# Competition Enforcement and Accounting for Intangible Capital *

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**Abstract**

Antitrust laws mandate regulatory review of mergers and acquisitions (M&A) when the book value of acquired assets exceeds a specified threshold. However, these policies overlook the fact that accounting standards do not allow firms to recognize most intangible capital as assets. We show this omission leads to thousands of acquisitions of intangible capital-intensive firms going unreported to regulators. Acquirers in unreported deals achieve higher equity values and price markups, especially when consolidating overlapping product markets. Unreported deals also accrue greater technological rents to acquirers by consolidating scientifically important patents and breakthrough technologies. We also show unreported deals in pharmaceutical markets are over three times more likely to consolidate overlapping drug projects and acquirers are over three times as likely to terminate these overlapping projects. We find that this encourages subsequent development of copycat drugs at the expense of novel projects. Our results suggest the growth of intangible assets may exacerbate market power through unreported consolidation of the sectors most concerning for consumers.

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# 1. Introduction

Policymakers and regulators worldwide have long been concerned that corporate consolidations increase market power, leading to higher prices, fewer choices, and reduced quality for consumers (e.g., Bonaime and Wang, 2024; Cooper et al., 2019; Eliason et al., 2020; Fathollahi et al., 2022; Garmaise and Moskowitz, 2006; Sapienza, 2002). Consistent with this concern, the recent empirical and theoretical literature shows that consolidating product markets allows firms to stifle innovation and deter new competitors (e.g., Cunningham et al., 2021; Kamepalli et al., 2022, respectively). Influenced by this evidence and the increasing body of research indicating a rise in corporate market power across the economy (e.g., Autor et al., 2020; De Loecker et al., 2020), a wave of policy actions have initiated heightened scrutiny of mergers and acquisitions (M&A) that consolidate markets (e.g., Biden, 2021). A necessary condition of enforcing these policies is that regulators become aware of anticompetitive M&A in the first place. However, we show that thousands of large M&A bypass regulatory scrutiny solely because the screening criteria that determines regulatory review ignores an increasingly important asset—namely intangible capital.

Given their resource constraints, regulators—e.g., the Federal Trade Commission (FTC) and Department of Justice (DOJ)—use thresholds based on the value of the deal and the size of the target firm's assets to determine which deals to review. However, these asset-size thresholds only consider the value of assets as reported under US Generally Accepted Accounting Principles (GAAP), which exclude nearly all self-generated intangible assets. This exclusion suggests the FTC and DOJ ignore an increasingly important class of assets in the economy (e.g., Crouzet et al., 2022). Indeed, acquired intangibles now represent eight times the amount of acquired tangible assets (see Figure 1). In line with the rise of intangibles, the FTC has recently focused explicitly on enforcing competition—including the appropriate screening mechanisms—in markets where firms' intangible capital plays a central role, such as in the pharmaceutical and technology sectors (FTC, 2022). Yet, despite its importance, little is known about the extent to which accounting rules regarding intangible capital shape M&A enforcement and, if they do, how that affects product market competition.

We collect novel data on intangible assets—e.g., patents, trade names, and in-process R&D—of target firms from post-merger purchase price allocations (PPAs) in acquirers' financial statements. We find that many acquisitions bypass premerger scrutiny solely because the intangible capital of target firms is not considered in determining whether to initiate regulatory review. If regulators required firms to add intangible capital to the targets' assets, the number of deals reported to the FTC and DOJ would increase by approximately 263 per year, more than half of which are horizontal consolidations among competitors. These un-

reported deals are nearly identical in size to reported deals (but are comprised of 50% more intangible assets). Thus, unreported deals, despite bypassing regulatory scrutiny, are sizable enough to warrant screening by antitrust regulators. If they were reported, we estimate that total Second Requests—the most stringent form of antitrust scrutiny by the FTC and DOJ short of litigation—would increase by approximately 10% per year.[1]

We next examine the types of sellers involved in unreported deals to understand the incentives of firms that may want to bypass premerger review. Unreported deals are more than twice as likely to have sophisticated investors—mostly venture capital funds.[2] One might expect these investors to be aware of the screening criteria that would trigger antitrust review that could terminate the M&A central to their investment strategies, and, hence, to have the most incentives to sell their firms before they exceed these asset thresholds.

We conduct four sets of tests to study whether deals that bypass premerger review can create benefits to acquiring firms' shareholders and impose costs to other stakeholders, such as consumers, through increased market power for acquirers. First, we compare the deal premiums in unreported M&A with those in reported M&A. If unreported deals indeed provide anticompetitive benefits, we expect acquirers in unreported acquisitions to pay more than those in reported deals. Consistent with this notion, we find that deal premiums are roughly 12% higher for unreported deals than for reported ones. We also find our results are entirely driven by deals that consolidate overlapping product markets.

Second, we compare changes in acquirers' equity values around the announcement date of unreported and reported deals. If unreported deals provide anticompetitive benefits, equity values of acquirers should impound this information (e.g., Fathollahi et al., 2022; Kepler et al., 2023). We find unreported mergers are associated with increased equity values (5.6% higher) for acquirers around the announcement date. Other firms in the industry should also benefit from such consolidations—e.g., from the ability to charge more due to lower competition. Consistent with this, we find that the equity values of industry rivals also increase (0.7% higher) following the announcement of an unreported deal by a competitor. Also consistent with a rise in market power following unreported deals, we find these market responses are largely driven by deals that consolidate overlapping product markets.

[1] One might wonder why antitrust regulators overlook these deals. In private correspondence between corporate lawyers and the FTC, presented in Online Appendix A, we find the regulators advise merging firms to strictly follow the HSR rules—even when the regulators are made aware that adding intangible capital to the target's assets would mean a deal should be reported. This advice is inconsistent with antitrust regulators believing these deals are harmless to consumers, given we also find nearly 26% of all Second Requests are for deals that are nearly identical in transaction value to those that go unreported. Taken together, these findings suggest antitrust regulators are likely unaware of the extent to which the current premerger notification rules overlook anticompetitive mergers involving the acquisition of intangible capital.

[2] This evidence helps explain, for instance, the findings of Ederer and Pellegrino (2023) of a shift from IPOs to exits via M&A by VC-backed startups.

Third, we examine markups following unreported acquisitions. The intuition is that a firm's ability to charge prices above marginal costs demonstrates market power (De Loecker et al., 2020). We find that the markups of acquirers' whose deals bypass premerger review increase following the acquisition. These increases begin in the subsequent year and persist for at least two years. These results are concentrated among deals that consolidate overlapping product markets and are driven by acquisitions of intangibles related to developed technologies and brands. This is consistent with acquisitions of these kinds of intangibles consolidating markets that might have immediate impacts on prices for consumers (e.g., consolidating competing brands can immediately affect an acquirer's ability to increase prices).

Finally, we explore one plausible mechanism for how consolidating intangible capital could have such immediate effects. In particular, consolidating higher quality intangible capital is more likely to generate rents for acquirers when they bypass antitrust scrutiny (e.g., by allowing acquirers to earn higher profits by consolidating ownership rights to breakthrough technologies). For these tests, we focus on over 9,000 patents, given that patents are one of the most commonly acquired intangible assets. We use future citations, the degree of patent importance, and the likelihood of breakthrough innovation to measure the quality of acquired patents. Using each of these measures, we find that the patents acquired in unreported deals are of higher quality. For instance, acquired patents in unreported deals receive more than twice as many future citations and are 27% more likely to be breakthrough patents than those in reported deals. Further consistent with intangibles in unreported deals having higher quality, we find that these results are concentrated among deals that allocate more of the deal value to the acquired patents.

Our results so far show that consolidating intangible assets can lead to higher markups for deals that involve developed products—i.e., those generating sales for the acquirer. However, intangible assets are just as common in firms' production of undeveloped products, if not more so. To examine the role of unreported deals in these emerging markets, we narrow our focus to pharmaceutical deals, where acquirers might buy targets with the intent to kill off early-stage, unpatented projects to preempt competition (e.g., Cunningham et al., 2021).[3] Using data on drug projects, we find that unreported deals are significantly more likely to involve the acquisition of targets with projects that overlap with those of the acquirer—and typically consolidate one of the few markets that the target firm intended to enter.

We also examine the post-acquisition development of overlapping pharmaceutical projects. We find that acquirers in unreported deals are roughly 40% more likely to discontinue the acquired project than acquirers in reported deals, despite observing no differences in the

[3]Acquiring to preempt competition—albeit in the technology sector—is also the focus of Kamepalli et al. (2022), who examine the development of "kill zones" around incumbent internet platforms.

ability to develop projects. Finally, we find undeveloped product markets with unreported pharmaceutical deals are also significantly more likely to experience an influx of copycat drugs at the expense of truly novel ones. These results are consistent with our prior findings concerning venture capital-backed sellers, who are focused on their near-term exit, focusing on projects most likely to earn the highest acquisition premiums.

Overall we have shown intangibles are a disproportionately large component of unreported deals and that intangible capital-intensive deals that bypass antitrust scrutiny result in higher market power for firms. These findings have a number of implications for public and private enforcement of such deals. We find that reported deals that are nearly identical in size to unreported deals receive 25% of all Second Requests. While the deals are rarely blocked, deals of this size are clearly of interest to regulators, but we have shown that thousands of similar deals are overlooked simply because of the accounting treatment of intangible assets. However, we do find some evidence that private enforcement substitutes for a lack of public oversight, albeit imperfectly, on account of the frictions associated with private litigation. Given that the United States relies on both of public and private enforcement (e.g., Baer, 2014), the presence of such frictions suggests many anticompetitive deals are likely to happen unfettered by public or private enforcement.

We compute a back-of-the-envelope calculation of the effects of an alternative size-of-person threshold that also includes the value that acquirers pay for intangible assets. Such a policy would be consistent with the accounting rules that recognize the value of intangibles after validation in a merger or acquisition. Our estimates suggest the FTC would review an additional 90 deals involving horizontal rivals each year at an expected cost of 2.6%–3.5% of the annual antitrust enforcement budget. Factoring in the effect on the reluctance of managers to initiate deals they believe would not pass antitrust review, this policy change would deter 23 of those 90 newly reportable deals from occurring.

Such a policy shift would also likely alter managers' incentives to manipulate deals to avoid antitrust scrutiny. Consistent with this, we find a 50% increase in the proportion of unreported deals shortly after the announcement of an accounting standard that moved leases onto firms' balance sheets but before the accounting treatment was adopted—i.e., implying that relevant deals would have otherwise occurred after the policy shift increased the size of firms' balance sheets, making their deals reportable to the FTC and DOJ. These findings suggest firms exercise discretion regarding the reportability of deals to regulators, and thus our back-of-the-envelope estimates on the regulatory implications of measuring intangible capital likely represent lowerbounds.

Our paper contributes to an extensive literature on the regulation of product market competition (e.g., Asker and Nocke, 2021; Nocke and Whinston, 2010, 2022; Segal and Whinston,

2007). A growing area of this literature focuses on how regulators use deal size as a threshold to determine which mergers to review (e.g., Wollmann, 2019), and the anticompetitive consequences of doing so (e.g., Cunningham et al., 2021; Wollmann, 2020). The intuition for using these thresholds is that smaller mergers are thought to threaten competition less, although firms are aware of these thresholds and can structure deals to avoid scrutiny (Kepler et al., 2023). However, as our study calls attention to, many large deals happening well above these deal-size thresholds can also avoid antitrust review—allowing firms to consolidate product markets and lessen competition—solely because authorities use accounting information that excludes the value of nearly all self-developed intangible assets. Our study thus broadens this literature by being the first to document how accounting rules for intangible assets might impede enforcement that relies on asset-size thresholds. In doing so, our study raises the question of whether accounting information primarily intended for investors can be used efficiently for regulating competition, and particularly for preventing anticompetitive deals in intangible capital-intensive industries.

Our study also contributes to the literature on the connection between accounting and regulation—in particular, the role that financial reporting standards play in regulation. Regulators have long used accounting information to monitor organizations (e.g., Covaleski et al., 1995; Holthausen and Leftwich, 1983; Solomon, 1970; Taggart, 1981), and a large literature examines how firms alter their financial reporting and investments in response to regulation(see Leuz and Wysocki, 2016, for a review). We contribute to this literature by showing that financial reporting standards have implications for product market structure when antitrust regulators use accounting information to determine which mergers to review.

Finally, our paper speaks to the literature studying intangible assets (e.g., Crouzet et al., 2022; Lev, 2019). A burgeoning stream of research documents the rising importance of intangibles as the economy shifts from relying on physical assets to services and technology as key production inputs (e.g., Haskel and Westlake, 2018; Peters and Taylor, 2017). Because the value of most intangible assets is difficult to measure (e.g., Glaeser and Lang, 2024, for a review), this literature focuses on the distortions that are unique to intangible assets, such as the difficulty of contracting on intangibles and the potential for inefficient prices (e.g., Eisfeldt and Papanikolaou, 2014; Giglio and Severo, 2012; Rampini and Viswanathan, 2010). We add to this literature by showing another potential inefficiency: reliance by regulators on asset values that exclude most intangibles can allow anticompetitive mergers to avoid scrutiny.

The remainder of this paper proceeds as follows. Section 2 discusses our setting. Section 3 describes our data. Section 4 presents results on the role of intangibles in unreported M&A. Section 5 separately analyzes developed and undeveloped product markets, and Section 6 discusses the implications of our results and additional analyses. Section 7 concludes.

# 2. Institutional Setting

## *2.1. Regulatory Screening of Proposed Mergers*

To promote competition in the United States, the antitrust divisions of the FTC and DOJ rely on the Hart-Scott-Rodino (HSR) Antitrust Improvements Act of 1976 to review proposed M&A. The act requires parties in deals above a specific size to file a premerger notification, which allows the FTC and DOJ to review whether the merger might lessen competition. After review, the FTC and DOJ can allow the merger to proceed or issue a "Second Request," seeking detailed information before determining whether to allow the transaction. Approximately 3% (6%) of all reviewed (horizontal) deals receive a Second Request (Billman and Salop, 2022).

For most deals, the FTC and DOJ do not require a premerger notification because the size of the deal or transacting parties fall below certain size thresholds (see Figure 2). Deals with transaction prices below the lower size-of-transaction threshold need not submit a premerger filing and thus bypass antitrust review. Deals with transaction prices above the upper size-of-transaction threshold must submit a premerger filing and be reviewed by regulators. In 2001, the lower and upper size-of-transaction thresholds were $50 million and $200 million, respectively. These thresholds have been adjusted since 2004 to track US gross national income. Consequently, by 2019, the lower threshold was $90 million and the upper threshold was $359.9 million (Figure 2 displays the annual threshold amounts).

For deals that fall between the thresholds, the "size of person" (hereafter, SoP) test applies. These transactions require review only if (i) the target has total assets or net sales above a specified level (e.g., $18 million in 2019), and (ii) the acquirer has total assets or net sales above a specified level (e.g., $180 million in 2019).[4] If either the target or acquirer does not meet these SoP conditions, a premerger filing is not required.[5] Nearly 50% of all deals reviewed by the FTC and DOJ from 2001 through 2019 are between the lower and upper size-of-transaction thresholds where the SoP test applies.[6]

When determining the target and acquirer's assets and net sales for the SoP test, firms must use financial information from their "last regularly prepared balance sheet" and "annual statement of income" (HSR Act Rules § 801.11(c)(1) and (2)). These values are based

[4]Both total assets and net sales are tested when the target is a manufacturer. When the target is not, only its total assets are tested.

[5]The intent for the SoP test is to ensure only the largest mergers are reviewed by antitrust regulators (Howell, 2001). For more about the statute and the rule, see www.law.cornell.edu/uscode/text/15/18a.

[6]We use the HSR Annual Reports published by the FTC and DOJ for our estimate. From 2001 through 2019, we find 29,293 HSR transactions. We then use the data from each report's Table I to compute the number of transactions that fall between the lower and upper deal-size thresholds. We estimate that 13,498 (46%) of these transactions were subject to, and ultimately above, the asset or net-sales-threshold test.

on book assets according to GAAP, which exclude the vast majority of intangible assets. Consistent with these rules, see Online Appendix A for an example of an FTC representative agreeing in 2007 that intangibles should be excluded in accordance with US GAAP from a target's total assets for premerger notification purposes, even though including intangibles would trigger regulatory review under the SoP test.[7] Such cases are likely common, as a growing range of firms—e.g., innovation-intensive companies—often have few tangible assets, and most of their intangibles are not recognized on their balance sheets. Consequently, these targets can fall below the assets and sales thresholds, allowing them to bypass premerger review simply because of accounting standards.

Bypassing premerger review benefits merging parties. In addition to avoiding filing fees (which range from $45,000 to $125,000), firms avoid the possibility of a substantially more costly Second Request. Second Requests typically last for six months and cost $2 million to $9 million, while consuming 1,000 hours of internal management and legal time (American Bar Association, 2014).[8] Perhaps most costly to merging firms, however, is that the vast majority (roughly 75%) of Second Requests convert into orders to terminate the transactions or divest of key assets to mitigate anticompetitive effects. Firms are aware of these risks and can take real actions to reduce the value of the target's assets, so that they can bypass premerger review. Consistent with this, Online Appendix A provides an example of correspondence with the FTC in 2004 regarding a target's plans to pay a special dividend, thereby reducing the size of its tangible assets enough to bypass premerger review.

### *2.2. Accounting for Intangible Capital*

Measuring total assets according to US GAAP for the SoP test immediately expenses internally generated intangibles rather than recording them as assets on the balance sheet.[9] A consequence is that book assets primarily comprise physical assets, leading to underreporting of the true value of the firm's economic assets. Only after a firm acquires another are inter-

[7]The email details a US GAAP reconciliation that was conducted as a requirement contained in an existing shareholder's agreement. Specifically, as part of the reconciliation, the company had to recognize an intangible asset, but doing so caused total assets to exceed the SoP threshold for targets. Because this reconciliation differs from the most recent regularly prepared balance sheet, the company requested clarification from the FTC on which balance sheet should be used to determine total assets. The FTC, in its response on July 12, 2007, simply wrote "agree" at the end of the email, to indicate the regulator agreed with the firm to not include intangible assets when determining total assets.

[8]Roughly 300,000 documents (equivalent to 28 GB of data) are produced during a Second Request, not including an additional 47 GB of email. For example, in a document submitted to the Bankruptcy Court in Delaware In re *RentPath Holdings, Inc (Case No. 20-10312)*, a senior executive of the firm estimated the costs associated with complying with a Second Request from the FTC totaled nearly $7 million and produced roughly 2.6 million pages of documents and a terabyte of data.

[9]The one exception is internally generated software, which firms capitalize the costs of after achieving technological feasibility until it is brought to market (ASC 350-40 and ASC 985-20).

nally generated intangible assets of the target recognized at their fair value (ASC 805-20-30). These intangible assets include those that can be separately identified, including customer relationships, in-process R&D, trade names, and patents. After determining the fair value of the target's assets and liabilities, the purchase price is allocated to the identifiable assets less liabilities (collectively called "net assets"). Any remaining amount of the purchase price is then recorded as goodwill on the acquirer's balance sheet.

These rules regarding accounting for intangible assets cause considerable differences in the target's book assets before versus after a merger. This difference has grown over time as intangible capital has become a prominent input for firms' production processes. Indeed, Figure 1 Panel A shows the ratio of acquired intangible-to-tangible assets in the economy has doubled in the past two decades. Acquired intangibles now represent eight times the amount of acquired tangible assets, with this increase equally driven by identifiable intangible assets and goodwill (see Panel B).[10]

An important result of overlooking the consolidation of intangible capital is that these accounting rules might be enabling intangible-intensive sectors to sidestep regulation by competition authorities. While a vast accounting literature examines how financial accounting standards can shape economic activity (e.g., Bens and Monahan, 2008; Dou et al., 2018; Garham et al., 2011; Kanodia and Sapra, 2016), little is known about whether and how the use of GAAP rules by noncapital market regulators might affect market structure and product market competition.[11]

[10] Although our evidence of the growth in the ratio of identifiable intangible-to-tangible assets resembles similar trends documented in the prior literature (e.g., Crouzet et al., 2022), our ratio using market prices is considerably larger than their estimates that use firms' expenses from the income statement and an assumed depreciation rate to estimate intangibles. To address selection concerns that our divergence from prior literature is due to acquired firms having more identifiable intangible assets, we focus on public targets in our sample and apply the same estimation procedures as used in Crouzet et al. (2022). In Online Appendix B, Panel A, we find the average ratio of actual identifiable intangible assets to total assets is 3.8 times the estimated proportion from prior research. In Panel B, we investigate whether this difference is being driven by differences in the identifiable intangible assets (i.e., the numerator) or the total tangible assets, which is also adjusted to their market value (i.e., the denominator). We find the ratio of post-acquisition to pre-acquisition total tangible assets is about 0.9—that is, nearly the same amount—and the ratio of actual identifiable intangible assets to estimated is about 4.1, suggesting the difference in our findings relative to the prior literature is likely the result of an underestimation of intangible capital using prior methods.

[11] Other studies on how accounting standards impact firms' economic decisions include Huber and McClure (2023), Bartov et al. (2021), Williams and Williams (2021), Chircop and Novotny-Farkas (2016), and Iselin and Nicoletti (2017).

# 3. Data and Descriptive Statistics

## *3.1. Data*

We obtain data on all completed M&A announced by public US firms from February 2001 through February 2020 from the Refinitiv Mergers and Acquisitions database ("Refinitiv"). We obtain details of the acquisition's purchase price allocations (PPA) from the acquirers' post-acquisition disclosures. We further require that the deal value fall within the annual HSR premerger review lower and upper size-of-transaction thresholds (see Figure 2).[12] We hand collect data for M&A in markets that are relevant to antitrust regulators. To determine a market's relevance, we use data on Second Requests from the HSR Annual Reports to rank industries (using three-digit NAICS) by the total number of such requests from 2001 through 2019.[13] We keep deals in industries that the FTC targets at least once a year on average with a Second Request. The final list of all industries that meet this requirement is presented in Online Appendix E. Our selection process, presented in Panel A of Online Appendix F, yields an initial sample of 3,526 unique deals across 13 industries, representing roughly $500 billion in total transaction value.

We obtain PPA data from the acquirer's post-acquisition 10-K. We collect the values of acquired tangible assets, intangible assets, and goodwill from the financial statement notes (see Online Appendix G for additional details). We exclude deals when the acquirer consolidates the PPA for two or more deals in a reporting period (about 5% of deals). We also exclude deals for which the PPA only reports net assets acquired rather than total assets (i.e., the basis for the SoP test).[14] This process reduces our sample from 3,526 to 1,918 deals.

[12] We follow HSR rules and adjust the deal value on the announcement date to reflect the total value of the target held by the acquirer after the deal closes (i.e., percentage acquired plus percentage held before the announcement). We explain this calculation in Online Appendix C. We classify deals as above or below the reporting threshold based on the post-acquisition fair value of assets, because we do not observe the book values of assets, which are the values used in determining whether deals are reviewed. In Online Appendix D, we describe how we mitigate concerns about misclassifying deals, by using fair values instead of book values.

[13] We use three-digit NAICS to identify industries because this convention is the one applied by the antitrust regulators in the HSR Annual Reports. Because the Refinitiv data include SIC but not NAICS classifications, we map SIC to NAICS (as shown in Online Appendix F) using the NAICS-to-SIC crosswalk at https://www.naics.com/naics-to-sic-crosswalk-2/.

[14] Using net assets could lead to incorrect classification. For instance, if the target reported $30 million in tangible assets and $25 million in liabilities, net assets would be $5 million ($30 million minus $25 million). Using net assets would cause us to erroneously classify the deal as below the SoP threshold, whereas total assets ($30 million) exceed the threshold.

### *3.2. Descriptive Statistics*

Of the 1,918 deals we use for our analysis, 1,682 (88%) involve private targets (see Online Appendix F). Horizontal deals—i.e., those where the target and acquirer share the same three-digit NAICS—constitute roughly 50% of the sample both in terms of number of deals and transaction value. Table 1 Panel A presents the distribution of deals by whether the deal was reported to the FTC and DOJ. We classify a deal as being reported (unreported) if the total assets for the target are above (below) the SoP asset threshold in that reporting year. For this analysis, we exclude 145 deals that fall below the asset threshold but were still subject to premerger review, as a result of net sales exceeding the SoP net-sales threshold.[15] Unreported horizontal deals represent roughly the same percentage as reported horizontal deals (both represent roughly 55%), but are, on average, smaller (i.e., $121.3 million versus $143.5 million).[16] In Panel B of Table 1, we present the distribution, by industry, of unreported horizontal deals. One-hundred and sixty-nine of the 219 (77%) unreported horizontal deals (total $20 billion in deal value) are in the computer and electronic product manufacturing and chemical manufacturing industries, which several of our subsequent analyses focus on, given the prominence of consolidation in these product markets. In total, over $26.5 billion in horizontal deals were not reviewed by the antitrust regulators. The total value of the 1,918 deals in our total sample of $268 billion, and thus 10% of all market consolidation involved horizontal mergers that was not reviewed.

In terms of the composition of assets in these deals, Panel C of Table 1, presents PPAs for reported and unreported horizontal M&A. Reported deals comprise roughly similar degrees of tangible and intangible assets (35.5% versus 27.7%, respectively). However, we find that identifiable intangible assets represent 46.8% of unreported deal values, roughly seven times more than tangible assets represent in unreported deals (6.7%).

To visualize how this omission of intangible capital impacts antitrust enforcement over time, Panel A of Figure 3 plots the number of deals in our sample that were subject to review

[15]To identify deals that fall below the SoP asset threshold but exceed the SoP net-sales threshold, we obtain information on the granting of an early termination from the FTC. Early terminations are premerger reviews completed before the 30-day waiting period, as a result of a request by one of the filing parties. The FTC and DOJ can approve an early termination request if they determine no competitive issues exist. Although requests for early terminations are not publicly available, approvals are. We use approvals published in the FTC online legal library to identify deals that, by definition, were reported. Thus, if a deal falls below the asset threshold but terminates early, we conclude it exceeded the net-sales threshold. Online Appendix H presents additional information on early terminations in our sample.

[16]Premerger reviews are conducted at the product level. To validate our measure of horizontal deals, we collect press releases, public disclosures, news articles, industry publications, and other information to determine whether the acquirer and target share common product markets. We find our measure using three-digit NAICS is highly correlated with our estimate of product overlap. Using this alternative measure, we also test for and find no statistically significant difference between the proportions of unreported horizontal and reported horizontal M&A.

(blue line) and the number that would be subject to review if intangible assets were included in the SoP test (red line). We determine the hypothetical number by adding in the fair value of intangibles from the acquirer's PPA. Doing so increases the number of reported deals by 25% to 60% each year. Panel B applies these increases to all reported deals reviewed by the FTC annually. This figure shows that another 5,003 deals ($630 billion of total deal value) would be reported if intangibles were included in the SoP test (or 263 deals at $33 billion annually).[17] This translates to an additional 466 unreported horizontal deals (about 25 per year) in the universe of US deals over our sample period.[18] This represents approximately $60 billion in deal value—i.e., 10% of all consolidation in the economy over this period.[19]

# 4. Unreported M&A and Intangible Capital

Our results so far indicate that accounting rules for intangible assets allow hundreds of intangible-intensive consolidations to bypass antitrust scrutiny every year. We next characterize the types of intangible assets in unreported deals and examine how seller incentives and deal characteristics differ for unreported versus reported transactions. Our empirical strategy compares deals that undergo the SoP test and are unreported to antitrust authorities with deals that undergo the test and are reported. However, whether an unreported or reported merger or acquisition occurs is not random. For instance, firms in some industries that are more subject to FTC scrutiny might be more likely to consolidate markets when they are unreported. Furthermore, firms might strategically time their deals to occur during years of heightened M&A activity when the FTC is unusually busy. We employ industry

[17] These estimates represent lower bounds, since unreported deals are less likely to be publicly disclosed in the first place (e.g. Barrios and Wollmann, 2022).

[18] We estimate the total number of unreported horizontal deals using our sample of 219 unreported horizontal deals and the fraction of deals in Refinitiv that are also disclosed in the HSR annual reports. Even though the number of deals in the HSR annual report does not, by definition, include unreported deals, we can use this amount to calculate the proportion of missing deals in our sample. From 2001 through 2019, the HSR annual reports indicate 13,498 premerger filings were submitted for deals with values where the SoP test applies. By contrast, Refinitiv data suggest approximately 6,300 deals for which the SoP test applies, suggesting our data capture about 47% (or 6,300/13,498) of actual reviewed M&A. We estimate from this ratio that, for every deal in our sample, an additional 1.13 deals are likely missing. Applying that ratio to our sample of 219 unreported horizontal deals gives us an additional 247 horizontal deals that are missing from our analysis.

[19] In addition to this approach, we use the findings of Wollmann (2023) to estimate the number of deals that are likely excluded from our analysis. Specifically, Wollmann (2023) documents that, from 2001 through 2011, approximately 60% of mergers in the Refinitiv data have undisclosed deal terms—and that the proportion increases to roughly 70% when narrowed to only horizontal M&A. This evidence suggests that, for each unreported horizontal (nonhorizontal) deal in our sample, an additional 2.3 (1.5) unreported deals involving private acquirers are missed in our analysis. Based on these figures, we estimate that, for horizontal deals alone, the total value of M&A that go unreported to antitrust regulators due to accounting standards is roughly $88.5 billion across 730 deals involving public and private acquirers (from 2001 through 2019).

and year fixed effects to deal with the first and second threats, respectively. We also leverage the fact that many acquirers in our sample that have both unreported and reported deals, which allows us to conduct within-acquirer tests, to help rule out differences in acquiring-firm preferences for deals of a certain kind to go unreported.[20]

### *4.1. Levels and Types of Intangibles in Unreported Deals*

We first characterize how reported and unreported deals differ in their intensity of intangible capital. Figure 4 reports deal-size density plots for each type of deal. Panels A and B show that the total deal value and intangible asset value distributions for reported and unreported deals are remarkably similar. Unreported deals have slightly more intangible assets than reported deals, consistent with our earlier findings that intangibles are a higher proportion of the deal value in unreported deals. In Online Appendix I, we find no statistically significant difference in the *level* of intangibles in unreported deals relative to reported deals. However, the *proportion* of the deal related to intangibles is more than 50% greater for unreported deals. Thus, despite the FTC and DOJ perceiving reported deals as larger, these results suggest unreported deals are quite similar in size but only differ in the accounting treatment for intangible assets when determining whether they bypass merger review.

We next examine the types of intangible assets acquired in these deals by collecting data on the categories of intangibles disclosed in the PPA of acquirers' 10-Ks for 1,810 of 1,918 deals with identifiable intangible assets, 75% of which allocate the purchase price into separate intangible categories (e.g., customer relationships, patents, and in-process R&D). See Online Appendices G and J for details of this collection process. Panel B of Table 2 shows identifiable intangibles total nearly $79 billion across 22 categories. In Panel C, we find that unreported deals have, on average, approximately four times the level of in-process R&D relative to reported deals and reported deals have twice the level of customer-related intangibles relative to unreported deals. Figure 5 shows these patterns visually. One reason for these findings is that customer relationships develop gradually and are thus more likely to be associated with mature firms with more tangible assets and will therefore be reported (e.g., Foster et al., 2016). By contrast, early-stage, innovative firms—which have few tangible assets—are more likely to rely on intangible capital as part of their production processes.

[20] An alternative sample of deals that might serve as a comparison group are those that both (1) exceed the upper transaction-size threshold and thus are reported and (2) involve target firms with a similar level of tangible assets as those that undergo the SoP test and are unreported. We investigate the prevalence of deals with such attributes but can identify only a handful that meet these requirements and therefore any tests using such a sample would be weak.

### *4.2. Sellers of Target Firms*

The differences we find in the firms being acquired in reported relative to unreported deals suggests that sellers also differ in meaningful ways. To better understand whether differences in incentives and strategies drive this variation, we next examine the types of sellers involved in unreported deals, 90% of which are private firms. We use Preqin to categorize sellers into four categories: venture capital, private equity, growth equity, and private equity funds focused on recapitalization. In Table 3, Panel A shows that venture capital and private equity are the two most common sellers. However, we find that venture capital investors are 2.5 times more likely to be involved with unreported deals. Conversely, private equity is twice as likely to be involved in reported deals. One reason for this is that venture capital firms are more likely to back early-stage technology and pharmaceutical target firms. We examine these patterns formally by estimating the following OLS model:

$$SellerType_{i,t} = \alpha + \beta Unreported_{i,j,t} + \tau_t + \gamma_{k(i)} + \epsilon_{i,t}, \tag{1}$$

where $SellerType_{i,t}$ is an indicator for a particular seller (e.g., venture capital) of target $i$ in year $t$. $Unreported_t$ is an indicator equal to 1 if the fair value of target firm $i$'s assets is equal to or less than the SoP threshold in the reporting year and 0 otherwise. We include fixed effects for reporting year ($\tau_t$) and acquirer-level industry ($\gamma_{k(i)}$). We include these year and industry fixed effects to mitigate concerns that private equity involvement occurs in waves and funds often have an industry focus (e.g., Kaplan and Strömberg, 2009). In all specifications, we cluster standard errors at the acquirer's industry and the reporting-year level. All variables are defined in Online Appendix K. Panel B of Table 3 presents results. The coefficient on the unreported indicator for venture capital (private equity) is positive (negative), suggesting that venture capital (private equity) is more likely to sell in unreported (reported) deals. In total, approximately 43% (27%) of unreported (reported) deals include sellers that are sophisticated investors, who one might expect to also be aware of screening criteria that would trigger antitrust review and have the most incentives to bypass reviews by exiting their positions before the reviews can happen.

### *4.3. Deal Premiums for Unreported M&A*

Our remaining tests in this section seek to understand whether characteristics of unreported transactions differ from reported ones in ways that might be symptomatic of consolidations that can soften market competition, absent regulatory enforcement. We first examine how deal premiums compare for reported and unreported deals. If deals that bypass regulatory

scrutiny are anticompetitive, we expect that acquirers will pay higher deal premia, given the rents that accrue from exercising market power. We measure deal premia following Kepler et al. (2023) and use the proportion of goodwill in the deal. Specifically, we estimate the following variant of Eq. (1):

$$DealPremium_{i,t} = \alpha + \beta Unreported_{i,j,t} + \tau_t + \gamma_{k(i)} + \epsilon_{i,t}, \tag{2}$$

where $DealPremium_{i,t}$ is the proportion of target $i$'s equity recognized as goodwill in year $t$. We include fixed effects for reporting year ($\tau_t$) and acquirer-level industry ($\gamma_{k(i)}$). Table 4 presents results. Consistent with unreported deals providing anticompetitive benefits that acquirers pay more for, column (1) shows deal premiums for unreported deals are approximately 10 percentage points higher (or 20% higher) than those in reported deals.

To better attribute the higher deal premiums for unreported deals to anticompetitive benefits that accrue to acquirers—rather than, say lower transaction costs associated with deals that bypass antitrust review—we consider whether the higher deal premia vary with an indicator for whether the M&A consolidated the acquirer's and target's product market ($ProductMarketOverlap$). To construct this measure, we manually read all press releases, public disclosures, and news articles about each deal to determine whether the target and acquirer have overlapping product markets. We interact *ProductMarketOverlap* with $Unreported_t$ and present results in column (2). We find that higher deal premia for unreported deals are more pronounced in deals that consolidate overlapping product markets—acquirers of unreported deals involving the consolidation of product markets are willing to pay a 13.3 percentage-point higher (or 26.6% higher) deal premium than acquirers of reported deals. We find similar results in columns (3) and (4), which include acquirer (rather than industry) fixed effects, which compares deal premiums within the same acquirer.

## *4.4. Acquirer Equity Values and Unreported M&A*

We next examine responses of acquirers' equity values following unreported deals. The intuition for these tests is that, if unreported deals reduce competition, the resulting increase in market power to acquirers should flow through to product prices at the expense of consumers (e.g., Stigler, 1964), which stock prices should reflect soon after the merger is announced. To test this, we conduct event studies that compare the market reactions of acquirers as well as those of rivals, respectively, around the announcement date of reported and unreported deals in the following OLS model:

$$AnnReturn_{i,[-2,2]} = \alpha + \beta Unreported_{i,j,t} + \delta DealPremium_{i,k,t} + \tau_t + \gamma_{k,(i)} + \epsilon_{i,t}, , \tag{3}$$

where $AnnReturn_{i,[-2,2]}$ is acquirer $i's$ market-adjusted five-day cumulative abnormal returns (centered on the announcement date) and all other variables are as previously defined.[21]

Panel A of Table 5 reports results. In column (1), we find no significant difference in announcement returns for unreported deals relative to reported ones. However, when we interact *Unreported* with *ProductMarketOverlap* in column (2), we find a 3.6 percentage-point incremental increase in abnormal returns of unreported deals that consolidate overlapping product markets, relative to reported deals that do the same. This represents a 125% increase over the mean abnormal returns for reported deals that consolidate product markets. We find similar results in columns (3) and (4), which include acquirer (rather than industry) fixed effects and therefore compare announcement returns within the same acquirer.

Finally, following Eckbo (1983), Chevalier (1995), and Fathollahi et al. (2022), we examine the abnormal returns of industry rivals around the deal's announcement. The intuition for these tests is that, if unreported deals soften competition, rents should also accrue to industry rivals, because they can free ride on the benefits. Consistent with this, in Table 5 Panel B we find abnormal returns of 0.7% for industry rivals following unreported deals that consolidate a product market. Collectively, our results in Table 5 are consistent with equity markets impounding into stock prices any anticompetitive benefits of unreported deals, particularly when an acquirer's market power increases.

# 5. Developed and Undeveloped Market Consolidation

We have shown that unreported deals receive higher deal premia and better market responses, especially for deals that consolidate overlapping product markets. Our next series of tests examines the implications of these deals for the consolidated product markets. We first leverage data on the most prominent intangibles that are consolidated in developed product markets—namely (1) trademarks and brands and (2) patents, technology, and software.[22] Second, we examine the role of intangibles in undeveloped product markets (e.g., in-process pharmaceutical drug projects), as a growing literature suggests the acquisition of undeveloped products—e.g., early-stage innovations—can have anticompetitive consequences (e.g., Cunningham et al., 2021; Kamepalli et al., 2022).

[21] We use a five-day window to capture market reactions that sometimes occur prior to the announcement date when, for example, the FTC publicly discloses an early-termination decision before the merging firms publicly disclose the merger.

[22] As shown in Table 2, these categories are among the largest intangibles in our sample, with over 40% and 45% of all deals in our sample having brand- and technology-related capital, respectively. Notably, 40.7% of unreported deals and 40.5% of reported deals include acquisitions of brand-related intangibles, and 56.3% of unreported deals and 41.2% of reported deals include the acquisition of technology-related intangibles.

### 5.1. *Markups and Developed Product Market Consolidation*

We first conduct event studies of acquirers' markups to provide evidence into one way that unreported intangible-intensive deals might impact market structure. Markups measure the degree to which firms price goods above marginal cost as a way to exercise market power. Therefore, we estimate the following regression:

$$\begin{aligned} Markup_{i,t-2:t+2} = {} & \beta_1 Unreported_{i,j,t} \times Post_{i,t+1:t+2} \times ProductMarketOverlap_{i,j,t} \\ & + \beta_2 Unreported_{i,j,t} \times Post_{i,t+1:t+2} + \beta_3 ProductMarketOverlap_{i,j,t} \times Post_{i,t+1:t+2} \\ & + \beta_4 Unreported_{i,j,t} + \beta_5 ProductMarketOverlap_{i,j,t} \\ & + \beta_6 Post_{i,t+1:t+2} + \tau_t + \gamma_{k(i)} + \varepsilon_{i,t-1:t+2}, \end{aligned} \tag{4}$$

where $Markup_{i,t-2:t+2}$ is acquirer $i$'s markup in the years $t-2$ through $t+2$ (but excludes year $t$).[23] $Post_{i,t+1:t+2}$ is an indicator for whether the markup is in year $t+1$ or $t+2$. All other variables are as previously defined. Table 6 Panel A presents results. Overall we find that unreported deals between firms in overlapping product markets are associated with higher post-acquisition markups. This association begins shortly after the acquisition (see column (2)) and continues to hold when we use firm fixed effects (columns (3) and (4)). Panel A of Figure 6 presents the results from column (4) graphically.

Finally, we examine whether these results vary based on the types of intangible assets that, when consolidated, might lead to increases in markups. We narrow our focus to acquisitions of brands and technologies, given that we expect them to be economically important in developed product markets (e.g., consolidating two competing brands likely has an immediate impact on a rival's market power). Panel B of Table 6 presents from separately estimating Eq. (4) for subsamples whether the deal involves (i) brands or technology (columns (1) and (2)), (ii) brands and technology (columns (3) and (4)), and (iii) neither brands nor technology (columns (5) and (6)). Overall we find that the increase in markups we found in Panel A is concentrated among deals that involve intangibles related to developed product markets. By contrast, in columns (5) and (6), where we restrict our sample to deals that do not involve either a brands or technology, we find no significant differences in markups.[24] Panels C through D of Figure 6 display these patterns graphically. Collectively, our results in Table 6 suggest that unreported deals between firms in overlapping product markets are more likely to improve acquirers' market power, which is exacerbated when these deals relate

[23] We exclude the acquisition-year markup from our analysis altogether.

[24] Further consistent with this, in Online Appendix L, we conduct our announcement return event study analysis from our previous section and find the increases increase in abnormal returns of unreported deals that consolidate overlapping product markets are greater for deals that include the acquisition of brand-related intangible capital and intellectual property, such as patents or technology.

directly to developed product markets.

### *5.2. Quality of Unreported Acquisitions*

We have shown that markups and equity values increase for acquirers following acquisitions of rival targets. We next explore one way the consolidation of intangible capital might have such immediate effects—e.g., on markups—in developed product markets. To do so, we analyze whether deals that bypass antitrust review are more likely to have acquired higher quality intangible capital. We focus on the acquisition of patents, given they are one of the most commonly acquired intangibles. We measure the quality of acquired intangibles in three ways. First, we use future patent citations to capture the economic value and scientific quality (e.g., Kogan et al., 2017). We also use two measures of technological innovation—i.e., the importance of the patent and breakthrough patents—developed by Kelly et al. (2021). The intuition behind these measures is that acquiring more important and higher quality patents should allow acquirers to accrue monopolistic rents. We can obtain these measures for approximately 9,200 patents whose ownership changed from a private target to a public acquirer following completion of the deal.[25]

Using these data, we examine whether the intangible assets from patents acquired in unreported deals are of higher quality. Table 7 Panel A presents results from regressing our measures of patent quality on Unreported in odd columns. Even columns present results from also including *ProductMarketOverlap* and its interaction with *Unreported*. Across all three measures, odd columns show that unreported deals have higher quality acquired intangible assets. However, the even columns show that this relation is driven entirely by deals that involve overlapping product markets. For instance, column (4) suggests acquired patents for unreported deals involving overlapping product markets have over twice the number of future citations as acquired patents in similar reported deals (i.e., 41.8 versus 18.5). Similarly, columns (8) and (12) suggests these patents are significantly more important and nearly 30% more likely to result in a breakthrough technology. Further consistent with these intangibles being higher quality, Panel B of Table 7 shows that the value of acquired patents—based on their disclosed PPA—relates positively to their quality for unreported deals with overlapping product markets (e.g., for every $1 million in value of acquired patent, the probability that it is a breakthrough technology is 0.6% higher).

[25] We focus on private targets with patents for two reasons. First, given that nearly 88% of our target firms are private, our focus on private-to-public mergers represents most of our sample. Second, we also examine acquirer returns around the announcement date of the merger. Kogan et al. (2017) show the economic value of patents, as measured by stock market responses around the patent grant date, relates positively to their scientific value. Thus, some of the patent's value for public targets would already be incorporated in prices before the announcement date.

### *5.3. Undeveloped Product Market Consolidation*

Our results thus far are consistent with unreported consolidations being associated with increases in acquiring firms' market power. We have also shown that this is partially driven by acquirers' ability to generate monopolistic rents from acquired intangible assets that bypass antitrust review where technology is already developed and firms generate profits. However, intangible assets are perhaps just as, if not more, common in firms' production for *undeveloped* product markets. Thus, we next explore the implications of accounting rules in facilitating the bypass of antitrust review in undeveloped product markets.

Because anticompetitive effects from deals in undeveloped product markets are unlikely to appear in markups, we focus on the pharmaceutical industry, which antitrust regulators define as chemical manufacturing (i.e., NAICS 325) and receives significant antitrust scrutiny (as shown in Online Appendix E, chemical manufacturing has the highest rate of Second Requests (14.72%) for mergers involving horizontal rivals).[26] Indeed, intangible assets—e.g., in-process R & D—involved in pharmaceutical firms are a key concern in public and private litigation (see Online Appendix M). Consistent with this, we find that intangible assets are particularly prevalent in pharmaceutical deals, especially for those that go unreported to antitrust regulators.[27] Furthermore, evidence from Cunningham et al. (2021) suggests this scrutiny might be warranted, given acquirers' incentives to preempt competition by consolidating undeveloped pharmaceutical firms.[28]

Focusing on pharmaceuticals also allows us to study the implications of unreported deals at a more granular level. Specifically, we obtain micro-level data on drug development from Cortellis Competitive Intelligence. These data provide the start and end dates for all phases of development for every drug project seeking FDA approval from January 2000 through the end of our sample period. These data also include the drug's intended market (e.g., cancer) and mechanism of action (e.g., Collagen 1 transition inhibitors), which, following

[26]This focus on pharmaceuticals is also consistent with Tucker (2013) in that the FTC's concerns about the effects on market structure are among the most frequently cited factors in Merger Screening memoranda leading to Second Requests in horizontal mergers in the pharmaceuticals industry.

[27]In particular, Online Appendix N shows that unreported deals include an additional $20.8 million (or nearly 65% more) intangibles relative to reported deals. Given that we find intangibles represent nearly 34% of the average deal value in reported pharmaceutical deals, these results imply identifiable intangibles represent nearly 75% of the average deal value in unreported deals. In terms of pharmaceutical deals, Online Appendix M shows that unreported pharmaceutical deals involve nearly three times as much in-process R&D relative to reported ones (i.e., 34.8% versus 8.8%).

[28]Consistent with this idea, accounting standard setters have provided explicit examples of how fair-value measurements of acquired in-process R&D should be conducted when the acquirer does not intend to complete the project but instead wants to lock up the project to "prevent its competitors from obtaining access to the technology." See the accounting for Defensive IPR&D Assets on p.101 in https://assets.ey.com/content/dam/ey-sites/ey-com/en_us/topics/assurance/accountinglink/ey-frdbb1616-06-29-2023.pdf.

Cunningham et al. (2021), we use to identify overlapping projects. We manually match drug projects to acquirers and targets in our Refinitiv data on M&A.

We use these drug data to determine whether horizontal acquisitions are more likely to be unreported when merging firms have overlapping projects. In this context, the acquisition of overlapping projects can be anticompetitive if acquirers exploit the acquisition to maintain market power for existing products (Cunningham et al., 2021). Regulators are aware of the potential for such behavior and therefore conduct overlapping product market-level reviews to determine whether a proposed merger or acquisition would harm consumers. Without this review, as is the case when a transaction is below the SoP threshold, which we have shown is more likely for intangible-intensive targets, deals will bypass antitrust enforcement.

#### *5.3.1. Acquisitions to Preempt Future Competition*

Following Cunningham et al. (2021), we identify overlapping drug projects by examining the intended therapeutic class (TC) and mechanism of action (MOA). If the acquirer and the target have a drug project that shares the same TC and MOA, we categorize the projects as overlapping. We then create a measure of the number of overlapping projects scaled by the target firm's total number of drug projects. Thus, if a target firm has only one project and that project overlaps with one of the acquirer's, the project is likely the focus of the deal. By contrast, if a target has many projects and one of the projects overlaps with a project of the acquirer, the overlapping project is less likely to be the focus. We begin by examining the prevalence of overlapping projects in unreported deals. Of the 169 horizontal pharmaceutical deals in our sample, 13 have at least one overlapping drug project. Overlaps occur in five of the 107 reported deals (a rate of 4.7%) and eight of the 62 unreported deals (a rate of 12.9%)—a test of the difference in means is significant at the 1% level. We use our two measures of overlap to compare unreported horizontal deals in the pharmaceutical industry with reported deals in the following OLS model:

$$ProjectOverlap_{i,j,t} = \alpha + \beta Unreported_{i,j,t} + \tau_t + \epsilon_{i,t}, \tag{5}$$

where $ProjectOverlap_{i,j,t}$ is either an indicator variable—equal to 1 if at least one project overlaps—or a continuous variable—the proportion of projects that overlap—in year $t$.

Table 8 Panel A presents results from estimating Eq. (5). The coefficient in column (1) indicates that, on average, unreported deals are associated with a 10.1-percentage-point higher likelihood of involving overlapping drug projects relative to reported deals—i.e., overlapping drug projects in unreported deals occur at over four times the rate of overlapping drug projects in reported deals (i.e., 13% versus 2.8%). Columns (3) of (4) report results

using $ProjectOverlap_{i,j,t}$ as the dependent variable and shows that unreported deals have a greater proportion of overlap between acquired projects. For roughly half of the horizontal deals in this sample, more than 15% of acquired projects overlap, all of which were unreported, partially because in-process R&D comprises nearly 35% (relative to 15% for reported deals) of the deal but is not accounted for in the SoP test.[29]

### *5.3.2. Project Development after Acquisition*

Given the prevalence of intangible capital in unreported deals for undeveloped pharmaceutical markets, we next examine how such projects are developed post acquisition. On the one hand, acquirers may choose to continue the projects when synergies exist (Beneish et al., 2022). On the other, they may choose to discontinue them when the acquisition was made to preempt competition. Consistent with the latter, Cunningham et al. (2021) shows incumbents acquire drug projects to shut them down when a project potentially substitutes for the incumbent's project. In our setting, the acquirer's ability to shut down overlapping projects is likely enhanced when the size of the target firm's assets is below the asset-size threshold, allowing the merger to bypass review. Moreover, as we show in section 6.1.2, the threat of private litigation by consumers is near zero because drug development occurs before commercialization.

To examine whether drug-development differs between unreported and reported deals, we exploit the granularity of our project-level data, which track the development throughout the project life cycle. We identify a project as discontinued if, after the acquisition date, the project's status is either "discontinued" or "no development reported." For this analysis, we use a sample of 210 overlapping projects across the 13 deals that involve overlapping projects, approximately 50% of which (or 98 of 210) are discontinued after acquisition.

Panel B of Table 8 presents results from regressing an indicator variable for whether a project is discontinued (*ProjectDiscont'd*) on *Unreported*. Overall we find that acquired overlapping projects in unreported deals are about 15 percentage points more likely to be discontinued than overlapping projects in reported deals. This magnitude represents a 40% increase over the 37.5% probability of discontinuing a project in reported deals. These results are robust to the inclusion of therapeutic-class fixed effects, which control for the possibility that unreported and reported deals differ in development rates (e.g., due to the types of drug projects acquired) as well as filing-year fixed effects (see columns (2) and (3), respectively).

One concern with the preceding analysis is that acquirers in unreported deals may naturally have higher project discontinuation rates (e.g., if they tend to be smaller and

[29] Illustrating the size of such deals that bypass antitrust review, in one deal from the sample, the estimated market size for therapeutic drugs is $1.4 billion in annual sales.

riskier projects). To address this concern, we broaden our analysis to also include all of the acquirers' ongoing projects that were initiated but not discontinued before the acquisition date. Combining these non-overlapping projects with the 210 overlapping projects increases our sample to roughly 3,500 unique drug projects. For this analysis, we modify the regression used in columns (1) and (2) of Panel B by including the interaction term $Unreported \times AcquiredProject$ in the following empirical model:

$$\begin{aligned} ProjectDiscont'd_{i,j,p,t} =& \alpha + \beta_1\ Unreported_{i,j,p,t} + \beta_2\ AcquiredProject_{i,j,p,t} \\ &+ \beta_3\ Unreported_{i,j,p,t} \times AcquiredProject_{i,j,p,t} \\ &+ \beta_4 X_{i,t-1} + \tau_t + \phi_{c\times m} + \epsilon_{i,j,t}, \end{aligned} \tag{6}$$

where $AcquiredProject$, is an indicator variable that assumes the value of 1 if the project is an overlapping project acquired via M&A and 0 otherwise. Given the larger sample for this analysis we can include a vector of controls that proxy for the size and the financial health of the acquirer (e.g., *Size*, *Sales*, *Leverage*, *EBITDA/Assets*, *Cash/Assets*, *CashFlow/Assets*, *R&D*, and *Q*). We also can include a therapeutic-class $\times$ mechanism of action fixed effect ($\phi_{c\times m}$), to control for different discontinuation rates that may exist for certain types of projects. All variables are defined in Online Appendix K.

Panel C of Table 8 reports results from estimating Eq. (6). Overall we find that overlapping projects in unreported deals are 16 percentage points more likely to be discontinued (column (1))—an increase of approximately 77% relative to the discontinuation rate in reported deals. Notably, the coefficient on *Unreported* is not statistically significant at conventional levels, suggesting the discontinuation rate of internally developed projects for acquirers with unreported deals does not differ from that of internally developed projects in acquirers with reported deals. Thus, no ex ante differences exist in the development rates across these firms, consistent with prior work on large firms having incentives to stifle innovation (e.g., Seru, 2014).

We obtain similar inferences when we control for the size and financial health of the acquirer (column (2)), but we also find the discontinuation rate for acquired projects in reported deals does not differ from that of internally developed projects. We also find similar results when we include therapeutic-class (filing year) fixed effects and controls to control for variation in discontinuation rates due to unobservable drug-therapy characteristics (time trends) in columns (3) and (4) ((5) and (6)). Finally, in columns (7) and (8), we replace therapeutic-class fixed effects with $TC \times MOA$ fixed effects and find that, even within the same therapeutic class and the same mechanism of action, acquired overlapping projects in unreported deals have a higher rate of discontinuation than internally generated ones.

Collectively, our results in Panel C are consistent with acquirers of overlapping projects in unreported deals striving to reduce product market competition.

### *5.4. Subsequent Project Innovation*

We have shown that unreported deals obtain larger deal premiums, due to their ability to generate rents extraction in developed product markets. We have also shown that allowing intangible capital-intensive deals to bypass antitrust scrutiny leads to higher discontinuation of acquired projects in undeveloped product markets. Over the long run, these forces might relate to the overall incentives for firms to create new drugs—recall that many of our projects are VC-financed, which tend to have near-term exit strategies. Thus, given their higher deal premiums, entrepreneurs may choose to pursue copycat projects rather than novel ones.

We test this conjecture using our drug development data and present results in Table 9. In Panel A, we find that competitors are more likely to initiate a project that overlaps with the acquired project for unreported deals than for reported ones. Additionally, in Panel B, we show the number of competitors initiating copycat projects is larger for unreported than for reported deals. These results appear to have long-run implications on project selection decisions, as they persist three years after the acquisition of the original overlapping project.

## 6. Implications and Additional Analysis

Overall we have shown intangibles are a disproportionately large component of unreported deals and that intangible capital-intensive deals that bypass antitrust scrutiny result in higher market power for firms in developed and undeveloped product markets. We now discuss some enforcement challenges associated with such deals. We also estimate the effects of a change in enforcement policy, consider a number of threats to our inferences, investigate the impact of a change in intangible capital accounting standards on unreported deals, and address how current reporting practices might shape the likelihood of deal completion.

### *6.1. Implications for Public and Private Enforcement*

#### *6.1.1. Public Enforcement*

Given antitrust regulators are resource-constrained, one possibility is that enforcement of deals subject to the size-of-person test—i.e., deals that fall between the lower and upper size of transaction test—receive lax enforcement. To examine this possibility, we obtain data from HSR reports on Second Requests (the highest degree of antitrust scrutiny prior

to litigation). We find roughly 25% of all Second Requests are for such deals (see Online Appendix O) and are similar in investigative length to the largest US mergers (e.g., 146 days versus 160 days; Tucker (2013)). Thus, public enforcement for deals scrutinized under the SoP appears to be costly from a compliance perspective but does not lead to denial of the merger. (These deals are 29 times less likely to be subject to actual enforcement actions against the deal; see Online Appendix P.)

### *6.1.2. Private Enforcement*

Given that we have shown accounting rules lead to many deals bypassing antitrust scrutiny, one might wonder whether private litigation substitutes for a lack of public enforcement against such deals (e.g., Lancieri et al., 2023), which are permitted under the Clayton Act. However, the fixed costs of private antitrust litigation for both plaintiff and defendant are high (e.g., Davis and Kohles Clark, 2022), potentially limiting its prevalence.

We examine the prevalence of private litigation in unreported versus reported deals in Online Appendix P. We find that 1.2% (i.e., 23/1,918) of the deals in our sample have private antitrust related litigation, which is comparable to the number of deals that undergo public litigation by the FTC (1.4%; (Billman and Salop, 2022)). Among the 23 deals with private litigation, eight relate to unreported deals. Thus, 2.1% of unreported deals in our sample faced a private antitrust lawsuit, which is 50% higher than the rate of public litigation for reported deals. Furthermore, most (60%) of private antitrust litigation is in the same industries as public litigation (i.e., technology and pharmaceutical sectors). Given that private antitrust litigation is financially costly to defendants (roughly $200 million on average for plaintiff-favorable rulings in one-third of cases), private antitrust litigation seems to at least partially substitute for a lack of public enforcement against anticompetitive deals that bypass regulatory scrutiny, due to the accounting rules for intangible capital.[30]

### *6.1.3. Frictions to Litigation*

While private litigation partially offsets a lack of public enforcement, plaintiffs—usually customers or competitors—face different thresholds for court dismissal than the FTC or DOJ. For instance, competitors must prove both that the merger violates antitrust law and that alleged harm from the merger is anticompetitive (e.g., predatory pricing practices; see the US Supreme Court's decisions in *Brunswick Corp.* v. *Pueblo Bowl-O-Mat, Inc.* and *Cargill, Inc.* v. *Monfort of Colorado, Inc.*). Private litigation is further limited by the nature of the

[30]In Online Appendix M, we study the extent to which intangibles appear in the court filings of public and private complaints. We find 80% (100%) of public (private) complaints discuss the harm from the merger because of the acquisition of an intangible asset.

markets impacted by intangible capital-intensive consolidations (e.g., undeveloped product markets). Indeed, all of the court complaints in our sample include allegations of anticompetitive harm either in existing product markets or those with sophisticated customers. Given the US relies on a combination of public and private enforcement (Baer, 2014), when private enforcement faces legal constraints or when no private enforcers are present, anticompetitive acquisitions will likely go unchecked by both public and private enforcement.[31]

## *6.2. Estimated Regulatory Effects*

We next provide back-of-envelope calculations of the effect of an alternative treatment that requires firms to include intangible assets in their calculations for the SoP test. Such a rule change would increase the number of reported mergers as well as the compliance costs to firms and enforcement costs regulators. Furthermore, it could also deter M&A with increased antitrust costs and enforcement risk. We estimate the magnitudes of these effects in our setting and consider how such a change may impact firms' incentives to manipulate deals to avoid premerger review. We also consider a recent change to accounting standards to understand the prevalence of manipulation around the threshold.

### *6.2.1. Enforcement Costs*

To begin our back-of-envelope calculation, recall we have estimated an additional 263 deals would be reported if intangible assets were included in the SoP test (Figure 3). However, 44% of those new filings would involve nonhorizontal deals (Table 1 Panel B), which are unlikely to receive a Second Request. The costs to regulators for reviews that do not require a Second Request are minimal (i.e., less than the filing fees; Wollmann, 2020). Thus, most of the premerger-review enforcement costs would come from the increase in reported horizontal deals, which constitute 55% of reported deals. Based on these amounts, recognizing intangible assets in the SoP test would increase the number of horizontal deals by 145 each year. We would expect 40% of these deals would be granted an early termination of the premerger review (see Online Appendix H). Therefore an additional 90 horizontal deals (i.e., 60% of the 145 deals) would be reviewed each year if intangible assets were included in the SoP test.

Of these 90 additional deals, roughly 6% (five or six) of these deals would likely result in a

[31] Despite these frictions, the deterrence effects from enforcement that we estimate are likely lower bounds for two reasons. First, deals are often abandoned after a Second Request is issued but before the FTC or DOJ file a legal complaint (Billman and Salop, 2022). Second, even after receiving a legal complaint, firms typically choose to resolve the issue before litigation commences. In fact, from 2001 to 2020, only 26 of the 441 legal complaints by the FTC or DOJ resulted in a court decision (Billman and Salop, 2022).

second request (see Section 2.1). Thus, at an estimated cost per Second Request investigation of $163,000 to $215,000 (Wollmann, 2020), recognizing intangibles in the SoP test would cost the regulator an estimated additional $815,000–$1,075,000 each year (a 2.6%–3.5% increase in total enforcement costs of $31 million to $41 million). When we include the expected effects of deterrence (i.e., we estimate 23 of the 90 additional horizontal deals would not occur if managers know the deal will not pass antitrust review; see Online Appendix Q), our estimates decrease to $652,000–$860,000 (2.1%–2.8% of annual enforcement costs).

#### *6.2.2. Incentives to manipulate deals to avoid scrutiny*

While including intangibles in the SoP test would likely increase the number of deals subject to review, doing so could also alter firms' incentives to manipulate financial and governance deal terms to sidestep premerger screening. Suggestive of this kind of manipulation, Kepler et al. (2023) find 45% higher-than-expected number of deals just below the lower deal-size threshold. Applying this magnitude to our estimates translates to 41 of the 90 annual horizontal mergers that our prior analysis suggest would become reportable would continue to avoid reporting through manipulation.

In terms of managers' incentives to avoid reviews, they may prefer deals to be unreported because they believe that antitrust regulators block deals that are not truly anticompetitive. However, our collective evidence on higher markups, project discontinuation, and private litigation are more symptomatic of unreported deals increasing firms' market power rather than avoiding an imperfect regulator. A related explanation would be that managers want to avoid regulator scrutiny because scrutiny increases deal termination/renegotiation risk, which is costly to acquirers. However, such cancellations and renegotiations are rare (3.9% and 3.1% of all deals, respectively), and only 0.2% of these deals cite "regulator concern" as the reason for cancellation or termination (see Online Appendix R).

#### *6.2.3. Changes to Accounting Standards*

To better understand managers' incentives to manipulate around the SoP thresholds, we examine how firms respond to changes in accounting standards that shift some deals from unreportable to reportable. Given that the SoP test uses the book value of assets to determine the need for a premerger review, any change in which assets are included on the balance sheet could shift deals from being unreportable to reportable. For deals with anticompetitive implications, such a shift would heighten the risk of regulatory intervention solely because the deal would then be reportable. If firms internalize these costs, we expect such a change to an accounting standard would affect the decision to acquire or the timing of deals. Consis-

tent with this, we find a 50% increase in the proportion of unreported deals shortly after an accounting standard that moved leases onto firms' balance sheets was announced but before its adoption (see Online Appendix S). We also find the increase is driven by target firms that, if operating leases were recognized on the balance sheet, would shift from unreportable to reportable. These results corroborate that requiring firms to include intangible capital in the SoP test would result in additional avoidance strategies by managers.

# 7. Conclusion

We show that accounting standards for antitrust screening lead to thousands of M&A going unreported to regulators, despite being otherwise similar to reported deals. These unreported deals consolidate overlapping product markets in venture capital-backed and intangible capital-intensive industries that regulators have expressed particular concerns over (e.g., technology and pharmaceutical markets). These deals often involve the acquisition of advertising brands, patented technology, and in-process R&D that we show lead to anticompetitive behavior for a significant fraction for deals. We find that acquirers and their rivals benefit from unreported deals in terms of higher equity values and product markups. Furthermore, we find unreported deals in the pharmaceutical industry are more likely to involve overlapping projects that are subsequently discontinued. Moreover, we find that unreported deals can reduce innovation by spurring more copycat pharmaceutical projects.

Our findings have policy implications. Given antitrust regulators' reliance on screening thresholds, accounting standards can influence the types of deals that bypass antitrust review and thus impact market structure. In this regard, our study suggests regulatory concern about the limitations set by premerger-review thresholds may be warranted. We add to this debate by showing that certain industries that are more intangible-intensive are more likely to consolidate, improving firms' market power but going undetected by regulators. Overall our study suggests that the continued growth of intangible assets may exacerbate market consolidation in the sectors that are of most concern for consumers.

# References


Asker, John, and Volker Nocke, 2021, Collusion, mergers, and related antitrust issues, *Handbook of Industrial Organization* 5, 177–279.

Autor, David, David Dorn, Lawrence F. Katz, Christina Patterson, and John Ven Reenen, 2020, The fall of the labor share and the rise of superstar firms, *The Quarterly Journal of Economics* 135, 645–709.

Baer, Bill, 2014, Public and private antitrust enforcement in the United States, Department of Justice.

Barrios, John M., and Thomas G. Wollmann, 2022, A new era of might mergers: Antitrust risk and investor disclosures, NBER Working Paper.

Bartov, Eli, C.S. Agnes Cheng, and Hong. Wu, 2021, Overbidding in mergers and acquisitions: An accounting perspective, *The Accounting Review* 96, 55–79.

Beneish, M.D., C.R. Harvey, A. Tseng, and P. Vorst, 2022, Unpatented innovation and merger synergies, *Review of Accounting Studies* 27, 706–744.

Bens, Daniel A., and Steven J. Monahan, 2008, Altering investment decisions to manage financial reporting outcomes: Asset-backed commercial paper conduits and FIN 46, *Journal of Accounting Research* 46, 1017–1055.

Biden, Joseph R., 2021, Executive order on promoting competition in the American economy, *Federal Register* 86, 36987–36999.

Billman, Logan, and Steven C. Salop, 2022, Merger enforcement statistics: 2001-2020, *Antitrust Law Journal* Forthcoming.

Bonaime, Alice, and Ye (Emma) Wang, 2024, Mergers, product prices, and innovation: Evidence from the pharmaceutical industry, *Journal of Finance* 79, 2195–2236.

Chevalier, Judith, 1995, Capital structure and product-market competition: Empirical evidence from the supermarket industry, *American Economic Review* 415–435.

Chircop, Justin, and Zoltan Novotny-Farkas, 2016, The economic consequences of extending the use of fair value accounting in regulatory capital calculations, *Journal of Accounting and Economics* 62, 183–203.

Cooper, Zack, Stuart V. Craig, Martin Gaynor, and John Van Reenen, 2019, The price ain't right? Hospital prices and health spending on the privately insured, *The Quarterly Journal of Economics* 134, 51–107.

Covaleski, Mark A, Mark W Dirsmith, and Sajay Samuel, 1995, The use of accounting information in governmental regulation and public administration: The impact of john r. commons and early institutional economists, *Accounting Historians Journal* 22, 1–33.

Crouzet, Nicolas, Janice C. Eberly, Andrea L. Eisfeldt, and Dimitris Papanikolaou, 2022, The economics of intangible capital, *Journal of Economic Perspectives* 36, 29–52.

Cunningham, Colleen, Florian Ederer, and Song Ma, 2021, Killer acquisitions, *Journal of Political Economy* 129, 649–702.

Davis, Joshua P., and Rose Kohles Clark, 2022, 2021 antitrust annual report: Class action filings in federal court, Working Paper.

De Loecker, Jan, Jan Eeckhout, and Gabriel Unge, 2020, The rise of market power and the macroeconomic implications, *Quarterly Journal of Economics* 135, 561–644.

Dou, Yiwei, Stephen G. Ryan, and Biqin Xie, 2018, The real effects of FAS 166/167 on banks' mortgage approval and sale decisions, *Journal of Accounting Research* 56, 843–882.

Eckbo, B. Espen, 1983, Horizontal mergers, collusion, and stockholder wealth, *Journal of Financial Economics* 11, 241–273.

Ederer, Florian, and Bruno Pellegrino, 2023, The great start-up sellout and the rise of oligopoly, *AEA Paper and Proceedings* 113, 274–278.

Eisfeldt, Andrea L, and Dimitris Papanikolaou, 2014, The value and ownership of intangible capital, *American Economic Review* 104, 189–194.

Eliason, P.J., B. Heebsh, R.C. McDevitt, and J. Roberts, 2020, How acquisitions affect firm behavior and performance: Evidence from the dialysis industry, *Quarterly Journal of Economics* 135, 221–267.

Fathollahi, Maryam, Jarrad Harford, and Sandy Klasa, 2022, Anticompetitive effects of horizontal acquisitions: The impact of within-industry product similarity, *Journal of Financial Economics* 144, 645–669.

Foster, Lucia, Joh Haltiwanger, and Chad Syverson, 2016, The slow growth of new plants: Learning about demand?, *Econometrica* 83, 91–129.

Francis, Jennifer, Donna Philbrick, and Katherine Schipper, 1994, Shareholder litigation and corporate disclosures, *Journal of Accounting Research* 32, 137–164.

FTC, 2022, The future of pharmaceuticals: Examining the analysis of pharmaceuticals mergers.

Garham, John R., Michelle Hanlon, and Terry Shevlin, 2011, Real effects of accounting rules: Evidence from multinational firms' investment location and profit repatriation decisions, *Journal of Accounting Research* 49, 137–184.

Garmaise, Mark J., and Tobias J. Moskowitz, 2006, Bank mergers and crime: [t]he real and social effects of credit market competition, *Journal of Finance* 61, 495–538.

Giglio, Stefano, and Tiago Severo, 2012, Intangible capital, relative asset shortages and bubbles, *Journal of Monetary Economics* 59, 303–317.

Glaeser, Stephen, and Mark Lang, 2024, Measuring innovation and navigating its unique information issues: A review of the accounting literature on innovation, *Journal of Accounting and Economics* 101720.

Harford, Jarrad, 2005, What drives merger waves?, *Journal of Financial Economics* 77, 529–560.

Haskel, Jonathan, and Stian Westlake, 2018, *Capitalism without capital: The rise of the intangible economy* (Princeton University Press).

Holthausen, Robert W, and Richard W Leftwich, 1983, The economic consequences of accounting choice implications of costly contracting and monitoring, *Journal of Accounting and Economics* 5, 77–117.

Howell, Andrew G., 2001, Why premerger review needed reform–and still does, *William Mary Law Review* 43, 1703–1745.

Huber, Stefan, and Charles McClure, 2023, Accounting for goodwill, *University of Chicago, Becker Friedman Institute for Economics Working Paper* .

Iselin, Michael, and Allison Nicoletti, 2017, The effects of sfas 157 disclosures on investment decisions, *Journal of Accounting and Economics* 63, 404–427.

Kamepalli, Sai Krishna, Raghuram Rajan, and Luigi Zingales, 2022, Kill zone, *NBER Working Paper* .

Kanodia, Chandra, and Haresh Sapra, 2016, A real effects perspective to accounting measurement and disclosure: Implications and insights for future research, *Journal of Accounting Research* 54, 623–676.

Kaplan, Steven N, and Per Strömberg, 2009, Leveraged buyouts and private equity, *Journal of Economic Perspectives* 23, 121–146.

Kelly, Bryan, Dimitris Papanikolaou, Amit Seru, and Matt Taddy, 2021, Measuring technological innovation over the long run, *American Economic Review: Insights* 3, 303–320.

Kepler, John D., Vic Naiker, and Christopher R. Stewart, 2023, Stealth acquisitions and product market competition, *Journal of Finance* 78, 2837–2900.

Kogan, Leonid, Dimitris Papanikolaou, Amit Seru, and Noah Stoffman, 2017, Technologival innovation, resource allocation, and growth, *Quarterly Journal of Economics* 132, 665–712.

Lancieri, Filippo, Eric A. Posner, and Luigi Zingales, 2023, The political economy of the decline antitrust enforcement in the united states, *Antitrust Law Journal* Forthcoming.

Leuz, Christian, and Peter D. Wysocki, 2016, The economics of disclosure and financial reporting regulation, *Journal of Accounting Research* 54, 525–622.

Lev, Baruch, 2019, Ending the accounting-for-intangibles status quo, *European Accounting Review* 28, 713–736.

Ma, Mark (Shuai), and Wayne B. Thomas, 2023, Economic consequences of operating lease recognition, *Journal of Accounting and Economics* 75, 101566.

Mitchell, Mark R., and J. Harold Mulherin, 1996, The impact of industry shocks on takeover and restructuring activity, *Journal of Financial Economics* 41, 193–229.

Nocke, Volker, and Michael D. Whinston, 2010, Dynamic merger review, *Journal of Political Economy* 118, 1200–1251.

Nocke, Volker, and Michael D. Whinston, 2022, Concentration thresholds for horizontal mergers, *American Economic Review* 112, 1915–1948.

Peters, Ryan H, and Lucian A Taylor, 2017, Intangible capital and the investment-q relation, *Journal of Financial Economics* 123, 251–272.

Rampini, Adriano A, and S Viswanathan, 2010, Collateral, risk management, and the distribution of debt capacity, *The Journal of Finance* 65, 2293–2322.

Sapienza, Paola, 2002, The effects of banking mergers on loan contracts, *Journal of Finance* 57, 329–367.

Segal, Ilya, and Michael D. Whinston, 2007, Antitrust in innovative industries, *American Economic Review* 97, 1703–1730.

Seru, Amit, 2014, Firm boundaries matter: Evidence from conglomerates and R&D activity, *Journal of Financial Economics* 111, 381–405.

Solomon, Ezra, 1970, Alternative rate or return concepts and their implications for utility regulation, *The Bell Journal of Economics and Management Science* 65–81.

Stigler, George J., 1964, A theory of oligopoly, *Journal of Political Economy* 72, 44–61.

Taggart, Robert A, 1981, Rate-of-return regulation and utility capital structure decision, *The Journal of Finance* 36, 383–393.

Tucker, Darren S., 2013, A survey of evidence leading to second requests at the FTC, *Antitrust Law Journal* 78, 4591–617.

Williams, Braden, and Brian M. Williams, 2021, Real effects of financial reporting on innovation: Evidence from tax law and accounting standards, *The Accounting Review* 96, 397–425.

Wollmann, Thomas G., 2019, Stealth consolidation: Evidence from an amendment to the Hart-Scott-Rodino Act, *American Economic Review: Insights* 1, 77–94.

Wollmann, Thomas G., 2020, How to get away with merger: Stealth consolidation and its real effects on u.s. healthcare, NBER Working Paper.

Wollmann, Thomas G., 2023, Strategic announcements of nonreportable mergers, NBER Working Paper.

## Figure 1. Ratio of Acquired Intangible Assets to Tangible Assets

Panel A displays the ratio of acquired intangible assets to tangible assets from 2002 through 2019. Panel B displays the breakdown, by goodwill and by identifiable intangible assets, of the ratio of intangible assets to tangible assets. In Panels A and B, the red line depicts the ratio of identifiable intangible assets plus goodwill, all scaled by tangible assets. In Panel B, the dashed lines depict goodwill scaled by tangible assets (dark gray) and identifiable intangible assets scaled by tangible assets (light gray), respectively. We use a sample of 11,436 unique observations that comprise M&As conducted by US publicly traded acquirers and represent $8.8 trillion in total acquired assets. For the purpose of our study, we narrow our focus to 1,918 deals that are subject to the size-of-person (SoP) test, as depicted in Figure 2. Our measure of intangible assets is identifiable intangible assets plus goodwill, and our measure of tangible assets is the sum of all tangible assets. We obtain values for each type of asset from the purchase-price allocation (PPA) disclosed in acquirers' 10-K SEC filings, found on EDGAR at www.SEC.gov. An example of the PPA disclosure is found in Online Appendix G.

**Panel A. Total Intangible Assets to Total Tangible Assets**

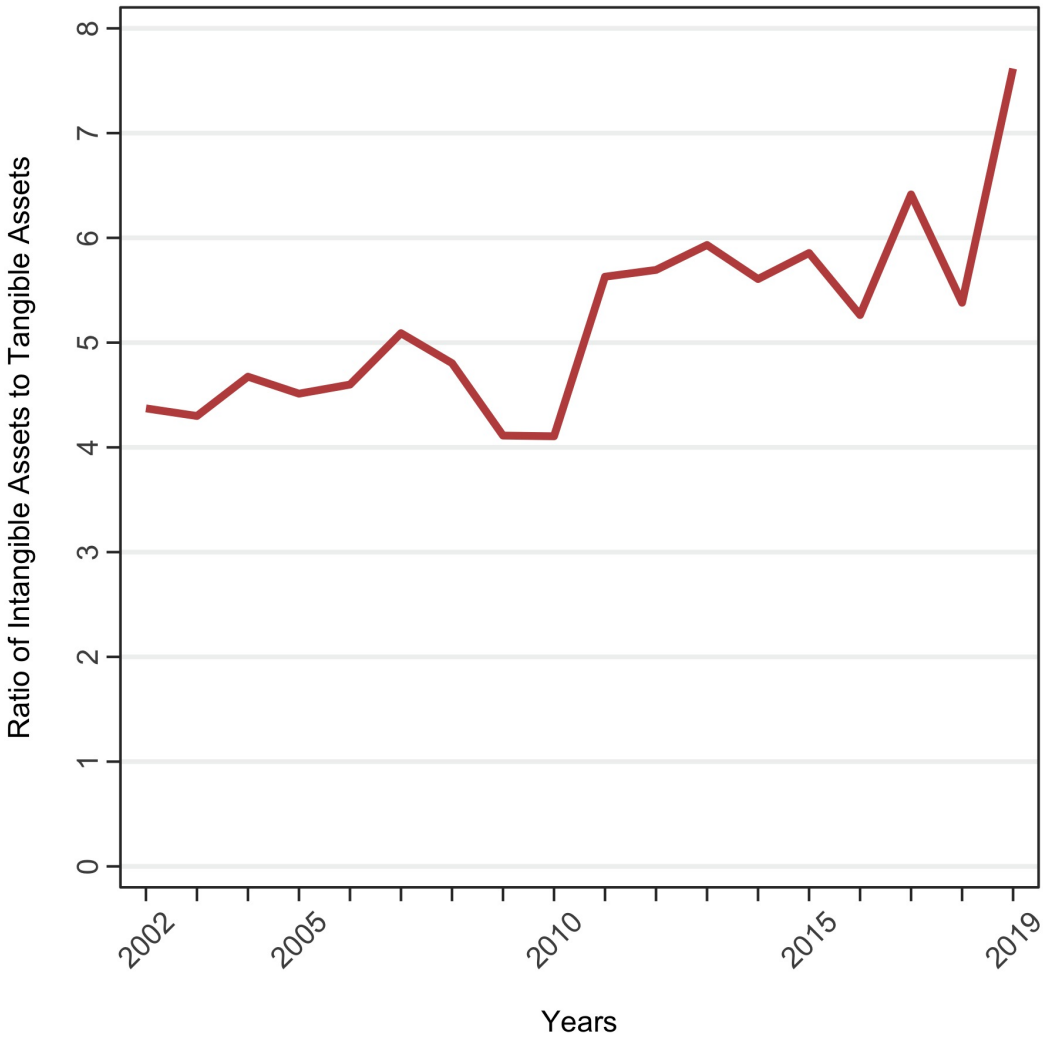
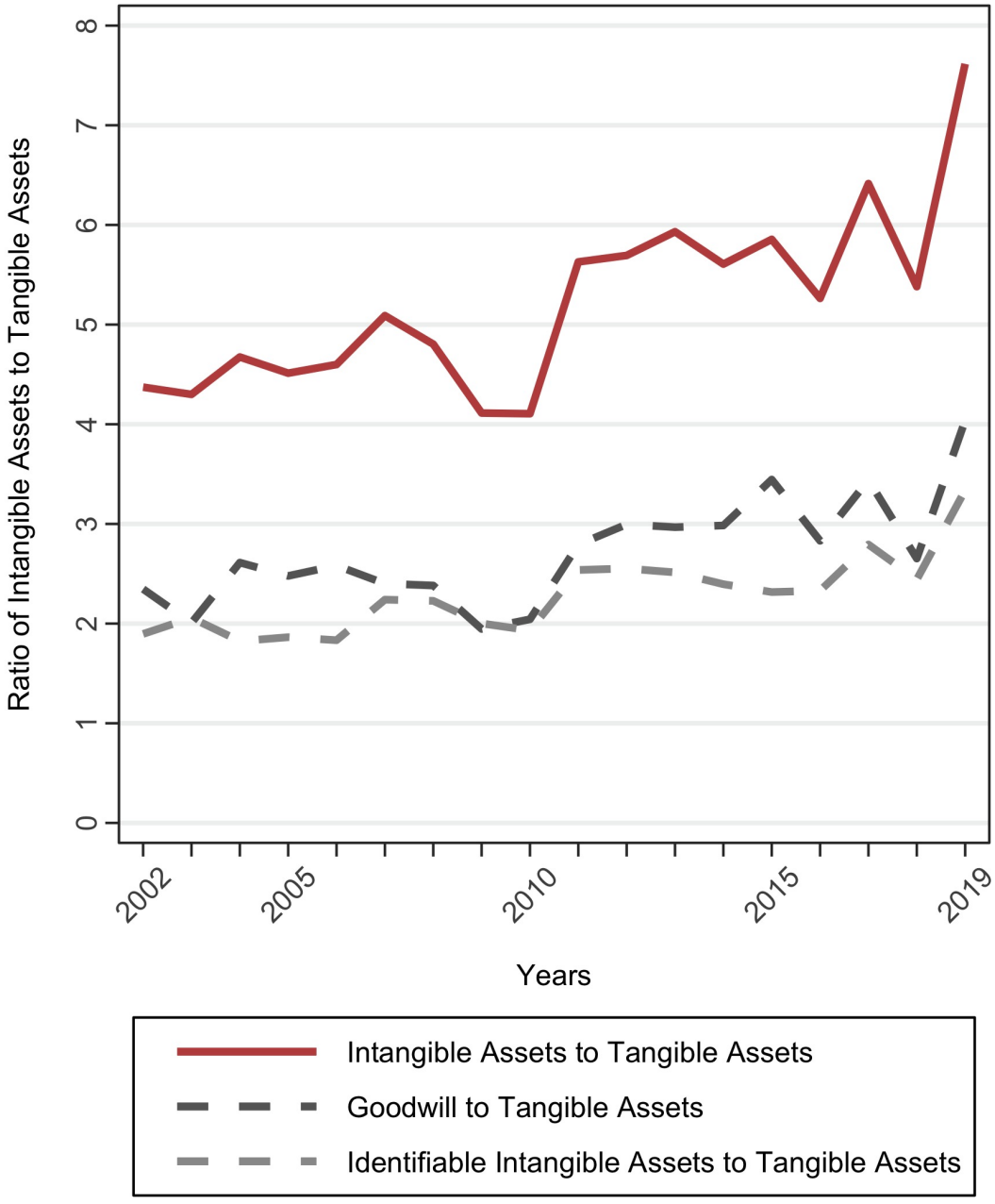


**Figure 1. Ratio of Acquired Intangible Assets to Tangible Assets (Continued)**

**Panel B. Breakdown of Intangible Assets to Tangible Assets**



## Figure 2. Notification Thresholds

**Rules of Premerger Notification for Size of Transaction and Size of Person Tests**


If, on the date the deal is announced, the total value of the target that would be held by the acquirer is *at or below* the lower size of transaction threshold, a **premerger notification is not required**.

If, on the date the deal is announced, the total value of the target that would be held by the acquirer is *above the lower* and *at or below upper size* of transaction thresholds, the "Size of Person" test is **used to determine if the deal is subject to a premerger notification is required**

If, on the date the deal is announced, the total value of the target that would be held by the acquirer is above the upper size of transaction threshold, a premerger notification is required.

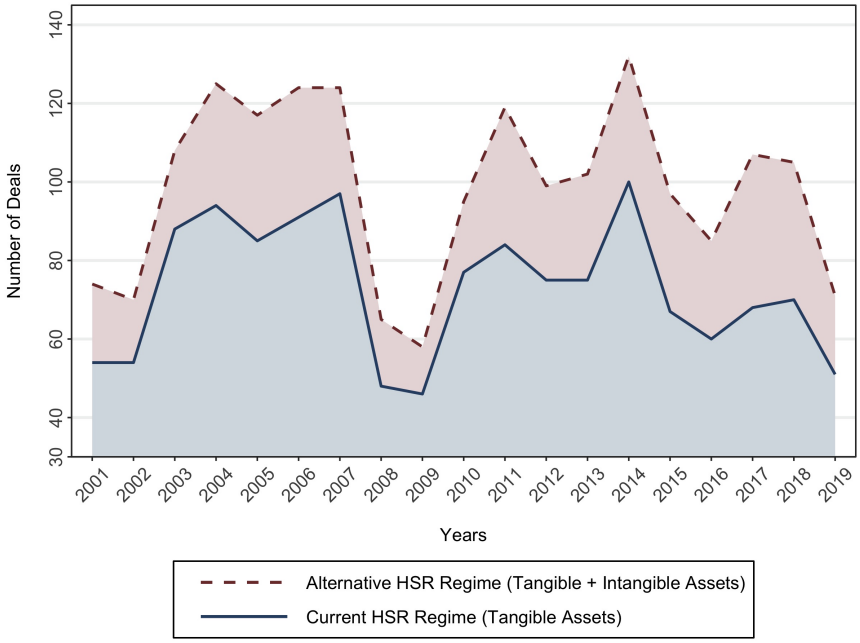
**Notification Thresholds (by year)**

| Reporting Year | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Size of Transaction Lower Threshold ($ mm) | 50.0 | 50.0 | 50.0 | 50.0 | 53.1 | 56.7 | 59.8 | 63.1 | 65.2 | 63.4 | 66.0 | 68.2 | 70.9 | 75.9 | 76.3 | 78.2 | 80.8 | 84.4 | 90.0 |
| Size of Person Asset Threshold ($ mm) | 10.0 | 10.0 | 10.0 | 10.0 | 10.7 | 11.3 | 12.0 | 12.6 | 13.0 | 12.7 | 13.2 | 13.6 | 14.2 | 15.2 | 15.3 | 15.6 | 16.2 | 16.9 | 18.0 |
| Size of Transaction Upper Threshold ($ mm) | 200.0 | 200.0 | 200.0 | 200.0 | 212.3 | 226.8 | 239.2 | 252.3 | 260.7 | 253.7 | 263.8 | 272.8 | 283.6 | 303.4 | 305.1 | 312.6 | 323.0 | 337.6 | 359.9 |
| Effective Date | Feb 1, 2001 | Feb 1, 2002 | Feb 1, 2003 | Feb 1, 2004 | Mar 2, 2005 | Feb 17, 2006 | Feb 21, 2007 | Feb 28, 2008 | Feb 12, 2009 | Feb 22, 2010 | Feb 24, 2011 | Feb 27, 2012 | Feb 11, 2013 | Feb 24, 2014 | Feb 20, 2015 | Feb 25, 2016 | Feb 27, 2017 | Feb 28, 2018 | Apr 3, 2019 |

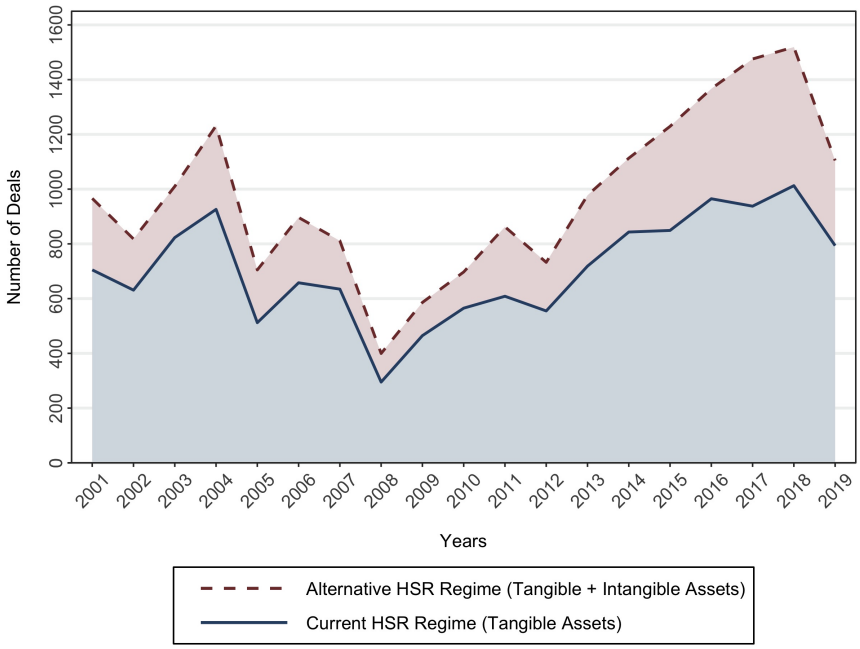
## Figure 3. Trends in Reported Deals

This figure displays the number of deals reported to antitrust regulators when only tangible assets are included in the size-of-person (SoP) test (in blue) and the number of deals that would be reported if both tangible and identifiable intangible assets are included in the SOP test (in red). In Panel A, we present the current HSR regime (blue) and the counterfactual regime (red) for only our sample of deals. In Panel B, we present the current HSR regime (blue) using data from HSR annual reports and then estimate the counterfactual HSR regime (red) using red-to-blue proportions obtained from Panel A.

**Panel A. Within-Sample Analysis**



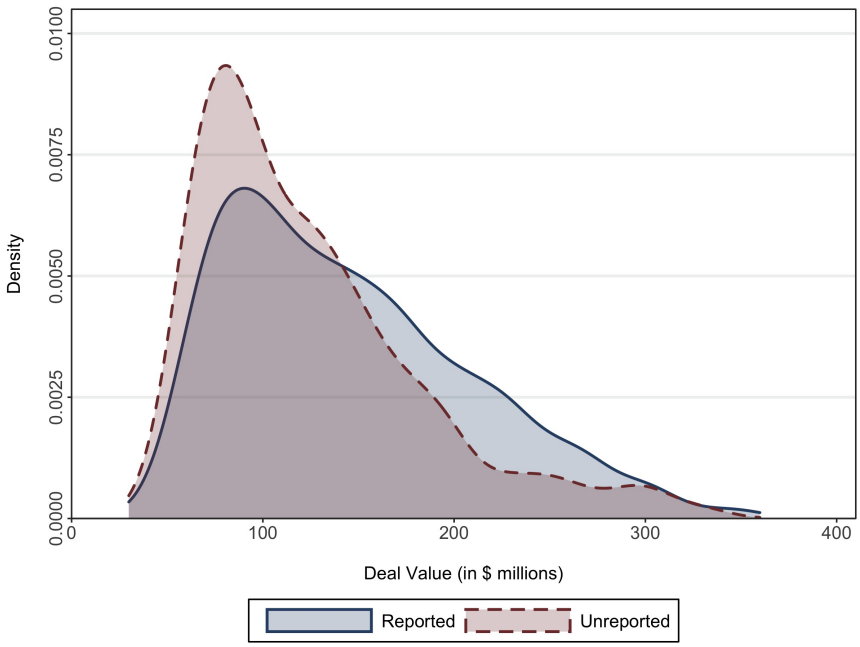

**Panel B. Market-Level Analysis**



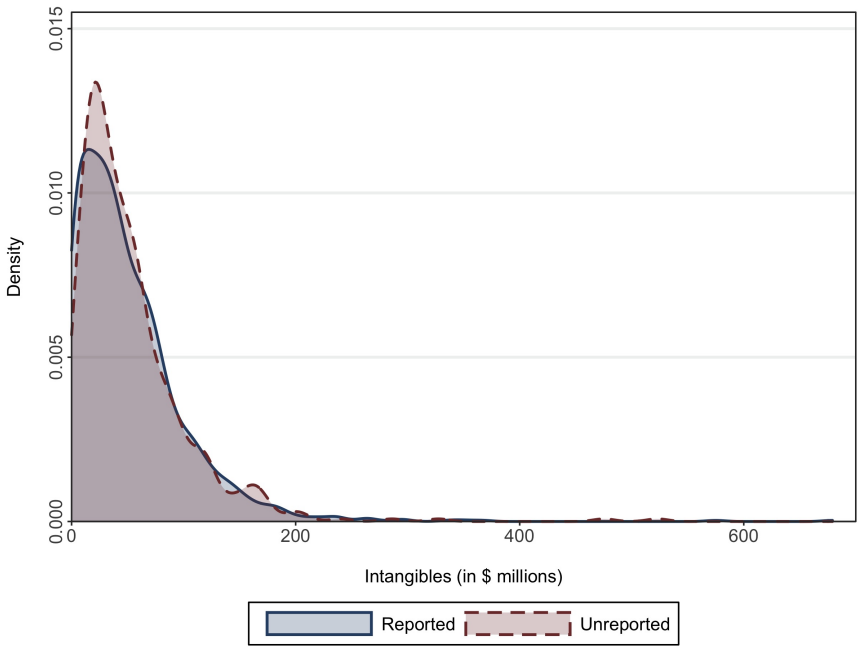
## Figure 4. Distribution of Deals: Unreported vs. Reported

This figure graphically displays the distribution of unreported vs. reported deals. In Panel A, we present the distribution of deal values for unreported and reported M&As. In Panel B, we present the distribution of identifiable intangible asset values for unreported and reported M&As.

### Panel A. Distribution of Deal Values for Unreported and Reported M&As

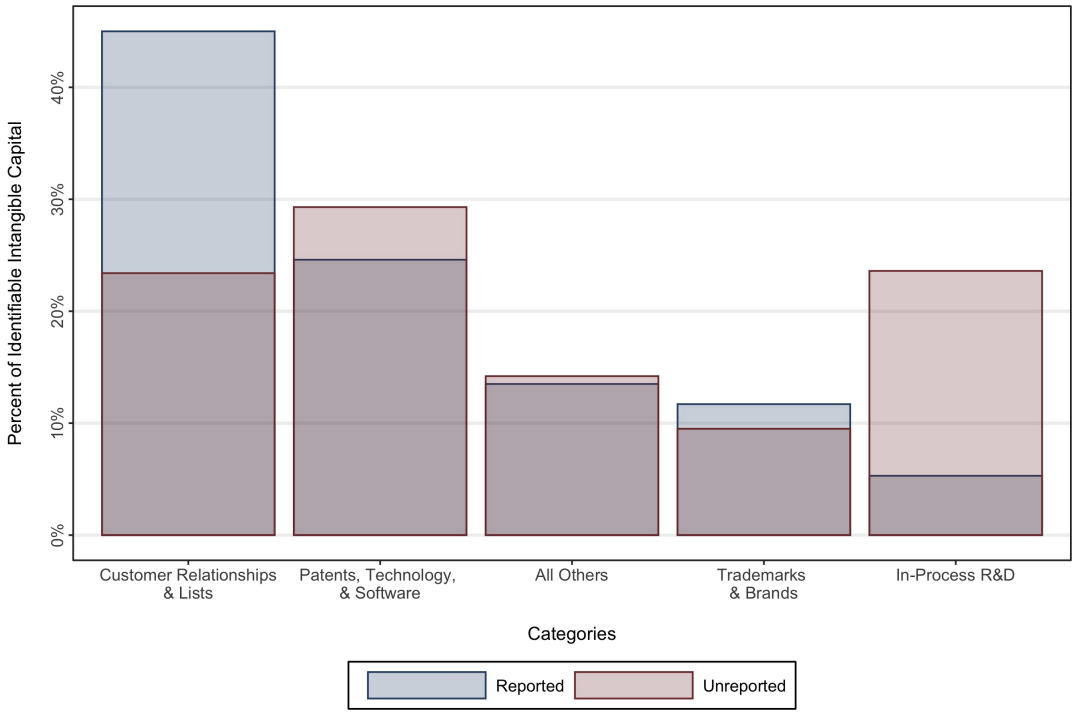



### Panel B. Distribution of Intangibles for Unreported and Reported M&As



## Figure 5. Categories of Intangibles

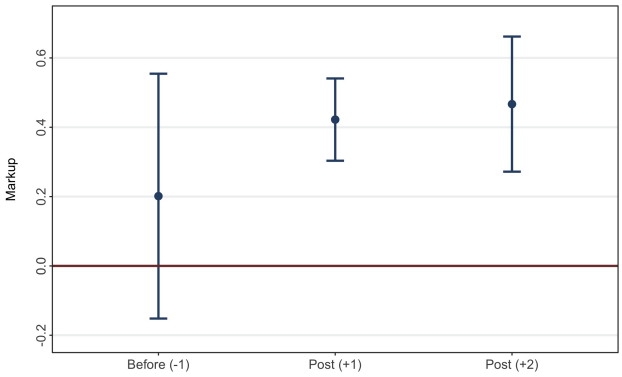
This figure displays, by reported vs. unreported, the percent of total identifiable intangibles that each category represents. We display the top four categories separately and then aggregate the remaining 18 categories and call it "All Others." See Panel B of Table 2 for the complete list of categories.



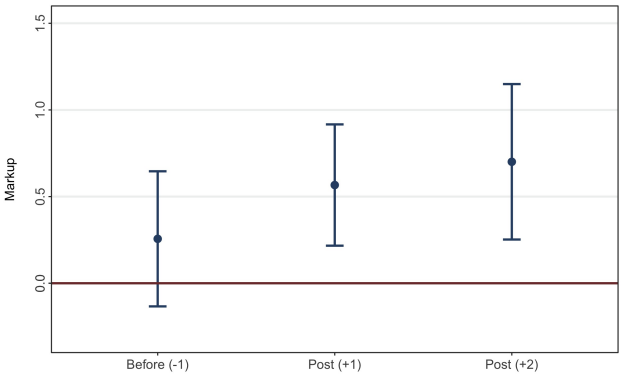
## Figure 6. Markups following Unreported Deals

This figure graphically displays the evolution of markups before and after acquisitions that consolidate developed product markets. In Panel A, the figure presents coefficients from column (4) of Panel A in Table 6. In Panel B, the figure presents coefficients from column (2) of Panel B in Table 6. In Panel C, the figure presents coefficients from column (4) of Panel B in Table 6. In Panel D, the figure presents coefficients from column (6) of Panel B in Table 6. Coefficients are for the following interaction terms in the model: *Unreported* × *ProductMarketOverlap* × *Before (-1)*, *Unreported* × *ProductMarketOverlap* × *Post (+1)*, and *Unreported* × *ProductMarketOverlap* × *Post (+2)*. Our exclusion year is *Before (-2)*.

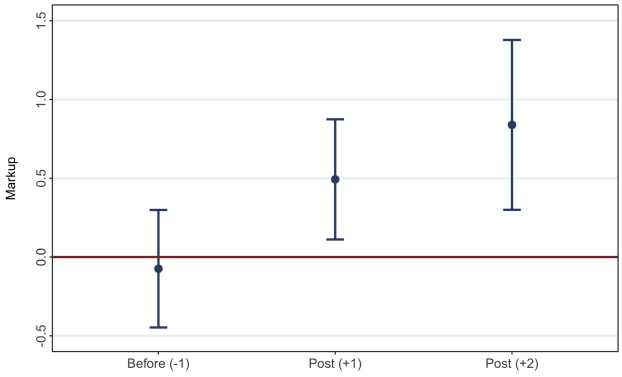
**Panel A. Markups following All Unreported M&As**



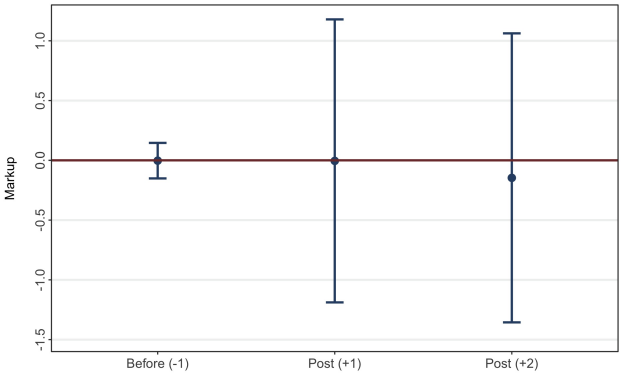

**Panel B. Markups following Unreported M&As of Brands or Technology**




**Panel C. Markups following Unreported M&As of Brands and Technology**




**Panel D. Markups following Unreported M&As of neither Brands nor Technology**



## Table 1. Descriptive Statistics

This table presents descriptive statistics for our sample of reported and unreported deals. A deal is classified as reported is it has total assets that are above the SoP threshold in that reporting year. A deal is classified as unreported if it has total assets that are equal to or below the SoP asset threshold in that reporting year but has not been reviewed by the FTC or DOJ. In Panel A, we present descriptive statistics separately for reported and unreported deals. In Panel B, we present descriptive statistics, by industry, for only unreported horizontal deals. In Panel C, we present, separately for reported and unreported horizontal deals, the mean percent of tangible assets, intangible assets, and goodwill. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

**Panel A. Reported vs. Unreported M&As**

| | Reported | Unreported | Difference |
|---|---|---|---|
| *Type of M&A* | | | |
| Horizontal (3-digit NAICS) | 766 (55.2%) | 219 (56.6%) | -1.0% |
| Non-Horizontal | 621 (44.8%) | 168 (43.4%) | 1.0% |
| *Average deal value (in $ millions)* | | | |
| Horizontal (3-digit NAICS) | $143.5 | $121.3 | $22.2*** |
| Non-Horizontal | $148.1 | $122.1 | $26.0*** |

**Panel B. Unreported Horizontal M&As**

| Industry | Horizontal M&As (Unreported) | Value (in $ billions) |
|---|---|---|
| Computer and Electronic Product Manufacturing | 107 (48.8%) | $11.83 |
| Chemical Manufacturing | 62 (28.3%) | $8.72 |
| Professional, Scientific, and Technical Services | 17 (7.80%) | $2.11 |
| Telecommunications | 8 (3.70%) | $0.71 |
| Utilities | 0 (0.00%) | $0.00 |
| Food and Kindred Products | 5 (2.30%) | $0.57 |
| Machinery Manufacturing | 10 (4.60%) | $1.62 |
| Transportation Equipment | 0 (0.00%) | $0.00 |
| Communications | 5 (2.30%) | $0.44 |
| Health Services | 0 (0.00%) | $0.00 |
| Publishing Industries (except Internet) | 4 (1.80%) | $0.45 |
| Hospitals | 1 (0.50%) | $0.12 |
| Merchant Wholesales, Nondurable Goods | 0 (0.00%) | $0.00 |
| Total | 219 (100%) | $26.56 |

**Panel C: Tangible Assets, Intangibles, and Goodwill of Horizontal M&As**

| | Reported | Unreported | Difference |
|---|---|---|---|
| *Horizontal M&As* | | | |
| Tangible assets | 35.5% | 6.7% | 28.8%*** |
| Intangibles | 27.7% | 46.8% | -19.1%*** |
| Goodwill | 36.8% | 46.4% | -9.6%*** |
| Total | 100% | 100% | |

## Table 2. Categories of Intangibles

This table presents results of the analysis of categories of intangibles. In Panel A, we present the frequency of intangibles in our sample. In Panel B, we present the amounts (in $ millions) and percents for all categories of identifiable intangible assets in our sample. In Panel C, we present results for difference-in-means tests, by category, for reported vs. unreported deals. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

**Panel A. Frequency of Intangibles in M&As**

| Description | Observations |
|---|---|
| No intangibles | 108 |
| Intangibles (not disaggregated) | 410 |
| Intangibles (disaggregated by category) | 1,400 |
| Total | 1,918 |

**Panel B. Economic Importance by Category of Intangible**

| Category | Amount($ millions) | Percent |
|---|---|---|
| Customer Relationships & Lists | $30,491.91 | 38.7% |
| Patents, Technology, & Software | $19,808.12 | 25.1% |
| Trademarks & Brands | $8,906.38 | 11.3% |
| In-Process R&D | $7,663.93 | 9.7% |
| Licenses | $3,212.06 | 4.1% |
| Product Rights | $3,036.69 | 3.9% |
| Distribution Agreements | $1,242.37 | 1.6% |
| Power Purchase Agreements | $628.67 | 0.8% |
| Other Intangibles | $627.16 | 0.8% |
| Non-Compete Agreements | $513.91 | 0.7% |
| Mineral Interests | $475.20 | 0.6% |
| Usage Rights | $391.00 | 0.5% |
| Franchise Rights | $325.60 | 0.4% |
| Databases | $272.60 | 0.3% |
| Lease Intangibles | $247.96 | 0.3% |
| Supplier Agreements | $163.03 | 0.2% |
| Maintenance Contracts | $122.20 | 0.2% |
| Management Agreements | $103.10 | 0.1% |
| Pipeline Capacity Rights | $87.60 | 0.1% |
| Other Contract Rights | $66.90 | 0.1% |
| Assembled Workforce | $50.80 | 0.1% |
| Royalty Agreements | $4.90 | 0.0% |
| Total | $78,760.16 | 100.0% |

**Panel C. Difference-in-Means Tests (by Category) for Reported vs. Unreported M&As**

| Category | Mean($ millions) Reported | Mean($ millions) Unreported | Difference |
|---|---|---|---|
| Customer Relationships & Lists | $25.19 | $12.04 | $13.15*** |
| Patents, Technology, & Software | $13.78 | $15.05 | −$1.27 |
| Trademarks & Brands | $ 6.54 | $ 4.88 | $1.66* |
| In-Process R&D | $ 2.94 | $12.14 | −$9.20*** |

## Table 3. Target Characteristics and Unreported M&As

This table presents results of the analysis of the characteristics of sellers of target firms in reported and unreported M&As. In Panel A, we present the sellers in reported vs. unreported M&As. In Panel B, we present ordinary least squares (OLS) regressions of type of seller on unreported M&As. The main variable of interest across all columns, *Unreported*, is an indicator variable that assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold; and 0 otherwise. The dependent variable in each column is an indicator variable that assumes the value of 1 if, immediately prior to the deal, the investor in the target firm was Venture Capital (column 1), Private Equity (column 2), Venture Growth (column 3), or Recapitalized by Private Equity (column 4). All variables are described in Online Appendix K. Across all columns of Panel B, we include filing-year and target's industry fixed effects, respectively. Robust t-statistics are reported in parentheses and calculated using standard errors clustered at the filing-year and the target's industry level, respectively. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

**Panel A. Target Characteristics for Reported vs. Unreported M&As**

| Type of Seller | Reported | Unreported | Difference (R)-(U) |
|---|---|---|---|
| Venture Capital | 13.2% | 33.3% | −20.1%*** |
| Private Equity | 10.0% | 5.2% | 4.8%*** |
| Venture Growth | 2.3% | 2.8% | −0.5% |
| P/E Recapitalized | 1.1% | 1.8% | −0.7% |
| All Sophisticated Sellers | 26.6% | 43.2% | −16.6%*** |

**Panel B. Target Characteristics for Unreported M&As**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent Variable: | *VentureCapital* | *PrivateEquity* | *VentureGrowth* | *P/E Recapitalized* |
| *Unreported* | 0.179*** | -0.041** | -0.00 | 0.008 |
| | (7.56) | (-2.25) | (-0.06) | (0.57) |
| *Constant(Reported)* | 0.137*** | 0.098*** | 0.024*** | 0.011*** |
| | (28.52) | (48.78) | (36.24) | (3.76) |
| Observations | 1,774 | 1,774 | 1,774 | 1,774 |
| Adjusted $R^2$ | 0.108 | 0.023 | 0.003 | 0.005 |
| Filing-year F/E | Y | Y | Y | Y |
| Industry F/E | Y | Y | Y | Y |

## Table 4. Deal Premiums and Unreported M&As

This table presents results from ordinary least squares (OLS) regressions of deal premiums on an indicator for whether the deal was reviewed or not reviewed by the antitrust regulators. The main variable of interest in columns (1) and (3), *Unreported*, is an indicator variable that assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold; and 0 otherwise. The main variable of interest in columns (2) and (4), *Unreported* × *ProductMarketOverlap*, is an interaction term that assumes the value of 1 when the acquirer and the target firm share overlapping product markets in an unreported deal; and 0 otherwise. Across all columns, the dependent variable, *DealPremium*, is a continuous variable that captures the proportion of the acquired equity that is allocated to goodwill. All variables are described in Online Appendix K. We vary the inclusion of fixed effects as follows. In columns (1) and (2), we include filing-year and acquirer's industry fixed effects, respectively. In columns (3) and (4), we include filing-year and firm (i.e., acquirer) fixed effects, respectively. *DealPremium* is winsorized at the 1% and 99% levels. Robust t-statistics are reported in parentheses and calculated using standard errors clustered at the filing-year and the acquirer's industry level, respectively. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent Variable: | *DealPremium* | *DealPremium* | *DealPremium* | *DealPremium* |
| *Unreported* | 0.099*** | 0.085** | 0.060* | 0.046 |
| | (3.16) | (2.50) | (1.86) | (1.32) |
| *ProductMarketOverlap* | | -0.046* | | -0.040 |
| | | (-2.13) | | (-1.21) |
| *Unreported* × *ProductMarketOverlap* | | 0.048* | | 0.053*** |
| | | (1.89) | | (4.37) |
| Observations | 1,663 | 1,663 | 707 | 707 |
| Adjusted $R^2$ | 0.151 | 0.154 | 0.481 | 0.482 |
| Filing-year F/E | Y | Y | Y | Y |
| Industry F/E | Y | Y | N | N |
| Firm F/E | N | N | Y | Y |

## Table 5. Announcement Returns and Unreported M&As

This table presents results from ordinary least squares (OLS) regressions of cumulative abnormal returns on an indicator for whether the deal was reviewed or not reviewed by the antitrust regulators. In Panel A, the main variable of interest in columns (1) and (3), *Unreported*, is an indicator variable that assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold; and 0 otherwise. The main variable of interest in columns (2) and (4), *Unreported* × *ProductMarketOverlap*, is an interaction term that assumes the value of 1l; and 0 otherwise. Across all columns, the dependent variable, *AnnReturn*, is a continuous variable that captures the 5-day market-adjusted cumulative abnormal returns of the acquirer centered on the announcement date. In Panel B, the main variable of interest in columns (1) and (3), *Unreported*, is an indicator variable that assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold, and 0 otherwise. The main variable of interest in columns (2) and (4), *Unreported* × *ProductMarketOverlap*, is an interaction term that assumes the value of 1, and 0 otherwise. Across all columns, the dependent variable, *RivalReturns*, is a continuous variable that captures the 5-day market-adjusted cumulative abnormal returns, centered on the announcement date, of the industry rivals of the acquirer . We control for *DealPremium* in all columns. All variables are described in Online Appendix K. In Panels A and B, we vary the inclusion of fixed effects as follows. In columns (1) and (2), we include filing-year and acquirer's industry fixed effects, respectively. In columns (3) and (4), we include filing-year and firm (i.e., acquirer) fixed effects, respectively. *AnnReturn* and *RivalReturns* are winsorized at the 1% and 99% levels. Robust t-statistics are reported in parentheses and calculated using standard errors clustered at the filing-year and the acquirer's industry level, respectively. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

**Panel A. Acquirer's Announcement Returns**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent Variable: | *AnnReturn* | *AnnReturn* | *AnnReturn* | *AnnReturn* |
| *Unreported* | -0.003 | -0.010 | 0.023*** | 0.009 |
| | (-0.33) | (-1.63) | (4.85) | (0.64) |
| *ProductMarketOverlap* | | 0.010 | | -0.016 |
| | | (1.60) | | (-0.95) |
| *Unreported* × *ProductMarketOverlap* | | 0.036** | | 0.056** |
| | | (2.16) | | (2.20) |
| *DealPremium* | -0.009 | -0.009 | -0.042 | -0.045 |
| | (-1.00) | (-0.93) | (-1.74) | (-1.74) |
| Observations | 1,064 | 1,064 | 505 | 505 |
| Adjusted $R^2$ | 0.003 | 0.011 | 0.169 | 0.180 |
| Filing-year F/E | Y | Y | Y | Y |
| Industry F/E | Y | Y | N | N |
| Firm F/E | N | N | Y | Y |

## Table 5. Announcement Returns and Unreported M&As (Continued)

**Panel B. Rivals' Announcement Returns**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent Variable: | *RivalReturns* | *RivalReturns* | *RivalReturns* | *RivalReturns* |
| *Unreported* | 0.005** | 0.003* | -0.001 | -0.002 |
| | (2.70) | (2.00) | (-0.15) | (-0.73) |
| *ProductMarketOverlap* | | 0.001 | | -0.003 |
| | | (0.64) | | (-0.83) |
| *Unreported* × *ProductMarketOverlap* | | 0.008* | | 0.007* |
| | | (2.14) | | (2.08) |
| *DealPremium* | -0.002 | -0.002 | 0.004 | 0.003 |
| | (-0.60) | (-0.62) | (0.27) | (0.25) |
| Observations | 998 | 998 | 458 | 458 |
| Adjusted $R^2$ | 0.010 | 0.010 | 0.031 | 0.026 |
| Filing-year F/E | Y | Y | Y | Y |
| Industry F/E | Y | Y | N | N |
| Industry F/E | N | N | Y | Y |

## Table 6. Markups and Intangible Capital in Unreported M&As

This table presents results from ordinary least squares (OLS) regressions of markups on an triple-interaction term for whether the deal was reviewed or not reviewed by the antitrust regulators, the acquirer and the target have product markets that overlap, and a time indicator. In Panel A, the main variable of interest in columns (1) and (3), *Unreported* × *ProductMarketOverlap* × *Post*, is an indicator variable that assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold, the acquirer and the target have product markets that overlap, and the year the markup is measured is after the acqusiition year and 0 otherwise. The main variables of interest in columns (2) and (4), *Unreported* × *ProductMarketOverlap* × *Post (+2)*, *Unreported* × *ProductMarketOverlap* × *Post (+1)*, and *Unreported* × *ProductMarketOverlap* × *Before (-1)*, are triple-interaction terms that include time indicator that takes the value of 1 if the markup is measured one-year before, one-year after, or two-years after the acquisition, respectively; and 0 otherwise. In Panel B, the main variable of interest in columns (1), (3), and (5), *Unreported* × *ProductMarketOverlap* × *Post*, is an indicator variable that assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold, the acquirer and the target have product markets that overlap, and the year the markup is measured is after the acqusiition year and 0 otherwise. The main variables of interest in columns (2), (4), and (6), *Unreported* × *ProductMarketOverlap* × *Post (+2)*, *Unreported* × *ProductMarketOverlap* × *Post (+1)*, and *Unreported* × *ProductMarketOverlap* × *Before (-1)*, are triple-interaction terms that include time indicator that takes the value of 1 if the markup is measured one-year before, one-year after, or two-years after the acquisition, respectively; and 0 otherwise. Across all columns of Panel A and B, the dependent variable, *Markup*, is a continuous variable that captures the acquirer's markup. All variables are described in Online Appendix K. In Panel A, we vary the inclusion of fixed effects as follows. In columns (1) and (2), we include acquisition-year and acquirer's industry fixed effects, respectively. In columns (3) and (4), we include acquisition-year and firm (i.e., acquirer) fixed effects, respectively. In Panel B, across all columns, we include acquisition-year and firm (i.e., acquirer) fixed effects, respectively. *Markup* is winsorized at the 1% and 99% levels. Robust t-statistics are reported in parentheses and calculated using standard errors clustered at the acquisition-year and the acquirer's industry level, respectively. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

## Table 6. Markups and Intangible Capital in Unreported M&As (Continued)

**Panel A. Markups following Unreported M&As**

| Dependent Variable: | (1) *Markup* | (2) *Markup* | (3) *Markup* | (4) *Markup* |
|---|---|---|---|---|
| *Unreported* × *ProductMarketOverlap* × *Post* | 0.425** | | 0.342*** | |
| | (2.42) | | (4.74) | |
| *Unreported* × *ProductMarketOverlap* × *Post (+2)* | | 0.587* | | 0.467*** |
| | | (1.79) | | (5.01) |
| *Unreported* × *ProductMarketOverlap* × *Post (+1)* | | 0.517*** | | 0.422*** |
| | | (7.28) | | (7.44) |
| *Unreported* × *ProductMarketOverlap* × *Before (-1)* | | 0.251 | | 0.201 |
| | | (1.46) | | (1.19) |
| *Unreported* × *ProductMarketOverlap* | -0.177 | -0.303 | -0.215** | -0.316** |
| | (-0.58) | (-1.06) | (-2.12) | (-2.46) |
| *Unreported* × *Post* | -0.162 | | -0.078 | |
| | (-1.44) | | (-0.70) | |
| *ProductMarketOverlap* × *Post* | -0.081 | | -0.062 | |
| | (-1.71) | | (-1.43) | |
| *Unreported* | 0.985*** | 1.022*** | 0.078 | 0.095 |
| | (5.50) | (6.87) | (0.46) | (0.70) |
| *ProductMarketOverlap* | 0.004 | 0.012 | -0.040 | -0.032 |
| | (0.03) | (0.12) | (-0.65) | (-0.48) |
| *Post* | -0.039 | | -0.025 | |
| | (-0.99) | | (-0.64) | |
| *Unreported* × *Post (+2)* | | -0.223 | | -0.105 |
| | | (-1.14) | | (-0.62) |
| *Unreported* × *Post (+1)* | | -0.177* | | -0.086 |
| | | (-1.77) | | (-0.57) |
| *Unreported* × *Before (-1)* | | -0.074 | | -0.032 |
| | | (-0.86) | | (-0.37) |
| *ProductMarketOverlap* × *Post (+2)* | | -0.123* | | -0.075 |
| | | (-1.88) | | (-1.39) |
| *ProductMarketOverlap* × *Post (+1)* | | -0.059 | | -0.064 |
| | | (-1.32) | | (-1.43) |
| *ProductMarketOverlap* × *Before (-1)* | | -0.016 | | -0.015 |
| | | (-0.36) | | (-0.47) |
| *Post (+2)* | | -0.038 | | -0.011 |
| | | (-0.70) | | (-0.24) |
| *Post (+1)* | | -0.022 | | -0.013 |
| | | (-0.68) | | (-0.62) |
| *Before (-1)* | | 0.017 | | 0.025 |
| | | (0.33) | | (0.57) |
| Observations | 4,700 | 4,700 | 4,700 | 4,700 |
| Adjusted $R^2$ | 0.184 | 0.183 | 0.860 | 0.860 |
| Acquisition-year F/E | Y | Y | Y | Y |
| Industry F/E | Y | Y | N | N |
| Firm F/E | N | N | Y | Y |

## Table 6. Markups and Intangible Capital in Unreported M&As (Continued)

### Panel B. Markups and Intangible Capital

| Dependent Variable: | (1) *Markup* | (2) *Markup* | (3) *Markup* | (4) *Markup* | (5) *Markup* | (6) *Markup* |
|---|---|---|---|---|---|---|
| Sample: | *Brand or Tech=1* | *Brand or Tech=1* | *Brand & Tech=1* | *Brand & Tech=1* | *Brand & Tech=0* | *Brand & Tech=0* |
| *Unreported* × *ProductMarketOverlap* × *Post* | 0.502* | | 0.694*** | | -0.069 | |
| | (1.96) | | (2.98) | | (-0.13) | |
| *Unreported* × *ProductMarketOverlap* × *Post (+2)* | | 0.701*** | | 0.839*** | | -0.147 |
| | | (3.27) | | (3.26) | | (-0.25) |
| *Unreported* × *ProductMarketOverlap* × *Post (+1)* | | 0.567*** | | 0.493** | | -0.005 |
| | | (3.39) | | (2.70) | | (-0.01) |
| *Unreported* × *ProductMarketOverlap* × *Before (-1)* | | 0.256 | | -0.074 | | -0.003 |
| | | (1.38) | | (-0.42) | | (-0.04) |
| *Unreported* × *ProductMarketOverlap* | -0.358* | -0.487*** | -0.515 | -0.481 | 0.413 | 0.420 |
| | (-1.80) | (-3.08) | (-1.46) | (-1.63) | (0.79) | (0.76) |
| *Unreported* × *Post* | -0.150 | | -0.141 | | 0.104 | |
| | (-0.82) | | (-1.37) | | (0.22) | |
| *ProductMarketOverlap* × *Post* | -0.059 | | -0.212** | | -0.071 | |
| | (-0.95) | | (-2.69) | | (-1.02) | |
| *Unreported* | 0.015 | 0.035 | -0.029 | 0.011 | -0.145 | -0.143 |
| | (0.09) | (0.30) | (-0.42) | (0.11) | (-0.46) | (-0.40) |
| *ProductMarketOverlap* | 0.064 | 0.075 | 0.298** | 0.319** | -0.111 | -0.109 |
| | (0.99) | (1.08) | (2.32) | (2.61) | (-0.68) | (-0.62) |
| *Post* | -0.062 | | -0.020 | | 0.039 | |
| | (-1.21) | | (-0.24) | | (0.90) | |
| *Unreported* × *Post (+2)* | | -0.226 | | -0.233 | | 0.198 |
| | | (-1.34) | | (-1.34) | | (0.37) |
| *Unreported* × *Post (+1)* | | -0.059 | | -0.131 | | 0.010 |
| | | (-0.81) | | (-1.12) | | (0.02) |
| *Unreported* × *Before (-1)* | | -0.118 | | -0.078 | | -0.014 |
| | | (-0.79) | | (-0.74) | | (-0.19) |
| *ProductMarketOverlap* × *Post (+2)* | | -0.080 | | -0.289** | | -0.070 |
| | | (-0.88) | | (-2.49) | | (-0.92) |
| *ProductMarketOverlap* × *Post (+1)* | | -0.059 | | -0.180* | | -0.077 |
| | | (-0.81) | | (-1.88) | | (-1.24) |
| *ProductMarketOverlap* × *Before (-1)* | | -0.021 | | -0.040 | | -0.004 |
| | | (-0.70) | | (-0.98) | | (-0.08) |
| *Post (+2)* | | -0.034 | | 0.034 | | 0.027 |
| | | (-0.46) | | (0.24) | | (0.63) |
| *Post (+1)* | | -0.042 | | -0.007 | | 0.038 |
| | | (-0.79) | | (-0.07) | | (1.12) |
| *Before (-1)* | | 0.047 | | 0.065 | | -0.013 |
| | | (1.36) | | (1.33) | | (-0.23) |
| Observations | 3,033 | 3,033 | 1,501 | 1,501 | 1,667 | 1,667 |
| Adjusted $R^2$ | 0.880 | 0.880 | 0.901 | 0.901 | 0.824 | 0.823 |
| Acquisition-year F/E | Y | Y | Y | Y | Y | Y |
| Firm F/E | Y | Y | Y | Y | Y | Y |

## Table 7. Quality of Acquired Products and Unreported M&As

This table presents results from ordinary least squares (OLS) regressions of forward patent citations, patent importance, and breakthrough patents, on an indicator for whether the deal was reviewed or not reviewed by the antitrust regulators. In Panel A, the main variable of interest in columns (1), (3), (5), (7), (9), and (11), *Unreported*, is an indicator variable that assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold; and 0 otherwise. The main variable of interest in columns (2), (4), (6), (8), (10), and (12), *Unreported* × *ProductMarketOverlap*, is an interaction term that assumes the value of 1 when the acquirer and the target firm share overlapping product markets in an unreported deal; and 0 otherwise. In Panel B, the main variable of interest in across all columns, *Unreported* × *ProductMarketOverlap* × *AnnReturn*, is a continuous variable that takes a non-zero value if the target firm's assets are below the size-of-person asset threshold, the acquirer and the target have product markets that overlap, and the 5-day market-adjusted cumulative abnormal return of the acquirer centered on the announcement date is greater than or less than zero. In Panel C, the main variable of interest in across all columns, *Unreported* × *ProductMarketOverlap* × *FairValue*, is a continuous variable that takes a non-zero value if the target firm's assets are below the size-of-person asset threshold, the acquirer and the target have product markets that overlap, and fair value of acquired innovation (e.g., patents) is greater than zero. In all panels, the dependent variable, *PatentCitations*, is a continuous variable that measures the number of forward patent citations; the dependent variable, *PatentImpt*, is a continuous variable that measures the importance of the patent; and the dependent variable, *BreakThrough*, ias an indicator variable that assumes the value of 1 if the patent is a breathrough innovation; and 0 othewise. All variables are described in Online Appendix K. *AnnReturn* is winsorized at the 1% and 99% levels. We vary the inclusion of filing-year fixed effects and the target's industry fixed effects. We also vary the inclusion of a control variable, *DealValue*. Robust t-statistics are reported in parentheses and calculated using standard errors clustered at the filing-year and the industry level, respectively. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

### Panel A. Product Market Overlap and Forward Patent Citations

| Dependent Variable: | (1) *Patent Citations* | (2) *Patent Citations* | (3) *Patent Citations* | (4) *Patent Citations* | (5) *Patent Impt.* | (6) *Patent Impt.* | (7) *Patent Impt.* | (8) *Patent Impt.* | (9) *Break Through* | (10) *Break Through* | (11) *Break Through* | (12) *Break Through* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Unreported* | 6.389** | 1.251 | 8.129** | 3.024 | 0.059*** | -0.003 | 0.071*** | 0.010 | 0.101*** | -0.003 | 0.125*** | 0.022 |
| | (2.40) | (0.23) | (2.91) | (0.51) | (4.78) | (-0.16) | (6.12) | (0.49) | (12.54) | (-0.06) | (23.99) | (0.39) |
| *ProductMarketOverlap* | | -10.235** | | -10.298** | | -0.036** | | -0.037*** | | -0.080*** | | -0.082*** |
| | | (-3.00) | | (-3.03) | | (-2.87) | | (-3.95) | | (-4.36) | | (-4.52) |
| *Unreported* × *ProductMarketOverlap* | | 15.776** | | 15.731** | | 0.154*** | | 0.153*** | | 0.268** | | 0.266** |
| | | (2.61) | | (2.31) | | (3.27) | | (3.43) | | (2.82) | | (2.81) |
| Observations | 9,260 | 9,260 | 9,260 | 9.260 | 7,534 | 7,534 | 7,534 | 7,534 | 7,534 | 7,534 | 7,534 | 7,534 |
| Adjusted $R^2$ | 0.071 | 0.075 | 0.075 | 0.079 | 0.125 | 0.140 | 0.143 | 0.157 | 0.097 | 0.112 | 0.119 | 0.133 |
| Controls | N | N | Y | Y | N | N | Y | Y | N | N | Y | Y |
| Filing-year F/E | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |
| Industry F/E | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y |

## Table 7. Quality of Acquired Products and Unreported M&As (Continued)

### Panel B. Fair Value of Patents and Forward Patent Citations

| Dependent Variable: | (1) *Patent Citations* | (2) *Patent Citations* | (3) *Patent Citations* | (4) *Patent Impt.* | (5) *Patent Impt.* | (6) *Patent Impt.* | (7) *Break Through* | (8) *Break Through* | (9) *Break Through* |
|---|---|---|---|---|---|---|---|---|---|
| *Unreported* × *ProductMarketOverlap* × *FairValue* | 0.561** | 0.459** | 0.444*** | 0.005*** | 0.003*** | 0.003*** | 0.010*** | 0.007*** | 0.006*** |
| | (2.96) | (2.80) | (3.55) | (4.22) | (6.96) | (6.52) | (6.61) | (6.24) | (5.67) |
| *Unreported* × *ProductMarketOverlap* | -2.889 | -0.870 | -0.364 | -0.019 | 0.033 | 0.040 | -0.062 | 0.059 | 0.075 |
| | (-0.49) | (-0.13) | (-0.06) | (-0.40) | (0.93) | (1.14) | (-1.12) | (0.84) | (1.01) |
| *Unreported* × *FairValue* | 0.218* | 0.264** | 0.259** | 0.000 | 0.000 | 0.000 | -0.001 | -0.000 | -0.000 |
| | (2.00) | (2.70) | (2.92) | (0.60) | (0.54) | (0.54) | (-0.47) | (-0.17) | (-0.11) |
| *ProductMarketOverlap* × *FairValue* | 0.186 | 0.225 | 0.224 | -0.001*** | -0.001* | -0.001** | -0.002* | -0.002 | -0.002* |
| | (1.61) | (1.42) | (1.82) | (-10.27) | (-2.09) | (-2.90) | (-2.30) | (-1.50) | (-2.08) |
| *Unreported* | -7.463** | -2.973 | -1.078 | -0.012 | -0.005 | 0.006 | 0.011 | 0.001 | 0.024 |
| | (-2.30) | (-0.49) | (-0.16) | (-0.85) | (-0.27) | (0.25) | (0.28) | (0.03) | (0.39) |
| *ProductMarketOverlap* | -12.840** | -13.853** | -13.219** | -0.001 | -0.014 | -0.010 | -0.045 | -0.042 | -0.034 |
| | (-2.43) | (-2.27) | (-2.30) | (-0.08) | (-0.99) | (-0.73) | (-1.07) | (-1.06) | (-0.99( |
| *FairValue* | -0.202 | -0.200 | -0.251*** | 0.001*** | 0.001* | 0.000 | 0.002* | 0.001 | 0.000 |
| | (-1.71) | (-1.79) | (-3.54) | (7.63) | (2.18) | (1.63) | (1.87) | (1.11) | (0.32) |
| Observations | 9,260 | 9,260 | 9,260 | 7,534 | 7,534 | 7,534 | 7,534 | 7,534 | 7,534 |
| Adjusted $R^2$ | 0.014 | 0.082 | 0.086 | 0.057 | 0.152 | 0.165 | 0.050 | 0.120 | 0.139 |
| Controls | N | N | Y | N | N | Y | N | N | Y |
| Filing-year F/E | N | Y | Y | N | Y | Y | N | Y | Y |
| Industry F/E | N | Y | Y | N | Y | Y | N | Y | Y |

## Table 8. Overlapping Pharmaceutical Projects and Unreported M&As

This table presents results from ordinary least squares (OLS) regressions of pharmaceutical projects on an indicator for whether the deal was reviewed or not reviewed by the antitrust regulators. The main variable of interest in Panels A and B, *Unreported*, is an indicator variable that assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold; and 0 otherwise. The main variable of interest in Panel C, *Unreported* × *AcquiredProject*, is an interaction term that assumes the value of 1 when an overlapping project is acquired in an unreported deal; and 0 otherwise. In columns (1) and (2) of Panel A, the dependent variable, *Pr(ProjectOverlap)*, is an indicator variable that assumes the value of 1 if the target firm and the acquiring firm have at least one drug development project that directly overlaps; zero otherwise. In columns (3) and (4) of Panel A, the dependent variable, *ProjectOverlap*, is a continuous variable that measures the proportion of the target firm's drug development projects that overlap with the acquirer's drug development projects. In all columns of Panel B, the dependent variable, *ProjectDiscont'd*, is a an indicator variable that assumes the value of 1 if a drug project is discontinued after the acquisition date. In Panel C, the dependent variable across all columns, *ProjectDiscont'd*, is a an indicator variable that assumes the value of 1 if a drug project is discontinued after the acquisition date. All variables are described in Online Appendix K. For both Panels A and B, we vary the inclusion of fixed effects as follows. In columns (1) and (3) of Panel A, we exclude filing-year fixed effects; in column (2) and (4), we include filing-year fixed effects. In column (1) of Panel B, we exclude fixed effects; in column (2) we include therapeutic-class fixed effects; and in column (3), we include therapeutic-class and filing-year fixed effects, respectively. For Panel C, we vary the fixed effects sturcture across columns. We also vary the inclusion of our control variables; e.g, we include control variables in columns (2), (4), (6), and (8). Control variables included, but not reported, in the estimations in Panel C are *Size*, *Sales*, *Leverage*, *EBITDA/Assets*, *Cash/Assets*, *CashFlow/Assets*, *R&D*, and *Q*. Robust t-statistics are reported in parentheses and calculated using standard errors clustered at the filing-year level. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

**Panel A. Overlapping Projects**

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent Variable: | *Pr(ProjectOverlap)* | *Pr(ProjectOverlap)* | *ProjectOverlap* | *ProjectOverlap* |
| *Unreported* | 0.101** | 0.098** | 0.015** | 0.012** |
| | (2.57) | (2.56) | (2.75) | (2.68) |
| Observations | 169 | 169 | 169 | 169 |
| Adjusted $R^2$ | 0.033 | 0.063 | 0.045 | 0.051 |
| Filing-year F/E | N | Y | N | Y |

**Panel B. Drug Project-Level Development and Competition**

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent Variable: | *ProjectDiscont'd* | *ProjectDiscont'd* | *ProjectDiscont'd* |
| *Unreported* | 0.148** | 0.332** | 0.595* |
| | (2.92) | (2.39) | (2.29) |
| Observations | 210 | 210 | 210 |
| Adjusted $R^2$ | 0.016 | 0.044 | 0.088 |
| Therapeutic Class F/E | N | Y | Y |
| Filing-year F/E | N | N | Y |

## Table 8. Overlapping Pharmaceutical Projects and Unreported M&As (Continued)

### Panel C. Drug Project-Level Development

| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| Dependent Variable: | *ProjectDiscont'd* | *ProjectDiscont'd* | *ProjectDiscont'd* | *ProjectDiscont'd* | *ProjectDiscont'd* | *ProjectDiscont'd* | *ProjectDiscont'd* | *ProjectDiscont'd* |
| *Unreported* × *AcquiredProject* | 0.161*** | 0.331** | 0.235*** | 0.424** | 0.216*** | 0.361** | 0.282*** | 0.366* |
| | (3.51) | (2.26) | (4.60) | (2.82) | (4.32) | (2.52) | (6.44) | (2.08) |
| *Unreported* | -0.013 | -0.026 | 0.000 | -0.007 | -0.043 | -0.026 | -0.002 | -0.017 |
| | (-0.38) | (-0.79) | (0.00) | (-0.23) | (-0.87) | (-1.25) | (-0.05) | (-0.64) |
| *AcquiredProject* | 0.209*** | 0.057 | 0.200*** | 0.028 | 0.190*** | 0.074 | 0.137*** | 0.074 |
| | (4.76) | (0.41) | (4.17) | (0.19) | (4.31) | (0.52) | (3.40) | (0.42) |
| Observations | 3,504 | 2,541 | 3,504 | 2,541 | 3,504 | 2,541 | 2,658 | 2,003 |
| Adjusted $R^2$ | 0.039 | 0.065 | 0.043 | 0.073 | 0.071 | 0.104 | 0.265 | 0.328 |
| Controls | N | Y | N | Y | N | Y | N | Y |
| Therapeutic Class F/E | N | N | Y | Y | Y | Y | N | N |
| Filing-year F/E | N | N | N | N | Y | Y | Y | Y |
| TC × MOA F/E | N | N | N | N | N | N | Y | Y |

## Table 9. Product Market Entry and Unreported Pharmaceutical M&As

This table presents results from ordinary least squares (OLS) regressions of market entry on an indicator for whether the deal was reviewed or not reviewed by the antitrust regulators. In Panels A and B, the main variable of interest, *Unreported*, is an indicator variable that assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold; and 0 otherwise. Across all columns of Panel A, the dependent variable, *Pr(Copying)*, is an indicator variable that assumes the value of 1 if, conditional on an overlapping project being acquired, a new entrant initiates a project that overlaps with the same TC and MOA as the acquired project; and 0 otherwise. Across all columns of Panel B, the dependent variable, *Log(Copies)* is the natural logarithm of one plus the number of entrants that, conditional on an overlapping project being acquired, initiate a project that overlaps with the same TC and MOA as the acquired project. In both Panels A and B, we examine market entry within 1 year (i.e., Post (+1)), 2 years (i.e., Post (+2), and 3 years (Post (+3) of the original discontinuation event, respectively. All variables are described in Online Appendix K. Across all columns of Panels A and Be, we include therapeutic-class and filing-year fixed effects, respectively. Robust t-statistics are reported in parentheses and calculated using standard errors clustered at the filing-year level. *, **, *** represent significance at the 10%, 5%, and 1% level, respectively.

**Panel A. Probability of Follow-On "Copycat" Projects**

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent Variable: | *Pr(Copying)* | *Pr(Copying)* | *Pr(Copying)* |
| Timeframe: | *Post (+1)* | *Post (+2)* | *Post (+3)* |
| *Unreported* | 0.526*** | 0.537*** | 0.542*** |
| | (3.53) | (4.62) | (5.41) |
| Observations | 210 | 210 | 210 |
| Adjusted $R^2$ | 0.729 | 0.321 | 0.316 |
| Therapeutic Class F/E | Y | Y | Y |
| Filing-year F/E | Y | Y | Y |

**Panel B. Number of Follow-On "Copycat" Competitors**

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent Variable: | *Log(Copies)* | *Log(Copies)* | *Log(Copies)* |
| Timeframe: | *Post (+1)* | *Post (+2)* | *Post (+3)* |
| *Unreported* | 0.601** | 0.903*** | 1.098*** |
| | (2.36) | (3.59) | (6.25) |
| Observations | 210 | 210 | 210 |
| Adjusted $R^2$ | 0.573 | 0.631 | 0.673 |
| Therapeutic Class F/E | Y | Y | Y |
| Filing-year F/E | Y | Y | Y |

# Online Appendix

**Competition Enforcement and Accounting for Intangible Capital**

This appendix contains additional analyses and details referenced in our paper and is organized as follows:

- Examples of FTC Correspondence in OA.A.
- Fair Value versus Estimated Value of Intangible Capital in OA.B.
- Process to Determine Total Value Held by Acquirer in OA.C.
- Process to Determine whether M&A Bypassed Premerger Antitrust Review in OA.D.
- Second Requests in OA.E.
- Sample Construction and Distribution in OA.F.
- Purchase Price Allocation Collection in OA.G.
- Early Terminations in OA.H.
- Degree of Intangible Assets in OA.I.
- Categories of Intangibles in OA.J.
- Variable Descriptions in OA.K.
- Acquirer's Announcement Returns and Intangible Capital in OA.L.
- Intangibles in Public and Private Litigation in OA.M.
- Unreported Pharmaceutical M&As in OA.N.
- Second Requests (within Lower and Upper Size-of-Transaction Thresholds) in OA.O.
- Litigation in OA.P.
- Deterrence Effects in OA.Q.
- Deal Termination and Renegotiation Risk in OA.R.
- Changes to Accounting Standards in OA.S.

# *OA.A. Examples of FTC Correspondence*

This section of the Online Appendix contains two correspondences between representatives of merging parties and the FTC. The correspondences concern two unrelated deals. The first correspondence is a letter to the FTC. The second is an email to the FTC. Correspondences were obtained from the FTC's publicly available records.

## Sample correspondence No. 1 (January 27, 2004)

[redacted]

801.10
801.90

**PRIVILEGED AND CONFIDENTIAL**

January 27, 2004

HAND DELIVERY

Mr. Michael Verne
Compliance Specialist
Premerger Notification Office
Bureau of Competition
Federal Trade Commission
Washington, DC 20580

2004 JAN 27 A 11:17
FEDERAL TRADE COMMISSION
PREMERGER NOTIFICATION OFFICE

Re: Balance Sheet based upon Payment of Extra-Ordinary Dividend

Dear Mr. Verne:

Pursuant to our telephone conversation of January 8, 2004 I have prepared this letter to memorialize the facts presented to you and to confirm your opinion on how the Premerger Office would analyze the parties' actions to reduce the assets found in the acquired person's balance sheet and thereby fail the HSR "size-of-the person" test.

FACTS:

Company A intends to acquire 100 percent of either the voting stock or the assets of Company B, which is not engaged in manufacturing. Company B has a large amount of cash, a corporate aircraft and other assets not deemed by management of Company B to be required for the operations of its core business. Company B may declare and pay an extra-ordinary dividend (cash and non-cash) to its shareholders resulting in Company B having less than $10 million in assets as reflected on its next regularly prepared balance sheet, which will be prepared by the time of the closing. There is nothing precluding the shareholders of Company B from leasing to Company A based on arm's length basis some of the non-cash assets distributed in the extra-ordinary dividend.

Company B's balance sheet for many years has normally been prepared on a fiscal year basis ending the last day of February each year. In 2003, Company B elected to be taxed as an S corporation under §1361 of the Internal Revenue Code and therefore consistent with applicable tax regulations adopted a December 31 tax year end. However, Company B will continue to prepare on a regular basis, a last day of February fiscal year end balance sheet. Continuing the preparation of such a consistent fiscal year balance sheet will enable management to compare financial results with prior years.

[redacted]

ANALYSIS:

For a proposed transaction valued in excess of $50 million and up to and including $200 million to be reportable under the HSR Act, the parties to the proposed transaction must meet the "size-of-person" test. In this regard, if an acquiring person has over $100 million in assets or sales and it intends to acquire the voting stock or assets of a person not engaged in manufacturing, the acquired person must have at least $10 million in assets as shown on its last regularly prepared balance sheet. Opinion number 195 of the Premerger Notification and Practice Manual (2003 edition) provides a question submitted to the Premerger Notification Office ("PNO") inquiring whether a problem arises where shortly before it is to be acquired the acquired person "declares an extraordinary (and accelerated) dividend that reduces its size below $10 million on its next regularly prepared balance sheet, which is prepared by the time of closing".

The PNO analysis in Opinion 195 states that it does not view this as a device for avoidance and that the HSR rules of practice instructs that the size of a person is to be determined by referring to its financial statements prepared in accordance with the accounting principles normally used; and, if the statements have been prepared on a regularly prepared basis in accordance with the person's normal accounting practices and show that the person does not satisfy the relevant size-of-person test the proposed transaction would not be reportable.

DISCUSSION:

In our conversation, I noted that the PNO's analysis in opinion 195 reverses the viewpoint presented previously in opinion number 215 published in the 1991 edition of the Premerger Notification and Practice Manual. In that opinion, based on a memorandum dated January 23, 1979, the PNO felt that an extra-ordinary dividend declared shortly before the transaction to reduce the person's size and thereby fail the size-of-person test would raise avoidance issues under section 801.90 of the rules. You stated that many of the older opinions in the 1991 edition have been reversed in the new edition of the Premerger Notification and Practice Manual (2003 edition) and that you had "no problem with opinion 195". Additionally, you noted that the size of a person is its size even though the extra-ordinary dividend was created to fail the size-of-person test and was created at the request of the acquiring person.

In regard to the issuance of a balance sheet on a calendar year basis for tax purposes, it is your view that this does not preclude Company B from issuing its regularly prepared balance sheet reflecting a fiscal year as it has done for numerous years in the past. We note that Company B's management needs such a financial statement for management and financial comparison purposes. Thus, the fiscal year statements continue to be regularly prepared financial statements because they will be prepared at the same time and in the same manner in the future as they have been prepared in the past.

CONCLUSION:

The issuance of the extra-ordinary dividend (cash and non-cash) does not raise avoidance issues under section 801.90 of the rules even though the issuance of the dividend occurs shortly before a proposed transaction results in the failure of the acquired person to meet the HSR "size-of-person" test. The continuation of the issuance of balance sheets on a fiscal year basis, to be used for management and financial comparison purposes, is considered to be the creation of regularly prepared balance sheets even though Company B has changed to a calendar year basis for tax purposes.

If the above analysis is incorrect, please telephone me at [redacted] to discuss the matter. Thank you for your time and consideration in this matter.

Sincerely,

[redacted]

AGREE.
B. Mueller
1/27/04

## Sample correspondence No. 2 (July 12, 2007)



~~801.11~~ 801.11

**Verne, B. Michael**

**From:** [redacted]
**Sent:** Thursday, July 12, 2007 3:43 PM
**To:** Verne, B. Michael
**Cc:** [redacted]
**Subject:** Size-of-Person Test

Hi Mike.

I hope you are doing well. It was nice to talk to you earlier today.

We have a question about the size-of-person test and the financials that are used to determine if a party satisfies the $12 million prong of the size-of-person test.

Company A proposes to acquire all of the voting securities of Company B, a U.S. issuer not engaged in manufacturing, for $70 million. Company B is its own UPE. Company A has in excess of $119.6 million in assets or annual net sales. Company B's most recent regularly prepared balance sheet (April 30, 2007) shows total assets of approximately $7 million. Company B's most recent regularly prepared annual income statement (FY 2006) shows total net sales of approximately $71 million.

Largely for historical reasons, and because of a contractual requirement contained in an existing Shareholder's Agreement among the shareholders of Company B, Company B performs a US GAAP reconciliation of its **annual** financial statements, which requires Company B to recognize an intangible asset. The reconciliation in Company B's most recent annual financial statement (12/31/06) shows total assets in excess of $12 million. However, Company B's most recent regularly prepared balance sheet (April 30, 2007) does not show assets in excess of $12 million because it was not performed with a US GAAP reconciliation. Company B does not do such reconciliations in connection with its monthly or quarterly financials.

We understand that when determining Company B's size under the size-of-person test, it is necessary to examine only its most recent regularly prepared annual income statement to determine its annual revenues and its most recent regularly prepared balance sheet (April 30, 2007) to determine its total assets, and we would disregard the 12/31 balance sheet that was prepared with a US GAAP reconciliation. Please advise if you agree.

Mike, thanks for your help.

Best regards,
[redacted]

[redacted]

Agree
B
7/12/07

This electronic message transmission contains information from this law firm which m

7/12/2007

## *OA.B. Fair Value versus Estimated Value of Intangible Capital*

This table presents the results of an analysis of fair values of identifiable intangible capital relative to estimated values. For fair values on intangible capital, we use data collected from purchase-price allocation (PPA) disclosures of US public acquirers. For estimated values, we follow prior literature and use the perpetual inventory method to estimate the level of intangible capital in the year before the acquisition year. Specifically, we use financial-statement data obtained from Compustat for a subsample of 518 deals for which the target firm is a publicly traded firm in the US. Panel A presents the mean of the 518 deal-level ratios of estimated intangible capital scaled by total tangible capital in column (1), and the mean of the 518 deal-level ratios of fair value of identifiable intangible capital scaled by the fair value of tangible capital in column (2). Panel B presents the mean of the 518 deal-level ratios of fair value of total tangible assets scaled by the book value of total tangible assets in column (1), and the mean of the 518 deal-level ratios of fair value of identifiable intangible assets scaled by the estimated value of intangible assets in column (2).

**Panel A. Estimated Ratios vs. Fair-Value Ratios**

| | (1)<br>*Estimated-Value Ratio* | (2)<br>*Fair-Value Ratio* |
|---|---|---|
| Mean | 0.278 | 1.053 |

**Panel B. Denominator vs. Numerator Effects**

| | (1)<br>*Tangible-Assets Ratio* | (2)<br>*Intangible-Assets Ratio* |
|---|---|---|
| Mean | 0.887 | 4.095 |

### *OA.C. Process to Determine Total Value Held by Acquirer*

We follow the FTC guidelines when determining the total value of the target held by the acquirer after the M&A is completed. Specifically, we use Refinitiv data on the percent of the target held by the acquirer on the date the deal is announced, and data on the deal value, to calculate the value (in $) of the target held by the acquirer on announcement date. For example, if the acquirer holds 20% of the target on the date the deal is announced, and is acquiring the remaining 80% for $80 million, the 20% has a value of $20 million (i.e., the total value of the target as implied by the acquisition is $80 million $\div$ 80% = $100 million).

Because HSR premerger-review rules stipulate that the total value of the target held by the acquirer after the completion of the merger must be used to determine whether an HSR filing is required, we apply the above calculation to our initial sample of M&As.

## *OA.D. Process to Determine whether M&A Bypassed Premerger Antitrust Review*

We use several datapoints to determine whether a deal is exempt from filing a premerger notice to the FTC and DOJ. To begin, we use data on the target's total assets collected from public disclosures by the acquirer. However, because the disclosed amounts are the fair-value estimates, these estimates may be higher or lower than the book value reported in the financial statements prior to the date of the acquisition, which is the value the FTC and DOJ use in the size-of-person (SoP) test. Importantly, differences between fair value and book value can lead to incorrect identification if, for example, the total fair value of total assets is slightly above the SoP threshold when the total book value of assets (if known) is below. In addition, sometimes the fair-value estimates are net of liabilities (i.e., fair value of tangible assets minus fair value of liabilities), thereby understating the amount of total assets. Because the rule requires the use of total assets when determining whether a premerger notification filing is required, this difference can also lead to incorrect identification if, for example, total assets are above the threshold but net assets are below.

To address this issue, we take three additional steps to help us identify mergers that are exempt from premerger review:

**Days to completion**: The Hart-Scott-Rodino (HSR) Act requires that parties to certain M&As submit premerger notification filings and wait before consummating the transaction. The waiting period begins when both the FTC and DOJ receive complete filings from both the buyer and seller. For most filings, the waiting period is 30 days (or 15 days for tender offers) and expires at 11:59 ET on the last day. If the waiting period expires without either agency issuing a request for additional information, the parties have met their HSR filing obligation and can complete the deal. However, because premerger filings are not publicly disclosed and cannot be obtained through Freedom of Information Act requests, we must use the announcement date and effective date of the deal to infer whether a filing was required (e.g., Wollmann, 2023). Specifically, if the number of days between these two dates is less than 30 (or less than 15 for tender offers), a filing was likely not required. One additional factor, however, will reduce the number of days, even if an HSR filing occurs: an Early Termination (ET) request. This request can be made by either party and, if granted by the FTC or DOJ, will mechanically reduce the premerger review time. Notably, all ETs that are granted are also publicly disclosed on the FTC website (https://www.ftc.gov/legal-library/browse/early-termination-notices), which allows us to verify that deals with fewer than 30 (or 15) days between announcement and completion dates have not been granted an ET and thus did not file a pre-merger notification.

**Acquirer's public disclosures**: We also search the public disclosures of acquirers for mention of "FTC," "DOJ," "HSR," and other related terms. If any of these terms are found in the disclosure, we examine the document for information pertaining to this specific transaction, for example, an indication of whether the deal required premerger review.

**Shareholder voting**: We also use data on shareholder voting to check whether the target (if it is a public firm) or the acquirer required the transaction to be approved by their respective shareholders, which can mechanically increase the number of days between the announcement and completion dates.

## Top Industries (by Second Requests)

This table presents industries ranked by the total number of Second Requests (from 2001-2019). Column (2) presents the total number of horizontal mergers reviewed by the FTC and DOJ (from 2001-2019); column (3) presents the percent of horizontal mergers that received a Second Request; column (4) presents the industry (as defined by the HSR Annual Report); column (5) presents the 3-digit NAICS code for the industry (obtained from the HSR Annual Report); and column (6) presents all 4-digit SICs that correspond to the 3-digit NAICS. Data on Second Requests, horizontal mergers, and industry (3-digit NAICS) are obtained from the HSR Annual Reports.

| (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|
| Second Requests | Horizontal Mergers (HSR) | % of Horizontal Mergers with Second Requests | Industry | NAICS (3-digit) | SIC (4-digit) |
| 102 | 693 | 14.72 | Chemical Manufacturing | 325 | 2812, 2813, 2816, 2819, 2821, 2822, 2823, 2824, 2833, 2834, 2835, 2836, 2841, 2842, 2843, 2844, 2851, 2861, 2865, 2869, 2873, 2874, 2875, 2879, 2891, 2892, 2893, 2895, 2899, 3087, 3861, 3952, 3999, 7389 |
| 50 | 540 | 9.26 | Computer and Electronic Product Manufacturing | 334 | 3429, 3495, 3571, 3572, 3575, 3577, 3578, 3579, 3599, 3651, 3652, 3661, 3663, 3669, 3671, 3672, 3674, 3675, 3676, 3677, 3678, 3679, 3695, 3812, 3822, 3823, 3824, 3825, 3826, 3829, 3842, 3844, 3845, 3873, 3915, 7372, 7819 |
| 42 | 655 | 6.41 | Publishing Industries (except Internet) | 511 | 2711, 2721, 2731, 2741, 2771, 7331, 7372 |
| 41 | 442 | 9.28 | Food and Kindred Products | 311 | 0723, 0751, 2011, 2013, 2015, 2021, 2022, 2023, 2024, 2026, 2032, 2033, 2034, 2035, 2037, 2038, 2041, 2043, 2044, 2045, 2046, 2047, 2048, 2051, 2052, 2053, 2061, 2062, 2063, 2064, 2066, 2067, 2068, 2074, 2075, 2076, 2077, 2079, 2082, 2083, 2087, 2091, 2092, 2095, 2096, 2098, 2099, 2899, 5147, 5441, 5461 |
| 41 | 947 | 4.33 | Professional, Scientific, and Technical Services | 541 | 0741, 0742, 0781, 1081, 1382, 1481, 3721, 3724, 3728, 3761, 3764, 3769, 4499, 4731, 5199, 6541, 7221, 7291, 7299, 7311, 7312, 7313, 7319, 7331, 7335, 7336, 7361, 7371, 7373, 7376, 7379, 7389, 7819, 8099, 8111, 8711, 8712, 8713, 8721, 8731, 8732, 8733, 8734, 8742, 8743, 8748, 8999 |
| 39 | 369 | 10.57 | Merchant Wholesales, Nondurable Goods | 424 | 5111, 5112, 5113, 5122, 5131, 5136, 5137, 5139, 5141, 5142, 5143, 5144, 5145, 5146, 5147, 5148, 5149, 5153, 5154, 5159, 5162, 5169, 5171, 5172, 5181, 5182, 5191, 5192, 5193, 5194, 5198, 5199 |
| 27 | 197 | 13.71 | Telecommunications | 517 | 4812, 4813, 4822, 4841, 4899, 7375 |
| 25 | 276 | 9.06 | Transportation Equipment | 336 | 2396, 2399, 2531, 3069, 3292, 3429, 3465, 3499, 3519, 3531, 3585, 3592, 3599, 3647, 3694, 3711, 3713, 3714, 3715, 3716, 3721, 3724, 3728, 3731, 3732, 3743, 3751, 3761, 3764, 3769, 3792, 3795, 3799, 3944, 3999 |
| 25 | 215 | 11.63 | Health Services | 621 | 4119, 4522, 8011, 8021, 8031, 8041, 8042, 8043, 8049, 8071, 8082, 8092, 8093, 8099 |
| 25 | 334 | 7.49 | Hospitals | 622 | 8062, 8063, 8069 |
| 24 | 260 | 9.23 | Machinery Manufacturing | 333 | 2499, 2599, 3429, 3433, 3443, 3444, 3496, 3511, 3519, 3523, 3524, 3531, 3532, 3533, 3534, 3535, 3536, 3537, 3541, 3542, 3544, 3545, 3546, 3547, 3548, 3549, 3552, 3553, 3554, 3555, 3556, 3559, 3561, 3563, 3564, 3565, 3566, 3567, 3568, 3569, 3577, 3578, 3579, 3581, 3582, 3585, 3586, 3589, 3593, 3596, 3599, 3634, 3639, 3699, 3743, 3799, 3821, 3827, 3841, 3861, 3999 |
| 42 | 404 | 10.40 | Communications | 513 | 4812, 4813, 4822, 4832, 4833, 4841, 4899 |
| 20 | 557 | 3.59 | Utilities | 221 | 4911, 4923, 4924, 4925, 4931, 4932, 4939, 4941, 4952, 4961, 4971 |

## *OA.F. Sample Construction and Distribution*

This table presents the sample-selection construction for our full-sample of M&A observations.This table presents the sample-selection construction for our full-sample of M&A observations. In Panel A, we present the sample distributed by HSR reporting year. Reporting Year is measured from the "Effective Date" of the current HSR reporting year to the day before the "Effective Date" of the following reporting year. See Appendix A for "Effective" dates and "Reporting" years. In Panel B, we present, by industry (3-digit NAICS), the horizontal M&As in the sample. In both panels, columns may not add up to 100%, due to rounding.

**Panel A. Sample Construction**

| Description | Observations | |
|---|---|---|
| Full sample: | | 3,526 |
| Horizontal M&As (by 3-digit NAICS) | 1,863 | |
| Non-horizontal M&As | 1,663 | |
| | 3,526 | |
| Less: M&As with incomplete or missing data on "assets" of the target | | (1,608) |
| Sample of M&As with data for analysis: | | 1,918 |
| Horizontal M&As (by 3-digit NAICS) | 1,065 | |
| Non-horizontal M&As | 853 | |
| | 1,918 | |

**Panel B. All M&As (by year)**

| Reporting Year* | M&As (Full sample) | M&As (For analysis) |
|---|---|---|
| 2001 | 220 (6.2%) | 81 (4.2%) |
| 2002 | 179 (5.1%) | 73 (3.8%) |
| 2003 | 209 (5.9%) | 110 (5.7%) |
| 2004 | 236 (6.7%) | 128 (6.7%) |
| 2005 | 243 (6.9%) | 120 (6.3%) |
| 2006 | 255 (7.2%) | 125 (6.5%) |
| 2007 | 253 (7.2%) | 127 (6.6%) |
| 2008 | 138 (3.9%) | 67 (3.5%) |
| 2009 | 115 (3.3%) | 58 (3.0%) |
| 2010 | 196 (5.6%) | 95 (5.0%) |
| 2011 | 189 (5.4%) | 121 (6.3%) |
| 2012 | 179 (5.1%) | 100 (5.2%) |
| 2013 | 168 (4.8%) | 102 (5.3%) |
| 2014 | 201 (5.7%) | 135 (7.0%) |
| 2015 | 153 (4.3%) | 97 (5.1%) |
| 2016 | 153 (4.3%) | 88 (4.6%) |
| 2017 | 158 (4.5%) | 111 (5.8%) |
| 2018 | 163 (4.6%) | 108 (5.6%) |
| 2019 | 118 (3.3%) | 72 (3.8%) |
| Full sample | 3,526 (100%) | 1,918 (100%) |
| Total value (in $ billions) | $477.8 | $267.7 |

**Panel C. Horizontal Mergers (by industry (3-digit NAICS))**

| Industry | Horizontal M&As (Full sample) | Horizontal M&As (For analysis) |
|---|---|---|
| Computer and Electronic Product Manufacturing | 662 (35.5%) | 409 (38.4%) |
| Chemical Manufacturing | 332 (17.8%) | 189 (17.8%) |
| Professional, Scientific, and Technical Services | 215 (11.5%) | 128 (12.0%) |
| Telecommunications | 123 (6.60%) | 64 (6.00%) |
| Utilities | 108 (5.80%) | 37 (3.50%) |
| Food and Kindred Products | 93 (5.00%) | 49 (4.60%) |
| Machinery Manufacturing | 92 (4.90%) | 59 (5.50%) |
| Transportation Equipment | 67 (3.60%) | 36 (3.40%) |
| Communications | 59 (3.20%) | 31 (2.90%) |
| Health Services | 29 (1.60%) | 17 (1.60%) |
| Publishing Industries (except Internet) | 29 (1.60%) | 18 (1.70%) |
| Hospitals | 28 (1.50%) | 9 (0.90%) |
| Merchant Wholesales, Nondurable Goods | 26 (1.40%) | 19 (1.80%) |
| Sample of Horizontal Mergers | 1,863 (100%) | 1,065 (100%) |
| Total value (in $ billions) | $247.4 | $146.2 |

## *OA.G. Purchase-Price-Allocation Collection*

We obtain data on the purchase-price allocation (PPA) by collecting and reading the post-acquisition public disclosures (e.g., 10-K, 10-Q, or Annual Report) of the acquirers. Such disclosure is required by Accounting Standards Codification (ASC) 805-10-50.

For foreign acquirers, we first search for public disclosures on the SEC.gov website. We also collect Annual Reports disclosed on company websites. If the disclosure in the Annual Report is not in US dollars, we convert the amounts using the conversion rate on the date of the acquisition.

PPA is usually presented in a table in the firm's disclosure, such as the example disclosure below. Acquirers sometimes disclose only the net of assets and liabilities acquired, which is permitted by the rules but not useful for our study. In addition, acquirers can consolidate several transactions into one PPA disclosure, if each transaction on its own is not considered material.

### *Example of a Purchase-Price-Allocation (PPA) Disclosure*

The following is an example of a PPA disclosure obtained from the acquirer's 10-K. Immediately below the PPA, the acquirer provides additional disclosure on the breakdown of the identifiable intangible assets acquired. We use these additional disclosures for our analysis of the categories of intangibles.

| | October 13, 2015 |
|---|---|
| Accounts receivable | $ 1,450 |
| Inventories | 682 |
| Other current assets | 166 |
| Property and equipment | 311 |
| Intangible assets | 46,200 |
| Other assets | 7 |
| Total identifiable assets | $ 48,816 |
| Accounts payable | $ 256 |
| Accrued liabilities | 1,589 |
| Total liabilities assumed | $ 1,845 |
| Net identifiable assets acquired | $ 46,971 |
| Goodwill | 69,871 |
| Total consideration | $ 116,842 |

The valuation of the intangible assets acquired and related amortization periods are as follows:

| | Valuation | Amortization Term (in years) |
|---|---|---|
| SUBTLE access technology | $ 2,179 | 5 |
| IPR&D | 44,021 | |
| Total | $ 46,200 | |

## *OA.H. Early Terminations*

This table shows the percent of deals that have early terminations granted by the FTC. We present these data by horizontal vs. non-horizontal deals and by reported vs. unreported deals. Data on early terminations are obtained from the FTC's online Legal Library. *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively.

| | Reported | Unreported | Difference |
|---|---|---|---|
| *Type of M&A* | | | |
| Horizontal (3-digit NAICS) | 312/766 (40.7%) | 80/299 (26.8%) | 13.9%*** |
| Non-Horizontal | 250/621 (40.3%) | 64/232 (27.6%) | 12.7%*** |

## *OA.I. Degree of Intangible Assets*

This table presents results from ordinary least squares (OLS) regressions of intangibles on unreported M&As. The main variable of interest, *Unreported*, assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold; and 0 otherwise. In columns (1), (2), and (3), the dependent variable is the natural log of intangible assets. In columns (4), (5), and (6), the dependent variable is the proportion of intangibles, measured as the level of intangibles scaled by the sum of assets plus intangibles plus goodwill. We include filing-year and industry (3-digit NAICS) fixed effects across all columns. Robust t-statistics are reported in parentheses and calculated using standard errors clustered at the acquirer's industry and reporting-year levels. *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively.

| Dependent Variable: | (1) *Log (Intangibles)* | (2) *Log (Intangibles)* | (3) *Log (Intangibles)* | (4) *Proportion of Intangibles* | (5) *Proportion of Intangibles* | (6) *Proportion of Intangibles* |
|---|---|---|---|---|---|---|
| *Unreported* | -0.098 | -0.039 | 0.061 | 0.136** | 0.156* | 0.157* |
| | (-0.73) | (-0.20) | (0.34) | (2.57) | (1.94) | (1.96) |
| Observations | 1,774 | 985 | 673 | 1,774 | 985 | 673 |
| Adjusted $R^2$ | 0.192 | 0.232 | 0.235 | 0.227 | 0.277 | 0.302 |
| Filing-Year F/E | Y | Y | Y | Y | Y | Y |
| Industry F/E | Y | Y | Y | Y | Y | Y |

## *OA.J. Categories of Intangibles*

The following table presents descriptions of the categories of intangibles.

| Category | Group | Description |
|---|---|---|
| Customer Relationships & Lists | Customer-related | Customer contracts and related customer relationships; noncontractual customer relationships; customer lists; order or production backlog. |
| Databases | Technology-based | Databases of information, typically stored electronically. |
| In-Process R&D | Technology-based | Research and development that is in process, has substance, but is incomplete. |
| Patents, Technology, & Software | Technology-based | Patented technology; trade secrets; computer software. |
| Non-Compete Agreements | Marketing-related | Legal arrangement that prohibit a person or business from competing with a company in certain market for a specified period of time. |
| Trademarks & Brands | Marketing-related | Trademarks; trade names; newspaper mastheads; painternet domain names. |
| Assembled Workforce | Contract-based | Intangible asset may be recognized for an assembled workforce acquired in an asset acquisition. |
| Distribution Agreements | Contract-based | Contractual-based distribution agreements. |
| Franchise Rights | Contract-based | Contractual-based franchise rights. |
| Lease Intangibles | Contract-based | Contractual-based leases. |
| Licenses | Contract-based | Contractual-based licenses. |
| Maintenance Contracts | Contract-based | Contractual-based maintenance agreements. |
| Management Agreements | Contract-based | Management contract may be below market value, resulting in an intangible asset. |
| Mineral Interests | Contract-based | Contractual-based mineral rights. |
| Other Contract Rights | Contract-based | All other contractual-based rights agreements. |
| Pipeline Capacity Rights | Contract-based | Contractual-based rights to pipeline capacity. |
| Power Purchase Agreements | Contract-based | Contractual-based power purchase agreements. |
| Product Rights | Contract-based | Various rights (e.g., manufacturing, distribution, etc.) attached to a specific product. |
| Royalty Agreements | Contract-based | Contractuak-based royalty agreements. |
| Supplier Agreements | Contract-based | Contractual-based supplier agreements. |
| Usage Rights | Contract-based | Contractual-based usage rights. |
| Other Intangibles | Any | Any identifiable intangible asset that does not fit into a specific category. |

## *OA.K. Variable Descriptions*

The following table presents descriptions of the variables.

| Variable | Description |
|---|---|
| *AcquiredProject* | Indicator variable that takes the value of 1 if the drug project was acquired, and 0 otherwise. Source: Refinitiv. |
| *AnnReturn* | Continuous measure of the 5-day, market-adjusted, cumulative abnormal returns of the acquirer, centered on the announcement date. Refinitiv (for announcement dates; CRSP (for returns data). |
| *Before (-1)* | Indicator variable that takes the value of 1 if the year the markup is measured is one year before the year the acquisition was completed, and 0 otherwise. Refinitiv (for acquisition dates; Compustat. |
| *Brand* | Indicator variable that takes the value of 1 if the M&A included brand-related intangible capital, and 0 otherwise. Source: SEC Edgar 10-K filings. |
| *Breakthrough* | Indicator variable that takes the value of 1 if the patent is a breakthrough innovation, and 0 otherwise. Source: Kelly et al. (2021). |
| *Cash/Assets* | Continuous measure of cash scaled by total assets of the acquirer. Source: Compustat. |
| *CashFlow/Assets* | Continuous measure of cash flow scaled by total assets of the acquirer. Source: Compustat. |
| *DealPremium* | Continuous measure of goodwill scaled by that acquired equity (i.e., net assets plus identifiable intangibles + goodwill). Source: SEC Edgar 10-K filings. |
| *EBITDA/Assets* | Continuous measure of EBITDA scaled by total assets of the acquirer. Source: Compustat. |
| *FairValue* | Continuous measure of the fair value of identifiable technology (e.g., patents), as disclosed in the purchase-price allocation. Source: SEC Edgar 10-K filings. |
| *ForwardCitations* | Continuous measure of the number of forward patent citations. Source: USPTO PatentViews. |
| *In-Process R&D* | In Table 4, Panel B, an indicator variable that takes the value of 1 if the M&A includes in-process R&D-related intangible capital, and 0 otherwise. In Table 6, Panel A, a continuous measure of in-process R&D of the target. Source: SEC Edgar 10-K filings. |
| *Leverage* | Continuous measure of current portion of long-term debt plus long-term debt of the acquirer. Source: Compustat. |
| *Intangibles* | Indicator variable that takes the value of 1 if an M&A includes the acquisition of brand-related, technology-related, or in-process R&D-related intangible capital, and 0 otherwise. Source: SEC Edgar 10-K filings. |
| *Log(Copies)MarketShare* | Natural logarithm of 1 plus the number of new projects started by competitors, that are not the target of the acquirer, after the acquisition that overlap with the original overlapping project, and 0 otherwise. Source: Cortellis |
| *MarketShare* | Continuous measure of market share, where market share is calculated as 100 divided by the number of firms with ongoing drug projects in the same therapeutic class and mechanism of action. Source: Cortellis |

## *OA.K. Variable Descriptions (Continued)*

The following table presents descriptions of the variables.

| Variable | Description |
|---|---|
| *Markup* | Continuous measure of acquirer's markup. Folowing De Loecker et al. (2020), we calculate markup, at the firm-year level, as net sales (sale) divided by cost of goods sold (cogs), and then multiply by the industry-level elasticity. Industry is defined at the 2-digit NAICS level. Industry elasticities are obtained from data files made publicly available by De Loecker et al. (2020). Source: Compustat. |
| *PatentCitations* | Continuous measure of forward patent citations. Source: USPTO. |
| *PatentImportance* | Continuous measure of the importance of the patent. Source: Kelly et al. (2021). |
| *Post* | Indicator variable that takes the value of 1 if the year is after the year during which the acquisition was completed, and 0 otherwise. Source: Refinitiv (for acquisition dates); Compustat. |
| *Post (+1)* | Indicator variable that takes the value of 1 if the year is one year after the year during which the acquisition was completed, and 0 otherwise. Source: Refinitiv (for acquisition dates); Compustat. |
| *Post (+2)* | Indicator variable that takes the value of 1 if the year is two years after the year during which the acquisition was completed, and 0 otherwise. Source: Refinitiv (for acquisition dates); Compustat. |
| *Pr(Copying)* | Indicator variable that takes the value of 1 if a competitor that is not the target or the acquirer starts a drug project after the acquisition date that overlaps with the original overlapping project, and 0 otherwise. Source: Cortellis. |
| *ProductMarketOverlap* | Indicator variable that takes the value of 1 if the acquirer and the target share product markets, and 0 otherwise. Source: Publicly available news articles. |
| *ProjectDiscont'd* | Indicator variable that takes the value of 1 if the drug project is terminated or there is no development activity after the acquisition date, and 0 otherwise. Source: Cortellis. |
| *Pr(ProjectOverlap)* | Indicator variable that takes the value of 1 if at least one ongoing drug project of the acquirer shares the same therapeutic class and mechanism of action as an ongoing drug project of the acquirer. Source: Cortellis. |
| *Proportion of ProjectOverlap* | Continuous measure of the number of overlapping drug projects scaled by the total number of ongoing drug projects of the target. Source: Cortellis. |
| *Q* | Continuous measure of market to book of the acquirer. Source: Compustat and CRSP. |
| *R&D* | Continuous measure of R&D expense of the acquirer. Source: Compustat. |
| *Sales* | Continuous measure of sales (in $ million) of the acquirer. Source: Compustat. |
| *Size* | Continuous measure of the natural logarithm of total assets of the acquirer. Source: Compustat. |
| *Tech* | An indicator variable that takes the value of 1 if an M&A includes the acquisition of technology-related intangible capital (e.g., patents, technology, or software), and 0 otherwise. Source: SEC Edgar 10-K filings. |
| *Unreported* | Indicator variable that takes the value of 1 if target's tangible assets, as reported in the acquirer's PPA, are below the asset-size threshold, and 0 otherwise. Source: Acquirer's public disclosures. |

## *OA.L. Acquirer's Announcement Returns and Intangible Capital*

The main variable of interest in columns (1) to (3), *Unreported* × *ProductMarketOverlap*, is an interaction term that assumes the value of 1 when the acquirer and the target firm share overlapping product markets in an unreported deal; and 0 otherwise. The main variable of interest in column (4), *Unreported* × *ProductMarketOverlap* × *Intangibles*, is a triple interaction term that assumes the value of 1 if when the acquirer and the target firm share overlapping product markets in an unreported deal and the deal includes the acquisition of either brand-related or technology-related intangible capital; and 0 otherwise. Across all columns, the dependent variable, *AnnReturn*, is a continuous variable that captures the 5-day market-adjusted cumulative abnormal returns of the acquirer centered on the announcement date. We include filing-year and acquirer's industry fixed effects, respectively. *AnnReturn* is winsorized at the 1% and 99% levels. Robust t-statistics are reported in parentheses and calculated using standard errors clustered at the filing-year and the acquirer's industry level, respectively. *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively.

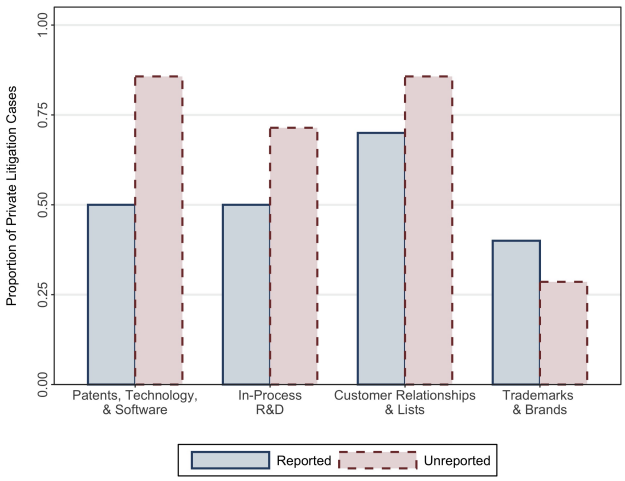
| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Dependent Variable: | *AnnReturn* | *AnnReturn* | *AnnReturn* | *AnnReturn* |
| Sample: | *Brand=1* | *Tech=1* | *IPR&D=1* | *Full* |
| *Unreported* × *ProductMarketOverlap* × *Intangibles* | | | | 0.082*** |
| | | | | (4.59) |
| *Unreported* × *ProductMarketOverlap* | 0.056* | 0.037** | 0.043 | -0.030 |
| | (1.90) | (2.99) | (1.38) | (-1.67) |
| *Unreported* × *Intangibles* | | | | -0.062*** |
| | | | | (-11.19) |
| *ProductMarketOverlap* × *Intangibles* | | | | -0.007 |
| | | | | (-0.78) |
| *Unreported* | -0.010 | -0.015*** | -0.020 | 0.039*** |
| | (-1.45) | (-2.98) | (-1.68) | (5.16) |
| *ProductMarketOverlap* | 0.009 | 0.009 | 0.001 | 0.015 |
| | (1.60) | (1.82) | (0.07) | (1.43) |
| *Intangibles* | | | | 0.010 |
| | | | | (1.12) |
| *DealPremium* | -0.035*** | -0.035** | -0.064* | -0.010 |
| | (-3.20) | (-2.94) | (-2.53) | (-1.11) |
| Observations | 479 | 548 | 217 | 1064 |
| Adjusted $R^2$ | 0.009 | -0.001 | 0.031 | 0.018 |
| Filing-year F/E | Y | Y | Y | Y |
| Industry F/E | Y | Y | Y | Y |

## *OA.M. Intangibles in Public and Private Litigation*

To investigate the importance of intangibles in litigation, we first obtain from the court records the initial "complaint" filing, which outlines the reason(s) for the lawsuit and details the proposed anticompetitive effects of the deal. We then read through each filing, with the aim of answering two questions. First, are the proposed anticompetitive effects of the deal related to the acquisition of identifiable intangible assets? Second, if yes, which categories of intangibles?

We determine whether the case involves identifiable intangible assets and identify which categories of intangible assets are involved based on whether they are mentioned in legal findings (Francis et al., 1994). We find intangible assets are prevalent in legal complaints for both public and private litigation. Specifically, of the 510 (17) public (private) cases we investigate, 417 (17) include the mention of intangible assets directly in the written complaint. Thus, more than 80% of public complaints and 100% of private complaints dispute the merger because of the alleged competitive harm caused by the acquisition of an intangible asset.

In the table below, we present descriptive evidence of the prevalence of intangibles, by category, for public and private litigation. Our analysis reveals that the four most frequently mentioned categories, in both public and private complaints, are Patents, Technology & Software, In-Process R&D, Customer Relationships & Lists, and Trademarks & Brands. Strikingly, nearly 50% of public antitrust litigation and 60% of private antitrust litigation involve a dispute over innovation projects that have yet to be developed into an actual product (i.e., in-process R&D). The figure below shows, for private litigation cases, a higher proportion of cases mentioning the largest categories of intangibles, including in-process R&D and internally generated technology, in unreported relative to reported deals.



## *OA.M. Intangibles in Public and Private Litigation (Continued)*

This table presents descriptive evidence of the prevalence, by category, of identifiable intangible assets in public and private litigation. *Public Frequency* represents the number of unique public litigation cases in which the complaint includes intangible capital (from that category). *Public Percent* represents the percent of all public complaints that the intangible capital (from that category) mentioned. *Private Frequency* represents the number of unique private litigation cases in which the complaint includes intangible capital (from that category). *Private Percent* represents the percent of all private complaints that the intangible capital (from that category) is mentioned.

| Category | Public Frequency | Public Percent | Private Frequency | Private Percent |
|---|---|---|---|---|
| Patents, Technology, & Software | 223 | 53.5% | 14 | 82.4% |
| In-Process R&D | 197 | 47.2% | 10 | 58.8% |
| Customer Relationships & Lists | 161 | 38.6% | 13 | 76.5% |
| Trademarks & Brands | 138 | 33.1% | 6 | 35.3% |
| Licenses | 94 | 22.5% | 3 | 17.6% |
| Product Rights | 79 | 18.9% | 3 | 17.6% |
| Distribution Agreements | 77 | 18.5% | 3 | 17.6% |
| Assembled Workforce | 68 | 16.3% | 6 | 35.3% |
| Supplier Agreements | 17 | 4.1% | 2 | 11.8% |
| Databases | 13 | 3.1% | 1 | 5.9% |
| Non-Compete Agreements | 12 | 2.9% | 4 | 23.5% |
| Lease Intangibles | 1 | 0.2% | 0 | 0% |
| Power Purchase Agreements | 0 | 0% | 0 | 0% |
| Other Intangibles | 0 | 0% | 0 | 0% |
| Mineral Interests | 0 | 0% | 0 | 0% |
| Usage Rights | 0 | 0% | 0 | 0% |
| Franchise Rights | 0 | 0% | 0 | 0% |
| Maintenance Contracts | 0 | 0% | 0 | 0% |
| Management Agreements | 0 | 0% | 0 | 0% |
| Pipeline Capacity Rights | 0 | 0% | 0 | 0% |
| Other Contract Rights | 0 | 0% | 1 | 5.9% |
| Royalty Agreements | 0 | 0% | 0 | 0% |

## *OA.N. Unreported Pharmaceutical M&As*

This table presents results from ordinary least squares (OLS) regressions of intangibles on unreported pharmaceutical M&As. The main variable of interest, *Unreported*, assumes the value of 1 if the target firm's assets are below the size-of-person asset threshold, and 0 otherwise. In columns (1) and (2), the dependent variable is 1 plus the natural log of intangible assets. In column (3) and (4), the dependent variable is the proportion of intangibles, measured as the level of intangibles scaled by the sum of assets plus intangibles plus goodwill. In all columns, we include only horizontal deals in the pharmaceutical industry, defined as deals with targets and acquirers having the same 3-digit NAICS code (i.e., NAICS code '325'). We include filing-year fixed effects in columns (2) and (4). Robust t-statistics are reported in parentheses and calculated using standard errors clustered at the reporting-year level. *, **, and *** represent significance at the 10%, 5%, and 1% level, respectively.

| Dependent Variable: | (1) *Log (Intangibles)* | (2) *Log (Intangibles)* | (3) *Proportion of Intangibles* | (4) *Proportion of Intangibles* |
|---|---|---|---|---|
| *Unreported* | 0.522* | 0.488* | 0.412*** | 0.399*** |
| | (2.05) | (1.80) | (8.08) | (7.49) |
| Observations | 169 | 169 | 169 | 169 |
| Adjusted $R^2$ | 0.029 | 0.023 | 0.369 | 0.385 |
| Filing-year F/E | N | Y | N | Y |

## *OA.O. Second Requests (within Lower and Upper Thresholds)*

This table presents, by FTC Fiscal Year, the number of Second Requests for M&As with deal values that fall between the lower and upper size-of-transaction thresholds. (See Figure 2 for size-of-transaction thresholds.) Deals within this range are subject to the size-of-person test. We also present the total number of Second Requests across all deal value sizes and the percent of all Second Requests that fall between the lower and upper size-of-transaction thresholds. FTC Fiscal Year is October through September (per the HSR Annual Reports).

| | (1) | (2) | (3) |
|---|---|---|---|
| FTC Fiscal Year | Second Requests (within Lower and Upper Thresholds) | Total Second Requests | Percent of Total Second Requests (1) ÷ (2) |
| 2001 | 20 | 70 | 29% |
| 2002 | 17 | 49 | 35% |
| 2003 | 15 | 35 | 43% |
| 2004 | 12 | 35 | 34% |
| 2005 | 13 | 50 | 25% |
| 2006 | 16 | 45 | 35% |
| 2007 | 21 | 63 | 33% |
| 2008 | 12 | 41 | 28% |
| 2009 | 7 | 31 | 22% |
| 2010 | 16 | 46 | 35% |
| 2011 | 11 | 58 | 19% |
| 2012 | 14 | 49 | 29% |
| 2013 | 14 | 47 | 29% |
| 2014 | 9 | 51 | 18% |
| 2015 | 8 | 47 | 17% |
| 2016 | 11 | 54 | 21% |
| 2017 | 11 | 51 | 22% |
| 2018 | 7 | 45 | 15% |
| 2019 | 7 | 61 | 12% |
| Total | 241 | 928 | 26% |

## *OA.P. Litigation*

**Litigation data**: Data on litigation comes from four sources. For data on public litigation, we use the HSR Annual Report, published jointly by the FTC and the DOJ. This report provides yearly data on the number of pre-merger review filings (by industry and range of deal values) and the number of Second Requests (by industry and range of deal values). We supplement the HSR data with transaction data on public litigation compiled by Billman and Salop (2022). For data on private litigation, we use Lex Machina's Legal Analytics Platform. Lex Machina categorizes federal court data from the Public Access to Court Electronic Records (PACER). One limitation of our analysis of private litigation is that, prior to 2007, the adoption by US district courts of electronic case filing using the PACER system was limited, reducing the number of deals we can match to court filings.[32] Finally, for our sample of M&A involving publicly traded acquirers, we collect additional data on public and private litigation from the legal proceedings section in the notes to their 10-K filings.

**Public Litigation**: Public enforcement beyond a Second Request, such as further investigation and litigation by the FTC or DOJ, imposes even higher costs on the antitrust regulators, likely forcing them to focus on fewer but larger deals (Wollmann, 2020). Indeed, when we match Second Requests that resulted in more stringent enforcement actions to deals, we find that deals above the upper size-of-transaction threshold are nearly 29 times more likely to be the target of these actions than deals that are subject to the (size-of-person) SoP test (i.e., 3.0% vs. 0.1%).[33] However, this amount decreases to approximately 3 times more likely when we narrow our focus to deals that are just above, i.e., within 100% of the upper size-of-transaction threshold, as compared to deals that are subject to the SoP test. In terms of the number of enforcement actions, the differences around the threshold are less pronounced; nine enforcement actions are for deals that are above but proximate to the upper size-of-transaction threshold versus seven for deals that are subject to the SoP test. Notably, these seven, more stringent enforcement actions represent roughly 5% of the total enforcement activity (i.e., 7 of 154 enforcement actions) that we can observe with the data.[34]

[32] For example, in 2002, only 11 of the 94 district courts used electronic filing.

[33] The results from an untabulated OLS regression reveal a positive and statistically significant relation between deal values and additional enforcement actions. More specifically, in a sample of 11,247 deals involving public and private acquirers, we find the mean deal has a 0.4% probability of an action, and this probability increases by roughly 0.9% for each $1 billion in deal value.

[34] Billman and Salop (2022) uncover 526 Second Requests that are not cleared by the FTC and DOJ, resulting in further enforcement actions, including litigation. We are able to match 154 of these cases to M&As. In other words, our finding of seven enforcement actions likely understates the true number by several-fold. However, our estimate of the rate of enforcement (i.e., 5%) is likely in the range of the true rate.

## Private Litigation

In Panels A, B, and C of the following table, we present descriptive evidence of private antitrust lawsuits for our sample of M&As. In Panel A, we show the number of cases, by reported and unreported. In Panel B, we show the number of cases, by industry. In Panel C, we show case outcomes.

**Panel A. Cases by Reported & Unreported Deals**

| Type | Cases | Total M&As | Percent |
|---|---|---|---|
| Reported | 15 | 1,529 | 0.98% |
| Unreported | 8 | 389 | 2.06% |
| Reported + Unreported | 23 | 1,918 | 1.20% |

**Panel B. Cases by Industry**

| Industry | Reported | Unreported | Total |
|---|---|---|---|
| Computer and Electronic Product Manufacturing | 4 | 5 | 9 |
| Chemical Manufacturing | 3 | 2 | 5 |
| Professional, Scientific, and Technical Services | 2 | 1 | 3 |
| Machinery Manufacturing | 3 | 0 | 3 |
| Food and Kindred Products | 1 | 0 | 1 |
| Merchant Wholesales, Nondurable Goods | 1 | 0 | 1 |
| Communications | 1 | 0 | 1 |
| Total | 15 | 8 | 23 |

**Panel C. Case Outcomes**

| Outcome | Observations | Average Length (in days) | Average Amounts ($ millions) |
|---|---|---|---|
| No electronic filings | 3 | n.a. | |
| Ongoing litigation | 5 | n.a. | |
| Terminated by plaintiff | 1 | 21 | |
| Forced divestiture | 1 | 2,056 | |
| Settlement or awarded damages | 4 | 1,973 | $187.4 |
| Complaint dismissed by court | 9 | 916 | |
| Total | 23 | | |

## *OA.Q. Deterrence Effects*

Thus far, our analysis has ignored the deterrence effect of the policy change. To estimate the expected level of deterrence, we assume firms not only incur the cost of filing but also costs related to the collection and filing of a comprehensive list of proprietary information they must file with the antitrust regulators.[35] Furthermore, firms would also likely consider the probability (and thus the additional costs) of a Second Request and, as a result, the probability of public enforcement (e.g, a consent decree or litigation) when deciding whether to merge. Thus, we expect that increasing antitrust costs and risk, through the policy change, will also deter some deals.

Wollmann (2020) estimates that up to three-quarters of horizontal mergers in the dialysis industry would be deterred if they needed to be reported. That estimate suggests that, despite the relatively low rate of Second Requests, merging firms would be unwilling to absorb the incremental antitrust costs arising from pre-merger review. The sample in Wollmann (2020) is for smaller deals (i.e., deal values less than $50 million) than what we examine. Thus, if we assume the relationship between deal value and the rate of deterrence is linear and negative (i.e., higher deal values are associated with lower deterrence rates), we can extrapolate the estimates in (Wollmann, 2020) to estimate the expected deterrence rate for our sample. Table 1 Panel A, shows the average deal value for a reported horizontal transaction in our sample is nearly three times that of the deals examined in Wollmann (2020), suggesting our sample's deterrence rate is about 25%. Applying this rate to the estimated 90 new reported horizontal deals means nearly 23 horizontal deals annually would not occur if a policy change was implemented. Moreover, the expected decrease in horizontal deals would also likely reduce our estimated number of additional Second Requests from five to four per year. As a consequence, our estimated additional regulatory costs per year would also likely decrease by a fifth to around $652,000–$860,000.

[35] Firms are required to disclose sensitive information to the FTC and DOJ in their pre-merger filing. The instructions for the filing, found online at https://www.ftc.gov/enforcement/premerger-notification-program/form-instructions, shed light on the cost burden placed on merging firms that are required to file.

Finally, deterrence is beneficial in at least two ways. First, it benefits regulators because it directly reduces the costs of investigation and potentially litigation. Second, it benefits consumers, if we believe the outcome of an anticompetitive deal would have been higher prices, lower quality, less choice, or a combination of these. However, given that our study includes many different industries, we do not attempt to estimate the benefits to consumers due to deterrence, although they are likely substantial.[36] Thus, one takeaway from our analysis is that, by requiring merging firms to include the fair value of intangibles in their size-of-person test, antitrust regulators could deter or block transactions that could harm consumers.

[36] Consistent with this, Wollmann (2020) estimates the value of lives saved in the kidney dialysis attributed to a reduction in horizontal mergers, and concludes the benefits approach $100 million per year.

## *OA.R. Deal Termination and Renegotiation Risk*

This table presents descriptive statistics of renegotiated and terminated M&As. We obtain M&A data from Refinitiv. A deal is included in this sample if the M&A was announced between January 1, 1997, and December 31, 2018, and if the deal value is at least $50 million. Completed and terminated M&As are included in the sample. Panel A describes the data by time and by event. Events are identified by an extensive examination of the public disclosures of contractual amendments, SEC filings, and news articles for each M&A. Panel B presents the reasons for renegotiations and terminations, which we obtain from publicly available documents.

**Panel A. Distribution of all deals, renegotiations, and terminated deals**

| | (1) | (2) | | (3) | | (4) | | (5) | | (6) | | (7) | | (8) | | (9) | | (10) | | (11) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | All Deals | Reneg. Up | | Reneg. Down | | All reneg. | | Term. by target | | Term. by acquirer | | Mutually term. | | Term. by regulator | | Term. by vote | | Undiscl. term | | All term. | |
| Years | N | N | %of deals | N | %of deals | N | %of deals | N | %of deals | N | %of deals | N | %of deals | N | %of deals | N | %of deals | N | %of deals | N | %of deals |
| 1997 - 2001 | 1953 | 25 | 1.3% | 27 | 1.4% | 52 | 2.7% | 11 | 0.6% | 19 | 1.0% | 47 | 2.4% | 10 | 0.5% | 0 | 0.0% | 5 | 0.3% | 92 | 4.7% |
| 2002 - 2008 | 1424 | 31 | 2.2% | 22 | 1.5% | 53 | 3.7% | 13 | 0.9% | 13 | 0.9% | 19 | 1.3% | 6 | 0.4% | 9 | 0.6% | 0 | 0.0% | 60 | 4.2% |
| 2009 - 2018 | 1517 | 38 | 2.5% | 7 | 0.5% | 45 | 3.0% | 9 | 0.6% | 3 | 0.2% | 15 | 1.0% | 9 | 0.6% | 3 | 0.2% | 0 | 0.0% | 39 | 2.6% |
| Total | 4894 | 94 | 1.9% | 56 | 1.1% | 150 | 3.1% | 33 | 0.7% | 35 | 0.7% | 81 | 1.7% | 25 | 0.5% | 12 | 0.2% | 5 | 0.1% | 191 | 3.9% |

## *OA.R. Deal Termination and Renegotiation Risk (Continued)*

**Panel B. Reasons for renegotiations and terminations**

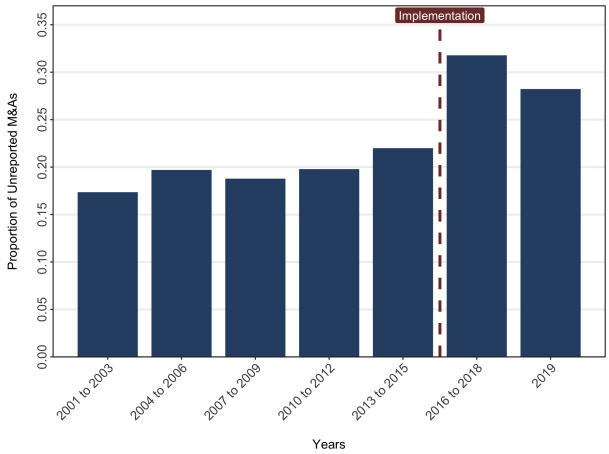
| Reason | Reneg. up | Reneg. down | Term. by target | Term. by acquirer | Mutually term. |
|---|---|---|---|---|---|
| Board dissent (acquirer or target) | | | 3 | 1 | |
| Breach of terms (acquirer or target) | | | 12 | 4 | 1 |
| Competing offer | 51 | | | | |
| Contract change | 1 | 3 | | | |
| Creditor concern | | 6 | | 5 | |
| Deadline expired | | | 10 | | 3 |
| Due diligence | | | | 2 | 1 |
| Material adverse event (acquirer or target) | 1 | 35 | 6 | 15 | 39 |
| Proxy advisor disapproval | 3 | | | | |
| Regulator concern | | 3 | 2 | 1 | 5 |
| Renegotiation unsuccessful | | | | | 4 |
| Shareholder dissent | 24 | | | | 5 |
| Strategic reason | | 2 | | | 16 |
| Undisclosed reason | 14 | 7 | | 6 | 7 |
| Total | 94 | 56 | 33 | 34 | 81 |

## *OA.S. Changes to Accounting Standards*

If accounting standards play a critical role in the regulation of the takeover market, significant changes to standards that impact how assets are measured could affect M&A activity. We exploit a recent change to the accounting standard for operating leases. Specifically, beginning in January 2019 (2022), ASU 2016-02 requires all US public (private) firms to recognize their operating leases as an asset (to represent the right of use) and, correspondingly, a liability (to represent the future payments) on their balance sheets. To put this change in perspective, some reports estimate the new standard added $3.3 trillion in operating leases to the balance sheets for publicly listed firms or an average of 12.5% of lagged sales (Ma and Thomas, 2023).[37] In our setting, increasing the target firm's assets via the capitalization of operating leases could conceivably shift deals from being unreported to being required to report.

To avoid the costs and risks associated with needing to report the deal, firms can take real actions. For instance, Online Appendix A shows private correspondence with the FTC from attorneys representing merging parties where the firms wanted to pay a special dividend to reduce the target's assets so it is below the SoP threshold. Alternatively, firms could conduct a merger earlier, because the standard was proposed in 2010 and finalized in 2016, but did not go into effect until 2019 for public companies (or 2022 for private companies). This idea parallels prior findings that observe that changes to regulation, at least partially, explain merger activity (e.g., Harford, 2005; Mitchell and Mulherin, 1996).

We first generate a histogram of the proportion of deals that are unreported.[38]




[37] See https://www.ifrs.org/content/dam/ifrs/project/leases/ifrs/educational-materials/leases-fact-sheet-jan-2016.pdf.

[38] We use 3-year increments because the accounting standard implementation period for public firms is three years (i.e., 2016 through 2018). We present 2019 alone because our data end in early 2020 and because the implementation for private firms continued until January 2022.

The histogram shows that from 2001 through 2015, the proportion of unreported M&As remains relatively stable (e.g., 0.18 to 0.22). By contrast, from 2016 through to the end of 2018, we see about a 50% increase in the proportion of deals that are unreported. This sharp increase coincides with the years during which public and private firms were aware of the forthcoming change to the accounting standard, but before the years they were required to adopt the new lease standard (i.e., 2019 for public firms and 2022 for private firms). Interestingly, we also find a slight decrease in the proportion of unreported deals in 2019—that is, when public firms were required to adopt the standard but private firms were not yet required to adopt. Given most of our target companies are private, and therefore not subject to the standard until 2022, the elevated activity in 2019 also suggests firms may be engaging in deals before the lease standard went into effect. Collectively, the evidence in the figure above is consistent with the idea that changes to accounting standards that impact assets could have real effects on M&A activity in our setting.

To provide further evidence, we present the results of an OLS model that regresses unreported deals on a set of time indicators. Specifically, following Ma and Thomas (2023), we create an indicator for the 3-year period (i.e., 2016 through 2018) during which firms were implementing but not yet adopting the new lease standard. To remain consistent, we create separate indicators for each of the 3-year windows that precede 2016, for example, an indicator for 2013 through 2015, for 2010 through 2012, and so on. We also create a single indicator for 2019, because this year is the first one that public firms were required to adopt the new lease standard while private firms could continue to implement the standard. We set the exclusion period in our specification to the 3-year window immediately at the beginning of our sample (i.e., 2001 to 2003). The results are presented in the table below.

| | (1) | (2) | (3) |
|---|---|---|---|
| Dependent Variable: | *Unreported* | *Unreported* | *Unreported* |
| *2004 to 2006* | 0.024 | 0.021 | 0.022 |
| | (0.69) | (0.61) | (0.63) |
| *2007 to 2009* | 0.011 | 0.011 | 0.011 |
| | (0.29) | (0.29) | (0.29) |
| *2010 to 2012* | 0.025 | 0.025 | 0.025 |
| | (0.56) | (0.60) | (0.60) |
| *2013 to 2015* | 0.044 | 0.044 | 0.044 |
| | (1.27) | (1.27) | (1.27) |
| *2016 to 2018 (Public and Private Firm Implementation)* | 0.145*** | 0.021 | 0.048 |
| | (4.21) | (0.60) | (1.38) |
| *2019 (Only Private Firm Implementation)* | 0.109*** | -0.017 | 0.005 |
| | (3.25) | (-0.52) | (0.15) |
| Observations | 1,774 | 1,774 | 1,728 |
| Adjusted $R^2$ | 0.011 | -0.002 | -0.002 |

In column (1), we find that relative to the exclusion window, the proportion of unreported deals in 2016 through 2018 is roughly 10 percentage points higher, or the equivalent of a 44.5% increase. Notably, we do not find a statistically significant difference in any of the 3-year windows before the exclusion window, suggesting our findings are not an artifact of a pre-period trend.

Next, we consider whether the increase in the proportion of unreported deals, shown in column (1), is indeed driven by deals that, if operating leases were included when determining the size of the target's assets, would shift from unreported to reported. For this analysis, we require data on future operating lease commitments, which we have for a subsample of 236 deals involving public targets. We use these data to estimate the relationship between deal values (i.e., target-firm size) and operating leases and then apply the coefficient from this regression to deals with missing values of operating leases. Specifically, we use the disclosure of future lease commitments located in the 10-K filings of public targets to determine the value of operating leases. Of the 236 public targets in our sample, we find disclosed operating lease commitments for 220 of them. At a minimum, nearly all firms disclose future operating lease commitments for at least two years, and approximately 72% of the firms disclose them for five years or more. For simplicity, we follow Moody's and multiply the first year of the future minimum lease commitments by a factor of 3.5, which is the average Moody's industry multiple. (See Moody's Investor Service report: https://ratings.moodys.com/api/rmc-documents/69913). We use this value as our estimated present value of operating leases (PVOP). Next, we use an OLS model to regress PVOP on deal values, and include target-firm industry fixed effects and year fixed effects, respectively. The output of this model is reported in the table below.

| Dependent Variable: | *Operating Leases* |
|---|---|
| *DealValue* | 0.044** |
| | (2.62) |
| Observations | 217 |
| Adjusted $R^2$ | 0.122 |
| Filing-year F/E | Y |
| Industry F/E | Y |

The magnitude of the coefficient (0.044) indicates that, on average, future operating lease commitments increase by roughly $44,000 per $1 million of deal value. This estimate appears realistic, given that we find the average future lease commitments for a sample of public targets in unreported deals is about $3.75 million. Finally, we use the coefficient from the regression output to impute the value of future lease commitments for deals with missing values. We use these imputed values for our analysis.

Specifically, we add the imputed lease amounts to only those deals occurring in 2016 through 2019 and then estimate the same equation we used in column (1) of the time-indicators analysis. We contend that if capitalizing operating leases increases the target's assets such that the deal shifts from unreported to reported, we should find no statistically significant difference in the 2016 to 2019 and 2019 windows relative to the exclusion window. Put differently, if operating leases are indeed economically important, we should find that capitalizing them shifts the additional unreported deals we found in column (1) to being reported deals. The results are reported in column (2). Consistent with our conjecture, in column (2), we do not find a statistically significant difference in any of the windows relative to the exclusion window. Moreover, when comparing the results in column (2) with those in column (1), we find a significant decrease in the magnitude of the coefficients for the 2016 to 2018 and 2019 windows, indicating operating leases are economically important for unreported deals. In column (3), we exclude those deals that, due to the capitalization of operating leases, shift from unreported to reported. The intuition is that, absent the announcement of a new lease standard, these deals might not have occurred. Our results continue to hold. Overall, the results suggest changes to accounting standards can have real effects on M&A activity via the SoP test.[39]

[39]One might question why some firms may choose to accelerate a merger, rather than just waiting and using an avoidance technique, such as the approach of paying a special dividend shown in Appendix A. However, section § 801.90 of the HSR Act prohibits "[a]ny transaction(s) or other device(s) entered into or employed for the purpose of avoiding the obligation to comply with the requirements of the act." Based on this fact, firms might be unwilling to delay and risk an avoidance strategy that the antitrust regulators will challenge.