Common Ownership and Merger Control Enforcement

José Azar[1] *and Anna Tzanaki*[2]

Outline

1. Introduction

What are the implications of common ownership for merger policy? The welfare effects of horizontal mergers and their presumed profitability may change in the presence of common ownership: mergers may no longer be privately profitable for the merging parties or in aggregate welfare increasing for society while the set of mergers being proposed given common ownership may be different compared to a world of separate ownership of industry

competitors. Taking into account the extent and significance of pre-merger common ownership between the merging firms and non-merging rival firms in the same industry may affect the outcome of the substantive assessment of horizontal mergers and the choice of any divestiture remedies, as it affects the analysis of both unilateral effects and efficiencies caused by such mergers.

More specifically, common ownership may reverse some long-standing assumptions underlying traditional merger policy. First, it may help explain or overcome the "Cournot merger paradox"[3] and rationalize or expand the motivations for firms to merge. Second, it may imply that the "No-Synergies Theorem" proposed by Farrell and Shapiro[4] – assuming that merging firms propose profitable mergers, those mergers are efficient from a total welfare point of view, albeit not necessarily beneficial for consumers – may be inapplicable. Third, it may challenge the "concentration privilege"[5] afforded to horizontal mergers, as opposed to cartels or "naked" restraints, and their more lenient antitrust law treatment given their presumed "efficiency creating potential".[6] In other words, the structural impact of common ownership may indirectly affect the assessment of market concentration, price effects and cost savings

---

[3] Stephen W Salant, Sheldon Switzer and Robert J Reynolds, 'Losses from Horizontal Merger: The Effects of an Exogenous Change in Industry Structure on Cournot-Nash Equilibrium' (1983) 98 The Quarterly Journal of Economics 185; Miguel Anton and others, 'Acquisitions, Common Ownership, and the Cournot Merger Paradox' <https://papers.ssrn.com/abstract=3226390>.

[4] Joseph Farrell and Carl Shapiro, 'Horizontal Mergers: An Equilibrium Analysis' (1990) 80 The American Economic Review 107; Joseph Farrell and Carl Shapiro, 'Scale Economies and Synergies in Horizontal Merger Analysis' (2001) 68 Antitrust Law Journal 685.

[5] Carles Esteva Mosso, 'The Contribution of Merger Control to the Definition of Harm to Competition' Speech by Acting Deputy Director-General for Mergers, European Commission, 1 February 2016: "This divergence of standards, which in practice lead to a more lenient treatment of horizontal mergers than to collusive agreements between firms holding similar amounts of market power (also referred to as 'concentration privilege', 'Konzentrationsprivileg' in German), seems, with hindsight, difficult to explain. [...] This divergence of treatment could only be premised on an implicit presumption of efficiencies in mergers, which would justify the clearance of operations below the level of dominance. Such a general presumption, however, appears today as a very theoretical construct, difficult to support empirically." Prior to the European Merger Regulation (EUMR) in 1990, mergers, partial mergers and "concentrative" joint ventures were treated more leniently under existing EU antitrust rules. Over time, the modernization of EU competition policy and procedure led to convergence under both set of rules with a focus on consumer welfare and the effects analysis of potentially anticompetitive business practices (albeit some residual differences remain). See Anna Tzanaki, 'The Regulation of Minority Shareholdings and Other Structural Links between Competing Undertakings: A Law & Economics Analysis' (Doctoral Thesis, UCL (University College London) 2017).

[6] Robert H Bork, 'The Rule of Reason and the Per Se Concept: Price Fixing and Market Division' (1966) 75 Yale Law Journal 373, 383–384 (arguing that the economic principle justifying the different policy and antitrust law treatment between mergers [rule of reason standard] and cartels [*per se* prohibition rule] was their "relative visibility of efficiency-creating potential"); Robert H Bork, *The Antitrust Paradox: A Policy at War with Itself* (Basic Books 1978) 217–224 (discussing the relative merits of the potential for "efficiencies of integration" versus any "significant non-collusive restriction of output" as an economic basis for evaluating the effects of horizontal mergers); Pablo Ibáñez Colomo (ed), 'The Substantive Assessment of Mergers', *The Shaping of EU Competition Law* (Cambridge University Press 2018) 219 ("A standard-based approach is deemed appropriate insofar as it is widely acknowledged that mergers [...] can be a credible source of efficiency gains. Formal analysis, in other words, suggests that it cannot be assumed that mergers are driven by anti-competitive motivations.").

produced by a horizontal merger. Consequently, omitting common ownership as a relevant substantive factor may produce misleading results in the analysis of horizontal mergers. On the other hand, countervailing factors such as managerial entrenchment (agency costs) and efficiencies or inter-industry effects[7] may water down any structural implications of common ownership and should also be taken into account in the substantive evaluation of horizontal mergers.

Traditionally, merger policy has considered cases of "cross-ownership",[8] where one firm holds shares in a direct competitor, but not "common ownership", when the merging or rival firms are partially held by institutional investors that are not active in the same relevant market. For instance, if one of the merging partners had a pre-existing minority shareholding in the other before the merger, then the incremental effect of a horizontal merger on competition would presumably be smaller compared to a situation where the merging firms had no cross-shareholding links in each other pre-merger.[9] In addition, minority shareholdings of any of the merging firms in another non-merging rival firm in the same industry are regularly taken into account in the substantive and remedies analysis of a notified merger by antitrust authorities.[10] In a setting of separate ownership prior to the merger, the objective of the firm has generally been treated as if all shareholders unanimously wanted to maximize its profits (firm value).[11]

---

[7] José Azar and Xavier Vives, 'General Equilibrium Oligopoly and Ownership Structure' [2020] Econometrica, forthcoming; José Azar and Xavier Vives, 'Revisiting the Anticompetitive Effects of Common Ownership' [2021] Working Paper.

[8] For the US and EU merger policy on partial acquisitions and cross-shareholdings respectively, see US DOJ & FTC Horizontal Merger Guidelines 2010 §13; and EU Horizontal Merger Guidelines, paras 20 and 47.

[9] Roman Inderst and Stefan Thomas, 'Price Pressure Indices, Innovation, and Mergers Between Commonly Owned Firms' (2019) 10 Journal of European Competition Law & Practice 572, 574. For seminal contributions to the analysis of partial ownership and non-controlling cross-shareholdings in rivals, see Daniel P O'Brien and Steven C Salop, 'Competitive Effects of Partial Ownership: Financial Interest and Corporate Control' (2000) 67 Antitrust Law Journal 559; David Gilo, 'The Anticompetitive Effect of Passive Investment' (2000) 99(1) Michigan Law Review 1.

[10] For an overview of EU cases, see Annex II 'Non-Controlling Minority Shareholdings and EU Merger Control' to Commission Staff Working Document, 'Towards More Effective EU Merger Control,' SWD(2013) 239 final, 5-10. For illustrative US cases and the general merger law treatment of minority shareholdings under Section 7 of the Clayton Act, see OECD, 'Antitrust Issues Involving Minority Shareholdings and Interlocking Directorates' (2009) Policy Roundtable DAF/COMP(2008)30 176–180.

[11] It is noted that there is no consensus on the proper firm objective function when shareholders have divergent interests, or any settled theory of the firm in oligopoly under partial ownership for intermediate cases of control (i.e., between "no control" or a "silent financial interest" and "full control"). See Joseph Farrell and Carl Shapiro, 'Asset Ownership and Market Structure in Oligopoly' (1990) 21 The RAND Journal of Economics 275, 286; Daniel P O'Brien and Keith Waehrer, 'The Competitive Effects of Common Ownership: We Know Less Than We Think' (2017) 81(3) Antitrust Law Journal 729, 760. As a result, cases of non-fully controlling minority shareholdings have generally been assumed to be "silent" financial interests or purely "passive" investments in rivals. For a law and economics re-assessment of the (dubious) validity of such default assumption, see Anna Tzanaki, 'Common Ownership and Minority Shareholding at the Intersection of Competition and Corporate Law:

However, the dramatic change in the ownership ecosystem forces us to consider the common ownership case and thus to generalize the objective function of the firm.[12] In a setting where direct competitors have overlapping shareholders that are diversified across the merging and other non-merging rival firms in an industry, those shareholders and the managers of their commonly held firms may prefer to maximize their aggregate portfolio profits rather than any firm specific profits (portfolio value). Such a revision of the objective function of the firm may have profound implications for merger policy in general and the assessment of stand-alone horizontal mergers specifically. Common ownership changes the pre-merger as well as the post-merger counterfactual against which the welfare effects of mergers are to be assessed and thus also the "merger-specificity" of alleged efficiencies and the relative costs and benefits of any less restrictive alternatives compared to the merger. The profitability criterion of mergers is not, in the presence of common ownership, a solid basis to rely upon for the design of merger control policy and legal standards, and for premising the welfare assessment of individual merger cases. Accounting for common ownership in a horizontal merger context requires some case specific calibration as well as systemic rethinking for merger policy to stay informed, efficient and effective.

Antitrust authorities across the Atlantic and beyond seem to cautiously follow the broader scholarly debate and policy implications arising from common ownership.[13] Yet, merger control enforcers both in the U.S. and in the EU have already taken into account common

---

Looking Through the Past to Return to the Future?' in Marco Claudio Corradi and Julian Nowag (eds), *The Intersections between Competition Law and Corporate Law and Finance* (Cambridge University Press 2021).

[12] José Azar, Martin C Schmalz and Isabel Tecu, 'Anticompetitive Effects of Common Ownership' (2018) 73 The Journal of Finance 1513; José Azar, 'Portfolio Diversification, Market Power, and the Theory of the Firm' (2016) <http://papers.ssrn.com/abstract=2811221>; Martin C Schmalz, 'Common-Ownership Concentration and Corporate Conduct' (2018) 10 Annual Review of Financial Economics 413.

[13] In response to the common ownership debate, the US antitrust agencies have proposed amending their merger control reporting rules to take into account *aggregate* institutional holdings and lowering the filing threshold to *more than 1%* for share acquisitions in competitors of the issuer (in case the "solely-for-investment" exemption does not apply). See Federal Trade Commission, Notice of Proposed Rulemaking, Federal Register Vol. 85, No. 231 (Tuesday, December 1, 2020): Proposed Rules, 77053-77093; and Anna Tzanaki, 'Varieties and Mechanisms of Common Ownership: A Calibration Exercise for Competition Policy' [2021] Journal of Competition Law & Economics (special issue on common ownership and interlocking directorates, forthcoming) 1, 16 (summarizing the proposed changes). See also 'U.S. FTC Hearings on Competition and Consumer Protection in the 21st Century, Panel #8: Common Ownership' (*Federal Trade Commission*, 6 December 2018). In the EU, two independent studies have been commissioned by the European Parliament and the Commission. See Simona Frazzani and others, 'Barriers to Competition through Joint Ownership by Institutional Investors' (2020) Study for the Committee on Economic and Monetary Affairs, European Parliament, Luxembourg; Nicoletta Rosati and others, 'Common Shareholding in Europe' (Publications Office of the European Union 2020) EUR - Scientific and Technical Research Reports (JRC121476). For the position and reactions of Germany and the UK, see Monopolkommission, 'Biennial Report XXII: Competition 2018' (3 July 2018), Chapter II; Note by the United Kingdom, 'OECD Roundtable on Common Ownership by Institutional Investors and Its Impact on Competition' (2017) DAF/COMP/WD(2017)92. For other countries, see their contributions to the OECD Roundtable on 'Common ownership by institutional investors and its impact on competition' (Paris, 6 December 2017).

ownership concerns in merger cases.[14] In particular, the European Commission in its recent decisional practice has considered pre-existing common ownership as an "element of context" during the substantive review of two agrochemical mergers between commonly owned portfolio companies.[15] While not a determinative factor in reaching its substantive conclusion in these cases, the Commission devotes a long annex discussing the potential significance and implications of common ownership for merger policy.

This chapter aims to provide further insight into how common ownership may affect the competitive analysis of horizontal mergers between portfolio companies and their respective treatment during merger control review. Section 2 discusses the welfare standards and policy presumptions applicable to horizontal mergers when considering their effects on competition, consumers and total welfare and the extent to which those may need to be revisited under common ownership. Providing a simple example of a merger to "effective" monopoly in an industry with common ownership, with symmetric or asymmetric firms, and a visual illustration of the changes in concentration measures with and without common ownership, this section also encapsulates the intuition of how the existence of common ownership between the merging and other rival firms may render the incremental effect of a merger on market structure and performance smaller or at least the same as prior to the merger. However, as we will show using the Delta-Northwest merger as a case study (section 3.c), when firms have common ownership with non-merging rivals, the effect is ambiguous, and common ownership may even increase the anticompetitive effects from the merger.

---

[14] The US antitrust agencies have not litigated to date any case involving common ownership by a single institutional investor. However, they have reached settlements in related cases against activist investors that attempted to influence management while relying on the "investment only" exemption, thus violating the premerger notification requirements under the Hart-Scott-Rodino Act. See OECD Hearing on Common Ownership by institutional investors and its impact on competition - Note by the United States (2017), DAF/COMP/WD(2017)86, para 3 (referring to the recent *ValueAct* case); Debbie Feinstein, Ken Libby, and Jennifer Lee, '"Investment-Only" Means Just That', Federal Trade Commission Blog - Competition Matters, 24 August 2015 (referring to the *Third Point* case). They have also challenged mergers and imposed divestiture remedies to eliminate competition concerns arising from common shareholding among the merging parties and other portfolio companies of private equity firms. See, for instance, *In the Matter of Red Ventures Holdco and Bankrat*e, Federal Trade Commission, 27 April 2018: https://www.ftc.gov/enforcement/cases-proceedings/file-no-1710196/red-ventures-holdco-bankrate, and Press Release, 'FTC Challenges Acquisition of Interests in *Kinder Morgan*, Inc. by The Carlyle Group and Riverstone Holdings', 25 January 2007: https://www.ftc.gov/news-events/press-releases/2007/01/ftc-challenges-acquisition-interests-kinder-morgan-inc-carlyle.

[15] Case M.7932 *Dow/DuPont*, Commission decision of 27 March 2017, Annex 5; Case M.8084 *Bayer/Monsanto*, Commission decision of 21 March 2018, paras 208-229.

Section 3 addresses the unilateral effects analysis of horizontal mergers taking into account common ownership.[16] In particular, it illustrates how the latter may reinforce or mitigate the potential for competitive harm and increase in market power post-merger and also how modified concentration and upward pricing pressure indices may be used to safe harbor unproblematic mergers or screen out potentially anticompetitive mergers in effectively concentrated oligopolistic markets. Section 4 considers the nature and types of potential efficiencies that may counterbalance any anticompetitive concerns over horizontal mergers with particular emphasis on whether the claimed efficiencies may be "merger-specific" or a direct consequence of a proposed merger in the presence of common ownership. Section 5 analyzes potential countervailing factors such as managerial entrenchment that may mitigate the effects of common ownership and should also be accounted for during merger review. Section 6 examines the relevance of common ownership for the evaluation of remedy options that may condition the approval of proposed mergers by antitrust authorities.

2. Welfare effects of horizontal mergers

a. Merger policy and welfare standards

Merger policy aims to distinguish between competitively harmful and beneficial or neutral mergers. Antitrust enforcers target and seek to intervene only in cases of anticompetitive mergers that enhance market power, for instance by raising price, reducing output or diminishing innovation, and harm consumers "as a result of diminished competitive constraints or incentives." In evaluating the effects of a merger, competition authorities focus on how the structural ownership change "affects conduct that would be most profitable for the firm."[17] In particular, substantive merger review assesses the potential competitive harm and increase in market power arising from a merger, such as "unilateral" (price) effects, against any likely, verifiable and "merger-specific" efficiencies in order to conclude on the net welfare effect of a merger.[18]

---

[16] Our analysis in this handbook chapter focuses on the unilateral effects where economic theory is to date more developed. For some early law and economics treatments of potential coordinated effects of partial and common ownership, see Anna Tzanaki, 'The Regulation of Minority Shareholdings and Other Structural Links between Competing Undertakings: A Law & Economics Analysis' (Doctoral Thesis, UCL (University College London) 2017); Edward B Rock and Daniel L Rubinfeld, 'Common Ownership and Coordinated Effects' [2018] NYU Law and Economics Research Paper No. 18-40; Lysle Boller and Fiona Scott Morton, 'Testing the Theory of Common Stock Ownership' [2019] NBER Working Paper No. w27515.

[17] US Horizontal Merger Guidelines 2010 §1.

[18] US Horizontal Merger Guidelines 2010 §10. The structure and analytical framework for substantive merger control review is essentially similar in the EU.

In most jurisdictions, mergers are evaluated based on a consumer welfare standard.[19] Thus, as a matter of policy, privately profitable but consumer welfare reducing mergers are prohibited. It is for this reason that a major part of substantive merger review is devoted to the analysis of the (unilateral) price effects of mergers that directly affect consumers. On the other hand, mergers that generate efficiencies, which are substantial enough to outweigh any anticompetitive effects and likely to be "passed on" and benefit consumers by leading to lower prices, improved quality or increased choice, are generally welcome. In such cases of efficiency creating mergers the net effect on consumers is positive or at least neutral.[20]

There are a number of economic efficiency and distributional rationales supporting this choice of welfare standard in antitrust and merger enforcement. To begin, economic theory shows that generally horizontal mergers in a Cournot oligopoly eliminate competition between the merging parties and thus, absent efficiencies, are anticompetitive in that they are expected to raise price.[21] In addition, although total surplus may be preferable as a general principle, a consumer surplus standard may be a more effective means to implement the principle and maximize total surplus in actual merger enforcement practice.[22] Introducing a consumer welfare standard for substantive review, induces merging parties to choose and propose more socially beneficial mergers among the set of privately profitable mergers.[23] Besides, a consumer-oriented merger policy sensibly is not primarily focused on the positive welfare effects of mergers on rival non-merging firms as competitors have diametrically antithetical interests to consumers. Such effects are irrelevant in enforcement practice to the extent that a merger does not produce efficiencies from which consumers benefit (overall market output reduction and likely market price increase) and also for this reason, any antitrust suits by rival

---

[19] Michael D Whinston, 'Chapter 36: Antitrust Policy toward Horizontal Mergers' in Robert H Porter and Mark Armstrong (eds), *Handbook of Industrial Organization*, vol 3 (Elsevier 2007) 2374: "enforcement practice in most countries (including the U.S. and the E.U.) is closest to a consumer surplus standard. If so, then no trade-off needs to be considered: the merger should be allowed if and only if the efficiencies are enough to ensure that price does not increase."; Steven C Salop, 'Question: What Is the Real and Proper Antitrust Welfare Standard? Answer: The True Consumer Welfare Standard' (2010) 22 Loyola Consumer Law Review 336.

[20] This does not mean that all consumers will be better off but at least that some might benefit while none will be worse off after the merger. See Kenneth Heyer, 'Welfare Standards and Merger Analysis: Why Not the Best?' (2006) 2 Competition Policy International 29, 31, 37 (distinguishing between the "actual" and "potential" Pareto consumer welfare standard).

[21] Farrell and Shapiro, 'Horizontal Mergers' (n 4) 109, 112.

[22] Joseph Farrell and Michael L Katz, 'The Economics of Welfare Standards in Antitrust' (2006) 2 Competition Policy International 3, 27: "[A]nalysis of the overall antitrust decision-making system suggests that, in some circumstances, a consumer surplus standard [...] can perform better than a total surplus standard, even if the ultimate goal is to maximize total surplus."

[23] Bruce R Lyons, 'Could Politicians Be More Right than Economists? A Theory of Merger Standards' [2002] University of East Anglia, Centre for Competition and Regulation. Working Paper CCR 02-1; Volker Nocke and Michael D Whinston, 'Merger Policy with Merger Choice' (2013) 103 American Economic Review 1006.

firms challenging proposed mergers are viewed skeptically from a consumer welfare point of view.[24] A further subtle ramification of this welfare standard choice is that substantive merger control review has progressively evolved away from a rigid structural analysis of horizontal mergers based on market shares and an "efficiency offense" basis for antitrust intervention[25] (competitor friendly merger control) and towards a full case-specific analysis of merger effects on prices and output that sympathetically incorporates an "efficiency defense" to determine whether a merger should be approved or not (consumer friendly merger control).[26]

b. Total welfare and policy presumptions

It is important to recall, however, that the overall policy design of the system of merger control is grounded on total welfare considerations, albeit enforcement decisions may optimally be based on different (welfare or process) standards.[27] Economists and economically oriented

---

[24] Farrell and Shapiro, 'Horizontal Mergers' (n 4) 114, 117 ("Note that, since nonparticipant firms' and consumers' interests concerning insiders' output are strictly opposed, a merger will never generate a Pareto improvement."); Frank H Easterbrook, 'The Limits of Antitrust' (1984) 63 Texas Law Review 1, 33–39 ("The antitrust laws are designed to prevent reductions in output and the associated higher prices. Yet higher prices are privately beneficial to the producers. [...] Antitrust may be useful in raising rivals' costs. [...] One line worth drawing is between suits by rivals and suits by consumers. Business rivals have an interest in higher prices, while consumers seek lower prices. [Courts] therefore should treat suits by horizontal competitors with the utmost suspicion.").

[25] In the early days of EU merger control enforcement, expansion of the merged firm's market share, albeit based on efficiencies and lower costs, could justify antitrust intervention against the merger rather than induce sympathy or regulatory approval. The rationale was that the merger would harm the market structure and also rivals. See Bruce Lyons, 'Competition Policy in the EU: Fifty Years on from the Treaty of Rome' in Xavier Vives (ed), *An Economic Assessment of European Commission Merger Control: 1958–2007* (Oxford University Press 2009) 151; Massimo Motta, *Competition Policy: Theory and Practice* (Cambridge University Press 2004) 275; Damien Neven, Robin Nuttall and Paul Seabright, 'Enforcement of the European Merger Regulation' in Louis Phlips (ed), *Applied Industrial Economics* (Cambridge University Press 1998) 434.

[26] Farrell and Shapiro, 'Scale Economies and Synergies in Horizontal Merger Analysis' (n 4) 686–687 ("The Merger Guidelines nevertheless recognize that most mergers 'are either competitively beneficial or neutral.' And this is reflected in practice [...] the agencies presume that where the loss of direct competition is slight, the transaction is likely motivated by efficiencies that outweigh that loss, and is thus on balance 'beneficial or neutral.' Thus a real sympathy to efficiencies is built into the Guidelines from the start."); Lars-Hendrik Röller and Miguel de la Mano, 'The Impact of the New Substantive Test in European Merger Control' (2006) 2(1) European Competition Journal 9, 16–17 ("The problem with this view [that efficiencies are assumed for all mergers up to the limit of dominance] is that the 'concentration privilege' implicitly assumes that every merger generates the same level of positive efficiency. This is of course factually wrong. Some mergers are very efficient, others are not. It is more than doubtful that the average efficiency level of mergers is even positive. As a result of these empirical facts, it simply makes no sense to argue that average efficiencies are assumed up to a level of dominance. Precisely because there are no efficiencies on average, is it necessary to consider efficiency explicitly. The new [SIEC] test, and especially the guidelines, allows for a more explicit consideration of efficiencies in terms of the extent to which such efficiencies could offset anti-competitive effects.").

[27] Notably, some smaller countries such as Canada, Australia and New Zealand adopt a total welfare standard as an operating principle for merger enforcement balancing overall gains against losses given that the size of the economy may affect the availability and profitability of alternative merger opportunities. However, the norm for merger enforcement in most jurisdictions is a consumer welfare standard, a policy choice that is also based on total welfare grounds. See Lyons (n 23) 3: "Only competition authorities in smaller countries have sometimes adopted a less consumer-oriented standard [...] allowing the possibility of weighing [efficiency] gains [e.g., on competitiveness, trade etc.] against [consumer welfare] losses, at least approximating the TWS.", 26: "Economists

legal scholars typically support this view. Oliver Williamson illustrated the famous "welfare tradeoff" between producer surplus (cost savings) and consumer surplus (deadweight loss) that led to incorporating an "efficiency defense" in merger enforcement.[28] Robert Bork favored mergers that integrate productive activities and create new efficiencies or mergers of firms with very small market shares that could not plausibly be anticompetitive but not mergers to monopoly which could be motivated by market power and monopoly profits – "on the basis of differing presumptions about the presence of efficiency."[29] Joseph Farrell and Carl Shapiro suggest that mergers can be presumed to be profitable for the merging firms and thus focusing on the external effects of a merger on consumers and rivals is key to determine its net welfare effects and justify antitrust intervention.[30]

The "No-Synergies Theorem"[31] is thus used to inform general merger policy. Observing a merger implies the existence of synergies. If there are no synergies, there is not a profit motive for the merger and hence, this merger is not expected to occur. The theorem implicitly rests on the so called "Cournot merger paradox" which suggests that a merger in a symmetric Cournot oligopoly may be unprofitable because while the merging parties restrict output and market share post-merger, rival firms expand and thus capture all private gains from the merger.[32] The

---

are almost unanimous in favouring total welfare as the yardstick for appraising economic policy. However, this does not mean that the same yardstick is appropriate for case-by-case implementation of that policy. [...] The CWS is not always better than the TWS, but it does have advantages in large, complex economies where there are socially preferable but privately less profitable merger opportunities."; Farrell and Katz (n 22) 1: "First, antitrust is not straightforwardly welfarist—it does not maximize but protects, and it does not forbid all actions that seem likely to lower some welfare measure. Rather, antitrust enforcement has both process and consequence components [...]. Second, the enforcement process involves multiple steps and multiple decision makers. Mergers, for instance, are proposed by the merging parties, reviewed and perhaps challenged by antitrust agencies, and reviewed by courts.", 4: "[T]otal surplus is an appropriate ultimate goal for antitrust enforcement, but the case for basing enforcement decisions on analysis of total surplus is much less clear. [...] it may be optimal to have specific agents [notably the antitrust agencies and the courts] within the broader system act to maximize a different objective (e.g., consumer surplus)".

[28] Oliver E Williamson, 'Economies as an Antitrust Defense: The Welfare Tradeoffs' (1968) 58 American Economic Review 18.

[29] Bork, *The Antitrust Paradox* (n 6) 67–68, 219 (discussing the problem of a "welfare trade-off between restriction of output and efficiency" potentially created by a merger).

[30] Farrell and Shapiro, 'Horizontal Mergers' (n 4) 109, 116 (also noting that the presumption of mainstream economic analysis has always been that "intervention should focus on externalities"). Indeed, a Coasian perspective supports both sides of the argument: since the merger is voluntary, it is presumably profitable for the transacting parties while public policy need only be concerned over externalities when transactions costs are positive (e.g., in not perfectly competitive markets). But see n 23 and 24 above noting the opposing interests of consumers versus non-merging rivals under separate ownership and that the choice of merger by the parties being privately profitable compared to less harmful alternatives is endogenous. Thus, adopting a consumer welfare rather than a total welfare standard may still have practical implications for merger policy and enforcement.

[31] Farrell and Shapiro, 'Scale Economies and Synergies in Horizontal Merger Analysis' (n 4) 697 (postulating that "absent synergies, a horizontal merger in a Cournot oligopoly [where firms compete in setting quantities] cannot lead to higher total output and a lower price.").

[32] Salant, Switzer and Reynolds (n 3).

reason is that (under the typical assumptions) firms' best-response functions in a Cournot oligopoly are downward slopping,[33] which means that firms' decisions are "strategic substitutes".[34] Possible explanations for mergers and acquisitions despite this paradoxical result have been suggested to be managerial agency costs (corporate managers who have objectives diverging from maximizing firm and shareholder profits) or partial ownership in the acquired firm (the acquirer's shareholders hold shares in the target and may be compensated by the increased value and positive returns to the target firm for any loss in profits on the acquirer firm).[35]

Yet, given the regularity of mergers, the practical policy insight is that antitrust agencies may infer efficiencies from the fact that firms choose to merge in a Cournot oligopoly setting.[36] In other words, a profitability presumption is associated with an observed merger, and in many cases an increase in net social welfare, although this does not necessarily entail that the proposed merger may also benefit consumers.[37] A small increase in market power (higher price and post-merger markups) should be tolerated, even absent "synergies" that reduce the merged firm's marginal cost and directly benefit consumers, if the merger may significantly improve the overall efficiency of the industry by achieving a rationalization and re-allocation of output from smaller, less efficient firms to larger firms with lower marginal costs in the Cournot model ("economies of scale"); in this case, the merger increases total surplus in aggregate.[38] To visualize these insights into the welfare effects of horizontal mergers, let us look at Figure 1

---

[33] Farrell and Shapiro, 'Horizontal Mergers' (n 4) 110–111.

[34] The profit motive and the equilibrium price-increasing effect caused by a merger is, on the contrary, all the more likely when firms' decisions are "strategic complements" (for example, under Bertrand price setting competition) since the merging firms' and their rivals' reaction move to the same direction. Hence, an increase in price by the merged firm post-merger induces a further price increase by rival firms. See Whinston (n 19) 2376.

[35] Anton and others (n 3) 1; Gregor Matvos and Michael Ostrovsky, 'Cross-Ownership, Returns, and Voting in Mergers' (2008) 89 Journal of Financial Economics 391; Gregory J Werden, 'Using the Herfindahl–Hirschman Index' in Louis Phlips (ed), *Applied Industrial Economics* (Cambridge University Press 1998) 369, footnote 1 (noting, besides managerial agency costs, further reasons that may motivate such mergers for the merging firms).

[36] Similar reasoning applies for mergers in other competitive settings (e.g., Bertrand competition, capacity constraints etc.).

[37] Farrell and Shapiro, 'Horizontal Mergers' (n 4) 115–117; Lyons (n 23) 1, 11–12, 16 ("Efficiency gains are crucial for horizontal merger appraisal. In their absence, any expected increase in market power reduces both consumer welfare and total welfare. [...] The treatment of efficiency gains is, therefore, an acid test in understanding the welfare standard being applied by a competition authority. [...] Firms always agree privately profitable mergers [i.e., where joint profits increase], and propose the most profitable mergers that are allowed. [...] Suppose there were no efficiencies following a merger. Then, the only acceptable mergers would be competitively neutral. [...] merger is always profitable, despite losing market share and even in the absence of cost savings. The independent firms gain even more, at least before efficiencies are taken into account.").

[38] This means that in some cases a more competitive, less concentrated, market structure may be suboptimal in that it decreases the efficiency and the overall firm productivity in the industry. See Farrell and Shapiro, 'Horizontal Mergers' (n 4); Farrell and Shapiro, 'Scale Economies and Synergies in Horizontal Merger Analysis' (n 4); Whinston (n 19) 2376–2383.

borrowed from Farrell and Shapiro: while all mergers in areas A, B and C are socially beneficial and ideally should be allowed by a total welfare oriented merger policy, mergers in area A are not expected to happen, absent compulsion or subsidies,[39] since they are unprofitable for the merging firms.
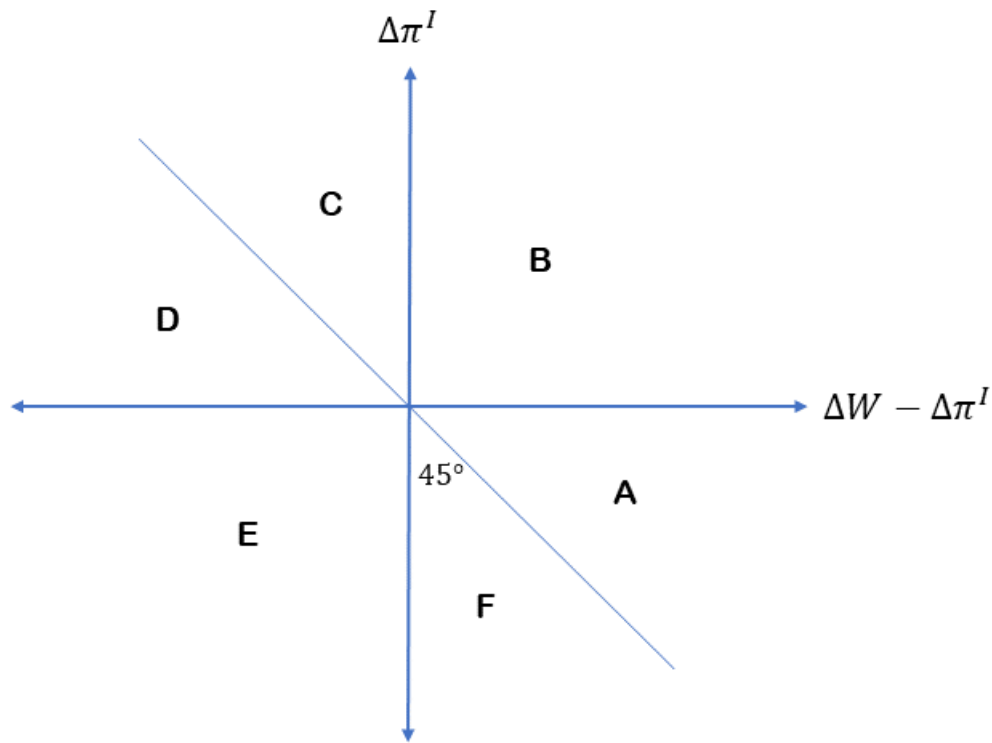

Figure 1: Farrell-Shapiro Diagram for Horizontal Merger Welfare Analysis

c. Common ownership implications

Common ownership challenges the empirical and theoretical basis for this embedded bias towards efficiencies in merger policy. First, it may diminish or increase the incremental (unilateral) effect of a given merger, and second, it may alter the set of mergers being proposed. In a world with common ownership, mergers in area A, that are beneficial for society in aggregate and potentially also for consumers are now in theory possible without compulsion. Although these mergers are privately *unprofitable* for the merging firms, they may be profitable for their diversified shareholders who are also invested in non-merging rivals and thus not interested in the increased joint profits of the merged firm *per se* but rather in maximizing total

---

[39] Farrell and Shapiro, 'Horizontal Mergers' (n 4) 117.

portfolio profits.[40] Essentially, as common ownership induces an internalization of externalities among the linked rival firms, common diversified shareholders may have a private profit motive to effect such mergers. The common owners' profits and any increased efficiency of rival firms (e.g., if production is shifted from less to more efficient firms) may then be passed on to consumers that come to benefit from lower prices or improved quality and increased choice.

More worryingly, mergers in areas E and F that without common ownership would be unprofitable and on balance socially harmful may also take place. In particular, mergers in area F have a *positive* net external effect (aggregating the effects caused by the merger on consumers and rivals), which suggests that under common ownership, these mergers may be good for commonly held rivals (and their diversified shareholders that hold relatively larger stakes in them than the merging firms) – even though bad for society and the merging parties – and thus, still likely to be occurring. A similar insight applies (albeit more dramatically given their welfare consequences) to mergers in area E with a net *negative* external effect. It may be that such mergers are unprofitable for the merging firms (due to reduced joint output and market share post-merger) in a Cournot oligopoly but beneficial to non-merging rivals as they expand output and market share in response to the merger, although total market output and thus also consumer welfare may be reduced on average. Common diversified shareholders that have relatively greater stakes and internalize more of the non-merging rivals' profits may thus have an incentive to merge – even if this is unprofitable for the merging firms as such and welfare decreasing for society and consumers. Effectively, for both mergers in areas E and F consumers and rival firms' interests remain antithetical as there is a tradeoff between losses to the former (and the merging firms) and gains to the latter (and the diversified shareholders). What changes are the relative proportions of these opposing external effects.

---

[40] Assuming these mergers are profitable for the commonly held rivals in which the diversified shareholders of the merging firms are invested and share in their profits. In this case, the diversified shareholders may overall benefit (total portfolio profits) from the merger as they stand to gain relatively more from the rivals' increased profitability compared to the loss in profit of the merging firms (individual firm profits). For an example of this theoretical possibility, see the Delta-Northwest merger case study in section 3.c. A further assumption underlying this scenario is that diversified shareholders have some control over the commonly held firms (both merging and non-merging) compared to undiversified shareholders and corporate management. This may be a reasonable assumption however in case of public, widely held firms with dispersed ownership structure and many, small retail shareholders but no large, dominant shareholder(s) that is only invested in the specific firm(s). In such case, diversified shareholders may be (partially) controlling in corporate governance versus other shareholders and also retain some control over managerial behavior. For a detailed discussion of the theoretical and empirical premises of the "common ownership hypothesis" and the nature and bounds of control of common owners vis-à-vis corporate managers, see further Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 13) and section 5 below on managerial entrenchment.

The corollary is that the possibility of area A, F and E mergers complicates the analysis of horizontal mergers and also changes the inference regarding efficiencies and profitability of merger activity, which may be assumed at the level of (diversified) shareholders of the commonly owned firms but not for the individual merging firms. The deeper systemic implication is that the possibility of mergers in area A (net positive external effect of unprofitable but socially beneficial merger) indicates that the interests of consumers and rivals may not be antithetical in a merger setting with common ownership, and further, mergers in areas F (net positive external effect of unprofitable and socially harmful merger) and E (net negative external effect of unprofitable and socially harmful merger) may entail that the interests of the rivals and common shareholders of the merging firms need not be opposing either. On the other hand, the possibility of area E and F mergers indicate that both the merging entities (and their undiversified shareholders) and consumers may be worse off given common ownership. Therefore, in a context of common ownership, optimal merger policy would like to allow potential mergers in area A and prohibit mergers in areas E and F.

With common ownership, however, antitrust agencies cannot simply assume any effect – the externality or profitability – of a proposed merger (or in what area of Figure 1 the merger may be placed). Also, the direction of wealth transfers due to the merger, e.g., from producers (merging and rival firms) to consumers or from rivals to the merged firm, and vice versa, is not clear. The balance of the net external and internal effect may also have policy implications for the choice of welfare standard in merger enforcement.

To make the intuition regarding the potential implications of common ownership for merger control more concrete, let us provide some illustrative examples. Consider a horizontal merger in a competitive setting of Cournot oligopoly with 10 symmetric firms. Without common ownership, this "10-to-9" merger is presumably profitable and efficient (area C in Figure 1) while, absent efficiencies, it may still be presumed profitable albeit socially harmful (area D). Contrast the case where 9 of the symmetric firms in the industry are commonly owned whereas the 10th firm, that is one of the merging parties, is separately owned. In such scenario, this is now a merger to "effective" monopoly since post-merger all firms in the industry will be commonly held. Disregarding common ownership, the merger would be viewed benignly by antitrust agencies as a potentially efficient merger (area C), otherwise the merging firms would not propose it (presumably profitable). The harm to competition and any market power motivation driving the merger (monopoly profits) may be underestimated when any "hidden"

concentration created by common ownership is not taken into account.[41] Given common ownership, however, this could be an area A merger (socially efficient but unprofitable for the merging firms). In addition, absent any efficiencies, a seemingly area D merger without common ownership (socially harmful and profitable), with common ownership it may be in area F (socially harmful and unprofitable).

Suppose further that the Cournot industry firms in this example are asymmetric in that the 10th separately owned firm is less efficient compared to the other 9 commonly held firms, which are equally efficient. The merger then may be motivated by "rationalization of production" efficiencies ("killer" merger) that improves industry efficiency and potentially performance. Conversely, if the 10th separately owned firm is comparatively more efficient, then the 9 commonly held firms may be induced to merge with it in order to scale down or close their own less efficient operations ("suicidal" merger). Unlike the symmetric Cournot example where the effectively merged firms would be indifferent, assuming constant marginal costs, as to which of the effectively monopolistic, commonly held firms produces, in the asymmetric example the merger may be driven by some efficiency benefits relating to the "shifting" of industry output towards more efficient firms.

The main conclusion to draw from this analysis is that under common ownership unprofitable mergers for the merging firms (area A) may occur and that observing mergers taking place does not imply efficiencies (area F). Indeed, common ownership is pivotal in making mergers profitable for the diversified common shareholders, which may otherwise be unprofitable for the merging firms.[42] This further suggests that under common ownership, there is no "Cournot merger paradox" and that if the level of common ownership is high enough, an increase in M&A activity is expected as the incentives for commonly owned firms to merge increase even absent efficiencies.[43]

---

[41] Azar, Schmalz and Tecu (n 12) 1; José Azar, Sahil Raina and Martin C Schmalz, 'Ultimate Ownership and Bank Competition' (2019) Working paper 4.

[42] This conclusion subverts established economic theory and merger policy. See, for instance, Gregory J Werden, 'Chapter 55: Unilateral Competitive Effects of Horizontal Mergers I: Basic Concepts and Models', *Issues in Competition Law and Policy* (2008) 1328: "Academic literature on mergers in Cournot industries has highlighted the issue of profitability. It was first observed that, with linear demand, equal marginal costs across competitors that are invariant to output, and no constraints on capacity, a merger is profitable only for merging firms accounting for at least 80 percent of industry production. But these assumptions produce an unrealistic model because a merger simply destroys the higher cost merging firm, and nothing of value is acquired. Because real world corporate acquisitions rarely are designed merely to destroy assets, the Cournot model is apt to be of interest to merger policy only if competitors' marginal costs increase as their outputs increase.".

[43] Anton and others (n 3).

d. Merger enforcement given common ownership

The above illustration clearly shows how common ownership affects the incentive to merge and the presumption of efficiencies associated with a horizontal merger. Common ownership essentially changes the *counterfactual* against which a proposed merger is to be assessed as it potentially changes the *scope* for competitive harm as well as the scope and nature of claimed *merger-specific* efficiencies. Common ownership may materially alter the internal profitability (for merging firms or "insiders" to a merger) and the external effects of a merger (on rival firms or "outsiders"),[44] due to either increased market power or improved efficiency. Indeed, the distinction is less meaningful or consequential in a common ownership environment as the merging firms' shareholders may simultaneously and in parallel be invested in non-merging rival firms. The concurrence of common ownership and a horizontal merger creates a *double - potentially opposing - internalization* effect: the merger tends to internalize the (negative) competitive externalities exercised by the merging parties on each other prior to the merger while common ownership of any or both of the merging parties in rivals, and vice versa, tends to internalize any positive (efficiencies) or negative (competition) spillovers on the merged firm's and the rivals' objective function post-merger.[45]

Thus, it is appropriate and necessary to take into account the presence and extent of common ownership, as part of the background and as a relevant substantive factor, before and after the merger in order to correctly assess both its *incremental* and *overall welfare* effects.[46] For instance, the incremental effect of a merger given common ownership may be smaller (compared to a counterfactual scenario without any common ownership) or not.[47] At the same time, it may also be that the combined effect of the merger and common ownership is larger in terms of competitive harm (increased market power) as the above example of a merger to "effective" monopoly suggests. In this setting and assuming no efficiencies, which cannot be simply presumed for a merger under common ownership, it is sensible to look at modified concentration and pricing pressure indices "*as context*" which may capture the core intuition regarding the changes in market structure and the interaction of effects produced by the merger

---

[44] On the terminology, see Farrell and Shapiro, 'Horizontal Mergers' (n 4) 114.

[45] For a more formal discussion of these effects and their interaction, see section 3.c below.

[46] See Case M.7932 *Dow/DuPont*, paras 4 and 81; and Case M.8084 *Bayer/Monsanto*, Commission decision of 21 March 2018, paras 228 ("common shareholding in the agrochemical industry is to be taken as an *element of context* in the appreciation of any significant impediment to effective competition that is raised in this Decision."). The so called "SIEC test" is the substantive review test under EU merger control.

[47] For a real-world example showing that the incremental effect of a merger in the presence of common ownership may not be smaller, see section 3.c where we use the Delta-Northwest merger as an illustrative case study.

and common ownership. In fact, absent the presumption of efficiencies, merger control enforcers may sensibly be skeptical about the parties' motive to merge and thus place more reliance on the competitive effects' analysis based on MHHIs and PPIs or GUPPIs.[48] This in turn is a fact-specific exercise depending on the relative stakes of the common owners in the merging and rival firms and the merger deal structure, as explained in more detail in section 3.c. Consequently, while common ownership does not fundamentally change the analytical framework for merger review, it may well change the particular outcome of the substantive assessment depending on the circumstances and specific facts of each case.[49]

3. Unilateral effects analysis

a. Price effects of horizontal mergers

As explained above, under a consumer welfare standard, merger enforcement in practice focuses on the likely price (and output) effects caused by proposed mergers during their substantive assessment. By analogy, the same reasoning in theory applies to consumer harm

---

[48] For the development of the modified Herfindahl-Hirschman Index (MHHI) in the context of horizontal joint ventures, and later its extension and the development of the Price Pressure Index (PPI) to account for the change in competitive incentives produced due to partial ownership interests in rival firms, see Timothy F Bresnahan and Steven C Salop, 'Quantifying the Competitive Effects of Production Joint Ventures' (1986) 4 International Journal of Industrial Organization 155; O'Brien and Salop (n 9). The modified HHI and PPI deltas measure the additional "effective" concentration and pricing pressure created by common shareholdings across competing firms in an industry under different corporate control assumptions. See section 3.c below. Besides the ownership structure details in each case, the particular surrounding circumstances will be crucial to assess the likely effects of the merger but also the fit of these indices to the industry setup and corporate governance dynamics at play. As it is noted for instance, with reference to the MHHI, by Fiona Scott Morton and Herbert Hovenkamp, 'Horizontal Shareholding and Antitrust Policy' (2018) 127(7) Yale Law Journal 2026, 2032: "we do not yet understand whether or what size of harms arise from large common owners compared to small ones, what constitutes 'large,' the impact of total amounts of horizontal shareholding, or the effects of the ordering of owner size (for example, the largest owner compared to a particular percentage amount of ownership). MHHI does not take into account ordinal impacts of ownership or the impact of communication.". Hence, more research is needed to sharpen and further develop such metrics as applied to common ownership in general and in the context of merger analysis; or that such quantitative measures and their underlying assumptions are evaluated in combination with the concrete surrounding context. In cases where unilateral effects are not the primary concern or the specific context is richer than the MHHI or the PPI assume, a "detailed incentives analysis" may be required. See Alistair Lindsay and Alison Berridge, *The EU Merger Regulation: Substantive Issues* (4th ed, Sweet & Maxwell 2012) section 14-020: "The third approach is to require a detailed analysis of the effect of the link on the incentives of the merged group to compete in light of the possible distortive effects identified in Exxon/Mobil […]"; Andrea Asoni and Yianis Sarafidis, 'Economic Tools for Gauging the Competitive Effects of Partial Acquisitions in the Energy Sector' Summer 2017 ABA Section of Antitrust Law - Transportation and Energy Industries Committee Newsletter 15, 22: "While the first two competitive concerns mentioned in the [US] Guidelines are incorporated into the mHHI and mGUPPI [i.e., influence over the acquired firm and incentives of the acquirer], the third concern [i.e., information flows] is outside their scope, thus further underlining the importance of a full merger investigation that goes beyond mHHI and mGUPPI, and looks at all possible ways in which a partial acquisition affects competition."

[49] Inderst and Thomas (n 9); Roman Inderst and Stefan Thomas, 'Common Ownership and Mergers between Portfolio Companies' (2019) 42 World Competition 551.

due to merger effects on other competitive parameters such as innovation, quality or choice.[50] The general presumption for horizontal mergers analyzed in static oligopoly models is that "absent efficiencies, prices will rise following a merger."[51] The reasoning behind this presumption is that integration of separately owned firms, which previously maximized own firm profits independently, has an "inherent" price-increasing effect. The merged firm, acting in its unilateral self-interest, post-merger has an "incentive to raise its price(s), in comparison with the pre-merger price(s), because of the elimination of direct competition between the two firms that have merged."[52] A merger of direct competitors induces them to "internalize the negative externality that more aggressive pricing or output choices" by each of the merging parties would have on the other.[53] The internalization of rivalry between the merging firms may thus make the merger anticompetitive in that it causes them to alter their actions and competitive behavior in the relevant market.[54]

"Unilateral effects" or "non-coordinated effects" theories of harm, aim to analyze and quantify the loss of competition produced by the merger, taking rivals' prices and outputs as given and without accounting for coordinated behavior.[55] Such anticompetitive merger effects are "unilateral" in the sense that the merging and rival firms' actions are decided independently

---

[50] Indeed, the two EU merger cases that took into account common ownership as an element of context relied on unilateral effects theories of harm based on increased pricing as well as reduced innovation incentives. See Case M.7932 Dow/DuPont, Commission decision of 27 March 2017; Case M.8084 Bayer/Monsanto, Commission decision of 21 March 2018.

[51] Whinston (n 19) 2375; Farrell and Shapiro, 'Horizontal Mergers' (n 4) 114 (whose theoretical findings "support the presumption that an oligopolistic merger will reduce aggregate industry output, and point to the nature and degree of synergies or scale economies that are required to overturn this presumption").

[52] Louis Kaplow and Carl Shapiro, 'Chapter 15: Antitrust' in Steven Shavell and A Mitchell Polinsky (eds), *Handbook of Law and Economics*, vol 2 (Elsevier 2007) 1139.

[53] Whinston (n 19) 2375.

[54] Gregory J Werden and Luke M Froeb, 'Unilateral Competitive Effects of Horizontal Mergers' in Paolo Buccirossi (ed), *Handbook of Antitrust Economics* (MIT Press 2008) 46.

[55] US Horizontal Merger Guidelines 2010 §1 ("A merger can enhance market power simply by eliminating competition between the merging parties. This effect can arise even if the merger causes no changes in the way other firms behave.") and §6 ("The elimination of competition between two firms that results from their merger may alone constitute a substantial lessening of competition. Such unilateral effects are most apparent in a merger to monopoly in a relevant market, but are by no means limited to that case."); EU Horizontal Merger Guidelines, para 22 ("[H]orizontal mergers may significantly impede effective competition, by eliminating important competitive constraints on one or more firms, which consequently would have increased market power, without resorting to coordinated behaviour.") and para 24 ("The most direct effect of the merger will be the loss of competition between the merging firms. For example, if prior to the merger one of the merging firms had raised its price, it would have lost some sales to the other merging firm. The merger removes this particular constraint. Non-merging firms in the same market can also benefit from the reduction of competitive pressure that results from the merger, since the merging firms' price increase may switch some demand to the rival firms, which, in turn, may find it profitable to increase their prices. The reduction in these competitive constraints could lead to significant price increases in the relevant market.").

within a set oligopoly game of competitive interaction (e.g., Cournot, Bertrand).[56] Unilateral effects analysis assesses the potential unilateral increase in market power brought about by the merger, for instance, by profitably being able to raise prices or reduce quality and innovation post-merger. If the estimated price increase resulting from such likely increase in market power is significant,[57] then antitrust authorities will challenge the merger. They will either seek to prohibit it or impose remedies that eliminate or mitigate any anticompetitive merger effects.

b. Common ownership in unilateral effects analysis

Common ownership by institutional investors produces its own unilateral effects that interact with any unilateral effects caused by a merger between portfolio companies held by the common investors-shareholders. Common shareholders that are invested across the industry and hold shares in rival firms will have incentives to maximize the sum of profits of all the firms in their portfolio and therefore, assuming they can influence management,[58] they will induce less aggressive firm behavior as they come to benefit from reduced competition among their portfolio firms. The "unilateral" anticompetitive effect of common ownership therefore

---

[56] Werden and Froeb (n 54) 46: "What makes the anticompetitive effect 'unilateral' is that the actions of nonmerging competitors are determined by the same, Nash equilibrium, best-response functions before and after the merger. The effects are unilateral even though nonmerging competitors do not take the same actions after the merger that they took before it, and even if the changes in their actions increase the merged firm's profit."

[57] Both from a legal certainty and institutional perspective as well as from an economic policy perspective such approach is considered sound and advisable. See Giorgio Monti, 'EU Merger Control After CK Telecoms UK Investments v. Commission' (2020) 43(4) World Competition 447, 449–450: "One of the less discussed aspects of competition law is that the rules tolerate some anticompetitive effects. For example, a merger must 'significantly' impede effective competition. This means we authorize mergers that have a minor adverse impact on competition. There may be good reasons for doing so, for example the cost of assessing all mergers that cause some anticompetitive effect may outweigh the societal benefit of regulating all such mergers. Alternatively it may be assumed that mergers where we might predict a low level of anticompetitive impact are likely to yield efficiencies that outweigh the small competitive risk and so we apply an implicit efficiency defence by clearing these mergers."; Stefan Thomas, 'The Known Unknown: In Search for a Legal Structure of the Significance Criterion of the SIEC Test' (2017) 13 Journal of Competition Law & Economics 346. This is in line with the preceding economic analysis suggesting that in case of minimal competitive harm (small increase in market power), efficiencies are to be presumed either in the form of integrating synergies between the merging parties or rationalization of production efficiencies improving firms' productivity in the industry (in the absence of common ownership). See n 38 above and surrounding text. Notably, the substantive merger control tests in the EU ("significant impediment of effective competition") and the U.S. ("substantial lessening of competition") support this position.

[58] Such shareholder influence on management is realistic in a setting of widely held, public companies with dispersed shareholder structure and no dominant shareholder(s) with total corporate control; under a proportionate control assumption, common diversified shareholders will then have *de facto* joint control relative to any undiversified, atomistic shareholders. See Azar, Schmalz and Tecu (n 12); Schmalz (n 12); Tzanaki, 'Varieties and Mechanisms of Common Ownership' (n 13). But see also section 5 below for the case with managerial entrenchment that may counteract or mitigate potential competitive effects of common ownership.

arises from the "indirect internalization of external effects of price increases" on the portfolio firms' common shareholders.[59]

While the commonly held firms are formally separate, their shareholders' overlaps and the potential concentration due to joint ownership and control[60] may have structural effects similar to those analyzed in mergers and partial cross-ownership cases.[61] The common shareholdings effectively create a "positive correlation" among the rival firms' profits and may result in a unilateral "softening of competition" effect.[62] Common shareholders thus indirectly internalize part of the gain from any portfolio companies' lost market shares or sales diverted to competitors via their small, parallel minority investments, in case they raise price or restrict output in the relevant market. Hence, by analogy to a merger situation, absent efficiencies, common ownership links among rivals may also have an "inherent" price-increasing effect.

This structural effect of common ownership bears practical implications for the substantive assessment of the price effects of horizontal mergers. It suggests that in the presence of common ownership, the unilateral effects of a merger may be smaller, although not

---

[59] Inderst and Thomas (n 49) 556.

[60] Frazzani and others (n 13) 76 (who, analyzing the European Commission's Dow/DuPont merger decision, note the distinction between "product market concentration among firms" and "common ownership concentration across firms" in the market, which the MHHI aims to capture in order to assess market power in the presence of common ownership); O'Brien and Salop (n 9) 612 (noting, in their interpretation of the modified structural indices, that the "MHHI and PPI deltas depend in a similar way on the ratios of the within-firm and across-firms concentration of ownership and control").

[61] The US antitrust agencies may review both full and partial mergers of competitors involving either cross- or common shareholdings. For the analysis of those cases, see US Horizontal Merger Guidelines 2010 §13: "In most horizontal mergers, two competitors come under common ownership and control, completely and permanently eliminating competition between them. This elimination of competition is a basic element of merger analysis. However, the statutory provisions referenced in Section 1 also apply to one firm's partial acquisition of a competitor. The Agencies therefore also review acquisitions of minority positions involving competing firms, even if such minority positions do not necessarily or completely eliminate competition between the parties to the transaction." Assumptions regarding control (no, full, partial) associated with partial ownership matter to determine the precise impact on incentives to compete. See Bresnahan and Salop (n 48) 174 ("There are substantial differences in competitive incentives resulting from the different ownership and control structures, although none of them changes competitive incentives as much as a merger."); O'Brien and Salop (n 9) (who generalize and analytically expand the intuition under varying economic formulas, and further suggesting that partial ownership structures "can raise either larger or smaller concerns than complete mergers").

[62] Robert J Reynolds and Bruce R Snapp, 'The Competitive Effects of Partial Equity Interests and Joint Ventures' (1986) 4 International Journal of Industrial Organization 141, 141–142 ("partial ownership arrangements could result in less output and higher prices than otherwise, even if the ownership shares are relatively small. These effects arise solely because these arrangements link the fortunes of actual or potential competitors, producing a positive correlation among their profits. In this sense, the effects are purely structural: they arise not because of increased opportunities for collusion or changes in the concentration of control, but because the linking of profits reduces each firm's incentive to compete."); David Gilo, 'Chapter 67: Passive Investment', *Issues in Competition Law and Policy*, vol 3 (ABA Section of Antitrust Law 2008) 1637 ("the [passively investing] firm has an incentive to compete less aggressively since it internalizes a portion of the rival's profits through its investment. This basic intuition translates directly into unilateral anticompetitive effects").

necessarily.[63] Since the common shareholders that are invested in multiple firms in the industry already *partially* internalize their profits pre-merger, the "*incremental* internalization" produced by a merger between commonly held portfolio firms will be mitigated.[64] Therefore, antitrust agencies need to examine both the pre-existing level of common ownership in the industry and how the merger changes any unilateral incentives to compete due to the merging parties' internalization of competitive externalities post-merger given the resulting common ownership, in order to properly determine the incremental effect of a proposed merger on the market structure and performance.

In the limit, assuming full pre-existing common ownership, the merger will have zero effect on the market structure as the industry will already operate as an "effective" monopoly.[65] Practically, this means that the higher the level of pre-merger common ownership, the less material is from the perspective of the common investors-shareholders as to which of the rival firms captures the industry profits.[66] For this reason, merger enforcement and substantive review needs to assess any structural and price effects pre- and post-merger, with and without common ownership, in order to determine the causality of those effects, i.e., whether they arise from and may be attributed to the merger or to pre-existing common ownership. This exercise, however, makes the effects analysis of horizontal mergers more complex.[67]

The above intuition may at first sight point towards a more lenient merger policy under which competition enforcement authorities may more easily clear mergers given common ownership that could otherwise potentially raise concerns in its absence. However, such a general conclusion is not justified as neither theory suggests, nor empirical research supports that in all circumstances common ownership will mitigate unilateral merger effects across the board. To the contrary, it is possible that a merger disproportionally increases common ownership in the non-merging rivals compared to the merging firms, in which case the incremental internalization effect produced by a merger may be larger rather than smaller post-merger.

This possibility implies that any merger-induced increases in common ownership such that common shareholders (come to) link not only the merging parties but also any or both of them and their rival firms in an oligopolistic industry may not be uniform or symmetric across the

---

[63] As we explain and further illustrate by means of a practical example in section 3.c.
[64] Inderst and Thomas (n 49) 558.
[65] As shown by the 10-to-9 merger example in a context of common ownership in section 2.c.
[66] All else being equal.
[67] Inderst and Thomas (n 9) 574.

commonly held firms. In such scenario, it may be theoretically and empirically plausible that the unilateral effects of the merger are reinforced with common ownership depending on the relative size of the shareholdings of the common investors in the merging and rival firms as well as the specific details of the merger deal structure, as explained in more detail in the next section. It is precisely for this reason that the effects analysis of mergers taking into common ownership needs to be more nuanced and fact-specific, hence more complex. As *a priori* conclusions cannot be drawn in the abstract, antitrust authorities will need to develop guidelines to inform businesses and investors as to how merger enforcement will adapt and proceed when interacting with common ownership in specific cases and circumstances.

c. *Modified concentration and price pressure indices*

To quantitatively measure the effects of mergers on output and pricing incentives, two economic methodologies have been developed: the Herfindahl-Hirschman Index (HHI) and the Price Pressure Index (PPI),[68] which are based on the Cournot homogeneous products model and on the Bertrand differentiated products model respectively.[69] These quantification tools assess the likely increase in concentration and market power (markup) post-merger.[70]

---

[68] Or more recently, the Upward Pricing Pressure (UPP) and the Gross Upward Pricing Pressure Index (GUPPI) methodologies for differentiated products industries. See Joseph Farrell and Carl Shapiro, 'Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition' (2010) 10 The B.E. Journal of Theoretical Economics; Joseph Farrell and Carl Shapiro, 'Upward Pricing Pressure and Critical Loss Analysis: Response' (2010) February 2010 The CPI Antitrust Journal 1; Serge Moresi, 'The Use of Upward Price Pressure Indices in Merger Analysis' (2010) 2 The Antitrust Source 1; Steven C Salop and Serge Moresi, 'Updating the Merger Guidelines: Comments' <https://www.ftc.gov/sites/default/files/documents/public_comments/ horizontal-merger-guidelines-review-project-545095-00032/545095-00032.pdf>; Carl Shapiro, 'The 2010 Horizontal Merger Guidelines: From Hedgehog to Fox in Forty Years' (2010) 77 Antitrust Law Journal 49; Steven Salop, Serge Moresi and John Woodbury, 'Scoring Unilateral Effects with the GUPPI: The Approach of the New Horizontal Merger Guidelines' [2010] CRA Competition Memo <http://www.crai.com/sites/default/files/publications/Commentary-on-the-GUPPI_0.pdf>; Robert Willig, 'Unilateral Competitive Effects of Mergers: Upward Pricing Pressure, Product Quality, and Other Extensions' (2011) 39 Review of Industrial Organization 19.

[69] O'Brien and Salop (n 9) 594. As explained above, O'Brien and Salop extend the MHHI first developed by Bresnahan and Salop (n 48) and also define the PPI drawing from and extending Carl Shapiro's "diversion ratio" approach. This formalized "Pricing Pressure Index" is the methodological predecessor of the now commonly used UPP and GUPPI approaches to assess mergers in differentiated products markets. On the latter, see Gregory J Werden and Luke M Froeb, 'Choosing Among Tools for Assessing Unilateral Merger Effects' (2011) 7 European Competition Journal 155, 161.

[70] Case COMP/M.2283, *Schneider/Legrand*, Commission decision of 30 January 2002, footnote 8: "Under certain conditions it can be demonstrated that the [HHI] reflects the average level of margins in an industry. The change in the Index caused by a transaction can be equated with a change in margins and is therefore a useful indicator of the potential effect of the transaction on prices. The HHI is therefore used to measure the intensity of competition on a particular market or the changes thereto caused by a transaction." See also Jean Tirole, *The Theory of Industrial Organization* (MIT Press 1988) 221–223 (section 5.5 on "Concentration Indices and Industry Profitability"); Eric A Posner, Fiona M Scott Morton and E Glen Weyl, 'A Proposal to Limit the Anti-Competitive Power of Institutional Investors' (2017) 81(3) Antitrust Law Journal 669, 681 ("The HHI approach is rooted in the economic theory of oligopoly, which goes back at least to Cournot. [...] More firms are better for competition and for consumers, all else equal. In a simple version of Cournot's model the mark-up that can be sustained in the

Furthermore, modified HHI and PPI formulas have been developed to specifically account for the altered competitive incentives and unilateral effects created by partial ownership interests in rival firms.[71] These modified indices have been further extended and adapted to address cases of common ownership links.[72]

The HHI, the Modified HHI and the merger-induced Delta

The HHI is calculated by summing the squares of market shares of each firm in the relevant market and is constructed under the assumption that individual firms are separately owned and independently operated.[73] Relevant thresholds for post-merger HHIs and the "HHI delta" (the change in HHI due to the merger) are included in enforcement guidelines to indicate safe harbors for presumably unproblematic mergers in relatively unconcentrated markets or to flag cases of potentially problematic mergers in moderately or highly concentrated markets.[74] Importantly, however, the EU Horizontal Merger Guidelines provide that such safe harbors do

---

industry over average marginal cost is precisely HHI/10,000 multiplied by the mark-up a monopolist would choose [the marginal consumer surplus]. This is one theoretical foundation for using the HHI statistic in competition enforcement"); Rosati and others (n 13) 26 ("The HHI assumes that market dispersion is a factor of competition [...] [It] is constructed in a competition setting à la Cournot, where firms compete in the market by setting quantities. In such an environment, each firm j in the industry maximises the profit of the shareholder, which does not have any other financial stakes in rival firms, and the consequent markup - the ratio between the selling prices and cost prices - is proportional to the firms' HHI.").

[71] See n 48 above. See also Annex I 'Economic Literature on Non-Controlling Minority Shareholdings ("Structural Links")' to Commission Staff Working Document, 'Towards More Effective EU Merger Control,' SWD(2013) 239 final, 20-23 (para 87: "the MHHI is an indicator of the average price-cost margin that additionally takes into account the anti-competitive effects of partial ownerships."; and para 89: "Salop and O'Brien (2000) refer to PPIs as indicators that measure the economic pressure to change prices in response to a change in ownership structures. Unlike the MHHI analysis, however, a separate PPI indicates the pricing pressure of each firm in the market. [...] An advantage of the PPI approach over the MHHI concept is its ability to incorporate efficiency benefits into the analysis in a practical way."); Posner, Scott Morton and Weyl (n 70) 683 ("The key idea behind MHHI is that firms maximize the return to their shareholders. [...] O'Brien and Salop then study a Cournot model among firms maximizing these objective functions. They show that rather than mark-ups being determined by marginal consumer surplus multiplied by HHI /10,000, it is now determined by MHHI /10,000").

[72] Azar, Schmalz and Tecu (n 12); Azar, Raina and Schmalz (n 41); Duarte Brito and others, 'Unilateral Effects Screens for Partial Horizontal Acquisitions: The Generalized HHI and GUPPI' [2015] Faculdade de Economia e Gestão, Universidade Católica Portuguesa (Porto), Working Paper Nº 02/2015; Inderst and Thomas (n 9); Inderst and Thomas (n 49). For economic studies showing a positive link between common shareholding and the market power of firms in the U.S. and the EU, see José Azar, 'A New Look at Oligopoly: Implicit Collusion Through Portfolio Diversification' (PhD Dissertation, Princeton University 2012) (especially chapter 6 on "Shareholder Networks and Market Power"); Rosati and others (n 13) (chapter 6 on "Linking Common Shareholding and Competition" and chapter 7 on "Effects of the BlackRock-BGI Merger on Beverages Manufacturers").

[73] Posner, Scott Morton and Weyl (n 70) 681 ("The HHI analysis assumes that the firms are independently owned or operated as if they were."); Werden (n 35) 369 ("The post-merger HHI is an HHI constructed by treating the merging firms as one. It contrasts with the pre-merger HHI, which treats the merging firms as separate.").

[74] US Horizontal Merger Guidelines 2010 §5.3; and EU Horizontal Merger Guidelines, para 16 ("While the absolute level of the HHI can give an initial indication of the competitive pressure in the market post-merger, the change in the HHI (known as the 'delta') is a useful proxy for the change in concentration directly brought about by the merger.") and paras 19-21. See also Werden (n 42) 1327 ("The Merger Guidelines' postmerger HHI is HHIpre plus the "change in the HHI," defined as twice the product of the market shares of the merging firms. In other words, the postmerger HHI is what HHIpost would be if the merger had no effect on market shares.").

not apply in "special circumstances" such as in the presence of "significant cross-shareholdings among the market participants".[75] It is further noted that "[i]n markets with cross-shareholdings or joint ventures the Commission may use a modified HHI, which takes into account such share-holdings".[76] While not explicitly mentioned in the US Merger Guidelines, economists at the antitrust agencies commonly use these tools to analyze partial acquisitions.[77] The European Commission has recently employed the MHHI during the review of the *Dow/DuPont* merger involving extensive common shareholding links between market participants.[78] Although it did not rely on these calculations for its final decision,[79] the Commission stated that given the level of common ownership in the markets assessed, traditional structural measures, such as market shares and the HHI, underestimate the actual concentration in the market structure, the merging parties' market power and the expected "non-coordinated" effects of the transaction.[80]

Ordover, Sykes and Willig (1982) show that performance as measured by the average industry markup is equal to the HHI divided by the elasticity of demand:[81]

$$\sum_{j=1}^{J} s_j \frac{P - C_j}{P} = \frac{HHI}{\epsilon},$$

where the HHI is calculated as the sum of market shares squared $\sum_{j=1}^{J} s_j^2$. Figure 2 provides a graphical representation of the HHI, in which we divide a square of side 1 into smaller squares with sides equal to the market shares of the firms in a market. The total area of these smaller squares is equal to the HHI, because it equals the sum of the market shares squared. This

---

[75] EU Horizontal Merger Guidelines, para 20 (c).

[76] Ibid, footnote 25. See Cases COMP/M.1383, *Exxon/Mobil*, Commission decision of 29 September 1999, para 256; COMP/M.2283, *Schneider/Legrand*, Commission decision of 30 January 2002, paras 18 (footnote 11) and 30; COMP/M.1715, *Alcan/Pechiney*, withdrawn (14 March 2000); Case M.6541, *Glencore/Xstrata*, Commission decision of 22 November 2012, paras 158 and 175.

[77] Asoni and Sarafidis (n 48) 16 (referring to the MHHI and the modified GUPPI).

[78] Case M.7932 *Dow/DuPont*, Commission decision of 27 March 2017, Annex 5, paras 67 et seq.

[79] Ibid, para 79: "The Commission acknowledges that it did not perform a case-specific assessment that would justify applying a specific assumption on the control weights. As a consequence, the Commission does not rely on MHHI computation in this Decision."

[80] Ibid, section 8.6.4 and Annex 5, paras 4 and 61 et seq.

[81] Janusz A Ordover, Alan O Sykes and Robert D Willig, 'Herfindahl Concentration, Rivalry, and Mergers' (1982) 95 Harvard Law Review 1857, 1864–1865. See also Keith Cowling and Michael Waterson, 'Price-Cost Margins and Market Structure' (1976) 43 Economica 267; John E Kwoka Jr, 'The Herfindahl Index in Theory and Practice Economics' (1985) 30 Antitrust Bulletin 915, 924–925; Werden (n 42) 1326.

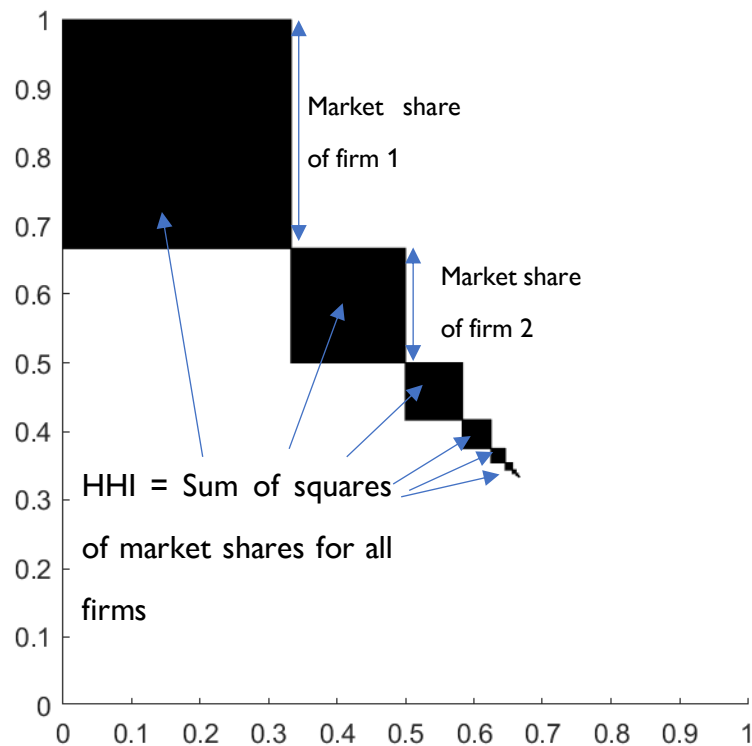assumes that firms maximize profits independently, which is reasonable if the firms are separately owned.

Figure 2: Graphical Representation of HHI

Figure 3 illustrates the "change in HHI" when a merger of two previously independent firms changes their ownership structure, so that they become one combined entity, and thus also the structure of the industry. The so called "HHI delta", or ΔHHI is the increase in concentration produced by the merger, which is depicted by the two additional black rectangles (AB and BA) in the graph that equal two times the product of the market shares of the merging firms, because that is the difference between the area of the larger square (A+B+AB+BA) whose side is the combined market share of the merging firms, and the areas of the two smaller squares (A and B) whose sides are the separate market shares of the two merging firms.
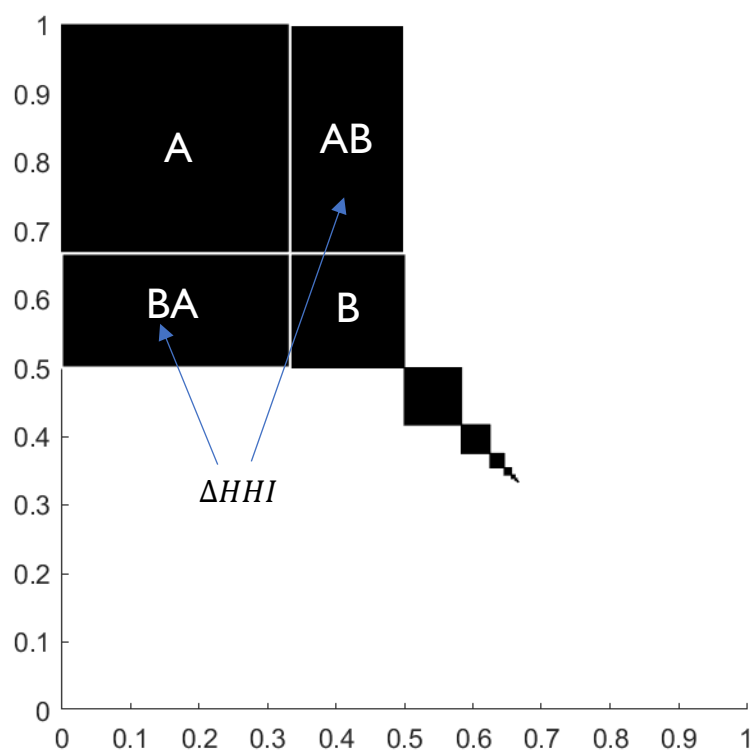
Figure 3: Graphical Representation of ΔHHI

O'Brien and Salop (2000) extend this result to the case in which firms have common shareholders.[82] In this case, the average industry markup is equal to the *modified* HHI divided by the elasticity of demand:

$$\sum_{j=1}^{J} s_j \frac{P - C_j}{P} = \frac{MHHI}{\epsilon},$$

where

$$MHHI = \underbrace{\sum_{j=1}^{J} s_j^2}_{HHI} + \underbrace{\sum_{j=1}^{J} \sum_{k \neq j} s_j s_k \lambda_{jk}}_{\delta MHHI}.$$

---

[82] O'Brien and Salop (n 9).

In the last expression, λ_{jk} is the Edgeworth sympathy coefficient, that is, the weight that firm j puts on firm k's profits in its objective function relative to its own profits. If we denote γ_{ij} the control share of shareholder i in firm j, and β_{ij} the financial interest share of shareholder i in firm j, then the expression for the Edgeworth sympathy coefficient for firm k in firm j's objective function is:

$$\lambda_{jk} = \frac{\sum_{i=1}^{I} \gamma_{ij}\beta_{ik}}{\sum_{i=1}^{I} \gamma_{ij}\beta_{ij}}.$$

When the shareholders of firm j have no stakes in competing firms, all the λ_{jk} are equal to zero, the MHHI becomes equal to the HHI, and the O'Brien and Salop (2000) formula simplifies to the Ordover, Sykes and Willig (1982) formula. When shareholders hold market portfolios with equal stakes in all firms, all the λ_{jk} are equal to one and the outcome is equivalent to monopoly.[83] The difference between the MHHI and the HHI is the part of overall concentration that is generated by common ownership, and is generally called the "MHHI delta",[84] which we will denote $\delta MHHI$. Figure 4 represents this situation graphically, in which the two largest firms in the market are partially connected by common ownership, and therefore the two rectangles from Figure 3 are now shaded but not completely black, to represent the fact that the weight that the two firms place on each other's profits is some λ that is less than one.

---

[83] José Azar, 'The Common Ownership Trilemma' (2020) 87 The University of Chicago Law Review 263.

[84] Rosati and others (n 13) 27: "The MHHI breaks down the total market concentration into two parts (i) the standard industry concentration, as measured by HHI, capturing the number and the relative dimension of competitors; and (ii) the common shareholding concentration, called ΔMHHI, which captures how natural competitors are connected by common shareholding. The MHHI represents the level of concentration after the ownership' acquisitions by common shareholders, and the change of concentration "delta" is the difference between the post-ownership' acquisition MHHI and the pre-ownership' acquisition HHI.".
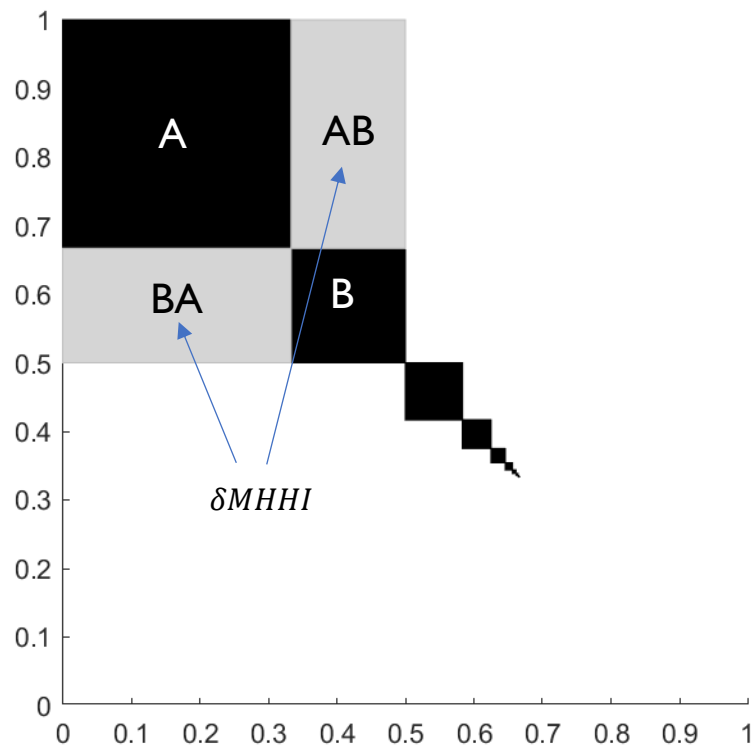
Figure 4: Graphical Representation of $\delta MHHI$

We denote the change in concentration due to common ownership using δ (i.e., a "lowercase delta") to distinguish it from the change in concentration due to a merger, which we denote using Δ (i.e., an "uppercase Delta"). The reason is that we want to save the "uppercase Delta" notation to denote the change in the $MHHI$ due to a merger. Thus, we will use $\delta MHHI$ to refer to the difference between the $MHHI$ and the HHI, and $\Delta MHHI$ to refer to the incremental effect in the MHHI induced by a merger in an environment of common ownership. Note that the $\Delta MHHI$ can be thought of as having two components: the "HHI Delta" (i.e., the change in the HHI due to the merger), and a "Delta MHHI delta" (i.e., the change in the MHHI "lowercase delta" due to the merger):

$$\Delta MHHI = \Delta HHI + \Delta \delta MHHI.$$

In the example from Figures 2, 3 and 4, the ΔHHI is equal to the area of the two rectangles, that is, two times the product of the market shares of the merging firms. However, if the initial situation were as in Figure 4, such that the two firms had some pre-existing common ownership, the $\Delta MHHI$ would be lower than the ΔHHI. In particular, it would be $\Delta HHI \times (1 - \lambda)$,

because the firms were, in a sense, already partially merged to the extent that λ was greater than zero. In the extreme case in which λ was equal to one before the merger (that is, the firms' ownership structures were already identical, even if they were formally separate), then the $\Delta MHHI$ would be zero, that, is, the merger would have no competitive effect. In this example, the $\Delta \delta MHHI$ is negative, because the $\Delta MHHI$ is lower than the ΔHHI, and thus the fact that firms were to some extent under common ownership reduces the anticompetitive effects of the merger itself.

It may be tempting to generalize from this example and think that taking common ownership into account in merger analysis will typically lead policymakers to conclude that the incremental effect of mergers is lower than if one ignored the existence of common ownership in the analysis. However, this is not generally the case. In cases in which the merging firms have common ownership links not just with each other, but also with non-merging competitors, some of the objective function weights λ can increase after the merger. For instance, this may occur when the merger disproportionally increases the common shareholders' post-merger stakes in the non-merging rivals compared to their stakes in the merging firms. Moreover, whether the objective function weights λ increase or not will depend on the details of the financial structure of the merger deal. That is, the effect of the merger on the objective function weights λ will depend on whether the merger is done through a cash acquisition or by offering stock, and in the latter case on the exact terms of the transaction.

For example, in a swap deal, the objective function weights λ that the merging firms put on other firms in the industry will tend to increase after the merger, due to a "dilution effect" pointed out by David Gilo.[85] Suppose firm 1 buys a rival firm 2 by offering shares of firm 1 to the shareholders of firm 2. In that case, the ownership share of the initial shareholders of firm 1 will go down. If these shareholders also have stakes in non-merging rivals, their stakes in the rival firms will have increased *relative to* the stakes that they own in firm 1. Therefore, the weight that firm 1's shareholders put on the rival firms will have increased due to the merger.

In cases in which the merging firms already have some common ownership links with many of their competitors, the effects of a merger on the objective function weights λ are complex, and there is no simple "rule-of-thumb" that can predict whether the overall effect will be in the

---

[85] Gilo (n 9) (discussing how, in the case of passive investment by controllers, the dilution of the controller's stake in the firm it controls exacerbates the anticompetitive threat of passive investment because the smaller the stake it has in the firm under its control, the more weight it places on its stake in a rival).

pro-competitive or anticompetitive direction. To illustrate this, we consider the merger of Delta Air Lines and Northwest Airlines, which was announced on April 14, 2008. Before the announcement, the airlines already had common shareholders with all of their major competitors. The structure of the deal was such that Northwest shareholders, in exchange for selling their firm to Delta, would receive 1.25 shares of Delta stock for each share of Northwest stock that they owned. This implied some dilution of the ownership stakes of Delta Air Lines' initial shareholders. Figure 5 shows the pre-merger and post-merger ownership shares of Delta's largest shareholders, sorted by pre-merger ownership share, under a counterfactual in which Northwest shareholders receive 1.25 shares of Delta stock for each share of Northwest stock. We can see that the dilution is not uniform across shareholders. For example, Delta's largest shareholder, J.P. Morgan Chase & Co., owned 15.2% of Delta stock pre-merger, which goes down to 7.6% due to the merger. The reason is that J.P. Morgan Chase Co.'s share in Northwest was relatively small, only 0.7%, and so this shareholder experienced substantial dilution. In contrast, Delta's second largest shareholder was Wellington Management Co., which owned 11.2% of Delta's stock pre-merger and 13.9% of Northwest's stock. Its relatively high ownership stake in Northwest implied that, although its initial stake in Delta was diluted, this was more than compensated by the Delta stock it received in exchange for its ownership of Northwest stock, and therefore the total stake in Delta increased to 12.3% due to the merger.
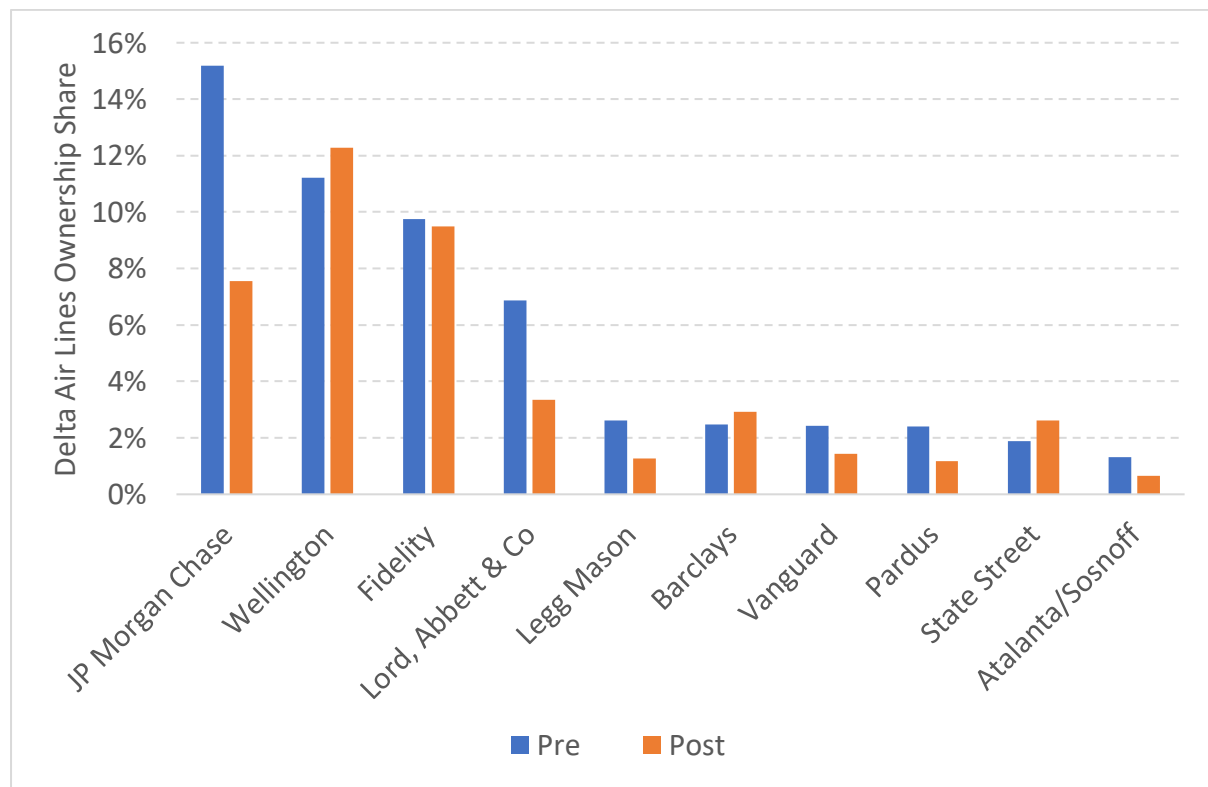
Figure 5: Pre- and Post-Merger Delta Air Lines Ownership Share for the Company's Largest Shareholders

Because Delta and Northwest had some common ownership in each other *ex ante*, one could reason that the merger would bring the market from a situation similar to Figure 3 (without common ownership) to one like in Figure 4 (with pre-existing common ownership), and therefore the $\Delta MHHI$ would always be lower than the ΔHHI. However, this is not the case, and, as we mentioned, the reason is that Delta and Northwest also had common ownership with competitors. As some of Delta Air Lines's initial shareholders' ownership shares were diluted by the deal, the relative weight that they placed on other carriers relative to Delta Air Lines increased after the deal. Thus, if Delta Air Lines's objective function is a weighted average of its shareholders' objective functions, the weight that Delta Air Lines's objective places on most other carriers increased after the deal. Similarly, the weight that Northwest Airlines's objective function places on most other carriers increased after the deal. The objective function weights λ (assuming control proportional to voting shares) for these two carriers pre-merger and of the combined firm are shown in Figure 6. It is important to emphasize that these changes depend on the particular structure of the merger deal, and different structures would have led to different post-merger objective function weights. For example, an all-cash deal would have implied that the weight that Delta Air Lines places on competitors remains the same, while Northwest Airlines' weight on competitors would become the same as Delta's (which were generally higher than Northwest's initial weights).
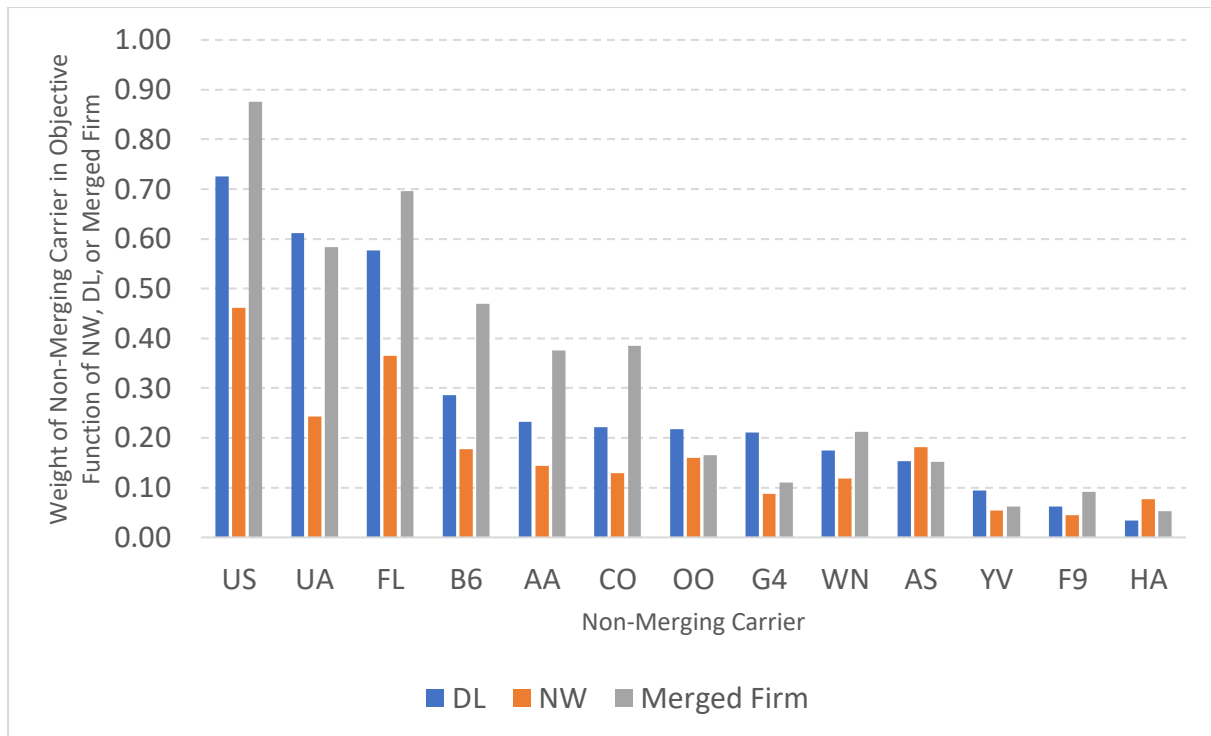
Figure 6: Weight of Non-Merging Carriers on Delta, Northwest, and Merged Delta-Northwest's Objective Function

In most markets, the increase in the objective function weights λ of Delta Air Lines and Northwest Airlines with respect to non-merging carriers more than compensated for the fact that there was already partial common ownership between Delta and Northwest themselves. Figure 7 shows a histogram of the distribution of the $\Delta\delta MHHI$ across routes. As we can see from the figure, unlike in the simple example in which there was only common ownership between the merging firms, in which the $\Delta\delta MHHI$ was negative, in the real-world case of the Delta-Northwest merger the $\Delta\delta MHHI$ was positive in the vast majority of routes. To be precise, the $\Delta\delta MHHI$ was positive in 3,360 markets, negative in 443 markets, and zero in 523 markets. The reason why the real-world case is different from the theoretical example is that in the former there was common ownership not just between the merging firms themselves, but also between the merging firms and the non-merging rivals.
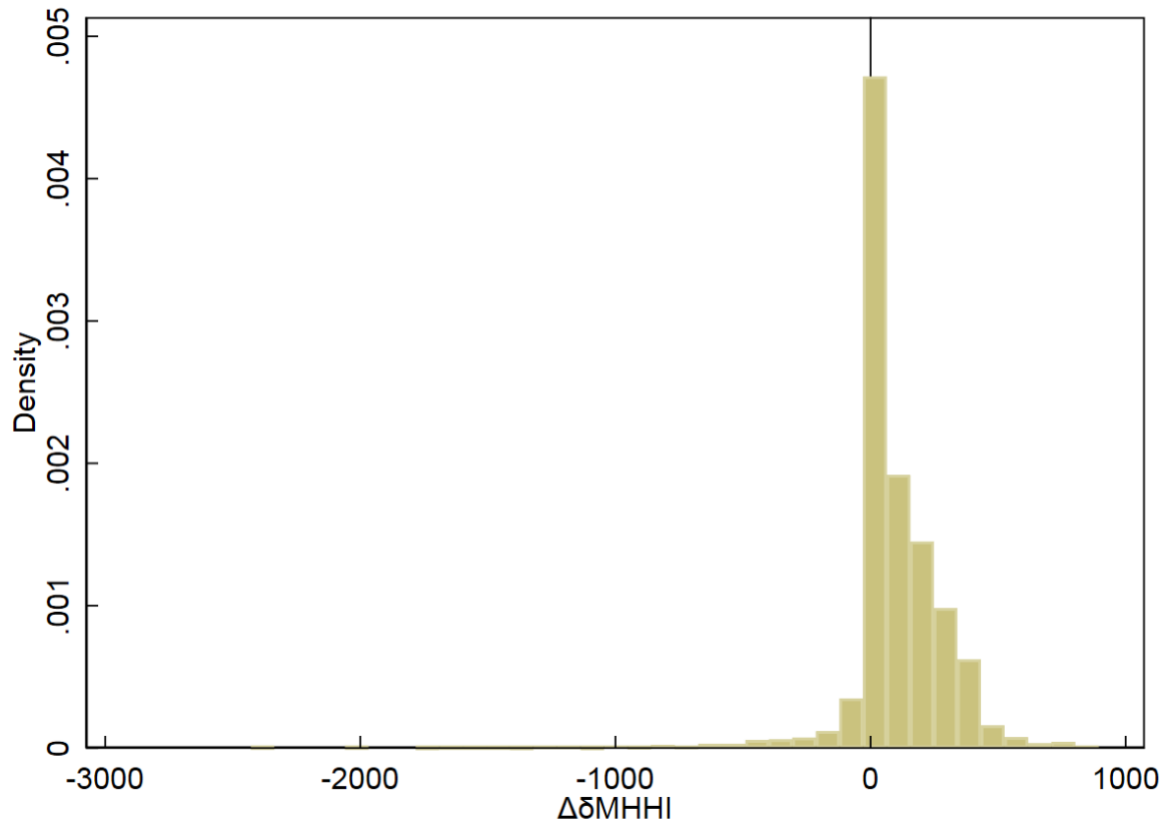
Figure 7: Histogram of $\Delta\delta MHHI$ Across Routes Induced by Delta-Northwest Merger

Because in most markets the $\Delta\delta MHHI$ is actually positive, the $\Delta MHHI$ is actually generally higher than the ΔHHI. For this reason, a much larger number of markets are above the threshold of 200 points of increase in concentration using the $\Delta MHHI$ compared to using the ΔHHI.[86] In particular, 3,668 markets have a $\Delta MHHI$ above 200, while the number of markets with a ΔHHI above 200 is 2,580. If we count the markets such that the ΔHHI is above 200 *and* the post-merger HHI is above 2500, the number of markets that satisfies the condition goes down to 2,339. Using the MHHI for the analysis yields 3,668 markets that satisfy that the $\Delta MHHI$ is above 200 and the post-merger MHHI is above 2500.

Figure 8 shows a scatter plot of the post-merger HHI and the ΔHHI across markets, highlighting in red the markets that have an HHI above 2500 and a delta above 200. Figure 9 shows a similar scatter plot but using the MHHI instead of the HHI. Although in some cases the MHHI delta is negative (while this obviously never happens for the HHI delta), the number

---

[86] US Horizontal Merger Guidelines 2010 §5.3: "Mergers resulting in *highly concentrated markets* [where the post-merger HHI is above 2500] that involve an *increase in the HHI* of more than 200 points will be presumed to be likely to enhance market power."

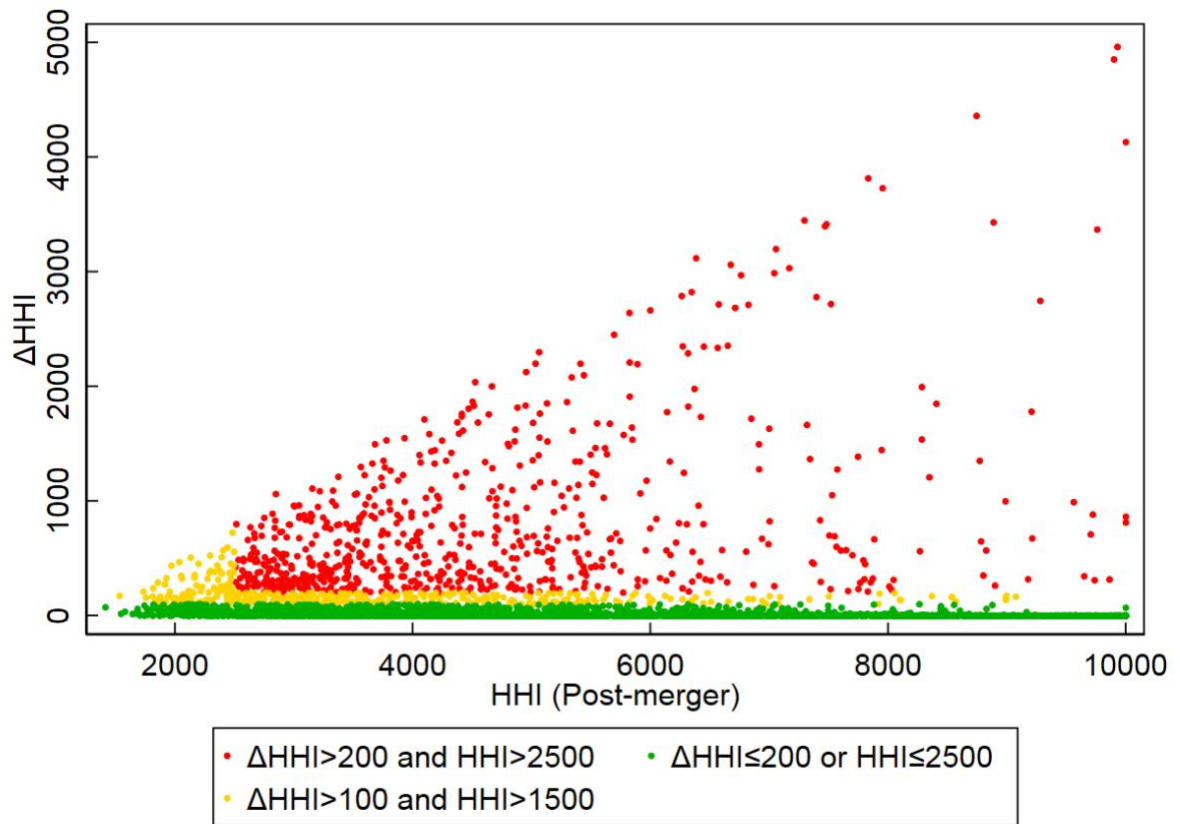of potentially problematic markets is much higher when doing the analysis taking common ownership into account.

Figure 8: Post-Merger HHI and Δ*HHI* Across Routes Induced by the Delta-Northwest Merger, Colored According to DOJ-FTC Guideline Thresholds
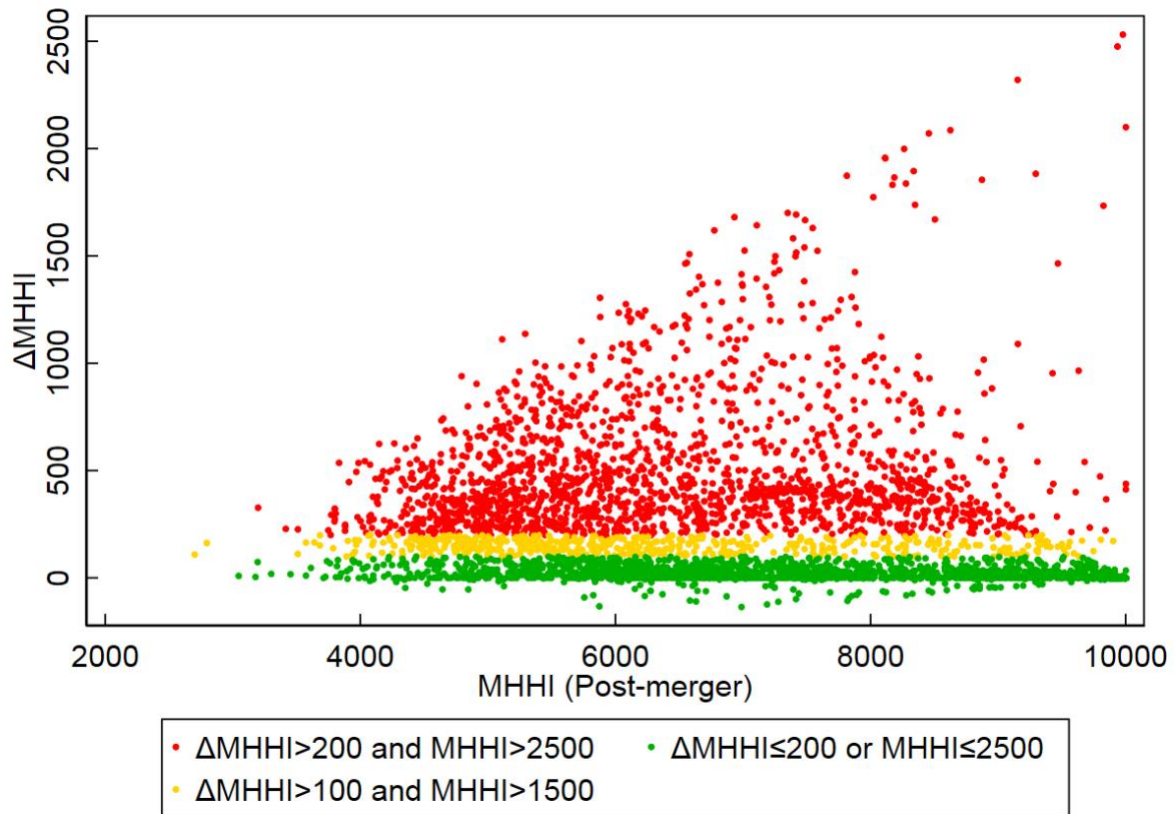
Figure 9: Post-Merger MHHI and $\Delta MHHI$ Across Routes Induced by the Delta-Northwest Merger, Colored According to DOJ-FTC Guideline Thresholds

Pricing pressure indices and the merger-induced Delta

The GUPPI is used to estimate unilateral effects in markets with differentiated products and is focused on "head-to-head competition" between the merging firms, rather than market shares.[87] Consider, for example, a firm 1 that competes with a rival firm 2 producing a differentiated product. When considering increasing its price, the firm faces a trade-off: its markup would be higher, but some of its sales would be diverted to other firms, including the rival firm 2. However, if the firms merge, the trade-off would change because the merged firm would internalize the diversion of sales to firm 2. The GUPPI scores the potential anticompetitive effects from a merger by providing a measure of the value of diverted sales. In particular, the GUPPI for firm 1 is the product of the diversion ratio D_{12} (i.e., the fraction of sales that are

---

[87] Asoni and Sarafidis (n 48) 19–20.

diverted form firm 1 to firm 2 if firm 1 marginally increases its price) from firm 1's product to firm 2's product, the percent margin of firm 2's product m_2, and the ratio of firm 2 to firm 1's prices p_2/p_1. That is:

$$GUPPI_1 = D_{12} \times m_2 \times \frac{p_2}{p_1}.$$

The intuition is simple: the value of the diverted sales to firm 2 is higher, the higher the fraction of diverted sales from firm 1's product to firm 2's product, the higher the percent margin of firm 2, and the higher the relative price of firm 2's product is.

A similar analysis can be applied to the case of partial ownership. In this case, we can use a modified GUPPI that indexes the internalization of going from no partial ownership to partial ownership, and takes into account that internalization after the change is only partial and proportional to the weight that firm 1 places on firm 2 due to the partial ownership transaction, that is, λ_{12}:

$$MGUPPI_1 = \lambda_{12} \times D_{12} \times m_2 \times \frac{p_2}{p_1}.$$

In the case of a common ownership network, in which firm 1 places a weight λ_{1j} on competitor j in its objective function the MGUPPI formula is the sum across firms of the individual MGUPPIs of firm 1 with respect to all other firms:

$$MGUPPI_1 = \sum_{j \geq 2} \lambda_{1j} \times D_{1j} \times m_j \times \frac{p_j}{p_1}.$$

If firm 1 and firm 2 merge, the change in the MGUPPI for firm 1 (or $\Delta MGUPPI_1$) measures the upward pricing pressure generated by the merger itself in a context of common ownership:

$$\Delta MGUPPI_1 = \left(1 - \lambda_{12,pre}\right) \times D_{12} \times m_2 \times \frac{p_2}{p_1} + \sum_{j > 2} (\lambda_{1j,post} - \lambda_{1j,pre}) \times D_{1j} \times m_j \times \frac{p_j}{p_1}.$$

The first term is lower than the GUPPI from the merger, which is $D_{12} \times m_2 \times \frac{p_2}{p_1}$. This reflects the common intuition that common ownership tends to make the marginal pricing pressure effect from the merger smaller because the firms are to some extent already partially owned. However, as with the MHHI analysis, the overall effect of the common ownership environment on the marginal effect from the merger is difficult to predict, because the merger also affects

the weights that firm 1 places on non-merging competitors. As before, the change in the λ weights depends on the details of the financial structure of the deal. The $\Delta MGUPPI_2$ for firm 2 is analogous:

$$\Delta MGUPPI_2 = \left(1 - \lambda_{21,pre}\right) \times D_{21} \times m_1 \times \frac{p_1}{p_2} + \sum_{j>2} \left(\lambda_{2j,post} - \lambda_{2j,pre}\right) \times D_{2j} \times m_j \times \frac{p_j}{p_2}.$$

Note that, unlike the case of no common ownership, there is also a non-zero MGUPPI delta for the non-merging rival firms, because the weight that they place on firms 1 and 2 in their objective function can change.

The MGUPPI delta (i.e., the change in the MGUPPI due to the merger) for firm i is:

$$\Delta MGUPPI_i = \sum_{j=1,2} \left(\lambda_{ij,post} - \lambda_{ij,pre}\right) \times D_{ij} \times m_j \times \frac{p_j}{p_i}.$$

Inderst and Thomas (2019) provide an example with 3 firms and a simple ownership structure in which common ownership reinforces the effect of a merger, because the merger widens the network of common ownership (i.e., a pair of firms that did not have common ownership before the merger has common ownership because of the merger).[88] In general, however, there is no simple rule for whether the common ownership environment will reinforce or mitigate the effect of a merger.

To illustrate this, we calculated the $\Delta MGUPPI$s for the Delta Air Lines-Northwest Airlines merger that we used for the HHI and MHHI analysis. For comparison, we also calculated the GUPPIs for the merger ignoring common ownership. We assumed diversion proportional to market shares, and a constant percent markup of 10%, and symmetric prices across carriers.

Figure 10(a) shows the distribution of the difference between the $\Delta MGUPPI$ and the GUPPI for Delta Air Lines. Most of the differences are positive, indicating that the pricing pressure effect of the merger is higher for most routes when taking common ownership into account. In particular, the difference is positive for 2,279 routes, zero for 6 routes, and negative for 1,371 routes. Figure 10(b) shows the distribution of the difference between the $\Delta MGUPPI$ and the

---

[88] Inderst and Thomas (n 49); Inderst and Thomas (n 9).

GUPPI for Northwest Airlines. As for Delta, the difference is positive for most routes. The difference is positive for 1,662 routes, zero for 1 route, and negative for 1,086 routes.

Figure 10(c) shows the distribution of the difference between the $\Delta MGUPPI$ and the GUPPI for all carriers except Delta and Northwest. Note that the GUPPI for all the non-merging carriers is zero, so the difference is simply the $\Delta MGUPPI$, which is not zero because under common ownership the merger changes the λ weights between the non-merging and the merging firms. Most of the $\Delta MGUPPI$s are positive for the non-merging firms as well. In particular, the $\Delta MGUPPI$ is positive in 8,528 cases, zero in 1,514 cases, and negative in 6,244 cases.
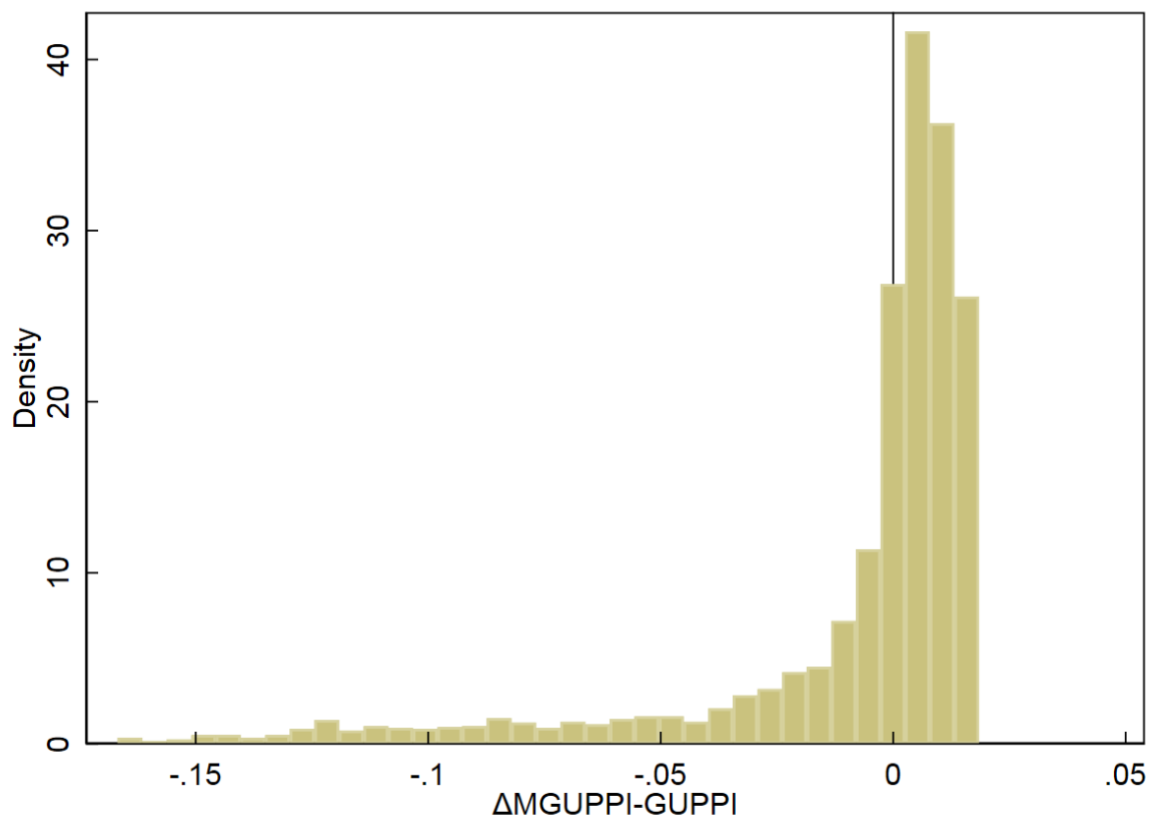

Figure 10 (a): Histogram of the $\Delta MGUPPI$ minus the GUPPI Across Routes for Delta Air Lines, Induced by the Delta-Northwest Merger
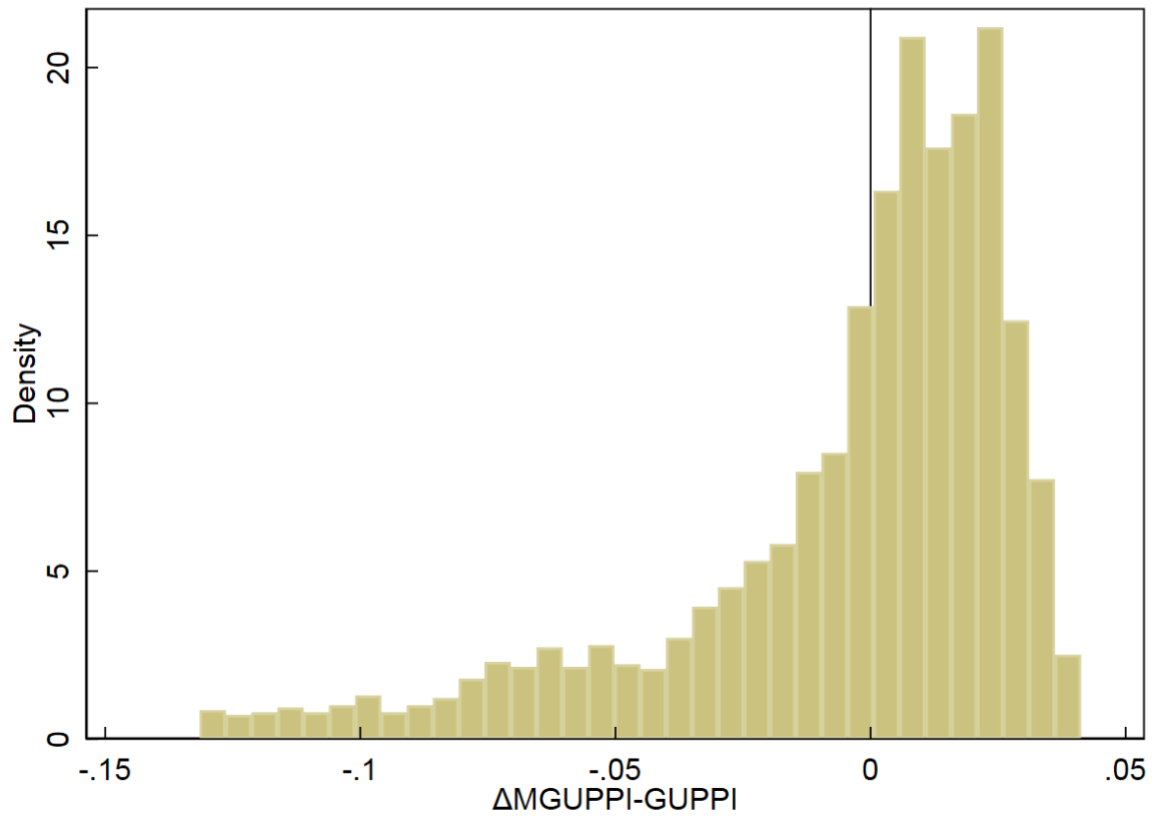
Figure 10 (b): Histogram of the ΔMGUPPI minus the GUPPI Across Routes for Northwest Airlines, Induced by the Delta-Northwest Merger
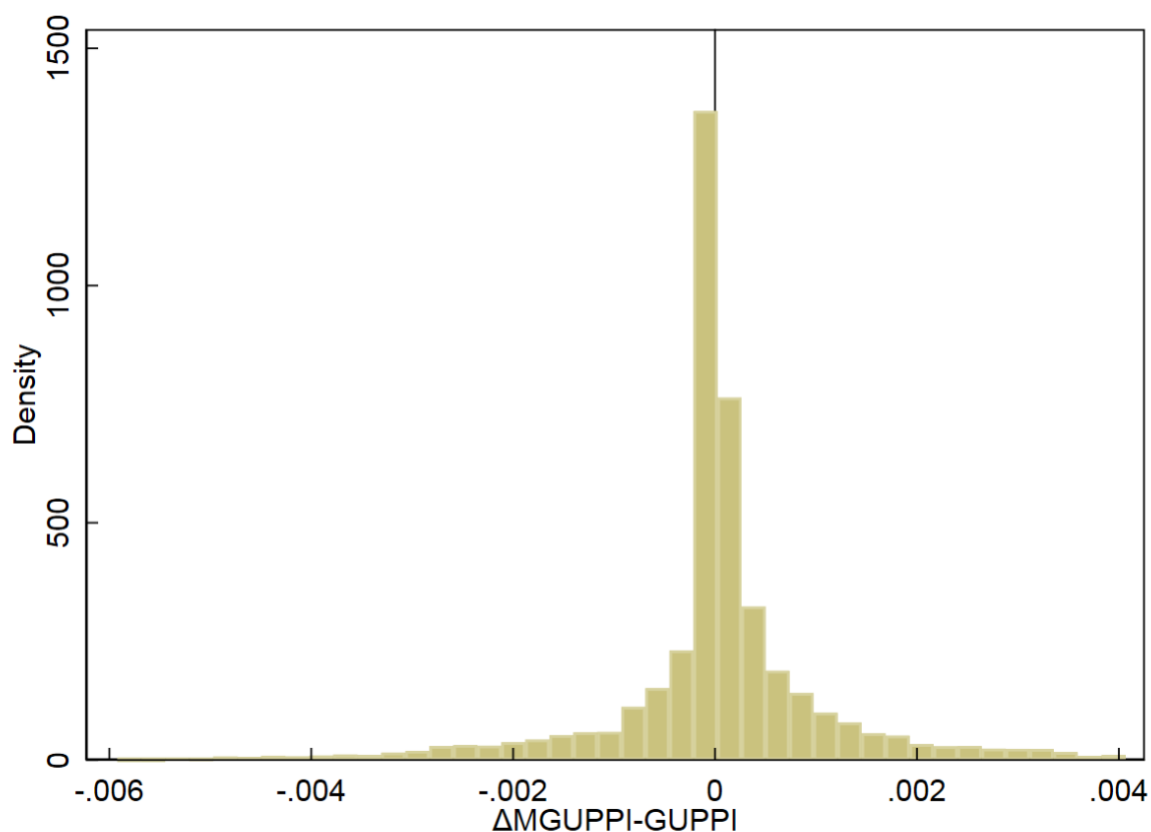
Figure 10 (c): Histogram of the $\Delta MGUPPI$ minus the GUPPI Across Routes for Non-Merging Airlines, Induced by the Delta-Northwest Merger

In summary, the GUPPI analysis can be readily extended to measure the pricing pressure generated by a merger in an environment with common ownership. As with the HHI and MHHI analysis, the competitive analysis depends in a non-trivial way on both the pre-existing network of common ownership between the merging firms and their rivals, and the details of the financial structure of the deal. The Delta-Northwest merger example illustrates how the effect of the merger can be reinforced by common ownership in some markets and mitigated in other markets. Interestingly, for this particular case, the pricing pressure from the merger is higher in most markets if one takes into account the pre-existing common ownership network. An important difference between the GUPPI analysis with common ownership relative to the no common ownership case is that the non-merging firms can have non-zero pricing pressure indices, because the change in ownership structure induced by the merger can change the weights that the non-merging firms place on the merging firms in their objective functions.

4. Efficiencies

Efficiencies that enhance the merged firm's ability and incentive to compete (e.g., cost savings, innovation synergies) and thus may counteract any negative impact on competition will also be considered during the overall assessment of a merger. Antitrust authorities will credit efficiency claims if they are "merger-specific", verifiable and substantial enough to outweigh any anticompetitive effects, and likely to be passed on to consumers.[89]

When a merger occurs in a context of common ownership, however, efficiencies may be more likely but less "merger-specific".[90] That is, efficiencies may not be the direct result of the merger. Any pre-existing positive spillovers between the commonly held companies will make it less likely that the merger creates new efficiencies. For instance, knowledge sharing, innovation or integrative efficiencies may already be partially captured and internalized by the common shareholders of the merging portfolio firms pre-merger. Besides, the internalization of the innovation spillovers provides another reason why common ownership may increase the motivation to merge in cases that it may not be profitable or efficiency creating for the merging firms as such. Thus, depending on the circumstances, "incremental" efficiencies caused by a proposed merger of commonly owned portfolio companies may be smaller. But as any "incremental" anticompetitive effects from a merger may also be smaller with pre-existing common ownership depending on the context, claimed efficiencies may be more likely to be considered of a substantial magnitude to counteract the harm. On the other hand, a merger to "effective" monopoly may not be justified on the basis of efficiencies.

Moreover, "out-of-market" efficiencies are generally not credited by antitrust enforcers as competition effects are assessed independently for each relevant market affected by the merger.[91] While such efficiencies (e.g., corporate governance or capital market benefits)[92] may be substantial in a context of common ownership, these will not be considered by antitrust

---

[89] US Horizontal Merger Guidelines 2010 §10; and EU Horizontal Merger Guidelines, paras 76-88.

[90] Merger-specificity means that "efficiencies could not be achieved without the merger [...] and could not be achieved unilaterally or through less restrictive means". See Daniel Gore and others, *The Economic Assessment of Mergers under European Competition Law* (Cambridge University Press 2013) 309.

[91] Cf US Horizontal Merger Guidelines 2010 §10, footnote 14. The US agencies, however, have some "prosecutorial discretion" to "consider efficiencies not strictly in the relevant market, but so inextricably linked with it that a partial divestiture or other remedy could not feasibly eliminate the anticompetitive effect in the relevant market without sacrificing the efficiencies in the other market(s). Inextricably linked efficiencies are most likely to make a difference when they are great and the likely anticompetitive effect in the relevant market(s) is small so the merger is likely to benefit customers overall."

[92] Jonathan B Baker, 'Overlapping Financial Investor Ownership, Market Power, and Antitrust Enforcement: My Qualified Agreement with Professor Elhauge' (2016) 129 Harvard Law Review Forum 212, 227–231.

authorities since they cannot compensate for the harm on consumers in the market where the efficiency gains do not materialize.[93]

5. Managerial entrenchment

More realistically, the effects and significance of common ownership will depend on the specific shareholder structure within each firm and the relative influence of common, diversified shareholders over corporate management.[94] Implicitly, they also depend on the absence of managerial agency costs. If management is entrenched, the impact of common ownership on firm incentives to compete will be mitigated.[95] Therefore, managerial entrenchment may be a countervailing factor to any effects from common ownership fully materializing and should also be taken into account during substantive merger review.

Azar shows that in a voting model where the objective function of the firm is determined by both the objectives of shareholders and of managers, a number of factors need to be accounted for, besides any (heterogeneous) shareholder preferences, such as: i) the within-firm concentration of shareholders, ii) the cost of shareholder dissent for managers[96], iii) how large the deterministic component of shareholder voting is. The higher any of these parameters is, reflecting the level of shareholder power and their ability or probability to discipline management, the greater the weight of shareholder objectives in the firm objective function. Also, the higher the within-firm concentration of ownership, the higher the MHHI delta. On the other hand, if managers directly own stock in their own firm or have other personal objectives (e.g., they are "empire-builders" or they wish to enjoy the "quiet life"), those will also affect the firm objective to the extent management is entrenched (agency frictions) and shareholders are more dispersed (less concentrated shareholder influence). [97]

---

[93] Menesh Patel, 'Common Ownership, Institutional Investors, and Antitrust' (2018) 82(1) Antitrust Law Journal 279, 56.

[94] For instance, the presence of a large, concentrated and atomistic shareholder may negate the practical impact of common, diversified investors within corporate governance and the anticompetitive effects of common ownership.

[95] Azar, 'The Common Ownership Trilemma' (n 83) 286–293; Posner, Scott Morton and Weyl (n 70) 686–687; Tzanaki, 'Common Ownership and Minority Shareholding at the Intersection of Competition and Corporate Law' (n 11) 16 (footnote 68).

[96] Jie (Jack) He, Jiekun Huang and Shan Zhao, 'Internalizing Governance Externalities: The Role of Institutional Cross-Ownership' (2019) 134 Journal of Financial Economics 400 (finding evidence that common ownership "positively predicts management losing a vote" and that it "incentivizes institutional investors to play a more active monitoring role").

[97] Azar, 'The Common Ownership Trilemma' (n 83) 286–293.

Counterintuitively, managerial entrenchment in this case is a reason to abide by "traditional" merger policy, disregarding common ownership. Although such agency costs are generally considered undesirable from a corporate governance perspective (e.g., potentially leading to unprofitable mergers),[98] they may be a valid and effective argument in certain cases countering the competitive implications of common ownership.

6. Remedies

Common ownership is also a relevant factor in the design and assessment of remedy proposals during merger control review. Specifically, not only the choice of remedy (type of remedy) but also its particular structure (share ownership level or governance rights limitations) will be affected by any insights on the unilateral effects of common ownership and its interaction with any merger effects. For instance, alternative forms of divestiture of partial ownership interests in a rival firm (e.g., proportional divestiture, turning voting into preferred stock, selling stock to a large independent shareholder) may have distinct consumer welfare implications.[99]

When considering structural remedies to clear a merger, the identity of the buyer and the existence and extent of common shareholding links to the merging parties and other rival firms in the market will be closely assessed. To evaluate the suitability of a purchaser, the European Commission will consider, among others, whether: i) the buyer is "independent and unconnected" to the parties; and ii) no "new competition problems" or risk of delayed implementation is created by the acquisition of the divested business by the proposed purchaser.[100] Concrete factors that have been considered when assessing the independence criterion of a proposed buyer include: 1) that the buyer is not owned or controlled by the parties or their affiliates ("cross-ownership"); 2) there are no interlocking directors; 3) the buyer and the parties do not participate in any joint venture together; 4) there are no entities where both hold a material interest; 5) any commercial links are immaterial and do not create dependency; 6) common shareholders that hold above 5% of shares in the buyer and the parties (i.e., BlackRock and Vanguard) do not have "special rights" or "control" as defined under Article 3

---

[98] Cf Whinston (n 19) 1382: "[U]sing the external effect to derive a sufficient condition for a merger to be welfare enhancing depends critically on the assumption that proposed mergers are privately profitable. To the extent that agency problems may lead managers to 'empire build' to the detriment of firm value, this assumption may be inappropriate."

[99] Duarte Brito, Luís Cabral and Helder Vasconcelos, 'Divesting Ownership in a Rival' (2014) 34 International Journal of Industrial Organization 9.

[100] Commission Notice on Remedies Acceptable under Council Regulation 139/2004 and under Council Regulation 802/2004 [2008] OJ C 267/01, para 48.

of the EU Merger Regulation.[101] In addition, in order to maintain the structural effect of a remedy, the merged parties have to commit not to subsequently acquire influence over the divested business ("no re-acquisition of material influence") for a period of 10 years.[102]

It is thus interesting to note that although common ownership is an "element of context" both during the substantive assessment and at the remedy stage, the presence of common shareholders does not, as such, disqualify a proposed buyer from being suitable.[103] The rationale offered for this stance is that a structural remedy only aims to maintain the *status quo ante*. In the recent *Bayer/ Monsanto* merger, the Commission suggested that the remedy was intended to replicate the role of one of the merging parties in the market absent the transaction, which would also have shareholders in common with some of its competitors, and that the number of independent competitors would not be reduced in this concentrated sector. In light of these considerations, the positive results of the market test, the absence of competitive overlaps and its commercial complementarity to the divested business, the buyer was found suitable albeit commonly owned.[104]

In hindsight, this approach should be no surprise. For instance, a "zero-delta" approach has been previously employed in the design of structural remedies (i.e., no change in the HHI) to ensure that no additional concerns are created by the remedies themselves and that the resulting market structure does not significantly impede effective competition.[105] Besides, the competitive impact of the common shareholding structure after the merger has been taken into account, together with other factors, for the purposes of designing the final remedy accepted,[106] while the MHHI delta has been employed to calculate changes in concentration before deciding a divestment down to 5% of a pre-existing majority stake.[107]

---

[101] Case M.8253, *BD/Bard*, Commission decision of 12 December 2017, paras 9-12; Case M.9196, *Marsh & McLennan/Jardine Lloyd Thompson Group*, Commission decision of 20 May 2019, paras 8-12.

[102] Case M.9196, *Marsh & McLennan/Jardine Lloyd Thompson Group*, Commission decision of 22 March 2019, commitments clause 4; Remedies Notice (n 100), para 43.

[103] Case M.8084 *Bayer/Monsanto*, Commission decision of 21 March 2018, para 3303. Of course, it is conceivable and plausible that under certain circumstances a case might arise in which common ownership may prevent a buyer from qualifying as "suitable" and "independent", but this has not come up in decisional practice thus far.

[104] Ibid, paras 3289-3309.

[105] Kalpana Tyagi, *Promoting Competition in Innovation Through Merger Control in the ICT Sector: A Comparative and Interdisciplinary Study* (Springer 2019) 177. See e.g., Case COMP/M.1715, *Alcan/Pechiney*, withdrawn (14 March 2000).

[106] Case M.6576, *Munksjö/Ahlstrom*, Commission decision of 24 May 2013, paras 7, 766 and 798.

[107] Case COMP/M.2283, *Schneider/Legrand*, Commission decision of 30 January 2002, para 30.

To the extent that common shareholders may induce or facilitate "knowledge sharing" among their commonly held firms,[108] then behavioral remedies may also be considered by competition authorities when reviewing a merger among portfolio firms.

7. Concluding remarks

Common ownership fundamentally upsets the well-settled merger enforcement ecosystem. Not only it challenges basic principles informing merger policy such as the presumed profitability of mergers for the merging firms and the merger-specificity of potential efficiencies but also it works against implementing tools and presumptions in merger practice such as concentration indices for screening out unproblematic from potentially harmful mergers. In a nutshell, pre-existing common ownership affects the analysis and quantification of unilateral effects arising out of mergers among commonly held portfolio companies in an oligopolistic industry. The incremental effect of a merger taking place in an environment of common ownership may be either smaller or larger by comparison to a counterfactual with no common ownership.

The sign and size of the merger effect will largely depend on the relative post-merger stakes of the common shareholders in the merging firms vis-à-vis any stakes in non-merging rivals in the same industry as well as on the specific financial structure of the merger deal (e.g., cash or share exchange transaction). On the one hand, assuming full common ownership implies "zero" merger effects as the merger will have no effect on the market structure and performance given that the industry will already operate as an "effective" monopoly. On the other hand, potential countervailing factors such as managerial entrenchment or potential inter-industry effects may point to the opposite direction suggesting that the anticompetitive effects of within-industry common ownership may be mitigated, although not necessarily fully eliminated. Under these conditions, mergers would have anticompetitive effects even if there was pre-existing full common ownership.

These insights suggest that merger enforcement will need to shift towards more fact-specific analysis and consequently become more complex. Essentially, many of the theoretical factors determining the significance and implications of common ownership for merger policy and enforcement are subject to empirical inquiry based on the facts of the specific case under review and ongoing scholarly research. For this reason, antitrust authorities will need to develop

---

[108] Rock and Rubinfeld (n 16); Leonard Kostovetsky and Alberto Manconi, 'Common Institutional Ownership and Diffusion of Innovation' [2020] Working Paper <https://papers.ssrn.com/abstract=2896372>.

guidelines to inform businesses and investors as to how merger control enforcement will adapt and proceed when interacting with common ownership in particular cases and circumstances.