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EFFICIENCIES IN MERGER ANALYSIS

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Efficiencies in Merger Analysis

Louis Kaplow[*]

Abstract

The supposed ubiquity of potential efficiencies is understood to justify permitting most horizontal mergers despite their tendency to raise prices. Yet efficiencies are said to be rarely decisive in actual merger decision-making. Moreover, the economic analysis of merger efficiencies lags far behind that of anticompetitive effects. This article addresses this analytical gap, drawing attention to the merger specificity of both efficiencies and anticompetitive effects, the teachings of neglected literature such as that on the theory of the firm, and the relevance of vertical efficiencies to horizontal mergers. The analysis is applied to economies of scale, economies of scope, and the sharing of assets between competitors. In addition, a focus on the long-run effects of merger policy shifts the debate on consumer versus total welfare (and regarding pass-through), alters the relevance of entry, and draws attention to endogenous asymmetries across firms and differences in the degree of competition across sectors of the economy. Finally, efficiencies are situated in a merger assessment framework, emphasizing how basic prescriptions of decision analysis conflict with official protocols for merger decision-making.

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Introduction

Efficiencies in merger analysis are an enigma. The prospect of merger efficiencies implicitly justifies permitting most horizontal mergers despite their tendency to raise prices. Yet it is rather murky just what those efficiencies are, relevant literature bearing most directly on merger specificity is not drawn upon, and pertinent expertise is not typically consulted. Moreover, what matters for the overall well-being of citizens is the long-run health of competition, yet analysis focuses on the short term, a particular problem with efficiencies that typically take time to materialize. Long-run analysis recasts and sometimes reverses much analysis that bears on efficiencies. Finally, official protocols regarding the proper conduct of efficiency analysis violate core maxims of rational decision-making, yet most dimensions of this discrepancy have escaped attention.

This article raises many questions, answers them as well as can be done given the present state of knowledge, and identifies areas for future research and potential reform, particularly of agency practice. It proceeds in three parts, each addressing its own set of questions.

Part I analyzes the concept of merger specificity, which involves an assessment of which sorts of efficiencies are deemed to count in the first place. The standard inquiry asks whether a proffered efficiency can be achieved short of merger, often by some form of contract. But doesn't this presume that there is a fundamental difference between activities governed by contracts and what goes on inside of firms? And why does efficiency analysis ignore literature addressing this central question, such as that on the "theory of the firm," associated with a series of Nobel Prizes? Why have authors in that literature, including those with an interest in competition policy (such as Oliver Williamson), failed to make this application themselves? Does analysis and evidence regarding vertical efficiencies inform the analysis of horizontal mergers, and how so? On another note, why do we ask only whether such alternatives to merger can achieve proffered efficiencies and not also whether, in the process, they also cause anticompetitive effects (perhaps the same ones the merger would produce)? Finally, are industrial organization economists who specialize in demand estimation and merger simulation, along with lawyers, best qualified to address these questions in a merger investigation or in court?

Part II addresses efficiencies from a long-run perspective. After all, doesn't overall well-being depend primarily on the long-run effects of competition policy on the economy? And aren't long-run effects often the opposite of short-run consequences? (Consider any investment that takes time to yield a return.) How can we make sense of the significant debate about whether total welfare (consumer plus producer surplus) or just consumer welfare should guide merger policy when, in long-run equilibrium, the two tend to coincide (because, even with imperfect competition, pure profits, properly understood, are zero)? Relatedly, why is pass-through analysis, with its focus on variable- versus fixed-cost efficiencies, deemed important when, in the long run, all costs are variable? Why is the likelihood of merger-induced entry regarded to favor permissiveness when entry is often socially excessive under imperfect competition? And how should merger analysis deal with the fact that dynamic concerns within industries and across sectors are often important and may reverse which decision is optimal?

Part III situates the analysis of merger efficiencies in an overall framework of optimal information collection and decision-making. How can the analysis of anticompetitive effects and merger efficiencies be sequential and separated when the information is often intertwined, the individual rationality constraint for parties' merger decisions combines the two, and it is

impossible to form a likelihood ratio (which indicates how various information updates prior probabilities) without a denominator? Can it make sense to first collect information on anticompetitive effects, deferring efficiencies, when these categories are not distinct, each informs the other, and information with a high diagnosticity to cost ratio often concerns efficiencies (particularly in light of diminishing returns relating to information on anticompetitive effects)? How can it be that most horizontal mergers are not challenged because of concerns for efficiencies, yet it is said that efficiencies rarely if ever decide particular cases? Is it plausible that the joint distribution of anticompetitive effects and efficiencies is such that it almost never happens that both are at levels anywhere near each other? Regarding the so-called efficiency credit—wherein mergers are allowed unless anticompetitive effects demonstrably exceed this allowance—does it make sense to set it so high that defendants' efficiencies seem never to exceed it? And not to allow the government to show that actual efficiencies are significantly lower, thus easing its burden on anticompetitive effects? Do agencies and courts actually follow official protocols that deviate so substantially from common sense?

These and other questions are asked throughout. In some instances, answers are developed, filling in important gaps and sometimes revising conventional wisdom. In other cases, responses are more sketchy in light of limits to existing knowledge. And some findings are disturbing. The premise of this investigation is that we should ask these questions regardless, and follow the resulting analysis wherever it may lead. Moreover, any proxies, screens, and shortcuts should be derived from our best analysis rather than posited a priori.

As a final note, in these respects and others the reader should bear in mind that this article consists entirely of economic and policy analysis, setting aside the state of existing law in various jurisdictions and what if any legal reforms may be appropriate. Relatedly, no position is taken regarding whether a more thorough analysis of merger efficiencies would result in more or less aggressive merger enforcement, a question that cannot be addressed without attention to empirical evidence that is not reviewed here. Instead, the focus throughout is on how best to conduct merger analysis, which should enable agencies and courts to better identify which proposed mergers are most harmful and which are instead benign or beneficial.

I. Efficiencies and Merger Specificity

This Part analyzes the substance of merger efficiencies: what they are and, closely related, how they may be created by a merger under consideration. The requirement that efficiencies be specific to the proposed merger is intuitive and uncontroversial.[1] If proffered efficiencies are to justify an otherwise anticompetitive merger—whether because they will be sufficiently passed on to consumers to overturn the anticompetitive effect or because they are otherwise sufficient to outweigh it[2]—it must be that the merger is necessary to achieve them. If not, we should be able to have our cake and eat it too: prohibiting the merger and thus avoiding the anticompetitive effect yet leaving the parties free to achieve the efficiencies outside the merger.

Applying this simple logic is easier said than done. It requires understanding why and

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[1]*See, e.g.*, U.S. Dep't of Justice & Fed. Trade Comm'n, Horizontal Merger Guidelines 30 (2010) [hereinafter U.S. Merger Guidelines]; Guidelines on the Assessment of Horizontal Mergers Under the Council Regulation on the Control of Concentrations Between Undertakings, 2004 O.J. (C 31) 5, ¶ 85 [hereinafter EU Merger Guidelines].

[2]*See infra* Section II.A.

when a horizontal merger enables two firms to achieve efficiencies (or anything else) that cannot be achieved otherwise, which often means by some contractual alternative. This general question has been the subject of a number of literatures—including on the theory of the firm, for which multiple Nobel Prizes have been awarded—that have not been incorporated in merger analysis. A partial explanation is that these literatures pertain primarily to vertical efficiencies, which may seem to be inapplicable to horizontal mergers.

At its core, it is useful to view the question of merger specificity as addressing the nexus between the anticompetitive effects and efficiencies under examination. Even in the simplest case in which it is contemplated that economies of scale can be achieved by internal growth, that process may entail market concentration and concomitant anticompetitive effects similar to those arising from a merger. Inquiries into merger specificity often instead contemplate contractual alternatives, yet anticompetitive effects can also arise from contracts and may result from those most likely to achieve the efficiencies. Accordingly, we need to know the extent to which alternatives to merger entail some of its anticompetitive effects along with its efficiencies.

Stepping back, the fundamental distinction between mergers and contracts, which standard antitrust formulations take for granted, is conceptually murky. It can also be obscure in practice, and the ordinary suppositions are sometimes reversed: contracts between distinct firms sometimes impose substantial hierarchy and may otherwise align firms' incentives, whereas the internal organization of a firm may be highly decentralized with negligible incentive alignment between business units. Moreover, along any single dimension there may be a dichotomy (such as when one or another party retains control rights in certain states of the world) or a continuum (such as with profit shares that can take on any value). So, even when contemplated differences exist in the presumed direction, there may be sharp distinctions or shades of gray, which in turn may be relevant to the assessment of alternatives to merger.

Section A begins by developing these ideas abstractly, sometimes making explicit the intuitions that underlie existing understanding but often requiring substantial amendment to current thinking. Section B sketches some applications, first casting new light on the merger specificity of scale economies and then considering economies of scope and the sharing of assets between competitors. Section C addresses what expertise is needed to assess merger efficiencies.

A. Analysis

This Section begins by explaining how the nexus between efficiencies and anticompetitive effects lies at the center of inquiries into merger specificity. Then it considers how the substance of the pertinent analysis is complexified and partly illuminated by literature relating to the theory of the firm. Finally, it explains how most relevant sources of efficiencies (in particular, what are often referred to as synergies) involve complements between firms' activities and assets and hence are analogous to or directly involve vertical relationships even when the merger under consideration is horizontal.

1. Nexus Between Efficiencies and Anticompetitive Effects

At the core of the merger-specificity requirement is the nexus between the efficiencies generated by a merger and the merger's anticompetitive effects, although the requirement is not usually put this way. If efficiencies and anticompetitive effects can be separated, we usually can

obtain the former without suffering the latter, but if they are inseparable, we face an all or nothing choice, which favors allowing the merger if and only if the efficiencies dominate.[3] In elaborating this idea, it is helpful to consider some variations, wherein it will be assumed for simplicity that the merger under examination involves some set of distinct activities over which the efficiencies and anticompetitive effects may be distributed with different intensities.

First, assume that the merger's efficiencies and anticompetitive effects are each spread uniformly. In that case, the merger should be blocked if the anticompetitive effects are greater and allowed if the efficiencies dominate. There is, by assumption, no way to decompose the merger so as to generate different ratios for different components, which might make it desirable to treat them differently.

Assume next that the efficiencies are concentrated on some components whereas the anticompetitive effects are concentrated on others. Then we can permit combination only with respect to the components with the efficiencies. Perhaps there are scale economies in payroll: this function might then be outsourced by both firms to a common provider while prohibiting the rest of the merger, which is taken to generate anticompetitive effects but no substantial efficiencies. Or two merging hospitals may demonstrate significant economies with respect to a single department, in which case a joint venture limited to that function might be permitted, again prohibiting the rest of the merger.

Now consider the reverse scenario, which is also familiar. Here, the efficiencies might be spread uniformly over the merged entity's activities whereas the anticompetitive effects are concentrated. In that case, the merger could be permitted subject to conditions, requiring spinoffs in areas of competitive overlap. Examples include retail mergers with only selective geographic overlap or a merger of two pharmaceutical companies that compete in only a modest subset of product lines or research fields.

Note importantly that it is also possible that there is substantial modularity but with both efficiencies and anticompetitive effects concentrated in the same components. In the retail example, the areas of geographic overlap may themselves be the source of wholesaling or other supply-chain efficiencies, or in the pharmaceutical example, perhaps both the efficiencies and the anticompetitive effects arise precisely in the overlapping lines of research.

The foregoing illustrations assume modularity: when a component with the efficiencies or one with anticompetitive effects is severed from the rest of the combined firms' operations, there is assumed to be no significant efficiency loss from the separation itself. Modularity in this sense means that there are no (significant) synergies across the pertinent components.[4] This point will be elaborated below.

Returning to the examples (and without regard to modularity), we can consider some rather different situations in which both efficiencies and anticompetitive effects are spread

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[3]Put yet another way, the merger specificity inquiry can be taken to ask whether the efficiencies are specific to that part of the merger that produces the anticompetitive effects. Only then are we forced to tolerate the anticompetitive effects if we wish to obtain the efficiencies. *Cf.* U.S. Merger Guidelines, *supra* note 1, at 30 n.14 (considering the possibility that efficiencies are "inextricably linked" across markets).

[4]When there is some synergy loss from breaking up components, one needs to consider various combinations to see which generates the greatest excess of efficiencies over anticompetitive effects. If no combination generates a positive net, the merger should be blocked. One may also be concerned with firms' rationality constraint—whether the permitted combination is profitable—but this will be true when efficiencies are positive and anticompetitive effects are nonnegative. The constraint would bind if, say, the socially best configuration involves positive efficiencies but a sufficient improvement in competition (and thus reduction in profits) to render the package as a whole unprofitable.

throughout the merging firms' activities or a substantial portion thereof. Here, we might also contemplate allowing only a partial merger or—as will be developed in the next Section—some regulation of alternative contractual arrangements such as joint ventures.

To suggest some elements of this broader and more difficult analysis, suppose now that there is a continuum from complete separation to full integration. Moreover, imagine that it lies on a single dimension, such as the degree to which the incentives of two decision-makers are aligned. In a single, merged entity, two division heads might be compensated by identical profit shares in their combined operations, and under a contractual alternative, similar profit-sharing between two separate entities may be employed. Suppose further that higher incentive alignment both improves efficiencies and worsens anticompetitive effects. This case will often be plausible: Incentive alignment can heighten efficiencies by mitigating hold-up problems and free riding. Likewise, alignment makes the two decision-makers softer competitors by internalizing business-stealing externalities that otherwise arise between them.

If efficiencies and anticompetitive effects both rise at the same rate with incentive alignment, then it will be optimal to permit full alignment (allowing the merger) when efficiencies are greater but to allow no alignment (blocking the merger and also contractual alternatives that align incentives) when anticompetitive effects are greater. If providing modest incentive alignment increases efficiencies greatly and anticompetitive effects modestly,[5] then it may be optimal to permit only partial alignment, such as by prohibiting the merger and also regulating (capping) the degree of alignment that the parties are permitted to achieve by contract.[6] If, instead, anticompetitive effects increase more quickly at first, then no alignment should be permitted—that is, unless efficiencies ultimately overtake anticompetitive effects, in which case complete alignment (such as by a full merger) may be optimal.[7]

In reflecting on this depiction, keep in mind that direct, contemporaneous incentive alignment is not the only way to address incentive problems, which might be mitigated through contractual specifications, inspections, and withholding future business. Anticompetitive coordination can, of course, also arise through means other than commonality of immediate incentives. Therefore, in considering the extent to which greater incentive alignment augments both efficiencies and anticompetitive effects, it is necessary to consider the degree to which similar results may emerge through other channels. Only the deltas from the appropriate benchmark should be considered in asking whether greater incentive alignment favors or

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[5]In general, the benefits of providing incentives are subject to diminishing returns (because modest incentives tend to induce behavior that has very low costs to the agent whereas incentives that approach full internalization induce efficient yet much costlier behavior) whereas anticompetitive effects produce increasing marginal social loss under a total surplus test (but not under a consumer welfare standard). *See infra* note 85.

[6]Because this is a conceptual rather than a legal doctrinal discussion, it is assumed throughout, for simplicity, that contractual alternatives, which involve agreements between competitors, are subject to scrutiny under a rule that parallels that applicable to horizontal mergers in disallowing the arrangement if and only if anticompetitive effects exceed efficiencies (counted in a similar manner with regard to the welfare standard). Thus ignored are respects in which, for example, Sherman Act Section 1 in the United States or TFEU Article 101 in the European Union may differ from those jurisdictions' merger regulations.

[7]Under some theories of the firm, considered later in this Section, choices may be discrete in a sharp sense (such as when a control right is assigned to one or another party, under the property rights theory) or through substantial nonlinearities (such as when, under some of Oliver Williamson's arguments, different dimensions tend to be complementary, suggesting the private optimality of either high or low integration). The analysis of the continuum case in the text will, nevertheless, be largely applicable because we can still ask, for any admissible point on the continuum, what is the net difference between efficiencies and anticompetitive effects and then decide what to permit accordingly.

opposes a merger.

The possibilities sketched here are meant to be suggestive. The central lesson is that it is necessary to determine the nexus between efficiencies and anticompetitive effects. Analysis of that relationship should be at the core of the inquiry into merger specificity. The challenge is to determine, in a given merger, what that nexus actually is, the subject to which we now turn.

2. Theory of the Firm: Some Challenges

To begin the discussion, consider just what is meant by a firm and how this contrasts with various contractual alternatives one can imagine. After all, many inquiries into merger specificity ask whether there is a practical contractual alternative to the merger—one that, as per the preceding Subsection, achieves much of the proffered efficiencies without causing most of the merger's anticompetitive effects. This formulation presupposes that there is some important, systematic difference between contractual arrangements and mergers. Yet prominent literature—associated with multiple Nobel Prizes going back to the first half of the twentieth century—questions the coherence of this distinction and addresses the puzzle of how it is that combining various "contracts" into a "firm" solves underlying economic incentive problems.[8]

A powerful hint at these difficulties is offered by Michael Jensen and William Meckling's famous statement that a firm is best understood as a nexus of contracts,[9] along with similarly powerful proclamations by others.[10] Taking this view literally, it seems impossible for a firm to be able to do anything whatsoever, socially good or bad, that cannot be achieved by contract.

Ever since Ronald Coase's 1937 article, *The Nature of the Firm*,[11] economists have been

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[8]For example, the recent award to Oliver Hart and Bengt Holmström is in significant part for work in this domain. *See* PRIZE COMM. OF THE ROYAL SWEDISH ACAD. OF SCI., CONTRACT THEORY: SCIENTIFIC BACKGROUND ON THE SVERIGES RIKSBANK PRIZE IN ECONOMIC SCIENCES IN MEMORY OF ALFRED NOBEL 2016 (2016); *see also* Oliver Hart, *Thinking about the Firm: A Review of Daniel Spulber's* The Theory of the Firm, 49 J. ECON. LIT. 101, 102 (2011) ("One problem any economist faces in analyzing the firm is one of definition. To pose a question that is often asked but rarely answered (at least satisfactorily)—what is a firm? Is a firm circumscribed by its legal status or by its economic activities? This question is quite important if, for example, one wishes to understand the motives for mergers."). Other pertinent awards include Ronald Coase and Oliver Williamson, as well as some of the work by Herbert Simon.

> The private corporation or firm is simply one form of *legal fiction which serves as a nexus for contracting relationships . . . .* While this definition of the firm has little substantive content, emphasizing the essential contractual nature of firms and other organizations focuses attention on a crucial set of questions—why particular sets of contractual relations arise for various types of organizations, what the consequences of these contractual relations are, and how they are affected by changes exogenous to the organization. Viewed this way, it makes little or no sense to try to distinguish those things which are "inside" the firm (or any other organization) from those things that are "outside" of it. There is in a very real sense only a multitude of complex relationships (i.e., contracts) between the legal fiction (the firm) and the owners of labor, material and capital inputs and the consumers of output.

Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. FIN. ECON. 305, 311 (1976).

[10]*See, e.g.*, Armen A. Alchian & Harold Demsetz, *Production, Information Costs, and Economic Organization*, 62 AM. ECON. REV. 777, 777 (1972) ("It is common to see the firm characterized by the power to settle disputes by fiat, by authority, or by disciplinary action superior to that available in the conventional market. This is a delusion."); Scott E. Masten, *A Legal Basis for the Firm*, 4 J.L. ECON. & ORG. 181, 181 (1988) ("[T]he word *firm* is merely descriptive, a collective noun denoting a particular cluster of otherwise ordinary contractual relationships.").

[11]R.H. Coase, *The Nature of the Firm*, 4 ECONOMICA 386 (1937).

aware of a number of challenges for the theory of the firm. On one hand, why are any firms necessary at all in light of the fact that, in principle, anything can be achieved by contract? Can't we just prohibit all mergers and break up even ten-person firms? On the other hand, if there are limits to contracts that bringing arrangements into a single firm solves, why (aside from regulatory constraints) doesn't the economy consist of one large firm, eliminating all incentive problems that interfere with profit maximization? To the extent that some limitations on cooperation are privately efficient, why can't this single firm decentralize its operations as it wishes, engaging in selective intervention from the top of the internal hierarchy when but only when that would be helpful?

Various theories have been developed. Herbert Simon studied organizations and contracts with employees, providing inspiration for the field of organizational economics. Williamson emphasized many of these challenges and suggested some answers. Oliver Hart, Bengt Holmström, and others have developed theories of the firm focusing on the control of assets and addressed related contracting questions. Scholars of management practices and other subjects have also investigated relevant issues.

Before proceeding to the substance, a number of observations are in order. First, scholarship on competition policy, enforcement agency guidelines, and court opinions have made virtually no reference to any of these bodies of work that seem most relevant to the question of merger specificity, concerning in particular the choice between the use of contractual arrangements between firms and bringing activities together within a single firm.

Conversely, these literatures have not attempted to say much about horizontal merger analysis. This point is remarkable regarding the work of Williamson, a prominent player in both domains. On one hand, he wrote the seminal article on the efficiency tradeoff in horizontal mergers,[12] and his work on the theory of the firm was partly motivated by his interest in antitrust policy, where he offered numerous applications.[13] On the other hand, he has not elaborated how his substantial body of work applies to horizontal merger efficiencies.[14] Other scholars, even when applying these literatures to antitrust, likewise say virtually nothing about the analysis of efficiencies in horizontal mergers.[15]

In addition to raising central challenges regarding what can be achieved in a firm versus

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[12]*See* Oliver E. Williamson, *Economies as an Antitrust Defense: The Welfare Tradeoffs*, 58 AM. ECON. REV. 18 (1968). Interestingly, that article referred to the choice between contracting and bringing activities inside the firm. *See id.* at 32 & n.12.

[13]*See, e.g.*, OLIVER E. WILLIAMSON, THE ECONOMIC INSTITUTIONS OF CAPITALISM: FIRMS, MARKETS, RELATIONAL CONTRACTING, ch. 14 (1985); Oliver E. Williamson, *The Economics of Antitrust: Transaction Cost Considerations*, 122 U. PA. L. REV. 1439 (1974).

[14]For example, his article revisiting the efficiencies defense, written subsequent to his 1975 book *Markets and Hierarchies*, likewise gives little attention to the subject: it contains a brief section on the transaction cost approach that emphasizes its application to vertical (or conglomerate) mergers. *See* Oliver E. Williamson, *Economies as an Antitrust Defense Revisited*, 125 U. PA. L. REV. 699, 723–26 (1977); *see also* WILLIAMSON, *supra* note 13, at 365–70 (examining antitrust enforcement in penultimate chapter, devoting five pages to merger policy, applauding the increasingly positive attitude toward efficiencies, but failing to indicate how his framework may aid in analyzing them).

[15]*See, e.g.*, Paul L. Joskow, *The Role of Transaction Cost Economics in Antitrust and Public Utility Regulatory Policies*, 7 J.L. ECON. & ORG. 53 (1991) (focusing on vertical issues); *see id.* at 65–66 (devoting just over a page to efficiencies in horizontal mergers, much merely reciting the U.S. Merger Guidelines, and closing with the conclusory statement: "Transaction cost economics teaches us that such a bias [toward requiring definitive proof of merger specificity, reflecting a view that market transactions can almost always replace internal organization] is misplaced."); Benjamin Klein & Andres V. Lerner, *The Firm in Economics and Antitrust Law*, *in* 1 ABA SECTION OF ANTITRUST LAW, ISSUES IN COMPETITION LAW AND POLICY 249 (Wayne Dale Collins ed., 2008).

by contract, some of the relevant literature raises another serious problem for the traditional understanding of these issues. Notably, it is ordinarily supposed that a key difference between organizing activities within a firm and through contracts between firms is the centrality in the former of hierarchical rather than decentralized decision-making. Yet in practice this depiction is sometimes violated, in both directions.

First and more familiar, firms are often decentralized. A division or subsidiary may be run as an independent profit center, with compensation of the top manager determined accordingly. Separate units may engage in arms-length bargaining to determine transfer prices or may choose to deal instead with outsiders.[16] In other respects as well, separated parts of a firm may act differently on that account.[17] One scholar has even questioned whether, to the extent that such independence is necessary to provide the incentives to cost minimize, a horizontal merger of competitors would generate the upward pricing pressure that standard theory assumes.[18] In short, not only is the inside of a firm not amenable to forms of magic unavailable via contract (on which more below), but also incentive alignment and hierarchy are not ubiquitous within firms.

From the other side, some scholars interested in contractual relationships—particularly involving supply chains—have observed that many contracts between firms impose substantial hierarchy. Indeed, such may be a central feature of these contractual arrangements. For example, a firm that distributes through independently owned franchises may impose detailed restrictions on franchisee behavior, may retain strong termination rights,[19] and may employ revenue or profit sharing that aligns incentives (in both directions, in light of two-sided moral hazard). Moreover, if some outlets are company owned, those managers may have as much or as little discretion as their franchisee peers and may be subject to similar incentive schemes.[20]

The domain of contractual hierarchy is, however, even broader. A firm may impose detailed restrictions on suppliers, embed its own employees in supplier firms, include hierarchical dispute resolution in the contract (not relying on courts), and align incentives in a variety of ways (in both directions, again to account for two-sided moral hazard). Actual practice may involve something close to command regarding suppliers' design of products,

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[16]*See* Bengt Holmström & Jean Tirole, *Transfer Pricing and Organizational Form*, 7 J.L. ECON. & ORG. 201 (1991). Due to impurities in this transfer pricing process, some suggest that decentralized units may actually prefer to deal with third parties in the external marketplace rather than with other units of the same firm. Empirically, many vertically integrated enterprises rarely engage in internal shipments (that is, of physical products by contrast to intangible inputs). *See* Enghin Atalay, Ali Hortaçsu & Chad Syverson, *Vertical Integration and Input Flows*, 104 AM. ECON. REV. 1120 (2014). However, when they do, the preference for internal trade seems to be high. *See* Enghin Atalay, Ali Hortaçsu, Mary Jialin Li & Chad Syverson, *How Wide Is the Firm Border?*, 134 Q.J. ECON. 1845 (2019).

[17]*See, e.g.*, Catherine Magelssen, *Allocation of Property Rights and Technological Innovation Within Firms*, 41 STRATEGIC MGMT. J. 758 (2020) (finding that tax-motivated allocations of technology ownership rights across subsidiaries affect their innovation activity).

[18]*See* Abraham L. Wickelgren, *Managerial Incentives and the Price Effects of Mergers*, 53 J. INDUS. ECON. 327 (2005). One would, of course, be wary about permitting a merger on the supposition that the merged entity would be operated with substantial independence because that may not occur, would be hard to be police as a condition, and might change in the future.

[19]Termination rights might be limited by state regulation, which is distinct from inherent limitations due to the nature of contracts.

[20]*See, e.g.*, Francine Lafontaine, *Agency Theory and Franchising: Some Empirical Results*, 23 RAND J. ECON. 263 (1992); G. Frank Mathewson & Ralph A. Winter, *The Economics of Franchise Contracts*, 28 J.L. & ECON. 503 (1985); Paul H. Rubin, *The Theory of the Firm and the Structure of the Franchise Contract*, 21 J.L. & ECON. 223 (1978).

manufacturing processes, and even features of those suppliers' own supply chains.[21]

In short, in theory as well as in practice, the distinction between conducting an activity through contractual arrangements and locating the activity inside a firm may have little connection to what antitrust analysts and official proclamations seem to imagine when inquiring into whether a proffered efficiency requires that the firms be able to merge rather than entering into some alternative contractual relationship. And to remind: there is also the corollary point that this inquiry is relevant not only to efficiencies but also to anticompetitive effects. We might ask, for example, whether a merger between two firms with elaborate, overlapping retailers generating high concentration gets an automatic pass (at least at the retail level, because the merger is not regarded to be horizontal at that level) if one of the firms does not own any of its retailers but instead relies entirely on franchise arrangements.[22]

3. Theory of the Firm: Some Ways Forward

Having discussed how the theory of the firm and related investigations raise serious challenges for the analysis of merger specificity, let us turn now to some of the answers this research offers. A variety of literatures are related to the theory of the firm, specifically concerning when and why it may be advantageous to bring groups of activities or assets together in a single firm rather than relying on contractual relationships between firms. These literatures vary in their degree of formal development, domains of application, and extent of empirical validation. And, as just noted, there has been little attempt to connect this body of work with the analysis of efficiencies in horizontal mergers. This Subsection offers a preliminary, highly selective sketch of some core ideas that will in varying degrees emerge in the applications presented in Section B.[23]

Coase's 1937 article on the nature of the firm is most responsible for placing the question on the map, although it was not much explored for decades thereafter. He suggested that bringing activities inside a single firm may advantageously reduce the transactions costs associated with separate contractual relationships, but that at some point diseconomies of scale would dominate, limiting the optimal size of the firm. The identity of those transactions costs, how bringing them inside a firm would eliminate them without incurring other costs of similar magnitude, and what was the nature of the pertinent diseconomies were not much illuminated.

As the century progressed, the study of organizations grew. Some of the most prominent

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[21]*See* ARTHUR L. STINCHCOMBE, INFORMATION AND ORGANIZATIONS, ch. 6 (1990); Lisa Bernstein, *Beyond Relational Contracts: Social Capital and Network Governance in Procurement Contracts*, 7 J. LEG. ANALYSIS 561 (2015).

[22]Put another way, the proper economic analysis—of whether efficiencies are merger specific and of anticompetitive effects—does not turn on some particular formal definition of what constitutes a firm's boundaries but rather on the comparison of a proposed merger (itself a phenomenon that should not be viewed formalistically) with plausible alternative arrangements (whatever they might be called) to determine (along the lines outlined in Subsection 1) whether a more favorable tradeoff of efficiencies and anticompetitive effects is likely.

[23]This Subsection focuses on transaction cost economics (associated with Williamson) and property rights theory (associated with Hart and coauthors), but there are other branches as well. *See, e.g.*, Robert Gibbons, *Four Formal(izable) Theories of the Firm?*, 58 J. ECON. BEHAV. & ORG. 200 (2005); Bengt Holmström, *The Firm as a Subeconomy*, 15 J.L. ECON. & ORG. 74 (1999); Bengt Holmström & John Roberts, *The Boundaries of the Firm Revisited*, J. ECON. PERSP., Fall 1998, at 73.

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work by economists is associated with Herbert Simon, another Nobel Prize winner.[24] And there is now the field of organizational economics, which emphasizes economic arrangements within organizations and also seeks to illuminate connections between firms.[25] Some research emphasizes the employment relationship, a subject extensively studied in labor economics. Some of the pertinent focus is on incentives, that is, the familiar moral hazard (principal-agent) problem, although in a vacuum it is not clear how the available approaches differ when contracts are inside the firm.

Before turning to subsequent work on the theory of the firm, it is useful to have in mind some of the economic problems to which the firm is sometimes seen as a solution. One set of challenges concerns the provision of high quality at low cost. An independent supplier would like to minimize effort while still selling its goods at the highest possible price, but it needs to convince buyers to purchase them. They, in turn, may have limited information about quality. As a result, they may rely on reputation and repeat dealings, hire their own inspectors, and so forth. Instead, they may produce the input internally, perhaps in a division devoted to that task. However, the manager and workers in that division present similar challenges. If the manager has a high-powered incentive scheme linked to that division's performance and substantial control over the workers, the division may operate much like an independent firm, with all of the benefits and limitations that entails. With low-powered incentives, there may be less of a motivation to cut quality but also insufficient effort overall, including to contain costs. Indeed, those are just the sorts of problems faced when procuring inputs from outsiders under cost-plus contracts. Most techniques used to motivate and monitor inside the firm have contractual analogues, and vice versa.

Another canonical setting addressed in much modern work on the theory of the firm involves the hold-up problem.[26] Suppose that a firm contemplates a significant relationship-specific investment: one in which the value depends on entering or maintaining a relationship with another particular firm. Once that investment is sunk, the firm is worried that the other firm will hold it up, insisting on a favorable price, thereby extracting much of the ex post surplus from the sunk investment. But since that surplus constitutes a quasi-rent, the anticipation of which provides the incentive for our original firm's investment, it will choose an inefficiently low level of investment. A natural solution is an ex ante contract, but that solution is fully effective only if complete contingent contracts are feasible, which requires not only anticipating and documenting myriad possibilities but also sufficient verifiability (of different actions and/or states) to enable enforcement. Ex post renegotiation can help address ex post inefficiencies but involves just the hold-up problem sought to be avoided; its prospect may also undermine the credibility of useful contractual commitments.

These are among the problems motivating the work of Williamson, leading to a body of scholarship referred to as transaction cost economics.[27] Due to the large volume and variety of

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[24]*See, e.g.*, JAMES E. MARCH & HERBERT A. SIMON, ORGANIZATIONS (1958); Herbert A. Simon, *Organizations and Markets*, J. ECON. PERSP., Spring 1991, at 25.

[25]*See, e.g.*, THE HANDBOOK OF ORGANIZATIONAL ECONOMICS (Robert Gibbons & John Roberts eds., 2013).

[26]*See* Benjamin Klein, Robert G. Crawford & Armen A. Alchian, *Vertical Integration, Appropriable Rents, and the Competitive Contracting Process*, 21 J.L. & ECON. 297 (1978).

[27]For overviews, see PRIZE COMM. OF THE ROYAL SWEDISH ACAD. OF SCI., SCIENTIFIC BACKGROUND ON THE SVERIGES RIKSBANK PRIZE IN ECONOMIC SCIENCES IN MEMORY OF ALFRED NOBEL 2009: ECONOMIC GOVERNANCE 1–8 (2009); Gibbons, *supra* note 23.

work, the fact that much is informal, and resulting differences in interpretation, what is offered here is my own selective distillation of some core features relevant to the present enterprise.[28]

Under Williamson's view, the central difference between contracts and firms—which he refers to in the title of his 1975 book as *Markets and Hierarchies*—concerns an amalgam of features: by contrast to markets, with their high-powered incentives, firms internally employ low-powered incentives, discretionary administrative control, and their own systems for dispute resolution. These differences are seen as going together, forming a complementary bundle.[29] For example, one cannot give a manager high-powered incentives, say, to incur up-front costs in order to secure a large future return, but leave to another administrator the ability to take away the rewards when they materialize (which that administrator may well have an incentive to do).[30]

Williamson (along with other prominent scholars advancing somewhat different theories[31]) argues that these distinctive features of internal relations within a firm have a comparative advantage in some (but not other) settings, which explains why it is efficient to bring some activities within a firm while leaving others to the market, with its high-powered incentives. For example, he suggests that more rapid adaptation is possible inside the firm.[32] More broadly, activities requiring a variety of subtle forms of coordination and interaction might best be conducted in such an environment.[33]

To suggest an analogy, individuals in a small village may be able to cooperate well due to myriad forms of informal social sanctions guided by rich yet subtle information flows, norms, and the like. Those who misbehave risk becoming outcasts, and separation from the village leaves much behind, just as a long-term employee forced to leave a firm may lose not only firm-specific human capital but also an established reputation that may take significant time to

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[28]Most relevant to the discussion that follows are OLIVER WILLIAMSON, MARKETS AND HIERARCHIES: ANALYSIS AND ANTITRUST IMPLICATIONS, chs. 2, 7 (1975), and WILLIAMSON, *supra* note 13, ch. 6. *See also* Oliver E. Williamson, *The Theory of the Firm as Governance Structure: From Choice to Contract*, J. ECON. PERSP., Summer 2002, at 171.

[29]*See, e.g.*, WILLIAMSON, *supra* note 28, at 130 ("Internal organization ought to be regarded as a syndrome of characteristics: distinctive strengths and distinctive weaknesses, in a comparative institutional sense, appear nonseparably—albeit in variable proportions—as a package.").

[30]A primary motivation for advancing this approach is the need to address a question originally advanced by Coase: Why would it not be efficient for the economy to be one large firm? Williamson further pushes this point by raising the possibility of selective intervention: Why cannot otherwise separate firms be operated as separate units in a single firm—each a profit center (the so-called M-form)—thereby preserving incentives, while having a higher manager whose sole role is to resolve conflicts, internalize inter-unit externalities, and so forth? Readers will note the analogue of this set of functions to the operation of the state in an otherwise market-based economy; familiar limitations concern the information available to the higher-level decision-makers as well as their incentives. Williamson, as suggested in the text, emphasized that such a supreme manager (even if perfectly informed and motivated to maximize the firm's overall profits) would have incentives to act in ways that, in anticipation, would undermine the incentives of the unit managers.

[31]*See, e.g.*, Bengt Holmström & Paul Milgrom, *The Firm as an Incentive Scheme*, 84 AM. ECON. REV. 972 (1994); Simon, *supra* note 24.

[32]The reasons for some of Williamson's conclusions are not always clear. For example, those with low-powered incentives may have less to lose by giving up their old ways but also less to gain. Indeed, many suggest that an important reason that major economic change often comes from new, disruptive firms rather than experienced, knowledgeable, and well-endowed incumbents is that large firms are much less flexible than independent, highly incentivized, market actors.

[33]Although this view is in accord with conventional wisdom, it is hardly obvious how the mechanisms operate and when they have the desired properties, a point reinforced by the example to follow in the text. Indeed, a feature of Oliver Hart's more recent work (some with coauthors) on "reference points" suggests that frictions may be greatest when much is left fuzzy and open-ended rather than fixed formally by contract. *See, e.g.*, Oliver Hart, *Hold-Up, Asset Ownership, and Reference Points*, 124 Q.J. ECON. 267 (2009).

reproduce elsewhere.[34] Of course, small villages are also associated with exploitation and stultification, and in modern societies arms-length contracts and formal legal enforcement often prove to be superior. Williamson's point, however, is not that what he regards as distinctive about firms is generically or even usually superior, but rather that firms are better than markets at an important subset of activities.

Subsection 2 noted another concern with the usual distinction: that firms often operate in a decentralized fashion with locally high-powered incentives, and contracts between distinct entities may employ substantial hierarchy.[35] Moreover, with both types of organization, reputation that arises with repeated interaction is often quite important but does not obviously differentiate the two supposedly distinct ways to organize activities.[36] The lesson for the analysis of merger efficiencies is that attention should be focused on substance rather than legal form.

In this regard, Subsection 1 already noted that incentive alignment may be similarly relevant to both efficiencies and anticompetitive effects, and that such alignment can be generated by contractual arrangements that are not regarded to be mergers (a sort of similarity illustrated above by franchising). In principle, permissibility under competition law should not depend on legal classification but rather on the pertinent economic effects of the arrangements. The theory under discussion is relevant to the extent it helps us understand why arrangements that are often employed within firms might enable distinctive efficiency benefits that cannot be obtained under alternative (often contractual) methods without also bringing about any concomitant reductions in competition. But usually it is not obvious just when and how this may be so and how large are the net gains from the optimal arrangement when it does involve bringing activities inside a single firm.

A distinct approach, referred to as the property rights theory, is advanced by Oliver Hart and coauthors.[37] It focuses on who should own various assets, where ownership is understood as entailing the residual right to determine how the asset is deployed in situations that are left open in the pertinent contract—a challenge associated with the inevitable incompleteness of contracts, noted above. To take one of many settings, suppose that there are two assets, *A* and *B*. Regarding ownership, there will be a tradeoff. On one hand, providing separate ownership will in some settings heighten incentives to develop each asset, maximizing the value of each, viewed separately. However, if there are benefits of coordination, the hold-up problem suggests that the owner of, say, *A*, will not develop that asset in a way that is most useful when combined with asset *B*—and conversely. Hence, joint ownership (merger) ex ante would be optimal, but only

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[34]Even basic knowledge of the individual's innate productivity may take others in a firm a significant time to learn, so starting afresh can involve a significant drop in one's wage.

[35]Arthur Stinchcombe (cited in Subsection 2's discussion of hierarchy embedded in contracts) focuses on complex procurement requiring substantial changes over the course of performance that are addressed with cost-plus contracting that has just these features. *See* STINCHCOMBE, *supra* note 21, ch. 6. And, as noted earlier in this Subsection, the sorts of low-powered incentive systems used inside firms have much in common with cost-plus contracting.

[36]*See, e.g.*, George Baker, Robert Gibbons & Kevin J. Murphy, *Relational Contracts and the Theory of the Firm*, 117 Q.J. ECON. 39 (2002); Gerald T. Garvey, *Why Reputation Favors Joint Ventures Over Vertical and Horizontal Integration: A Simple Model*, 28 J. ECON. BEHAV. & ORG. 387 (1995); Maija Halonen, *Reputation and the Allocation of Ownership*, 112 ECON. J. 539 (2002).

[37]*See, e.g.*, Sanford J. Grossman & Oliver D. Hart, *The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration*, 94 J. POL. ECON. 691 (1986); Oliver Hart & John Moore, *Property Rights and the Nature of the Firm*, 98 J. POL. ECON. 1119 (1990). For a more recent perspective, see Oliver Hart, *Incomplete Contracts and Control*, 107 AM. ECON. REV. 1731 (2017) (Nobel lecture).

insofar as the diminution in incentives with regard to each asset is not too large.[38]

Note that much of the theoretical development, as suggested by this example, involves physical assets. Nevertheless—with some departure from the property rights theory and, in respects, combining it with other theories[39]—one can imagine variations under which, instead of physical assets, there are two teams of workers in place, each of which has developed relationships that make it more effective than the stand-alone marginal products of each of the individual workers. Putting them under a new, common boss may better coordinate their efforts but also partly undermine within-group cohesion and thus productivity. Whether regarding tangible assets or otherwise, it tends to be difficult to determine when unified ownership is optimal and, when it is, how large is the net efficiency gain from that arrangement compared to the most effective albeit inferior contractual alternative.[40] And, as with any of the theories, for antitrust purposes we also wish to know the extent to which the alternative likewise may result in some of the same anticompetitive effects as would arise under the proposed merger.[41]

4. Vertical Efficiencies and Horizontal Integration

Subsection 3's discussion of theories of the firm suggests that the negligible application to efficiencies in horizontal mergers may derive from the fact that most of the analysis seems primarily applicable to efficiencies in vertical relationships. Examples and related models often involve supply relationships, wherein one firm produces an input for use by the other. (A common example is a power plant locating next to a coal mine.[42]) This feature no doubt largely explains why the literature has been drawn upon to address how competition law should treat vertical restraints and vertical mergers even though it has been ignored in the horizontal context.

Nevertheless, a wide class of efficiencies that can arise in horizontal mergers are vertical in nature. Actually, the concept of a "vertical" relationship is more of a metaphor (or a convention in creating blackboard or PowerPoint diagrams) than an analytical construct. Most synergies involve complementarities among assets (broadly construed), and it is familiar in economics that complementarity and verticality have much in common.[43] For example, the problem of double marginalization that may arise with vertical contracting is understood to be an instance involving contractual inefficiency with Cournot complements. A consumer wants an electronic device, but it must be invented, manufactured, and ultimately delivered; each of these

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[38]An important feature of property rights theory is its focus on ex ante investment incentives, abstracting from ex post contracting inefficiency that may be important in understanding the internal workings of large firms. *See, e.g.*, Hart, *supra* note 8, at 106.

[39]*See, e.g.*, Hart, *supra* note 37, at 1735 ("[T]he prior work of Coase and Williamson emphasizes authority over human capital as the defining feature of the firm: an employer can tell an employee what to do. In contrast, [the property rights theory] emphasizes control over physical (more generally, non-human) assets."). But some subsequent extensions connect more closely to some previous analysis more focused on the employment relationship. *See id*. at 1748–49.

[40]On difficulties in empirically testing the property rights theory, see Holmström, *supra* note 23, at 87, and Michael D. Whinston, *On the Transaction Cost Determinants of Vertical Integration*, 19 J.L. ECON. & ORG. 1 (2003).

[41]In all of these literatures, the focus is usually on efficiency from the perspective of the firms in question, setting aside possible externalities, here, negative externalities in the guise of anticompetitive effects.

[42]Note also that much of the literature, as in this example (and in the Fisher Body case that has also received much attention), focuses on mining, manufacturing, and related activities whereas these sectors collectively have long been a modest and shrinking share of developed economies.

[43]Indeed, synergy, the most commonly used term for merger-specific efficiencies, has a dictionary definition that is close to economists' definition of complements, and common examples include vertical relationships in business.

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three activities can be regarded as a complementary input to the consumer's experience (and, as with some instances of complementarity, each feature may be a jointly necessary condition).[44]

The applications in Section B will show how most synergies associated with horizontal mergers involve the combination of complementary assets. Moreover, many of these synergies involve important violations of modularity, which was assumed in some of the analysis in Subsection 1.[45] For example, mergers that realize economies of scope (see Subsection B.2) typically involve the use of some capability, say A, of firm 1—that is already employed internally to enhance the performance of some other asset (or collection of assets) of type B—being extended to improve the performance of the B asset(s) of firm 2, which is deficient with respect to capability A. Perhaps firm 1 is distinctively skilled at marketing certain types of consumer goods that are also produced, but marketed poorly, by firm 2. Or firm 1 is skilled at logistics, or working with suppliers, or using IT in sophisticated ways, or devising and deploying process innovations in manufacturing, relative to firm 2's proficiency in these domains. Moreover, when firm 1's advantages regarding capability A are industry specific, it may be that the only way or the best way to extend their range is through their application to existing B-type assets in the same industry, which compete with firm 1's B-type assets.

One may go further by stating that nearly all efficiencies in horizontal mergers—except for pure economies of scale (see Subsection B.1)—are vertical in character.[46] A key idea, related directly to theories of the firm, is that complex contracting designed to coordinate economic activities of a sort that might better be conducted inside a single firm often involve complementary activities and assets rather than identical ones. When horizontal mergers involve two firms that do not each consist entirely of the same type of stand-alone asset, there will be vertical elements, and when those vertical features are entangled with the purely horizontal ones, as they often are, there may be vertical efficiencies from horizontal integration.

Observe that, for horizontal mergers that have important vertical aspects—where, moreover, it may be that economies of scale or scope, say, upstream, are the real source of potential efficiencies—it is natural to consider the nature of the horizontal anticompetitive effects that arise, say, downstream. If an integrated firm acquires an unintegrated or simply less efficient rival to its downstream operations, might we associate any resulting downstream market power with the upstream activities, which are not themselves expanded by the merger? If, for example, the acquirer's advantages upstream would lead it, if not allowed to merge, to expand and eventually to achieve further dominance downstream, we may have the sort of situation discussed in Subsection 1 and elaborated in some of the examples to follow in which anticompetitive effects are not merger specific either. As discussed in Subsection B.1 on economies of scale, however, if a reviewing agency or court is not sure whether the magnitude of the efficiencies exceeds the (here, downstream, horizontal) anticompetitive effects, it may make sense to prohibit the merger, which avoids the anticompetitive effects if the efficiencies turn out to be insubstantial or incapable of being extended to additional downstream activity.

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[44]Complementarity between a right and a (matching) left shoe constitutes a simple illustration of a setting that would not be viewed as vertical but raises the same issues because each shoe is of little use without the other.

[45]To emphasize this further refinement, note that bread and butter (or beer and pizza) may be highly complementary but still modular: each is produced and purchased separately, but they are often consumed together. Nevertheless, all complements, even modular ones, can give rise to double marginalization.

[46]A further implication, which extends beyond the scope of this article, is that such mergers accordingly may also involve some of the anticompetitive effects associated with vertical mergers, such as raising barriers to entry.

B. Applications

The analysis outlined in Section A is rather abstract, and it is not straightforward to determine how various theories of the firm illuminate the merger specificity of particular types of efficiencies that may be proffered to justify horizontal mergers. This Section examines some of the more important types of efficiencies to suggest how the various considerations just elaborated may be applied. As will be seen, some familiar understandings are sharpened while others are modified, extended, or overridden. Nevertheless, given the current state of development and the theoretical and empirical challenges involved, the present discussion should be seen as merely suggestive of the path forward.

1. Economies of Scale

Economies of scale are the most familiar merger efficiency. Traditional analysis—dating at least to Williamson's 1968 article on merger tradeoffs[47] and the 1968 Merger Guidelines[48]—holds that such economies should generally be achieved by internal growth. Under this view, merger-specific efficiencies would only be those associated with any speed or rationalization differential: if scale can be reached more quickly or through a more orderly redeployment of assets via merger, any scale economies would be credited only to that extent. Why there might exist such a differential—or, indeed, why it might be positive rather than negative (perhaps internal growth would be more orderly than merger)—is not much addressed. As a further note, similar analysis can be applied to industry consolidation, such as when there is declining demand. Absent a merger, some assets will eventually exit the industry regardless; an efficiency in this setting will only be merger specific to the extent that the merger somehow achieves this inevitable transition more effectively.[49]

The foregoing statement often leads to approximately the right conclusion, but the underlying logic is incomplete in many respects. Moreover, the meaning of economies of scale and, relatedly, the domain of this line of analysis, are insufficiently understood.

Let us begin with some terminology. Joseph Farrell and Carl Shapiro distinguish between the choice of a different quantity under a given production function and changes in the production function itself.[50] If costs are lower when $2X$ is produced in a single plant than when X is produced in each of two (say, smaller) plants, there are what I will call pure economies of scale. A familiar example involves pipelines, whose capacity is related to the diameter squared but whose construction cost is related to the diameter. (If two pipelines each need to be constructed and buried separately, the costs of that duplication may accentuate the construction cost difference.) Importantly, such examples suppose that the plants or pipelines constitute

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essentially the entirety of the firms in question, a point to which we will return shortly.

Whether arising ab initio, upon growth in demand, or with the emergence of a new technology, the presence of pure economies of scale in the production function leads us to expect that independent firms (whether entrants or incumbents) would find it profitable to operate at efficient scale even if no mergers were allowed.[51] If there is a transition—perhaps new technology doubles the optimal scale of new plants—then preexisting, independent, single-plant firms would either (ultimately) replace their old plants with new ones of the larger scale or exit (assuming constant demand). If all is that simple, it is not clear how firms pairing off and merging would either accelerate or slow that process or result in any other difference in outcome. Nor is acceleration beneficial per se: if there are significant sunk costs in existing plants, it may well be optimal to continue their operation for some period, particularly if achieving the new scale economies entails fixed costs. Moreover, both independent firms and a merged entity would tend to do just that, so neither would be speedier in making the transition.

A key omission in this familiar analysis is that anticompetitive effects would also tend to be generated—to the same degree and with the same speed—if the firms were not allowed to merge. Whether ten small firms pair off and merge or instead one of each pair exits while the other doubles in size, the market is left with five larger firms. Therefore, any anticompetitive effects from ending up with five firms rather than ten are not merger specific either. In the simplest case, these contemplated mergers would be a matter of indifference, both to the firms' owners and to consumers, because both costs and competitive interactions would be the same at the end of the day whether the mergers are permitted or the economies of scale are achieved through a mix of internal growth and exit.

In such cases, the merger may be regarded to be undesirable principally on account of uncertainty. Consider the stock argument that internal growth is preferable to merger because it is socially preferable for the firms to compete for the market by remaining independent and fighting it out. The underlying reasons for the hypothesized difference, however, are murky. Perhaps independent firms' decision-makers more intelligently adapt, or perhaps they all have hubris and the most overly optimistic will reign over merged entities whereas survival of the fittest in a world with no mergers will entail more efficient selection. Or perhaps these pairings should be reversed. The suggestion here is that a more powerful basis for an antimerger preference may be grounded in a more rigorous analysis of the underlying uncertainty.

Suppose that an agency concludes that the merger would indeed generate anticompetitive effects and that the efficiency associated with scale may be large but is uncertain, particularly to the reviewing agency, which understands less about these matters than do the firms' managers. (It may not be known how soon it would be optimal to replace existing capacity, or the alleged scale economies associated with the new technology may be difficult to assess.) In that event, working through the simple decision tree for this problem, blocking may well be optimal.

On one hand, if the economies are truly present and substantial, they will be achieved even if the merger is blocked. To be sure, the anticompetitive effects will also materialize. But society is (under the stated assumptions) no worse off for blocking the merger, and this is so even when the efficiencies exceed the anticompetitive effects. On the other hand, if the economies would not actually materialize, then blocking the merger matters and will enhance

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[51]Throughout, the discussion abstracts from the integer constraint (e.g., if demand is 7 and efficient scale is 2, there cannot be 3.5 plants).

welfare. As long there is a nontrivial probability of the latter, blocking is the better choice.
Moreover, even if there is some positive differential (of speed or orderliness) from permitting the
merger, it would need to exceed the probability-weighted loss in the event that the economies are
not real or substantial.[52] Accordingly, one should not naively compute the expected
anticompetitive effects and expected efficiencies from the merger but rather take into account as
well the different types of outcomes in the blocking scenario. In a sense, one may think of
blocking as having option value: society will, by comparison to permission, achieve a better
competitive outcome in the state of the world in which the economies are absent—because
market actors will not, in that case, endogenously exercise the real option under which some
firms expand and others exit.

  Focusing on the nexus between anticompetitive effects and efficiencies thus recasts
conventional wisdom about economies of scale. Let us now consider how the other ideas in
Section A contribute to our understanding of the subject. A key limitation of the standard view
as well as the foregoing discussion is that the supposed case of pure economies of scale, however
important it may be, constitutes a special one. Typically mergers do not involve firms that
constitute single plants (or pipelines) but rather multiple ones and/or clusters of related activities.
Indeed, even a single plant often involves myriad activities. (Consider a hospital. Or a retail
store that carries 10,000 SKUs.) Moreover, a firm with a single plant that performs a unitary
function often employs many types of workers (who need to be hired, trained, and provided with
benefits), needs to obtain all manner of supplies through sometimes complex arrangements,
requires financing, engages in marketing and distribution, and establishes ways of doing business
that motivate workers, comfort contracting partners, and reassure customers. Many proposed
mergers that require substantial analysis by agencies involve entities that are vastly more
complex than the stick-figure firms in the preceding analysis of pure scale economies. Note in
particular that the pertinent activities that are complementary, say, to a firm's plant are often
vertically related. That is, even though the competitive threat is horizontal, the efficiencies may
be primarily vertical, as elaborated in Subsection A.4.

  There are efficiency-related reasons for much of this complexity, wherein multiple
related functions are undertaken in a single firm, an idea advanced in much of the theory of the
firm literature and that is central to explaining why nontrivial firms exist in the first place and
often demonstrate substantial marketplace superiority to their less complicated rivals. More
important for present purposes, because of the myriad complementary assets and activities,
economies of scale limited to a single plant or activity cannot usually be achieved in isolation. A
plant and the rest of the related activities are not modular but interdependent. There exist
reasons why having some firms own just the plants, contracting on the spot market or otherwise
for each of the related functions, is often less efficient than combining the plants and some of
these activities in a single firm.[53] As a consequence, mergers purportedly motivated by
seemingly simple scale economies in a particular production function may not be so simple to
analyze.

  Let us return to the example of technological change that doubles the optimal scale of

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[52]There could also be a positive differential due to synergies, as discussed below.

[53]*See, e.g.*, Frank M. Gollop & James L. Monahan, *A Generalized Index of Diversification: Trends in U.S.
Manufacturing*, 73 REV. ECON. & STAT. 318 (1991) (finding that diversification has been growing in manufacturing firms
while simultaneously decreasing within establishments, suggesting that narrow economies of scale are not a central force
in enterprise diversification).

plants, and suppose further that demand remains constant. If some particular firm replaces its plant with one twice the scale and another firm exits, we should inquire into the fate of the complementary assets of the latter firm as well as how the former firm, once it has a new plant double the size, will perform the other, related functions at the now-larger scale.

If all of the complements can be obtained on spot markets with no frictions, we are back to the analysis of pure economies of scale. But here we are supposing the contrary. Workers may have specific skills; teams may have longstanding working relationships; suppliers may have long-term contracts and histories; in all, there may be substantial going concern value associated with a firm that transcends its mere physical plant.[54]

If the remaining firm that doubles its scale also needs simultaneously to double (or at least substantially expand) everything else, there may be significant costs in doing so. Relatedly, if the exiting firm's assets leave the industry, this involves not merely scrapping its obsolete plant but also scattering into the wind the rest of what was associated with that plant, destroying the value entailed in that assemblage. Here, it may well be efficient for the expanding firm to buy, as a whole, the exiting firm. Whether it literally merges (as that term might be defined under some jurisdiction's corporation law) or acquires most or all of the relevant assets, including the assumption of contracts and the like, one by one or in clusters (if such could be effectuated without losing the synergies), the result would be the same.[55]

In this instance, we may well have substantial merger-specific efficiencies. Those efficiencies do not pertain to the plant with the scale economies in isolation but rather to these related activities. Whether and why such efficiencies might exist and not be achievable by other means are difficult questions that were considered in Section A.

This example further illustrates the importance of the possibility that—supposing the scale economies to be large enough that they would be fully realized without the merger, despite the inefficiencies—the anticompetitive effects may be the ones that are not merger specific. That is, prohibiting such a merger (or similar asset acquisition) may lose the aforementioned portion of the efficiencies but not avoid the merger's anticompetitive effects if the same concentration will inevitably arise, just with the firms having higher production costs in the resulting equilibrium because of the forgone efficiencies. Although this too is a special case, its logical structure should be appreciated. The question of nexus should be clearly kept in mind: it emphasizes the relationship between the efficiencies and anticompetitive effects as well as the question of how a merger versus a nonmerger alternative affects them both.

There is another important lesson that can be drawn from a modest variation on this example, which had imagined that there were ten symmetric single-plant firms pairing off. Once the firms are asymmetric, as is typical, there is the further question of which (if any) incumbent firms should be permitted to acquire which no-longer-efficient small firms. Consider for

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[54]*See, e.g.*, Oliver Hart & Bengt Holmström, *A Theory of Firm Scope*, 125 Q.J. ECON. 483, 511 (2010) ("It is remarkable how few practitioners, organizational consultants, or researchers studying organizations within disciplines other than economics (e.g., sociology and organizational behavior) ever talk about firms in terms of asset ownership. For most of them a firm is defined by the things it does and the knowledge and capabilities it possesses."); Ryan Kellogg, *Learning by Drilling: Interfirm Learning and Relationship Persistence in the Texas Oilpatch*, 126 Q.J. ECON. 1961 (2011) (finding that the productivity of an oil production company and its drilling contractor increases with their experience in working together). Indeed, it is even possible that the plant itself is inconsequential, constituting an asset that can be rented on the spot market, unlike many of the complementary functions that are conducted inside the firm.

[55]At least an agency reviewing such transactions should either view it as such or determine why there would be any differences and how they matter to efficiencies and anticompetitive effects.

simplicity a case in which there are not significant differences in the realized efficiencies for two potential acquirers of a particular target firm. In that event, the one generating smaller anticompetitive effects would be socially preferable whereas the more anticompetitive acquirer will typically be willing (ceteris paribus) to pay the most for the acquisition and thus may be the merger that would transpire if the reviewing agency would allow it.[56] In this instance, the alternative to the proffered merger may not be exit or internal expansion but rather a different merger. Here, the efficiencies should not be regarded as merger specific because they can be achieved by an alternative, less anticompetitive merger.[57] By contrast, if that other merger were instead proposed, the same sorts of synergies might appropriately be deemed merger specific. In sum, we can see that both efficiencies and anticompetitive effects need to be considered together and also that the proposed merger may need to be compared to a range of plausible alternatives.

2. *Economies of Scope*

Another class of possible merger-specific efficiencies involves what are often called economies of scope.[58] It is supposed that one firm has a distinctive capability that would be valuable to another firm in the same industry.[59] For example, an acquirer may be particularly good at distribution, where the target is weak (or merely average); or good at marketing, supply chains, process innovation, other technology,[60] and so forth. Note that, even though the anticompetitive threat of the merger is taken to be horizontal—the acquiring firm operates significantly in the same activity that is at the core of the target firm—the economies in question often have a complementary, vertical relationship to that activity, illustrating the analysis in Subsection A.4. For a variety of reasons, some firms will develop powerful capabilities that give them advantages in cost or quality over their rivals. As a consequence, a merger with such rivals may entail, along with anticompetitive effects, some merger-specific efficiencies. But are they?

The most straightforward alternative to merger is the analogue to internal growth in the target firm (usually considered when addressing economies of scale). Perhaps that firm can just get its act together by hiring better employees, tightening its operations, and so forth. But if

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[56]The core idea is familiar in a range of settings: a more anticompetitive acquirer tends to raise industry profits more and to benefit from a larger share of any profit boost, so on both accounts it would be willing to bid more than would other potential acquirers that would generate smaller anticompetitive effects.

[57]This analysis explains why the so-called failing-company defense should not in principle be available when there exists a significantly less anticompetitive acquirer. *See* U.S. Merger Guidelines, *supra* note 1, at 32 & n.16.

[58]For early discussions and formalizations, see John C. Panzar & Robert D. Willig, *Economies of Scope*, 71 AM. ECON. REV. (PAPERS & PROC.) 268 (1981), and David J. Teece, *Economies of Scope and the Scope of the Enterprise*, 1 J. ECON. BEHAV. & ORG. 223 (1980). Relatedly, the resource-based view of the firm emphasizes identifying firms' particular strengths vis-à-vis their competitors. *See* DAVID J. COLLIS & CYNTHIA A. MONTGOMERY, CORPORATE STRATEGY: A RESOURCE-BASED APPROACH (2d ed. 2005); Birger Wernerfelt, *A Resource-based View of the Firm*, 5 STRATEGIC MGMT. J. 171 (1984). Such comparative advantages seem suggestive of opportunities to exploit economies of scope through horizontal mergers.

[59]Interestingly, in this application, it is not actually necessary that there be economies of scale in the capability in question: it may be that doubling the coverage would double the cost of that department, but gains may still be merger specific if the other features elaborated below are present. Note further that the discussion in the text focuses on the unidirectional case involving one capability. Some mergers might generate efficiencies due to two-way synergies. For example, perhaps Amazon's acquisition of Whole Foods aimed to combine Amazon's comparative advantage in logistics, supply chain, and IT with Whole Foods' capabilities in the grocery industry.

[60]*See, e.g.*, Bengt Holmström & John Roberts, *supra* note 23, at 91 ("We think that knowledge transfers are a very common driver of mergers and acquisitions and of horizontal expansion of firms generally . . . .").

everything could so readily be done in a superlative manner, all retailers' supply chains would be as efficient as Walmart's, any tech firm could replicate Apple's products, many delivery firms could effectively compete with FedEx, and any coffee shop could compare favorably to Starbucks. There are often significant and sometimes huge differences in firms' capabilities that laggards and upstarts cannot readily erase.[61]

Another alternative is for deficient targets to hire consultants to help them catch up. This possibility is a variation on, and could be taken as implicit in, the notion of internal growth. There is a large consulting industry that indeed is used in these ways for many functions in many sectors of the economy. But, as already suggested, there are undoubtedly limitations as well. No consultant may be able to duplicate Walmart by delivering detailed work plans. There are also significant challenges in hiring consultants, including ascertaining their value and providing appropriate incentives. Another alternative is for a target to outsource the task as a whole to a third party, such as with payroll services, but for related reasons such may often be inferior, particularly with more complex and industry-specific operations.[62]

The target might instead enter a contract with the prospective acquirer, in essence purchasing consulting services or other technology transfers from it. Indeed, the licensing of intellectual property, sometimes from competitors, is commonplace. But such arrangements face the usual agency problems with contracts as well as a distinctive one arising when contracting with competitors: namely (as elaborated in the next Subsection), the firm providing the services may suffer competitively the more effective is its assistance. Furthermore, the better are contractual arrangements in aligning incentives to avoid these problems, the more such arrangements may pose competitive threats through the softening of competition. An additional difficulty is that the firm supplying the consulting services or technology may be concerned that the other firm would thereby appropriate its skills, a prospect that may be difficult to limit contractually. Furthermore, asymmetric information, a particular problem with process innovation, may impede contracting because of the difficulty the licensee faces in valuing the license unless the licensor first divulges its trade secrets. In these respects and others, the key capabilities may not be modular.

Yet another alternative to merger is internal growth by the prospective acquirer. Instead of purchasing the target's assets, it could replicate them, expand on its own, and, if it is indeed more efficient, ultimately displace the target. Many firms such as Walmart have primarily grown (in this instance, at the retail level) through internal expansion rather than acquisition.[63]

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[61]One reason firms may come to have distinctive capabilities that rivals have difficulty duplicating is learning by doing. *See, e.g.*, Hal R. Varian, *Recent Trends in Concentration, Competition, and Entry*, 82 ANTITRUST L.J. 807, 828–29 (2019).

[62]*See* Panzar & Willig, *supra* note 58, at 271 ("However, the model from which Proposition 2 [formalizing economies of scope] is derived *presumes* that the services of the quasi-public input are self-produced. If, instead, these services could be efficiently allocated by a market, then both the economies of scope and the need for horizontal integration over the final products . . . would disappear. Hence, in this limited framework, questions on the scope of the firm devolve to questions on the efficient marketability of the services of the quasi-public input."); *id*. ("Finally, any type of market transactions costs and any of the many other causes of vertical integration can lead self-production of shared-input services to be the efficient (or just profitable) alternative. In such instances, Proposition 2 delineates the implications for the scope of the firm.").

[63]It is interesting to contemplate the heterogeneity in strategies across firms and industries. For example, Walmart may add much of its value through headquarters' operations. Downstream, for retail, it has employed internal expansion and, notably, owns its stores (rather than selling thousands of SKUs to independent retailers or using a franchise model). These choices may reflect economies of scope, a high need for control of retailers (including to

However, as with economies of scale, especially those entangled with complementary industry- and firm-specific assets, this alternative to merger may be slower and result in significant losses from discarding teams and other relationships that constitute the going concern value of the target.[64] Furthermore, to the extent that internal expansion is ultimately successful, it may entail anticompetitive effects similar to those associated with the proposed merger.[65]

When most of these reasons apply to a sufficient extent, the ability to achieve the economies of scope —while simultaneously avoiding most of the anticompetitive effects feared from the merger—may be significantly limited. To that extent, the efficiencies in question might be merger specific. For this actually to be so, it must also be true that, as with the other examples, the merger itself would achieve these benefits: that is, bringing the arrangement inside the firm has to solve the contracting challenges to a sufficient degree for the economies to be realized. As emphasized in Section A, many of the difficulties with contracting do not vanish, as if by magic, when activities are brought inside a single firm. Synergies that motivate mergers often do not materialize. Such failures might occur because the proffered efficiencies were contrived but also because the underlying contractual challenges were more difficult to overcome via merger than was appreciated.

3. *Sharing Assets Between Competitors*

Sometimes an efficiency is not merger specific because it can be achieved through contracts with third parties. Recall the simple case in which there are economies of scale in payroll processing that may be attained as well (or even better) by the merging firms outsourcing the task to an unrelated firm that specializes in that function. When assets (including intangible ones, such as capabilities of a team of workers) are industry-specific, however, contractual alternatives to a merger may require contracts between competitors. Such arrangements raise anticompetitive concerns as well as a particular type of incentive problem that may be challenging for the parties to address, which in turn may suggest that efficiencies of this sort should be regarded as merger specific.

Suppose that we have a fully symmetric setting with ten firms. Each produces a different variety of a product in a single plant located in a different region. The technology is such that a

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conduct A/B testing that requires common formats), and few industry-specific assets (which may otherwise have made acquisitions attractive). Upstream, where it may also have substantial, specialized know-how, it generally contracts with independent suppliers, although when doing so its contractual relationships are often long term and involve substantial governance (from Walmart to the suppliers) that are often associated with the conduct of activities inside the firm (as discussed in Subsection A.2). This difference (particularly the failure to develop supply internally or to acquire suppliers) may reflect the heterogeneity of suppliers, economies of scope that are limited in domain, and suppliers optimally selling to (different types of) third parties. By contrast, large pharmaceutical firms often conduct innovation internally while also acquiring firms with promising innovations rather than contracting with them, which may be motivated by economies of scope in testing, approval processes, and marketing but more heterogeneous abilities regarding innovation. (In this discussion, anticompetitive explanations are omitted, the focus being on the understanding of possible merger-specific efficiencies.)

[64]For example, if a hospital chain has significant economies of scope with respect to central functions, it would not be efficient (or, in many regions, feasible, in part due to regulation) to engage in substantial internal expansion (building new hospitals), while having existing, less efficient facilities exit the industry.

[65]As noted in the discussion of economies of scale, when there is substantial uncertainty about the potential magnitude of synergies and the problem of stranding useful assets is not great, there may be value in blocking a merger so that the anticompetitive effects result only when significant efficiencies in fact exist.

plant can readily produce enough quantity of each variety for that region or of a single variety for the entire country, but it would be quite costly to construct a second plant in a region. In the initial equilibrium, each variety is shipped to and consumed in every other region despite nontrivial transportation costs.[66] Consider whether a merger between two (or more) of these firms should be permitted.

Setting aside any alternatives to merger, we can compare the anticompetitive effects produced by such a merger with the efficiencies resulting from saved transportation costs—assuming that the merged firms would produce their varieties at the plants nearest to that variety's consumers. Suppose further that the efficiency gain is sufficient to render the merger permissible. If, for example, a consumer welfare standard governs, this assumption entails that the marginal cost reduction from saved transportation costs is sufficient to result in prices that are the same or lower after the merger.

Our question here is whether this efficiency savings should be regarded as merger specific, which sometimes seems to be taken for granted in existing discussions of analogous cases.[67] A possible alternative would be a contract between the proposed merger partners in which each would agree to produce the other's product in sufficient quantities at its own plant, for sale locally. Such an arrangement, on its face, saves the transportation costs (the source of the proffered efficiency gain) without the firms having to merge. Nor is this possibility far-fetched: for example, it is quite common for a firm to license its patented technology to other firms in different regions (particularly different countries) for local production.[68]

Consider first the possible incentive problems that may accompany such an arrangement. Each firm would naturally worry about the effort exerted by the other firm in producing its product (or performing ancillary activities, such as innovation, marketing, or distribution). This is the standard agency problem, the severity of which would depend on the ability to monitor, to enforce contractual provisions (which may be unavoidably incomplete), to provide explicit financial incentives (on which more in a moment), or to rely on repeat business to generate

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[66]It is also interesting to consider an initial equilibrium in which transportation costs are prohibitively high so that interregional shipments do not occur, with the result that consumers in each region have access to only one variety of the good. That is, there are local monopolies, each unconstrained by competition from other varieties from outside regions. Here, permitting mergers would, instead of saving transportation costs, raise welfare due to consumers' access to more varieties. Note as well that there would be no loss in competition because there is no competition to begin with. Contractual alternatives would raise similar issues. They could be superior if the agency problem is not too severe because they would have the benefit of raising competition, although for that very reason such contracts might not be profitable to the firms. Unconstrained contracting (if feasible in light of incentives) would not introduce any competition but would enhance variety, much the same as would mergers. A regulated contract could, in principle, raise surplus relative to an unconstrained contract by reducing price, but so would price regulation of the monopoly that would result if all of the firms were permitted to merge.

[67]See U.S. Merger Guidelines, *supra* note 1, at 31 (in discussing one of the few examples of efficiencies more likely to be credited, states that "efficiencies resulting from shifting production among facilities formerly owned separately, which enable the merging firms to reduce the incremental cost of production, are more likely to be susceptible to verification and are less likely to result from anticompetitive reductions in output," without suggesting any problem regarding merger specificity).

[68]Another alternative—really a different industry structure—would be a vertical separation between the ownership (and development and promotion) of the different varieties and of the plants in which they are produced. Note, however, that in this case the regional plant owners would still have regional market power, constrained by imports from the other regions. A difference from the contractual alternative considered in the text is that there would be the usual contractual agency problems between firms owning the varieties and those owning the plants, but the plants would not have incentives to favor some varieties while undermining others (if these contracts were symmetric).

appropriate incentives. We have a familiar outsourcing problem that is sometimes better addressed by keeping activities inside a single firm, as discussed in Section A.

Here, however, there is an additional contracting challenge. Because each firm's contracting partner is not a third party, as in the payroll outsourcing example, but rather the firm's competitor, the partner actually has an affirmative incentive to underperform. Reduced sales of the other's variety (say, due to poorer customer satisfaction with lower quality output) redounds in part to the benefit of the producer firm. This enhanced agency problem may also be potentially addressed in familiar ways, notably, with stronger contractual incentives, such as forms of profit sharing (including royalties and allocations of regional price-setting authority).

Turn now to the second type of problem with this sort of contractual alternative: that it may be anticompetitive. As emphasized in Subsection A.1, it is important to consider this possibility as well, particularly when the alternative involves contracts between competitors. Even without regard to the aforementioned agency problems, the parties would wish to structure the incentives and decision-making in any such contract in the manner that minimizes competition, internalizing the business-stealing externality between the contracting parties. If the operator of each plant, for example, charged the other firm not only its marginal cost but also an increment reflecting the profit-maximizing price-cost margin on local sales, then competitive pressure between the two firms would be averted, just as in a merger. If some sort of cross-production contract were to be permitted short of merger, therefore, a competition authority would need to scrutinize its terms as well—which may be challenging because it would involve regulation of interfirm pricing (and possibly more).

Interestingly, the pricing arrangement that maximizes the firms' self-interest with regard to competition between them is also one that, as a first cut, may best address the agency problems noted earlier. This should not be surprising because, regarding both agency concerns and competition, joint profit maximization entails shared interests: equal weight on a firm's own profits and those of its contracting partner. This, in turn, is just what a merger is ordinarily understood to produce.

This example illustrates some of the contracting and theory of the firm issues explored in Section A.[69] And the comparison also raises some particular questions: Might it be that incentives far short of full internalization or other contractual provisions could solve most of the agency problems without generating much of the anticompetitive effect, in which case such a contractual alternative may be preferable to the merger? And just how is it that a merger avoids the agency problems in any event? That is, how is a firm able to provide the right incentives for each plant manager (who requires incentives to minimize cost and maintain quality) and each variety manager (who requires incentives to innovate and to market the product), particularly if we are supposing that this cannot be done through contracts between separate entities?

Some readers will notice that the structure of this analysis is similar to that in some other antitrust settings, such as ones involving the cross-licensing of patents.[70] Under some parameters, this problem may actually be akin to one of natural monopoly. If variety is quite valuable, transportation costs are very high, and the agency problems of contracting outside the

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[69]It also illustrates how vertical efficiencies may be intertwined with horizontal mergers, as discussed in Subsection A.4. Here, horizontal dimensions arise with respect to plants and varieties, whereas vertical linkages include those between varieties and plants and distribution (and possibly other features, such as innovation and marketing).

[70]*See, e.g.*, Louis Kaplow, *The Patent-Antitrust Intersection: A Reappraisal*, 97 HARV. L. REV. 1813, 1867–73 (1984).

firm are great, it may be that the best industry structure involves a single firm operating all the plants and controlling all of the varieties. On the other hand, if transportation costs are very low, the situation could instead be one that would permit intense competition to function well, without either contracts between competitors or horizontal mergers—in which case allowing cross-contracting or merger would generate significant anticompetitive effects with negligible efficiency gains.[71] In any event, the core lessons of Section A stand: it is often nontrivial to compare the efficiency of a merger to contractual alternatives, and in any case it is necessary to consider as well whether such alternatives generate some or all of the anticompetitive effects associated with the merger under consideration.

C. Expertise

Merger guidelines require that proffered efficiencies be verifiable in order to be credited.[72] Yet it is difficult for agencies or adjudicators to determine the validity and magnitude of efficiencies given the subtlety and industry-specificity of the analysis, a point that is already well appreciated and is further magnified by the foregoing analysis.[73] This Section suggests that current practice may be hampered by a failure to make full use of the most relevant expertise.

The analysis of efficiencies is usually regarded to be primarily in the domain of agencies' economists, yet most of them are primarily experts in the modeling of anticompetitive effects and the empirical analysis required for demand estimation and merger simulation. Typically, their training is in certain areas of industrial organization economics, the traditional turf for competition policy, yet economic literature pertaining to efficiencies, such as that noted in Section A, is scattered across many fields and is often the focus of scholars at business schools. Relatedly, managers, consultants, investment bankers, private equity partners, and stock market analysts who assess efficiencies for a living have significantly different skill sets. And those competencies are not core to most who work at competition agencies.

There are three complementary ways to address this shortcoming. One is to develop industry expertise through experience, as both economists and lawyers in many agencies surely do. Still, lacking the relevant training and receiving little of the direct feedback that is essential to successful learning by doing, there are limits to this strategy.[74]

Another is to rely heavily on the merging parties' internal documents. Here, it is understood that the most credible ones tend to be those that the parties have generated over the years while operating in their industries rather than those created during (or even after) the merger decision, which may be advocacy statements rather than firms' actual understanding of their operations. Of course, to the extent that the analysis of synergies relates to the pairing of the two particular merging firms, some of the relevant material must inevitably relate to the

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[71]An important qualification concerns whether a free-market equilibrium entails excessive or inadequate provision of variety. *See infra* Section II.B.

[72]*See, e.g.*, EU Merger Guidelines, *supra* note 1, ¶¶ 86–88; U.S. Merger Guidelines, *supra* note 1, at 30–31.

[73]As the reader will appreciate, the analysis in this Part is theoretical and subtle. Ascertaining in practice not only what efficiencies a merger can achieve but also the efficiency and anticompetitive effects of various hypothesized alternatives is daunting, which challenge magnifies the potential value of drawing on appropriate expertise.

[74]To the extent that agencies have not historically conducted in-depth analysis of efficiencies very often or in a systematic manner, experience will be circumscribed. Moreover, the just-noted lack of feedback is a substantial barrier because agency staff would need to follow the internal operations of merged firms over time—although some crude sense might be inferred from subsequent pricing (itself difficult to assess even when formal retrospectives are conducted).

proposed transaction. There remain, however, significant concerns about reliability, interpretation, quantification, and more. To the extent that the identification of relevant documents and assessment of their credibility must be done by outsiders without expertise, this channel is further encumbered. Indeed, many at agencies readily admit the difficulties of efficiency analysis, and some go further to suggest that efficiencies are inscrutable and thus should not receive much weight in deciding which mergers to block.

A third approach, which enhances the value of the others, is to draw directly on the relevant expertise. Although this tactic is obvious and is employed across the government and private sector, its current use by competition agencies appears to be less than ideal. Agencies rely primarily on their own experience and case-specific attempts to contact industry participants. The latter supplementation, however, tends to be limited. Even sophisticated buyers often will understand little about whether various synergies are merger specific and substantial. Some competitors may know more but, as is familiar, have perverse incentives when assisting the agencies. Key personnel of the merging parties are an important source of pertinent information but obviously are not the best positioned to provide the critical perspective that the agencies need.[75]

These market players are sometimes supplemented in various ways. Experts in other government agencies might be approached, calls may be placed to knowledgeable individuals in the private sector, and experts might be hired for specific merger investigations. For a number of reasons that differ across jurisdictions, the latter is not the rule before a decision has already been made to mount a serious challenge to a pending merger (when it is time to retain experts for litigation). Finally, agencies do have internal staff with some of the pertinent training and experience.

It is worth reflecting on the extent to which the far greater attention to the analysis of anticompetitive effects, compared to that of efficiencies, is a self-fulfilling prophecy. Agencies do what they are good at. They hire staff who have the skills to do what the agencies do. Efficiencies seem inscrutable not only due to the inherent difficulties (anticompetitive effects are not so easy either) but also because those attempting to scrutinize efficiencies are operating outside their training and comfort zone.[76]

Serious consideration should be given to whether a larger portion of competition agency staff should be composed of individuals whose primary expertise relates to efficiencies. Some might be experts in the theory of the firm, organizational economics, management practices, productivity, or complex contracting. Others might have relevant knowledge of and experience in particular industries, more from the operations side than competitive strategy. And for

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[75]At least in the United States, it is common for the merging parties' lawyers to use the firms' executives to present the business case for a merger to the agencies, and for agency lawyers to take depositions of firms' managers. However, the ability of agencies to scrutinize this information—including the determination of whose depositions to take, what questions to ask, which documents to examine, and how to interpret them—would be substantially improved if other individuals with useful expertise were active members of the government's team.

[76]A colorful depiction of this state of affairs appears in F.M. Scherer, *Comment* on Robert D. Willig, *Merger Analysis, Industrial Organization Theory, and Merger Guidelines*, BROOKINGS PAPERS ON ECONOMIC ACTIVITY: MICROECONOMICS 281, 325–26 (1991) ("Although it authorized a formal 'efficiencies' defense in its 1984 merger guidelines, the Department of Justice since then has been back-pedaling and attempting to avoid making such trade-offs. I'm not sure why; I suspect it's because the Antitrust Division's staff is good at manipulating economic models but would be like the proverbial city slicker in a cow pasture if it attempted to evaluate the efficiency of real-world firms' operations. Nevertheless, I will not let Willig escape (shoes unstained?) so lightly.").

assessing dominant firms' acquisitions of perhaps disruptive entrants, those who have advised venture capital suppliers in the relevant domain may have useful expertise on efficiencies (and on anticompetitive effects). In addition to hiring more and more varied experts—and in the interim—agencies might identify experts to have on call to use as consultants, able to lend substantial, in-depth assistance from an early stage in analyzing proposed mergers that plausibly involve nontrivial anticompetitive effects.

Adjudicators face two problems. The first is parasitic on agencies' difficulties in assessing efficiencies: if the government's presentation does not itself sufficiently engage important aspects of the proffered efficiencies, it is hard to see how reviewing courts (whether at trial or on appeal) can do better.

Second, courts are hampered regarding the analysis of efficiencies—and of anticompetitive effects—by their own lack of expertise and experience. It is beyond the scope of this article to address possible reforms. Nevertheless, it seems that there are a variety of ways to improve adjudication by U.S. trial courts, which are substantially responsible for making initial decisions whether to block particular mergers. Court-appointed expert magistrates or advisors could assist in the narrowing of issues, organization of proceedings (such as to consider specific issues at once rather than scattered across weeks), questioning of expert witnesses, and more, as some have suggested.[77] Others have advocated greater reliance on court-appointed testifying experts.[78] Note here as well that, in considering what expertise is relevant, both the analysis of efficiencies and that of anticompetitive effects should be kept in mind because different experts may be required for each.

II. Efficiencies and the Long Run

In merger analysis, it is conventional to concentrate on the short run, whether regarding direct price effects, entry, or efficiencies. The allure of the short run is that it often is easier to predict, an important consideration given the complexity of the issues.[79]

Nevertheless, two substantial qualifications must be kept in mind: sometimes the medium or long run is easier to predict, and when focusing on the short run it is important to choose indicators that are most predictive of ultimate consequences, particularly in light of the fact that some short-run signals are negatively related to long-run effects. Running maintenance to zero and eschewing investments always save resources in the short run but oftentimes are seriously detrimental overall.[80] It may be quite hard to predict whether malfunction or collapse will

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[77]*See, e.g.*, SECTION OF ANTITRUST LAW, AM. BAR ASS'N, PRESIDENTIAL TRANSITION REPORT: THE STATE OF ANTITRUST ENFORCEMENT 17–19 (Jan. 2017).

[78]*See, e.g.*, J. Gregory Sidak, *Court-Appointed Neutral Economic Experts*, 9 J. COMPETITION L. & ECON. 359 (2013).

[79]*See, e.g.*, U.S. Merger Guidelines, *supra* note 1, at 31 n.15 ("The Agencies normally give the most weight to the results of this analysis over the short term. The Agencies also may consider the effects of cognizable efficiencies with no short-term, direct effect on prices in the relevant market. Delayed benefits from efficiencies (due to delay in the achievement of, or the realization of customer benefits from, the efficiencies) will be given less weight because they are less proximate and more difficult to predict."). This short-term focus is criticized in Michael L. Katz & Howard A. Shelanski, *Merger Analysis and the Treatment of Uncertainty: Should We Expect Better?*, 74 ANTITRUST L.J. 537, 547–48 (2007).

[80]More familiarly, eating all the desserts one likes and omitting effortful exercise are myopically optimal behaviors that public health experts seek to alter rather than reinforce.

happen anytime soon but easy to know that, over some longer horizon, failure is nearly certain or sufficiently likely to be worth avoiding. Nor are all new product launches or expenditures on medical research best avoided because the certain short run involves significant costs and no benefits, whereas prospective gains are distant and speculative.

These simple points are central in many realms of competition policy. Predation and some other exclusionary strategies may benefit consumers in the short run. Some mergers may raise the risk of coordinated price elevation, but it may be difficult to predict whether or how soon such will occur.

The long run (appropriately discounted) is the correct time horizon in principle.[81] This Part elaborates some key implications of a long-run perspective and also suggests that, in some respects, long-run considerations offer a superior practical guide to the analysis of merger efficiencies.[82] One important reason for the latter is that fundamental market forces illuminate important features of the long-run (albeit imperfectly competitive) equilibrium, including its welfare properties. Proper long-run analysis is, nevertheless, difficult and, accordingly, simple proxies are desired. Yet the right proxies are those that best indicate when blocking a merger promotes long-run well-being.

A. Consumer Versus Total Welfare

Whether consumer or total welfare (or indeed any welfare standard) should guide competition agencies' and courts' decision-making has been subject to ongoing debate that will not be revisited here.[83] Many competition agencies' merger guidelines, including in the European Union and United States, proclaim consumer welfare as their objective, although without purporting to ground this judgment in the analysis of legal sources (which are not considered here either).[84] It also is unclear whether core features of these guidelines are

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[81]Consider all the attention given to whether public companies exhibit short-termism due to market pressures. Both sides in the debate regard short-termism to be a decision-making defect, not a virtue.

[82]This Part does not attempt to be comprehensive. A number of important dynamic efficiency considerations are omitted, such as the beneficial effect of the prospect of hostile acquisitions in disciplining management ex ante, which favors a more permissive merger regime, and the fact that an important benefit of extant competition is to discipline management, which favors a tougher regime.

[83]See, e.g., Joseph Farrell & Michael L. Katz, The Economics of Welfare Standards in Antitrust, COMPETITION POL'Y INT'L, Autumn 2006, at 3.

[84]These endorsements are most explicit when indicating that efficiencies are to be credited only to the extent that they offset otherwise anticompetitive price increases. See, e.g., EU Merger Guidelines, supra note 1, ¶ 79 ("The relevant benchmark in assessing efficiency claims is that consumers will not be worse off as a result of the merger."); U.S. Merger Guidelines, supra note 1, at 2 ("Regardless of how enhanced market power likely would be manifested, the Agencies normally evaluate mergers based on their impact on customers."); id. at 30–31 ("the Agencies consider whether cognizable efficiencies likely would be sufficient to reverse the merger's potential to harm customers in the relevant market, e.g., by preventing price increases in that market"). But see COMPETITION BUREAU CANADA, MERGER ENFORCEMENT GUIDELINES 44 (2011) ("A merger that results in a price increase generally brings about a negative resource allocation effect (referred to as 'deadweight loss'), which is a reduction in total consumer and producer surplus within Canada."). In the United States, for example, the legislative history of the current version of Section 7 of the Clayton Act, enacted in 1950, refers to a range of social, political, and economic concerns (although not of the modern sort), and the first Supreme Court interpretation, drawing on the legislative history, is widely regarded to reflect more of a concern for small producers' surplus, even at the expense of consumers and total welfare. See Brown Shoe Co. v. United States, 370 U.S. 294, 344 (1962) ("But we cannot fail to recognize Congress' desire to promote competition through the protection of viable, small, locally owned businesses. Congress appreciated that occasional higher costs and prices might result from the maintenance of fragmented industries and markets. It resolved these competing considerations in favor of

consistent with their assertions about objectives.[85] Regardless, this Section elaborates two points relating to a long-run view that have received limited attention in the literature.

First, in the long run, the difference between consumer and total welfare tends to diminish.[86] Even with imperfect competition in a sector of the economy, from an ex ante perspective the expected risk-adjusted present value of profits is zero in a range of models, so consumer surplus equals total surplus. All profits are quasi-rents: recoveries for prior investments. With free entry and exit (and setting aside the integer constraint), price will equal average cost in equilibrium, so in that sense all fixed costs will be borne by consumers, reflecting that in the long run (or from an ex ante perspective) fixed costs are variable. This approach, moreover, is adopted in many workhorse models of imperfect competition, such as those crystalized by Gregory Mankiw and Michael Whinston in their 1986 article.[87] As developed there, this does not mean that the imperfectly competitive equilibrium is optimal. Taking a single-sector focus, price exceeds marginal cost and the number of firms (often modeled as varieties) may be insufficient or excessive.[88]

Moreover, merger-specific efficiencies often will not be generated immediately. Perhaps a duplicative plant will be closed promptly, but as discussed in Subsection I.B.1, this outcome may not be merger specific. Some synergies may materialize quickly, but many will take years to develop, and the merger proposal itself and initial integration often involve up-front costs. Not surprisingly, therefore, most retrospective studies of consummated horizontal mergers—which tend to focus on the first couple of years to make the identification of price

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decentralization.”); Derek Bok, *Section 7 of the Clayton Act and the Merging of Law and Economics*, 74 HARV. L. REV. 226, 236–37 (1960) (“To anyone used to the preoccupation of professors and administrators with the economic consequences of monopoly power, the curious aspect of the [legislative] debates is the paucity of remarks having to do with the effects of concentration on prices, innovation, distribution, and efficiency. To be sure, there were allusions to the need for preserving competition. But competition appeared to possess a strong socio-political connotation which centered on the virtues of the small entrepreneur to an extent seldom duplicated in economic literature.”). Section 7 refers specifically to “competition” (and “monopoly”), 15 U.S.C. § 18, which are subject to multiple interpretations. *See, e.g.*, Louis Kaplow & Carl Shapiro, *Antitrust*, *in* 2 HANDBOOK OF LAW AND ECONOMICS 1073, 1132–36, 1165-66 (A. Mitchell Polinsky & Steven Shavell eds., 2007).

[85]On one hand, the stated requirement that efficiencies must be passed through to consumers instantiates a consumer welfare objective. On the other hand, for the analysis of unilateral effects (which some suggest to be the bulk of the cases), it is regarded by many to be mysterious why guidelines’ targets refer not only to the change in the HHI (which might be seen as a proxy for upward pricing pressure) but also to the *level* of the post-merger HHI (which is absent in some models and has the opposite sign in others). However, the overall level of price elevation, which may be seen as proxied for by the HHI level, is positively related to the total welfare cost of a price increase (because marginal deadweight loss rises with the price elevation) but negatively related to the consumer welfare cost of a price increase (because marginal consumer welfare loss is determined by the quantity, which is negatively related to the price elevation). *See* Louis Kaplow, *On the Choice of Welfare Standards in Competition Law*, *in* THE GOALS OF COMPETITION LAW 3, 18–25 (Daniel Zimmer ed., 2012). For additional reasons noted in Section D, a higher price level tends to be related to the total welfare effects of price increases (even their sign).

[86]*See, e.g.*, Michael L. Katz & Howard A. Shelanski, *Mergers and Innovation*, 74 ANTITRUST L.J. 1, 54–55 (2007); Gary L. Roberts & Steven C. Salop, *Efficiencies in Dynamic Merger Analysis: A Summary*, 19 WORLD COMPETITION 5 (1996).

[87]N. Gregory Mankiw & Michael D. Whinston, *Free Entry and Social Inefficiency*, 17 RAND J. ECON. 48 (1986).

[88]These and other second-best lessons have also been analyzed in a multisector general equilibrium setting. *See* Louis Kaplow, *Competition Policy in a Simple General Equilibrium Model*, NBER Working Paper No. 28482 (2021) (offering an analysis that extends prior literature on the social optimality of entry by explicitly examining competition policy, incorporating possible effects thereof on firms’ cost functions, and examining general equilibrium with multiple sectors).

effects more credible—do not analyze efficiencies, and those studies that do find that efficiencies that do arise may appear a few years after the merger.[89] Section B will explain the centrality of entry to efficiency analysis, and that too does not usually occur immediately. In many respects, the analysis of merger efficiencies involves medium- and long-run predictions, time frames over which the two welfare standards tend to be closer in their prescriptions. And if, as this Part's introduction suggests, optimal policy is addressed to the present discounted value of all merger effects, then the standards' prescriptions will tend to be closer.[90]

Second, if the primary argument for favoring consumer over total welfare is a concern for the overall distribution of income, a total welfare standard dominates when the income tax (and transfer) system may also be adjusted. Economists have long favored achieving distributive objectives through taxes, with other policies (public goods, environmental regulation) aimed at efficiency: the latter maximize the social pie, and the former is the least inefficient means of redistributing it.[91] Moving any policy, such as merger regulation, in the direction of maximizing total surplus and simultaneously adjusting the tax and transfer system to hold the distribution of income constant will, in simple models, enable a Pareto improvement, benefitting those at all levels of income.[92] In addition, a conjecture is that, in the long run, political forces will tend to be in distributive equilibrium, one that may evolve over time but that reflects, perhaps with some lag, shifting views and forces on the subject. In particular, it may not be plausible to suppose that the same political actor (say, a legislature) would simultaneously wish to inefficiently promote greater redistribution through a specialized channel (like competition policy) while intentionally redistributing less through the more direct tax channel.[93] The efficient combination, as mentioned, can benefit all income groups. Of course, special interests and public misunderstandings of various policies' effects can generate different, more detrimental outcomes.

B. Entry and Efficiency

Following conventional usage, efficiencies in this article are taken to refer to a reduction in the merged entities' costs (or quality-adjusted costs). However, a merger may also influence productive efficiency through effects on entry,[94] which is usually considered only in connection with predicting a merger's anticompetitive effects. The standard argument is that, if a merger as

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[89]*See, e.g.*, Orley Ashenfelter, Daniel Hosken & Matthew Weinberg, *Did Robert Bork Understate the Competitive Impact of Mergers? Evidence from Consummated Mergers*, 57 J.L. & ECON. S67, S94–S95 (2014); Albert Sheen, *The Real Product Market Impact of Mergers*, 69 J. FIN. 2651 (2014) (finding that mergers of product market competitors reduce prices two to three years after mergers, attributing this to operational efficiencies and lower costs).

[90]Because of discounting and transition effects, the standards will not in general fully converge in a given case. However, when taking a long-run ex ante perspective of merger rules, as suggested in Section D, the standards may differ even less than may appear from the present discussion.

[91]This preference is expressed, for example, by Williamson, *supra* note 12, at 28.

[92]For formal analysis, see Louis Kaplow, *Market Power and Income Taxation*, AM. ECON. J.: ECON. POL'Y (forthcoming), and for relevant qualifications, see LOUIS KAPLOW, THE THEORY OF TAXATION AND PUBLIC ECONOMICS, ch. 6C (2008). A previous, informal treatment of the general subject is Louis Kaplow, *On the (Ir)relevance of Distribution and Labor Supply Distortion to Government Policy*, J. ECON. PERSP., Fall 2004, at 159, with application to competition policy in Kaplow, *supra* note 85, at 10–14. For discussion of some of the confusion about and inattention to the use of the income tax to achieve distributive objectives in the antitrust setting, see *id*. at 11 n.11.

[93]*See* Kaplow, *supra* note 85, at 14–18.

[94]Analysis of product repositioning is similar.

an initial matter boosts price, that may induce entry which, in turn, will mitigate the resulting price increase—probably not immediately but perhaps fairly soon.

This formulation has many deficiencies.[95] For present purposes, the focus is on one: Supposing that a merger is allowed and entry in fact results in this fashion, is that good or bad for welfare?[96] It is taken to be good because prices will fall partway back to the premerger level. But because entry is usually costly (otherwise prices would always be kept down to cost), additional productive resources will be consumed in the process. Moreover, as is familiar from prior work, including Mankiw and Whinston's article, entry can be inadequate or excessive from a social perspective in equilibrium when there is imperfect competition. Specifically, when goods are homogeneous or when variety is not valued very highly, entry tends to be excessive, in which case a merger that induces entry would be socially worse on that account.[97] (This line of literature emerged, starting in the 1970s, to correct the misimpression—still widespread in competition policy circles—that entry tends systematically to be socially valuable.) On the other hand, if entry enhances variety that is valued enough that the pre-merger equilibrium involved too little entry, then entry would raise welfare to that extent. This analysis, it should be noted, adopts a total welfare standard; viewing consumer surplus alone, it can be desirable to subsidize or otherwise induce inefficient entry in order to reduce prices.

Merger policy may affect entry in yet another way, by changing the incentives to enter for the purposes of being bought out by an incumbent dominant firm.[98] Taking the case of a homogeneous goods industry, when entry contributes nothing to variety, such entry can be excessive and thus inefficient. Here, as some simulation work has shown, a strict merger policy can promote total welfare precisely because it discourages ex ante entry.[99] In this case as well, therefore, a central effect of merger policy on productive efficiency can be through how it affects entry over the long run, and in instances in which entry tends to be socially excessive, a stricter merger policy may be advantageous. However, when entry sufficiently enhances variety or innovation, entry may be socially insufficient. The prospect of subsequent acquisitions may thus induce efficient entry that would not otherwise occur, but it also may result in forfeiting

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[95]For a criticism of the core logic, see Willig, *supra* note 76, at 307–10, who explains that the main reason easy entry favors allowing mergers is due to an inference from the merging parties' rationality constraint: if entry is indeed easy, firms would not find it profitable to merge for anticompetitive reasons, so we can infer that the proposed merger is probably efficient (and entry, although easy, will not in fact occur). Another point, noted in Farrell & Shapiro, *supra* note 47, at 703, is that merging parties' claims that there are important economies of scale may contradict their suggestion that entry is easy. Conversely, an agency challenging a merger contradicts itself if it disagrees with both of those contentions.

[96]For further analysis, see Louis Kaplow, *Entry and Merger Analysis* (unpublished manuscript), and Kaplow, *supra* note 88.

[97]This point is noted in Michael D. Whinston, *Antitrust Policy Toward Horizontal Mergers*, *in* 3 HANDBOOK OF INDUSTRIAL ORGANIZATION 2369, 2388 (Mark Armstrong & Robert H. Porter eds., 2007), but seems largely unnoticed beyond that.

[98]The seminal article is Eric Rasmusen, *Entry for Buyout*, 36 J. INDUS. ECON. 281 (1988), and a broader analysis appears in Kaplow, *supra* note 96. As Rasmusen emphasizes, with incumbent oligopolists, there is a free-rider problem with respect to buying out entrants, so the ex ante incentive to enter for buyout (that is, when entry would not otherwise be profitable) may be absent.

[99]*See* Gautam Gowrisankaran, *A Dynamic Model of Endogenous Horizontal Mergers*, 30 RAND J. ECON. 56 (1999); Ben Mermelstein, Volker Nocke, Mark A. Satterthwaite & Michael D. Whinston, *Internal Versus External Growth in Industries with Scale Economies: A Computational Model of Optimal Merger Policy*, 128 J. POL. ECON. 301 (2020). Interestingly, in these simulations, a stricter merger policy not only raises total welfare but also incumbent firms' profits, while slightly reducing consumer surplus because consumers lose the temporary benefits from inefficient entry.

competitive gains that disruptive entry would otherwise generate.[100] And in yet other settings, the prospect of subsequent acquisitions may have little effect on ex ante entry.

C. Pass-through

Competition agencies that employ a consumer welfare standard relatedly require that efficiencies count only to the extent that they would be passed on to consumers, which in turn means that the savings must be in marginal (variable) costs and that demand curvature must be estimated to determine the pass-through rate. This Section considers aspects of the subject that are most relevant for present purposes.

First, observe that the post-merger entry analysis in Section B depends on pass-through. Specifically, the more efficiencies are passed through, and thus the less the merger initially raises price (if it does so at all), the less incentive there is for entry. Accordingly, pass-through analysis can be relevant under a total welfare standard as well.

Second, it has already been mentioned that the degree of pass-through depends very much on the time frame. In a long-run (even if imperfectly competitive) equilibrium, all costs are passed through, price equals average cost, and consumer and total welfare coincide.[101] Relatedly, which costs are variable depends on the time period: in the very short run, most costs are fixed; and in the very long run, all are variable. Hence, to the extent that pass-through is relevant, it is important to specify the appropriate time frame. The more long run the perspective, the more costs will be variable and thus passed through.[102]

Third, although determining pass-through can be challenging, Gregory Werden's 1996 article instructs us that the direction of the net price effect in a unilateral effects analysis depends only on whether the magnitude of upward pricing pressure (at the premerger price) exceeds the magnitude of marginal cost savings.[103] Put another way, the level of upward pricing pressure indicates how much marginal cost reduction would be necessary in order for the merger not to raise prices at all. More recent analysis indicates how the degree of the predicted price change can best be estimated, however imperfect those methods may be.[104]

D. Efficiencies and Asymmetries

Many horizontal mergers are between firms that are asymmetric in terms of size and capabilities, and they arise in industries in which other firms are asymmetric on various

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[100]*See, e.g.*, Thomas Wollmann, *Stealth Consolidation: Evidence from an Amendment to the Hart-Scott-Rodino Act*, 1 AM. ECON. REV.: INSIGHTS 77 (2019).

[101]These results hold precisely only when the overall process of entry, investment, and exit arises in a setting in which all rents are dissipated, which is to say that ex ante profits are zero—a property of many dynamic models but not one that we can be confident closely describes all actual industries.

[102]Note that if pass-through is limited in the first year of a merger but is likely to be substantial a few years out, it is unlikely that the merger would thereby induce entry, say in year two, because entry tends to entail sunk costs and a rational entrant would anticipate that the price increase induced by the merger was temporary.

[103]*See* Gregory J. Werden, *A Robust Test for Consumer Welfare Enhancing Mergers Among Sellers of Differentiated Products*, 44 J. INDUS. ECON. 409 (1996); *see also* Carl Shapiro, *Mergers with Differentiated Products*, ANTITRUST, Spr. 1996, at 23.

[104]*See* Nathan H. Miller, Marc Remer, Conor Ryan & Gloria Sheu, *Pass-Through and the Prediction of Merger Price Effects*, 64 J. INDUS. ECON. 683 (2016).

dimensions as well. By contrast, much theoretical analysis of mergers has been undertaken in models with symmetric firms, which presents some challenges for applications.[105] Moreover, these asymmetries arise endogenously and develop over time from decisions about entry and exit as well as investment.

These features, often abstracted from, are important in understanding individual mergers, particularly because in many respects the analysis involves predictions about the merged entity's future evolution as well as that of its rivals. For example, with homogeneous goods industries and Cournot competition, many anticompetitive mergers that would not otherwise be profitable under conventional, static analysis[106] may become so once account is taken of subsequent investment decisions (specifically that the merged firm will reduce investment).[107] Moreover, they are relevant to formulating merger policy because the criterion for blocking mergers influences ex ante entry and investment decisions, a point already raised in Section B in discussing entry for buyout.

A wholly different form of asymmetry involves differences across the economy. Most theoretical and empirical analysis assumes (often implicitly) that the entire economy outside the sector under investigation is perfectly competitive. This is often formally implemented through the device of an outside good that is taken to be supplied at marginal cost.[108] Yet it has long been understood that much of the economy is imperfectly competitive and to widely varying degrees.[109] In that case, improving competition in the sector under examination tends to increase deadweight loss in other, distorted sectors by drawing resources from them (and conversely for worsening competition in a given sector, which beneficially moves resources into other, distorted sectors). A more complete analysis of this multisector general equilibrium problem, taking into account effects on entry in other sectors, the nature of demand, and so forth is beyond the scope of this investigation but can be expected to have first-order implications for the overall efficiency consequences of horizontal mergers and thus for optimal merger policy.[110]

III. Efficiencies in a Merger Assessment Framework

This Part addresses how the analysis of efficiencies should be incorporated in the overall

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[105]This limitation also applies to broader analysis of competition that likewise focuses on symmetric firms, such as in the previously cited papers of Mankiw & Whinston, *supra* note 87, and Kaplow, *supra* note 88.

[106]*See, e.g.*, Stephen W. Salant, Sheldon Switzer & Robert J. Reynolds, *Losses From Horizontal Merger: The Effects of an Exogenous Change in Industry Structure on Cournot-Nash Equilibrium*, 98 Q.J. ECON. 185 (1983).

[107]*See* Steven Berry & Ariel Pakes, *Some Applications and Limitations of Recent Advances in Empirical Industrial Organization: Merger Analysis*, 83 AM. ECON. REV. (PAPERS & PROC.) 247 (1993). Note that, in such cases, a merger may not raise price in the short run but only in the long run, as capacity is reduced.

[108]It is often further assumed that this good is additively separable and not subject to diminishing marginal utility, so that there are no income effects. *See, e.g.*, Mankiw & Whinston, *supra* note 87, at 50 & n.5.

[109]*See, e.g.*, Ian R. Domowitz, R. Glenn Hubbard & Bruce C. Petersen, *Market Structure and Cyclical Fluctuations in U.S. Manufacturing*, 70 REV. ECON. & STAT. 55 (1988); Jan De Loecker, Jan Eeckhout & Gabriel Unger, *The Rise of Market Power and the Macroeconomic Implications*, 135 Q.J. ECON. 561 (2020); Robert E. Hall, *New Evidence on the Markup of Prices over Marginal Costs and the Role of Mega-Firms in the U.S. Economy*, NBER Working Paper No. 24574 (2018). For further discussion and criticism, see Susanto Basu, *Are Price-Cost Markups Rising in the United States? A Discussion of the Evidence*, J. ECON. PERSP., Summer 2019, at 3, and Chad Syverson, *Macroeconomics and Market Power: Context, Implications, and Open Questions*, J. ECON. PERSP., Summer 2019, at 23.

[110]*See* Kaplow, *supra* note 88. As alluded to in note 85, one implication may be to favor stricter merger policy in industries with higher markups, ceteris paribus.

framework for the assessment of horizontal mergers. It begins by elucidating pertinent principles of optimal decision-making and information collection in merger analysis.[111] Although the concept of decision analysis is sometimes invoked in the literature[112] and most of its features are deeply ingrained in economists' thinking and intuitively understood by lawyers, judges, and many others, it is useful to make key elements explicit. As will be seen, standard depictions of existing practice diverge substantially from these principles, including references to the so-called efficiency credit and invocations of burdens of proof with regard to efficiencies. Although it seems likely that internal agency analysis and judicial decision-making do not in practice fully reflect these divergences, merger practice and policy would benefit from a sharper understanding of the pertinent precepts.

A. Decision-making

Decision-making under uncertainty involves an iterative process of information collection and assessment. It is iterative because, particularly at early stages, the decision will not just be whether to (sue to) block or to allow a merger, but what additional information if any to collect. For U.S. agencies, at the conclusion of the first stage they decide whether to issue a second request or to step aside, allowing the merger. Throughout, an agency is also deciding which information to collect and in what order.

To explain how this process should optimally be conducted, the discussion here proceeds in two steps. This Section considers how the block/allow decision should be made with whatever information is in hand. The next Section returns to the beginning in order to consider how optimally to collect information along the way. The final Section relates the analysis to contrary pronouncements by antitrust scholars, agencies, and courts.

At its core, the decision whether to block (or impose significant conditions on) a horizontal merger involves some sort of balancing of benefits and costs. The benefit is avoiding anticompetitive effects, taken here for expositional convenience to be price increases on sales of given qualities and varieties. The cost of blocking a merger is the loss of efficiencies.[113] As discussed in Section II.A, depending on how the objective is understood, efficiencies may be viewed in their totality or limited to those that offset short-run anticompetitive effects—that is, marginal cost reductions that would be passed on to consumers sufficiently to nullify or reverse what would otherwise be an anticompetitive price increase.

How should a decision-maker proceed in light of the inevitable uncertainty in attempting to predict the future, both with and without the merger? Standard decision theory calls for the use of (Bayesian) prior probabilities, to be updated by the information in the case at hand. As a

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[111]This Part adopts the decision-theoretic framework that is typically employed by agencies, although a number of factors—such as ex ante entry (explored in Section II.B), strategic considerations in merger proposals, and the prospect of subsequent mergers—make a mechanism design approach more apt. Most of the ideas developed here are applicable under both formulations. For a formal comparison that emphasizes the differences between the approaches, see Louis Kaplow, *On the Optimal Burden of Proof*, 119 J. POL. ECON. 1104 (2011).

[112]*See, e.g.*, Katz & Shelanski, *supra* note 79.

[113]This weighing of anticompetitive effects and efficiencies from blocking a merger oversimplifies in a number of additional respects that will be set aside in most of the analysis: ex ante effects of the anticipated application of merger rules, other dynamic considerations associated with the repeated application of rules to an evolving industry, endogenous merger proposal decisions, administrative costs, and more. The basic lessons advanced here and corresponding criticisms of conventional rubrics would carry over, albeit with various supplements.

practical matter, these components blur: cases must be categorized to determine the applicable prior probabilities and converting information into a likelihood ratio—which indicates how the prior probabilities should be updated—requires prior knowledge of the information's relevance.

Optimal decision-making is comparative. Whether in promulgating a regulation, deciding whether to make an investment, or choosing a medical treatment, no sensible decision-maker would employ a default protocol that focused on only one side of the balance—here, the analogue being a substantial consideration of anticompetitive effects before contemplating merger efficiencies. How can one determine which way a scale is likely to tip—and whether by a little or a lot—by zooming in on only one side of the balance?

Moreover, information processing—formulating a likelihood ratio—is itself comparative. The likelihood ratio used for updating prior probabilities is defined as the likelihood we would see the information given the truth of one hypothesis (that the merger generates anticompetitive effects) divided by the likelihood we would see that information given the truth of the other hypothesis (that the merger generates efficiencies). Obviously, one cannot determine the likelihood ratio without regard to its denominator, which renders mysterious (really, baffling) many depictions of the merger decision-making process that are examined in Section C.

To make this point concrete while introducing an essential feature of merger analysis, consider the individual rationality constraint, which is a focus in some economics literature on the effects of horizontal mergers. In the present context, this concept refers to the supposition that, if parties are proposing a merger, they find it profitable.[114] Furthermore, take the conventional view that parties expect to profit from proposed mergers for one of two (non-mutually exclusive) reasons: anticompetitive effects and efficiencies.[115]

Merger proposals are associated with an array of possible combinations of these two effects. A fundamental feature of statistical inference is that (typically) evidence bearing on one possibility influences what inference should be made about the other. For example, if anticompetitive effects are likely to be large, they alone could motivate the merger—indeed, this is so even if the merger generates nontrivial *in*efficiencies. From the universe of possibilities before we considered anticompetitive effects, a significant range of efficiencies becomes less likely, and in particular the likelihood of significant (positive) efficiencies falls. Conversely, if efficiencies are likely to be large, a merger can readily be motivated without any prospect of anticompetitive effects, making those less likely than before efficiencies were considered. (This observation is independent of the additional point that efficiencies themselves may counteract anticompetitive effects.) To make the interdependence point more sharply, consider settings in which there are two mutually exclusive and exhaustive interpretations; then anything that bears on the probability of one bears mechanically—one to (minus) one—on the probability of the other.

A further type of interdependence arises when particular evidence can only be understood comparatively, by reference to both sorts of explanation. This logic can be illustrated by attempts to determine the motivation for a particular merger proposal by drawing on internal documents. Whenever the meaning or import of some document is ambiguous, it is impossible to assess the likelihood of one interpretation except by reference to other possible interpretations.

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[114]More precisely, they find it sufficiently profitable to justify the costs of the merger itself: management time, inevitable costs of integration, disruption while a merger is pending, fees for professionals, and costs of agency review.
[115]Because of this article's focus on efficiencies, other possible merger motives—such as empire building, hubris (optimism bias), tax savings, and exploitation of stock market misvaluations—are set to the side here.

Indeed, for there to be ambiguity, there have to be at least two competing interpretations (hypotheses), and it is incoherent to purport to resolve ambiguity by confining attention to only one of them.

The foregoing logic applies not only to probabilities but also to magnitudes. A likely but trivial anticompetitive effect may not motivate a merger in the absence of efficiencies because of the need to incur proposal, filing, and integration costs. Likewise, a large rather than a trivial efficiency gain is necessary to motivate merging parties' incurring substantial transaction costs in the absence of anticompetitive effects.

To summarize, for both conceptual and practical reasons, merger analysis should in many respects engage in an integrated assessment of the benefits and costs of blocking a merger. This is no different from any other type of decision. A diagnostic test in medicine by definition involves differential diagnosis. That is, a test is diagnostic precisely to the extent that it distinguishes different explanations for a patient's symptoms.[116]

B. Information Collection

Merger decision-making requires information. Information collection decisions are made in the large (issuing a second request) and in the small (whom to interview, how much data to demand, whose depositions to take). Information collection and associated analysis are expensive and subject to diminishing returns, and delay in merger assessment is costly.

As a consequence, when considering whether to collect a particular, incremental quantum of information, it is necessary to assess whether its value is worth the cost. In addition, one must decide in which order to collect information as well as when it makes sense to work in parallel or possibly to combine processes rather than to proceed serially, one step at a time. Precise optimization confronts what is referred to as the curse of dimensionality (there are too many possible permutations)[117] and other obstacles (how does one value what one does not yet know but may, or may not, learn?). Nevertheless, some commonsense guidelines can be offered.

Begin briefly with the concept of the value of information. In the classic decision analytic formulation, one either makes a decision with the information in hand (block or allow the merger) or instead collects a single, predefined clump of additional information, after which one will make the decision.[118] The value of information is the difference between the expected value of the more-informed decision and the value of the best of the two decisions one could make as currently informed. The additional information should be collected if and only if this differential value exceeds the costs of collection, processing, delay, and so forth.

What determines this value of information? The answer lies at the intersection of how much would be learned and the likelihood that the information would swing a decision, thereby producing a better outcome. Beginning with the latter, when the decision is fairly clear additional information tends not to be that valuable (although it is possible that it could be highly informative, changing a decision with sufficient probability). For the former, additional

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[116]"Diagnostic" derives from a Greek word meaning "able to distinguish."

[117]*See* RICHARD ERNEST BELLMAN, DYNAMIC PROGRAMMING ix (1957); RICHARD ERNEST BELLMAN, ADAPTIVE CONTROL PROCESSES: A GUIDED TOUR 94-95 (1961).

[118]*See, e.g.*, HOWARD RAIFFA, DECISION ANALYSIS: INTRODUCTORY LECTURES ON CHOICES UNDER UNCERTAINTY (1968). For a simple exposition and an illustration aimed at a legal audience, see HOWELL E. JACKSON ET AL., ANALYTICAL METHODS FOR LAWYERS 22–25 (3d ed. 2017).

information will be more illuminating when two things are (each) true: when there is more uncertainty up front, and when the information will do more to resolve that uncertainty. Current ignorance and likely scrutability jointly determine how enlightening additional information will be. Ignorance about efficiencies is great, but limits of scrutability may weigh against extensive inquiries. Relatedly, devising ways to improve the latter should be prioritized.

Consider now the question of optimal sequencing. If one plans to collect everything under the sun, leaving no stone unturned, and if one knows in advance where all the stones are and there are no synergies in how and when they are exhumed, one can proceed forthwith. But reality is often otherwise to a substantial degree, so guidance is helpful.

First, suppose—unrealistically, as we will see—that all possible information consists of discrete units. Which should be collected first? The answer, in intuitive terms, is to prioritize information with the highest diagnosticity to cost ratio. If two sets of information had the same cost to collect and only one could be collected, we would prefer the more informative one. And if there were two equally informative sets, we would prefer the cheaper one. Generalizing, the ratio of diagnosticity to cost—the amount we would learn per unit of expenditure—indicates the relative values of different clumps of information that we might collect.

This simple characterization has powerful implications. Suppose that there are five distinct pieces of information an agency can collect about anticompetitive effects and another five on efficiencies. If the agency could collect only a single clump of information, then (given some additional assumptions), it would be fifty-fifty whether the agency should collect additional information on anticompetitive effects or on efficiencies. More starkly, suppose that the agency could collect five clumps. The likelihood that all of them should pertain to anticompetitive effects is exceedingly small (1 in 252). Suppose further that—as is usually the case—there are diminishing returns in investigating either issue. Then the likelihood that the agency should start with anticompetitive effects and stick with it until it was exhaustively assessed, before switching to efficiencies, is much smaller, if that is even possible given the preceding point.

A number of additional factors are relevant. First, if, say, anticompetitive effects were inherently more scrutable (or likely to be so in a given case) than efficiencies, this would moderate the lesson. However, because the starting point is so extreme after one has proceeded a good ways, it would take exceptional differences to significantly modify the basic point.

Second, a key value of information in merger investigations (and in many other settings) is that early information provides clues about where it makes sense to look next. That is, the value of a given additional piece of information will be importantly influenced by what the agency has already learned. Early information tells an agency where to explore and how costly it is likely to be to generate further information.

These intuitive points are undoubtedly reflected in practice to some degree. Note that there are also interactions across anticompetitive effects and efficiencies. Section A identified conceptual linkages, such as through imputation of intent predicated on profit maximization. Much information will generate cross-fertilization. Broader understanding of an industry helps guide learning about particular elements. Features of firms' cost functions and capacity limitations revealed in examining efficiencies also illuminate the nature of competitive interaction, and assessing the ease of entry for purposes of assessing anticompetitive effects often involves understanding scale economies and other matters that bear on efficiencies. Moreover, information learned while investigating one issue will clarify the diagnosticity and cost of collecting further information about both issues. Stepping back, an agency cannot fully

articulate the optimal path of inquiry up front. It can only form conjectures about the information with the highest diagnosticity/cost ratio, collect the first (few) item(s), and then, as with GPS guidance, recalculate its route. That recalculation can change the order within and across issues. Substantial a priori separation, therefore, comes at a considerable cost.

A qualitatively different and important challenge is that the whole idea of sequential siloing—investigating one issue first, the other only afterwards—presupposes that distinct clumps of information pertain only to one or the other issue, but in key respects this is untrue. As noted in Section A, through the assumption of profit maximization by the merging parties, there is an inherent interrelationship. Recall the example of internal documents that pertain to merging firms' understanding of the industry and rationale for the merger. Or information on the production function, which bears on the nature of competitive interactions and on efficiencies. More broadly, recall as well the point that one cannot form a likelihood ratio without a denominator. This holds not just broadly but also as to particular fragments of information. In sum, the notion that information falls into two mutually exclusive sets is a simplification that, in the present context, can be more misleading than helpful.

There is another, rather different dimension regarding optimal information collection: the tradeoff of synergy and option value. To see this most readily, consider a situation in which there are two sets of information that one may collect. (As per the foregoing, each may concern anticompetitive effects, efficiencies, or both.) Should they be collected together or sequentially?

The primary value of combination is the possibility of synergies. This is easiest to see when considering an interview or deposition of an individual who may have knowledge related to both issues, a phenomenon that is frequent in merger investigations.

The primary value of sequencing is option value. If one starts with the first set of information (presumably, the one with the higher diagnosticity/cost ratio), it is possible that what the agency will learn will render it suboptimal to collect the second. The first may be so informative that one should cease information collection, deciding at that point to block or allow the merger. Or the first inquiry may reveal information that renders the second redundant. To be sure, the choice to eschew the second often will not be free—one loses whatever incremental value remains—but if the cost is large enough, there will be a net expected savings from eschewing collection of the second. This savings, however, is possible only when one proceeds sequentially, leaving open the option to stop, rather than proceeding in combination.

Agencies often face substantial time pressure, which tends to make combination or parallel processing necessary. However, there are also capacity constraints. Hence, decisions on sequencing and combined collection are central to an optimal information collection process.

A key implication of many of these lessons is that the analysis of efficiencies should, a priori, often be interspersed, intertwined, and/or conducted in parallel with that of anticompetitive effects. Combining the lessons of Section A, we see that optimal information collection and decision-making each involve substantial integration of the consideration of anticompetitive effects and of efficiencies.

C. Divergences in Existing Merger Analysis

This Section juxtaposes the preceding analysis with what agencies and courts state that they do and what, as best we can speculate, they actually do. As we will see, official pronouncements diverge substantially from the principles of optimal information collection and decision-making, but in practice the difference is probably less than meets the eye.

Regarding decision-making, the locus of most official pronouncements, there appears to be a conundrum. On one hand, the U.S. Horizontal Merger Guidelines articulate a gauntlet of prerequisites for efficiencies to be cognizable,[119] and it is widely stated that efficiencies (virtually?) never swing a decision from blocking to allowing a merger. On the other hand, despite the fact that most nontrivial horizontal mergers generate at least some upward pricing pressure, agencies allow most of them and lose some of the challenges they bring.[120] Moreover, this lenity is rationalized by the presumed ubiquity of efficiencies that mergers may generate.[121]

Reflection reinforces this conundrum. A priori, various possible and proposed horizontal mergers are each associated with some level of anticompetitive effects and some degree of efficiencies. In more formal parlance, there exists some joint distribution of these two traits. A particular (and peculiar) view about this joint distribution is required to rationalize the aforementioned state of affairs in which most mergers are allowed due to presumed efficiencies but efficiencies are rarely if ever sufficient to overcome anticompetitive effects when they are found. The distributions of anticompetitive effects and of efficiencies must not be normal—either in the formal sense or more crudely, indicating some central tendency, with more extreme values being decreasingly likely. Perhaps we have bimodal distributions and, moreover, there is a particular interdependence between anticompetitive effects and efficiencies: most mergers have nontrivial efficiencies and at most negligible anticompetitive effects (and hence most are not challenged), and some have significant anticompetitive effects and trivial efficiencies (and hence are challenged). But it is rarely the case that the two are close (or, when they are, it just so happens that anticompetitive effects virtually always outweigh efficiencies; the reverse being a rare event). Given the huge variety of industries, firms, and merger partners as well as the substantial uncertainty surrounding predictions of both anticompetitive effects and efficiencies, such would be an astounding coincidence. What's going on? And what would we think of any other agency that had undertaken a form of cost-benefit analysis for decades and claimed that decisions were never close and, accordingly, costs essentially never had to be quantified?[122]

A further puzzle relates directly to the analysis in Sections A and B. It is generally optimal to integrate inquiries into anticompetitive effects and efficiencies, yet standard rubrics suggest instead that they are sequentially siloed:[123] anticompetitive effects are analyzed first and,

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[119]The U.S. Merger Guidelines relegate efficiencies to a late, modest section. The topic sentences introducing three key points begin as follows: "The Agencies credit only those efficiencies . . . ." "Efficiencies are difficult to verify and quantify . . . ." "Efficiency claims will not be considered if . . . ." U.S. Merger Guidelines, *supra* note 1, at 30. *See generally* Daniel A. Crane, *Rethinking Merger Efficiencies*, 110 MICH. L. REV. 347 (2011) (broadly criticizing the U.S. Merger Guidelines' subjection of efficiencies to greater proof requirements than those for anticompetitive effects).

[120]For example, from 2003–2012, among mergers sizeable enough to require reporting in the United States, second requests were issued in 3.1% of the cases and 60% of those generated some form of opposition. *See* JOHN KWOKA, MERGERS, MERGER CONTROL, AND REMEDIES: A RETROSPECTIVE ANALYSIS OF U.S. POLICY 9–10 (2015). Unfortunately, such data do not distinguish horizontal from other mergers, so the relevant rate is higher to an unknown (and perhaps substantial) degree.

[121]*See, e.g.*, U.S. Merger Guidelines, *supra* note 1, at 29 ("[A] primary benefit of mergers to the economy is their potential to generate significant efficiencies and thus enhance the merged firm's ability and incentive to compete, which may result in lower prices, improved quality, enhanced service, or new products.").

[122]The text focuses on agencies—because few cases reach the courts. There, we have a selected sample, and if only very strong cases were brought, efficiencies might rarely exceed anticompetitive effects. However, it is hard to reconcile this explanation from the courts' perspective since they find against the agencies with some regularity.

[123]The text here abstracts from other considerations, such as entry. *See supra* Section II.B.

typically, efficiencies are never reached.[124] This suggests that most investigations, which do not result in a challenge, allow mergers on the grounds of no anticompetitive effects despite the aforementioned general tendency for horizontal mergers to create upward pricing pressure and, the key here, that the likely magnitude of any countervailing efficiencies has not been analyzed.

This depiction does not make sense. This Section first presents and criticizes an emerging, unofficial rationale that is sometimes referred to as involving an efficiency credit. Then it offers conjectures about actual practice, including how that may diverge from official pronouncements. Finally, it remarks on some ambiguities and confusion associated with burdens of proof in merger cases regarding the assessment of efficiencies.

1. Efficiency Credit Rationalization

First mentioned in the 1980s in the United States and increasingly noted more recently (albeit informally) is the notion of an efficiency credit, akin to the standard deduction in the U.S. individual income tax.[125] The concept and its underlying motivation are as follows.

Efficiencies are ever present but difficult and costly to analyze in merger investigations. Therefore, it makes sense to impute some degree of efficiencies—the efficiency credit—automatically. With that credit in mind, an agency or a court first examines anticompetitive effects. If, as happens frequently, predicted anticompetitive effects are below the efficiency credit, the merger is allowed (without any explicit analysis of efficiencies in the merger at hand). Moreover, this credit is fairly large, so that most cases are resolved in this manner. If, however, anticompetitive effects exceed the credit, we then examine efficiencies proffered by the merging parties. Importantly, because notable efficiencies have already been imputed automatically, merging parties' efficiency proffers matter only if they demonstrate efficiencies in excess of this credit. Furthermore, because the credit is large and efficiencies are difficult to predict, rarely do the parties convince an agency or a court that efficiencies exceed this credit. Accordingly, actual efficiencies in the case at hand are almost never big enough to exceed the initially demonstrated anticompetitive effects, so these mergers are blocked.

The efficiency credit notion seems to help understand what is said and done. However, on examination, there are serious problems with this methodology and rationale.

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[124]A partial justification is that agencies must engage in some analysis to determine whether there exists nontrivial competitive overlap between the merging parties' activities, that is, whether the merger is horizontal to begin with. (Of course, some vertical or other mergers might also be analyzed, but most attention is restricted to horizontal mergers, which is the domain of interest in this article.) Accordingly, the reader should interpret the discussion in the text to refer, roughly speaking, to all analysis that follows the initial determination of competitive overlap.

[125]*See* Frederick R. Warren-Boulton, *Merger Policy and Enforcement at the Antitrust Division: The Economist's View*, 54 ANTITRUST L.J. 109, 112 (1985) ("I should preface this discussion by saying that the very existence of 'safe harbor' Herfindahls in the *Guidelines* already implies a 'standard deduction' for efficiencies. Such a standard deduction is implicit in a policy that allows mergers that increase concentration to some extent, even without a showing of any efficiency gains. Alternatively, the parties can choose to itemize efficiencies, rather than just take the standard deduction, by presenting an explicit efficiency defense."); *see also* Kaplow & Shapiro, *supra* note 84, at 1162–69; Katz & Shelanski, *supra* note 86, at 11 & n.28; Joseph Farrell & Carl Shapiro, *Antitrust Evaluation of Horizontal Mergers: An Economic Alternative to Market Definition*, B.E. J. THEORETICAL ECON., Jan. 2010, art. 9, 1. Due to the latter writings (and reflecting in part that Joseph Farrell and Carl Shapiro were, respectively, the chief economists at the FTC and the Antitrust Division at the time of the 2010 revisions to the U.S. Merger Guidelines), this way of thinking has become more widespread. *See, e.g.*, Herbert Hovenkamp, *Antitrust Balancing*, 12 N.Y.U. J.L. & BUS. 369, 379–81 (2016). Nevertheless, it remains an unofficial rationale.

An initial and obvious question concerns how the efficiency credit is set. Because we are examining an informal and mostly unstated rubric, no explicit articulation is available. (Some commentators have posited various levels, such as a level sufficient to offset upward pricing pressure of five percent, but these statements are usually offered for expositional purposes.)

In principle, the appropriate level of such a credit should be empirically based, reflecting our Bayesian prior probabilities concerning perhaps the usual or average level of efficiencies. Setting aside what these priors may be, there is a further question: Is there one credit for all mergers? Regardless of the industry? The size of the merging parties? Their relationship (whether two merging hospitals are adjacent or far apart; whether the parties' supply chains potentially overlap)? The nature of the technology? Anything regarding non-merger alternatives for attaining the efficiencies? And so forth.

Indeed, any clean separation between the pertinent Bayesian priors and the information developed regarding a particular proposed merger that may be used to update those priors is difficult to maintain. If the credit is not purely one size fits all—independent of all of the foregoing questions—a decision-maker would have to decide which priors should be applied to the case at hand, an assessment that quickly becomes entangled with analyzing the plausible efficiencies in the particular case, something that is to be eschewed under the efficiency credit formulation unless anticompetitive effects exceeding the credit have been established. Relatedly, consider argument before an agency or in court about the proper size of the efficiency credit for the merger under consideration. Does it really make sense, say, to consult conflicting experts on the correct prior—without regard to the plausible efficiencies in the actual merger—rather than considering as well or instead how to predict efficiencies in the actual case? And has this ever happened? Once one starts examining efficiencies specific to the merger under review for purposes of setting the efficiency credit, against which anticompetitive effects are to be compared, the sequential siloing of anticompetitive effects and efficiencies has been substantially breached, which should open the way to optimal information collection and decision-making as outlined in Sections A and B.

Next, suppose (favorably to the efficiency credit construction) that there exists some way to set an appropriate credit without inquiring (much) into the efficiencies in the case at hand. How high (given one's priors) should the credit be set? Perhaps it should equal the mean or median level of expected efficiencies.[126] In that event, however, we should expect that, crudely, half the time when one does reach the inquiry into efficiencies, the best estimate of predicted efficiencies would exceed the credit. Yet (so it is said), this seems (almost) never to happen. That suggests that the credit is set very high, above the likely level of efficiencies in virtually all possible cases. However, such a setting would result in many false negatives—failures to block net undesirable mergers—and, moreover, many of these errors would involve substantial welfare losses. To mitigate this problem, a low credit makes sense. But then sufficient anticompetitive

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[126]The analysis in this Subsection as a whole suggests that an efficiency credit does not make sense or, perhaps, should be set at a fairly low level (and should incorporate at least some case-specific information). Note that if a regime allows the merging parties to challenge the credit as too low in a given case but does not allow the agency to argue that it is too high (as discussed next in the text), then the credit should on that account be set lower. If two-way challenges are welcomed, then the credit, a sort of presumption, would tend not to matter as much. Compare the discussion in Subsection 3 regarding a production burden of proof for efficiencies. Finally, any efficiency credit should not be set solely with regard to the (unconditional) distribution of efficiencies because of the jointness of the distribution of efficiencies and anticompetitive effects and the inferences to be drawn from merging parties' rationality constraint.

effects would often be present and, moreover, defendants would frequently be able to suggest plausible efficiencies in excess of the credit, both contrary to apparent practice.

The efficiency credit also entails an asymmetry that seems difficult to justify.[127] If merging parties are permitted to demonstrate efficiencies above the credit, shouldn't the agency challenging a merger be allowed to demonstrate that efficiencies are below the credit?[128] This apparent prohibition is particularly glaring if the credit is set quite high, as suggested above.

To rationalize the posited efficiency credit requires either that efficiencies (at least in readily identifiable classes of cases) be nearly uniform, which seems highly implausible, or that efficiencies are nearly always substantially inscrutable. The latter has some air of truth,[129] although this may in part reflect the limited attention given to efficiencies (which Part I seeks to begin remedying) and the mismatch of expertise devoted to scrutinizing efficiencies (examined in Section I.C). This limitation also requires that we take a particularly dim view of the ability to assess efficiencies, a stance contradicted by frequent claims that proffered efficiencies in some mergers are extremely weak—in which event the agency should be able to use this fact to lower the credit, perhaps substantially.[130] Furthermore, the argument for sticking to our priors is strongest when our priors are highly informed and precise, whereas the opposite seems to be the case with regard to merger efficiencies. Finally, this stance also supposes that the ability to predict anticompetitive effects is substantially better, which is sometimes true but often is not.

Stepping back, we can see that the concept of an efficiency credit, although it is alluring and superficially rationalizes some current practice, violates fundamental principles of optimal information collection and decision-making. Moreover, because the magnitude of this credit is unstated and cannot readily be extracted from pertinent prior probabilities, it cannot really provide strong guidance to agencies or courts, much less tightly constrain them. Upon examination, much confusion lies beneath the surface. Accordingly, there is reason to suspect that actual practice may be more in accord with the optimal decision framework after all.

2. Conjectures Regarding Existing Practice

This Subsection advances the view that actual practice in agencies and courts is significantly closer to the ideal than formal pronouncements suggest, yet there is likely to be room for improvement. It is difficult to empirically verify or refute these claims. They reflect the common sense point that lawyers, economists, and judges are inclined to act in reasonable ways even when some of their instructions suggest that they behave otherwise, particularly when

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[127]Some degree of asymmetry might be justified by the fact that the possible magnitude of the error of not allowing the merging parties to challenge the credit is unbounded, whereas the error from not allowing the government to revise it downward is bounded by the size of the credit.

[128]For brief prior suggestions, see Richard Schmalensee, *Should New Merger Guidelines Give UPP Market Definition?*, GCP: ANTITRUST CHRON., Dec. 2009, at 2, 4, and Robert Willig, *Unilateral Competitive Effects of Mergers: Upward Pricing Pressure, Product Quality, and Other Extensions*, 39 REV. INDUS. ORG. 19, 26 (2011).

[129]*See, e.g.*, Farrell & Shapiro, *supra* note 125, at 10 ("[M]erger-specific efficiencies are often very hard to predict, even for the firms themselves but especially for antitrust agencies and courts . . . ."); Dennis A. Yao & Thomas N. Dahdouh, *Information Problems in Merger Decision Making and Their Impact on Development of an Efficiencies Defense*, 62 ANTITRUST L.J. 23 (1993).

[130]The U.S. Merger Guidelines themselves suggest that sometimes efficiencies can be analyzed despite the difficulties. *See* U.S. Merger Guidelines, *supra* note 1, at 31. Furthermore, the agencies' commentary offers a number of examples from past cases. *See* FED. TRADE COMM'N & U.S. DEP'T OF JUSTICE, COMMENTARY ON THE HORIZONTAL MERGER GUIDELINES 49–59 (2006) [hereinafter U.S. MERGER GUIDELINES COMMENTARY].

the instructions are vague and oversight is limited. In addition, numerous discussions with and presentations by lawyers and economists at (and formerly at) the agencies and who represent merging parties suggest to me an intermediate view (which I also find when reading between the lines of some judicial opinions). That said, my inputs are limited and noisy: clear central tendencies seem apparent regarding certain aspects but not others, and on some points I have heard diametrically opposed opinions from individuals who should be in the know.

Another interpretive difficulty concerns the interrelated phenomena of cognitive dissonance, motivated reasoning, and reverse engineering. Consider a decision-maker that, upon concluding its analysis, believes that anticompetitive effects slightly outweigh efficiencies. Such a conclusion—or the reverse, in which efficiencies just exceed anticompetitive effects—may well leave the decision-maker feeling queasy because of the significant uncertainties surrounding both factors and difficulties of quantification. Moreover, such a conclusion is readily second-guessed by others: an agency espousing such a view may readily lose in court—or be criticized for underenforcement in the reverse case—and a lower court may fear reversal on appeal. Relatedly, those blocking mergers may be reluctant to admit publically that they are likely sacrificing significant efficiencies, and those allowing mergers may not wish to confess that they are risking the possibility of significant anticompetitive effects that are deemed to be slightly outweighed by efficiencies.

As a decision-maker comes ever closer to resolution in close cases, it may be inclined to believe ever more strongly the arguments favoring the larger consideration and opposing the smaller one. It also may exaggerate the former and understate the latter in making official pronouncements. Across many areas of law and policy, it seems atypical, even in seemingly close cases that generate disagreements, for an authority to suggest that its finding was a difficult call.

We might expect an agency or a court deeming a merger to be on-balance anticompetitive to state both that anticompetitive effects are large and that efficiencies are small or unconvincing, and one allowing a merger to find negligible anticompetitive effects and perhaps also nontrivial efficiencies—even though many cases would be closer. As a consequence, decision-makers that follow the information collection and decision-making protocols elucidated in Sections A and B may articulate decisions that look more like those associated with the granting of a significant efficiency credit, raising the attendant conundrums sketched in the preceding Subsection.

Consider further the behavior of competition enforcement agencies and of courts. In the United States, despite many suggestions of a sequential inquiry into anticompetitive effects and efficiencies, with the latter rarely being reached, there are contrary indications as well. At points, enforcement agencies suggest that the order of presentation in their merger guidelines does not imply such a sequencing of the agencies' analysis.[131] And the 2006 Commentary on the U.S. Merger Guidelines contains a substantial section illustrating the agencies' internal efficiency analysis (indeed, one that dominates by an order of magnitude examples of unilateral effects analysis in homogeneous goods markets, which receive substantial attention in outside

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[131]*See* U.S. MERGER GUIDELINES COMMENTARY, *supra* note 130, at 2 ("The ordering of these elements in the Guidelines, however, is not itself analytically significant, because the Agencies do not apply the Guidelines as a linear, step-by-step progression that invariably starts with market definition and ends with efficiencies or failing assets. Analysis of efficiencies, for example, does not occur 'after' competitive effects or market definition in the Agencies' analysis of proposed mergers, but rather is part of an integrated approach.").

literature and analysis, including by current and former employees of the enforcement agencies).[132]

Regarding agency practice, a key consideration is that, regardless of what their own guidelines, governing legislation, and reviewing courts may say about the structure of merger analysis, agencies are largely free to proceed internally as they wish. This point is particularly powerful in the many instances in which they do not ultimately seek to block (or impose conditions on) a merger. One suspects that internal protocols for information gathering and analysis are informal and flexible, guided by common sense, and (particularly on certain issues and types of evidence) influenced by economists who are trained to think about these matters in the manner outlined above.[133]

Another factor in agency analysis and decision-making, which involves a departure from the decision analysis setting assumed in Sections A and B, is the built-in asymmetry arising from the fact that agencies can drop an investigation at any point, without having to prove anything to any outsider, whereas decisions to block mergers are subject to external review. Even so, this difference does not favor sequencing the analysis of anticompetitive effects and of efficiencies. As already explained regarding inferences from the merging parties' rationality constraint (the imputation of profit maximization), information on each naturally informs the other. If a peek at efficiencies suggests that they are paltry, the agency should be much more aggressive in considering anticompetitive effects, whereas if significant efficiencies seem likely, a failure to find powerful anticompetitive effects seems readily explained and thus should be easier to accept. Likewise, many sources of information relate to both. And so forth.

For these reasons, merging parties often lead their presentations to agencies—both in written submissions and at meetings with agency staff—with the business justifications for the proffered merger, which relate to efficiencies. Furthermore, from the agencies' side of the interaction, there is significant time pressure and, if they are ultimately going to challenge a proposed merger they will need to be prepared to fend off an efficiency defense, which requires that they have undertaken much of the necessary investigation regarding proffered efficiencies.

Courts—particularly trial courts in the United States—proceed more in the open. And trials, like written opinions, necessarily have (at least on the surface) a distinctive order in a single dimension: time, for trials, and the flow of words, for briefs and opinions. It does not follow, however, that this linear presentation mirrors the information processing and decision framework that was employed. (Just as, for example, this article was not conceived, researched, or written linearly, from the first word to the last.)

Suggestions by some experienced practitioners and my interpretation of some court opinions indicate that, at least in many cases, at the end of the day the judge's decision reflects an overall, on-balance judgment on the bottom-line question of whether the merger is likely to reduce welfare or instead to be beneficial or at least neutral. Because formal rubrics, to the extent they are to the contrary, are ambiguous and incomplete (in some respects noted above)[134]

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[132]*See id*. at 49–59.

[133]One suspects that lawyers who have worked much of their careers in the field would tend to absorb many of these principles and may well have understood them from the outset. My own experience speaking with lawyers and economists currently or previously at competition agencies reveals some differences but not gross discrepancies, although my sample is probably biased due to selection effects.

[134]Notably, the efficiency credit is not in official pronouncements, its magnitude must implicitly be determined by the decision-maker in the case at hand, and decisions are not made until the end, when all information has been heard.

and are not deeply familiar to many of the generalist judges deciding these cases, it seems plausible that commonsense principles and bottom-line considerations guide analysis and outcomes. At a minimum, for advocates on either side of the dispute who believe that such methods are to their advantage, there is every incentive to deploy their skills accordingly. Regarding formalistic statements of decision rubrics and the ordering of opinions themselves, this Subsection's discussion suggests that they should be interpreted with a grain of salt.

As already noted, it is difficult to assess empirically and with any confidence the extent to which the foregoing conjectures are true on average or in particular merger investigations and court decisions. Even if actual practice is closer to the first principles articulated in Sections A and B rather than to various contrary pronouncements, the latter are a source of concern. When official criteria contradict sound practice, and when reasoning must be transposed into alternative and variously irrational structures, much may be lost. Most obvious are transparency and accountability. More deeply, official statements of proper assessment and decision-making, which actors in the system need to regularly consult and repeat, inevitably influence to some degree their actual investigations and conclusions. Furthermore, conscientious actors may well believe that they are bound to follow official protocols. Competing pulls from logic and common sense may steer them toward the right direction, but not always and not completely. Finally, the failure of leading commentary, merger guidelines, and court opinions to articulate the correct way to integrate the consideration of merger efficiencies with the analysis of anticompetitive effects is not conducive to progress in research, policy, or practice. It is difficult to improve matters that are inaccurately, even incoherently described, all the more so if key actors feel constrained from engaging in proper analysis derived from first principles.

3. Burdens of Proof[135]

This Subsection examines the standard view that the burden of proof on efficiencies should be and is placed on the merging parties.[136] The aim is to clear up confusions that may arise because "burdens" may be understood differently by lawyers and economists and, perhaps more importantly, because typical usages are often misuses. Invocations of proof burdens have some import, but this is better described explicitly in terms of our decision framework, which puts matters in a different light.

Giving the merging firms the burden of proof on efficiencies is usually grounded in the fact that much of the pertinent information is in the hands of the parties themselves.[137] Even this simple starting point is problematic. To begin, it is routine to put legal burdens on the challenging party even though the defendant has the pertinent information. In a simple negligence case, the plaintiff must demonstrate that the benefit (the reduction in expected loss that the omitted precaution would have engendered) exceeds the cost of taking the precaution, the latter being analogous to efficiencies. The standard rule is not that the plaintiff, say, has to

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[135] *See generally* Kaplow, *supra* note 111; Louis Kaplow, *Burden of Proof*, 121 YALE L.J. 738 (2012).

[136] *See, e.g.*, Williamson, *supra* note 12, at 24. The current U.S. Merger Guidelines do not address proof burdens, but the 2006 Commentary, referring to the prior Guidelines, states: "In litigation, the parties have the burden on any efficiencies claim (Guidelines § 0.1 n.5) . . . ." U.S. MERGER GUIDELINES COMMENTARY, *supra* note 130, at 59.

[137] *See, e.g.*, U.S. Merger Guidelines, *supra* note 1, at 30. It is possible that agencies, *see id*. at 30–31, and others' skeptical of efficiencies advance this view in part for strategic reasons: once they challenge a merger that they regard to be on-balance detrimental, they prefer the court to adopt a questioning stance toward proffered efficiencies.

establish that some precaution would have generated some level of harm reduction, with the burden then on the defendant to establish that its cost of undertaking the precaution would have been larger.

Moreover, the underlying logic regarding who possesses information is incomplete. The merging parties, after all, have much internal information relevant to potential anticompetitive effects (such as data on past prices and quantities that are central to the government's analysis). And regarding both anticompetitive effects and efficiencies, the government can compel information production. Moreover, in serious challenges merging parties commonly—and voluntarily, before any analysis much less demonstration of anticompetitive effects—offer significant information on the legitimate business justifications for the merger, hoping to convince the agency not to delay, impose costs on, or disrupt their deal.

Consider next what a burden regarding efficiencies actually means and does (the two being quite different). There may be a production burden—requiring the merging parties to come forward with some minimum amount of evidence in order for efficiencies to be taken seriously—and/or a persuasion burden, indicating in the context of U.S. civil litigation that the party bearing the burden must convince the trial court that its position is the one more likely than not to be true.

Begin with a requirement that the merging parties have a production burden on efficiencies. Such burdens are normally taken to be fairly light; they will not decide cases in which the merging parties, if they have a serious efficiency claim, would be inclined to offer substantial evidence thereof in any event. Indeed, one can ask how much it matters if the parties did not have this burden and accordingly chose not to present much or any evidence of efficiencies, in any event an amount that would have failed to meet this burden if they bore it. At the end of a trial, complete with battles of experts, how likely would a judge be to find that the merging parties met the higher persuasion burden (or that the government, if it had that burden, failed to meet it) when we are hypothesizing that the same judge does not regard the merging parties' proffer to be sufficient even to take the efficiencies claim seriously? Although production burdens can help in small stakes cases and to organize proceedings, in heavily contested battles this is likely to be rounding error.

Perhaps production burdens (and persuasion burdens) are an oblique way of talking about Bayesian priors and updating with respect to efficiencies. Specifically, we are in the realm of so-called negative inferences that (particularly in sharply configured settings) can be sensitive to how cases of silence are interpreted. However, as noted, with high stakes and serious efficiency claims, silence is unlikely regardless.[138] Suppose that I am sued for nonpayment of a bill, and my defense is that I did pay it, with my credit card. A decision-maker will be skeptical if I am unwilling to show my receipt or to produce my credit card statement. One could state that I have an initial production burden of showing one or the other, or assign the burden to the other side while permitting it to demand that I produce these records, or simply omit all talk of burdens. Because no decision-maker would believe me if I did not produce such records ("voluntarily" or otherwise), it should not make much difference which regime prevails.

Returning to efficiencies as such, if one believes that substantial merger efficiencies are

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[138]*See, e.g.*, Katz & Shelanski, *supra* note 79, at 564 ("We note that decision theory thus supports the *Oracle* decision with respect to efficiencies if the decision is applying the following logic: (a) if efficiencies had a significant expected value, then there would be credible evidence indicating so; (b) if credible evidence existed, then Oracle would have strong incentives to produce it in court; and, therefore, (c) expected efficiencies must be small.").

fairly unusual—or, echoing Subsection 1's formulation, that efficiencies exceeding the efficiency credit are infrequent—it will take significant evidence of high efficiencies to move our priors sufficiently. That process involves logical inference from particular factual predicates, not some modified decision rule that is to be applied after all inferences have been made. More broadly, negative inferences—inferences from a lack of evidence that would be expected—are a form of inference that is entirely permissible and routinely made. Legalistic talk about production burdens on merging parties regarding efficiencies may be little more than an imprecise reminder that this familiar process of inference is available.[139]

Turn now to the persuasion burden, which indicates which party must prove its position more likely than not to be correct. On its face, a persuasion burden is a mere tiebreaker, and exact ties have zero probability in settings such as this one that involves multiple continuous variables with substantial uncertainty in all of the estimates. Once again (and putting aside the previous considerations), we can ask what is really going on.

Many judges will find their heads spinning in response to much of what they hear in merger (and other complex business) cases. Or at least in a substantial range of cases in which it is not obvious that one or the other side should prevail. Under a pure balancing test, they may feel hard-pressed to defend either outcome.[140] In such settings, as a psychological and practical matter, the side that has the persuasion burden will often lose. This is so even when the best estimate indicates that the opposite result is superior if that estimate feels too much like a guesstimate for the decision-maker to embrace and defend. True ties are rare, but queasiness may be frequent. And when one is very queasy, it is much easier to subjectively believe and publicly declare that one is "unconvinced" that X is (probably) true than that one is "convinced" that X is (probably) false. If so, the assignment of the persuasion burden may, despite its limited literal dictates, determine which side wins in a substantial range of cases.

Rational decision-making is otherwise: guided by best estimates, and properly weighted using the appropriate welfare criterion. In deciding on surgery or other consequential medical treatment, one wants the specialist's best estimate rather than having decisions made in the large mass of cases with significant uncertainty by some outsider's assignment of a presumption.

Persuasion burdens also may be problematic for another reason: they are formally taken to require that a position be more likely than not true in order to prevail, which is often interpreted to focus solely on the probabilities of good versus bad outcomes, abstracting from the magnitudes of the benefits and costs associated with either choice. Again the point is clear in medical decision-making: one should take a pill or a vaccine even if it has a small probability of providing a benefit if that benefit is very large, despite a high probability (even certainty) of having a cost, including the cost of the treatment itself or a side effect, if that cost is sufficiently

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[139]Economists should be more attuned to this way of putting things. If the decision rule is "block if and only if anticompetitive effects exceed efficiencies," we form our best estimates of each and then decide. Or more precisely, we take our unified loss function, input appropriate estimates, and then decide. That function does not have "production burdens" or "proof burdens" as such. One is balancing expected benefits and costs, no more and no less. However, failing to see explicit recognition of these principles in official pronouncements, some economists might find it attractive to support legal notions that seem to correlate with the correct underlying thought process.

[140]Observe that this is almost the opposite of the scenario depicted in Subsection 1, in which it was imagined that, in most cases, either anticompetitive effects are confidently quite low or instead they are very high and, in addition, efficiencies are very low. The current argument is complementary to Subsection 2's suggestion that pronouncements by decision-makers in merger cases may tend to (significantly) overstate matters in one direction or the other, to make a difficult decision appear not to be close.

small. Conversely, a high (above fifty percent) probability of a modest benefit (say, clearing up a rash) is not worth even a fairly small probability of a serious side effect. In all, we wish to know whether the expected net benefit of prohibiting a given merger is positive, whatever are the particular probabilities of particular magnitudes of anticompetitive effects and efficiencies.

For mergers, a twenty percent probability of a significant anticompetitive effect warrants prohibition even at the cost of a highly probable but small forgone efficiency. Likewise, a high probability of a very modest anticompetitive effect does not warrant blocking a merger with, say, a forty percent chance of generating large efficiencies. In the United States, it is entirely plausible to read Clayton Act Section 7's prohibition of mergers where "the effect . . . *may be* substantially to lessen competition, or to *tend* to create a monopoly"[141] (along with some of the legislative history, which refers to stopping rising concentration in its "incipiency"[142]), as embodying some such view, although an alternative interpretation would retain the (suboptimal) focus on probabilities without regard to magnitudes and interpret the requisite probability threshold to be lower than fifty percent.

Standard decision analysis, developed over more than half a century, does not contain analogues to these familiar proof burdens. Given their ubiquity in legal formulations along with other considerations, it is not surprising that there would be some influence on actual decision-making. Echoing the discussion in Subsection 2, it is hardly clear that courts in fact formalistically apply any of these devices rather than, as a first approximation, trying to make the best on-balance decision they can. That said, courts' awareness of and queasiness about limits to their expertise combined with the complexity and uncertainty of merger analysis may lead to proof burdens having important and not necessarily desirable influences on decision-making.[143] In principle, it would be better to cease confused invocations of proof burdens and instead appeal directly to the correct information protocol and decision rule.

IV. Conclusion

The concept of merger specificity is central to the determination of which efficiencies may justify horizontal mergers, but the underlying logic needs further development along many dimensions. First, we have seen that sometimes merger alternatives that may achieve proffered efficiencies also generate anticompetitive effects, possibly the same ones the merger would produce. Second, comparison of contractual alternatives to a proposed merger requires identifying the subtle differences between contracts and activities within firms that lie at the center of the literature on the theory of the firm and other subfields in economics and business. Third, the analysis of synergies is closely related to that of vertical relationships, which has not typically been extended to the assessment of horizontal mergers. Insights drawn from these inquiries shed new light on economies of scale, economies of scope, and the sharing of assets between competitors, applications that cover much of the domain of proffered merger

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[141] 15 U.S.C. §18 (emphasis added).

[142]*See, e.g.*, Brown Shoe Co. v. United States, 370 U.S. 294, 318 nn.32 & 33, 323 n.39 (1962) (quoting legislative history to this effect).

[143]This conclusion is part of the motivation for the analysis of expertise in Section I.C. It also may motivate some commentators' and political actors' advocacy of various rules, such as the so-called structural presumption to ease the government's proof burden or a strong desire to suppress the consideration of efficiencies out of a fear that the process is already skewed against blocking mergers.

efficiencies.

Shifting the conventional focus from short-term effects to long-run equilibrium consequences—which are most relevant to the overall impact of merger policy on well-being—leads to corresponding changes in analysis and results. Because all costs are variable in the long run and profits tend toward zero in long-run equilibrium (even an imperfectly competitive one), the purported difference between consumer and total welfare and related questions of pass-through become less important. That mergers may induce entry can readily make them less, not more desirable because entry is socially excessive in many contexts. Asymmetries of firms—an important feature of reality that is absent in many models—arise endogenously over time and should play an important role in merger analysis, as should differences across sectors, because mergers in a targeted sector cause resource flows to and from other sectors that also exhibit distortions due to the absence of perfect competition there.

Lessons from decision analysis regarding information collection and decision-making should guide merger review, yet official protocols often conflict sharply, in ways that do not seem widely appreciated. For example, the so-called efficiency credit that is increasingly regarded to rationalize existing practice is problematic in many respects, and typical pronouncements that efficiencies are rarely if ever decisive in actual cases should either be disbelieved or taken as a sign of serious dysfunction given the highly implausible implications regarding the joint distribution of anticompetitive effects and efficiencies in proposed mergers.

The analysis of efficiencies in horizontal mergers requires that we ask many new questions and do our best to provide answers, while identifying important gaps in knowledge that demand further research. Moreover, both current practice and further inquiry should draw more on expertise outside the traditional scope of competition-focused industrial organization economics. Finally, proxies, screens, and shortcuts that are necessary for everyday operation need to be derived from our best analysis rather than posited a priori.