



Economic analysis in merger investigations



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Foreword

Economic analysis is central to effective merger review. It provides the framework that underpins the analysis of competition and the likely welfare effects of mergers. Merger review is unique in competition law because it is largely a forward-looking exercise concerned with the prevention of expected competitive harm. This presents unique challenges for economic (and legal) analysis. It requires the marshalling of relevant evidence to form an expectation about likely future effects, but there are few certainties in merger review.

The economic framework for merger analysis provides the scaffolding on which to hang both quantitative and qualitative evidence and analysis of data, documents and witnesses, in order to build an integrated picture of how competition and efficiency are likely to be affected by a merger. Hence, economists have a role to play in the analysis of all types of information pertinent to the review of a merger. What sort of analysis is possible in any given merger review will depend on the information that is accessible and the time and resources available to a competition agency. Just because a particular piece of analysis is possible, however, does not necessarily mean it will be a good use of resources. Once an agency has a handle on how competition works (or does not) in the relevant market, economists can help identify key pieces of information or filters that may enable a merger to be cleared relatively quickly without extensive and detailed analysis. Where more extensive and detailed analysis is required, there will still be limits on what is possible. A number of more or less complex quantitative techniques, from critical loss analysis to merger simulation can be employed, if they are likely to be useful and relevant data is available in a timely fashion. Quantitative techniques can inject a degree of discipline on the analysis and provide a check on loose thinking, but they can also suggest false precision. Quantitative analysis will never be enough on its own. It needs to be integrated and consistent with the analysis of documentary and witness evidence. As well as being central to the merger review process, economists also have an important role to play in the analysis of proposed remedies and in ex post merger review.

Ideally, economists should be integrated within an agency so that they can be both closely involved in all types of analysis alongside investigators and lawyers, but also receive professional oversight and support. This requires competition agencies to have both strong horizontal and vertical organisational links. For many agencies, internal economic resources are limited and the cost of engaging external economists limits their use. It is important, therefore, to make the best use possible of third party economists engaged by the merger parties (or others) and several agencies have published guidance to assist those economists. The choice of an economist for the courtroom is also important. One of the most important skills for a courtroom economist is communication. They need to be able to explain how they see the economics of a merger to a Judge in a way that is relevant to the legal test that applies in a particular jurisdiction.

This paper was written by Jill Walker (Member of the Australian Competition Tribunal and former Commissioner at the Australian Competition and Consumer Commission – ACCC, and the New Zealand Commerce Commission - NZCC) working as a consultant for the OECD Competition Division. The views expressed herein do not necessarily reflect those of the Tribunal, the ACCC or the NZCC.

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1 Introduction

Competition law is economic law, informed by an analytical framework that tells us that absent market failure, competitive markets tend to drive efficient outcomes. Economic analysis is therefore a fundamental part of merger control. It underpins the theories of harm that guide merger reviews, and it provides the tools to interpret evidence when assessing these theories.

The specific legal test to prohibit anti-competitive mergers varies across jurisdictions, e.g. “substantial lessening of competition”, “significant impediment to effective competition” or “dominance”. However, all competition regimes are concerned with whether a merger reduces competition or increases market power.

While all (horizontal) mergers will have some effect on competition, they can also result in efficiencies in production, transactions costs or research and development. Furthermore, maintaining a healthy “market for corporate control” is important and it may well be the case that the best alternative owners for a firm are already in the same market. Hence, most competition regimes only prohibit mergers that meet some sort of threshold in terms of the size of their impact on competition. In addition to requiring competition effects to meet some sort of threshold, many regimes also include provision to take account of merger specific offsetting efficiencies, either as part of the competition test or as an offset or exemption.

Economics provides the framework and the tools to analyse the likely effects of a merger on competition and efficiency, analysis that is fundamentally the same regardless of the specific legal test. The legal regime in particular jurisdictions then determines whether any particular effects, and the relevant evidence, are sufficient to establish a breach of the law in that jurisdiction.

Merger review is unique in competition law because it addresses market structure and is generally concerned with potential future rather than past or current conduct.¹ This has particular implications for the nature and role of economic analysis and evidence in merger review and control.

Economic expertise can be of value at each stage of a merger investigation, from screening, evidence gathering and analysis to the assessment of remedies. Economic analysis is not necessarily time consuming, complex or expensive. Nor does economic analysis equate to quantitative analysis. It is equally important for evaluating documentary and witness evidence as it is for econometrics, because it provides the analytical framework within which that evidence can be interpreted.

However, it is not always straightforward for authorities to select methodologies for economic analysis, decide how limited economic resources should be distributed, and develop a strategy to get the most out of economic analysis. This session will seek to explore some of these challenges.

To provide background for the discussion, this paper will provide an overview of the relevant economic framework, theories of harm and relevant evidence for merger review, as well as the use of economics to analyse possible remedies and for ex post merger review. It will also look at the use and organisation of economists by competition agencies.

2 Economic Framework for Merger Analysis

In this section, we provide a brief overview of the basic economic framework that underpins merger control and the specific theories of harm that may be relevant when analysing particular mergers. This analytical framework is reflected in the merger guidelines published by competition agencies around the world and the practical guidance for merger review assembled by the International Competition Network (ICN) as well as papers prepared for various OECD Roundtables.

2.1 Market Power and Competition

Merger review and control is concerned with identifying whether and how a merger might reduce competition and increase market power. Market power in supply is the ability to profitably raise prices above competitive levels, or reduce quality and other non-price benefits below competitive levels (for a non-transitory period).

Competition may also be reduced and market power increased on the demand side of a market as a result of a merger. Buyer power is the mirror image of supply side market power: the power to reduce prices (or non-price benefits) below those that would emerge in a competitive market (Noll, 2005^[1]). It is erroneous to think that reducing upstream prices through the exercise of monopsony power will necessarily benefit consumers.² While buyers with market power will benefit from lower prices, it does not follow that final product prices will be lower: if fewer upstream purchases translates into lower downstream supply, or if supply comes from less efficient sources, prices are more likely to rise.³ Furthermore, the sellers who lose out are also consumers in other markets and their lost income translates into lower demand, resulting in an overall loss of allocative efficiency. This is perhaps particularly obvious in the case of labour markets, which have been receiving more attention as a focus of concern for competition law (OECD, 2020^[2]).

In what follows we focus on mergers on the supply side of the market, as this tends to be the more common cause for concern. However, it is important not to neglect potential demand side considerations where a merger results in a small number of buyers and suppliers have limited options.⁴

Market power (or increased market power) can be constrained by substitution. If a sufficient number of consumers will switch to alternative suppliers, including imports and potential new entrants, merged firms will not generally enhance their ability to profitably increase prices above competitive levels, or reduce non-price benefits. Hence, merger review and merger guidelines generally consider questions of market definition, concentration, import substitution, entry and countervailing power because each of these factors tells us something about substitution and competitive constraints in and on the market.⁵

2.1.1 Market Definition

Market definition essentially identifies the most immediate competitive constraints on the merged entity. This includes other goods and services that consumers consider to be close economic substitutes and suppliers who could switch production capacity to supply any such products.⁶

Most competition agencies have now adopted the hypothetical monopolist SSNIP test to identify the relevant market(s). This “test” is really a framework and intellectual discipline for organising various pieces of evidence. It identifies the relevant market as the (smallest)⁷ area of product and geographic space over which a profit maximising hypothetical monopolist would impose a small but significant and non-transitory increase in price (SSNIP). In this way, it identifies an area over which it is possible to exercise market power, making the market relevant for review of the merger. It defines “close” substitution as that which would prevent a SSNIP (rather than, for example, substitution that would only occur in the event of a much larger price rise). It also helps to focus the collection of evidence regarding whether and to what extent consumers and producers would actually switch in response to a SSNIP, rather than whether such switching is possible but unlikely in the event of (only) a SSNIP.

While the product and geographic scope of the market are the most common focus for delineation, other dimensions that may be relevant are the functional, time and consumer dimensions. The functional dimension refers to the relevant stage of the supply chain. While not often contentious, it can become so if it is argued that substitution at one stage of the supply chain constrains the exercise of market power at another stage. This was a contentious issue, for example, in a series of grocery wholesale mergers in Australia, where it was argued that downstream competition from vertically integrated chain stores constrained the upstream prices charged by wholesalers to non-integrated retailers.

In some merger scenarios where dynamic effects on competition are a particular concern, it may be markets for pipeline products or more remotely *innovation markets* that need to be defined (Gilbert and Sunshine, 1995^[3]). In the latter case the concern is with reduced activity in competing research and development, which might ultimately result in new or improved products. Analogous to the SSNIP test, a SSNDR&D test could be applied.

Increasingly competition agencies are called on to review mergers involving multi-sided platforms. However, while it will always be important to take account of feedback loops or cross platform network effects, it is important to consider substitution on *each* side of the platform as they may be different (see, for instance, OECD (2018^[4]) and OECD (2020^[5])). One side may be subject to more competitive constraints than the other side; and products which may be complements on one side may be substitutes on the other side.

While market definition is not essential from an economic perspective, it is a helpful discipline to identify the area of close competition over which it might be possible to exercise market power. Furthermore, it is often a legal requirement of the competition test for mergers.

2.1.2 Market Concentration

One advantage of market delineation is that it allows market shares and measures of concentration to be calculated. Theories of harm in horizontal mergers are all underpinned by the economic theory that higher levels of concentration brought about by mergers reduce the options available to consumers and can allow suppliers to exercise increased market power, either unilaterally or collectively. A review of merger decisions by European competition agencies recently confirmed the relevance of concentration filters for merger review: completed mergers in more concentrated markets were associated with larger price increases (Ormosi, Mariuzzo and Havell, 2015^[6]).

In some jurisdictions, there is a rebuttable presumption of harm above certain levels of concentration. More commonly, concentration is used as a filter to take mergers off the table, establishing safe harbours for mergers that are highly unlikely to raise competition concerns because the level and/or increase in market concentration is low.⁸ However, a number of recent reports on the digital economy have proposed the adoption of rebuttable presumptions for certain acquisitions (OECD, 2020, p. 34_[5]). Both approaches reflect the fact that measures of concentration will not tell the whole story. They are a necessary but not sufficient condition for competition concerns in relation to a merger. A more complete analysis is required before intervention is warranted.

Common measures of concentration that are used by competition agencies for this purpose are the merged firm's market share, the CR4, CR3⁹ or Herfindahl-Hirschman Index (HHI)¹⁰. Often there will be two different screens for unilateral and coordinated effects. The merged firm's own market share will be most relevant for unilateral effects and some measure of market concentration will be most relevant for coordinated effects. It can also be important to look at how market shares change over time, e.g. bidding markets can show large shifts in market share when new contracts are awarded.

A number of units of measurement can be used for these concentration ratios, each of which may provide a different insight into competition in the market, e.g. production capacity, unit sales or revenue. Each measure can be quite different in some markets and some will be more relevant than others, e.g. the combination of capacity shares and units of sales may be particularly informative in markets for homogeneous goods, while revenue shares may be more informative in markets for differentiated products. In digital markets, the options may increase even further and may be different on each side of a platform, e.g. share of audience (which in turn may be measured in various diverse ways such as unique visits, user sessions, page impressions or time spent on a site), share of inventory (e.g. in the case of classifieds) and share of advertising revenue.¹¹

2.1.3 Import Competition

Import competition is often singled out in merger analysis, particularly for small open economies. The competitive constraint imposed by imports may be greater or less than suggested by their market share. On the one hand, imports may face additional costs and obstacles to supplying the market. On the other hand, once supply chains are established, the elasticity of supply may be high, especially if the destination market is relatively small compared to production capacity at the origin of imports.

In some cases, export diversion may be more relevant: if domestic firms currently export a large proportion of their output and this could be readily diverted to the domestic market, this supply could impose a competitive constraint similar to imports. The relevant question for merger review is to what extent imports or diverted exports are likely to constrain the exercise of market power post merger. This will depend on market specific factors that in turn affect whether consumers are likely to switch to these products and whether supply can readily expand in response to increased demand.

2.1.4 Barriers to Entry

Barriers to entry are often a particular focus of inquiry in merger reviews. If barriers to entry are low, then the merged firm will be constrained by the threat of entry and substitution by customers to potential entrants as well as existing rivals.

While economists may argue over what is and is not a barrier to entry, what matters for merger review is the likelihood of entry that will be sufficient to constrain the exercise of market power in a timely manner post-merger. Focusing on that question can avoid unnecessary and unproductive debates between warring economists.

In some cases there may be existing plans for entry which are sufficient to alleviate competition concerns, but those plans will need to be critically examined to ensure that they would be likely to generate sufficient supply of close substitutes that consumers would be willing to buy in sufficient numbers to constrain the exercise of increased market power post-merger. In other cases, it will be necessary to consider the conditions for entry more generally.

Supply side factors that may be relevant to that assessment include regulatory barriers, sunk costs, economies of scale, technological developments and access to scarce inputs such as raw materials or appropriate sites.

On the demand side of the market, brand loyalty, search and switching costs or behavioural bias may affect the likelihood of switching to entrants by consumers, making entry more difficult.

Network effects, both same-side and cross-platform, as well as consumer inertia and switching costs, plus access to “big data” will be particularly important considerations for platform markets.

The history of entry (or not) will likely provide a starting point for the relevant analysis, but it will also be necessary to take account of how market circumstances may have changed or be changing, e.g. whether demand is growing or declining, whether new technologies have increased the prospect of entry and whether regulatory barriers are being removed or erected.

2.1.5 Countervailing Power

Countervailing power, as the name suggests, refers to a situation where buyers are able to prevent the exercise of increased market power by suppliers. While large buyers may have bargaining power, if market power increases on the supply side of the market, the new bargain may still result in higher prices.¹²

Only if the buyer is in a position to prevent the exercise of increased market power post-merger, perhaps because they are in a position to vertically integrate or sponsor entry, will a buyer truly have countervailing power. Furthermore, it may be the case that only some buyers have countervailing power.

2.1.6 Concluding remarks on market power

Each of these elements of merger analysis are important and it may help to organise the evidence according to these factors. The legal test may even specifically require them to be addressed. In particular, the test for unlawful mergers in many jurisdictions refers to changes in competition or market power *in a market*, which tends to require a market to be delineated. It is important, however, that these elements of the analysis not become tick boxes. Rather, they need to be addressed as an integral part of a complete economic (and legal) analysis of the likely competitive effects of a merger.

When analysing the effects or likely effects of a merger, the central question that has to be answered is “what changes?” How will competition and efficiency be affected by the merger? The state of competition pre-merger may be relevant to that assessment, but it does not in itself tell us what the incremental effect of the merger on competition will be.

Delineation of the market, measuring concentration and identifying barriers to entry and other relevant factors is important, but ticking the boxes will not tell us whether the merger will necessarily make things worse unless we have a coherent story, a theory of harm. These individual elements can also become stumbling blocks to getting to the ultimate answer. Markets are messy and often the specific delineation does not matter very much. Barriers to entry can be “barriers to understanding” (Carlton, 2004^[7]) if what we really need to do is identify the likelihood of entry.

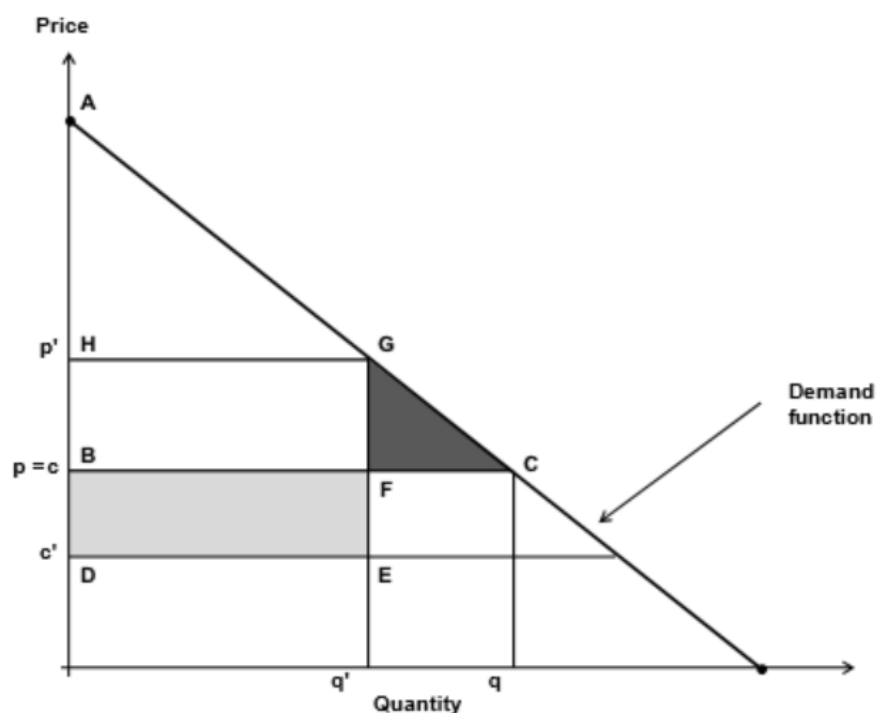
2.2 Welfare Framework

The basic (static) welfare economics underpinning merger analysis can be illustrated with Williamson's (1968^[8]) "naïve" trade-off model in Figure 1. The basic competition concern that arises in relation to mergers is that reduced competitive pressure or increased market power (on the supply side of the market) will result in higher prices charged to consumers or an equivalent reduction in quality or other non-price benefits. In Figure 1, pre-merger prices are assumed to be at the competitive level $p=c$, where c is average costs. The merger results in an increase in prices from p to p' . Unless suppliers are able to price discriminate, demand will fall from q to q' . Consumer welfare falls by the area BCGH. This consists of a dead weight loss¹³ to allocative efficiency of FCG and a transfer from consumers to producers of BFGH.

The merger may also result in cost efficiencies, such that c falls to c' . The resource savings from the merger equate to the area BDEF at the reduced output level q' . Producer surplus has increased by HDEG, the sum of this resource cost saving and the transfer from consumers. Total welfare has increased by the amount of the resource savings but has decreased by the dead weight loss¹⁴, resulting in a net gain or loss of BDEF minus FCG.¹⁵ It is easy to see that the cost savings rectangle could outweigh – particularly in such a 'naïve' example – the dead weight loss triangle in a particular merger scenario, resulting in a net gain to total welfare.

Whether and to what extent the cost savings are taken into account in any particular jurisdiction will depend on the relevant legal threshold(s) and the underlying welfare standard that has been adopted. In particular, whether a total or consumer welfare standard is adopted, or something in between. Potential cost savings may be completely discounted, may only be counted to the extent that they are likely to offset price increases,¹⁶ may be weighted according to the likely distribution of benefits or may be counted in full. In most, but by no means all, competition regimes, the effect on consumer welfare is what matters, in which case efficiency benefits will only be relevant if they are sufficient to offset the increase in market power.

Figure 1. Williamson's Trade-Off with pre-merger prices at P_c

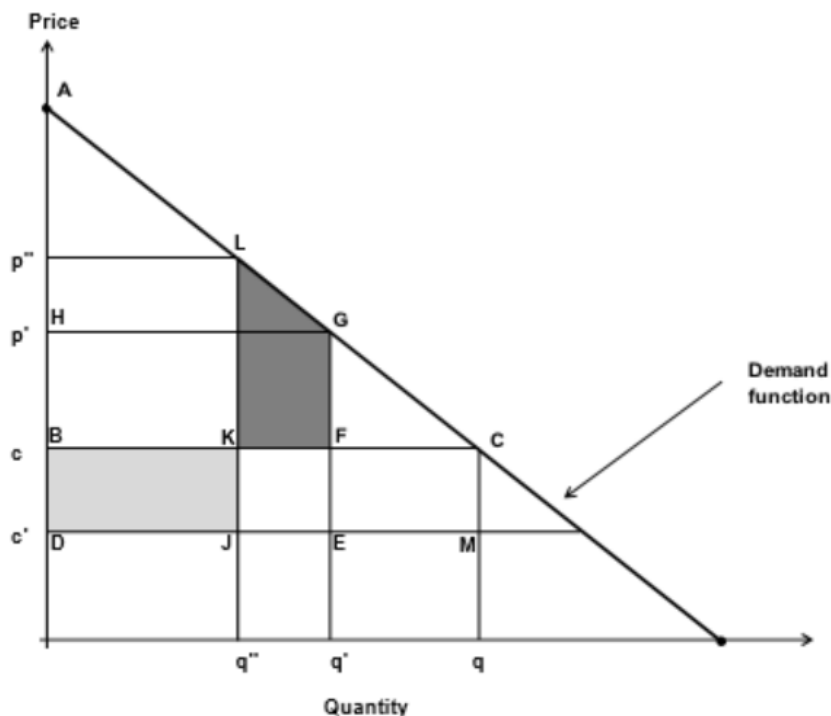


Source: Excerpted from OECD (2012, p. 9^[9]).

There are several potential complications that arise in this analysis. One issue that arises is the extent to which the cost efficiencies are merger specific or whether they could or would have been achieved through less anti-competitive means, in which case the benefit of the rectangle may have been achieved without the cost of the triangle. If the cost efficiencies could have been achieved by other means, further questions arise as to whether they would have been achieved as quickly and whether additional transactions costs would have been incurred. Even if the cost efficiencies are merger specific, there will be a question as to how confidently the efficiencies can be predicted or conversely how speculative they may be.

A critical assumption in Figure 1 was that pre-merger prices were at competitive levels. This will not necessarily be the case in many markets where there are concerns about limited competition pre-merger. In Figure 2 this assumption is dropped and pre-merger prices are assumed to be above the competitive level. This change in the assumption can significantly affect the welfare analysis of the merger. If pre-merger prices were already at p' and quantity demanded at q' , if the merger results in reduced competitive pressure such that prices rise further to p'' and output falls to q'' , the size of the cost savings rectangle will be smaller (BDJK instead of BDEF) because the resource cost saving is over a smaller level of output.¹⁷ On the other hand, the dead weight loss arising from the merger will be larger as it will now equate to the trapezoid (FGLK). It is now easy to see that the size of the trapezoid is more likely to exceed the size of the rectangle in particular merger scenarios. The lesson here is that while merger review is concerned with the incremental effect on competition arising from the merger, the loss to allocative efficiency from the merger will be higher if pre-merger prices are already above competitive levels.

Figure 2. Williamson's Trade-Off with pre-merger prices above P_c



Source: Excerpted from OECD (2012, p. 10_[9]).

Of course the static welfare trade-off represented in these diagrams does not take account of the dynamic effects of lost competition or of dynamic efficiencies that may be generated by the merger (OECD, 2019_[10]). These effects could result in either higher future costs due to loss of competitive pressure or lower costs

from innovation. In some mergers, dynamic effects are the prime concern. Mergers may affect the development of pipeline products, new technologies and/or research and development efforts.

2.3 How Mergers Can Affect Competition

Every merger is different and the specific theory or theories of harm that may be relevant will be different. While economists and competition agencies differ in the extent to which they tend to be concerned about different types of mergers and different theories of harm, most recognise the same broad categories of potential harm that should be considered and that each may be relevant in certain circumstances.

In order to arrive at a theory or theories of harm that may be relevant, it is important to first get a good understanding of how the relevant market or markets currently operate. What is the nature of the product and demand for it and who are the customers? Who are the main suppliers and what share of the market do they supply? What are the key characteristics of the production process and the supply chain? What are the size and frequency of transactions and how are price and output determined? What are the dimensions of competition?

Getting a good understanding of how competition currently works (or does not work) and mapping the effect of the merger on the horizontal and vertical structure of an industry, will enable an economist and a competition agency to see what theories of harm may or may not be relevant. What does the merger change and how might that affect competition? This will help to guide the types of evidence and economic analysis that will most usefully inform an assessment of the potential competitive effects of the merger. In some cases, a few key pieces of information and analysis may enable a theory of harm to be discounted and a merger to be cleared efficiently and limited economic resources to be focused on other more significant mergers.

However, it is also important to ask whether there are reasons to think the future absent the merger will see the market change in such a way that the current state of competition in the market may not be a guide to the future state of competition absent the merger. This can be important, for example, in the case of “failing firms”, where one party to the merger is expected to leave the market regardless of whether the merger proceeds. In that case, it will be relevant to consider whether there is an alternative buyer or whether the assets would leave the market absent the merger; and what the effect would be of transferring the target customer base to the acquirer rather than letting the remaining firms compete for those customers. These issues may be particularly relevant at the current time as the Covid-19 pandemic results in severe contraction of demand in some markets, e.g. airlines. However, it is still important to consider the arguments and options carefully, because structural changes to a market rushed through in a crisis can have a long hangover effect on competition (OECD, 2020^[11]).

Alternatively, a market might be likely to open up to competition absent the merger. For example, a patent may be about to expire but the vertical acquisition of the supplier of an essential input would prevent increased competition. In other cases a horizontal acquisition might be targeting new sources of supply that would otherwise have increased competition absent the merger, perhaps because of regulatory or technological change, and which could be “killed” or neutralised by the merger (OECD, 2020^[5]). Box 1 provides examples of supermarket acquisitions considered in Australia and New Zealand, which involved arguments about the counterfactual absent the merger.

Box 1. Preventing or preserving supermarket competition in New Zealand and Australia

The Warehouse decision in New Zealand and the Glenmore Ridge decision in Australia provide two examples where the future absent the acquisition was thought to be potentially more competitive than the current market or the future with the acquisition. By contrast, in the Metcash case in Australia, the Court rejected the Australian Competition and Consumer Commission (ACCC) contention that an alternative purchaser would provide a more competitive market going forwards.

In 2007, New Zealand's two major grocery chains each sought clearance to acquire a new entrant, Warehouse Extra. In the context of a clearance application, the applicants had to satisfy the Commerce Commission, or the court on appeal, that the merger would not substantially lessen competition. The Commission declined to give clearance, because it considered that there was a real risk that prices would be higher and quality, service and innovation materially lower, than in the counterfactual through either or both non-coordinated or coordinated effects. The decision was overturned by the High Court but reaffirmed by the Court of Appeal, finding that the Warehouse sought to establish a market niche for itself through an innovative approach and the court was concerned that the merger would foreclose *“the one stop shop innovation before it had a chance to prove itself as a matter for concern, especially as this concept is the only realistic source of ongoing competition to Woolworths and Foodstuffs in the near future.”* (at para 205)

In 2010, the Australian grocery wholesaler Metcash, which supplied a range of independent grocery retailers, acquired the grocery wholesale and retail operations of Franklins. The ACCC applied to the Federal Court to block the merger on the grounds that absent the acquisition an alternative buyer would result in a more competitive wholesale market. Franklins and one other small wholesaler, Spar, were the only alternative suppliers of packaged groceries to independent retailers in NSW and the ACT. It was agreed that Franklins owner Pick n Pay would exit the market as Franklins was losing substantial sums of money, but the ACCC argued that an alternative buyer, the KKKL consortium, was a likely counterfactual to the merger. In this context, the onus was on the Commission to satisfy the court that a substantial lessening (or prevention) of competition was likely. The Full Federal Court on appeal from the Federal Court agreed that the evidence did not support the contention that there was a real chance that a binding offer would be made by the KKKL consortium that would be accepted by Pick n Pay absent the acquisition by Metcash.

A different set of facts were at issue in 2013 when the ACCC considered the acquisition of a supermarket site at Glenmore Ridge by the Woolworths grocery chain. The ACCC considered that the acquisition would be likely to substantially lessen competition in the local supermarket market surrounding the target site. At the time, the only existing supermarket in Glenmore Park was also owned and operated by Woolworths, with a second supermarket operator, Aldi, expected to enter the following year. The ACCC considered that the acquisition of the site would prevent the entry of a third supermarket choice, bringing price and non-price competition to the local market. The supermarket site was subsequently acquired by Coles, bringing a third operator to the local market.

Sources:

Court of Appeal of New Zealand Judgment in Commerce Commission v. Woolworths Limited, 1 August 2008, https://comcom.govt.nz/_data/assets/pdf_file/0021/96402/Commerce-Commission-v-Woolworths-limited-and-ors-Court-of-Appeal-Judgment-1-August-2008.pdf;

Federal Court of Australia Judgment in Australia Competition and Consumer Commission v. Metcash Trading Limited, 30 November 2011, <https://www.judgments.fedcourt.gov.au/judgments/Judgments/fca/full/2011/2011fcafc0151>;

ACCC, Public Competition Assessment, 25 October 2013, Woolworths Limited - proposed acquisition of supermarket site at Glenmore Ridge Village Centre <https://www.accc.gov.au/system/files/public-registers/documents/D13%2B147531.pdf>

Theories of harm are generally classified into unilateral or coordinated horizontal effects, vertical effects and conglomerate effects. Sometimes more than one theory may be relevant and as the process of investigation and analysis proceeds, new information will result in theories being discounted, added or amended. Each of these theories of harm is considered in greater depth in other OECD Roundtables and work products of the ICN.

2.3.1 Unilateral Effects

Unilateral horizontal effects arise where the merged firm can exercise increased market power without relying on the accommodating actions of rivals in the market. All horizontal mergers eliminate competition between the merging parties and it is that loss of competition which gives rise to potential unilateral effects. Whereas pre-merger a price increase or output reduction by one of the merger parties would likely result in some substitution to the other merger party, that competitive constraint is removed by the merger. A price increase or output reduction by the merged firm then reduces competitive pressure on other firms in the market, leading to broader effects on price and non-price factors.

Whether unilateral effects are of concern in any particular merger will depend on the likely impact of removing that competition on prices, quality or other non-price dimensions of firms' offers. The impact of removing competition between the merger parties will depend on factors such as how closely the two suppliers compete in product and geographic space, the number and capacity of other suppliers of close substitutes in the market, the likelihood of entry, switching costs and any countervailing power. Unilateral effects can occur in either homogeneous or differentiated product markets. In homogeneous goods markets, supply side responses will tend to dominate, while in differentiated goods markets, demand side responses will tend to dominate.

Where a market is characterised by homogeneous products and excess capacity, unilateral price increases may be hard to sustain post-merger; whereas a merger that combines a substantial share of supply in a market with little excess capacity will be of greater concern. In cases of increasing marginal costs, e.g. natural resource markets, the merged firm may be able to profit by withdrawing capacity or reducing supply from lower down the market supply curve, such that prices have to rise in order to induce higher cost sources of supply into the market.

A merger of firms supplying the two closest substitutes in a differentiated product market may give rise to unilateral effects concerns regardless of excess capacity in the hands of other suppliers if not enough consumers would switch to those suppliers to constrain post-merger price increases. Quality reductions, including reduced variety, or reduced investment in innovation may sometimes be a bigger concern than increased prices in differentiated product markets (see OECD (2013_[12]) and OECD (2018_[13])). Recently there has been increasing concern with "killer acquisitions", where products or product developments, not just their competitive constraint, are "killed" to remove the competitive threat (OECD, 2020_[5]).

2.3.2 Coordinated Effects

In contrast to unilateral effects, coordinated effects depend on the accommodating actions of other suppliers in the market to increase prices or reduce non-price attributes. They reflect the exercise of the combined market power of firms in the market. Coordination may be tacit or explicit and may or may not be unlawful under other provisions of the competition law. A theory of harm that rests on coordinated effects does not imply anything morally reprehensible about firms or individuals in the market. Rather it depends on the objective characteristics of the market and how the merger may make the market more vulnerable to coordination.

Economists generally agree that three conditions need to be satisfied for coordination to be sustained: firms need to be able to reach agreement (either explicitly or tacitly) on price or quantity; they need to be

able to detect deviations from that agreement; and they need to be able to punish those deviations. While it will generally be in the joint interests of suppliers to coordinate to raise prices, it will often be in their individual interest to cheat on the agreement or understanding (Stigler, 1964^[14]). Raising prices above the competitive level will leave unmet demand and the individual firm can benefit from this demand by shaving prices. If this cheating cannot be detected and punished, sustaining a coordinated outcome becomes more difficult.

In addition to these “internal” factors, the agreement is unlikely to be sustained if threatened by “external” factors such as the reactions of actual and potential competitors outside the coordinating group or of customers able to mobilise alternatives.

A number of factors are recognised as potentially making a market more or less vulnerable to coordination. Concentration, cross ownership, product homogeneity, firm symmetry, price transparency, size and frequency of purchases, barriers to entry and the presence or absence of a maverick, are often listed in merger guidelines around the world. It is important that this does not lead to a tick box approach to assessing coordinated effects. Not all such factors need to be present for coordination to be successful¹⁸ and the key question for merger review is how does the merger *change* the likelihood of successful coordination, if at all? The question that needs to be answered is whether there is a coherent story that can be told about how the merger could make the market more vulnerable to coordination or how coordination might become more complete or more sustainable? (Dick, 2003^[15]). Even evidence of actual coordination will not answer this question.

The most obvious thing that changes with a merger is concentration. With fewer firms in the market, it generally becomes easier to reach an agreement and to detect deviations from that agreement. The acquisition of a maverick, a firm with divergent interests that has tended to undermine attempts at coordination in the past, should be particularly troubling (Baker, 2002^[16]).

It is not just horizontal mergers that can have coordinated effects. Vertical mergers that increase symmetry and result in price competition being focused at the more transparent retail level might also facilitate coordination; and where a vertical or conglomerate merger results in the acquisition of a potentially disruptive entrant, that acquisition may prevent coordination from being undermined in future.¹⁹

2.3.3 Vertical Effects

Most economists (and others) agree that vertical mergers are less likely to raise competition concerns than horizontal mergers. Nevertheless, some vertical mergers do raise serious (and complicated) concerns (OECD, 2019^[17]). Vertical competition effects do not arise directly from increased levels of concentration at any particular level of the supply chain.²⁰ Rather, the main concern with vertical mergers is that market power at one stage of the supply chain will be leveraged into another stage of the supply chain, e.g. by foreclosing rivals from access to inputs or customers.²¹ The merger is vertical, but the effects are horizontal, at one or both of the levels in the supply chain that are affected by the merger.

Most merger guidelines adopt the “ability and incentive” framework for analysing vertical mergers. They ask whether the merged firm will have the ability, the market power as a supplier or a buyer, to foreclose²² rivals or to raise their costs; and secondly whether they will have the incentive to do so, whether it would be profitable? By reducing sales or purchases from rivals, the vertically integrated firm will likely be foregoing revenue or increasing their own costs. Is the firm likely to gain more by leveraging market power than they lose by a strategy of exclusion and how will this likely affect competition and prices? Box 2 provides an example of a recent vertical merger reviewed by the New Zealand Commerce Commission, which involved foreclosure concerns at each level of the supply chain affected by the merger.

Box 2. Trade Me Limited and Limelight Software Limited 2018

In 2017, the New Zealand Commerce Commission considered an application by Trade Me Limited (Trade Me) to acquire Limelight Software Limited, trading as Motorcentral (Motorcentral). Trade Me was the leading provider of online vehicle auction and classified advertising services in New Zealand and Motorcentral was the leading provider of dealer management software (DMS) to independent car dealers, used to manage their inventory of motor vehicles. As well as horizontal concerns in the DMS market - Trade Me supplied a software tool DealerBase, which it was expected to develop into a stronger competitor to Motorcentral absent the merger – the Commission had vertical foreclosure concerns in both the DMS and advertising markets. An important role of DMS software is to allow car dealers to upload inventory listings to advertising platforms. The Commission considered that the merged entity would likely have the ability and incentive to inhibit the interaction between Motorcentral and rival advertising platforms and between Trade Me and rival DMS software. Its market power in each market provided the ability to foreclose and the Commission also considered the expected benefits from foreclosure would likely outweigh any expected costs to the merged entity, providing the necessary incentive. Such conduct would raise the costs of rivals and potential entrants in both markets, thereby reducing or preventing competition and protecting the market power of the merged entity in each market. Accordingly, the Commission was not satisfied that the proposed merger would not substantially lessen competition.

Source: Commerce Commission New Zealand, Determination in Trade Me Limited and Limelight Software Limited, 8 March 2018, https://comcom.govt.nz/_data/assets/pdf_file/0030/91839/2018-NZCC-1-Trade-Me-Limited-and-Limelight-Software-Limited-clearance-determination-8-March-2018.pdf

Vertical mergers can also give rise to efficiencies. Indeed, the empirical literature suggests that vertical integration tends to be efficient and benefit consumers.²³ The two major sources of efficiencies derive from the very fact that a vertical merger replaces market transactions with the internal command and control of the firm. Firstly, vertical mergers can result in transactions cost efficiencies where market based transactions are costly to implement (Williamson, 1974_[18]).²⁴ Secondly, vertical mergers can result in the elimination of double marginalisation (EDM), resulting in lower final prices as well as higher profits, because the merged firm will base its downstream pricing decisions on the true marginal cost of inputs rather than the market price.²⁵ However, neither source of efficiencies is a given in any particular merger scenario: EDM will not arise on sales to third parties and may be achieved through contract in some cases; while transactions cost savings will depend on the complexity of contracts compared to the benefits of market driven efficiency incentives.

One recent high profile vertical merger case that involved an assessment of both input foreclosure and offsetting EDM benefits, was AT&T/Time Warner. This was a vertical merger of Time Warner's valuable (upstream) Turner content with AT&T's DirecTV (downstream) distribution service. The input foreclosure concern was that the merged entity would have the ability and incentive to raise the input costs of downstream rival "multichannel video program distributors" (MVPDs) who required access to the Turner content, thereby reducing their ability to effectively compete with DirecTV. However, it was also accepted by the Department of Justice (DoJ) that there would be an EDM benefit arising from the merger. Relying on a Nash bargaining model, where the outcome depends on each party's best alternative to a negotiated agreement, it was argued that the merger would change Time Warner's best alternative when negotiating with MVPDs because the loss of upstream sales to downstream competitors would increase expected sales to the merged entity's own downstream arms. It was further argued that the costs to competition and consumers would likely exceed the benefits from EDM in that merger. The Court was not satisfied of the

DoJ's case on the factual evidence before it. The DoJ encountered problems convincing the court of the relevance of the Nash bargaining model to the particular merger scenario and the data and assumption used in the model.²⁶ The basic analytical framework for vertical mergers that was employed, and the particular Nash bargaining model that was used, are unremarkable and economically sound. Problems with data and assumptions, which are important issues in modelling, should not void the basic analytical framework.²⁷

2.3.4 Conglomerate Effects

Conglomerate mergers can raise competition concerns for similar reasons to vertical mergers. In the same way that goods or services supplied at different stages of a supply chain are consumed together, goods and services in different supply chains may also be related in production and/or consumption. For example, if two products tend to be consumed together²⁸, if a firm with market power in one of those product markets acquires a firm in the other market, they may have the ability and incentive to engage in a strategy of anti-competitive tying or bundling of the two products to foreclose competition in the other market. As for vertical mergers, the relevant questions to ask are whether the merged firm will have the ability and incentive to exclude competition?

As discussed at a recent OECD Roundtable, conglomerate effects are raising increasing concerns in digital markets (OECD, 2020_[19]). Network effects and the use of data across digital platforms can make these markets particularly vulnerable to anti-competitive effects from conglomerate mergers.

2.3.5 Partial acquisitions

Acquisitions of partial shareholdings can also affect competition (and produce efficiencies) (Salop and O'Brien, 2000_[20]). Not all merger regimes cover partial acquisitions, but in most competition regimes they are subject to the same competition test as full mergers. Essentially the same sorts of core competition concerns can arise as a result of partial acquisitions: unilateral, coordinated and vertical or conglomerate effects. However, the mechanism is potentially somewhat diluted and it may be harder to determine the effect and reach the relevant competition threshold, depending on the specific legal regime.

There are three principle mechanisms through which partial acquisitions can affect competition. First, a partial shareholding may confer control over another entity, even with less than 50 per cent, if the remaining shareholdings are widely dispersed. This would enable the acquirer to direct the decision making of the target in much the same way as a full merger (but without some of the efficiency benefits of integration). Second, owning shares in a rival (or a vertically related customer or supplier) can affect incentives. Rather than maximising profits of the acquiring firm, post-acquisition the owners will seek to maximise profits across their combined shareholdings. In the same way that a full acquisition of firm B by firm A creates upward pricing pressure through recaptured sales and profits when an increase in the price of B results in some consumers switching to A, a partial shareholding results in a partial recapture of lost profits. Indeed, the combination of a partial shareholding plus control can actually result in greater competitive harm than a full acquisition because when customers switch from B to A, the acquiring firm gets all the benefit but shares the losses with other shareholders. Third, there may be opportunities for information sharing between the entities, which facilitate coordinated effects in particular.

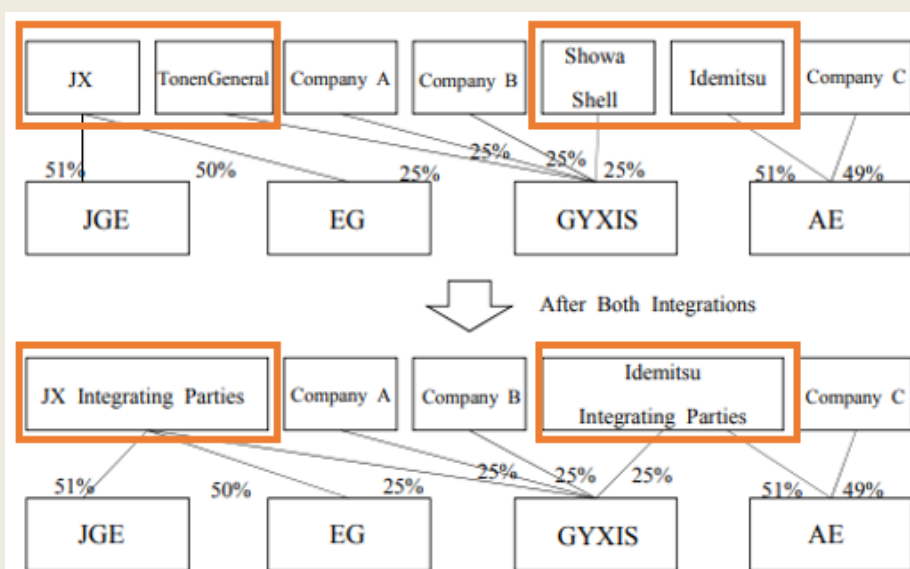
Box 3 illustrates a somewhat complex situation analysed by the Japan Fair Trade Commission (JFTC). While the horizontal acquisitions themselves involved partial shareholdings, it was agreed that both conferred control. However, the acquisitions also resulted in the effective aggregation of existing vertical partial shareholdings.

Box 3. JFTC consideration of partial ownership in Idemitsu/Showa Shell and JX/Tonen General in 2016

Two separate integrations of oil refiners (JX and Tonen General and Idemitsu/Showa Shell) were reviewed together by the JFTC. One of the concerns raised by the JFTC related to coordinated effects between LP gas distributors (i.e., JGE, EG, GYXIS and AE) that were partially owned by the merging parties and their competitors as illustrated in the figure below. Whereas pre-integrations there were three separate ownership groups, the two integrated entities would separately or jointly have ownership interests in all the distributors. The aggregated market share of these companies in the field of primary distribution of the LP gases would be around 80% in all regions of Japan and over 90% in some regional blocks. One of the JFTC's concerns was that the price of these LP gas distributors could be shared among them through their common owners.

In order to analyse the impact of the integrations on the price of propane (a type of LP gas) of each of the four LP gas distributors, the JFTC conducted an economic analysis based on the PCAIDS (Proportionally-Calibrated AIDS) model taking into account the structure of partial ownership illustrated in the figure below.

The analysis suggested that the transactions could increase the price of certain LP gas distributors by 2-6%. The JFTC concluded that the integrations would, through the coordinated conduct of the four LP gas distributors, substantially restrain competition in the field of LP gas distribution.



Source: Decision of the JFTC in Idemitsu/Showa Shell and JX/Tonen General (2016), https://www.jftc.go.jp/houdou/pressrelease/h28/dec/161219_files/161219.pdf

3 Economic Analysis of Mergers

Every merger is different and the economic analysis of mergers will need to be relevant to the particular fact situation. What particular types of quantitative and qualitative analysis will be relevant in a particular merger review will depend on both what questions need to be answered, either to discount theories of harm or to substantiate them, and what information and data is available to do so.

In this section, we review potential sources of data and a number of quantitative techniques that might be useful in answering the questions that are raised by a merger, but also the types of qualitative evidence that can be brought to bear. Economists have an important role to play in both.

3.1. Quantitative Analysis

Quantitative economic analysis is virtually never enough on its own. While nirvana might be a bespoke merger simulation that fully incorporates relevant real world market characteristics, this never happens in practice. Data is limited, model building is time consuming and requires assumptions to be made to make it tractable, and some things are just too difficult or impossible to model in practice. Beware snake oil that promises false precision. Nevertheless, quantitative economic analysis can reduce the scope for loose thinking. Quantitative analysis can take many forms. It can help to screen out mergers that are unlikely to raise competition concerns and provide an important stream of analysis to be combined with more qualitative analysis of documents and witness evidence in more in depth merger reviews.

What sort of quantitative analysis can be done will often be constrained by data availability. However, the data should not blindly dictate the analysis just because it is possible or interesting to the economist. It is important that quantitative analysis is properly focused. What is the question the analysis is seeking to answer and why is it relevant for analysing the competitive effects of the merger? If data limitations require assumptions to be made, those assumptions need to be clear and based in reality, otherwise any results may be entirely spurious.

Economists and competition agencies can be opportunistic in merger reviews. There may be pre-existing studies of the affected market(s) or aspects of a market, e.g. demand characteristics that help inform the potential effects of the merger. Natural experiments can be another rich source of data for analysis. For example, the temporary closure of a retail outlet may be very informative regarding the closest substitutes for that outlet.

Whatever the nature of the quantitative analysis that is undertaken, it should always be clear, transparent and replicable, so that it can be scrutinised and stress tested by all parties. Furthermore, it needs to be comprehensible to decision makers, in terms of what has been done and why it matters.

3.1.1. Data

Data that might be used for quantitative analysis in a merger review may be pre-existing or specifically collected to assist in the review. What is possible in terms of quantitative analysis will often be limited by

what data is available, and how long it will take to collate and clean it. Where time permits, surveys may be specifically undertaken for the purposes of a merger review.

Potential sources of pre-existing data include the merging companies, their rivals, suppliers and customers. A lot of data will be collected by the companies themselves, e.g. in relation to costs and prices; sales; or win/loss records of tenders. It is always important to understand the context in which this data is collected to understand its usefulness and limitations.

Data is not always organised in a way that is useful for economists and others and it can be time consuming to collate and clean. This is an important step and often the most time consuming. Misunderstanding definitions or units of measurement, time periods and so on in company records can result in spurious statistical results and invalid comparisons. When requesting data from firms, be as precise as possible to ensure that comparable data is collected across the market as far as possible. Talking to firms and understanding the way in which data is collected and recorded will often be critical. It is also important to look out for potential errors in the data, e.g. coding errors, or missing data points. Rubbish in, rubbish out.

In some cases, data is collected by third parties from firms across a market to be aggregated and used to calculate market shares or other metrics. In some cases, third parties may even collect data from suppliers, which is then fed back to them as a service which itself is an important aspect of how competition operates in a market. For example, in Australia the Informed Sources service collected and provided access to real time data on retail petrol prices at the outlet level. The data has been used to analyse local competition in merger reviews relating to retail petrol markets; and that same data service was also regarded as facilitating price coordination.²⁹

Other data may be collected on behalf of firms by market research companies: suppliers often want to know the same things about consumer behaviour in a market and their own customers that are relevant to competition agencies and their economists in merger review. This might include, for example, information about where consumers shop and why, what product attributes are important, search and switching behaviour and so on.

Another popular source of data on consumer behaviour is point of sale scanner data, which records information on prices and quantities, including the impact of promotional pricing on consumer purchasing patterns at retail outlets, or equivalently for online sales. The plethora of loyalty cards and credit cards can also provide useful information, e.g. linking geographic shopping patterns with place of residence.

Sometimes data collected by national statistical offices can prove useful for merger review. For example, sector specific retail survey data on sales and costs could provide the basis for critical loss analysis. Other government departments may also collect relevant data for some markets. This is often the case for regulated or partially regulated industries, e.g. electricity and telecommunications.

Conducting a survey, usually of consumers, for purposes of a merger review is time consuming and resource intensive. However, a survey can sometimes fill important information gaps that may be critical to determining the potential competition impact of a merger if time permits. They can be a particularly rich source of information on issues such as the demographic characteristics of customers, search and switching behaviour, choice attributes, geography, cross-channel substitution and the closeness of competition.

Importantly, survey design requires a very specific skill set which most competition agencies do not possess internally. How to ask clear and well understood questions is not as easy as might be thought and phrasing a question one way can produce quite different results to phrasing it another way. Questions about actual behaviour are generally more reliable than hypotheticals, but if hypotheticals are necessary, they should be as meaningful as possible for the survey respondent. Who and when to sample consumers and how many questions to ask to get the most reliable responses are also important considerations.

It will generally be preferable to commission a survey from an external market research company with the requisite skill set. However, this does not mean that the competition agency can simply hand over a brief and wait for the results to come back. It will still be critical for the competition agency to work closely with the external provider to ensure that they properly understand the brief and that there is an ongoing dialogue on the survey design and implementation. It will also usually be useful to share proposed survey design with the merger parties, especially to avoid any potential bias.

Box 4. CMA Review of the Original Bowling Company Ltd/Bowlplex Ltd 2015

In 2015, the CMA reviewed a proposed merger of two chains of tenpin bowling facilities. The CMA concluded that there was a realistic prospect of a substantial lessening of competition in six local areas and accepted undertakings to divest six sites to resolve their concerns. In the six local areas of concern, the CMA considered that the parties competed closely and that there would be insufficient remaining competition from other tenpin bowling facilities post-merger.

The review involved the use of survey evidence provided by the parties in relation to diversion ratios (discussed below) between the parties as well as other tenpin bowling operators and other leisure activities. It provides a useful example of some of the difficulties involved with survey evidence. The survey was conducted without consulting the CMA and the CMA expressed concern with the sampling methodology and questionnaire design. In particular, the CMA raised concerns with the questionnaire presenting respondents with a list of alternative leisure options shortly before a forced diversion question, which may have prompted respondents to think about those alternatives rather than alternative tenpin bowling facilities in the event that the tenpin bowling alley they were planning to attend was closed. Furthermore, the particular framing of the forced diversion question may have further prompted respondents to consider the wider choice set rather than focus on their second choice option, which the diversion question should be seeking to elicit. While the parties argued that the survey evidence likely overstated diversion to other tenpin bowling facilities, the CMA considered that it was in fact likely to have understated diversion to other tenpin bowling facilities and overstated diversion to other leisure activities.

Evidence indicated the importance of location for customer choice and pricing and accordingly the CMA analysed competition on a local basis, using information on catchment areas (discussed below) and their overlap. The CMA analysed local competition on the basis of drive time catchment areas representing 80% of customers and found 16 overlap areas. For locations where the CMA had no customer information, they used a catchment area based on 25-minute drive times around the parties' sites (representing the 'average' 80% catchment areas) and expanded these areas to 40 minutes in order to test the sensitivity of results.

Despite the survey shortcomings, the CMA used the estimated diversion ratios obtained from the survey, which differed by location, along with information on the parties margins, to estimate GUPPI (discussed below). These estimates suggested significant risk of unilateral effects in the six areas of concern, with GUPPI ranging from 7-29%.

Source: CMA investigation of the anticipated acquisition by The Original Bowling Company Ltd of Bowlplex Ltd. <https://www.gov.uk/cma-cases/the-original-bowling-company-bowlplex-merger-inquiry>.

In some cases the merger parties themselves commission surveys to be undertaken for the purposes of supporting an application for merger clearance. It is important that these surveys avoid potential bias in matters such as sampling and the phrasing of questions. Box 4 provides an example where the merger

parties conducted a survey themselves, but the Competition and Markets Authority (CMA) had concerns with both the sampling and the questionnaire design.

The CMA probably has the most experience in the use of surveys for the purpose of merger review. They have produced a very detailed guide on the use of customer survey evidence in merger cases (CMA, 2018^[21]). Important issues covered by the guide include identifying the relevant population, sampling and interview method; and questionnaire design, piloting, fieldwork and monitoring.

3.1.2. Some Quantitative Techniques

In this section, we provide an overview of some of the quantitative techniques that can be useful for purposes of merger review.

Descriptive Statistics

Before jumping headlong into more advanced quantitative techniques, there are many descriptive statistics that can help to paint a picture of the market(s) under review. While the particular descriptive statistics that might be insightful will differ across markets, some that will often be relevant are:

- Market shares and concentration, including changes over time;
- Share of imports in the market;
- Cost structures and capacity utilisation;
- Research and development expenditures;
- Number and value of transactions and contract length;
- Consumer purchasing patterns, search and switching behaviour; and
- Price and non-price strategies and responses by consumers and suppliers.

These basic descriptive statistics both provide important information about the nature of the market and also provide the building blocks that can be used for some of the other quantitative techniques discussed below. For example, information on prices and costs can be used to calculate the critical loss and information on consumer behaviour can be used to assess whether the actual loss will exceed the critical loss.

Box 5 provides two examples of the use of descriptive statistics to examine the nature of competitive interactions in markets, one involving unilateral effects in confectionary markets in Europe and the other involving coordinated effects in retail petrol markets in Australia.

Box 5. Descriptive statistics used in unilateral and coordinated effects cases

Unilateral Effects in chocolate markets

The Kraft/Cadbury merger, considered by the European Commission in 2010, shows how a descriptive analysis of the evolution of prices and sales data can be useful for understanding the nature of competition in a market. Both Kraft and Cadbury were strong players in the chocolate confectionary business in the EU, with positions differing according to each EU Member State (which were considered to be separate geographic markets). A descriptive analysis of Nielsen prices and sales data indicated that Kraft and Cadbury were not each other's closest competitors, since there was a limited relationship between the evolution of Kraft's market shares and that of Cadbury. In the UK, for example, where Cadbury had a large share of the market, the data indicated that Cadbury Dairy Milk had recently lost significant market shares over a number of weeks, while Mars Galaxy gained corresponding market

shares during this period. By contrast, Kraft's brands, such as Toblerone, did not see significant changes during these periods. This suggested that the intensity of competition between Cadbury Dairy Milk and Mars Galaxy (both British heritage chocolates) was stronger than that between Cadbury Dairy Milk and e.g. Toblerone (which is a continental-style chocolate packaged in a signature triangular shape). In France, the data showed that Cadbury's brand, Poulain (mainly black chocolate tablets) significantly decreased its prices in 2008. Following this change, however, no change in price, sales or promotions/advertising were observed for Kraft's leading brand, Milka (mainly milk chocolate tablets), suggesting that Poulain may not exert a significant competitive constraint on Milka. By contrast, private label sales were affected by the decrease in Poulain's price.

Source: Decision of the European Commission of 6 January 2010, Case No COMP/M.5644 – Kraft Foods / Cadbury https://ec.europa.eu/competition/mergers/cases/decisions/m5644_20100106_20212_en.pdf.

Coordinated Effects in retail petroleum markets

The Caltex/Mobil merger considered by the Australian Competition and Consumer Commission (ACCC) in 2009 involved extensive interrogation of detailed retail petrol pricing data submitted on a site-by-site basis as frequently as every 15 minutes by the parties and other retailers to Informed Sources. The data allowed the ACCC to examine the nature of the regular price cycles, which were a feature of retail petrol markets in Australia's capital cities. The analysis involved combining the detailed pricing data with documentary evidence of how the data was used by the merging parties and others. Prices would increase on a single day (the restoration phase) across metropolitan areas and then fall gradually in a saw tooth pattern across the period of a week (the discounting phase), with discounting tending to be followed on a more localised basis. One of the major retailers generally initiated the price increase across all their sites, which was signalled through Informed Sources and generally followed by most other retailers. The price leader was able to observe whether other retailers followed the price increase or not. If other retailers were tempted to delay following prices up to get a short term volume advantage, they risked the price leader reversing the price increase. The merger would have substantially increased the market share of Caltex, already one of the price leaders, and the ACCC considered that alternative buyers of the retail assets, some of whom did not subscribe to Informed Sources, were more likely to destabilise price restorations and benefit consumers (who did not have access to Informed Sources).

Source: ACCC Public Competition Assessment 9 February 2010, <https://www.accc.gov.au/system/files/public-registers/documents/D10%2B2899903.pdf>.

Elasticities and Diversion Ratios

Elasticities measure the responsiveness of one variable to another, in terms of the percentage change of one variable in response to the percentage change in another variable. For the purposes of defining a market using the hypothetical monopolist SSNIP test, we are interested in the elasticity of demand in response to price for the candidate market. This is the "own price elasticity of demand", how much demand will fall in response to a price increase in that market. The more substitutes that are available, the higher own price elasticity of demand tends to be. Own price elasticity measures may already be available for certain candidate markets. However, the own price elasticity does not on its own tell us if the candidate market is too small (or too big). We need to know how much substitution is enough to make a SSNIP unprofitable: the "critical elasticity" (see below under critical loss analysis).

Other elasticities may also provide useful points of reference for delineating the relevant market. Cross price elasticities, which measure the responsiveness of demand for one product to the price of another product, can tell us whether two products are substitutes (positive cross price elasticity) or complements

(negative cross price elasticity). However, a positive cross price elasticity cannot tell us if there will be *enough* substitution from the candidate product market A to require incorporating product B into the market. Even a large percentage response in demand for product B may be small in absolute terms and relative to demand for product A if the base level of demand for product B is small.

Diversion ratios identify where demand goes to in the event of a price rise and provide a measure of how closely products and firms compete and can be a useful input to market delineation and/or unilateral effects. The diversion ratio from product A to product B tells us in the event of a price rise for product (or supplier) A, what percentage of lost sales are picked up by product (or supplier) B. The higher the diversion ratio, the closer the competition.³⁰

The diversion ratio overcomes the noted shortcoming of cross price elasticity of demand, because it takes account of the amount of switching to B relative to the size of A rather than B. Formally it can be expressed as the ratio of the cross price elasticity of demand for B in response to the price of A and the own price elasticity of demand for product A, multiplied by the ratio of the quantities of A and B:

$$D_{AB} = E_{BA}/E_{AA} * Q_B/Q_A$$

Cross price elasticities of supply can also be useful as an indicator of potential sources of supply side substitution. Own price elasticity of supply will be especially useful in evaluating unilateral effects in homogeneous goods markets: if rival firms have highly elastic supply curves over the relevant range, unilateral effects will be difficult to sustain.

Critical Loss Analysis

Critical loss analysis is a technique that can help to operationalise the hypothetical monopolist SSNIP test for market definition (Harris and Simons, 1989^[22]). It translates a somewhat abstract test into something more concrete and specific. The critical loss (CL) tells us how much substitution is necessary to make a specified SSNIP by a hypothetical monopolist over a nominated product and geographic space unprofitable. Lost sales as a result of the SSNIP will result in lost profits, but the SSNIP will increase profits on remaining sales. When the latter outweighs the former, the price increase will be profitable.

Accordingly, the CL depends on the size of the SSNIP and the contribution margin (CM)³¹ for the nominated hypothetical monopolist:

$$CL = SSNIP/(SSNIP+CM)$$

Where:

$$CM = (P-MC)/P$$

In practice, while price (or average revenue) data may be available, data on marginal cost will not generally be available and average variable cost is used as a proxy. There will often be problems identifying which costs are variable and which costs are fixed and it will be useful to calculate a range of critical loss values.

For any given SSNIP, the higher the CM the smaller the critical loss that is necessary to make such a SSNIP unprofitable. The intuition behind this is that the higher the CM, the more profit and contribution to fixed costs that will be lost with the sales that are lost as a consequence of the SSNIP. Hence, for any given SSNIP, and associated increase in profit on remaining sales, the smaller the loss of sales that is necessary to provide an offsetting loss of profits. Any given CL equates to an equivalent “critical elasticity” of demand.

What the CL calculation does not tell us is whether the actual loss is likely to be greater than or less than the critical loss. If it is likely to be greater, the SSNIP is likely to be unprofitable, and if it is likely to be less, the SSNIP is likely to be profitable. The extent of the actual loss depends on the elasticity of demand over the range of the SSNIP for the nominated market. In some cases, estimates of the relevant price elasticities

(and/or cross price elasticities) may be available, but often the answer to this question will have to be assessed from surveys or qualitative market information.

It is also important to understand the relationship between the contribution margin, elasticity of demand and the profit maximising price for the individual firm (as distinct from the hypothetical monopolist). An individual profit maximising firm acting unilaterally to set price, will set that price at a level determined by the 'Lerner Index', where:

$$(P-MC)/P = CM = 1/Ed$$

Where:

Ed=the absolute value of the firm's own price elasticity of demand.

The Lerner Index tells us that the lower the elasticity of demand facing the individual firm, the higher they will set their profit maximising contribution margin. This relationship between the CM and the actual elasticity of demand facing the individual firm might suggest some circularity in the critical loss calculation – the smaller the critical loss, the smaller the actual loss – but this confuses the individual firm with the hypothetical monopolist. If an individual firm is already maximising profits, a SSNIP will not be profitable, but the same is not true for a hypothetical monopolist over substitute sources of supply resulting in lower own price elasticity of demand.³² Elasticity of demand for the hypothetical monopolist will be less than elasticity of demand for the individual firm (unless the hypothetical monopolist is also an actual monopolist).

Box 6 provides an example of the use of CLA by the KFTC in its 2006 consideration of the Hite/Jinro merger, where a major issue of contention was the relevant product market.

Box 6. Critical loss analysis by the KFTC in the Hite/Jinro merger 2006

The Korean Fair Trade Commission (KFTC) used critical loss analysis to determine the relevant markets in the Hite/Jinro merger. Hite and Jinro were major producers of beer and soju in Korea, supplying more than 50% of each product respectively. The product market definition was a key issue in the case, the main question being whether beer and soju belong in the same product market.

The KFTC carried out critical loss analysis for soju and beer separately. For soju, the critical loss was calculated based on the margins of Jinro since it was the major soju producer. For beer, the critical loss was calculated based on a weighted average of margins of Hite and its competitors. Actual loss was estimated based on a consumer survey.

The analysis, summarised in the table below, revealed that actual loss was likely to be less than the critical loss in the case of price increases of 5% and 10%. On this basis, the KFTC defined the soju and beer markets separately.

Increase in price	Soju		Beer	
	Critical loss	Actual loss	Critical loss	Actual loss
5%	14.3%	5.6%	15.3%	13.2%
10%	25.0%	10.6%	26.5%	22.1%

Source: Decision of the KFTC of 24 January 2006 no 2006-009. OECD (2011, p. 171^[23]).

Two important limitations of CLA should also be kept in mind. First, it assumes a uniform price increase. However, in the case of product and/or geographic differentiation, a non-uniform price increase may be profitable when a uniform price increase is not. For example, prices may be profitably increased at the "centre" of the nominated market if the margins on lost sales are recovered by switching to products at the margin of the nominated market.³³ Second, in some cases where a SSNIP is not profitable, a higher price

rise may be profitable as marginal customers with high demand elasticity are foregone but remaining customers provide very high margins due to very low demand elasticity (Pittman, 2017^[24]).

Price or Quantity Correlations

Price correlations indicate the extent to which the prices of two products move together. This is often a relatively easy piece of quantitative analysis to employ, and it may be informative, but it is rarely definitive.

While a finding that prices are positively correlated may indicate that two products are substitutes, the correlation may be due to some other common factor. In particular, common inputs can result in prices of two products, or two sources of supply, being closely correlated even if there is little or no substitution between them. For example, the price of milk and yoghurt may be correlated because of their common input, but they are not necessarily close substitutes. The same product supplied in geographically distant markets will have virtually identical inputs and hence their prices may be closely correlated, but they may or may not be close substitutes, depending on things such as relative transport costs.

On the other hand, a finding that there is a negative correlation or no correlation between the prices of two products may be enough to rule out substitution between them. Even here, though, care must be taken to make sure the analysis is not too simplistic and could have overlooked issues such as lags in one set of prices. It could also be the case that products are demand side substitutes but have very different inputs. If the cost of one set of inputs rises, the competitive price of that product will rise. That does not necessarily mean that the two products were not close substitutes, but their relative substitutability may have changed.

More sophisticated price tests such as error correction models and co-integration analysis can be performed, but they too have limitations. Care should always be taken to understand the limitations of the analysis and to sanity check it with other evidence.

A negative correlation between product volumes may indicate switching by consumers. However, that switching may reflect a change in tastes rather than any competitive interaction. For example, a shift in demand away from tea and coffee and towards soft drinks may reflect a change in the season that shifts consumption away from hot drinks and towards cold drinks. It does not necessarily indicate that suppliers of tea or coffee would be constrained from increasing prices by substitution towards soft drinks. Similarly, a shift in sales from bricks and mortar stores to online purchases does not necessarily imply a strong competitive constraint imposed by online outlets on prices charged by bricks and mortar stores if the shift in sales is driven by other factors.

Transport costs, shipment data and the Elzinga-Hogarty test

For geographic markets, transport costs will often be determinative of which sources of supply are close substitutes for each other. If transport costs are “high” relative to the price of the product, those sources of supply are unlikely to be close substitutes. This begs the question of what is “high”? Ultimately, what matters is whether there will be enough substitution to constrain a SSNIP. This is where the critical loss framework is so helpful and all of the other quantitative and qualitative evidence, including relative transport costs, contributes to assessing whether the actual loss is likely to exceed the critical loss.

Shipment data between geographic areas can indicate the extent to which different geographic sources of supply currently compete. The Elzinga-Hogarty (EH) test sets thresholds for “little in from outside” (LIFO) and “little out from inside” (LOFI) (Elzinga and Hogarty, 1973^[25]; Elzinga and Hogarty, 1978^[26]). If both are less than 25% (weak test) or 10% (strong test), a relevant geographic market is said to exist. While this test can provide a useful reference point, it is a static measure of current product flows and is not necessarily indicative of how supply and demand would change in response to a change in relative prices. The EH test was used extensively in historical hospital merger cases in the United States. Broad geographic markets were defined with apparently low levels of market concentration. Nevertheless, post-

merger price rises were frequently observed. In that case the test was particularly problematic, because prices were determined by bargaining between hospitals and insurers and patient flows (used for the EH test) were then determined at a later stage, independent of price (Capps, Dranove and Zabinski, 2017^[27]).

Isochrones and catchment areas

In the case of retail mergers, particularly those involving bricks and mortar outlets, location is often an important dimension of competition (CMA, 2017^[28]). Outlets may be close substitutes for consumers if they are within a particular drive time or walk time of where consumers live or work (or are transiting through) or within a particular distance. The relevant drive time or distance will vary according to the particular product market and geography of the area. For example, inner city residents may only regard grocery stores very close to where they live as being close substitutes, whereas rural residents may travel further.

Catchment areas indicate the area from which a retail outlet draws a specified percentage of its customers, e.g. an 80% catchment area maps the area around an outlet from which 80% of customers are drawn. These will often be approximated by circles around the outlet, e.g. where customer data indicates that 80% live within 5 km of the retail outlet, a circle with radius of 5 km is used as an approximation. Adjustments can be made on the basis of case specific information, e.g. where there are significant barriers to travel. Where catchment areas overlap, outlets are likely to be substitutes, at least for some consumers.

Travel time will often be the actual driver of customers choice of outlet. An isochrone is a line that joins points of equal travel time from a retail outlet, e.g. a 10-minute isochrone joins all points that are a ten-minute drive from the outlet. These can be drawn like contours around each retail outlet for different drive times. Information from surveys or elsewhere on how far customers are prepared to travel (or currently travel) can be combined with isochrones to indicate the degree of competitive overlap between outlets. Where significant topographic features affect catchment areas, isochrones will be more useful than straight-line distances for mapping catchment areas.

Information on catchment overlaps across the retail outlets of merger parties is often used as a filter in retail mergers with important local dimensions to competition, e.g. supermarkets, petrol stations or cinemas. Box 4 described an example of the merger of two national chains of tenpin bowling facilities reviewed by the CMA which examined overlap areas identified by mapping catchment areas.

These mergers may involve large numbers of outlets with overlapping catchment areas that could potentially raise competition concerns. Often a simple metric, such as the number of independent outlets in an area post-merger is used to filter out local markets that are unlikely to raise competition concerns, in order that the agency can focus more detailed analysis on the locations that are most likely to be problematic. Box 7 provides a case study where the JFTC employed this type of screening analysis.

Upward Pricing Pressure (UPP) and its close relatives

If firms supplying substitute products were maximising profits pre-merger, they would not find it profitable to increase prices because of substitution to rival firms. However, if two of those firms, producers of products A and B, merge, one source of substitution is internalised within the merged firm: a price increase for A results in lost sales of A, but some of those lost sales will be recaptured by B.

Upward Pricing Pressure (UPP) measures combine information on diversion ratios with information on margins to estimate the extent to which a merger is likely to create “upward pricing pressure” by making such a price increase more profitable post-merger than pre-merger (Farrell and Shapiro, 2010^[29]). UPP provides an indication of what changes with the merger, how the removal of one competitive constraint increases the ability of the merged firm to raise prices. The UPP on the product of firm A arising from a merger with firm B will depend on the extent to which sales lost from a price increase for A are recaptured in sales of B (the diversion ratio) and the margin on those recaptured sales.

The “Gross Upward Pricing Pressure Index” (GUPPI) for product A in a merger with product B is defined as (Salop and Moresi, 2009^[30]):

$$\text{GUPPI}_A = D_{AB} \cdot \text{CM}_B \cdot P_B / P_A$$

Where D_{AB} is the diversion ratio from product A to product B; P_A and P_B are the prices of products A and B, and CM_B is the contribution margin on product B. The equivalent GUPPI for product B (which could be different) would simply swap all the subscripts between A and B.

It might seem counter intuitive that for CLA a high margin reduces the likelihood of a SSNIP, but for UPP a high margin increases the likelihood of a price rise. This is because different margins are at play. In the case of CLA we are considering the profitability of a SSNIP for the hypothetical monopolist (equivalent to a merger of all firms in the nominated market). The relevant margin for that calculation is the margin on *lost sales* for the hypothetical monopolist. In the case of UPP, we are considering the incremental incentive to raise the price of *one* of the merged firms products (A) post merger. The incremental incentive arises because some of the lost sales will be recaptured through sales of product B and what is relevant for that is the margin on product B, not the margin on product A.³⁴

GUPPI will always be positive as long as products A and B are substitutes and margins are positive. It is therefore necessary to specify some threshold for GUPPI which will raise significant competition concerns. Since GUPPI does not take account of any potential efficiency gains arising from the merger, which would put downward pressure on the price of A, an assumption as to the likely efficiency gains could be the basis for such a threshold. Farrell and Shapiro suggested assuming a ten per cent efficiency gain.

An assumption or actual evidence regarding likely efficiencies could be used to calculate a “net” upward pricing pressure index or UUPI. Alternatively, Werden suggests the calculation of what is called the “compensating marginal cost reduction” (CMRC), being the marginal cost reduction needed to leave prices unchanged post merger (Werden, 1996^[31]). This could then be compared to evidence regarding likely merger specific efficiencies.

Box 7 provides an example of the use of GUPPI as part of a filtering exercise in the JFTC’s consideration of the FamilyMart/UNY merger in 2015. GUPPI was also used in the CMA review of the Original Bowling Company/Bowlplex merger described in Box 4.

Box 7. GUPPI analysis by the JFTC in the FamilyMart/UNY merger 2015

FamilyMart and UNY both own numerous convenience stores in Japan. The JFTC focused its investigation on 863 areas where the parties both had convenience stores within a radius of 500 metres. These areas were classified into the following four groups:

1. Group of areas which would see, after the merger, the number of competing convenience store chains within a 500-metre radius of a base store (hereinafter referred to as “the number of chains within 500 metres”) decrease from three to two, and at the same time, would have a competing convenience store within the range of 500 metres to one kilometre of the base store (hereinafter referred to as “within a one kilometre range”);
2. Group of areas which would see, after the merger, the number of chains within 500 metres decrease from three to two, and at the same time, would have no competing convenience store within a one kilometre range’
3. Group of areas which would see, after the merger, the number of chains within 500 metres decrease from two to one, and at the same time, would have a competing convenience store within a one kilometre range; and

4. Group of areas which would see, after the merger, the number of chains within 500 metres decrease from two to one, and at the same time, would have no competing convenience store within a one kilometre range.

In order to assess whether the convenience stores that would belong to the merged entity would have an incentive to increase prices, the JFTC calculated GUPPI for selected convenience stores from each of the four groups above.

Assuming that prices were the same across the stores of Company α and Company β , the JFTC modified the GUPPI formula as follows:

$$\text{GUPPI}\alpha = D\alpha\beta * \text{CM}\beta$$

For the diversion ratio and the contribution margin, the JFTC used respectively the results of the consumer survey and financial data submitted by the merging parties.

While the GUPPI for most of the stores were below 3%, one store belonging to Group 4 showed a GUPPI of approximately 4.8%, a relatively higher value. The JFTC undertook more detailed consideration of Group 4 (68 areas) where it ultimately found that competition would not be substantially restrained.

Source: Decision of the JFTC in FamilyMart and UNY (2015),
https://www.jftc.go.jp/dk/kiketsu/toukeishiryosougou/h27jirei09_01_files/h27jirei09.pdf.

Neither GUPPI nor UPPI predict the actual price rise, which will depend on the shape of the demand curve. If assumptions are made about the shape of the demand curve, an Indicative Price Rise (IPR) can be calculated as:

$$\text{IPR (linear demand)} = \text{CM} * D / (2(1-D)); \text{ or}$$

$$\text{IPR (isoelastic demand)} = \text{CM} * D / (1 - \text{CM} - D)$$

The contrast between the two formulae indicates the importance of the shape of the demand curve: an isoelastic demand curve will give a higher IPR than a linear demand curve.

Box 8 provides an example of the use of both GUPPI and IPR by the Italian Competition Authority in its consideration of the Manzotin/Simmenthal merger.

Box 8. GUPPI and IPR in the ICA's consideration of the Manzotin/Simmenthal merger 2012

The Italian Competition Authority (ICA) employed quantitative techniques in its assessment of the contemplated acquisition by Manzotin of Simmenthal, a producer of canned beef and canned tripe with tomato sauces. The ICA closely scrutinised the canned beef market, where the combined market share of the parties would be 60-80%.

In this case, the ICA estimated that the diversion ratio from Manzotin to Simmenthal was nearly 60%, using data provided by the merger parties, indicating that Simmenthal represented an important competitive constraint for Manzotin. The diversion ratio from Simmenthal to Manzotin was estimated at approximately 30%.

The diversion ratios were used in the calculation of GUPPI for canned beef products. Based on a gross margin value of 20-30% obtained from the parties, the ICA estimated the GUPPI to be 5-8% for Simmenthal and 15-23% for Manzotin. The ICA also calculated the IPR in order to predict the actual

price rise, which was estimated to reach 21% for the demand satisfied by Manzotin and 8% for that of Simmenthal.

The above analysis contributed to the finding that the merger would have negative effects on competition in the canned beef market. The ICA ultimately cleared the transaction subject to remedies, including the sale of a Manzotin business unit to a competitor and the creation within Simmenthal of a separate sales unit for the commercialisation of Simmenthal products.

Source: Decision of the Italian Competition Authority of 5 December 2012, Case 11799 - Bolton Alimentari/Simmenthal. (ICN, 2013, p. 64^[32]).

Neither UPPs nor IPRs take account of the likely competitive response from actual and potential rivals. For this reason, they cannot provide a complete analysis as to the likelihood of competitive harm arising from a merger. Rather they provide an alternative and more focussed way of filtering mergers for potential unilateral effects compared to calculating market shares.

While UPP is potentially more precise than market shares as an indication of potential unilateral effects (Garmon, 2017^[33]), it is not necessarily straightforward to estimate diversion ratios or to determine the relevant marginal or variable costs to calculate contribution margins (Bishop, 2013^[34]). Which costs are variable and over what period can be important.

Originally developed for the purpose of screening unilateral effects, a further variant of UPP analysis is the “coordination GUPPI” or cGUPPI for coordinated effects (Moresi et al., 2015^[35]). The cGUPPI is defined as the lowest of the most preferred (profit maximising) price increase for the various members of a hypothetical coordinating group (HCG) of firms. Just as GUPPI and its variants screen for unilateral effects by examining the changed incentive to increase prices unilaterally post-merger, the cGUPPI, or rather the delta cGUPPI, screens for coordinated effects by examining the changed incentive to coordinate prices through parallel accommodating conduct (PAC). The cGUPPI can also be translated into indicative price rises based on assumptions around the shape of demand and cost functions. Calculation of the cGUPPI requires similar information on margins and diversion ratios to the unilateral GUPPI but for all firms in the HCG, not just the merger parties, and also requires information on their market shares. Where the merging firms are constraining PAC pre-merger, including where one or both parties act as “mavericks”, the delta cGUPPI and indicative price rise are likely to be positive. An example of the use of cGUPPI was in Brazil’s review of the Alesat/Ipiranga fuel distribution merger.³⁵ Important assumptions underlying calculation of cGUPPI are that prices are transparent, there is rapid detection and response to price change and that the PAC equilibrium will be stable for some time. A complete analysis of coordinated effects will obviously require these assumptions to be tested.

Natural Experiments

Natural experiments, or “shock” analysis, involve examining historical events that link changes in competitive conditions to changes in market performance (Coate, 2013^[36]). Examples of such shocks include new product launches, innovation, exchange rate changes, firm exit or merger, store closures, new entry or input cost increases to see what they can tell us about competitive interactions in the market. In some cases the natural experiment might give a direct indication of the potential effect of the merger.

One example of a natural experiment that has been used a number of times to help delineate geographic markets is when a retail outlet, e.g. a supermarket or a petrol station, is temporarily or permanently closed. This is equivalent to an infinite SSNIP, it forces diversion of customers to their next closest substitute. Data on which alternative outlets customers switch to in response to the closure can be used to estimate diversion ratios and is relevant for both geographic market definition and unilateral effects.

One technique that is often used to explore the effects of a natural experiment is “difference in differences”. This involves comparing the differential effect of a “treatment” on outcomes for a treatment group compared to a control group, which was not affected by the treatment. This technique was employed by the FNE as part of its analysis of a cinema merger described in Box 12. It was also used as part of an ex post review of a merger in the Canadian mortgage market, described in Box 16.

Box 9 provides an example of a natural experiment in the pathology market in Queensland, Australia. This was an example of failed upward price leadership, where the ACCC was concerned that the proposed merger would make such a price rise more likely to be followed and sustained in the future.

Box 9. A Natural Experiment in Pathology Billing Practices

In 2012 Sonic Healthcare Limited (Sonic) proposed to acquire various Australian pathology businesses from Healthscope Limited (Healthscope). The ACCC opposed the acquisition of some of these state based services, including those in Queensland, and did not oppose the acquisitions of others. It considered that the acquisition was likely to result in a substantial lessening of competition in the Queensland market for community (out of hospital) pathology services, where Healthscope was a much smaller but significant third supplier after Primary (the market leader) and Sonic. Healthscope had a wide spread of collection centres, ran a hub and spoke laboratory network and owned medical centres and hospitals. In Australia, community pathology tests are primarily funded by the Commonwealth Government through Medicare rebates on a fee-for-service basis, in some cases supplemented by out-of-pocket payments by patients. Pathology providers can decide whether to receive only the Medicare rebate for services (bulk billing) or impose an additional charge to patients (privately billed). If the pathology provider chooses to bulk bill, payment is received directly from the government and the patient makes no out-of-pocket payment. The ACCC found that the extent of bulk billing was one of the ways in which competition manifested itself in pathology markets. A natural experiment occurred in July 2009 when Sonic changed its billing policy to privately bill a much greater proportion of patients in Queensland. Sonic then rapidly lost referrals until it reversed the change in billing policy in early 2010. Based on its review of documentary evidence, the ACCC concluded that Healthscope had played a significant role in disrupting a potentially broader move by Sonic and Primary to privately bill a larger proportion of patients in Queensland. The ACCC considered that if the acquisition were to proceed, a change of billing policy by either Sonic or Primary would likely be accommodated by the other and not disrupted by any remaining or new pathology provider.

Source: ACCC Public Competition Assessment, 28 August 2013, <https://www.accc.gov.au/system/files/public-registers/documents/MER13%2B7337.pdf>.

While natural experiments can be extremely useful, a word of caution is also necessary. It is important to understand the possible cause and effect relationship. In some cases, it may be difficult to determine that the particular shock has caused the change in a market variable. It will always be important to consider potential alternative explanations.

Price-Concentration and Quality-Concentration tests

Price-concentration tests investigate the relationship between price and concentration, or market share, across markets in a given industry. If a positive relationship is found, it may be possible to extrapolate this to see the likely impact of a merger. The analysis can also be used to examine the impact of the presence or absence of particular competitors in different markets. Two well-known merger reviews that employed

price-concentration analysis are the Federal Trade Commission (FTC) review of the (first) Staples/Office Depot merger (Box 10) and the European Commission's review of the Ryanair/AerLingus merger (Box 11).

Box 10. Price-concentration analysis in Staples/Office Depot

In 1996, the two largest office supply superstore (OSS) chains in the United States, Staples and Office Depot, proposed to merge. The FTC opposed the merger on the grounds of likely harm to competition in the “market for the sale of consumable office supplies sold through office superstores”, where the merger parties were two of the three main players (with Office Max being the third). The parties elected to contest the decision in court. Documentary evidence and descriptive statistics indicated that Staples set prices in its stores by zone according to the number of competing office superstores in the area. Prices were lower the more rival superstores were present in the local area. Absent the merger, Staples expected the number of areas with three OSS to increase, resulting in lower prices.

The case was characterised by extensive and detailed econometric evidence presented by both the FTC and the merger parties. This analysis was directed at establishing the extent to which the observed relationship between the number of OSS competitors and the level of prices was a systematic difference once other variables were controlled for. For example, it could be that areas with fewer competitors were also characterised by higher costs; or it could be that the number of mass merchandisers was correlated with the number of OSS and it was the former rather than the latter that were driving price outcomes. While experts for both parties started with essentially the same regression equation, they produced vastly different results, with the FTC expert results predicting a price increase post-merger of 8.6% and the merging parties' expert predicting a price increase of only 0.9%. The difference was primarily explicable by the different assumptions about how prices were set in response to competition and the way in which the estimated price increase was calculated. In relation to the first issue, the merging parties' expert assumed that prices were set at the profit maximising level at each store, taking account of local competition. By contrast, the FTC assumed that prices were set by zones, taking account of the number of competitors in the zone. This was both consistent with the documentary evidence and makes sense for reasons of administrative costs, standardised advertising material and brand reputation. In relation to the second issue, the merging parties' expert calculated a price increase that was averaged across all stores, regardless of whether competition would be affected in the local area. The FTC expert calculated the expected price increase averaged across only those areas where the number of competitors would be reduced.

The economic experts were disappointed when the Judge did not refer to the volumes of econometric evidence in his judgement granting an injunction. He relied instead on the documentary evidence and the descriptive statistics. However, the two were consistent and perhaps the result would have been different if the econometrics had been contradictory.

Source: Serdar Dalkir and Frederick R Warren-Boulton (2009) “Prices, Market Definition, and the Effects of Merger: Staples-Office Depot” in Kwoka and White (eds) *The Antitrust Revolution* 5th edition; and Orley Ashenfelter, David Ashmore, Jonathan B Baker, Suzanne Gleason & Daniel S Hosken (2006) “Empirical Methods in Merger Analysis of Pricing in *FTC v Staples*” *International Journal of the Economics of Business* 13:2, 265-279

Care should always be taken when conducting price-concentration analysis to control for other factors that may be causing a correlation between concentration and prices. It is also important to compare apples with apples: some markets may be characterised by higher quality products reflected in higher prices that may have nothing to do with market concentration.

Box 11. Price-Concentration Analysis in Ryanair/AerLingus

In 2006 Ryanair, a low cost carrier, sought to buy the Irish flag carrier, Aer Lingus. Both parties had their main hub at Dublin airport. They overlapped on 35 direct routes and on 22 routes their combined market share was 100%. In its review of the merger, the European Commission (the Commission) undertook multiple regression analysis to test a number of propositions, including:

- Does the presence of Ryanair on a route reduce the price charged by Aer Lingus on that route and vice versa?
- Does Ryanair exert a stronger competitive effect on Aer Lingus than any of the other airlines operating out of Dublin and vice versa?
- Does the price effect of Ryanair on Aer Lingus increase as the number of frequencies offered by Ryanair increases and vice versa?

The Commission found that Aer Lingus' prices were on average 5-8% lower on those routes where Ryanair competed with Aer Lingus compared to those where Ryanair did not compete with Aer Lingus. This provided the answer to the first question above: the presence of Ryanair on a route does reduce the price charged by Aer Lingus. As regards the price effect of Aer Lingus on Ryanair, the Commission did not find a significant effect. However, being unable to find a statistically significant effect is not the same as proving that there is no relationship. In this case, the lack of a statistically significant relationship was attributed to a lack of variation in Aer Lingus entry on Ryanair routes, whereas there were many instances of Ryanair entering Aer Lingus routes.

Using the same data, the Commission found that Ryanair had at least double the effect of any other airline on Aer Lingus' pricing. The Commission also found that a 1% increase in Ryanair frequencies had the effect of decreasing Aer Lingus' prices by 0.03%. These elements answered the second and third questions above.

The Commission concluded that "[t]he Commission's regression analysis confirms and complements the conclusions derived from qualitative evidence that Ryanair and Aer Lingus are close competitors. Moreover the results from the regression analysis are also in line with the majority of respondents to the Customer Survey that consider the Merging Parties to be the closest competitors when other carriers are present on the route." The merger was blocked.

Source: Decision of the European Commission of 27 June 2007, Case No COMP/M.4439 –Ryanair / Aer Lingus, https://ec.europa.eu/competition/mergers/cases/decisions/m4439_20070627_20610_en.pdf. OECD (2011, p. 47^[23]).

However, there is good reason to believe that concentration may also be inversely correlated with quality, both in terms of some absolute (vertical) measure of quality, e.g. time spent queuing to get into the cinema or the extent to which products are out of stock in a supermarket; and in terms of (horizontal) variety (OECD, 2013^[12]). Matsa (2011^[37]) found that Walmart's entry into the supermarket industry in the US caused a 33% reduction in stock shortfalls, which were a leading cause of consumer dissatisfaction with supermarkets and therefore an important indicator of quality. He also found that low shortfall rates were correlated with good performance on other measures of quality, such as cleanliness, staff courteousness and average checkout speed. In service industries, quality of service will often be correlated with expenditure on human resources, e.g. additional staff employed to stock shelves, serve customers or clean the premises. This relationship was used by the FNE in Chile to examine the effects of a cinema merger on quality of service (Box 12).

Box 12. Quality-Concentration Analysis in Cinemundo/CineHoyts 2012

In 2011, the second and third largest cinema chain in Chile merged, resulting in a 47% share, with the previous market leader holding a 38% share. The Fiscalía Nacional Económica (FNE) analysed the risk to competition from this completed acquisition in local geographic areas. The economic analysis included several econometric tests directed at analysing the transaction's effects on local price and quality. The analysis suggested that the most significant unilateral effects involved harm to service quality, a conclusion that was consistent with the qualitative information collected during the FNE's investigation. Some of the differentiating factors identified were time spent in queues buying tickets and at concession stands, theatre cleanliness, air conditioning, sound and image quality, screen size and availability of additional services. The level of expenditure on human resources was used as an indicator of service quality. These expenses were regressed on distance to the nearest competitor as well as various control variables. The results indicated that for each additional kilometre to the nearest competitor, expenditure on salaries declined on average between 1.6-1.8%.

The FNE also examined a "natural experiment" involving the entry of Cinemundo into the Estacion Central neighbourhood of Santiago, locating its facilities 300 metres from CineHoyts. Using a "difference in differences" approach, the FNE found an increase in salaries expenditure by CineHoyts of 13-22% in response to entry. This was also consistent with qualitative information collected in the investigation.

The case was settled with the merged entity committing to divest two cinema complexes in locations where the FNE found the most significant unilateral risk to competition.

Source: Contribution from Chile in OECD (2013, p. 67_[12]).

Bidding Analysis

In markets characterised by sales through tender, existing market shares may not tell us very much about current competitive interactions in the market, as they are the result of past tender rounds. Win/loss analysis can be particularly informative of how closely particular firms compete. If one firm generally comes second to another in tenders and vice versa, that tends to suggest particularly close competition between those firms. It is also important to look at firms who do not win many tenders, however. It may be, for example, that there are two major suppliers in a market and a third smaller player who may not win many tenders but who brings a competitive tension to the tender process, eliciting lower priced offers from the major suppliers.

If enough data points are available, it may be possible to estimate econometrically the effect on prices, margins or discounts of one merger party's participation in the tender when the other party also participates. This was done in the European Commission's consideration of the GE/Alstom merger (Box 13).

Box 13. Bidding analysis in European Commission consideration of GE/Alstom 2015

In the GE/Alstom case, the European Commission conducted an extensive analysis of the bidding data for the supply of large heavy duty gas turbines (Large HDGTs) where GE (the market leader) and Alstom (the third largest competitor) would have a combined market share of around 50-60%, both in the European Economic Area (EEA) and worldwide (excluding China and Iran). There were only two other full technology players, Siemens and MHPS. The bidding analysis of more than 150 pages is enclosed as Annex I of the decision.

The analysis indicated that, among other things, (i) after Siemens, Alstom competed the most often against GE, (ii) other competitors had more limited competitive interactions with GE than Alstom, (iii) Alstom and GE competed against one another in a significant share of competitive tenders (roughly half), which were the tenders the most likely to suffer from a loss of competition between the merging parties and (iv) tenders where GE and Alstom competed against one another had a concentrated market structure, with at least [40-50]% of tenders including only one other participant in addition to the parties based on GE's estimate of participation in each tender.

The Commission also conducted Probit analysis to assess the impact of Alstom's and other rivals participation on the probability of GE winning the bid; and a margin-concentration analysis to estimate the impact of Alstom and other rivals participation on GE's bidding behaviour. The former found that GE was significantly less likely to win a tender when Alstom participated; and the latter found that GE bid significantly lower prices when Alstom participated in the tender.

The transaction was ultimately cleared subject to remedies consisting of the divestiture of key elements of Alstom's HDGT business to a smaller competitor.

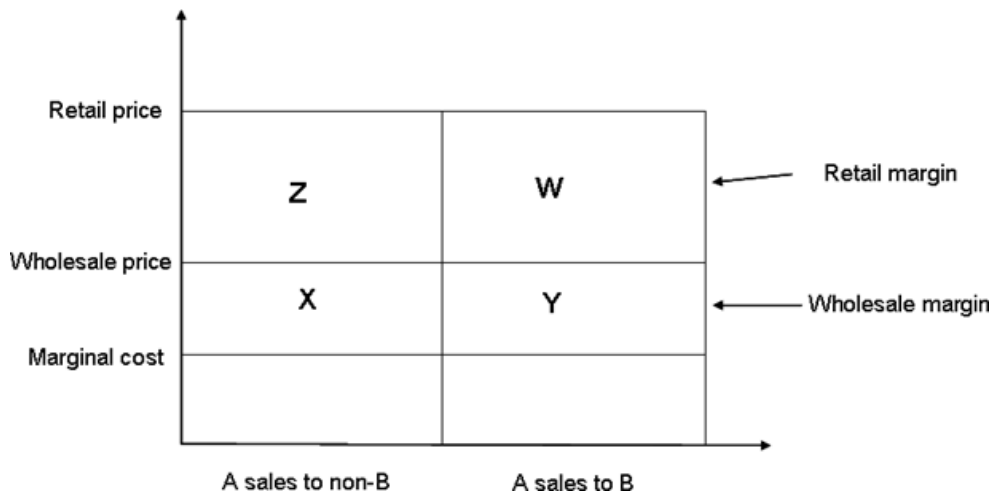
Source: Decision of the European Commission of 8 September 2015, Case No COMP/M.7278 – GE/Alstom, https://ec.europa.eu/competition/mergers/cases/decisions/m7278_6808_3.pdf. RBB Brief 52: Estimating post-merger price effects in bidding markets: lessons from GE/Alstom, June 2016, https://www.rbbecon.com/downloads/2016/06/RBB_B52_Brief-Web.pdf.

Vertical Arithmetic and vGUPPI

As noted earlier, aside from coordination concerns, theories of harm in relation to vertical mergers focus on the ability and incentive of firms to foreclose (fully or partially) rivals from access to inputs or customers, raising rivals costs and reducing the competitive price constraint on the merged firm.

Vertical arithmetic can shed light on the likelihood of competitive harm arising from vertical mergers. It can be illustrated graphically as follows. Firm A is an upstream supplier proposing to merge with firm B downstream. Figure 3 illustrates the situation pre-merger with firm A supplying both firm B and other downstream firms.

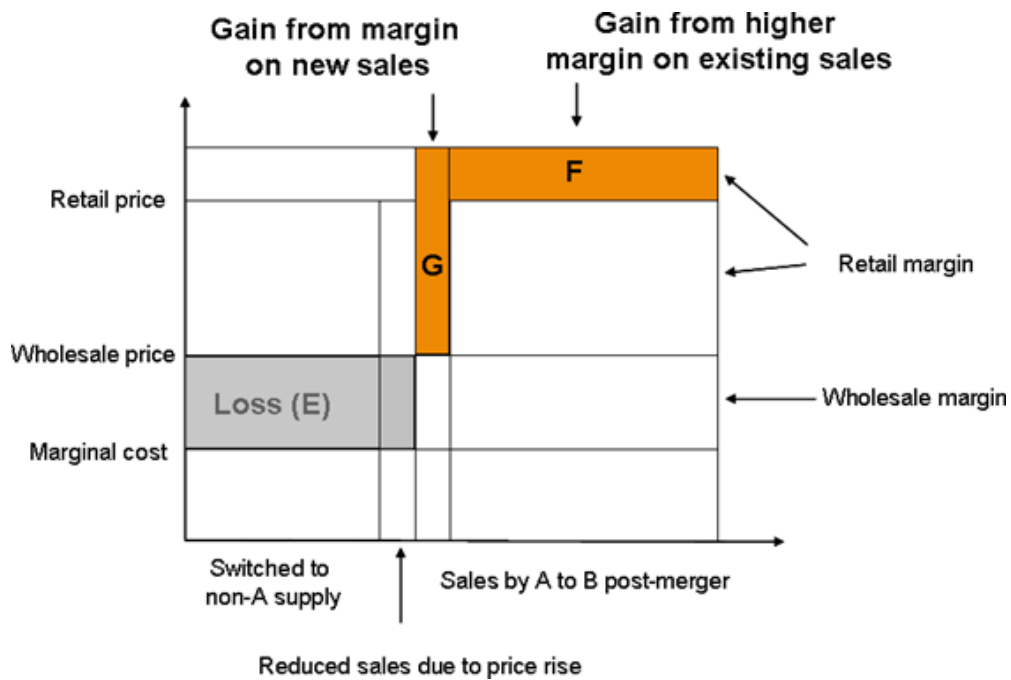
Figure 3. Vertical arithmetic pre-merger



Source: Excerpted from OECD (2011, p. 29_[23]).

Figure 4 illustrates what happens with input foreclosure. The merged firm no longer supplies non-B firms or raises prices to them such that they switch to their second choice supplier, raising their input costs.³⁶ The merged firm loses the margin on sales that are lost to non-B firms (area E) but those firms are now less competitive in the downstream market. As a result, the merged firm A-B will win some sales and associated margins (area G) from non-B firms and overall price levels will be higher, increasing margins on existing sales (area F). If the inequality $F+G > E$ is satisfied, input foreclosure will be a profitable strategy and competition is harmed, as reflected in higher prices and reduced sales.³⁷

Figure 4. Vertical arithmetic post-merger



Source: Excerpted from OECD (2011, p. 30_[23]).

In the AT&T/Time-Warner case, Carl Shapiro (the DoJ expert) estimated the share of subscribers that would be lost by MVPDs as a result of losing access to Turner content, the diversion ratio from those MVPDs to DirecTV and additional margins gained by the merged firm from an input foreclosure strategy (Shapiro, 2019^[38]). However, there were considerable practical data difficulties in making these estimates and in the end the Court was not convinced by the estimates. The Court found other evidence, contradicting the likelihood of anti-competitive effects more persuasive. In that case, the burden of proof lay with the DoJ to demonstrate that the merger *would* substantially lessen competition (without the benefit of the structural presumptions that apply to horizontal mergers in the US).

By contrast, when the New Zealand Commerce Commission considered a vertical/conglomerate merger between Sky (content) and Vodafone (communications/distribution) it abandoned attempts to quantify the vertical effects of the merger as too unreliable and relied instead on qualitative evidence, which caused concern in relation to bundling and foreclosure from telecommunications markets.³⁸ That was in the context of a merger clearance regime, where the onus was on the applicants for clearance to demonstrate that the proposed merger *would not* substantially lessen competition and the Commerce Commission was not satisfied of that. An interesting feature of this proposed merger was its timing: it occurred at a time when New Zealand was rolling out its ultrafast broadband (UFB) network, so that consumers were shifting to new telecommunications plans and hence were “in play”, and the Commission was concerned that the merger would lock in a permanent advantage for Vodafone, foreclosing a substantial share of customers in telecommunications markets going forwards.

Even if the areas E, F and G cannot be calculated precisely, as will often be the case, the framework provides a basis for evaluating relevant quantitative and qualitative evidence that goes to the following elements:

- margins on upstream and downstream sales;
- the proportion of lost upstream sales that will be re-captured as downstream sales by the merged firm; and
- the likely effect of foreclosure on downstream prices.

Like other indicators, vertical arithmetic will not tell the whole story. It does not analyse dynamic adjustments that might occur through entry and expansion and, as noted earlier, vertical mergers can also give rise to efficiencies. It can, however, provide a first cut of possible vertical merger concerns and when combined with other relevant evidence those concerns may be confirmed or dismissed.

Box 14. vGUPPI used by the competition agency in Chile in Santander/Servipag 2018

The competition agency in Chile (FNE) used vGUPPI in its investigation of the contemplated partial acquisition of Servipag by Santander bank. Servipag is a digital payment platform that intermediates between different billers and their customers. Santander bank planned to purchase a 33.3% stake in Servipag, becoming the third equal owner of Servipag with Bank of Chile and Banco de Crédito e Inversiones (BCI). Santander, Bank of Chile and BCI also had controlling stakes in Servipag’s main competitor in the digital payment button market, Transbank.

One of the competitive concerns raised by the FNE was input foreclosure. The investigation revealed that a key input for entering the digital payment platform market was a payment button and that the most important payment button was Webpay owned by Transbank. The FNE was concerned that access to Webpay would be restricted, as a result of which digital payment platform’s potential entry and expansion, that could compete with Servipag would likely be reduced.

The incentives to exercise an input foreclosure strategy were analysed using vGUPPIs, which indicated that Webpay's vGUPPI on Servipag's rival companies would be 200-400%, showing strong incentives to increase Webpay's price post-transaction.

Although the parties offered remedies, they did not include any measures aimed at resolving the vertical risks and, in addition, they were considered by the FNE as inadequate to mitigate the existing horizontal risks. Since the parties did not offer adequate, sufficient and proportional remedies, the FNE finally decided to block the deal.

Source: Decision of the FNE of 18 July 2018, Case N° F-101-2017 – Santander/Servipag, https://www.fne.gob.cl/wp-content/uploads/2018/07/inproh_F101_2017.pdf.

Vertical arithmetic, like CLA and UPP, depends on estimates of diversion ratios and margins for the examination of potential anti-competitive consequences of vertical mergers. Hardly surprising then that a vGUPPI can be calculated for both the upstream and downstream prices of the merged firm and the downstream prices of rival firms (Moresi and Salop, 2013^[39]). However, the data requirements of vGUPPI are substantial and its prediction power somewhat dubious (Slade, 2019^[40]). The FNE in Chile employed vGUPPI in its review of the Santander/Servipag merger (Box 14).

Merger Simulation

Merger simulation involves modelling the market of interest and predicting the price effects of a proposed merger. The model requires information or assumptions relating to demand and cost functions and the nature of competition between firms, e.g. Bertrand, Cournot or an auction model, that are firmly grounded in the facts of the relevant market.³⁹ Incorrect information or assumptions can have a dramatic effect on the predicted price rises. For example, if demand is isoelastic rather than linear, predicted price effects will be larger, yet accurately estimating demand functions is difficult: in particular, demand elasticity at current prices is not necessarily indicative of demand elasticity at higher prices. The form of competition between firms can also change as a result of the merger: in particular, firms may stop competing on price and start accommodating parallel price increases (see, for instance, the OECD background note in OECD (2011, p. 19^[23])).

As a consequence of these difficulties, merger simulation will generally produce a wide range of plausible price rises. Retrospective analysis of horizontal merger simulation models generally find that they have not performed well (Peters, 2006^[41]; Weinberg, 2011^[42]; Weinberg and Hosken, 2013^[43]; Björnerstedt and Verboven, 2016^[44]). Indeed, Miller et al (2017^[45]) find that GUPPI predictions are no less accurate than those from mis-specified merger simulations. Nevertheless, a well-specified merger simulation can be a useful tool for merger evaluation.

Walker provides examples from the EU of the “right” and “wrong” way to do merger simulation (OECD, 2011^[23]). In the Volvo-Scania case a merger simulation was based on list prices for trucks without “add-ons”, when almost no sales were made at list prices and very few trucks were sold without “add-ons”. This was described as “a study based on prices nobody pays for trucks nobody buys.” By contrast, in Oracle-Peoplesoft a bespoke auction model was used to simulate both the effect on prices and the effect on consumer welfare from a loss of choice, meaning that some buyers would not be able to obtain their preferred product post merger, when it was known that the Peoplesoft product was likely to disappear as a result of the merger.

However good the merger simulation, it will never be enough on its own. It will always involve some simplification and assumptions. Furthermore, it does not generally take account of dynamic adjustments in the market in response to the merger, such as the entry of new competitors, diversification of existing suppliers or vertical integration of large buyers. Merger simulation must always be combined with in depth

fact based economic analysis of all the issues relevant to the potential competitive effects of a merger. Indeed, good merger simulation will be grounded in and consistent with the observable facts in the market. Given the data (and time) limitations in any particular merger review, it may well be the case that merger simulation can add little to UPP, price-concentration analysis or more qualitative analysis. Nevertheless, in appropriate cases a well done merger simulation can be valuable.

There have also been some proposals for estimating coordinated effects through merger simulation that goes beyond the calculation of a delta cGUPPI. Moresi et al considered a broader simulation that incorporated the pricing responses of firms not in the HCG, but found that it made little difference to the delta cGUPPI as this effect was missing from both the pre-merger and post-merger cGUPPI (Moresi et al., 2015^[35]).

Kovacic et al (2009^[46]) proposed a slightly different approach to quantifying coordinated effects that builds on unilateral effects modelling to examine the incremental payoffs from coordination arising from the merger; as well as the incremental payoffs from cheating.⁴⁰ If the payoff from coordination compared to competition increases, firms should be prepared to expend more effort in overcoming the obstacles to successful coordination post-merger. The payoffs from deviation may also increase post-merger, but may be short lived if prices then revert to competitive levels.

Entry Profitability Analysis

The likelihood of entry into the market post-merger is often an important consideration in merger review. In order for entry to remove competition concerns, it should be likely, sufficient in extent and timely. It may be possible to quantify the profitability of potential entry using information on costs and prices (and the effect of entry on prices) and the likely customer base available to a potential entrant. Where economies of scale are significant, an entrant may add substantial capacity to the market, depressing prices and expected returns. Where brand loyalty is strong or switching costs are significant, entrants may not be able to attract enough customers to achieve the necessary scale efficiencies.

Information from market participants can sometimes be used to inform a required payback period (N) and discount rate (i), which will reflect the riskiness of investment e.g. the extent to which costs are sunk on entry, as well as expected sales and costs to estimate cash flow (R) at different price levels. This information can then be used to calculate the net present value (NPV) of investment in entry, providing an indication of what level prices would need to be to attract entry:

$$NPV(i, N) = \sum_{t=0}^N \frac{R_t}{(1+i)^t}$$

While this sort of calculation can be useful, it will only be as good as the assumptions made and it cannot take account of all entry barriers, in particular regulatory barriers, access to scarce resources or strategic behaviour by incumbent firms. An example of where it has been used, and the difficulties involved, is provided in the New Zealand Commerce Commission's modelling of entry into the mobile phone top-up market as part of its review of the Epay/Ezipay merger.⁴¹ In that case, the calculation suggested that expectations of profitable entry would require an entrant to be confident of rapidly growing its market share and the Commission was not satisfied that was likely.

Valuation Analysis

A final quantitative technique that has received increased attention in the context of “killer acquisitions” and the amounts paid by large digital platforms to acquire smaller targets in the digital economy, is valuation analysis (OECD, 2020^[5]; Latham, Chisholm and Lynch, 2019^[47]). However, valuation analysis can be informative in any merger scenario. The essence of valuation analysis is to critically examine the price paid for an acquisition or proposed acquisition. A target may be more valuable to an acquirer than it is to the existing owner because of synergies that can be extracted, because of superior management skills and/or because the merger will reduce actual or potential competition.

Comparing the standalone valuation of a target to the acquirers’ valuation, e.g. using discounted cash flow analysis, and examining potential explanations for the difference can help inform the competition analysis. Theoretically, the seller should not be prepared to accept a price less than the standalone discounted cash flow valuation. If the acquirer is willing to pay significantly more than this, it will be useful to enquire as to why that is the case and whether the premium can be justified on the basis of efficiencies or is predicated on an increase in market power or prevention of competition that would otherwise erode the profitability of the acquirer’s existing business.

Alternatively, a comparison of price to earnings ratios for the merger under review and comparable acquisitions may highlight concerns, but care needs to be taken that apples are being compared with apples.

3.2. Qualitative Evidence

Economists are not equivalent to econometricians. As discussed earlier, economics provides the analytical framework which underpins competition law and merger review. This framework allows all relevant evidence, whether quantitative or qualitative, to be organised and interpreted. As John Maynard Keynes remarked, economics “*is a method rather than a doctrine, an apparatus of the mind, a technique of thinking, which helps its possessor draw correct conclusions*” (Keynes, 1922, pp. v-vi^[48]). An understanding of markets, competition and market power and the role of incentives allows the market evidence to be organised into a coherent narrative. It provides a lens through which to make sense of the facts.

Accordingly, it is important to involve economists in framing document and information requests from the merger parties and other market participants and reviewing those documents when received. An economic framework is important for knowing what to ask for and what is significant in the response. Equally important, economists should be engaged to help frame interview questions for the parties and other market participants and preferably be involved in the interviews so that they can ask relevant follow up questions.

3.2.1. Document and data requests

The types of documents that will be relevant to collect in a merger investigation will depend on the nature of the market or markets of interest. Often it will be beneficial to have an initial discussion with the merger parties to get some understanding of the nature of the market and how competition currently works in order to formulate an initial document request. Almost certainly, document requests will be an iterative process – as the market is better understood, the importance of different types of information will become clearer.

Nevertheless, it is possible to think about some general categories of information that might be relevant to request in different merger scenarios:

- Market research in relation to consumer behaviour, brand loyalty, search and switching costs, substitution, catchment areas;

- Relevant contracts and tender documents;
- Regulatory requirements that may be relevant to product substitution and/or entry costs;
- Internal strategy documents relating to competition, rivals, suppliers and customers, investments, regulatory and other barriers to entry and expansion, pricing, marketing and promotion;
- Internal assessments of new product launches or store openings, market entry or any relevant “natural experiments”;
- Sales, cost and revenue data that may be useful for calculating market shares and performing critical loss or UPP type analysis among other things;
- Time series price and quantity data that may indicate patterns of interaction between firms;
- Data relating to capacity utilisation;
- Documents assessing potential efficiency gains arising from the merger.

More detailed discussion of the types of evidence that might be collected in a merger review are discussed elsewhere, e.g. in various ICN work products (2005^[49]; 2006^[50]; 2013^[32]).

Documents that are produced in the ordinary course of business are likely to be most useful in understanding how a market operates. Documents that pre-date contemplation of the merger will also generally be of most probative value as they are less likely to be influenced by how they might be interpreted during the merger review process. Regardless of the timing or context in which documents have been produced, economists can provide a helpful critical assessment of them, taking account of the context and incentives underpinning them.

3.2.2. Interviews

Interviews with market participants are another important source of qualitative (and quantitative) information during the merger review process. They can both answer relevant questions that go to critical issues of substitution and competition, but also alert agencies to the existence of relevant data, documents and natural experiments that may be useful for the merger review process.

Economists can be particularly helpful in framing questions that are sufficiently specific to be useful, e.g. relating to substitution in response to a SSNIP, and probing with follow up questions. It is also important to understand what different market participants can and cannot usefully inform competition agencies about in a merger review and what incentives they may have to emphasise or de-emphasise particular matters. Economists can help agencies understand both of these things and critically assess what both the merger parties and third parties are saying (Farrell, 2004^[51]; Heyer, 2006^[52]).

Customers (or suppliers if the concern is with increased buyer power that might arise from the merger) will be an important source of information on questions such as the availability of substitutes, search and switching costs, and the ease or difficulties associated with importing. Suppliers too can be an important source of information on consumer behaviour as well as on the nature of production, marketing and contracting and on barriers to entry. As for documentary evidence, a more detailed discussion of the types of information that can be gathered in interviews with the parties, their customers and suppliers can be found in the various ICN work products.

Customers of the merger parties may have strong views, either positive or negative, about a proposed merger, but just because they are the ones most likely to be affected by any loss of competition (and any efficiencies that may arise) does not mean they are necessarily well placed to assess them. Consumers can provide many useful insights about consumer behaviour in a market, which will often complement more systematic market wide quantitative evidence. For example, they may be able to explain why different products are or are not close economic substitutes and why consumers do or do not switch suppliers. They can explain just what it is that a product does and how difficult (or not) it would be for them to switch

supplier or product and why. Market research or survey evidence may provide market wide information about consumer behaviour but the “why?” question may be more difficult to answer without direct evidence from individual consumers. This sort of information may also be relevant for reputational barriers to entry, e.g. if switching to an entrant of unknown quality could risk imposing significant costs on users, individual customers can explain why that would be the case.

Consumers would not, however, necessarily know about suppliers’ excess capacity or a potential new entrant to the market, each of which could be critical pieces of information in determining the likely outcome of a merger. In some circumstances, however, they might have relevant supply side information, e.g. a large customer considering vertical integration or sponsoring entry. In this case, however, it will be important to consider the position of other customers who may not be so well placed and whether the supplier will be able to price discriminate post-merger. Customer concerns about the market and/or the merger can also help guide requests for relevant information and documents from the merger parties and other suppliers. This can include pointing the agency to natural experiments that have occurred and which might throw further light on the potential consequences of a merger.

While it might be thought that customers would give an unbiased (if not always fully informed) view of the likely effect of a merger, this may not always be the case. For intermediate customers, who compete with other buyers in the supply of downstream products, they will not only be concerned with how the merger may affect them, but also with how it affects their rivals. If it seems likely to affect their rivals more adversely than them, e.g. because rivals are more dependent on the merging firms, they may tend to downplay the potential adverse consequences of the merger (Heyer, 2006^[52]). Conversely, if a merger promises efficiencies that seem likely to benefit rivals more than themselves, an intermediate customer may object to a merger. In some cases, it may be that all incumbent intermediate customers would benefit or lose from a merger relative to potential entrants. For example, it could be the case that all incumbent firms have long-term contracts that secure their prices for several years into the future. More generally, cost pass through will depend on the shape of cost and demand curves and the nature of competitive interactions (RBB Economics, 2014^[53]). It is certainly too simplistic to suggest that if buyers are in favour of a merger it must be good for competition and if they are against it, it must be bad.

Perhaps even more obviously than is the case for consumers, suppliers are not free from bias either. However, it is too simplistic to just say that if rival firms are against a merger it must be good and if they are in favour it must be bad. While it is true that merger review should be concerned with competition and not competitors, in markets where there are very few competitors, the two may not always be so different. In particular, where the concerns are not about a stronger competitor but about potential conduct to exclude competitors, the interests of rivals and consumers may be more aligned. For example, a vertical merger may give the merged firm control over a critical input or customer, which might raise concerns about foreclosure.

3.3. Putting it all together

“Competition authorities and courts face a difficult task in evaluating proposed mergers. Predicting a future world following consummation of a merger that has not yet occurred is no simple chore” (Heyer, 2006, p. 3^[52]). This looking into the future is what makes merger review particularly difficult, especially for lawyers and courts that are used to dealing with evidence and facts. As (former Justice) Finkelstein (2020, p. 82^[54]) has remarked:

When the Federal Court considers what may, or may not, happen in the hypothetical markets being examined, the Court is not embarking upon a fact-finding exercise. It is merely predicting what may occur.

Putting together all the pieces of evidence in a merger review is a bit like a jigsaw puzzle. Sometimes a few key pieces of evidence will be enough to satisfy an agency that a merger is not a significant concern for competition and the picture is sufficiently clear without filling in all the missing pieces. When a merger does raise concerns, more pieces of the jigsaw must be found, but there will virtually always be a few missing pieces.

Economists should not pretend that they can predict the future with a mathematical model. A “founding father” of economics (and a trained mathematician), Alfred Marshall wrote in a letter to A.L. Bowley in 1906:

I had a growing feeling in the later years of my work at the subject that a good mathematical theorem dealing with economic hypothesis was very well unlikely to be good economics: and I went more and more on the rules - (1) Use mathematics as shorthand language, rather than as an engine of inquiry. (2) Keep to them till you have done. (3) Translate into English. (4) Then illustrate by examples that are important in real life (5) Burn the mathematics. (6) If you can't succeed in 4, burn 3. This last I did often.

Economists models are likely far less reliable than epidemiological models of Covid-19 because economics is not a science. Beware the snake oil seller (Bishop, 2013^[34]). Indeed, there is a danger that warring economists with fancy quantitative modelling that claims more predictive power than it can actually deliver may simply cancel each other out and be discounted altogether. Whereas each model may in fact have something useful to tell us and understanding why different models have produced different results may be helpful to understanding the potential impact of the merger.

What is really important is that a sound economic (and legal) framework is applied to evaluate all of the evidence, whether it be documents, witnesses or quantitative analysis. That framework provides a means of organising all the potentially relevant information and analysis to get a good understanding of how competition currently works in the market and to make the best possible assessment of the likely future consequences of a merger, which simply cannot be predicted with one hundred per cent accuracy. Different types of information will generally provide pieces of the jigsaw puzzle that fit together, e.g. cost and revenue data can be used to calculate critical loss; survey data may be useful for actual loss and evidence from witnesses may explain why the actual loss is likely to be less than or more than the critical loss. If the different pieces of evidence are not consistent, further investigation will be required to explain the inconsistencies. At the end of the day, merger review requires a judgement call considering all of the evidence against the statutory test. It is far more useful to the decision maker if economists clearly explain what their analysis can and cannot say about competition in the market and the likely consequences of a merger, rather than claiming more than it actually delivers.

3.4. Assessing Remedies

Once a merger review has been completed (and sometimes before it has been completed), the parties may offer remedies in an attempt to resolve competition concerns that have been raised. Indeed, globally a large proportion of mergers are now resolved through remedies. Ensuring the effectiveness of such remedies is just as important as analysing the competitive effects of the merger. If the remedies are ineffective, that is equivalent to clearing a merger. Worse still, there could be unintended adverse consequences for competition. On the other hand, effective remedies can help secure merger specific efficiencies while largely removing competition concerns relating to a merger – concerns which may be confined to a limited set of all the markets affected by the merger. Designing an effective remedy requires careful deliberation and consultation and can involve many challenges, even for what might appear to be a relatively straightforward divestiture. The ICN revised its Merger Remedies Guide in 2016 to reflect the experience and learnings of agencies implementing remedies, which provides an extensive discussion of all the issues that may arise when considering merger remedies (ICN, 2016^[55]).⁴²

Economists can play an important role in the assessment of remedies. Understanding the economic framework and analysis of the potential impact of the proposed merger will be important in understanding what remedies would be sufficient to alleviate the concerns and to consider potential unintended consequences. The analysis of constraints and incentives in relation to remedies can be especially important (Kwoka, 2017^[56]). What are the constraints on the merged firms conduct and the incentives for the parties to comply with the remedy - and how readily can the agency detect non-compliance? Does the remedy remove constraints or create new incentives for other market participants? Box 15 provides an example of the economic analysis of proposed remedies by the Brazilian competition authority, CADE.

Box 15. Economic analysis in the assessment of remedies by the Brazilian competition authority

The Brazilian competition authority (CADE) carried out economic analysis in order to evaluate the effectiveness of the remedies proposed by the merging parties in the ArcelorMittal/Siderurgia merger. In this case, CADE was concerned that the merger could result in long steel price increases caused by the merged entity's market power and the risk of coordinated conduct between the major companies in the sector. In order to address these concerns, the parties submitted remedies the conditions of which remained confidential.

The effectiveness of the proposed remedies was evaluated by CADE's Department of Economic Studies (DEE). The post-remedy market structure was evaluated based on the HHI, Δ HHI as well as concentration ratios. The post-remedy unilateral effects were evaluated based on GUPPI and UPP.

On this basis, DEE found that the proposed remedy package would not be sufficient to fully address competition concerns identified by CADE. DEE's opinion was followed by CADE. The parties subsequently revised their remedy proposal, which was ultimately accepted by CADE.

Source: Technical note of DEE dated 12 January 2018 in case No 08700.002165 / 2017-97, ArcelorMittal/Votorantim Siderurgia, <http://www.cade.gov.br/aceso-a-informacao/publicacoes-institucionais/dee-publicacoes-anexos/nota-tecnica-no-2.pdf>.

The distinction is usually made between structural and behavioural remedies (ICN, 2016^[55]). Most competition agencies have a stated preference for structural remedies⁴³ and in some cases the law only provides for this type of remedy.⁴⁴ Structural remedies involve the divestiture of assets and restoration of a market structure with the capacity to largely maintain competition at pre-merger levels. Behavioural remedies, by contrast, involve commitments to behave in certain ways that will prevent the adverse competitive outcomes of concern, e.g. a requirement to supply an input to rivals. Kwoka points out that the crucial economic difference between structural and behavioural remedies is that structural remedies rely on maintaining a market structure, whereby firms own profit maximising incentives drive the maintenance of competition, whereas behavioural remedies require firms to conduct themselves in a way that is generally contrary to their own profit maximising incentives (Kwoka and Moss, 2012^[57]; Kwoka, 2017^[56]; Kwoka, 2020^[58]).

In practice, the distinction between structural and behavioural remedies is less clear-cut: an effective structural remedy often requires transitional (or even ongoing) behavioural commitments, e.g. guaranteeing transitional input supplies or licensing of brands. Equally, behavioural remedies may in fact be quasi-structural, e.g. a (very) long term content or brand licensing agreement.

It is generally recognised that the core difference in the incentives around behavioural versus structural remedies, combined with asymmetric information, are likely to give rise to particular problems around effective enforcement of behavioural remedies and requirements for ongoing monitoring (with associated costs). Nevertheless, behavioural remedies are still common, especially for vertical mergers that do not in

themselves alter the horizontal market structure and for horizontal mergers where a merger is likely to create efficiencies but perhaps raises competition concerns in one particular market that are not easily resolved through divestiture. Nor are structural remedies without risk. In particular, it is critical that the divested assets are sufficient to maintain competition and the acquirer has the capabilities to use those assets in such a way that competition is maintained. Transitional behavioural remedies will often be important to secure the success of structural remedies.

An example of (avoiding) unintended consequences are the conditions imposed on an airline alliance between Virgin Australia and Air New Zealand for the supply of trans-Tasman services.⁴⁵ When the alliance was first authorised in 2010, the ACCC imposed conditions requiring the airlines to commit to certain levels of capacity on each of several specific routes of concern. When authorisation was renewed in 2013, the conditions of authorisation were varied to impose an aggregate capacity condition across the routes of concern, providing the parties with more flexibility to efficiently allocate capacity in response to demand and avoiding a situation which might provide particular airports with monopoly leverage over the airlines, knowing that they were required to acquire a minimum level of airport services at particular ports.⁴⁶

Another example of unintended consequences is the case of the Danish concrete market. While not a remedy imposed in relation to a merger, it could easily have been. In 1993, the Danish Competition Authority decided to gather and publish information on firm specific prices for two grades of ready mixed concrete, in order to increase market transparency and facilitate consumers shopping around. However, the increased transparency seems to have had a greater impact in facilitating price coordination in a concentrated market as prices subsequently increased by 15-20%, increases which could not be otherwise explained, and prices of firms supplying particular geographic areas tended to converge (Albæk, Møllgaard and Overgaard, 1997^[59]).

3.5. Ex post Review of Mergers

A final area in which economists have a key role to play is in the ex post review of completed acquisitions (including those in which remedies have been imposed). The FTC has been one of the major proponents of “merger retrospectives” and recently reaffirmed and expanded its commitment to undertaking them, as well as encouraging and disseminating the work of others in doing so.⁴⁷ The EU has also published a major piece of work it commissioned from academic researchers to conduct an ex post review of merger decisions by EU competition authorities (Ormosi, Mariuzzo and Havell, 2015^[6]). The OECD has held roundtables and workshops exploring the experiences of various agencies with ex post evaluation of enforcement decisions, including merger reviews.⁴⁸

Ex post merger reviews can serve a number of purposes. First, they can help evaluate whether competition agencies have been too permissive in their approach to merger enforcement by examining price (and non-price) outcomes in markets where mergers have occurred compared to comparable markets where no merger occurred, using methods such as difference in differences. Second, they can help to evaluate the predictive power of various economic tools used to screen or evaluate mergers, e.g. UPP indices or merger simulation. Third, they can help to evaluate the effectiveness of merger remedies of various kinds in addressing potential adverse effects of mergers.

Box 16. The effect of mergers in search markets: evidence from the Canadian mortgage industry

Allen et al used a difference in differences approach to examine the impact of a merger between two of the top eight mortgage providers in Canada, each with a network of local branches. They compared a 'treatment group' of consumers who had the option of using the branches of both merger parties with a 'control group' that had the option of only one or none. The mortgage market was characterised by nationally posted prices but consumers who searched and negotiated prices with local branch managers to a variable extent, resulting in considerable price dispersion. The authors explored not just the impact of the merger on the average consumer, but also the impact on the distribution of prices charged. They found that prices increased for about three quarters of consumers but for consumers paying the highest interest rates, those who did less searching and negotiating, prices were unaffected. This resulted in a compression of the overall price distribution.

Source: Allen, Jason, Robert Clark, and Jean-François Houde. 2014. "The Effect of Mergers in Search Markets: Evidence from the Canadian Mortgage Industry." *American Economic Review*, 104 (10): 3365-96

A concrete example of the effectiveness of ex post merger review in changing a competition agency's approach to merger assessment is the experience of the FTC with hospital mergers. After a number of unsuccessful challenges to hospital mergers in the late 1990s, the FTC undertook merger retrospectives exploring the price effects of a number of completed hospital mergers. Those reviews concluded that the Elzinga-Hogarty method for delineating geographic markets resulted in markets that were much too broad and that not-for-profit hospitals exercised market power. These reviews resulted in a new approach to hospital merger enforcement by the FTC and subsequent successful challenges.⁴⁹

When agencies have limited resources, it is difficult to divert them away from reviewing current merger proposals to undertaking ex post merger reviews. However, all agencies can benefit from lessons learned from the ex post review of mergers by those with more resources and greater experience. The FTC website includes a bibliography of retrospectives undertaken by third parties⁵⁰ in addition to those undertaken by the FTC themselves.⁵¹ It also includes transcripts and videos from the 2019 Hearing on Merger Retrospectives.⁵²

The New Zealand Commerce Commission is one small agency that has managed to use ex post review in a more targeted way (Csorgo and Chitale, 2015_[60]). Rather than seeking to determine whether a merger has adversely affected prices (or non-price outcomes), with the attendant data and analytical requirements, the Commission has carried out investigations that seek to determine whether anticipated market developments that were key to its decisions, such as entry or increased imports, did in fact take place and if not, why not. This was done across a wide number of transactions with the goal of determining which techniques and types of evidence were most useful.

Reviews by both economists and business analysts that have focused on the realised efficiency gains of mergers have suggested that expected efficiencies are often not realised (see, for example, Kwoka (2020_[58]) and Christensen et al (2011_[61])). This work tends to confirm that agencies are right to be sceptical about claimed efficiencies in merger review and to require that merger parties provide convincing evidence before they are accepted.

4 Using and Organising Economists

Economics lies at the heart of competition law. Economics provides the analytical framework on which to hang the facts. Economists should play an important role in analysing all types of evidence, not just data but also documents and evidence from witnesses. However, ultimately economic analysis must be judged against a legal standard and it is critically important that economists can explain their analysis to lawyers and judges. How best then to use and organise economists in the enforcement of competition law?

A number of issues arise for consideration, but this section will deal with three:

- The use and organisation of economists within competition agencies;
- The use of the merger (and other) parties economists;
- Expert evidence in the courtroom.

3.6. The use and organisation of economists by competition agencies

According to the Global Competition Review Competition Economics Handbook for 2020, approximately two thirds of the agencies listed had a position of Chief Economist or equivalent (GCR, 2020^[62]). This seems to be on a slight upward trend from previous years. Over half of respondents to an ICN Economist Survey in 2017 indicated that the role of economists had increased over the preceding decade, including by creating or expanding the role of Chief Economist.⁵³

All agencies that responded to the GCR questions indicated that they employed economists. However, the organisational models varied. Around two thirds had a specialist economics unit or a structure that grouped economists together in a specialist area (GCR, 2020^[62]). There was not an exact mapping of those agencies with a Chief Economist and the agencies with an economics unit or equivalent. In particular, several smaller agencies had a Chief Economist but no specialist economics unit. Virtually all agencies seem to embed economists within case teams as well as or instead of employing them in a specialist unit. Particular mention was often made of the role played by economists in merger review.

Slightly less than two thirds of respondents to the ICN Economist Survey in 2017 reported that their agency had a specialist economic unit, but respondents unanimously indicated that lawyers and economists work together on case teams and case team leadership appeared to be evenly divided between lawyers and economists.⁵⁴

These reports of what is happening on the ground within agencies reflect a rational response to the challenge of how to make the most effective use of economic resources within an agency. The enforcement of economic law requires lawyers and economists to work together. Ideally, they should each have some understanding of both the law and the economics of competition. However, economists also need to talk to each other, to discuss ideas and to have their work critically reviewed by other economists. There are advantages and disadvantages to what have been described as a functional or centralised organisational model on the one hand, where economists are grouped together in a specialist area, and a divisional or devolved model on the other hand, where economists are integrated into multi-disciplinary teams and divisions (Froeb, Pautler and Röller, 2008^[63]). Froeb et al (2008^[63]) find that having a centralised unit tends

to produce higher quality analysis but integrating the analysis into decision-making (addressing relevant questions and communicating the analysis) can be more difficult than when economists are embedded into divisions. Unsurprisingly they conclude that an effective functional organisation requires strong horizontal links across the agency and that an effective divisional organisation requires strong vertical links, such as independent economic recommendations and managers with functional expertise in both economics and law.

While agencies adopt a variety of organisational structures, most appear to recognise the importance of integrating high quality economic analysis into their operations, including merger review and to a greater or lesser extent adopt some sort of hybrid model that has both specialist and embedded economists and/or where economists from the specialist unit are embedded in particular case teams but also report back to the Chief Economist or equivalent.

3.7. Merger (and other) parties economists

It is common practice for merger parties, and less frequently third parties such as major customers of the merging parties who may be concerned about the potential competitive effects of the merger, to engage their own economists to perform economic analysis for them, which is then submitted in a report to the competition agency. While the parties commissioning this work are clearly not unbiased observers, the economists they employ are not always simply “hired guns”; they are generally keen to maintain a reputation for independent analysis that will have a greater chance of being taken seriously by decision makers in the future. If done well, the economic analysis submitted by external parties can be very helpful to competition agencies, especially where the latter have limited resources to perform the analysis themselves.

In an attempt to make external economic analysis more useful, several agencies have produced guidance notes for the submission of economic evidence, particularly quantitative economic analysis. Examples include the European Commission⁵⁵, the UK Competition Commission (adopted by the CMA),⁵⁶ the Bundeskartellamt⁵⁷ and the New Zealand Commerce Commission.⁵⁸

Some common principles adopted in these guidelines are:

- The objective of the analysis is clear and relevant;
- Assumptions underlying the analysis are clearly articulated;
- Appropriate techniques are applied;
- Data is fit for purpose;
- The analysis is transparent and replicable;
- Results are robust to small changes in the data or methodology;
- Results are explicable, including any inconsistency with other evidence; and
- The analysis is clearly presented and can be understood by non-technical experts.

If these principles are well understood and external experts present their analysis in a timely fashion so that the competition agency is able to review and test the analysis, it can be very helpful and save scarce internal resources.

3.8. The Economist in Court

Ultimately some mergers may end up in court and then it will be important that the economic evidence presented can be understood by Judges (OECD, 2008^[64]). The evidence should be both relevant and

admissible, but it also needs to be well articulated. While the legal systems and rules of evidence applicable to competition law proceedings differ around the world and it is beyond the scope of this paper to review the role of expert economists in the courtroom across those different legal systems, there are some common issues that can be briefly considered here.

In the context of merger review and competition law more generally, economics is not abstract theory but the application of economic reasoning to the facts of a case for the purpose of determining whether a proposed (or completed) merger will involve a breach of the law. Many merger reviews may never see the inside of a court room, as they will be determined by the competition agency, but in most competition law regimes the Court is the ultimate decision maker in contested mergers, either at first instance or on appeal. When decision makers within a competition agency make determinations in merger review, they will do so within the framework of the applicable law in that jurisdiction and generally “with a Judge on their shoulder”, considering whether the evidence would be sufficient to meet the applicable legal threshold. Often the decision makers within agencies will have legal rather than economic training. Accordingly, what is an effective presentation of economic analysis in Court will also generally be an effective presentation to decision makers within agencies.

To quote Keynes (1936, pp. 297-298^[65]) one final time:

Too large a proportion of recent "mathematical" economics are mere concoctions, as imprecise as the initial assumptions they rest on, which allow the author to lose sight of the complexities and interdependencies of the real world in a maze of pretentious and unhelpful symbols.

While some Judges may have mathematical training and be able to follow an abstract economic theorem set out as algebra, most would probably prefer not to receive evidence of that type. It may also simply not be relevant evidence to receive. Economic evidence is useful to a Judge if it clearly articulates the application of economic reasoning to the facts of a case. As economics and economists play an increasingly large role within agencies, it is important that the analysis is well grounded and clearly articulated in a legal setting – otherwise they risk becoming less relevant in the most challenging (and challenged) cases. Agencies would do well to choose an economic expert who can follow Keynes advice, communicating economics in plain language and applying it to the facts of the merger. As Ronald Coase reportedly advised Judge Ginsburg, “*if an economist couldn't express himself adequately in plain language then it is likely that he did not know what he was talking about*” (OECD, 2008, p. 89^[64]).

Some jurisdictions make provision for the use of lay Members of the relevant Court or Tribunal, who are often economists with training and experience relevant to competition law. For example, the New Zealand High Court has lay member economists sitting with Judges to hear competition cases. In Australia, lay members sit with a presiding Judge on the Australian Competition Tribunal, a body that can review various decisions of the ACCC. The Competition Tribunals of Canada and South Africa, which are both specialist first instance decision makers, similarly have non-judicial members that will usually include economists. In the UK, the Competition Appeals Tribunal includes economists sitting as Members alongside Judges. This can be a useful arrangement to assist Judges in understanding the economic arguments raised and applying economic reasoning in a particular case. However, it is by no means a common construct and it is a lazy economic expert who relies on the lay Member to translate their evidence for the Judge.

Some courts have made provision for experts to confer with each other. In Australia, for example, the Federal Court Practice Note on Expert Evidence⁵⁹ makes specific provision for expert conferences, joint reports (that explain to the court how and why the economists agree or disagree on various issues) and concurrent evidence or so-called “hot tubs”, for the presentation and testing of economic evidence. Interestingly, the “hot tub” method originated in the Competition Tribunal and was later adopted in the Federal Court. Some jurisdictions may also provide for the use of Court appointed experts (OECD, 2016^[66]).

Endnotes

¹ However, in the case of completed acquisitions, evidence of post-merger conduct may also be relevant.

² In the special case of creating a monopsony/oligopsony in a market already characterised by monopoly/oligopoly, final consumers may benefit, but it is not necessarily the case, as discussed in Noll (2005^[1]).

³ There can also be adverse effects in other product markets, e.g. if the exercise of monopsony by producers of product X results in less efficient sources of supply being drawn into that market instead of supplying product Y, this could result in higher prices for product Y.

⁴ For example, in Australia the market power of milk processors as acquirers of raw milk in markets which are geographically limited by transport costs and product perishability was highlighted in a recent market inquiry (ACCC, 2019^[67]). Increased market power in the acquisition of raw milk had long been a principle concern in relation to dairy industry mergers in Australia. For instance, the ACCC was concerned about the proposed acquisition of assets from Murray Goulburn by Saputo Dairy Australia Pty Ltd partly on the grounds of reduced competition in the acquisition of raw milk in Western Victoria. The merger was approved subject to divestiture of processing assets and other commitments. See: <https://www.accc.gov.au/public-registers/mergers-registers/public-informal-merger-reviews/saputo-dairy-australia-pty-ltd-proposes-to-acquire-murray-goulburns-operating-assets>.

⁵ Each of these issues is addressed in more detail elsewhere, including in a number of previous OECD Roundtables and various ICN work products. A comprehensive coverage is not attempted here.

⁶ In some jurisdictions supply side switching is incorporated in market definition, while others cover this when identifying market participants or under entry conditions. What matters is that all relevant constraints are identified at some point.

⁷ While the smallest such area will often be the relevant market, in some cases the relevant market will be wider.

⁸ Noting, however, the issue of “killer acquisitions” or more generally the acquisition of potential competitors (OECD, 2020^[5]).

⁹ The CR4 is the combined market share of the four largest firms in the market, while the CR3 is the combined market share of the three largest firms.

¹⁰ The HHI is the sum of the squares of each market participant’s market share and is directly related to pricing outcomes in the Cournot model of oligopoly.

¹¹ See, for example the ACCC review of Carsales proposed acquisition of Trading Post at: <https://www.accc.gov.au/system/files/public-registers/documents/MER13%2B5165.pdf>

¹² Furthermore, if the large buyer(s) have market power in their downstream market, the merger could create or increase the “double marginalisation” problem.

¹³ The dead weight loss is the lost consumer surplus of value (represented by the demand curve) over cost for the output that is lost as a result of the increase in market power resulting from the merger.

¹⁴ A further detriment that may arise is where additional transport costs are incurred to supply consumers affected by the exercise of market power (Williamson, 1977^[76]).

¹⁵ Figure 1 illustrates the trade-off in the context of a horizontal merger, but such a trade-off may also be relevant in the context of vertical and conglomerate mergers. For example, transactions cost efficiencies may result from a vertical merger that may be offset against the dead weight loss or the total loss of consumer welfare (Williamson, 1974^[18]).

¹⁶ Reductions in marginal cost will reduce the profit maximising price even for a monopolist and the net result could be a smaller price increase, no price increase or even a lower price post-merger.

¹⁷ Furthermore, if pre-merger prices are used as a proxy for costs in this scenario, the extent of cost savings from the merger will be overestimated.

¹⁸ See, for instance, (Levenstein and Suslow, 2006^[68]). Indeed some factors can work in opposite directions depending on other market characteristics. For example, cost symmetry between firms may make reaching agreement on the profit maximizing price easier, but asymmetry of costs can enable a leading firm to discipline weaker firms with high costs by threats of price wars.

¹⁹ Including where one or both parties have a small toehold presence in the other’s market, as was the case in the Premdor-Masonite merger discussed in Dick (2003^[15]).

²⁰ However, any particular merger may have horizontal as well as vertical effects.

²¹ As noted above, vertical mergers can also raise coordinated effects concerns if they make coordination easier to achieve or sustain.

²² Note that foreclosure does not have to be complete to reduce competitive constraints and result in higher prices.

²³ See OECD (2019^[17]) However, as Slade (2019^[40]) points out, many of these studies relate to competitive industries and some of the efficiencies associated with vertical integration cannot be achieved by vertical mergers (geographic proximity) or have been over emphasised (EDM).

²⁴ Absent such efficiencies, firms might be expected to take advantage of the high-powered incentives of market-based transactions. If instead they pursue vertical integration, this might suggest a need for closer scrutiny of potential anti-competitive effects from vertical mergers.

²⁵ EDM is a major focus of the US Vertical Merger Guidelines issued on 30 June 2020, see: <https://www.justice.gov/atr/page/file/1290686/download>.

²⁶ For further discussion on this case see, for example, the Competition Policy International Antitrust Chronicle Summer 2019 edition at: https://www.competitionpolicyinternational.com/wp-content/uploads/2019/07/AC_July_2.pdf.

²⁷ Wright and Rybnicek (2018^[75]), who agreed with the Court’s decision, argues that the Court did not reject the theory or the particular Nash bargaining model, but rather rejected their particular application in this case. The Court of Appeal seemed to agree in *USA v AT&T (United States Court of Appeals for the District of Columbia*, No.18-5214, 26 February 2019). See also (Whelan, 2019^[77]).

²⁸ The two products do not necessarily need to be complements in the usual economic sense. For example, a firm supplying two unrelated products to hospitals may be able to engage in anti-competitive bundling that excludes competition from one or both markets.

²⁹ See, for example, Caltex 2009 proposed acquisition of Mobil retail assets: <https://www.accc.gov.au/system/files/public-registers/documents/D10%2B2899903.pdf>. The ACCC also instituted proceedings alleging that the Informed Sources service, or rather the agreements through which the service was provided, was itself in breach of other provisions of the competition law: <https://www.accc.gov.au/media-release/accc-takes-action-against-informed-sources-and-petrol-retailers-for-price-information-sharing>. That action was subsequently settled by behavioral undertakings whereby Informed Sources agreed to only provide its service on condition that the data was also made available to consumers and third party information service providers: <https://www.accc.gov.au/media-release/petrol-price-information-sharing-proceedings-resolved>. See also presentation by Dr Graeme Woodbridge, Chief Economist ACCC, ICN-OECD Workshop, Korea 4 May 2018.

³⁰ Importantly, the diversion ratio from A to B will not necessarily be the same as from B to A as substitution is not necessarily symmetric.

³¹ To be exact, it depends on the CM across the range of output associated with the lost sales. By using the CM at current sales levels, we are implicitly assuming that the CM remains constant over the relevant range of sales. In most cases, this will be a reasonable assumption, but not always.

³² A critical loss calculation may, however, be useful for a merged firm: pre-merger each party should be maximizing their own profits, but not the profits of the merged firm. A critical loss calculation can then provide some insight into whether a post-merger price rise is likely to be profitable (when combined with information on likely sales and possible entry and expansion).

³³ An issue that sometimes arises in market definition is “chains of substitution”, where product A is a close substitute for product B and product B is a close substitute for product C etc. It is sometimes suggested that such chains of substitution imply broad markets, with boundaries only occurring when there are significant breaks in the chain. However, a hypothetical monopolist over part of the chain may well be able to impose a profitable SSNIP over a segment of the monopolised area. Furthermore, even a uniform SSNIP becomes more likely as the chain or the circle is expanded because the interior of the market, over which higher margins will be earned, increases faster than its edge, over which margins will be lost.

³⁴ Another way to think of it is if we have a hypothetical monopolist of product A, the incentive to impose a SSNIP will depend on the contribution margin on lost sales of product A, but an existing monopolist will already be maximizing profits and have no additional incentive to raise prices further (by a SSNIP or anything else), until they merge with the supplier of product B, being the next closest substitute. The margin on product A is unchanged and will not provide any new incentive to raise the price of A, but the ability to recapture margins through sales of product B is new post merger and the degree of the incremental incentive will depend on the diversion ratio from A to B and the margin on recaptured sales. That is what has changed. See also Pittman (2017^[24]) for further discussion of CLA and UPP and their relationship.

³⁵ See, for example, the description (in Portuguese) at: <http://www.cade.gov.br/aceso-a-informacao/publicacoes-institucionais/dee-publicacoes-anexos/nota-tecnica-05-2017-publica-sei-0297765.pdf>

³⁶ This may arise from higher prices, increased transport costs or having to acquire a lower quality product, which could simply be one that does not work as well in combination with that firm’s downstream value added services.

³⁷ Customer foreclosure will have an equivalent effect to input foreclosure by directly reducing purchases from the independent upstream firm and/or increasing distribution costs. Some mergers may raise both input and customer foreclosure issues where both firms A and B have market power at the respective levels of the supply chain.

³⁸ Commerce Commission New Zealand, Determination in Vodafone Europe B.V. and Sky Network Television Limited, 22 February 2017, https://comcom.govt.nz/_data/assets/pdf_file/0026/76922/2017-NZCC-1-and-2-Vodafone-Europe-B.V.-and-Sky-Network-Television-Limited-Clearance-determination-22-February-2017.pdf.

³⁹ For further information on different types of merger simulation models, see ICN (2013_[32]).

⁴⁰ The article applies this approach to an actual hospital merger case, where they find substantial increases in the payoffs from coordination. Despite a short-term increased incentive to deviate, substantial coordination concerns remained.

⁴¹ See Commerce Commission New Zealand Determination in ePay New Zealand Limited and Ezi-Pay Limited & Ors, 15 June 2012, https://comcom.govt.nz/_data/assets/pdf_file/0024/76092/NZCC-Decision-13-epay-and-Ezi-Pay-15-June-2012.pdf at pp.93-94.

⁴² There have been a number of studies undertaken in relation to the effectiveness of merger remedies (FTC, 1999_[70]; FTC, 2017_[69]; Kwoka, Greenfield and Gu, 2015_[71]). See also the debate between Kwoka and FTC staff in relation to the latter (Vita and Osinski, 2018_[72]; Kwoka, 2017_[73]).

⁴³ The Department of Justice most recently emphasised a strong preference for structural remedies in its revised Merger Remedies Manual: <https://www.justice.gov/atr/page/file/1312416/download>.

⁴⁴ This is the case for example in New Zealand.

⁴⁵ While not strictly a merger, airline alliances are a common means by which airlines have been able to achieve efficiencies without merging, in an industry, which is characterised by a range of ownership restrictions, and similar competition issues can arise as for mergers.

⁴⁶ ACCC Determination regarding applications for authorisation lodged by Virgin Australia Airlines Pty Ltd, Air New Zealand Limited and Others, 3 September 2013, https://www.accc.gov.au/system/files/public_registers/documents/D13%2B121728.pdf.

⁴⁷ See <https://www.ftc.gov/policy/studies/merger-retrospectives>.

⁴⁸ See OECD (2011_[74]) and materials from the OECD Workshop on Ex-post Evaluation of Enforcement Decisions: <https://www.oecd.org/daf/competition/workshop-expost-evaluation-competition-enforcement-decisions.htm>.

⁴⁹ See presentation by Daniel Hosken (2015) at the OECD Workshop on Ex-post Evaluation of Enforcement Decisions: <https://www.oecd.org/daf/competition/workshop-expost-evaluation-competition-enforcement-decisions.htm>; and Capps et al (2017_[27]).

⁵⁰ See: <https://www.ftc.gov/policy/studies/merger-retrospectives/bibliography>

⁵¹ See: <https://www.ftc.gov/policy/studies/merger-retrospectives/bureau-of-economics>

⁵² See: <https://www.ftc.gov/news-events/events-calendar/ftc-hearing-14-merger-retrospectives>

⁵³ Available at: https://www.internationalcompetitionnetwork.org/wp-content/uploads/2018/10/AEWG_EconomistSurvey2017Results.pdf

⁵⁴ Available at: https://www.internationalcompetitionnetwork.org/wp-content/uploads/2018/10/AEWG_EconomistSurvey2017Results.pdf

⁵⁵ Available at: https://ec.europa.eu/competition/antitrust/legislation/best_practices_submission_en.pdf

⁵⁶ Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/284388/best_practice.pdf

⁵⁷ Available at: https://www.bundeskartellamt.de/SharedDocs/Publikation/EN/Bekanntmachungen/Notice%20-%20Standards%20for%20economic%20opinions.pdf?__blob=publicationFile&v=2

⁵⁸ Available at: <https://comcom.govt.nz/about-us/our-policies-and-guidelines/guidelines-for-quantitative-analysis>

⁵⁹ Available at: <https://www.fedcourt.gov.au/law-and-practice/practice-documents/practice-notes/gpn-expt>.

References

- ACCC (2019), *Dairy inquiry final report*, <https://www.accc.gov.au/publications/dairy-inquiry-final-report>. [67]
- Albæk, S., P. Møllgaard and P. Overgaard (1997), “Government-Assisted Oligopoly Coordination? A Concrete Case”, *The Journal of Industrial Economics*, Vol. 45/4, <https://doi.org/10.1111/1467-6451.00057>. [59]
- Baker, J. (2002), “Mavericks, Mergers, and Exclusion: Proving Coordinated Competitive Effects Under the Antitrust Laws”, *New York University Law Review*, Vol. 77, <https://www.nyulawreview.org/wp-content/uploads/2018/08/NYULawReview-77-1-Baker.pdf>. [16]
- Bishop, S. (2013), “Snake-oil with mathematics is still snake-oil: Why recent trends in the application of so-called “sophisticated” economics is hindering good competition policy enforcement”, *European Competition Journal*, Vol. 9/1, <http://dx.doi.org/10.5235/17441056.9.1.67>. [34]
- Björnerstedt, J. and F. Verboven (2016), “Does Merger Simulation Work? Evidence from the Swedish Analgesics Market”, *American Economic Journal: Applied Economics*, Vol. 8/3, pp. 125-164, <https://www.aeaweb.org/articles?id=10.1257/app.20130034>. [44]
- Capps, C., D. Dranove and Z. Zabinski (2017), “The Long, Slow Decline of Elzinga-Hogarty and What Comes After”, *CPI Antitrust Chronicle* July 2017, <https://www.bateswhite.com/assets/html/documents/07.2017.CPI-Capps-Dranove-Zabinski.pdf>. [27]
- Carlton, D. (2004), “Why Barriers to Entry are Barriers to Understanding”, *American Economic Review*, Vol. 94, pp. 466-70. [7]
- Christensen, C. et al. (2011), *The New M&A Playbook*, <https://hbr.org/2011/03/the-big-idea-the-new-ma-playbook>. [61]
- CMA (2018), *Guidance: Good practice in the design and presentation of customer survey evidence in merger cases*, <https://www.gov.uk/government/publications/mergers-consumer-survey-evidence-design-and-presentation/good-practice-in-the-design-and-presentation-of-customer-survey-evidence-in-merger-cases>. [21]

- CMA (2017), *Retail mergers commentary*, [28]
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/607524/retail-mergers-commentary.pdf.
- Coate, M. (2013), "The Use of Natural Experiments in Merger Analysis", *Journal of Antitrust Enforcement*, Vol. 1/2, pp. 437-467. [36]
- Csorgo, L. and H. Chitale (2015), *Targeted Ex Post Evaluations in a Data Poor World : Paper for the Discussion of the OECD Competition Committee's Working Party No. 2*, [60]
[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/WP2\(2015\)10&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP/WP2(2015)10&docLanguage=En).
- Dick, A. (2003), "Coordinated Interaction: Pre-Merger Constraints and Post-Merger Effects", *George Mason Law Review*, Vol. 12/1, http://demotesturl.com/george-mason/wp-content/uploads/2014/03/12-1_Dick.pdf. [15]
- Elzinga, K. and T. Hogarty (1978), "The Problem of Geographic Market Delineation Revisited: The Case of Coal", *Antitrust Bulletin*, Vol. 23, pp. 1-18. [26]
- Elzinga, K. and T. Hogarty (1973), "The Problem of Geographic Market Delineation in Antimerger Suits", *Antitrust Bulletin*, Vol. 18/45, pp. 45-81. [25]
- Farrell, J. (2004), "Listening to Interested Parties in Antitrust Investigations: Competitors, Customers, Complementors and Relativity", *Antitrust Spring*. [51]
- Farrell, J. and C. Shapiro (2010), "Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition", *The B.E. Journal of Theoretical Economics: Policies and Perspectives*, Vol. 10/1. [29]
- Finkelstein, R. (2020), "What is wrong with mergers in the Federal Court", *Competition & Consumer Law Journal*, Vol. 27/2. [54]
- Froeb, L., P. Pautler and L. Röller (2008), "The Economics of Organizing Economists", [63]
Vanderbilt Law and Economics Research Paper 08-18,
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1155237.
- FTC (2017), *The FTC's Merger Remedies 2006-2012: A Report of the Bureau of Competition and Economics*, https://www.ftc.gov/system/files/documents/reports/ftcs-merger-remedies-2006-2012-report-bureaus-competition-economics/p143100_ftc_merger_remedies_2006-2012.pdf. [69]
- FTC (1999), *A Study of the Commission's Divestiture Process: Prepared by the Staff of the Bureau of Competition*, [70]
https://www.ftc.gov/sites/default/files/documents/reports/study-commissions-divestiture-process/divestiture_0.pdf.
- Garmon, C. (2017), "The accuracy of hospital merger screening methods", *The RAND Journal of Economics*, Vol. 48/4, <https://doi.org/10.1111/1756-2171.12215>. [33]
- GCR (2020), *Competition Economics Handbook 2020*, [62]
<https://globalcompetitionreview.com/insight/the-handbook-of-competition-economics/2020/form/thank-you>.

- Gilbert, R. and S. Sunshine (1995), “Incorporating dynamic efficiency concerns in merger analysis: the use of innovation markets”, *Antitrust Law Journal*, Vol. 63/2. [3]
- Harris, B. and J. Simons (1989), “Focusing Market Definition: How Much Substitution is Necessary?”, *Research in Law and Economics*, pp. 207-226. [22]
- Heyer, K. (2006), “Predicting the Competitive Effects of Mergers by Listening to Customers”, *Economic Analysis Group Discussion Paper*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=959455. [52]
- ICN (2016), *Merger Remedies Guide*, https://www.internationalcompetitionnetwork.org/wp-content/uploads/2018/05/MWG_RemediesGuide.pdf. [55]
- ICN (2013), *The Role of Economists and Economic Evidence in Merger Analysis*, https://www.internationalcompetitionnetwork.org/wp-content/uploads/2018/05/MWG_RoleofEconomics.pdf. [32]
- ICN (2006), *Merger Guidelines Workbook*, <http://old.internationalcompetitionnetwork.org/uploads/library/doc321.pdf>. [50]
- ICN (2005), *Investigative Techniques Handbook for Merger Review*, https://www.internationalcompetitionnetwork.org/wp-content/uploads/2018/05/MWG_HBInvestigativeTechniques.pdf. [49]
- Keynes, J. (1936), *The General Theory of Employment, Interest and Money*. [65]
- Keynes, J. (1922), *Introduction to Hubert D. Henderson*, Nisbet. [48]
- Kovacic, W. et al. (2009), “Quantitative Analysis of Coordinated Effects”, *Antitrust Law Journal*, Vol. 76, https://www.bateswhite.com/media/publication/31_media.76.pdf. [46]
- Kwoka, J. (2020), *Controlling Mergers and Market Power: A Program for Reviving Antitrust in America*, Competition Policy International. [58]
- Kwoka, J. (2017), “Merger Remedies: An Incentives/Constraints Framework”, *The Antitrust Bulletin*, Vol. 62/2, <https://doi.org/10.1177/0003603X17708365>. [56]
- Kwoka, J. (2017), *Mergers, Merger Control, and Remedies: A Response to the FTC Critique*, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2947814. [73]
- Kwoka, J., D. Greenfield and C. Gu (2015), *Mergers, Merger Control, and Remedies: A Retrospective Analysis of U.S. Policy*, MIT Press. [71]
- Kwoka, J. and D. Moss (2012), “Behavioral Merger Remedies: Evaluation and Implications for Antitrust Enforcement”, *The Antitrust Bulletin*, Vol. 57/4, <http://dx.doi.org/10.1177/0003603X1205700410>. [57]
- Latham, O., S. Chisholm and S. Lynch (2019), “Acquisitions of potential rivals in digital/tech: Valuation analysis as key economic tool – PayPal/iZettle”, *CRA Competition Memo*, http://www.crai.com/sites/default/files/publications/Competition%20Memo_Use%20of%20valuation%20analysis%20in%20merger%20assessment.pdf. [47]

- Levenstein, M. and V. Suslow (2006), "What Determines Cartel Success?", *Journal of Economic Literature*, Vol. 44/1, pp. 43-95, [68]
<http://dx.doi.org/10.1257/002205106776162681>.
- Matsa, D. (2011), "Competition and Product Quality in the Supermarket Industry", *The Quarterly Journal of Economics*, Vol. 126/3, pp. 1539-1591, [37]
<https://www.jstor.org/stable/23015707>.
- Miller, N. et al. (2017), "Upward pricing pressure as a predictor of merger price effects", *International Journal of Industrial Organization*, Vol. 52, pp. 216-247, [45]
https://econpapers.repec.org/article/eeeindorg/v_3a52_3ay_3a2017_3ai_3ac_3ap_3a216-247.htm.
- Moresi, S. et al. (2015), *cGUPPI: Scoring Incentives to Engage in Parallel Accommodating Conduct*, [35]
<https://scholarship.law.georgetown.edu/cgi/viewcontent.cgi?article=2513&context=facpub>.
- Moresi, S. and S. Salop (2013), "vGUPPI: Scoring Unilateral Pricing Incentives in Vertical Mergers", *Antitrust Law Journal*, Vol. 79/1, pp. 185-214. [39]
- Noll, R. (2005), "'Buyer Power" and Economic Policy", *Antitrust Law Journal*, Vol. 72, [1]
 pp. 589-624,
https://www.researchgate.net/publication/254130874_Buyer_Power_and_Economic_Policy.
- OECD (2020), *Competition in Labour Markets*, [2]
<https://www.oecd.org/daf/competition/competition-in-labour-markets-2020.pdf>.
- OECD (2020), *Merger control in the time of COVID-19*, [11]
<http://www.oecd.org/competition/Merger-control-in-the-time-of-COVID-19.pdf>.
- OECD (2020), *Roundtable on Conglomerate Effects of Mergers - Background note by the Secretariat*, [19]
[https://one.oecd.org/document/DAF/COMP\(2020\)2/en/pdf](https://one.oecd.org/document/DAF/COMP(2020)2/en/pdf).
- OECD (2020), *Start-ups, killer acquisitions and merger control: Background note by the Secretariat*, [5]
<http://www.oecd.org/daf/competition/start-ups-killer-acquisitions-and-merger-control.htm>.
- OECD (2019), *Merger Control in Dynamic Markets: Background note by the Secretariat*, [10]
<http://www.oecd.org/daf/competition/merger-control-in-dynamic-markets-2020.pdf>.
- OECD (2019), *Vertical Mergers in the Technology, Media and Telecom Sector: Background Note by the Secretariat*, [17]
[https://one.oecd.org/document/DAF/COMP\(2019\)5/en/pdf](https://one.oecd.org/document/DAF/COMP(2019)5/en/pdf).
- OECD (2018), *Considering non-price effects in merger control: Background note by the Secretariat*, [13]
[https://one.oecd.org/document/DAF/COMP\(2018\)2/en/pdf](https://one.oecd.org/document/DAF/COMP(2018)2/en/pdf).
- OECD (2018), *Rethinking Antitrust Tools for Multi-Sided Platforms*, [4]
<https://www.oecd.org/daf/competition/Rethinking-antitrust-tools-for-multi-sided-platforms-2018.pdf>.

- OECD (2016), *The Resolution of Competition Cases by Specialised and Generalist Courts: Stocktaking of international experiences*, [66]
<http://www.oecd.org/daf/competition/The-resolution-of-competition-cases-by-Specialised-and-Generalist-Courts-2016.pdf>.
- OECD (2013), *Competition Policy Roundtables: The Role and Measurement of Quality in Competition Analysis*, [12]
<http://www.oecd.org/competition/Quality-in-competition-analysis-2013.pdf>.
- OECD (2012), *Roundtable on the Role of Efficiency Claims in Antitrust Proceedings: Background note by the Secretariat*, [9]
[http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP\(2012\)16&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=DAF/COMP(2012)16&docLanguage=En).
- OECD (2011), *Competition Policy Roundtable on Economic Evidence in Merger Analysis*, [23]
<http://www.oecd.org/daf/competition/EconomicEvidenceInMergerAnalysis2011.pdf>.
- OECD (2011), *Competition Policy Roundtable on Impact Evaluation of Merger Decisions*, [74]
<https://www.oecd.org/daf/competition/Impactevaluationofmergerdecisions2011.pdf>.
- OECD (2008), *Competition Policy Roundtable on Presenting Complex Economic Theories to Judges*, [64]
<http://www.oecd.org/competition/abuse/41776770.pdf>.
- Ormosi, P., F. Mariuzzo and R. Havell (2015), *A review of merger decisions in the EU: What can we learn from ex-post evaluations?*, [6]
<https://ec.europa.eu/competition/publications/reports/kd0115715enn.pdf>.
- Peters, C. (2006), "Evaluating the Performance of Merger Simulation: Evidence from the U.S. Airline Industry", *Journal of Law and Economics*, Vol. 49/2, pp. 627-649, [41]
https://econpapers.repec.org/article/ucpjlawec/y_3a2006_3av_3a49_3ai_3a2_3ap_3a627-49.htm.
- Pittman, R. (2017), *Three Economist's Tools for Antitrust Analysis*, [24]
<https://www.justice.gov/atr/page/file/925641/download>.
- RBB Economics (2014), *Cost pass-through: theory, measurement, and potential policy implications - A Report prepared for the Office of Fair Trading*, [53]
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/320912/Cost_Pass-Through_Report.pdf.
- Salop, S. and S. Moresi (2009), *Updating the Merger Guidelines: Comments*, [30]
<https://scholarship.law.georgetown.edu/cgi/viewcontent.cgi?article=2675&context=facpub>.
- Salop, S. and D. O'Brien (2000), "Competitive Effects of Partial Ownership: Financial Interest and Corporate Control", *Antitrust Law Journal*, Vol. 67, pp. 559-614, [20]
<https://scholarship.law.georgetown.edu/cgi/viewcontent.cgi?article=1200&context=facpub>.
- Shapiro, C. (2019), *Testing Vertical Mergers for Input Foreclosure (Note for OECD Roundtable)*, [38]
[https://one.oecd.org/document/DAF/COMP/WD\(2019\)75/en/pdf](https://one.oecd.org/document/DAF/COMP/WD(2019)75/en/pdf).

- Slade, M. (2019), *Note for OECD Roundtable on Vertical mergers in the technology, media and telecom sector*, [40]
[https://one.oecd.org/document/DAF/COMPWD\(2019\)68/en/pdf](https://one.oecd.org/document/DAF/COMPWD(2019)68/en/pdf).
- Stigler, G. (1964), "A Theory of Oligopoly", *The Journal of Political Economy*, Vol. 72/1, [14]
 pp. 44-61.
- Vita, M. and F. Osinski (2018), "John Kwoka's Mergers, Merger Control and Remedies: A Critical Review", *Antitrust Law Journal*, Vol. 82, [72]
https://www.ftc.gov/system/files/documents/biographies/michael-g-vita/10_vita_osinski_alj_82-1_final_pdf.pdf.
- Weinberg, M. (2011), "More Evidence on the Performance of Merger Simulations", [42]
American Economic Review, Vol. 101/3, pp. 51-55,
<https://www.aeaweb.org/articles?id=10.1257/aer.101.3.51>.
- Weinberg, M. and D. Hosken (2013), "Evidence on the Accuracy of Merger [43]
 Simulations", *The Review of Economics and Statistics*, Vol. 95/5, pp. 1584-1600,
<https://ideas.repec.org/a/tpr/restat/v95y2013i5p1584-1600.html>.
- Werden, G. (1996), "A Robust Test for Consumer Welfare Enhancing Mergers among [31]
 Sellers of Differentiated Products", *Journal of Industrial Economics*, Vol. 44.
- Whelan, C. (2019), *Cutting edge economic tools*. [77]
- Williamson, O. (1977), "Economies as an Antitrust Defense Revisited", *University of [76]
 Pennsylvania Law Review*, Vol. 125/4, pp. 699-736.
- Williamson, O. (1974), "The Economics of Antitrust: Transaction Cost Considerations", [18]
University of Pennsylvania Law Review, Vol. 122, pp. 1439-1496,
https://scholarship.law.upenn.edu/cgi/viewcontent.cgi?article=5726&context=penn_law_review.
- Williamson, O. (1968), "Economies as an Antitrust Defense: The Welfare Tradeoffs", [8]
American Economic Review, Vol. 58/1, pp. 18-36.
- Wright, J. and J. Rybnicek (2018), "United States v. AT&T/Time Warner: A Triumph of [75]
 Economic Analysis", *George Mason Law & Economics Research Paper* 18-34,
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3251817.

www.oecd.org/competition

