from consumer switching data and accounting information were reasonable approximations to the true values of those parameters. Nevertheless, econometric demand analysis can significantly reduce the uncertainty related to such approximations. Such analysis can also provide measures of the statistical uncertainty of the estimates, and hence more clearly quantify the impact of the parameter uncertainty on the assessment of the merger.

The costs of an estimated merger simulation can, however, be substantial, both in terms of data requirements and the high-skilled resources needed to complete the analyses. A thorough econometric analysis of demand tends to require additional detailed data on demand, prices and product- and consumer characteristics. Such data is not always available from a single source, and collecting and analysing data from multiple sources is time consuming (the next section will briefly discuss the DCCA’s experiences with data collection from a single centralised source vs. multiple decentralised sources). Furthermore, completing a thorough econometric analysis of demand is not just a matter of pushing a button - it requires careful scrutiny of assumptions, data validity, the econometric specification and robustness of the results. Such analyses are time consuming and benefit greatly from prior experience with econometric analysis. Whether the benefits are proportional to the costs depends on the specifics of the case, including the importance of reduced uncertainty and the strength of other evidence in the case.

¹⁴ See e.g. Crooke, Philip, Luke Froeb, Steven Tschantz and Gregory J. Werden (1999), “Effects of Assumed Demand Form on Simulated Postmerger Equilibria”, *Review of Industrial Organization* 15: 205-217.

¹⁵ In some cases, the price increase based on log-linear demand is so large that the DCCA effectively concludes that there is no upper bound to the uncertainty related to the shape of the demand curve.

¹⁶ For instance, by use of the Antitrust package in R (see footnote 11), the functions used to run a merger simulation are the exact same as the ones used to calculate IPR – the only difference is that the data input is expanded from the merging parties alone to encompass data from competitors as well.

Box 5: Simulating the Tryg/Alka merger

The DCCA applied a calibrated merger simulation in the Tryg/Alka merger. In its investigation, the DCCA collected data on consumer switching behaviour along with accounting information from the 9 largest insurance companies in Denmark (covering more than 90% of the market). Diversion ratios were calculated from switching data, and the DCCA used accounting information to approximate margins, which were used to calibrate the necessary price elasticities.

In this particular case, the magnitude of the price elasticities played an important role, and the DCCA made attempts to econometrically estimate the price elasticities as a test of whether the observed demand patterns could support or provide evidence against the calibrated parameters. The Authority collected detailed data on insurance sales, prices and characteristics from the 8 largest insurance companies in Denmark (covering more than 80% of the market) and completed an econometric analysis of demand for insurance. The DCCA's preferred specification firmly supported the price elasticities calibrated from accounting data. A number of sensitivity tests were performed with constructive inputs from the merging parties, and it turned out that the estimates were not considered robust when a certain type of aggregation was introduced. As a result, the DCCA decided to base the final decision on the calibrated merger simulation, while the estimated merger simulation was referred to an appendix.

Merger simulations tend to pose additional challenges related to communication of methodology and results due to the complexity of the analyses, and because the analyses depend on confidential data provided by third parties. The DCCA spends considerable time assessing and replying to requests for access to data and information from the merging parties, and the resource costs tend to be higher, the more complex the analyses are. Similarly, the more complex the analyses are, the greater effort the DCCA takes to engage with the merging parties in technical dialogue about the analyses and to ensure that the methodology is properly and precisely documented in the final decision.

Box 6: Experience with 'economic analysis sessions'

During the investigation of the Tryg/Alka insurance merger, the DCCA invited the economic consultants representing the merging parties to a series of "economic analysis sessions", during which the DCCA presented details on methodology and assumptions made and allowed the consultants to propose and test their own specifications. For reasons of confidentiality, the representatives were not given access to data. Given the complexities involved in that particular case, the discussions were mutually beneficial by providing the DCCA with a critical methodological review during the investigation in return for giving the representatives of the merging parties a deeper insight into the methods used by the DCCA. The sessions were, however, also very time consuming.

Other standard and ad hoc methods

While market definition and the evaluation of HHI are initially used for screening purposes, this evidence still plays an important role in most of the DCCA's merger decisions by helping identify actual and potential competitors and by giving an overall indication of how market concentration is affected by the merger. In the screening phase, market shares and HHI are typically based on a tentative market definition informed by the merger notification, preliminary interviews with market participants and available case law. During a typical in-depth investigation in Phase II, the DCCA devotes resources to completing a more elaborate assessment of the market definition based on extensive market surveys and related evidence. In several cases¹⁷, the DCCA has applied Critical Loss Analysis (including versions of CLA based on aggregate diversion ratios) in support of qualitative evidence, and in the withdrawn merger between JP-Politikken and Børsen, the DCCA developed a two-sided version of the CLA.¹⁸

¹⁷ See e.g. the Competition Council's decisions of 26 September 2012, "ARCUS-GRUPPEN HOLDING AS' OVERTAGELSE AF PERNOD RICARD DENMARK AVS", <https://www.kfst.dk/media/13407/afgoerelse-om-fusion-arcus-pernod-ricard-denmark.pdf> (in Danish); and of 27 February 2019, "Royal Unibrews køb af Cult", <https://www.kfst.dk/media/k14ene4k/20190227-afgoerelse-royal-unibrew-cult.pdf> (in Danish). The DCCA also applied CLA in the proposed mergers between JP-Politikken and Børsen in 2016 and HusCompaniet/Eurodan in 2020, but both of these mergers were withdrawn before the Competition Council made its decision, and the DCCA's analyses are not publically available.

¹⁸ See e.g. Katz, Michael L. and Carl Shapiro (2003), "Critical Loss: Let's Tell the Whole Story", *Antitrust Magazine*, spring 2003; Daljord, Øystein, Lars Sørgard and Øyvind Thomassen (2008), "The SSNIP test and market definition with the aggregate diversion ratio: A reply to Katz and Shapiro", *Journal of Competition Law and Economics* 4(2): 263-270; Meyer, Christine and Yijia Wang (2012), "A comprehensive look at the Critical Loss Analysis in a Differentiated Products Market", *Journal of Law and Economics* 8(4): 863-879. The two-sided version of the CLA method has to account for the network externality effects both when deriving the Critical Loss threshold from a 5-10% price increase of a hypothetical monopolist, and when calibrating the price elasticities implied by observed margins.

In some merger cases, the specifics of the case suggest that alternative analytical methods are appropriate as supplements to or instead of the workhorse models discussed above. One example is the merger between Danica and SEB, two large pension funds.¹⁹ The merging parties were active in the bidding market for the administration of retirement savings plans offered to businesses. The DCCA collected detailed bidding data from brokers and analysed the bidding patterns to investigate how often the merging parties participated in the same bids and how often they were winners and runners-up in the same bid. The Authority concluded that the merging parties were not particularly close competitors and, with the qualitative evidence pointing in the same direction, cleared the merger.

In another case, the merger between SE and Boxer²⁰ on the market for flow-TV packages, a crucial question was to which extent Boxer's customers had access to the cable and fibre network of SE, a cable-TV operator. To investigate this question, the DCCA collected data on the physical addresses of all Boxer's customers as well as all the addresses covered by the SE cable and fibre network. By merging the two datasets, the DCCA found that a relatively small proportion of Boxer customers had access to SE networks and that SE therefore was unlikely to put much competitive pressure on Boxer. Based on the overall assessment of the coverage analysis, an IPR analysis and the qualitative evidence, the DCCA concluded that a few concerns were properly addressed by remedies offered by the merging parties early in the process, and the merger was cleared with remedies.

In mergers with elements of local competition, the DCCA uses quantitative methods to define local areas of competition. For instance, in the merger between Imerco and Inspiration²¹ on the retail market for home furnishing articles the DCCA found that a number of factors indicated that the geographical market for retail sales of mid-range/high-end home furnishing articles could be defined as no wider than national in scope with elements of local competition. In the subsequent assessment of local effects, the DCCA examined areas where the local areas specified in a consumer survey of the parties' shops were overlapping and the number of competitors in the areas consisted of less than four shops.

The DCCA is generally on the look-out for relevant natural experiments or supply shocks, which in the Authority's view may provide solid evidence on experienced effects of mergers or firm entry/exits on the market. However, such natural experiments are rare, and the DCCA has yet to

apply a shock analysis to a merger investigation. Recently, the DCCA made a decision in a case on abuse of dominant position on the market for unaddressed mail, in which the Authority documented FK Distribution's dominant position by showing how its prices were raised significantly in response to its main competitor's exit from the market in 2017.²² If available, similar types of analyses can be applied in merger reviews.

3. Primary data sources

The choice of which data sources to tap is closely related to the choice of methodology, and it follows the same basic principle: Are the costs in terms of resource burdens put on external data providers and time spent on internal data analysis proportional to the expected gain in knowledge and understanding of the likely effects of the merger?

The available data and the costs of collecting data vary a great deal across merger cases. The data most often collected by the DCCA can be divided into five broad categories:

1. Surveys among competitors
2. Surveys among customers
3. Accounting data and expected merger efficiencies
4. Centralised data sources
5. Decentralised data sources

Each will be briefly discussed below.

Surveys among competitors

It is standard practise in virtually all investigated merger cases to conduct a survey among the competitors of the merging parties to extract information about the relevant markets affected by the merger, how competition is played out on those markets and the views of the competitors regarding the merger.

Much of the information gained in this process is qualitative in nature, but the DCCA frequently asks two types of questions, which collect responses that are used in the quantitative economic analyses: i) aggregate data on sales and revenues used to calculate market shares and HHI; and ii) hypothetical questions related to competitors' responses to a weakening of competition, including to which extent (potential) competitors would be inclined to enter the market or engage in supply substitution in response to an increase in prices.

It is recognised that competitors may have a strategic interest in responding to the survey in a way that may improve their own competitive standing on the market. Hence, the responses have to be interpreted with care, particularly responses to hypothetical questions and when asking for the respondents' opinions about the merger. Even so, the DCCA finds the competitor surveys useful for gaining a better understanding of how the relevant markets operate.

¹⁹ The Competition Council's decision of 30 May 2018, "Danica Pension, Livsforsikringsaktieselskabs erhvervelse af enekontrol med SEB Pensionsforsikring A/S og SEB Administration A/S", https://www.kfst.dk/media/50518/20180530-danica_seb.pdf (in Danish)

²⁰ The Competition Council's decision of 27 september 2017, "SE's køb af Boxer", <https://www.kfst.dk/media/47326/20172709-se-boxer.pdf> (in Danish)

²¹ The Competition Council's decision of 16 August 2017, "Imerco Holding A/S' erhvervelse af enekontrol over Inspiration A/S", <https://www.kfst.dk/media/47066/20170816-imerco-inspiration-16-august-2017.pdf> (in Danish)

²² The Competition Council's decision of 30 June 2020, "FK Distributions vilkår om koblingssalg", https://www.kfst.dk/media/b3rmkvun/20200630-fk-distributions-vilk%C3%A5r-om-koblingssalg_feb2021-final-a.pdf (in Danish)

Surveys among customers

Surveys among customers are considered to be some of the most important data sources, particularly in cases where other data reflecting customer demand is not readily available. The DCCA has extensive experience with conducting customer surveys and prioritises considerable resources into careful preparation and running of surveys.

Through customer surveys, the DCCA obtains quantitative and qualitative information on the demand side of the relevant markets, including information on customers' actual demand behaviour, their stated preferences regarding product characteristics, and their stated responses to hypothetical situations.

Perhaps the most important piece of information gained from customer surveys – at least for use in quantitative analyses – is responses regarding customer switching behaviour. If it is possible to identify customers, who have recently switched supplier, the DCCA generally prefers to ask respondents about their actual behaviour rather than posing hypothetical questions regarding their expected behaviour in a given situation. Asking customers about their recent experience with switching supplier ensures that the respondents have at least to some extent considered the alternatives on the market and made their own preferences clear so as to be able to make a choice.

Box 7: Customer surveys in the SE/Boxer merger

In the SE/Boxer merger case on the market for flow-TV packages, the DCCA completed two customer surveys, one among a representative sample of all households in Denmark, and another among the merging parties' former customers, who recently cancelled their TV-subscription. When asking the representative household sample about their hypothetical second choice, more than half the respondents replied "Don't know". In contrast, when asking previous customers about their recent switch, respondents could give information about which provider the customers switched to as well as their motivations for doing so. The DCCA interpreted these findings to imply that a substantial proportion of households did not consider their TV options on a regular basis, and the Authority concluded that the survey conducted among the representative sample provided a more uncertain picture of the customers' switching behaviour compared to the survey among the parties' former customers (the household survey did, however, provide a wealth of information related to other features of demand than switching behaviour).²³

²³ It should be noted that data on customer churn carry its own caveats as well. Mainly, the use of diversion ratios based on churn data or exit interviews assumes that the choices of the exiting customers also reflect the second best options of the remaining customers. In the SE/Boxer case, the DCCA found no evidence to suggest otherwise, but this may not always be the case.

In some cases, it may not be possible to obtain contact information on customers, who have recently switched provider, or previous switching behaviour may be less relevant to the merger. In such cases, the DCCA typically formulates questions on customer responses to hypothetical situations.

The DCCA carefully considers two forms of hypothetical questions on switching behaviour: The "price-increase question" (internally denoted the "SSNIP-question", referring to the notion of the "Small, but Significant and Non-transitory Increase in Price") and the Second Choice question. With a SSNIP-question respondents are asked how they expect to react to a 5-10% increase in the price of their currently purchased product.²⁴ A second choice question asks respondents what they expect to do if their current preferred option was no longer available.

Assuming that respondents correctly reveal their true preferences, the main advantage of the SSNIP-question is that the responses can be used to derive both the customers' price sensitivity (the own-price elasticity) and their switching behaviour (the cross-price elasticities/diversion ratios). However, the DCCA has found that there is a risk that respondents are overestimating their own price sensitivity, particularly when the relevant products are purchased as a form of subscription (such as an insurance policy, a newspaper subscription or a TV-package). Respondents may very well have the intention of switching to a cheaper alternative if the price of their currently purchased product increases, but consumption inertia and search costs may often hinder customers from actually carrying out their stated intention. Consumption inertia is especially acute with subscriptions, as switching requires an active and conscious response from the customers. As a result of these and similar challenges, the DCCA will not always pose the SSNIP-question. As a viable alternative, the Authority often favours the use of a Second Choice question, as noted below, and the DCCA may in some cases base the market definition on other qualitative and quantitative evidence, such as measured customer behaviour, the characteristics of the products and their intended use.²⁵

Because of the risk of biased responses to the SSNIP-question in some cases, the DCCA frequently poses the second choice question instead or as a supplement. As the second choice question does not reveal reactions to an increase in

²⁴ Traditionally, the DCCA's formulation of the question has closely followed the EU Commissions Notice on the definition of the relevant market and defined the SSNIP as a 5-10% increase in price. However, in some recent cases, the Authority has opted for fixing the SSNIP at 10% as this makes it more clear to respondents what the hypothetical price increase entails and as it makes the subsequent interpretation of the results easier. If the DCCA has information about the current price paid by each customer, the question may be formulated as a price increase measured in DKK to make the magnitudes clearer for the respondents.

²⁵ In a recent ruling, the Competition Appeals Board affirmed the view of the Competition Council that a quantitative SSNIP-test or a CLA is not a requirement for market definition in all cases, see "Kendelse af 27. april 2021 - Forbruger-Kontakt A/S mod Konkurrencerådet", <https://www.kfst.dk/media/dfgd2uzn/20210427-kan-kl-4-2020-final-a.pdf> (in Danish).

price, the responses do not say anything about the price sensitivity of customers. However, the responses reveal which option is the next-best alternative to the customers' current purchases and the responses can be used to calculate diversion ratios. The DCCA often applies these diversion ratios in conjunction with measures of price sensitivity calibrated from operating margins approximated from accounting data (see discussion of accounting data below).

The DCCA generally considers customer surveys a relatively low-cost and highly flexible source of data. Although the survey may disturb thousands of potential respondents, the burden put on each individual respondent is minor. Surveys can typically be tailored to extract information on features, which are particularly relevant to each merger investigation. As a result, the DCCA carries out customer surveys in almost all merger cases, which proceed beyond the screening phase.

Accounting data and expected merger efficiencies

The DCCA usually collects product-level accounting data on the products affected by the merger from the merging parties, and in some cases from competitors as well. The Authority needs indicators on product prices and margins from the merging parties to complete the analyses of UPP/CMCR and IPR, and in cases, where a full (calibrated) merger simulation is warranted, similar indicators are required from relevant competitors as well.

In principle, margins are not directly observable, but they can be approximated from accounting data as the difference between revenues and marginal costs. The greatest challenge is identifying the best approximation to the true marginal costs. The DCCA conducts a case-by-case assessment of marginal costs, in which the Authority tends to apply a fairly parsimonious standard, generally only counting as marginal costs the short term costs of producing and selling one additional unit or servicing one more customer.

The DCCA encourages the merging parties to forward documentation detailing a quantification of the cost savings that they expect to derive from the merger. Theoretically a horizontal merger between competitors will always generate adverse competitive effects, unless the loss of competition can be outweighed by efficiency gains, e.g. in terms of economies of scale. The DCCA includes the expected efficiencies put forward by the merging parties directly in the economic analysis, to the extent that the efficiency claims are properly documented. When assessing the documentation forwarded by the merging parties, the DCCA closely follows the standards established by the EU Commission's guidelines²⁶ and case law, requiring that the claimed efficiencies are 1) to the benefit of consumer; 2) merger specific; and 3) verifiable.

Centralised data sources

The DCCA will when relevant seek to obtain more detailed data from a centralised data source, if such data is available. For example, in the investigation of the merger between SEAS-NVE and Ørsted subsidiaries on the retail market for electricity and natural gas, the DCCA retrieved data on each customer's current gas and power provider as well as customer-level data on switches between providers for all Danish households and firms. In Denmark, such data is kept in a central government-run data hub to facilitate customers' switching between different providers. The highly detailed data enabled the DCCA to derive very precise measures of market shares (by volume) and diversion ratios.

Data from a centralised data source is often associated with relatively low costs in terms of data collection and subsequent analysis. Since such data is typically stored in standard format for the purpose of analysis and statistical summary, and it is often relatively easy to extract in a form, which is usable for the DCCA. Consequently, requesting data from a centralised data source tends to put fairly modest burdens on the data providers.

Decentralised data sources

A usable high-quality and centralised data source is a luxury, which is not always available. A somewhat more costly alternative is to request the desired data directly from several individual market participants, such as the merging parties, their competitors, main customers or main suppliers.

The DCCA has good experience with gathering detailed data from multiple decentralised data sources. In the SE/Boxer merger case, the DCCA requested accounting data, data on sales and prices over time, as well as address data on all customers and cable network coverage from the 8 main providers of flow-TV and broadband connections. Similarly in the Tryg/Alka case, the DCCA obtained accounting data, customer switching data as well as detailed monthly data on sales, prices and product characteristics at the postal-code level from 9 of the largest insurance companies in Denmark. The very detailed sales data were necessary for carrying out an estimated merger simulation, as discussed in Box 4: Simulating the Tryg/Alka merger.

In the experience of the DCCA, data from decentralised data sources is much more costly and time consuming to extract and analyse than data from a centralised data source. Individual firms tend to store their data in a format that is specifically tailored to their business needs, such as administering invoicing of their customers, calculating Key Performance Indicators, etc., which is not necessarily directly useful for the DCCA's analytical purposes. As a result, it is potentially time-consuming for the firms to extract the requested data and deliver it to the DCCA in a form that is

²⁶ EU Commission's "Guidelines on the assessment of horizontal mergers under the Council Regulation on the control of concentrations between undertakings" (2004/C 31/03), para. 76-88, [https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52004XC0205\(02\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52004XC0205(02)&from=EN).

useful for further analysis. Furthermore, each firm tends to have their own idiosyncratic systems and standards for storing and reporting data, and the data obtained from different firms may not be directly compatible with one another. Nevertheless, the DCCA has found that careful planning of the data request based on close dialogue with the merging parties and competitors can alleviate many of the challenges associated with gathering decentralised data, and data provided by individual firms remains a potentially powerful - though more costly - option, should the investigation of the case require it.

The DCCA is also exploring the potential for systematic gathering of information publically available from the Internet through web-scraping. The DCCA sees web-scraping as a potentially useful supplementary data source, particularly in markets relying on the Internet for marketing products and communicating prices.²⁷ The DCCA's use of web-scraping is still in its infancy, and the authority has yet to apply scraped data in a merger decision.

4. Discussion: Choice of economic methodology

At any stage in a given merger investigation, the DCCA will decide to deepen the investigation and apply more advanced methods, if the benefits of doing so can be expected to justify the costs in the specific case. While the DCCA is mindful that some of the costs are often paid by the merging parties or third parties in terms of time spent providing data, the Authority will request whatever data is deemed necessary and proportional in a given merger investigation. In cases, where narrowing the uncertainty is vital for the assessment of the merger, the DCCA is prepared to allocate the resources needed for a deep and thorough investigation.

There is an inherent challenge concerning the timing of these decisions given the tight deadlines of a merger investigation. Since data collection and analysis tends to be time consuming, the DCCA has to make the decisions of which methods to apply and what data to collect at a relatively early stage in the merger investigation. The challenge is that costs and benefits of using more advanced methods may not be completely clear at the early stages of the investigation process. This presents a dilemma for the DCCA: Initiate relatively costly data collection early in the process and run the risk that highly advanced methods may not be as necessary as anticipated, or delay the data collection until the benefits of advanced methods have become clearer, leaving less time for a thorough analysis.

The DCCA begins identifying and collecting data as early as possible in the merger investigation process to ensure sufficient time is available for a thorough analysis. The Autho-

riety initially proceeds cautiously, by focusing on collecting the “cheapest” and the most important data first – usually data, which already exists in a usable form or which can be prepared with modest costs, data provided by the merging parties, centralised data sources and public data, as well as data, which is vital to any merger investigation. Later in the process – usually after the investigation has entered Phase II – the DCCA may decide to expand the data collection to more costly sources if necessary.

Box 8: An example of the DCCAs data collection approach

The investigation of the Tryg/Alka merger is a good example of the DCCAs efforts to have a pragmatic approach to collecting data. During the pre-notification discussions, the DCCA learned from dialogue with the merging parties that detailed data on customer switching could be delivered with modest effort. This enabled the DCCA to submit the first request for accounting and customer switching data from the merging parties a few days after receiving the first draft of the merger notification. When the DCCA later in Phase II decided that additional detailed data from the merging parties as well as their competitors was needed, the Authority was in a position to identify the data requirements based on the preliminary analyses of the data collected earlier in the process. This enabled the DCCA to prepare very detailed data requests, which greatly facilitated the data collection.

Ultimately, the quantitative economic methods applied in merger cases are chosen on a case-by-case basis. There is no one-size-fits-all methodology, and the DCCA always seeks to adapt the chosen methods to the specifics of the case. No matter how advanced the chosen methods are, the merger assessment can never rely on the quantitative economic analyses alone – the DCCA always bases its decision on an overall assessment of all available quantitative and qualitative evidence.

²⁷ One drawback with web-scraping is that data scraped for a specific purpose typically represents a snap-shot of the data currently available on the Internet, e.g. current prices and product characteristics, whereas historical data and developments over time are often not available. For this reason, the DCCA tends to view web-scraping as a supplement rather than an alternative to the traditional data sources detailed above.