Serial Acquisitions in Tech*

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Abstract

We document novel empirical patterns in technology-sector serial acquisitions from 2010 to 2023. Using a granular S&P taxonomy, we show that serial acquisitions—sequences of transactions by the same acquirer within the same or adjacent market categories—constitute approximately one-quarter to one-third of majority-control mergers and acquisitions. Follow-on targets tend to be larger and older than initial targets, and publicly-traded non-private equity acquirers account for over half of these transactions, challenging the prevailing view that serial acquisitions primarily represent small-scale private equity roll-ups. We further examine a cumulative screening framework wherein regulatory review is triggered by the aggregate value of sequential transactions rather than individual deal thresholds. This approach typically maintains existing review timing or advances it moderately, though in extended acquisition series it can accelerate scrutiny by several transactions or multiple years. For GAFAM (Google/Alphabet, Apple, Facebook/Meta, Amazon, and Microsoft) and other top technology acquirers, the cumulative approach primarily expands coverage to transactions below traditional thresholds and those with incomplete valuation data, rather than accelerating reviews of already-reportable acquisitions. An algorithmic screening tool implementing such a framework could enable antitrust agencies to monitor consolidation patterns in real time and complement traditional transaction-by-transaction merger reviews.

Keywords: Serial acquisitions; cumulative merger review; GAFAM; antitrust; technology M&A.
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1. Introduction

The growing footprint of large digital platforms, especially Alphabet/Google, Amazon, Meta/Facebook, Apple, and Microsoft (referred to as GAFAM), has renewed long-standing policy concerns about the adequacy of existing merger control frameworks to capture how dominant firms expand. One increasingly important channel is serial acquisition, a strategy in which an acquirer purchases multiple firms over time, often within related technological domains. Recent debates in the United States and abroad have questioned whether individually small or non-reportable acquisitions can cumulatively dampen competition, reduce entry, or entrench incumbency advantages (FTC 2021; Kwoka and Valletti 2021; Hearn et al. 2022; Hearn and Shaban 2022; Mehta et al. 2022; Abate and Lyon 2023).

Despite the policy salience of this issue, systematic empirical evidence on the structure and frequency of serial acquisitions remains limited. Most prior discussions have focused on high-profile examples such as Meta's acquisitions of Instagram and WhatsApp[1], Google's purchases of DoubleClick and AdMeld[2], a private equity firm's effort to buy up anesthesia practices in Texas[3], or transactions that prompted renewed attention to the "stealth consolidation" hypothesis (Wollmann 2019, 2024; Mayo and Press 2025). Yet these case studies and various policy efforts to improve government visibility in the U.S.[4], EU[5],

[1] In 2020, the FTC alleged that Meta/Facebook used acquisitions of Instagram (2012) and WhatsApp (2014) to eliminate competitive threats and consolidate its monopoly power. Source: https://www.ftc.gov/news-events/news/press-releases/2020/12/ftc-sues-facebook-illegal-monopolization. The case went on trial in April 2025, with the court decision pending.

[2] In January 2023, the US DOJ sued Google for monopolizing digital advertising technologies, "through serial acquisitions and anticompetitive auction manipulation." Source: https://www.justice.gov/atr/case-document/file/1566706/dl?inline=. In April 2025, the District Court judge ruled that Google monopolized two online advertising markets, but did not find Google's serial acquisitions of DoubleClick and Admeld anticompetitive. See New York Times summary of the court ruling at https://www.nytimes.com/2025/04/17/technology/google-ad-tech-antitrust-ruling.html.

[3] In September 2023, the FTC sued U.S. Anesthesia Partners (USAP) and Welsh, Carson, Anderson & Stowe (WCAS), a private equity firm, for using a "roll-up" strategy to buy up nearly every large anesthesia practice in Texas and engage in other anti-competitive practices to monopolize the anesthesiology market in Texas. Source: https://www.ftc.gov/news-events/news/press-releases/2023/09/ftc-challenges-private-equity-firms-scheme-suppress-competition-anesthesiology-practices-across.

[4] The U.S. Department of Justice (DOJ) and Federal Trade Commission (FTC) updated their merger guidelines in December 2023, including Guideline #9 "When a Merger is Part of a Series of Multiple Acquisitions, the Agencies May Examine the Whole Series." Source: https://www.justice.gov/atr/merger-guidelines.

[5] The European Union's Digital Markets Act (DMA) Article 14 states that "A gatekeeper shall inform the Commission of any intended concentration within the meaning of Article 3 of Regulation (EC) No 139/2004, where the merging entities or the target of concentration provide core platform services or any other services in the digital sector or enable the collection of data, irrespective of whether it is notifiable to the Commission under that Regulation or to a competent national competition authority under national

UK[6], and other countries[7] leave open fundamental questions about the broader prevalence, timing, and composition of serial acquisition behavior across the technology sector.

This paper provides the first large-scale, data-driven characterization of serial acquisitions in the technology sector between 2010 and 2023. Using transaction-level data and a granular taxonomy from S&P Global Market Intelligence, we define an acquisition series as a sequence of majority-control deals by the same acquirer within the same (narrow) or adjacent (broad) business categories. This definition allows us to trace how acquirers expand across technological verticals—patterns invisible in datasets that record deals as independent events.

Our analysis uncovers several surprising empirical regularities. First, serial acquisitions are pervasive, accounting for roughly one-quarter to one-third of all majority-control technology M&A transactions. Second, follow-on targets are on average larger and older than the initial ones, contrary to the "roll-up" narrative often associated with private equity or early-stage consolidation (Pitchbook 2023). Third, public non-PE acquirers, rather than private equity, dominate this landscape, and many serial sequences unfold gradually over multiple years. These patterns suggest that serial acquisitions may go beyond short-term opportunistic maneuvers and could reflect sustained strategic programs of cumulative expansion. They also imply that the scope of serial activity, and its potential impact on innovation and competition, may be considerably broader than what case-based enforcement has so far recognized.

We then explore the policy implications of these findings for merger control. Under current frameworks such as the U.S. Hart-Scott-Rodino (HSR) Act, merger review is triggered by individual deal thresholds. This design ensures administrative simplicity but can miss sequences of smaller acquisitions whose combined value or strategic effect is substantial. The concern is particularly relevant in digital markets, where large incumbents often acquire complementary or adjacent capabilities—data, engineering talent, or niche technologies—through transactions below notification thresholds. Although antitrust agencies have acknowledged the limits of deal-by-deal assessment, there remains little quantitative evidence on how cumulative acquisition patterns might alter the timing or intensity of regulatory scrutiny.

merger rules." Source: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R1925.

[6]The UK's Digital Markets, Competition, and Consumers Act, effective January 1, 2025, requires firms with "Strategic Market Status" to report M&A transactions under lower-than-usual notification thresholds. Source: https://www.legislation.gov.uk/ukpga/2024/13/enacted.

[7]According to Abate and Lyon (2023), South Africa amended its Competition Act in 2019 to enable its competition authority to address serial acquisitions, and Germany's Federal Court of Justice acknowledged the potential harm of serial acquisitions in 2008.

To address this gap, we explore a cumulative approach to merger screening, under which agencies assess the aggregate value and frequency of a firm's acquisitions within a defined technological category rather than treating each deal independently. Using our dataset, we simulate how the timing of review would change if cumulative thresholds were applied. The results suggest that while most acquirers would experience only modest shifts, the cumulative framework could substantially expand the coverage of currently unreportable sequences. In the subset of long acquisition series, cumulative thresholds would trigger review several deals, or several years, earlier than under the status quo.

Applying this framework to GAFAM and the top 1 percent of public technology acquirers yields nuanced insights. Both groups exhibit similar structural features in their serial acquisitions: comparable numbers of follow-on targets per series, frequent zero time or deal gaps, and persistent activity across multiple verticals. Yet for these firms, the cumulative approach primarily broadens oversight by capturing small, below-threshold acquisitions and those with incomplete valuation data rather than materially advancing the timing of review for already reportable transactions. In other words, the most significant enforcement gain arises from increased visibility into incremental consolidation, not from earlier intervention in large-scale deals.

Finally, we argue that the cumulative approach is increasingly operationally feasible. Advances in data infrastructure and computational methods make it possible for competition authorities to develop algorithmic screening tools that track acquisition sequences in real time. Such systems could automatically aggregate transaction values across related markets, identify firms whose cumulative activity exceeds pre-specified benchmarks, and flag them for potential review. Rather than replacing traditional legal or economic analysis, these tools would complement existing casework by providing early-warning indicators and improving prioritization.

Overall, this paper contributes along three dimensions. Empirically, it documents new and previously unrecognized patterns in serial acquisitions across the technology sector. Conceptually, it develops a cumulative framework for understanding and screening sequential mergers. Practically, it outlines how algorithmic monitoring could implement this framework within existing institutional architectures. Together, these contributions help bridge the gap between the evolving structure of digital consolidation and the tools available to monitor and regulate it.

The remainder of the paper is organized as follows. Section 2 reviews related literature. Section 3 describes the S&P dataset and outlines how we use the its taxonomy to clas-

sify acquisitions as initial, follow-on, or singleton. Section 4 documents four key empirical patterns of serial acquisitions in the tech sector. Section 5 analyzes deals above and below the HSR threshold, and Section 6 examines the serial acquisition behavior of GAFAM and other top technology firms. Section 7 proposes a cumulative approach for merger review, and Section 8 concludes with limitations and directions for future research.

2. Literature review

This work builds on the extensive literature on mergers and acquisitions (M&As), which explores the determinants of M&A strategies and their implications for firm performance. For example, Capron and Shen (2007) examines acquirers' preferences for private versus public targets and the alignment of target types with acquirer profiles, while Fine and Gray (1999) and Gupta and Gerchak (2002) investigate how synergies arise through operational cost reductions and organizational integration. Within this broad literature, two related streams concern (i) private firms' exits via M&A and (ii) public acquirers' M&A strategies and performance.

For private firms, especially venture capital (VC)-backed startups, exit is often the ultimate objective (Pisoni and Onetti 2018). Although prior research has examined outcomes of VC-backed startup acquisitions (Bryan and Hovenkamp 2020; Cotei and Farhat 2018), little attention has been paid to whether these startups themselves acquire other firms and how such acquisitions affect their own exits. In contrast, private equity (PE) firms, while less focused on exit, are active acquirers with distinct advantages: they achieve higher stock returns in cross-border takeovers (Humphery-Jenner, Sautner and Suchard 2017) and pay lower acquisition premiums than public acquirers (Bargeron et al. 2008). Recent studies show that PE firms may pursue serial acquisitions to consolidate markets, leading to higher prices (Asil et al. 2024). Yet, despite growing public debate, the prevalence and patterns of serial acquisitions remain underexplored. Our study fills this gap by systematically analyzing serial acquisitions undertaken by private companies and PE firms in the technology sector.

Public firms remain the most extensively studied acquirers, partly due to data availability. Much of this work examines stock market reactions to M&A announcements. Moeller, Schlingemann and Stulz (2004) finds that smaller public acquirers earn higher announcement returns, while Fuller, Netter and Stegemoller (2002) shows that frequent acquirers benefit when targeting private firms but lose value when acquiring public ones. Golubov and Xiong (2020) reports that public acquirers underperform private ones oper-

ationally, whereas Maksimovic, Phillips and Yang (2013) finds that public acquirers can realize greater gains during acquisition waves. Laamanen and Keil (2008) find that serial acquisitions are negatively associated with post-acquisition performance among public firms, while Aktas, De Bodt and Roll (2011) observe declining cumulative abnormal returns (CARs) across successive deals, moderated by CEO characteristics. In comparison, we characterize the relative importance of public and private acquirers in serial acquisitions, and document how public acquirers' serial acquisition strategies correlate with their market value, market competitiveness, and innovation activities in the tech sector.

Another strand of research concerns the pro- and anti-competitive effects of M&A. Acquisitions can enhance innovation by generating synergies and complementarities (Zhao 2009; Bena and Li 2014), but they may also reduce the novelty of acquired technologies (Seru 2014) or suppress innovation by removing potential competitors (Motta and Peitz 2021; Bourreau and Gautier 2024).[8] Empirical evidence for such "killer acquisitions" remains limited to the pharmaceutical sector (Cunningham, Ederer and Ma 2021). In practice, acquisitions can be driven by efficiency gains—economies of scale and scope, reduced duplicative R&D, or elimination of double marginalization (Cabral 2021)—and may even spur innovation by encouraging entry-for-buyout (Rasmusen 1988; Jin, Leccese and Wagman 2024*b*).[9] We contribute to this literature by examining serial acquisitions, an increasingly common but understudied strategy that has attracted renewed attention from antitrust agencies, despite historical precedents dating back to the 19th century.[10]

With rising regulatory scrutiny, recent work has documented the implications of venture acquisitions by major technology platforms such as GAFAM for entry, innovation, venture capital investment, and ecosystem building (Wen and Zhu 2019; Kamepalli, Rajan and Zingales 2020; Affeldt and Kesler 2021; Prado and Bauer 2022; Jin, Leccese and Wagman 2023; Cheng, Sokol and Cennamo 2025). Ederer, Seibel and Simcoe (2025) extend this analysis to a broader set of large technology companies (GAFAM plus Cisco, Intel, and Qualcomm) and find that patenting activity in affected CPC groups rises following acquisitions, especially when follow-on acquisitions occur in the same technology space; acquired patents also receive more citations post-acquisition than comparable patents. Our study complements this line of research by systematically

[8] See Jin, Leccese and Wagman (2025) and Lefouili and Madio (2025) for a comprehensive review of the effect of M&A on innovation.

[9] Relatedly, Eisfeld (2022) uses a structural model to quantify how entry-for-buyout and kill-zone mechanisms shape startup entry, finding that banning venture acquisitions would reduce entry by 8–20%.

[10] See, e.g., Standard Oil Co. v. U.S., 221 U.S. 1, 31–42 (1911); U.S. v. American Tobacco Co., 221 U.S. 106, 157–60 (1911). More case studies of serial acquisitions can be found in Abate and Lyon (2023); Tombak (Fall 2002).

documenting serial acquisition strategies across both GAFAM and other large technology firms, situating them within the broader dynamics of technology-sector M&As.

A growing body of research also investigates the merger review process. Wollmann (2024) and Mayo and Press (2025) show that the 2000 increase in HSR reporting thresholds led firms to pursue mergers below the threshold, thereby avoiding review. Wollmann (2019) finds that small, unreported deals in the U.S. dialysis industry can nonetheless significantly alter market structure and harm consumer welfare. Conditional on HSR filings between 2001 and 2023, Mayo, Press and Whitener (2025) reports that only 15% of proposed mergers received an initial DOJ or FTC investigation, with the remaining 85% proceeding without scrutiny. They further show that the early stage scrutiny likelihood increases in industries with more intra-industry mergers, higher concentration, and prior challenges, indicating that enforcement is history-dependent. Given that the technology sector is characterized by frequent startup entries and buyouts, most of which are either non-reportable or uninvestigated, tech M&As—especially serial ones—may increasingly evade antitrust review. Our analysis extends this literature by linking HSR coverage directly to serial acquisition strategies, documenting systematic differences between below- and above-threshold deals, and assessing how cumulative acquisition value could inform future merger review design.

More importantly, the literature faces two key limitations. First, there is no consistent definition of serial acquisitions. Second, prior findings about their disadvantages may not reflect the increasing prevalence and strategic sophistication of serial acquisitions in recent years. Our paper addresses these gaps by proposing a novel definition of serial acquisitions, leveraging a granular taxonomy of the technology industry (Jin, Leccese and Wagman 2023), and providing a comprehensive analysis of serial acquisitions in the tech sector over the past decade and a half. We further propose a cumulative approach of merger review, which can complement existing casework by providing early-warning flags and improving prioritization.

3. Definition and Data

3.1. Definition

If one had a clear definition of each relevant market, it would be straightforward to define a series as a sequence of acquisitions that the *same* acquirer completes in the *same* market over the sample period.

As illustrated in Figure 1, suppose acquirer #1 sequentially acquires targets A, B, and

C in the green market. In this case, A–B–C form a series for acquirer #1. We label the acquisition of A as the initial deal and B and C as follow-on deals. At the time of deals B and C, A had already occurred, so all follow-on deals are serial acquisitions. However, at the time of deal A, the occurrence of B or C could not have been anticipated with certainty. Therefore, we classify A as a non-serial acquisition, even though it retrospectively initiates the A–B–C series.

In contrast, in the blue market, acquirer #2 acquires only target D during the sample period; D is thus a singleton acquisition. If acquirer #2 later acquires another target in the same market beyond our sample period, D would retrospectively become an initial deal in a future series but remains a non-serial acquisition in our definition. Under this framework, the classification of serial versus non-serial acquisitions is time-neutral, whereas the labels "initial" or "singleton" can be time-dependent. Following the same logic, in the gray market acquirer #3 acquires E and F, while acquirer #4 acquires G only in the yellow market. Here, E is an initial deal, F a follow-on deal, and G a singleton deal. E and F form a series once F occurs, but only F is referred to as a serial acquisition. Henceforth, we use "follow-on deal," "serial deal," and "serial acquisition" interchangeably.

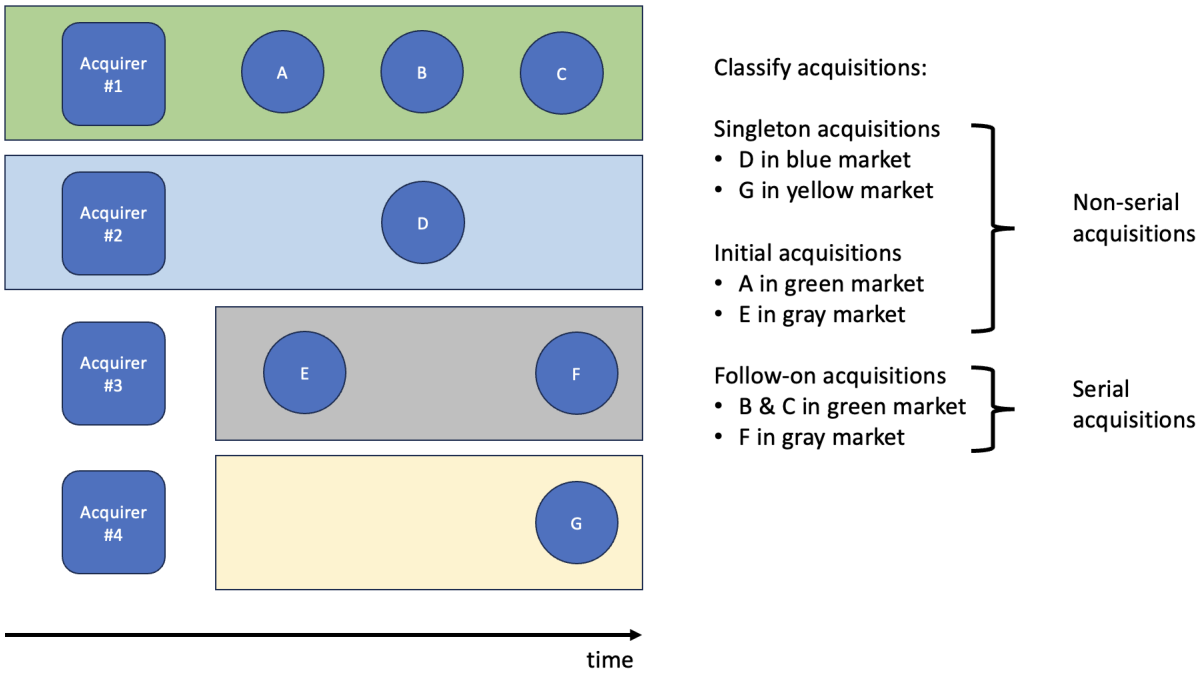


FIGURE 1. Definition of serial and non-serial acquisitions

Our definition is independent of whether an acquirer is active in the market before

completing its initial deal, although this distinction may be relevant for regulators and policymakers. Later, our data summary reports whether the acquirer and the initial target belong to the same business category as one target attribute. Moreover, a single acquirer may engage in multiple series of acquisitions across different markets. For instance, if acquirers #1, #3, and #4 in Figure 1 represent the same entity, the A–B–C series may strengthen its incumbency in the green market, the singleton acquisition of G may enable entry into the yellow market, and the E–F series may facilitate entry and expansion in the gray market.

Our framework is conservative in that we take each acquirer and target identity as recorded, without consolidating information at the parent-company level. For example, if acquirer #1 acquires targets A, B, and C in the green market, and A subsequently acquires H and I, we do not treat H and I as part of acquirer #1's A–B–C series. Under our definition, H and I may form a separate series for acquirer A if they are in the same market (not necessarily the same as A's). As shown in Appendix B, tracing acquirer identity to the ultimate parent does not affect our conclusions.

3.2. S&P data and taxonomy

Unfortunately, there is no clear consensus on how to define which firms compete in the same market within the technology sector. Rapid technological change continually generates new products, features, and modes of accessing, consuming, and delivering digital goods and services, blurring traditional market boundaries. This challenge motivates us to rely on proxies commonly used by financial markets for business classification.

Our primary data source is the database maintained by Standard and Poor's Global Market Intelligence, called 451 Research (henceforth, S&P). The data track majority (control) acquisitions of technology companies since the early 2000s, focusing on information, communication, and energy technologies (ICET). In a majority-control acquisition, the acquirer obtains more than 50% of the target's voting shares. The S&P data are updated daily and widely used by investors and analysts in the financial industry. However, according to the provider, entries prior to 2010 may be less comprehensive due to incomplete or imprecise information. Accordingly, our analysis focuses on acquisitions consummated between January 1, 2010 and December 31, 2023. As shown in Jin, Leccese and Wagman (2023, 2024*a*), for majority-control acquisitions in the tech sector, the S&P data are more comprehensive than Refinitiv's Worldwide Mergers, Acquisitions, and Alliances database, which is broader in scope because it also includes non-tech and minority acquisitions.

A key advantage of the S&P dataset is its hierarchical four-level technology taxonomy. Level 1 provides broad industry groupings (e.g., "Application Software," "Internet Content & Commerce," comparable to 4-digit NAICS codes such as 5112 and 5191), while Level 4 captures narrow technology verticals (e.g., "Benefit and Payroll Management," "Video-On-Demand Servers"). Each Level 1 "parent" category contains multiple Level 2 "child" categories, though not all Level 2 categories extend further. In total, the taxonomy comprises about two dozen Level 1 and roughly two hundred Level 2 categories, or about nine Level 2 categories per Level 1 on average. We refer to two Level 2 categories as "adjacent" if they share the same Level 1 parent.

Each firm in the database is assigned a primary category representing its core business, which includes Level 1, Level 2, and—if available—Level 3 and Level 4 classifications. Firms may also have one or more secondary categories. To avoid ambiguity, we use only the primary Level 1 and Level 2 categories to classify each firm.

The S&P data report firms' headquarters location, public or private status, acquisition consummation dates, and founding dates (available for 90.71% of targets and 92.49% of acquirers), allowing us to compute firm age at the time of acquisition. The data also include firm employment and transaction value, although these fields are more sparsely populated: only 23.82% of deals report target employment size, and 24.21% report transaction value, as public acquirers must disclose deal size only if the transaction is deemed material.[11] As detailed in Jin, Leccese and Wagman (2024*a*), the S&P taxonomy is more systematic, reliable, and granular than alternative taxonomies used in studies of technology mergers.

The S&P taxonomy, however, does not necessarily align with the market definitions used by antitrust agencies or courts. Antitrust investigators can rely on confidential firm and market data, whereas S&P classifications are based on publicly available information. To account for this, we define serial acquisitions using two complementary approaches. The "narrow" definition groups targets within the same Level 1 and Level 2 categories (henceforth, Level-1/Level-2), while the "wide" definition groups targets sharing only the same Level 1 category (henceforth, Level-1). The wide definition treats acquisitions in adjacent Level 2 categories as part of the same series, thereby classifying more transactions as follow-on or serial deals and lengthening observed series.

It is difficult to gauge how these definitions compare with those used in antitrust enforcement. Two recent U.S. cases involve serial acquisitions in the tech sector: *FTC*

[11] A deal is "material" if it leads to at least a 20% increase in key acquirer metrics such as revenue or assets, although qualitative factors—such as strategic importance—are also considered. Non-material transactions, especially small venture acquisitions, are typically not reported to the SEC on an 8-K form.

v. Facebook/Meta (2020) and *DOJ v. Google/Alphabet* (2023). The FTC alleged that Facebook's acquisitions of Instagram and WhatsApp formed a series. In the S&P taxonomy, Facebook is categorized as "Internet Content & Commerce" (Level 1) and "Social Networking & Collaboration" (Level 2); Instagram as "Mobility" (Level 1) and "Applications" (Level 2); and WhatsApp as "Mobility" (Level 1) and "Messaging" (Level 2). Thus, these deals would form a series only under our wide definition. Conversely, the DOJ alleged that Google's acquisitions of DoubleClick and Admeld formed a series. In the S&P taxonomy, Google/Alphabet is "Internet Content & Commerce" (Level 1) and "Search" (Level 2); DoubleClick and Admeld are both "Internet Content & Commerce" (Level 1) and "Online Advertising" (Level 2). These two acquisitions qualify as a series under both definitions. However, because DoubleClick was acquired in 2008, outside our 2010–2023 sample, these deals are not counted in our summary statistics.

Despite such differences, Facebook's acquisition of WhatsApp is classified as a follow-on deal even under our narrow definition, since Facebook had previously acquired Beluga Inc. in the same Level 1/Level 2 categories. Google, by contrast, made no other acquisitions in the same Level 1/Level 2 category as Admeld between 2010 and 2023, so Admeld does not belong to any series in our dataset. This illustrates that the time horizon used to define a series also matters for identifying serial acquisitions.

In short, our narrow definition of serial acquisitions based on the S&P taxonomy is more conservative than the FTC's interpretation in the *Meta* case but offers broader coverage within our sample period, as we track all M&A deals by the same acquirer in the S&P data.

4. Stylized Facts About Serial Acquisitions

In this section, we leverage the S&P dataset to document four facts about serial acquisitions in the technology sector.

4.1. How prevalent are serial acquisitions?

Table 1 reports the composition of singleton, initial, and follow-on deals in our full sample of 2010-2023.[12] The first panel follows our narrow definition, which limits deals in a series to the same level-1 and level-2 categories; the second panel uses the wide definition, requiring deals in a series to belong only to the same level-1 category.

[12] Figure A.2 in the appendix depicts the time trends of singleton, initial, and follow-on deals for our narrow and wide definitions.

Of the total 57,804 M&A deals in the S&P data, 24.37-37.16% are follow-on deals (and thus serial acquisitions), depending on which of the narrow or wide definitions we employ. The percentage of initial deals is slightly higher under the wide definition (15.04% vs. 12.39%) because some series may only involve follow-on deals that belong to the same level-1 but a different level-2 from the initial deal. We report the average number (length) of follow-on deals per series as of the end of our sample period. To compute this average, we first count follow-on deals in each series and then average them across all series. This average is higher under the wide definition (2.47) than under the narrow definition (1.99), suggesting that, on average, the number of serial acquisitions in a series increases by 24.12% if we count follow-on acquisitions in adjacent level-2 categories.

TABLE 1. Summary of Deal Attributes

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	36,552	7,164	14,088
Percent of total deals	63.23%	12.39%	24.37%
Percent of deals with deal value within the column	21.40%	29.91%	28.59%
Avg. deal value ($MM) conditional on having deal value	356.85	324.48	602.38
	(1,820.25)	(1,438.61)	(2,634.80)
Median deal value ($MM) conditional on having deal value	30.00	40.00	60.00
# of series per acquirer			1.41
Avg. length per series (# of follow-on deals)			1.99
Avg. time span (days) from initial to first follow-on per series			705.24
Avg. time span (days) from first follow-on to last follow-on per series (if $\geq$ 2 follow-on deals)			1117.74
Wide Definition: Level-1			
# of M&A deals	27,631	8,691	21,482
Percent of total deals	47.80%	15.04%	37.16%
Percent of deals with deal value within the column	19.23%	28.55%	28.85%
Avg deal value ($MM) conditional on having deal value	291.46	266.21	597.56
(standard deviation)	(1,523.19)	(966.05)	(2,649.54)
Median deal value ($MM) conditional on having deal value	25.00	34.33	60.00
# of series per acquirer			1.34
Avg. length per series (# of follow-on deals)			2.47
Avg. time span (days) from initial to first follow-on per series			670.65
Avg. time span (days) from first follow-on to last follow-on per series (if $\geq$ 2 follow-on deals)			1219.89

Note: Standard deviations in parentheses. Deal values in millions of US dollars. Time span measured in days.

Conditional on the 24.21% of deals with reported deal size, follow-on deals are, on average, substantially larger than singleton and initial deals. This difference is even greater under our wide definition of serial acquisitions, suggesting that follow-on deals in adjacent Level-2 categories tend to be larger than those within the same Level-1 and

Level-2 categories. Notably, this differs from the pattern where PE acquirers usually begin with a larger target (a 'platform' deal) when they enter a business area and then add smaller targets to the series (Pitchbook 2023). This difference occurs partly because most acquirers in serial acquisitions are non-PE firms.[13] In Table 1, we also report the standard deviation and median deal values for each type of deal. The standard deviation is more than four times the average, and the median deal size is about 10-12% of the average; both suggest that the distribution of deal value is highly skewed across all deal types, regardless of the definition employed.

Figure A.1 reveals significant heterogeneity in deal number and size across technology sectors and deal types. The left panel shows that, beyond large sectors like application software or IT services & distribution, serial acquisitions are particularly common in business areas such as carrier infrastructure, mobility, security, semiconductors, and systems, relative to singleton deals. The right panel, which reports the total value of deals, reveals that high-value follow-on acquisitions occur in several tech sectors, whereas singleton deals exceed follow-on values only in a few areas, such as datacenters, infrastructure management, and storage. AI and app development & deployment stand out for having relatively modest singleton and initial deal values, yet follow-on acquisitions in these categories are among the most expensive, exceeding $1 billion, on average. This pattern suggests that sector-specific factors, such as barriers to entry, shape the strategic value of follow-on acquisitions and help explain their prevalence and scale in certain domains.

In the last five rows of Table 1, we focus on follow-on deals and examine series characteristics. We find that, regardless of the narrow or broad definition, firms typically have only one series, averaging about two follow-on acquisitions, a figure that rises to 2.5 under the broader definition.

Moreover, firms wait nearly two years, on average, before making their first follow-on acquisition, and among series with multiple follow-ons, the average time between the first and last deal in the same series exceeds 3 years. This suggests that serial acquisition strategies unfold over extended periods, and effective scrutiny of such consolidation patterns requires a long-run perspective.

4.2. Which firms are targeted in acquisition series?

Table 2 summarizes target attributes by deal type. Surprisingly, only 9.33-10.5% of all targets were VC-funded, and only 9.66-10.41% of targets were publicly traded as of the

[13] We did observe follow-on deals have a smaller deal size on average than initial deals in recent years, if we condition on PE acquirers.

deal time. Conditional on being VC-funded, follow-on targets have, on average, raised more capital than singleton and initial targets as of the deal time. However, conditional on being publicly traded, follow-on targets are, on average, of a smaller market value than singleton and initial deals as of the deal time. Regarding target age and number of employees, follow-on targets tend to be older and larger than singleton and initial deals.[14]

Table 2 also reports several variables summarizing the acquirer-target relationship. Overall, 50.43-57.13% of acquirers and targets belong to the same Level-1 for initial or follow-on deals, and these numbers are substantially higher than those for singleton deals (35.22-37.61%). Similarly, more acquirer-target pairs belong to the same level-1 and level-2 categorization for initial and follow-on deals (27.91-37.17%) than for singleton deals (19.56-22.81%).[15]

Since acquisitions within the same category may pose a higher risk of consolidation, in Figure A.4, we zoom into acquisitions that occur within the original core level-1/level-2 category of the acquirer and report the average probability of such deals across level-1 categories, separately for singleton, initial, and follow-on acquisitions. We find that such same-level-2 serial acquisitions are especially prevalent in Hosted Services, Semiconductors, Internet Content & Commerce, and Carrier Infrastructure. These sectors are often characterized by strong network effects, economies of scale, or technological compatibility, which may increase incumbents' returns from engaging in serial acquisitions. Overall, these patterns raise potential competition concerns that firms in certain sectors may use serial acquisitions to entrench or expand dominance within their core business areas.

4.3. Which firms engage in serial acquisitions?

Table 3 reports various acquirer attributes for singleton, initial, and follow-on deals. Since only follow-on deals are counted as serial acquisitions in our definition, we focus on them first. Classifying acquirers into three exclusive groups—PE, public non-PE (henceforth, public), and private non-PE (henceforth, private)—we find that public acquirers account for 53.83-55.25% of all follow-on deals, PE acquirers account for 23.96-24.98%, and the remaining 20.79-21.19% are private acquirers. This pattern contrasts with

[14] Figure A.3 in the appendix depicts how the target age (as of the deal time) changes over time. Independent of deal type and narrow/wide definition, the average target age increases over time, suggesting that acquirers have become more conservative and prefer more mature targets in more recent years.

[15] While the likelihood of having an acquirer as a minority investor in the target prior to the M&A deal is higher in follow-on deals (0.11-0.12%) than in initial and singleton deals (0.07-0.08%), these percentages are all lower than 1%, suggesting that the vast majority of targets are not acquired by their own PE or corporate investors.

TABLE 2. Summary of Target Attributes

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	36,552	7,164	14,088
Percent if target is VC funded	9.87%	10.50%	9.38%
If VC funded, $ raised ($MM)	62.67	59.67	81.80
	(682.23)	(485.41)	(666.71)
Percent if target is publicly traded	9.66%	10.33%	10.36%
If publicly traded, market value ($MM)	41,154.00	35,514.73	35,329.24
	(128,801.11)	(67,031.97)	(64,213.63)
Target age (years)	15.22	16.14	17.17
Target size (# of employees)	672.97	604.78	1,991.70
Percent if acquirer/target in same level-1 category	37.61%	54.56%	57.13%
Percent if acquirer/target in same level-1 & level-2	19.56%	33.85%	37.17%
Percent if acquirer/target in same country	67.65%	62.49%	55.82%
Percent if acquirer/target in same state	33.30%	27.14%	22.20%
Percent if acquirer/target in same city	9.37%	5.76%	4.42%
Percent if acquirer invested in target before	0.91%	0.67%	1.53%
Wide Definition: Level-1			
# of M&A deals	27,631	8,691	21,482
Percent if target is VC funded	9.33%	10.37%	10.25%
If VC funded, $ raised ($MM)	68.06	53.46	70.58
	(773.85)	(441.21)	(573.60)
Percent if target is publicly traded	9.72%	10.41%	9.97%
If publicly traded, market value ($MM)	40,721.95	38,707.24	36,747.36
	(139,828.77)	(79,272.96)	(66,788.19)
Target age (years)	14.97	15.91	16.84
Target size (# of employees)	634.58	637.32	1,573.30
Percent if acquirer/target in same level-1 category	35.22%	50.43%	53.94%
Percent if acquirer/target in same level-1 & level-2	22.81%	28.89%	27.91%
Percent if acquirer/target in same country	68.59%	64.93%	58.07%
Percent if acquirer/target in same state	35.49%	29.32%	22.76%
Percent if acquirer/target in same city	10.28%	6.63%	4.87%
Percent if acquirer invested in target before	0.86%	0.67%	1.40%

Note: Standard deviations in parentheses. Market value and $ raised in millions of US dollars.

the disproportionate public attention on PE acquirers regarding serial acquisitions.[16]

Understandably, publicly-traded non-PE acquirers and PE acquirers can more readily engage in serial acquisitions because they may be able to access greater financial

[16]Since our main analysis treats subsidiaries as independent companies, and PE firms may be more likely to acquire through them, we verify that our qualitative results hold when attributing deals completed by subsidiaries to their parent PE firm (see Appendix B).

TABLE 3. Summary of Acquirer Attributes

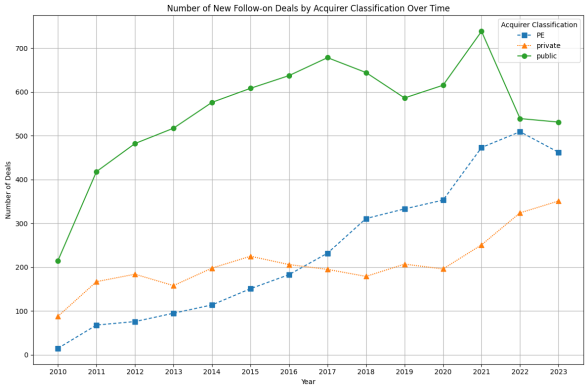
	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	36,552	7,164	14,088
Percent if acquirer is private non-PE	42.88%	25.57%	20.79%
Percent if acquirer is public non-PE	34.64%	49.09%	55.25%
Percent if acquirer is PE	22.49%	25.34%	23.96%
Percent if acquirer's level-1 category is Application software	17.88%	20.48%	21.02%
Percent if acquirer's level-1 category is IT services & distribution	12.16%	11.93%	12.13%
Percent if acquirer's level-1 category is Internet content & commerce	11.47%	12.69%	13.05%
Percent if acquirer's level-1 category is Technology portfolio investors	11.99%	8.86%	8.94%
Percent if acquirer's level-1 category is not the above four	46.50%	46.04%	44.86%
Acquirer age by time of merger (years)	23.65	26.30	30.46
Acquirer market value if public ($MM)	44,824.40	43,241.18	87,424.70
	(165,831.53)	(120,020.52)	(231,426.79)
Acquirer total $ raised if private and VC funded ($MM)	146.30	182.58	264.66
	(569.57)	(1,015.37)	(623.16)
Wide Definition: Level-1			
# of M&A deals	27,631	8,691	21,482
Percent if acquirer is private non-PE	48.39%	28.86%	21.19%
Percent if acquirer is public non-PE	30.60%	45.38%	53.83%
Percent if acquirer is PE	21.01%	25.76%	24.98%
Percent if acquirer's level-1 category is Application software	17.83%	19.43%	20.25%
Percent if acquirer's level-1 category is IT services & distribution	12.23%	11.92%	12.07%
Percent if acquirer's level-1 category is Internet content & commerce	10.87%	12.33%	13.34%
Percent if acquirer's level-1 category is Technology portfolio investors	11.56%	9.40%	10.55%
Percent if acquirer's level-1 category is not the above four	47.51%	46.91%	43.79%
Acquirer age by time of merger (years)	21.82	25.54	30.58
Acquirer market value if public ($MM)	28,550.39	31,025.81	85,168.74
	(124,481.19)	(86,037.09)	(229,414.93)
Acquirer total $ raised if private and VC funded ($MM)	126.13	162.28	273.97
	(499.38)	(883.45)	(749.34)

Note: Standard deviations in parentheses where applicable. Market values and $ raised in millions of US dollars.

resources than private non-PE firms. In fact, conditional on being public, the market value of acquirers in follow-on deals at the deal time almost doubles that of acquirers in singleton or initial deals. More surprisingly, many private non-PE firms engaging in serial acquisitions are venture capital (VC) funded startups themselves. Conditional on being private and VC funded, acquirers of follow-on deals tend to raise significantly more capital than acquirers of singleton or initial deals.

For acquirers that conduct initial and follow-on acquisitions (henceforth, serial acquirers), the three most common level-1 categories are Application Software, Internet Content & Commerce, and IT Services & Distribution. While Application Software and IT Services & Distribution are also the top two level-1 categories for acquirers of singleton

A. Narrow Definition: Level-1/Level-2



B. Wide Definition: Level-1

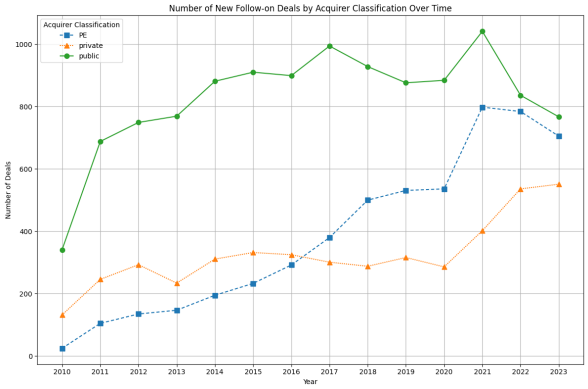


FIGURE 2. Trends in follow-on deals by acquirer type

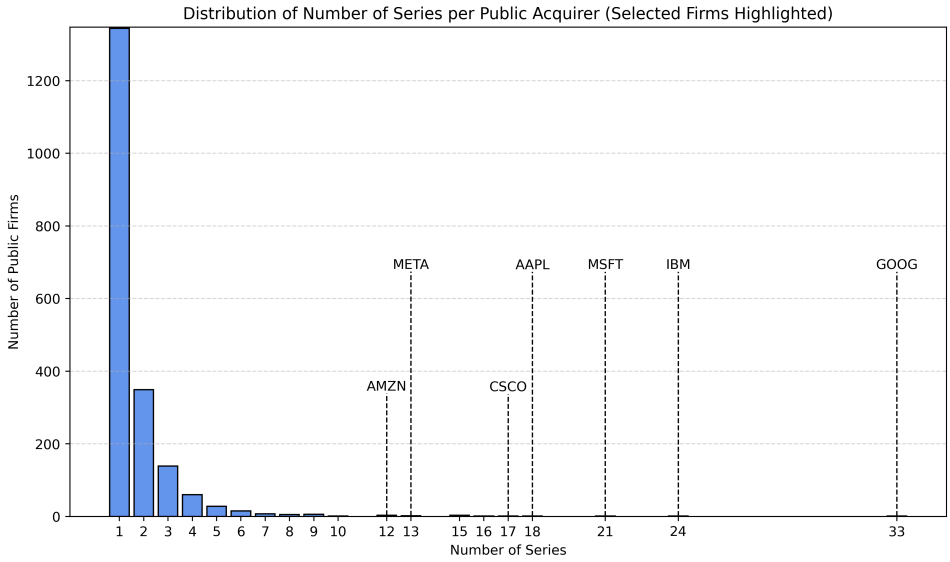


FIGURE 3. Distribution of number of series per public acquirer

Note: Selected leading public serial acquirers in the figure are labeled by their ticker symbols.

deals, serial acquirers are more common in the level-1 category of Internet Content & Commerce themselves and less common in the level-1 category of Technology Portfolio Investors.

Figure 2 shows the time trend of follow-on acquisitions by acquirer type. Regardless of whether we use a narrow or wide definition for follow-on acquisitions, the steady growth in the number of follow-on acquisitions by public (non-PE) acquirers appears to have stopped after 2017; meanwhile, follow-on acquisitions by PE acquirers continue to grow or even accelerate after 2017, and those by private acquirers begin to show

impressive growth since 2020. Possibly, stricter reporting requirements and the rising costs of public listings, together with abundant private capital, thicker secondary markets, and low interest rates through 2022, have made it increasingly attractive for firms to remain private while pursuing acquisition-driven growth.

To identify the leading serial acquirers in our sample, Figure 3 plots the distribution of series counts among all public firms. GAFAM firms rank among the most active serial acquirers, but they are not alone. Other tech giants such as IBM and Cisco, with 24 and 17 series respectively, also stand out.[17] Within GAFAM, Google emerges as the most active, followed by Microsoft (21), while Apple (18), Amazon (13), and Meta (12) follow closely. Motivated by this evidence, Section 6 takes a closer look at the serial acquisition behavior of GAFAM and other top technology acquirers.

4.4. Firm characteristics and outcomes associated with serial acquisitions among public firms

Because public non-PE acquirers account for more than 50% of serial acquisitions, we first analyze which types of public non-PE firms are more likely to engage in serial acquisitions and then examine how engaging in serial acquisitions relates to the acquirer's firm performance, market competitiveness, and innovation output.

To carry out the analysis, we merge the S&P data with Compustat data and focus on public non-PE firms that are based in the US and have acquired at least a tech company in 2010-2023—and hence appear as acquirers in the S&P data.[18] We further merge our sample with the Hoberg-Phillips TNIC3 HHI data from Hoberg and Phillips (2016), which aims to capture the intensity of competition among all public firms. Specifically, this database uses 10-K annual filings to identify a set of competitors for each public firm.[19] Then, based on each firm's share of sales within the set, an HHI is computed. Because Mayo (2025) points out the inconsistency of TNIC3 market definition in an example, we use TNIC3 HHI as an imperfect proxy for the market environment facing the focal public firm.

[17] Three additional firms—Oracle, Accenture, and Volaris Group—each recorded 15 series, while J2 Global completed 16.

[18] Most of the public firms in the sample remain public from 2010 to 2023 so we can observe their market value throughout. A few public firms were delisted and became private sometime between 2010 and 2023. We keep their yearly records until their delisting. Similarly, for companies that went public after 2010 (e.g., Facebook/Meta), we collect their information from that year on.

[19] Any pair of firms belongs to the same TNIC3 if their cosine similarity based on 10-K annual filings is above a certain threshold. This threshold is chosen so that if one picks two firms at random from the Compustat universe, the likelihood of them belonging to the same three-digit SIC code is the same as the one of belonging to the same TNIC3 (2.05%).

We define two samples. The full sample consists of 10,412 unique U.S. companies that were publicly listed at any point between 2010 and 2023. The tech-acquirer sample is a subset resulting from merging the S&P dataset with Compustat and includes 2,099 companies. We use these two cross-sectional samples and the narrow definition of serial acquisitions to examine the firm-level attributes associated with engagement in serial acquisitions.

Specifically, we regress either (i) an indicator for whether a firm completed any serial acquisitions between 2010 and 2023 or (ii) the total number of serial acquisitions in the same period, on a set of baseline firm characteristics: the logarithm of market value, the logarithm of R&D expenditure, and the logarithm of number of employees, as well as the firm's age since going public.[20] All covariates are measured at the firm's first post-2010 appearance in our data—typically as of 2010, or the firm's first appearance year if it went public later. Because some covariates have missing values, we impute missing observations with zeros and include indicator variables for missingness. We augment the model with 3-digit NAICS code fixed effects and cluster standard errors at the firm level. We estimate a logit model to analyze the likelihood of engaging in any serial acquisitions and a Poisson model to assess the number of serial acquisitions completed. The results are summarized in Table 4.

We find that among firms engaging in at least one tech M&A deal, those with higher market value, fewer employees, a longer public history, and operating in less concentrated markets are more likely to engage in serial acquisitions. Specifically, a 1% increase in market value is associated with an increase in the odds of making any serial acquisition by approximately 0.12%, whereas a 1% increase in the number of employees is associated with a decrease in the odds of making any serial acquisition by approximately 0.17%. Interestingly, a 1% larger R&D expenditure does not affect the propensity to initiate any serial deal, but it increases the total number of follow-on deals by 24.11%. Results are similar when considering the number of deals, except that TNIC HHI is no longer statistically significant at the 5% level. The Tech-acquirer sample is our preferred one because the full sample includes firms that have never engaged in tech deals in 2010-2023, which makes the existence of systematic differences across types of firms more likely to explain our results. Nonetheless, we present our results using this sample in columns (1) and (3) of Table 4, and the main qualitative patterns discussed above remain robust.

We further explore the determinants of serial acquisitions by considering whether

[20] Throughout the analysis, we add one to variables before log transformation to account for zero values and retain observations in the estimation sample.

TABLE 4. Determinants of Serial Acquisitions

Dep. var.	Any serial deal		Total serial deals	
Sample	Full	Tech-acquirer	Full	Tech-acquirer
	(1)	(2)	(3)	(4)
log(Market Value)	0.298***	0.125***	0.288***	0.179***
	(0.0350)	(0.0407)	(0.0558)	(0.0621)
log(R&D Expenditure)	0.0513	0.0355	0.170***	0.216***
	(0.0358)	(0.0399)	(0.0492)	(0.0566)
log(Employment Size)	-0.0722	-0.171***	0.00705	-0.0289
	(0.0536)	(0.0578)	(0.0718)	(0.0768)
TNIC HHI	-0.354*	-0.701***	-0.240	-0.364
	(0.212)	(0.230)	(0.239)	(0.238)
Public Age	-0.00714*	0.0171***	0.000053	0.0160***
	(0.00385)	(0.00498)	(0.00520)	(0.00543)
Observations	10,412	2,099	10,412	2,099
NAICS 3-digit FE	Yes	Yes	Yes	Yes
Clustered SE	Firm	Firm	Firm	Firm
Model	LOGIT	LOGIT	POISSON	POISSON

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Dummies control missing values in dependent variables

firms are influenced by the serial acquisition behavior of others operating in the same technological space. Figure A.5 illustrates the distribution of follow-on deals by public firms across level-1 categories over time. Each hexagon's size corresponds to the number of follow-on deals in that sector-year, revealing that serial acquisitions are both persistent and broadly distributed across tech sectors, with consistent activity in areas such as Application Software, IT Services & Distribution, and Internet Content & Commerce. The widespread and sustained presence of follow-on activity suggests that public firms systematically rely on serial acquisitions to build or consolidate capabilities in key domains. This pattern is consistent with a form of strategic clustering, whereby firms respond to peer behavior and perceived competitive pressures within specific markets.

To examine the relationship between serial acquisition and firm outcomes over time, we reorganize the tech-acquirer sample into a panel format and merge it with additional annual outcome variables. This results in a firm-year panel of U.S.-based public non-PE firms that engaged in at least one tech acquisition between 2010 and 2023. This panel structure allows us to examine the dynamic relationship between serial acquisition behavior and firm performance, market competitiveness, and innovation output. To

capture performance, we use market value.[21] For market competitiveness, we include both TNIC3 HHI and product market fluidity, where the latter reflects the extent to which firms modify their product offerings over time. High fluidity indicates more dynamic industries where incumbents face greater competitive threats (Hoberg, Phillips and Prabhala 2014). To assess innovation output, we consider three measures: the number of patent applications filed, the citations received by those patents, and the private real value of patents filed in a given year, as proposed by Kogan et al. (2017).[22]

We exploit cross-firm variations by comparing the public firms that engaged in any serial acquisitions in our sample with public firms that have no serial acquisitions but have completed non-serial acquisitions as tracked by S&P between 2010 and 2023. Because different serial acquirers may start serial acquisitions at different times (measured by the date of the firm's first follow-on deal), we can carry out a difference-in-differences (DiD) analysis:

$$Y_{i,t} = \beta_1 Serial\ Start_{i,t-1} + u_i + v_{m,t} + \varepsilon_{i,t}, \tag{1}$$

where $Y_{i,t}$ is one of the dependent variables considered; $Serial\ Start_{i,t}$ is a dummy that is equal to one on and after the year when firm i starts any serial acquisitions. Since firms may make acquisition decisions based on their concurrent market value, rather than the other way around, we include the one-year lag $Serial\ Deal_{i,t-1}$ in the specification; u_i and $v_{m,t}$ represent firm and market by year fixed effects; ε_{it} is the residual. We define a firm's market as the S&P level-1 sector for acquirers classified as tech firms in S&P, and as the NAICS 3-digit industry for non-tech acquirers.[23] We cluster standard errors at the firm level.

We estimate Equation (1) via OLS using both two-way fixed effects (TWFE) and the doubly robust estimator developed by Callaway and Sant'Anna (2021) (henceforth CS), which accounts for the staggered timing of *Serial Start*. Because unobserved factors—such as technology-specific demand shocks—may influence both the likelihood of initiating a series of acquisitions and firm outcomes (e.g., innovation or valuation), we emphasize

[21] A large literature in economics, finance and management has used measures based on market value to approximate firm performance (e.g., Morck, Shleifer and Vishny (1988); Lang and Stulz (1994); Laamanen and Keil (2008)).

[22] All the information on patents comes from the updated data used in Kogan et al. (2017), which is publicly available at: https://github.com/KPSS2017/Technological-Innovation-Resource-Allocation-and-Growth-Extended-Data. Though not all innovations are patented, patent statistics are by definition related to inventiveness (Griliches 1998), so that they have become a standard source of data to capture both the amount and quality of firm innovation (Moser, Ohmstedt and Rhode 2018).

[23] S&P groups all non-tech firms into a residual category labeled "Non-tech sector."

TABLE 5. Serial Acquisitions and Firm Outcomes

Dep. var.	(1) log ($MktValue$)	(2) log ($PatentCounts$)	(3) log ($PatentCites$)	(4) log ($PatentValue$)	(5) Product fluidity	(6) TNIC HHI
Panel A: TWFE						
$Serial\ Start_{it-1}$	0.0508	0.0952**	0.0554	0.172***	-0.0449	-0.00600
	(0.0365)	(0.0381)	(0.0579)	(0.0648)	(0.0801)	(0.00710)
Observations	14,207	14,324	14,324	14,324	12,780	12,827
R-squared	0.962	0.947	0.895	0.922	0.747	0.743
Panel B: CS						
$Serial\ Start_{it-1}$	0.103**	0.0824	0.0504	0.174**	-0.0334	-0.00615
	(0.0437)	(0.0518)	(0.0803)	(0.0875)	(0.0941)	(0.00965)
Observations	14,207	14,324	14,324	14,324	12,780	12,827
Firm fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Market*Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Clustered SE	Firm	Firm	Firm	Firm	Firm	Firm

Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

that our findings are descriptive and should not be interpreted causally.

Table 5 presents the estimated coefficients of *Serial Start* for various firm outcomes, using both TWFE (Panel A) and the doubly robust estimator developed by CS (Panel B).[24] Across both specifications, we find that serial acquisitions are associated with economically meaningful increases in firm performance and innovation outcomes. In particular, the CS estimates indicate that the initiation of serial acquisitions is associated with a statistically significant increase in market value (10.8%) and patent value (19%). While the coefficient on patent counts is positive, it is only statistically significant under the TWFE specification. We find no robust effects on product market fluidity or TNIC HHI, suggesting that serial acquisitions may not measurably relate to firms' perceived market positioning or competitive threat. These findings are consistent with serial acquisitions enhancing firm performance primarily through innovation-related synergies rather than by reshaping product market competition.

[24] Figure A.8 presents event study estimates based on the CS approach, illustrating dynamic patterns around the initiation of serial acquisition series.

5. Serial Acquisitions and Stealth Consolidation

To evaluate which M&A deals are more likely to raise competition concerns while allocating enforcement resources efficiently, antitrust authorities require pre-merger notification for transactions exceeding a specified value threshold. In the U.S., this process is governed by the HSR Act, which mandates notification to the FTC and DOJ when the value of a proposed acquisition exceeds the relevant threshold.[25] In serial acquisitions, many deals within a series may individually fall below this threshold, thereby escaping scrutiny. Since small non-reportable acquisitions can nonetheless increase market concentration and reduce product quality (Wollmann 2024), such exemptions may heighten competitive risks by limiting oversight of cumulative dealmaking.

This section documents the distribution of deal values—missing, below, or above the HSR threshold—and examines whether follow-on acquisitions differ systematically across these categories. The HSR size-of-transaction test sets a lower and upper bound ($50 and $200 million) that determine exemption or reporting requirements, as adjusted annually for inflation.[26] Because we lack consistent data on firms' assets and sales—particularly for technology firms with mostly intangible assets—we use the annually adjusted lower bound as our benchmark to identify whether each deal falls below or above the threshold in its transaction year and confirm robustness using the upper bound in the appendix. Although the HSR test applies only to transactions with sufficient U.S. nexus,[27] we treat all transactions as if they were subject to HSR reporting for consistency.

Of the 57,804 M&A deals in our sample, only 13,992 (24.21%) report deal values. Based on these 13,992 deals, Table 6 summarizes the characteristics of the merging parties by deal type and HSR coverage. In particular, 8,654 (62%) of the 13,992 valued deals fall below the HSR threshold. Follow-ons represent 33.68% of above-threshold deals but only 25.77% of below-threshold ones, indicating that most below-threshold transactions are not part of a series. Indeed, serial acquisitions are more likely to exceed the HSR threshold than non-serial ones.[28]

Figure 4 shows that average transaction value increases monotonically with serial-

[25] If a merger is exempt from HSR filing, the agencies can still challenge it if they become aware of the transaction. See: https://www.justice.gov/sites/default/files/atr/legacy/2015/04/02/311222.pdf.

[26] For example, the lower bound was increased to $126.4 million for transactions closing on or after February 21, 2025. Source: https://www.ftc.gov/enforcement/competition-matters/2025/02/new-hsr-thresholds-filing-fees-2025.

[27] See 16 C.F.R. § 802.50 and § 802.51, available at https://www.law.cornell.edu/cfr/text/16/802.50 and https://www.law.cornell.edu/cfr/text/16/802.51.

[28] Figure A.9 in the appendix documents trends in the share of below-threshold deals by deal type and acquirer category.

TABLE 6. Summary of Parties Involved in Deals Above and Below the HSR Threshold

Metric	Below HSR Threshold			Above HSR Threshold		
	Singleton	Initial	Follow-On	Singleton	Initial	Follow-On
Acquirer Attributes						
# of M&A deals	5,115	1,309	2,230	2,706	834	1,798
Percent if acquirer is private non-PE	12.86%	5.73%	6.77%	7.35%	3.48%	3.45%
Percent if acquirer is public non-PE	78.63%	87.24%	88.16%	65.34%	77.58%	79.03%
Percent if acquirer is PE	8.50%	7.03%	5.07%	27.31%	18.94%	17.52%
Percent if acquirer is VC funded	5.22%	4.66%	5.25%	2.88%	2.16%	2.50%
Percent if acquirer's level-1 is Application software	16.38%	22.46%	24.62%	8.98%	9.47%	13.96%
Percent if acquirer's level-1 is IT services & distribution	7.39%	8.10%	9.91%	3.73%	7.07%	5.90%
Percent if acquirer's level-1 is Internet content & commerce	11.50%	10.85%	10.54%	8.50%	10.55%	11.57%
Percent if acquirer's level-1 is Technology portfolio investors	7.12%	2.90%	1.97%	23.69%	15.11%	13.24%
Percent if acquirer's level-1 is not the above four	57.61%	55.69%	52.96%	55.10%	57.79%	55.34%
Acquirer age by merger (years)	23.41	25.53	27.52	35.16	34.56	36.06
Acquirer market value if public ($MM)	7,807.52	11,616.44	18,072.24	36,364.96	34,267.89	57,763.39
	(40,972.38)	(56,616.92)	(96,600.04)	(107,759.34)	(73,905.79)	(166,178.59)
Acquirer total $ raised if private and VC funded ($MM)	274.38	126.93	222.09	793.37	2,638.87	881.93
	(597.24)	(178.40)	(313.61)	(1,221.36)	(6,959.67)	(1,312.57)
Target Attributes						
Percent if target is VC funded	19.32%	22.31%	20.45%	22.95%	26.86%	25.75%
If VC funded, $ raised ($MM)	22.38	20.70	21.63	55.25	156.68	68.60
	(44.15)	(28.03)	(30.42)	(60.64)	(1,183.58)	(97.99)
Percent if target is publicly traded	18.01%	13.45%	14.30%	38.99%	35.73%	36.48%
If publicly traded, market value ($MM)	11,856.81	18,869.52	25,773.09	26,558.33	26,254.64	28,428.06
	(52,447.76)	(43,670.53)	(59,352.85)	(60,183.72)	(57,224.15)	(55,643.09)
Target age (years)	14.97	15.05	15.92	23.24	20.69	22.13
Target size (# of employees)	341.84	128.28	134.14	2058.36	2123.95	2525.89
Percent acquirer/target in same level-1 category	33.86%	54.85%	63.68%	29.19%	47.84%	55.67%
Percent acquirer/target in same level-1 & level-2	16.19%	33.84%	41.48%	11.20%	23.38%	32.48%
Percent acquirer/target in same country	62.39%	59.21%	53.99%	62.42%	64.15%	59.68%
Percent acquirer/target in same state	35.27%	27.12%	23.50%	27.68%	25.30%	20.91%
Percent acquirer/target in same city	9.13%	4.58%	4.04%	6.95%	5.16%	4.12%
Percent acquirer invested in target before	0.61%	0.31%	0.49%	0.52%	0.24%	0.61%

Note: Standard deviations in parentheses. Market values and $ raised in millions of US dollars. We use the lower bound of the HSR size-of-transaction test, which corresponds to $50 million (as adjusted).

ness—from singletons to successive follow-ons—driven largely by public acquirers. PE firms have the highest average transaction values across all deal types, followed by public and private corporate acquirers. Contrary to the common view that PE firms engage in large initial "platform" acquisitions followed by smaller "add-ons" (Hammer et al. 2017), we find that PE follow-ons are on average more valuable than initial deals.

To assess whether missing values bias these patterns, Figure A.10 plots the share of deals without reported transaction values by serialness and acquirer type. Missingness does not vary systematically, suggesting that differences in below-threshold incidence are not driven by reporting gaps.

Table 6 further shows that follow-on deals involve older, larger acquirers, while above-threshold targets have raised more venture capital, are more often public, and less likely to share the acquirer's industry. Notably, over 41% of below-threshold serial

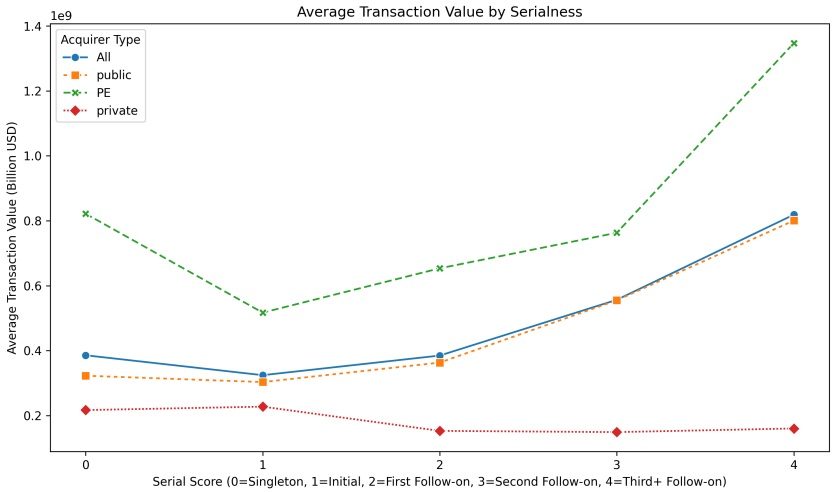


FIGURE 4. Average transaction value by serialness

deals involve targets in the same level-1/2 category as their acquirer, compared with 16.19% for below-threshold singletons and 32.48% for above-threshold serials.

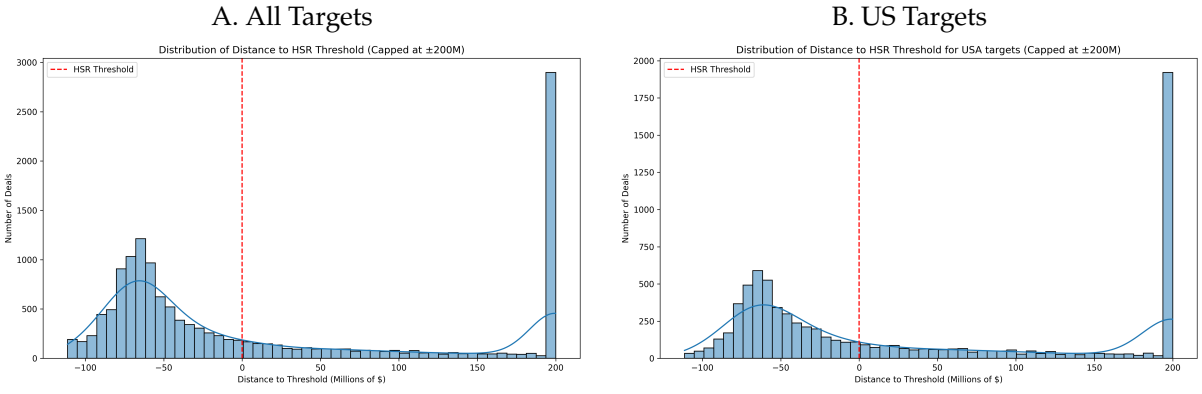


FIGURE 5. Distribution of distance to the HSR threshold

Note: The lower bound of the size-of-transaction test corresponds to $50 million (as adjusted).

Finally, we test whether acquirers strategically report or structure deals to avoid HSR notification.[29] Following Wollmann (2019) and Mayo and Press (2025), we examine whether deal values cluster just below the applicable threshold. Figure 5A shows no

[29]The FTC has noted that firms have historically used tactics such as contingent payments to evade filing thresholds, clarifying in 2020 that such behavior may constitute reportable consideration under Rule 801.90. See: https://www.ftc.gov/enforcement/competition-matters/2020/09/seeing-whole-picture-avoidance-devices.

bunching near the threshold, indicating no systematic manipulation of transaction values. Results are unchanged when restricting to U.S.-headquartered targets (Figure 5B).[30]

In sum, deal values are frequently missing or fall below the HSR threshold, but follow-on acquisitions tend to be larger and thus less likely to escape review. We find no evidence that acquirers strategically underreport or structure transactions to remain below reporting thresholds. Instead, the evidence points to serial acquirers—typically older and larger firms—pursuing targets within similar categories, highlighting potential competitive risks from cumulative acquisitions even absent deliberate reporting avoidance.

6. Serial Acquisitions by GAFAM

Motivated by Figure 3 and the public and policy attention surrounding GAFAM's serial acquisitions, we next examine whether these firms exhibit distinct acquisition patterns compared to other firms in our sample.

Consistent with the analyses in previous sections, we only count deals made directly by GAFAM firms, excluding those by their acquired subsidiaries. For instance, Microsoft's 2016 acquisition of LinkedIn is counted as one of Microsoft's deals, but LinkedIn's acquisitions before or after 2016 are not. In contrast, acquisitions by non-acquired subsidiaries (e.g., Google under Alphabet or Facebook under Meta) are included. Appendix B confirms that our results are robust when counting all acquisitions by GAFAM subsidiaries after their acquisition.

Comparing Tables 1 and 7 shows that GAFAM firms are far more likely to engage in serial acquisitions than other firms. Although GAFAM account for only 582 (1%) of the 57,804 M&A deals in the S&P data, 56.19% of their deals are follow-ons under the narrow definition and 84.36% under the wide definition, compared to 24.37% and 37.16% in the full sample. The average number of follow-ons per initial deal is also higher for GAFAM (7.55 under the wide definition) than for the full sample (2.47). In both samples, follow-on deals tend to have larger transaction values than initial or singleton deals when deal value data are available.

GAFAM firms also form longer acquisition series than other public companies. However, the average time between the initial and first follow-on, and between the first and last follow-on, is similar to that of other public acquirers. The range of categories targeted by GAFAM firms is notably broad, consistent with prior evidence that they pursue technological diversification through an "acquire-adjacent-and-expand" strategy (Jin,

[30] Figure A.11 in the appendix shows the full log distribution of deal values.

Leccese and Wagman 2023).

The most striking difference lies in the number of acquisition series undertaken. While most public firms engage in one or two series, GAFAM firms undertake substantially more. Although this may raise consolidation concerns, it is important to note that our sample includes all tech-related deals, not only those by tech acquirers. Consequently, average series counts may be diluted by non-tech firms completing only a few acquisitions within specific categories. These conclusions remain robust when comparing GAFAM to the top 5% of public acquirers by average market value.

TABLE 7. Summary of Deal Attributes: GAFAM

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	145	110	327
Percent of total deals	24.91%	18.90%	56.19%
Percent of deals with deal value within the column	15.17%	20.00%	11.93%
Avg. deal value ($MM) conditional on having deal value	2,351.28	1,254.63	3,597.23
	(5,859.1577)	(3,995.1589)	(12,171.2421)
Median deal value ($MM) conditional on having deal value	207.50	209.50	380.24
# of series per acquirer			16.83
Avg. length per series (# of follow-on deals)			3.05
Avg. time span (days) from initial to first follow-on per series			779.52
Avg. time span (days) from first follow-on to last follow-on per series (if $\geq$ 2 follow-on deals)			1692.91
Wide Definition: Level-1			
# of M&A deals	26	65	491
Percent of total deals	4.47%	11.17%	84.36%
Percent of deals with deal value within the column	11.54%	15.38%	14.26%
Avg. deal value ($MM) conditional on having deal value	536.86	1,155.95	2,949.31
	(525.83)	(2,648.51)	(9,824.19)
Median deal value ($MM) conditional on having deal value	550.00	119.00	262.50
# of series per acquirer			10.83
Avg. length per series (# of follow-on deals)			7.55
Avg. time span (days) from initial to first follow-on per series			707.69
Avg. time span (days) from first follow-on to last follow-on per series (if $\geq$ 2 follow-on deals)			2276.88

Note: Standard deviations in parentheses. Deal values in millions of US dollars. Time spans are measured in days.

Figure A.6 in the appendix illustrates how the composition of singleton, initial, and follow-on deals evolves over time for GAFAM. In contrast to the full sample (Figure 2), all three deal types have declined for GAFAM since 2019, under both narrow and wide definitions of serial acquisitions—likely reflecting intensified global antitrust scrutiny.

Table 8 reports the average attributes of GAFAM targets.[31] Compared to the full sam-

[31]Table A.3 in the appendix summarizes key GAFAM acquirer characteristics. Because S&P classifies

TABLE 8. Summary of Target Attributes: GAFAM

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	145	110	327
Percent if target is VC funded	34.48%	27.27%	30.28%
If VC funded, $ raised ($MM)	38.61	25.06	25.33
	(141.68)	(31.80)	(48.77)
Percent if target is publicly traded	6.90%	5.45%	5.81%
If publicly traded, market value ($MM)	138,026.41	142,642.05	79,394.84
	(124,308.91)	(123,524.54)	(101,144.17)
Target age (years)	10.26	9.07	7.84
Target size (# of employees)	2,036.95	63.05	709.98
Percent if acquirer/target in same level-1 category	15.86%	11.82%	15.29%
Percent if acquirer/target in same level-1 & level-2	1.38%	3.64%	3.67%
Percent if acquirer/target in same country	68.97%	69.09%	69.42%
Percent if acquirer/target in same state	23.45%	34.55%	38.53%
Wide Definition: Level-1			
# of M&A deals	26	65	491
Percent if target is VC funded	26.92%	24.62%	31.77%
If VC funded, $ raised ($MM)	22.47	23.25	29.88
	(19.11)	(31.92)	(89.23)
Percent if target is publicly traded	11.54%	7.69%	5.50%
If publicly traded, market value ($MM)	157,558.25	106,947.16	97,663.53
	(136,141.47)	(151,234.49)	(107,925.71)
Target age (years)	12.27	10.29	8.28
Target size (# of employees)	208.33	85.75	1,040.48
Percent if acquirer/target in same level-1 category	0.00%	9.23%	16.29%
Percent if acquirer/target in same level-1 & level-2	0.00%	3.08%	3.26%
Percent if acquirer/target in same country	65.38%	75.38%	68.64%
Percent if acquirer/target in same state	15.38%	36.92%	34.62%

Note: Standard deviations in parentheses. Market values and $ raised in millions of US dollars.

ple (Table 2), GAFAM targets are substantially more likely to be VC funded (24.62–34.48% vs. 9.33–10.5%) and less likely to be publicly traded (5.45–7.69% vs. 9.97–10.41%). GAFAM targets are also much younger. Within GAFAM, initial and follow-on targets average 7.86–10.29 years of age versus 10.26–12.27 years for singletons, while the opposite holds in the full sample (15.91–17.17 vs. 14.97–15.22). Unlike the steady rise in target age observed overall, Figure A.7 shows that GAFAM target age remains flat or fluctuates

three of the five GAFAM firms as Internet Content & Commerce (and Microsoft and Apple as Systems and Mobility, respectively), a higher share of GAFAM deals occur within acquirers' level-1 categories than in the full sample. Since our sample begins in 2010, and only Facebook was private then, nearly all GAFAM deals involve public acquirers.

over time.[32] Interestingly, GAFAM follow-on targets are on average more than ten times larger in employment than initial targets, despite being younger. Early movers in technology markets may struggle to scale independently due to pioneering costs (Lieberman and Montgomery 1998), and missing employment data may also amplify this difference given the smaller sample of GAFAM deals.

Another notable distinction is that GAFAM firms are less likely to share the same level-1/2 categories as their targets but more likely to be headquartered in the same country or state—unsurprising given their concentration in Silicon Valley and the Seattle area. The lower category overlap suggests that GAFAM may use acquisitions to enter new markets rather than reinforce dominance in their core business lines, raising questions about whether such diversification is pro- or anti-competitive.

We next examine GAFAM's below-HSR acquisition behavior, an issue central to current policy debates. The EU Digital Markets Act, for example, requires designated gatekeepers (including GAFAM) to notify the European Commission of all acquisitions, regardless of deal value.

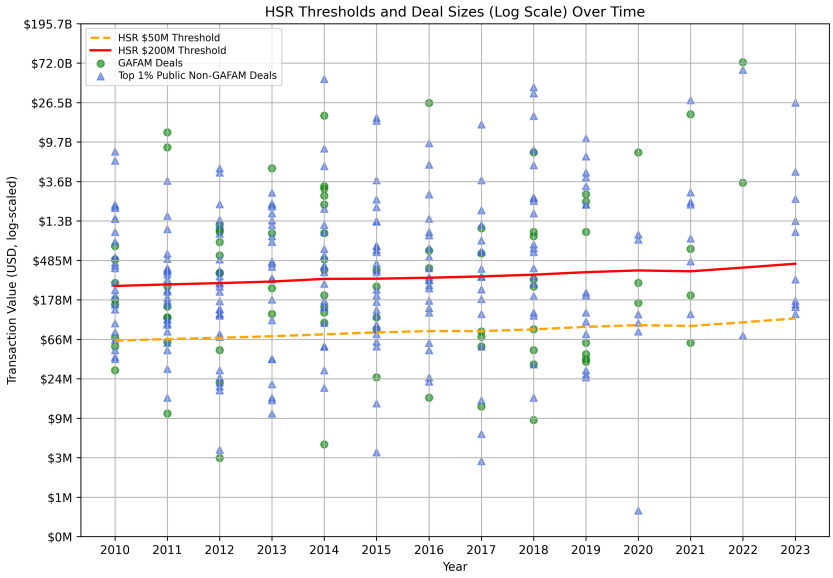


FIGURE 6. HSR thresholds and deal sizes (log-transformed) over time

We compare the reported value of GAFAM deals with those of the top 1% of public technology acquirers (excluding GAFAM, PE firms, and non-serial acquirers), classified using the S&P taxonomy.[33] Figure 6 plots (log-transformed) deal values for GAFAM

[32] The larger variation toward the end of the sample likely reflects fewer GAFAM deals in recent years.

[33] This group includes Oracle, Cisco, Intel, NVIDIA, SAP SE, IBM, Visa, AT&T, Broadcom, Comcast, Mastercard, Alibaba, PayPal, RTX Corporation, and Netflix.

and these top public acquirers against the HSR size-of-transaction thresholds. Post-2019, acquisition volumes declined sharply for both groups, likely due to heightened antitrust scrutiny. Among remaining deals, an increasing share exceeds the lower HSR threshold, suggesting fewer very small transactions. GAFAM deals (green circles) are more likely than others (blue triangles) to fall below the upper threshold, though differences narrow at the lower threshold.

While we have thus far treated GAFAM as a group, Figure 3 reveals substantial heterogeneity. Figure 7 applies the narrow definition and plots follow-on deals by level-1 sector, with circle size proportional to deal counts per sector-year. The visualization shows significant overlap in acquisition activity across GAFAM firms, implying convergence in technological focus. Most sectors feature follow-ons by multiple GAFAM firms, with few—such as Enterprise Networking, IT Outsourcing, IT Services & Distribution, Payments, and Storage—dominated by a single acquirer (Google, Microsoft, or Meta).

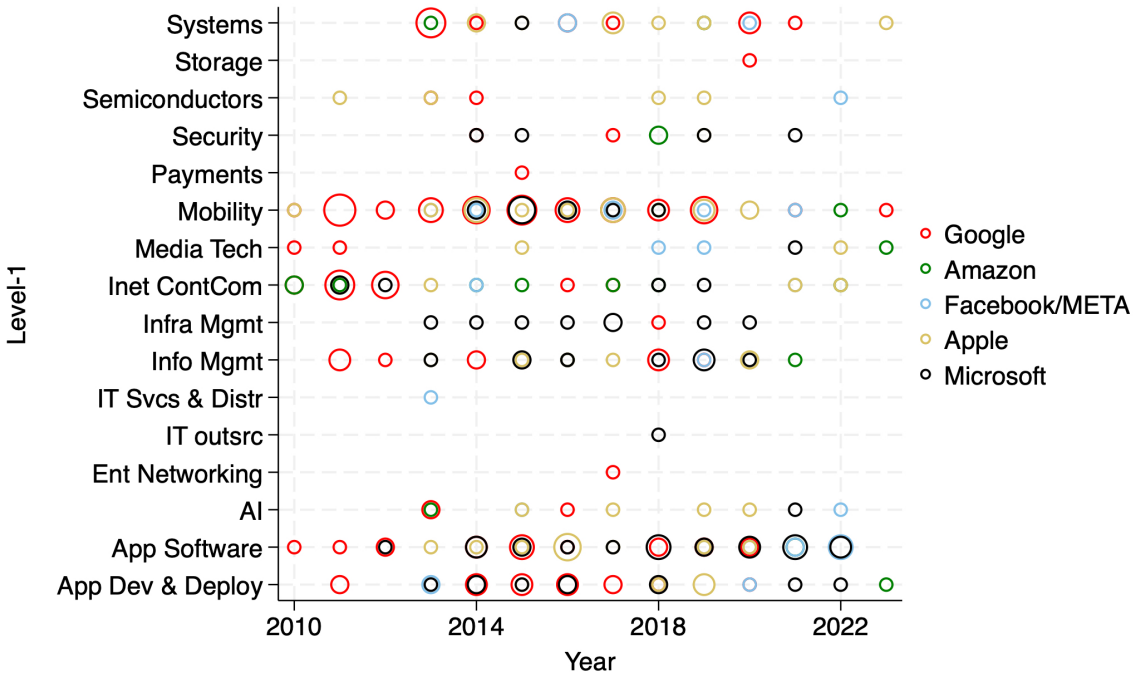


FIGURE 7. GAFAM serial acquisitions across level-1s

Note: The figure shows the distribution of follow-on deals by GAFAM firm and level-1 sector over time. Circle size reflects the number of follow-on deals in a given level-1-year. Follow-ons are defined narrowly, i.e., second or subsequent deals completed by a firm within a level-1/2 category previously entered.

Timing and intensity also differ. Google initiated serial acquisitions earlier and across more sectors, consistent with its historically aggressive strategy. Apple is active across

many categories, often as a first mover in Mobility and Semiconductors. Microsoft and Meta concentrate more in Infrastructure Management and Mobility, respectively. Amazon, with fewer overall series, focuses primarily on Internet Content & Commerce, where it was also an early mover.[34]

In summary, GAFAM firms stand out for their extensive use of serial acquisitions, broader diversification beyond core business areas, and preference for younger, smaller, VC-funded, and private targets, especially in initial and follow-on deals. These patterns align with policymakers' increased scrutiny of large technology platforms, as reflected in recent antitrust cases against Google/Alphabet and Facebook/Meta. Nonetheless, GAFAM's initial and follow-on deals represent only 2.6–3.1% of all such transactions in our S&P data, suggesting they are not representative of serial acquisitions in the broader tech sector. Other large technology and PE firms exhibit a comparable intensity of serial acquisition activity, and there is significant heterogeneity across GAFAM members in acquisition timing, sectoral focus, and intensity—underscoring that a one-size-fits-all policy approach may be inadequate.

7. A Cumulative Approach for Merger Review

In this section, we propose a cumulative framework for merger review that complements, rather than replaces, the existing deal-by-deal approach. The central idea is that antitrust agencies could evaluate the cumulative value of an acquirer's entire series of transactions up to the completion of a focal deal, instead of assessing each acquisition in isolation. This approach builds directly on Guideline #9 of the 2023 Merger Guidelines, which explicitly authorizes agencies to consider a "pattern or strategy of multiple acquisitions" as part of a unified review.

Table 9 summarizes how this cumulative framework would operate in practice. We analyze 6,755 acquisition series using the lower bound of the size-of-transaction test as our main threshold.[35] For comparison, column 1 replaces missing deal values with zeros, while column 4 replaces them with the yearly average of non-reportable deals.[36]

Under the current deal-by-deal regime, agencies only review acquisitions whose individual transaction values exceed the HSR reporting threshold. By contrast, the

[34] Alongside Google, Amazon was among the first GAFAM firms to complete serial acquisitions in Artificial Intelligence and Systems.

[35] Appendix A replicates the baseline results in Table 9 using the upper bound for both narrow and wide definitions of a series.

[36] Table A.2 and Appendix C report robustness results using the wide definition and median imputation.

cumulative approach would trigger review once the sum of all completed deals by the same acquirer within a defined series crosses the same threshold. On average, acquirers engage in 1.41 series, and 67–75% of these series consist entirely of deals below the HSR threshold, regardless of whether they are evaluated individually or cumulatively. The remaining series can be divided into two groups: (i) *only-cumulative-crossing* series where no single deal exceeds the threshold but the cumulative value does—and (ii) *single-and-cumulative-crossing* series where at least one deal is already reportable individually.

Columns 1 and 4 show that 111 to 641 series fall into the first group, implying that cumulative review would expand the set of transactions subject to scrutiny, albeit at some enforcement cost. Imputing missing values with yearly averages naturally raises the number of cumulative crossings, since unreported small deals can jointly push a series above the threshold. These results suggest that cumulative review would capture additional consolidation otherwise invisible under the individual framework, particularly when missing-value deals represent small, unreported acquisitions.

In the second group (1,569 series), at least one deal is already above the threshold, meaning that cumulative assessment would not add new notifications but could alter the *timing and content* of review. We find that in 1,536 cases (97.90%), the cumulative and individual approaches would trigger review simultaneously. However, considering the series as a whole would allow agencies to evaluate patterns of acquisition and related business strategy with information not readily available under single-deal review.

For the remaining cases, the bottom panel of Table 9 quantifies the time and deal gaps between the single-deal and cumulative approaches. In most instances, cumulative review would advance intervention by one or two years or by one or two deals, though a small number of series—6 (13) in column 1 (4)—show gaps exceeding five years. In 10 (25) series, the cumulative trigger would occur at least three deals earlier than under individual review. These longer gaps highlight scenarios where gradual consolidation could proceed unchecked for extended periods before agencies are alerted under current rules.

Beyond earlier detection, the cumulative framework broadens coverage. Once the combined value of an acquirer's ongoing series exceeds the threshold, all subsequent transactions in that series would automatically qualify for review. In the last three rows of Panel A, we compare the share of serial deals captured under the two frameworks. The individual approach reviews 11.5% of serial acquisitions, whereas the cumulative approach expands scrutiny by an additional 3.5–5.6%, ensuring that small follow-on deals are not overlooked once a series becomes reportable.

TABLE 9. HSR Thresholds and the Cumulative Value of Series

	Baseline			Average Imputation		
	All Acquirers (1)	GAFAM (2)	Top 1% public tech (3)	All Acquirers (4)	GAFAM (5)	Top 1% public tech (6)
Panel A: All Series						
Total # of series	6,755	101	102	6,755	101	102
# of series per acquirer	1.41	16.83	6.80	1.41	16.83	6.80
Avg. length per series (# of follow-on deals)	1.99	3.05	2.87	1.99	3.05	2.87
# of no-crossing series	5,075	68	33	4,545	51	29
	(75.13%)	(67.33%)	(32.35%)	(67.28%)	(50.50%)	(28.43%)
# of only-cumulative-crossing series	111	1	0	641	18	4
	(1.64%)	(0.99%)	(0.00%)	(9.49%)	(17.82%)	(3.92%)
# of single-and-cumulative-crossings series	1,569	32	69	1,569	32	69
	(23.23%)	(31.68%)	(67.65%)	(23.23%)	(31.68%)	(67.65%)
Avg. % of deals investigated under individual	11.52%	9.22%	32.43%	11.52%	9.22%	32.43%
Avg. % of deals that investigated under cumulative	15.00%	15.01%	43.24%	17.13%	21.09%	44.09%
Avg. difference (cumulative–individual) in % of deals investigated	3.48%	5.79%	10.81%	5.61%	11.87%	11.66%
Panel B: Conditional on single-and-cumulative-crossing series						
# of series with time gap = 0	1,536	32	69	1,483	29	69
0 < # of series with time gap $\leq$ 1 year	11	0	0	34	3	0
1 < # of series with time gap $\leq$ 2 years	9	0	0	21	0	0
2 < # of series with time gap $\leq$ 3 years	2	0	0	10	0	0
3 < # of series with time gap $\leq$ 4 years	2	0	0	3	0	0
4 < # of series with time gap $\leq$ 5 years	3	0	0	5	0	0
# of series with time gap > 5 years	6	0	0	13	0	0
# of series with deal gap = 0	1,536	32	69	1,483	29	69
# of series with deal gap = 1	14	0	0	41	2	0
# of series with deal gap = 2	9	0	0	20	0	0
# of series with deal gap = 3	6	0	0	12	1	0
# of series with deal gap = 4	0	0	0	1	0	0
# of series with deal gap $\geq$ 5	4	0	0	12	0	0

Note: The HSR threshold refers to the lower bound of the size-of-transaction test, corresponding to $50 million (as adjusted). The top 1% of public technology firms are defined by average market capitalization in our sample, excluding PE firms, GAFAM, acquirers that have never engaged in serial acquisitions, and those classified by S&P as non-technology companies. For comparison, we use the first single crossing and the first cumulative crossing of each series. The deal gap is calculated using deal serialness, defined as 0 for singletons, 1 for the initial deal in a series, 2 for the first follow-on, 3 for the second follow-on, and so on. The first three columns replace missing transaction values with zeros, whereas in columns (4) to (6), missing values are replaced with the yearly average value of deals below the HSR threshold.

The proposed cumulative framework can be implemented alongside the existing system through the following five steps:

(a) **Identify acquisition series.** Agencies define a series as a set of transactions by the same acquirer targeting firms within related technological or industry categories, consistent with market definitions used in merger review.

(b) **Track cumulative transaction value.** For each acquirer, maintain a running sum of deal values (adjusted for inflation) within each defined category, resetting only after a defined cooling-off period or divestiture.

(c) **Establish cumulative reporting triggers.** Once the aggregate transaction value within a series exceeds the HSR reporting threshold, subsequent deals in that series become subject to mandatory notification, even if individually below the threshold.

(d) **Integrate real-time data.** Using public and proprietary data (e.g., S&P, PitchBook), agencies can automate detection through algorithmic monitoring systems to flag series approaching or exceeding cumulative thresholds.

(e) **Conduct cumulative review.** At the review stage, assess both the competitive effects of the focal deal and the cumulative pattern of acquisitions, including potential foreclosure or entrenchment effects within and across related markets.

This stepwise system complements the current HSR regime rather than replacing it. The deal-by-deal process remains essential for evaluating transaction-specific effects, while the cumulative framework provides a broader temporal lens to capture gradual consolidation. Together, they enable earlier detection of serial acquisition patterns, especially in markets where repeated sub-threshold deals can collectively reshape competition.

Applying this framework to large acquirers such as GAFAM and the top public technology firms yields informative contrasts. Columns 2–3 (and 5–6 with imputed values) of Table 9 show that each GAFAM firm engages in over three times as many acquisition series as a top public acquirer, though with similar average length.[37] Roughly 67% of GAFAM series consist entirely of below-threshold or missing-value deals, compared to 32–51% for top public acquirers. One GAFAM series crosses the threshold cumulatively but not individually. However, this same figure rises to 18 when imputing missing values, compared to the 4 series for top public acquirers, underscoring how the cumulative approach can help flag also large companies' accumulation of market power.

In contrast to the broader sample, almost all series undertaken by GAFAM and other top public acquirers exhibit zero time or deal gaps, meaning both frameworks would trigger review at the same point. The primary advantage of the cumulative approach for these firms lies in *coverage*, not timing: it ensures that entire sequences of smaller acquisitions are visible to regulators, even when each transaction alone would fall outside the reporting scope. In this respect, the cumulative framework aligns conceptually with the DMA-style reporting obligations for large digital platforms, which seek comprehensive coverage rather than accelerated intervention.

[37] Under the wide definition, Table A.2 shows that GAFAM's series are longer on average, but top public firms such as IBM and Cisco exhibit comparable activity.

The final rows of Panel A quantify this expansion. Under the current regime, agencies review about 12% of serial deals in the full sample, 32% among top public acquirers, and 9% among GAFAM. The cumulative framework raises these figures by 3.5–5.6 percentage points overall, capturing between 6–11% of additional GAFAM transactions and 11–12% for top public acquirers.

In sum, a cumulative review mechanism would enhance the existing merger framework by detecting long-run consolidation strategies that evade scrutiny under deal-by-deal review. Implemented algorithmically with real-time data feeds, it could allow agencies to flag serial acquisition patterns earlier and prioritize investigations where cumulative effects are most likely to distort competition. Such a hybrid system would preserve the strengths of individualized case analysis while enabling a forward-looking, data-driven enforcement paradigm consistent with the evolving nature of digital markets.

8. Conclusion

With antitrust authorities increasingly focused on the competitive implications of serial acquisitions, our study provides a systematic, data-driven account of such activity in the technology sector from 2010 to 2023. We show that serial acquisitions constitute roughly one-quarter to over one-third of majority-control tech M&A deals, are primarily undertaken by publicly traded non-PE firms, and typically involve larger, more mature targets than singleton or initial acquisitions. Among public acquirers, initiating a series correlates with higher market valuations and greater innovation value, though we find no evidence of changes in market concentration or competitive threat measures.

Analyzing transactions relative to the Hart–Scott–Rodino reporting thresholds, we find that follow-on deals are generally larger than initial or singleton acquisitions and therefore less likely to fall below the thresholds. Below-threshold follow-ons, however, are more likely to target firms within the same business category as the acquirer, raising potential concerns about cumulative competitive effects. We find no evidence that acquirers systematically manipulate transaction values to avoid reporting.

Focusing on GAFAM, we document greater reliance on serial acquisitions, more frequent expansion beyond core categories, and a stronger emphasis on younger, VC-backed private targets, particularly early in a series. Although these patterns warrant policy attention, GAFAM's initial and follow-on acquisitions represent a small share of serial deals overall, and several other large technology and PE firms exhibit comparable acquisition intensity. This suggests that concentrating scrutiny solely on GAFAM may over-

look other significant sources of cumulative consolidation. A more systematic framework is needed to identify acquirers that engage in frequent and extended acquisition series.

Comparing a cumulative framework for merger review with the current deal-by-deal system, we find that the cumulative approach would expand coverage to entirely below-threshold series, and, for mixed cases, allow scrutiny of an additional 3–6% of serial deals—particularly those by GAFAM and other top public technology acquirers. For series that cross both individual and cumulative thresholds, cumulative review would also trigger earlier scrutiny. Although fewer than 6% of serial deals would be reviewed earlier in practice, these cases can be critical in markets characterized by long acquisition sequences, where the current system allows multiple unreported deals before review begins. Incorporating a cumulative perspective into algorithmic monitoring frameworks could therefore provide a tractable, evidence-based means of detecting consolidation patterns earlier.

Overall, our findings highlight that serial acquisitions are a pervasive yet heterogeneous feature of the technology M&A landscape, with risks and dynamics that vary across acquirer types, target profiles, and transaction sizes. While our analysis, given data limitations on market definitions and outcomes, does not evaluate the welfare implications of these acquisitions, it offers a foundation for future research to investigate the motivations and competitive consequences of serial acquisitions and their role in shaping technological innovation.

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ONLINE APPENDICES

Appendix A. Additional figures and tables

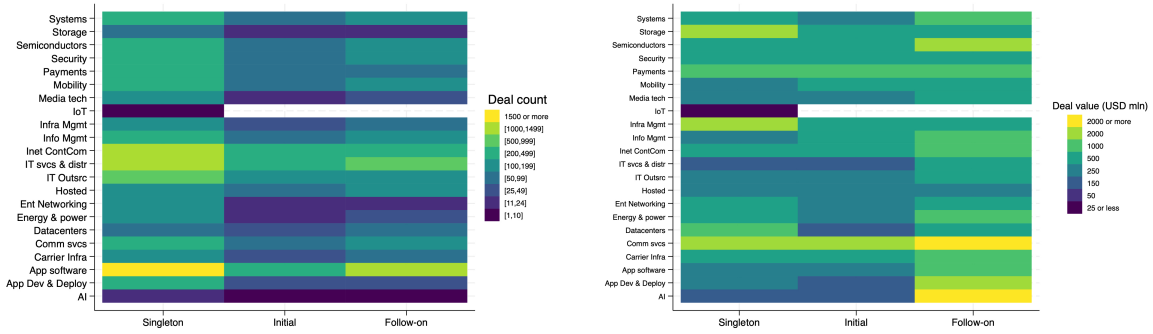


FIGURE A.1. Total number of deals and sum of their deal values across S&P Level-1 categories

A. Narrow Definition: Level-1/Level-2

B. Wide Definition: Level-1

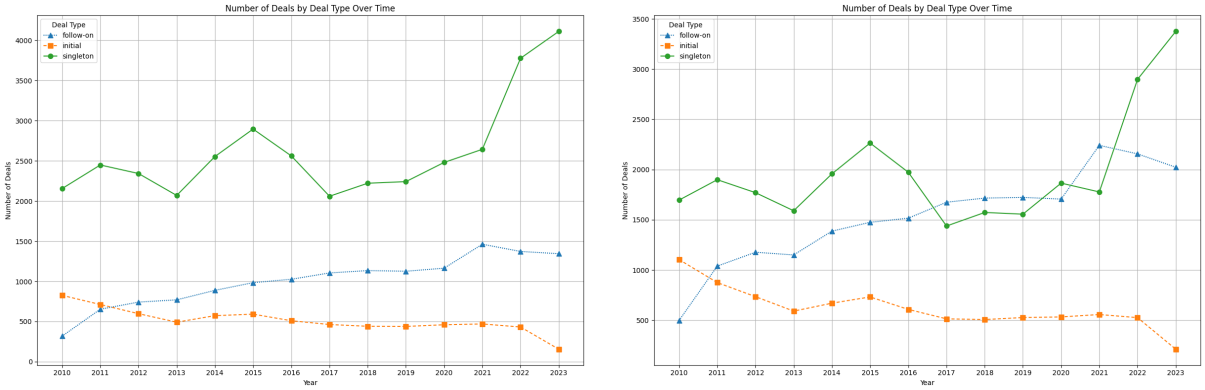
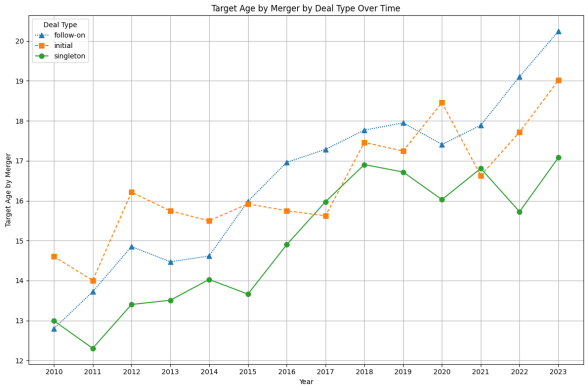


FIGURE A.2. Number of deals by deal type over time

A. Narrow Definition: Level-1/Level-2



B. Wide Definition: Level-1

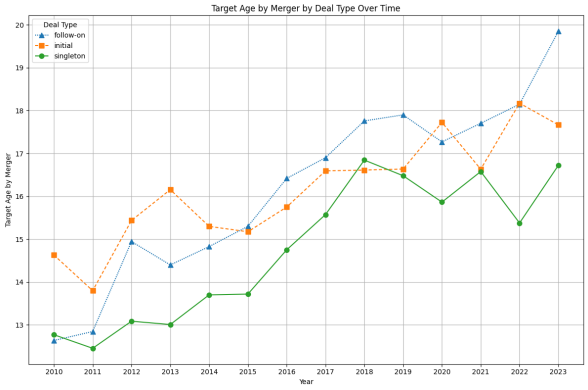


FIGURE A.3. Average target age by deal type over time

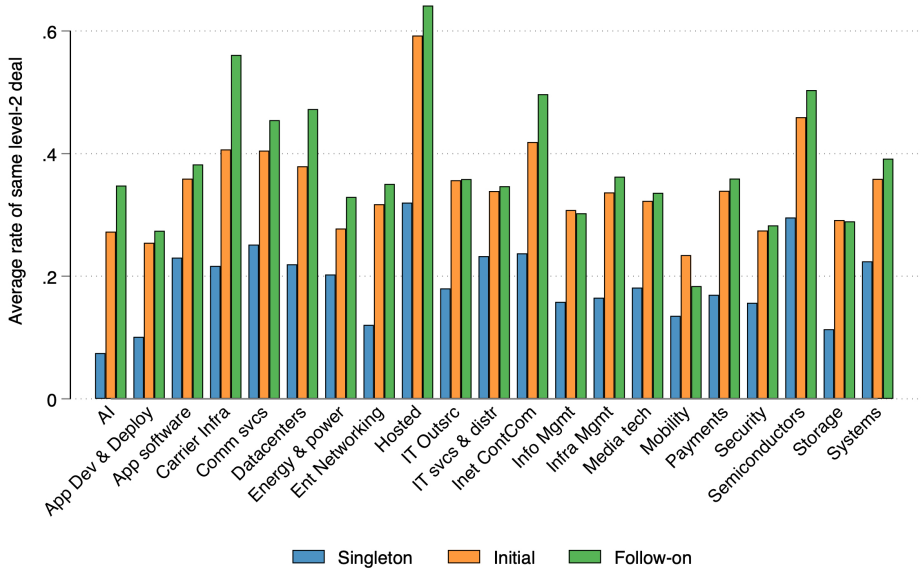


FIGURE A.4. Distribution across level-1s of same-level-2 deals

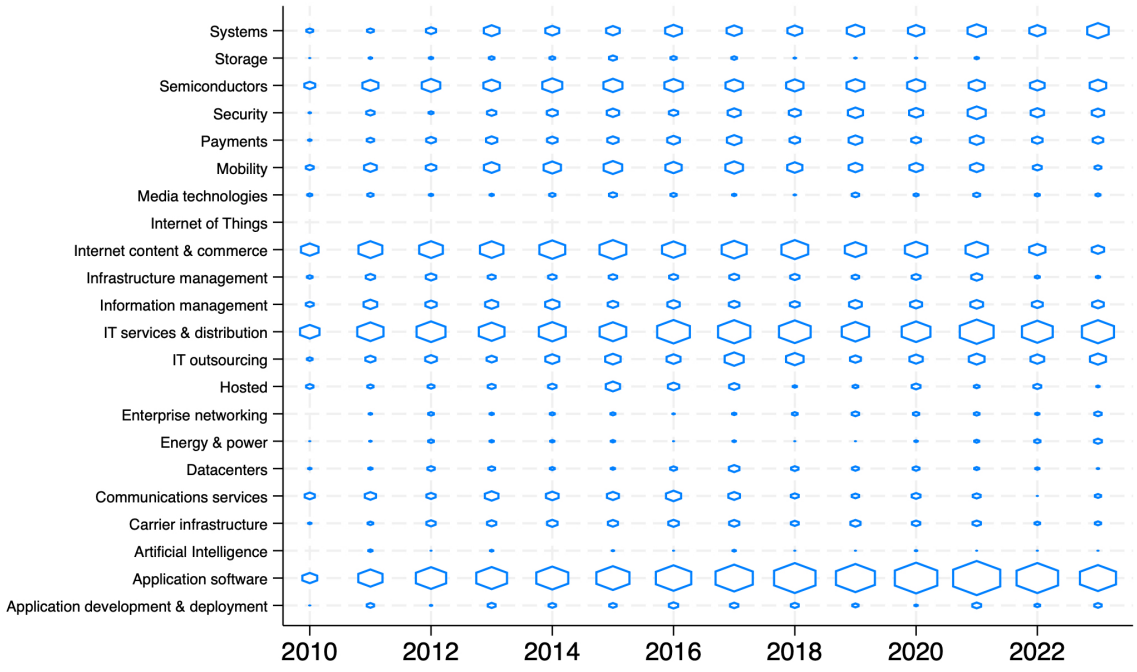
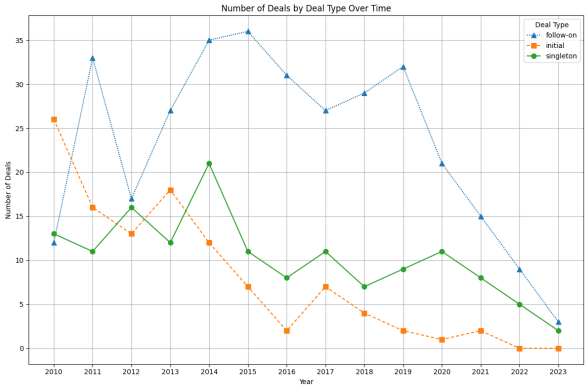


FIGURE A.5. Serial deals across level-1s

A. Narrow Definition: Level-1/Level-2



B. Wide Definition: Level-1

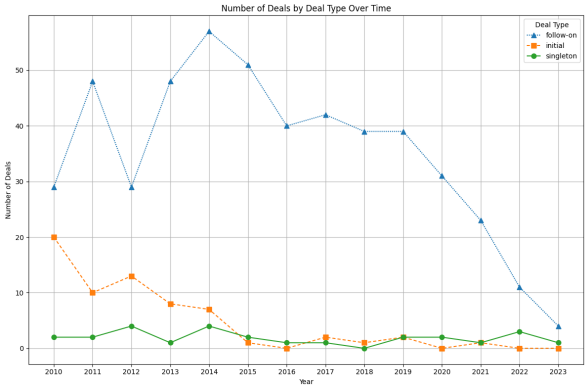
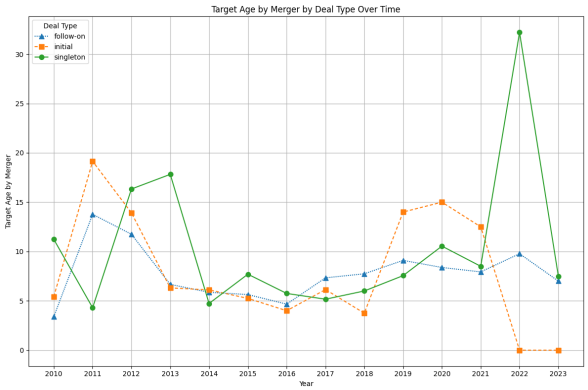


FIGURE A.6. Trends in GAFAM deals by type (deals completed by acquired subsidiaries excluded)

A. Narrow Definition: Level-1/Level-2



B. Wide Definition: Level-1

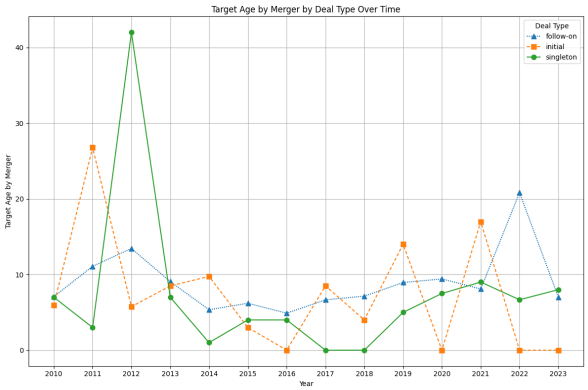


FIGURE A.7. Average GAFAM target Age by deal type over (deals completed by acquired subsidiaries excluded)

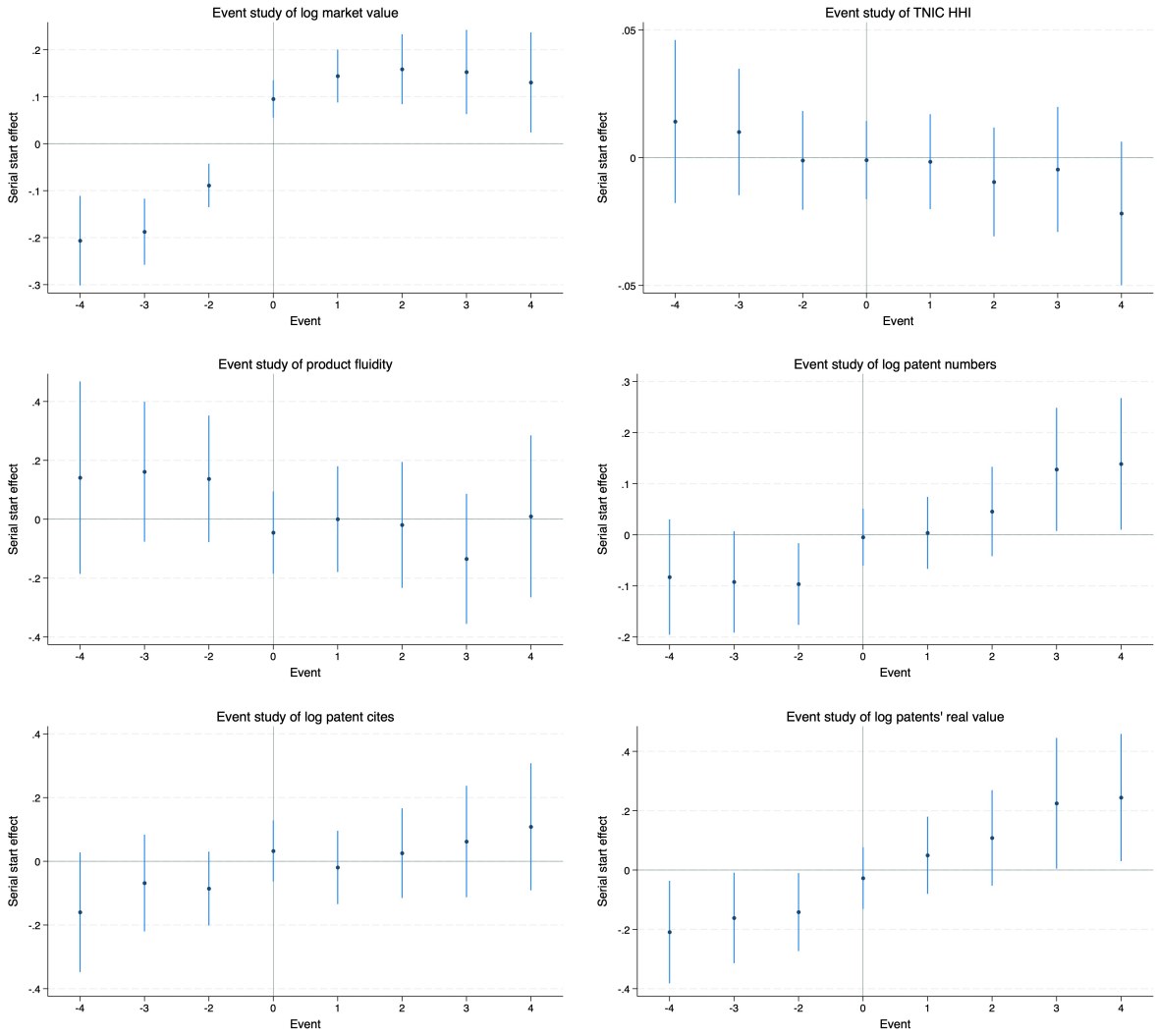


FIGURE A.8. Dynamic correlation between initiating a series and acquirer outcomes: Event-study plots

Note: The sample is conditional on public firms with at least one tech acquisition, meaning that the focal public firm appears as an acquirer in the S&P database.

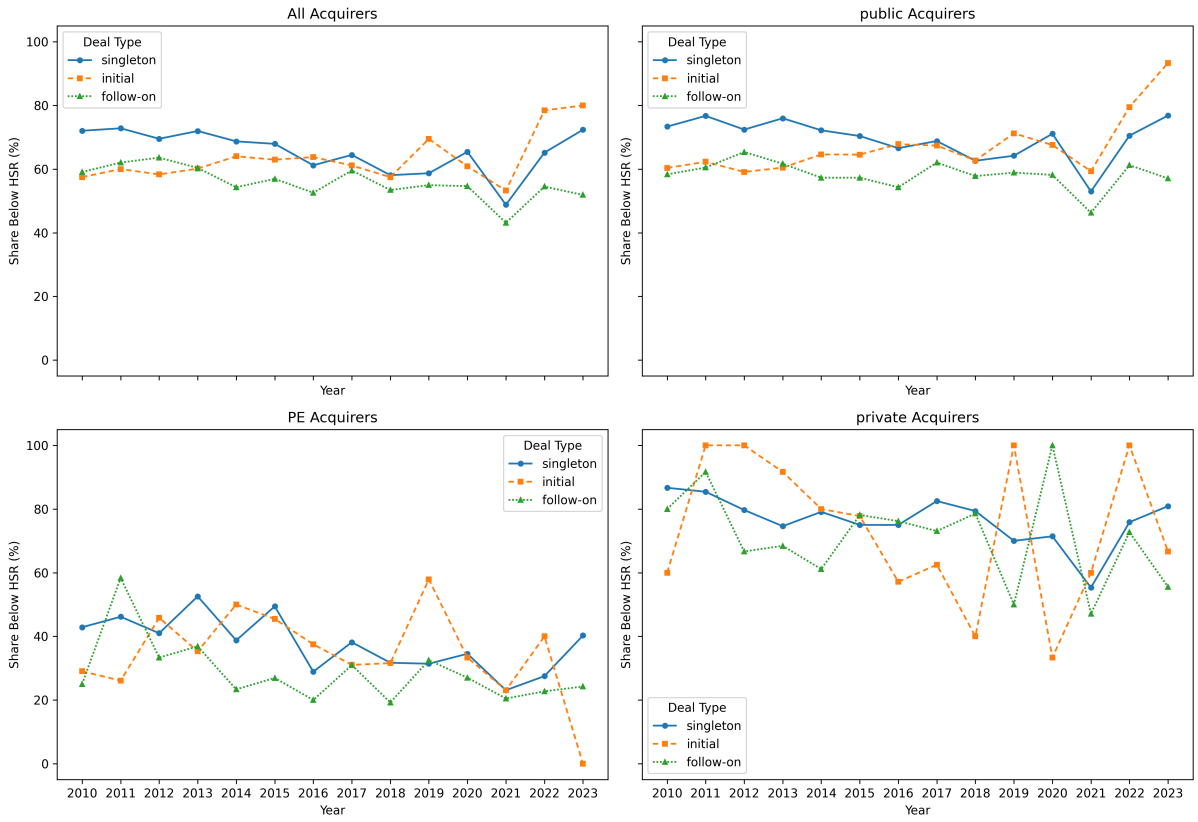


FIGURE A.9. Trends in the share of deals below the lower bound of the HSR size-of-transaction test

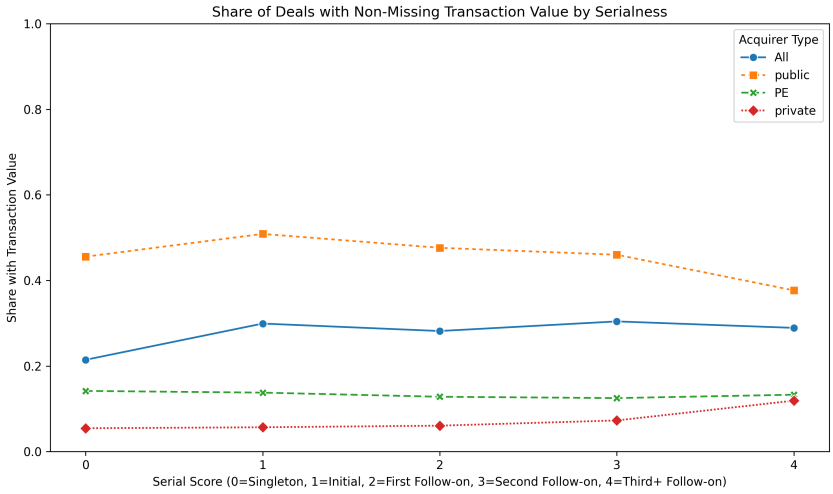


FIGURE A.10. Share of deals with non-missing transaction price by deal serialness

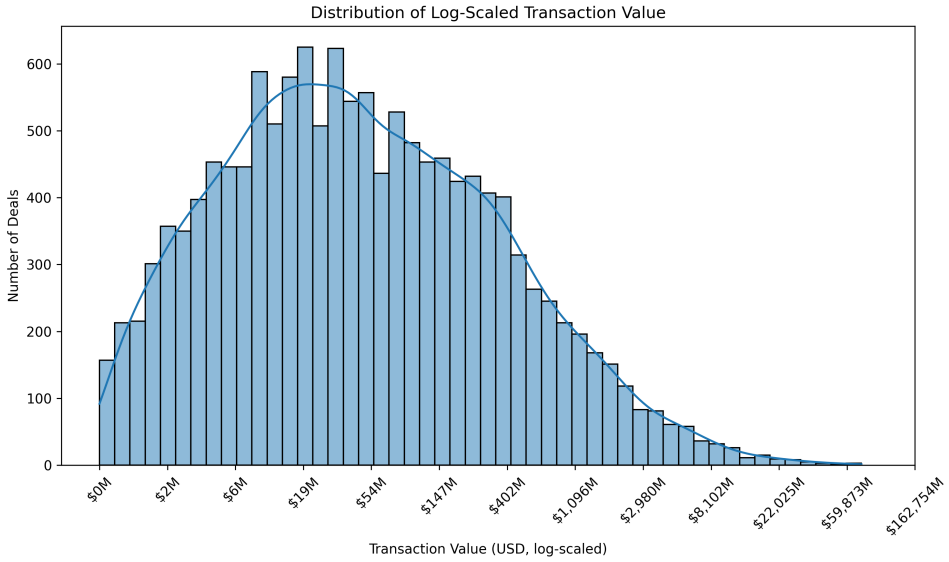


FIGURE A.11. Distribution of log-transformed transaction value

TABLE A.1. Summary of Parties Involved in Deals Above and Below the HSR Threshold under the Wide Series Definition

Metric	Below HSR Threshold			Above HSR Threshold		
	Singleton	Initial	Follow-On	Singleton	Initial	Follow-On
Acquirer Attributes						
# of M&A deals	5,115	1,309	2,230	2,706	834	1,798
Percent if acquirer is private non-PE	12.86%	5.73%	6.77%	7.35%	3.48%	3.45%
Percent if acquirer is public non-PE	78.63%	87.24%	88.16%	65.34%	77.58%	79.03%
Percent if acquirer is PE	8.50%	7.03%	5.07%	27.31%	18.94%	17.52%
Percent if acquirer is VC funded	5.22%	4.66%	5.25%	2.88%	2.16%	2.50%
Percent if acquirer's level-1 is Application software	16.38%	22.46%	24.62%	8.98%	9.47%	13.96%
Percent if acquirer's level-1 is IT services & distribution	7.39%	8.10%	9.91%	3.73%	7.07%	5.90%
Percent if acquirer's level-1 is Internet content & commerce	11.50%	10.85%	10.54%	8.50%	10.55%	11.57%
Percent if acquirer's level-1 is Technology portfolio investors	7.12%	2.90%	1.97%	23.69%	15.11%	13.24%
Percent if acquirer's level-1 is not the above four	57.61%	55.69%	52.96%	55.10%	57.79%	55.34%
Acquirer age by merger (years)	23.41	25.53	27.52	35.16	34.56	36.06
Acquirer market value if public ($MM)	7,807.52	11,616.44	18,072.24	36,364.96	34,267.89	57,763.39
	(40,972.38)	(56,616.92)	(96,600.04)	(107,759.34)	(73,905.79)	(166,178.59)
Acquirer total $ raised if private and VC funded ($MM)	274.38	126.93	222.09	793.37	2,638.87	881.93
	(597.24)	(178.40)	(313.61)	(1,221.36)	(6,959.67)	(1,312.57)
Target Attributes						
Percent if target is VC funded	19.32%	22.31%	20.45%	22.95%	26.86%	25.75%
If VC funded, $ raised ($MM)	22.38	20.70	21.63	55.25	156.68	68.60
	(44.15)	(28.03)	(30.42)	(60.64)	(1,183.58)	(97.99)
Percent if target is publicly traded	18.01%	13.45%	14.30%	38.99%	35.73%	36.48%
If publicly traded, market value ($MM)	11,856.81	18,869.52	25,773.09	26,558.33	26,254.64	28,428.06
	(52,447.76)	(43,670.53)	(59,352.85)	(60,183.72)	(57,224.15)	(55,643.09)
Target age (years)	14.97	15.05	15.92	23.24	20.69	22.13
Target size (# of employees)	341.84	128.28	134.14	2058.36	2123.95	2525.89
Percent acquirer/target in same level-1 category	33.86%	54.85%	63.68%	29.19%	47.84%	55.67%
Percent acquirer/target in same level-1 & level-2	16.19%	33.84%	41.48%	11.20%	23.38%	32.48%
Percent acquirer/target in same country	62.39%	59.21%	53.99%	62.42%	64.15%	59.68%
Percent acquirer/target in same state	35.27%	27.12%	23.50%	27.68%	25.30%	20.91%
Percent acquirer/target in same city	9.13%	4.58%	4.04%	6.95%	5.16%	4.12%
Percent acquirer invested in target before	0.61%	0.31%	0.49%	0.52%	0.24%	0.61%

Note: Standard deviations in parentheses. Market values and $ raised in millions of US dollars. We use the lower bound of the HSR size-of-transaction test, which corresponds to $50 million (as adjusted).

TABLE A.2. HSR Thresholds and the Cumulative Value of Series under the Wide Series Definition

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	8691	65	85
# of series per acquirer	1.34	10.83	5.67
Avg. length per series (# of follow-on deals)	2.47	7.55	5.25
# of Series (no deal value crossing HSR threshold)	5,805	78	46
	(85.94%)	(77.23%)	(45.10%)
# of Series (only cumulative deal value crossing HSR threshold)	99	1	2
	(1.47%)	(0.99%)	(1.96%)
# of Series (both single and cumulative value crossings)	851	22	54
	(12.60%)	(21.78%)	(52.94%)
Avg. % of deals that would be investigated under single crossing	5.82%	5.61%	22.62%
Avg. % of deals that would be investigated under cumulative crossing	8.00%	9.56%	33.83%
Avg. differences in % of deals investigated cumulative vs. single	2.19%	3.95%	11.21%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	1944	31	58
$0 <$ # of series with time gap ≤ 1 year	22	0	0
$1 <$ # of series with time gap ≤ 2 years	22	0	0
$2 <$ # of series with time gap ≤ 3 years	9	0	0
$3 <$ # of series with time gap ≤ 4 years	4	0	0
$4 <$ # of series with time gap ≤ 5 years	4	0	0
# of series with time gap > 5 years	7	0	0
# of series with deal gap $= 0$	1944	31	58
# of series with deal gap $= 1$	29	0	0
# of series with deal gap $= 2$	18	0	0
# of series with deal gap $= 3$	10	0	0
# of series with deal gap $= 4$	4	0	0
# of series with deal gap ≥ 5	7	0	0

Note: We use the lower bound of the HSR size-of-transaction test, which corresponds to $50 million (as adjusted). The top 1% of public technology firms are defined by average market capitalization in our sample, excluding PE firms, GAFAM, acquirers that have never engaged in serial acquisitions, and those classified by S&P as non-technology companies. Since META went public during our sample period, we treat separately the series undertaken while the firm was private and while it was public. For comparison, we use the first single crossing and the first cumulative crossing of each series. The deal gap is calculated using deal serialness, defined as 0 for singletons, 1 for the initial deal in a series, 2 for the first follow-on, 3 for the second follow-on, and so on.

TABLE A.3. Summary of Acquirer Attributes: GAFAM

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	145	110	327
Percent if acquirer is private	7.59%	3.64%	4.89%
Percent if acquirer is public	92.41%	96.36%	95.11%
Percent if acquirer's level-1 is Internet content & commerce	66.21%	61.82%	57.80%
Percent if acquirer's level-1 is Systems	21.38%	20.00%	22.32%
Percent if acquirer's level-1 is Mobility	12.41%	18.18%	19.88%
Acquirer age by time of merger (years)	20.34	23.21	28.44
Acquirer market value if public ($MM)	643,224.03	359,549.30	675,720.59
	(598,193.41)	(280,621.65)	(496,123.33)
Wide Definition: Level-1			
# of M&A deals	26	65	491
Percent if acquirer is private	23.08%	4.62%	4.48%
Percent if acquirer is public	76.92%	95.38%	95.52%
Percent if acquirer's level-1 is Internet content & commerce	69.23%	63.08%	59.88%
Percent if acquirer's level-1 is Systems	19.23%	20.00%	22.00%
Percent if acquirer's level-1 is Mobility	11.54%	16.92%	18.13%
Acquirer age by time of merger (years)	17.73	19.81	26.66
Acquirer market value if public ($MM)	892,730.76	291,222.39	636,552.13
	(783,534.25)	(216,760.14)	(501,159.41)

Note: Standard deviations in parentheses. Market values in millions of US dollars.

TABLE A.4. Summary of Parties Involved in Deals Above and Below the Upper Bound of the HSR Size-of-Transaction Test under the Narrow Series Definition

Metric	Below HSR Threshold			Above HSR Threshold		
	Singleton	Initial	Follow-On	Singleton	Initial	Follow-On
	Acquirer Attributes					
# of M&A deals	6,545	1,775	3,094	1,276	368	934
Percent if acquirer is private non-PE	11.87%	5.30%	6.11%	6.27%	2.72%	2.57%
Percent if acquirer is public non-PE	76.67%	85.35%	86.01%	60.50%	74.46%	77.73%
Percent if acquirer is PE	11.46%	9.35%	7.89%	33.23%	22.83%	19.70%
Percent if acquirer is VC funded	4.86%	4.11%	4.72%	2.12%	1.63%	1.71%
Percent if acquirer's level-1 is Application software	15.48%	19.49%	22.40%	5.33%	7.34%	11.46%
Percent if acquirer's level-1 is IT services & distribution	6.74%	7.94%	9.02%	2.98%	6.52%	5.14%
Percent if acquirer's level-1 is Internet content & commerce	11.06%	10.76%	10.96%	7.37%	10.60%	11.13%
Percent if acquirer's level-1 is Technology portfolio investors	9.06%	4.96%	3.98%	32.29%	20.65%	17.02%
Percent if acquirer's level-1 is not the above four	57.66%	56.85%	53.65%	52.04%	54.89%	55.25%
Acquirer age by merger (years)	25.71	27.52	29.05	36.52	35.88	38.69
Acquirer market value if public ($MM)	12,374.61	16,627.44	25,132.20	49,229.11	41,917.53	73,559.84
	(57,543.37)	(59,252.99)	(113,063.37)	(126,085.96)	(85,080.94)	(184,720.24)
Acquirer total $ raised if private and VC funded ($MM)	328.04	957.13	366.13	914.89	169.63	1,072.52
	(731.27)	(4,030.15)	(718.04)	(726.15)	(93.08)	(1,640.30)
	Target Attributes					
Percent if target is VC funded	21.50%	25.35%	23.66%	15.83%	17.93%	20.02%
If VC funded, $ raised ($MM)	28.88	25.45	28.95	83.82	624.32	120.63
	(44.13)	(27.65)	(38.78)	(90.05)	(2,577.83)	(139.19)
Percent if target is publicly traded	20.44%	16.28%	17.36%	50.00%	50.27%	46.90%
If publicly traded, market value ($MM)	14,115.58	17,414.17	24,296.65	31,404.38	33,470.88	31,307.79
	(54,944.98)	(38,972.61)	(54,092.81)	(60,068.28)	(68,419.32)	(59,452.19)
Target age (years)	16.18	16.04	16.94	26.52	23.13	24.50
Target size (# of employees)	434.21	237.22	224.73	3402.29	3923.95	4249.72
Percent acquirer/target in same level-1 category	33.29%	53.18%	62.09%	26.88%	47.01%	53.53%
Percent acquirer/target in same level-1 & level-2	15.29%	31.61%	39.82%	10.19%	20.92%	29.66%
Percent acquirer/target in same country	62.63%	60.17%	54.88%	61.21%	65.76%	61.99%
Percent acquirer/target in same state	33.89%	26.54%	23.14%	26.25%	25.82%	19.70%
Percent acquirer/target in same city	8.63%	4.68%	3.91%	7.05%	5.43%	4.60%
Percent acquirer invested in target before	0.60%	0.23%	0.48%	0.47%	0.54%	0.75%

Note: Standard deviations in parentheses. Market values and $ raised in millions of US dollars. The upper bound of the HSR size-of-transaction test corresponds to $200 million (as adjusted).

TABLE A.5. Summary of Parties Involved in Deals Above and Below the Upper Bound of the HSR Size-of-Transaction Test under the Wide Series Definition

Metric	Below HSR Threshold			Above HSR Threshold		
	Singleton	Initial	Follow-On	Singleton	Initial	Follow-On
Acquirer Attributes						
# of M&A deals	4,558	2,064	4,792	755	417	1,406
Percent if acquirer is private non-PE	14.30%	6.10%	5.88%	8.87%	3.60%	2.28%
Percent if acquirer is public non-PE	73.74%	84.21%	85.45%	56.29%	70.26%	74.96%
Percent if acquirer is PE	11.96%	9.69%	8.66%	34.83%	26.14%	22.76%
Percent if acquirer is VC funded	5.24%	4.17%	4.42%	2.52%	1.68%	1.64%
Percent if acquirer's level-1 is Application software	14.52%	17.93%	21.29%	5.70%	6.24%	9.46%
Percent if acquirer's level-1 is IT services & distribution	6.49%	7.27%	8.66%	2.65%	4.80%	4.98%
Percent if acquirer's level-1 is Internet content & commerce	10.38%	11.29%	11.44%	6.36%	7.91%	11.10%
Percent if acquirer's level-1 is Technology portfolio investors	10.22%	5.09%	4.86%	34.30%	23.74%	20.55%
Percent if acquirer's level-1 is not the above four	58.38%	58.43%	53.76%	50.99%	57.31%	53.91%
Acquirer age by merger (years)	24.10	26.78	29.60	32.87	37.98	39.39
Acquirer market value if public ($MM)	7,073.70	12,719.01	25,227.53	31,625.65	37,710.08	72,558.40
	(23,907.61)	(47,743.05)	(107,371.07)	(51,802.59)	(74,534.30)	(180,955.50)
Acquirer total $ raised if private and VC funded ($MM)	305.90	758.78	394.80	1,113.31	142.83	757.44
	(666.98)	(3,490.43)	(813.07)	(744.80)	(93.22)	(1,237.76)
Target Attributes						
Percent if target is VC funded	19.42%	24.52%	25.00%	14.30%	17.03%	19.63%
If VC funded, $ raised ($MM)	27.97	27.29	28.77	78.98	525.09	110.78
	(50.30)	(29.77)	(35.93)	(92.16)	(2,326.56)	(127.62)
Percent if target is publicly traded	22.03%	17.59%	16.63%	50.99%	52.04%	46.87%
If publicly traded, market value ($MM)	12,323.69	22,999.67	20,924.27	26,566.11	41,452.93	31,511.10
	(47,951.25)	(73,053.00)	(49,233.40)	(59,708.43)	(70,753.93)	(58,335.78)
Target age (years)	16.31	16.21	16.49	26.47	24.26	24.99
Target size (# of employees)	495.28	240.68	261.24	3314.36	4423.76	3852.80
Percent acquirer/target in same level-1 category	28.17%	47.14%	58.16%	22.38%	39.09%	48.65%
Percent acquirer/target in same level-1 & level-2	17.62%	27.96%	29.51%	13.91%	16.79%	21.98%
Percent acquirer/target in same country	63.01%	61.82%	56.70%	61.85%	63.31%	61.95%
Percent acquirer/target in same state	35.91%	29.84%	24.04%	27.81%	28.06%	20.41%
Percent acquirer/target in same city	9.41%	5.77%	4.61%	8.48%	5.04%	4.84%
Percent acquirer invested in target before	0.70%	0.24%	0.44%	0.53%	0.24%	0.71%

Note: Standard deviations in parentheses. Market values and $ raised in millions of US dollars. The upper bound of the HSR size-of-transaction test corresponds to $200 million (as adjusted).

TABLE A.6. The Upper bound of the HSR Size-of-Transaction Test and the Cumulative Value of Series under the Narrow Series Definition

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	6,755	101	102
# of series per acquirer	1.41	16.83	6.80
Avg. length per series (# of follow-on deals)	1.99	3.05	2.87
# of Series (no deal value crossing HSR threshold)	5,805	78	46
	(85.9%)	(77.2%)	(45.1%)
# of Series (only cumulative deal value crossing HSR threshold)	99	1	2
	(1.5%)	(1.0%)	(2.0%)
# of Series (both single and cumulative value crossings)	851	22	54
	(12.6%)	(21.8%)	(52.9%)
Avg. % of deals after single crossing	4.64%	9.08%	25.71%
Avg. % of deals after cumulative crossing	4.97%	9.48%	26.53%
Avg. difference in % of deals after cumulative vs. single crossings	0.33%	0.40%	0.82%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	829	22	53
$0 <$ # of series with time gap ≤ 1 year	7	0	0
$1 <$ # of series with time gap ≤ 2 years	4	0	0
$2 <$ # of series with time gap ≤ 3 years	6	0	1
$3 <$ # of series with time gap ≤ 4 years	2	0	0
$4 <$ # of series with time gap ≤ 5 years	2	0	0
# of series with time gap > 5 years	1	0	0
# of series with deal gap $= 0$	829	22	53
# of series with deal gap $= 1$	13	0	0
# of series with deal gap $= 2$	1	0	0
# of series with deal gap $= 3$	4	0	0
# of series with deal gap $= 4$	2	0	1
# of series with deal gap ≥ 5	2	0	0

Note: We use the lower bound of the HSR size-of-transaction test, which corresponds to $50 million (as adjusted). The top 1% public tech firms are defined based on average market capitalization in our sample, excluding PE firms, GAFAM, and all the acquirers classified as non-technology companies by S&P. We use the first single crossing and first cumulative crossing of each series for comparison. The deal gap is calculated using deal serialness, which is defined as 0 for singletons, 1 for initial in a series, 2 for the first follow-on, 3 for the second follow-on, etc.

TABLE A.7. The Upper Bound of the HSR Size-of-Transaction Test and the Cumulative Value of Series under the Wide Series Definition

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	8,691	65	85
# of series per acquirer	1.34	10.83	5.67
Avg. length per series (# of follow-on deals)	2.47	7.55	5.25
# of Series (no deal value crossing HSR threshold)	7,427	40	40
	(85.46%)	(61.54%)	(47.06%)
# of Series (only cumulative deal value crossing HSR threshold)	155	1	3
	(1.78%)	(1.54%)	(3.53%)
# of Series (both single and cumulative value crossings)	1,109	24	42
	(12.76%)	(36.92%)	(49.41%)
Avg. % of deals that would be investigated under single crossing	5.18%	7.32%	20.72%
Avg. % of deals that would be investigated under cumulative crossing	8.30%	24.42%	39.14%
Avg. differences in % of deals investigated cumulative vs. single	3.12%	17.11%	18.42%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	1,066	23	40
$0 <$ # of series with time gap ≤ 1 year	6	0	0
$1 <$ # of series with time gap ≤ 2 years	11	0	0
$2 <$ # of series with time gap ≤ 3 years	8	0	1
$3 <$ # of series with time gap ≤ 4 years	6	0	1
$4 <$ # of series with time gap ≤ 5 years	3	0	0
# of series with time gap > 5 years	9	1	0
# of series with deal gap $= 0$	1,066	23	40
# of series with deal gap $= 1$	10	0	1
# of series with deal gap $= 2$	10	0	0
# of series with deal gap $= 3$	7	0	0
# of series with deal gap $= 4$	5	0	1
# of series with deal gap ≥ 5	11	1	0

Note: We use the upper bound of the HSR size-of-transaction test, which corresponds to $200 million (as adjusted). The top 1% public tech firms are defined based on average market capitalization in our sample, excluding PE firms, GAFAM, and all the acquirers classified as non-technology companies by S&P. We use the first single crossing and first cumulative crossing of each series for comparison. The deal gap is calculated using deal serialness, which is defined as 0 for singletons, 1 for initial in a series, 2 for the first follow-on, 3 for the second follow-on, etc.

Appendix B. Deals Completed through Acquired Subsidiaries

As described in Section 3, we adopt a conservative approach to defining serial acquisitions by taking the acquirer and target identities of each M&A deal as recorded, without incorporating information on the parent company. In this section, we assess the robustness of our findings to this choice, which abstracts from the possibility that firms may complete acquisitions through subsidiaries they have previously acquired.

Data limitations allow us to identify such patterns cleanly only for public firms, since a firm's stock market symbol changes following an ownership change. This is not a major concern, however, as acquisitions through previously acquired subsidiaries are primarily relevant for large companies that acquire other large targets, which were themselves active acquirers, and such firms are typically public.

Nevertheless, we provide evidence that this is not an issue for private firms. Focusing on private firms that appear in our dataset both as acquirers and as targets, we identify 519 such cases. Together, their acquisitions account for only 3.68% of the total acquisitions made by private acquirers. The vast majority of these firms (about 75%) complete only a single deal (Figure B.1), and over 80% have no follow-on deals—as shown by the top panels of Figure C.4. Moreover, among the 58 (83) firms classified as serial acquirers under our narrow (wide) definition, most have only one series (middle panels of Figure C.4), and for more than 60% of them the average series length consists of a single follow-on deal (bottom panels of Figure C.4).

Focusing on public companies, we gauge the impact of accounting for acquisitions completed through acquired subsidiaries by identifying for each acquirer its ultimate parent, using information on stock market symbols. Specifically, when a public company makes an acquisition through a subsidiary, our data records the stock market symbol of the parent. Tables B.1–B.10 in this appendix replicate the public-company results from the main text using this ultimate-parent information.

In theory, tracing an acquirer's identity to its ultimate parent can affect both the number and the length of acquisition series. If the target of an earlier deal subsequently acquires other firms in the same S&P category, this may extend the original acquirer's series. Conversely, linking firms through a common parent can also combine multiple singleton deals into a new series, thereby increasing the total number of series.

In net, incorporating subsidiaries' acquisitions increases the total number of follow-on deals from 7,784 (11,564) to 8,918 (13,022) under the narrow (wide) definition. Additionally, we observe that series become, on average, longer. The tables show that using

parental-company information yields only moderate changes relative to our conservative baseline. Interestingly, a larger share of public firms' serial acquisitions with non-missing deal values now fall below the HSR threshold, consistent with these companies using subsidiaries to make smaller acquisitions. Overall, we conclude that the key qualitative patterns documented in the main text remain robust.

Finally, we turn our attention to PE firms and assess the robustness of one of our main results: although PE firms have attracted considerable attention in the debate on serial acquisitions, public companies are the primary serial acquirers. Since our main analysis treats subsidiaries as independent companies, and PE firms may be more likely than other types of acquirers to transact through acquired subsidiaries, we use information on each firm's ultimate parent at the end of our sample to compute an upper bound on the total number of PE deals. This upper bound counts as PE deals any acquisitions made by subsidiaries that were themselves acquired by a PE firm, even if those acquisitions occurred before the subsidiary came under PE ownership. By construction, this inflates the number of PE deals. Nevertheless, even under this generous definition—applied only to PE firms, while keeping statistics for private and public acquirers unchanged—the qualitative pattern remains: public companies remain the main serial acquirers, whereas PE firms complete a total of 5,478, which account for less than 34% of all serial deals. Instead, if we compute the statistics for public and private acquirers in the same way, the share of PE serial deals falls to less than 32%.

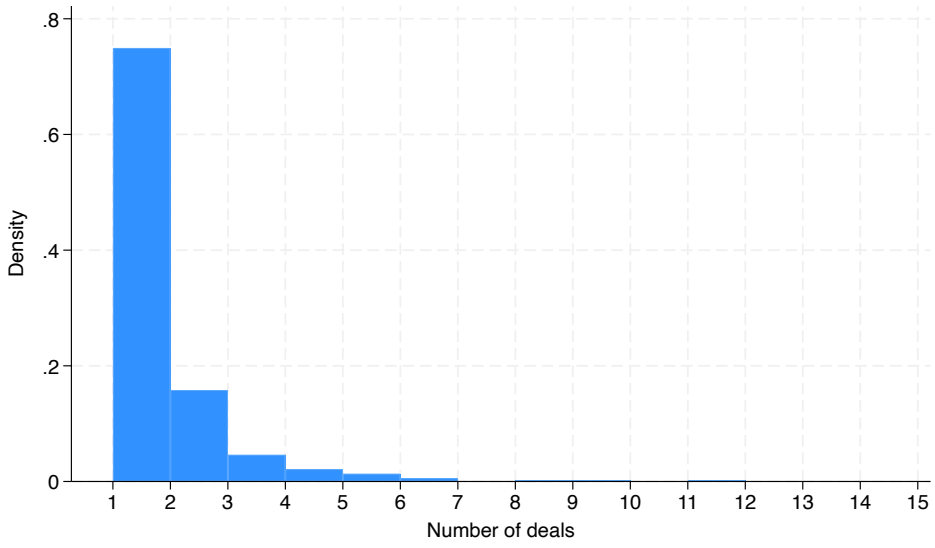


FIGURE B.1. Acquisitions of acquired private companies

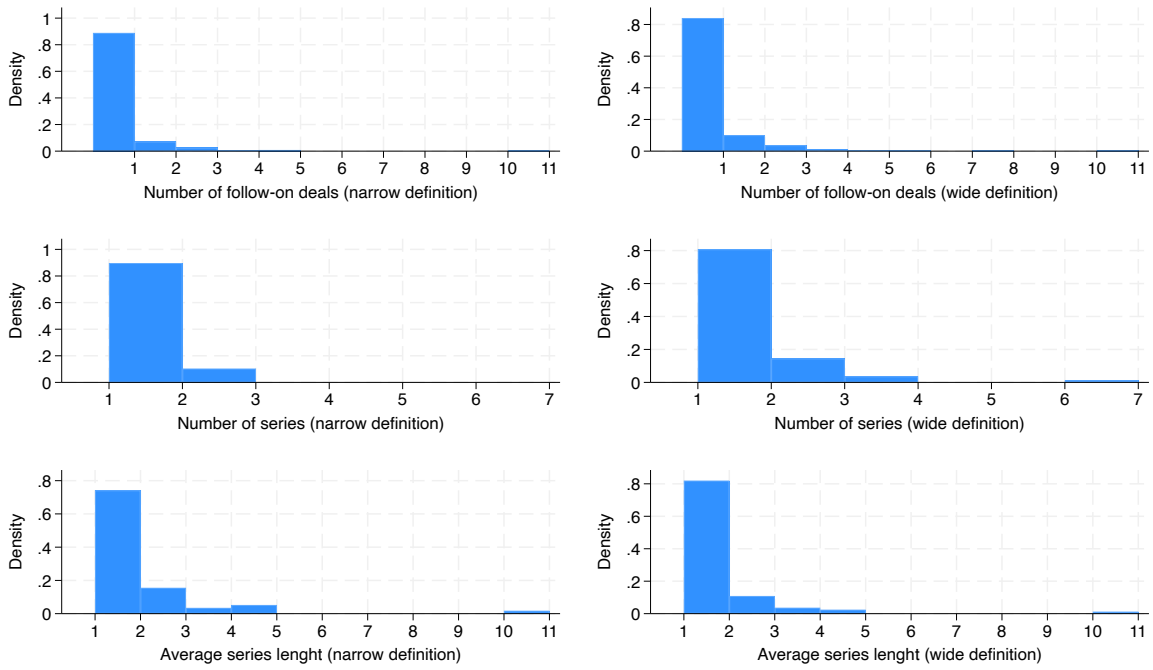


FIGURE B.2. Characteristics of serial acquisitions completed by acquired private companies

TABLE B.1. Summary of Deal Attributes (Public non-PE acquirers)

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	11,332	3,711	8,918
Percent of total deals	47.29%	15.49%	37.22%
Percent of deals with deal value within the column	47.75%	51.15%	41.01%
Avg. deal value ($MM) conditional on having deal value	254.65	341.22	595.47
	(1,560.83)	(1,666.71)	(2,733.52)
Median deal value ($MM) conditional on having deal value	21.00	35.00	54.00
# of series per acquirer			1.93
Avg. length per series (# of follow-on deals)			2.40
Avg. time span (days) from initial to first follow-on per series			824.64
Avg. time span (days) from first follow-on to last follow-on per series (if $\geq$ 2 follow-on deals)			1404.32
HHI of follow-on deals' categories within each series (0–10,000)			8012.15
Wide Definition: Level-1			
# of M&A deals	6,999	3,940	13,022
Percent of total deals	29.21%	16.44%	54.35%
Percent of deals with deal value within the column	48.32%	52.46%	42.37%
Avg. deal value ($MM) conditional on having deal value	158.44	257.13	568.40
	(653.57)	(1,192.85)	(2,734.58)
Median deal value ($MM) conditional on having deal value	16.65	27.00	50.00
# of series per acquirer			1.62
Avg. length per series (# of follow-on deals)			3.31
Avg. time span (days) from initial to first follow-on per series			751.96
Avg. time span (days) from first follow-on to last follow-on per series (if $\geq$ 2 follow-on deals)			1584.89
HHI of follow-on deals' categories within each series (0–10,000)			8456.03

Note: Standard deviations in parentheses. Deal values in millions of US dollars.
Time span measured in days. HHI is the Herfindahl–Hirschman Index (0–10,000 scale).

TABLE B.2. Summary of Target Attributes (Public non-PE acquirers)

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	11,332	3,711	8,918
Percent if target is VC funded	11.18%	13.28%	10.71%
If VC funded, $ raised ($MM)	69.07	47.09	69.23
	(434.06)	(229.01)	(427.16)
Percent if target is publicly traded	11.81%	13.28%	12.49%
If publicly traded, market value ($MM)	44,020.13	29,874.32	38,266.94
	(156,536.30)	(60,760.86)	(71,280.66)
Target age (years)	15.13	15.79	16.81
Target size (# of employees)	543.09	680.29	636.03
Percent if acquirer/target in same level-1 category	29.04%	48.69%	54.79%
Percent if acquirer/target in same level-1 & level-2	11.36%	24.47%	31.44%
Percent if acquirer/target in same country	60.09%	55.54%	48.35%
Percent if acquirer/target in same state	33.50%	30.50%	25.10%
Percent if acquirer/target in same city	8.06%	5.07%	4.27%
Percent if acquirer invested in target before	0.71%	0.35%	0.77%
Wide Definition: Level-1			
# of M&A deals	6,999	3,940	13,022
Percent if target is VC funded	9.77%	12.87%	11.70%
If VC funded, $ raised ($MM)	72.26	49.30	67.20
	(392.87)	(229.26)	(448.54)
Percent if target is publicly traded	11.94%	13.71%	12.05%
If publicly traded, market value ($MM)	50,581.86	33,720.36	35,983.26
	(192,106.14)	(75,609.08)	(67,990.47)
Target age (years)	15.01	15.68	16.37
Target size (# of employees)	467.46	628.23	652.66
Percent if acquirer/target in same level-1 category	22.03%	42.23%	52.05%
Percent if acquirer/target in same level-1 & level-2	13.52%	22.46%	24.33%
Percent if acquirer/target in same country	60.85%	57.56%	51.11%
Percent if acquirer/target in same state	35.51%	33.55%	25.79%
Percent if acquirer/target in same city	8.84%	5.99%	4.81%
Percent if acquirer invested in target before	0.67%	0.41%	0.77%

Note: Standard deviations in parentheses. Market value and $ raised in millions of US dollars.

TABLE B.3. Summary of Acquirer Attributes (Public non-PE acquirers)

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	11,332	3,711	8,918
Percent if acquirer is public non-PE	100.00%	100.00%	100.00%
Percent if acquirer's level-1 category is Application software	13.13%	15.31%	18.77%
Percent if acquirer's level-1 category is IT services & distribution	8.79%	10.43%	12.18%
Percent if acquirer's level-1 category is Internet content & commerce	12.22%	15.14%	15.28%
Percent if acquirer's level-1 category is Technology portfolio investors	2.56%	0.49%	0.38%
Percent if acquirer's level-1 category is not the above four	63.30%	58.64%	53.39%
Acquirer age by time of merger (years)	33.47	34.63	38.12
Acquirer market value if public ($MM)	38,999.26	43,948.53	89,141.80
	(155,282.06)	(118,912.72)	(233,688.05)
Wide Definition: Level-1			
# of M&A deals	6,999	3,940	13,022
Percent if acquirer is public non-PE	100.00%	100.00%	100.00%
Percent if acquirer's level-1 category is Application software	12.84%	14.31%	17.41%
Percent if acquirer's level-1 category is IT services & distribution	8.09%	9.24%	11.82%
Percent if acquirer's level-1 category is Internet content & commerce	10.36%	13.27%	15.83%
Percent if acquirer's level-1 category is Technology portfolio investors	3.43%	0.91%	0.51%
Percent if acquirer's level-1 category is not the above four	65.28%	62.26%	54.43%
Acquirer age by time of merger (years)	31.47	33.25	38.17
Acquirer market value if public ($MM)	18,736.26	28,062.48	84,943.70
	(104,668.89)	(76,006.97)	(226,818.79)

Note: Standard deviations in parentheses where applicable. Market values and $ raised in millions of US dollars.

TABLE B.4. Summary of Parties Involved in Deals Above and Below the HSR Threshold (Public non-PE, Narrow)

Metric	Below HSR Threshold			Above HSR Threshold		
	Singleton	Initial	Follow-On	Singleton	Initial	Follow-On
	Acquirer Attributes					
# of M&A deals	3,824	1,206	2,100	1,587	692	1,557
Percent if acquirer is public non-PE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Percent if acquirer's level-1 is Application software	16.53%	22.14%	25.10%	9.83%	9.83%	14.58%
Percent if acquirer's level-1 is IT services & distribution	7.74%	8.46%	10.48%	4.98%	6.94%	7.19%
Percent if acquirer's level-1 is Internet content & commerce	11.38%	10.61%	10.71%	10.14%	12.28%	14.19%
Percent if acquirer's level-1 is Technology portfolio investors	1.65%	0.25%	0.14%	1.89%	0.43%	0.32%
Percent if acquirer's level-1 is not the above four	62.71%	58.54%	53.57%	73.16%	70.52%	63.71%
Acquirer age by merger (years)	25.02	27.23	28.87	42.65	39.63	39.80
Acquirer market value if public ($MM)	7,504.12	10,284.84	18,656.60	32,760.15	37,433.86	58,135.56
	(41,244.60)	(41,635.47)	(98,506.77)	(105,927.01)	(77,166.97)	(163,742.31)
	Target Attributes					
Percent if target is VC funded	19.25%	22.22%	20.14%	26.28%	29.91%	26.91%
If VC funded, $ raised ($MM)	18.85	20.99	19.26	49.97	36.44	70.02
	(25.73)	(28.53)	(28.37)	(50.90)	(29.41)	(97.44)
Percent if target is publicly traded	11.06%	12.19%	12.67%	31.25%	32.66%	34.81%
If publicly traded, market value ($MM)	18,893.74	19,613.90	21,027.27	28,660.69	24,060.55	31,780.59
	(70,281.23)	(46,303.27)	(51,728.20)	(69,454.55)	(58,883.46)	(60,342.67)
Target age (years)	14.18	15.29	16.29	22.22	19.77	21.93
Target size (# of employees)	280.44	129.65	134.69	1464.02	1959.60	1957.82
Percent acquirer/target in same level-1 category	32.51%	53.57%	63.24%	33.46%	52.17%	62.30%
Percent acquirer/target in same level-1 & level-2	14.72%	31.51%	40.14%	11.72%	23.70%	34.87%
Percent acquirer/target in same country	60.22%	58.46%	52.38%	60.74%	61.42%	57.48%
Percent acquirer/target in same state	34.52%	28.69%	24.67%	27.03%	26.59%	23.38%
Percent acquirer/target in same city	8.63%	5.14%	4.24%	6.18%	4.62%	4.37%
Percent acquirer invested in target before	0.47%	0.17%	0.62%	0.57%	0.29%	0.64%

Note: Standard deviations in parentheses. Market values and $ raised in millions of US dollars.

TABLE B.5. Summary of Parties Involved in Deals Above and Below the HSR Threshold (Public non-PE, Wide)

Metric	Below HSR Threshold			Above HSR Threshold		
	Singleton	Initial	Follow-On	Singleton	Initial	Follow-On
	Acquirer Attributes					
# of M&A deals	2,534	1,378	3,218	848	689	2,299
Percent if acquirer is public non-PE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Percent if acquirer's level-1 is Application software	15.67%	19.67%	23.56%	9.43%	9.72%	13.22%
Percent if acquirer's level-1 is IT services & distribution	7.06%	7.55%	10.41%	4.95%	5.66%	6.87%
Percent if acquirer's level-1 is Internet content & commerce	10.42%	11.68%	11.28%	8.96%	9.43%	14.18%
Percent if acquirer's level-1 is Technology portfolio investors	2.17%	0.44%	0.25%	2.36%	0.87%	0.52%
Percent if acquirer's level-1 is not the above four	64.68%	60.67%	54.51%	74.29%	74.31%	65.20%
Acquirer age by merger (years)	23.84	25.71	28.98	41.16	40.49	41.09
Acquirer market value if public ($MM)	3,387.91	7,182.93	18,428.73	15,544.23	28,448.26	57,448.75
	(10,082.61)	(23,086.61)	(91,476.85)	(33,015.20)	(59,233.96)	(158,253.61)
	Target Attributes					
Percent if target is VC funded	17.92%	22.71%	20.51%	23.94%	26.85%	28.49%
If VC funded, $ raised ($MM)	15.68	21.66	20.60	50.70	42.64	59.81
	(19.95)	(25.91)	(31.32)	(55.57)	(36.51)	(82.63)
Percent if target is publicly traded	10.66%	12.26%	12.34%	31.13%	35.12%	32.97%
If publicly traded, market value ($MM)	11,769.74	31,457.36	19,935.06	30,348.36	26,724.03	29,718.57
	(33,505.78)	(101,533.57)	(50,094.82)	(84,883.33)	(54,714.12)	(57,709.44)
Target age (years)	14.03	14.91	15.77	22.73	20.96	21.48
Target size (# of employees)	364.92	141.98	133.51	1126.64	1885.31	1937.00
Percent acquirer/target in same level-1 category	26.05%	47.17%	59.26%	23.94%	43.83%	59.03%
Percent acquirer/target in same level-1 & level-2	16.73%	28.59%	30.08%	15.21%	21.48%	26.79%
Percent acquirer/target in same country	60.34%	59.43%	54.69%	61.67%	61.39%	58.20%
Percent acquirer/target in same state	36.15%	31.93%	25.73%	27.12%	29.46%	23.66%
Percent acquirer/target in same city	9.23%	5.81%	5.19%	6.60%	5.08%	4.65%
Percent acquirer invested in target before	0.59%	0.22%	0.47%	0.71%	0.15%	0.61%

Note: Standard deviations in parentheses. Market values and $ raised in millions of US dollars.

Table B.6. Summary of Deal Attributes (GAFAM with children)

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	135	118	349
Percent of total deals	22.43%	19.60%	57.97%
Percent of deals with deal value within the column	14.07%	20.34%	11.75%
Avg. deal value ($MM) conditional on having deal value	2,298.68	1,473.66	3,407.90
	(6,171.64)	(4,032.67)	(11,892.13)
Median deal value ($MM) conditional on having deal value	165.00	245.00	300.00
# of series per acquirer			23.60
Avg. length per series (# of follow-on deals)			2.96
Avg. time span (days) from initial to first follow-on per series			859.58
Avg. time span (days) from first follow-on to last follow-on per series (if $\geq$ 2 follow-on deals)			1662.93
HHI of follow-on deals' categories within each series (0–10,000)			854.63
Wide Definition: Level-1			
# of M&A deals	15	66	521
Percent of total deals	2.49%	10.96%	86.54%
Percent of deals with deal value within the column	13.33%	13.64%	14.01%
Avg. deal value ($MM) conditional on having deal value	530.29	1,304.70	2,821.42
	(743.46)	(2,767.12)	(9,636.75)
Median deal value ($MM) conditional on having deal value	530.29	275.00	250.00
# of series per acquirer			13.20
Avg. length per series (# of follow-on deals)			7.89
Avg. time span (days) from initial to first follow-on per series			667.61
Avg. time span (days) from first follow-on to last follow-on per series (if $\geq$ 2 follow-on deals)			2355.50
HHI of follow-on deals' categories within each series (0–10,000)			1543.17

Note: Standard deviations in parentheses. Deal values in millions of US dollars.
Time span measured in days. HHI is the Herfindahl–Hirschman Index (0–10,000 scale).

TABLE B.7. Summary of Target Attributes (GAFAM with children)

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	135	118	349
Percent if target is VC funded	35.56%	29.66%	29.51%
If VC funded, $ raised ($MM)	39.96	24.95	24.82
	(144.50)	(30.84)	(48.15)
Percent if target is publicly traded	4.44%	5.08%	6.30%
If publicly traded, market value ($MM)	106,688.89	106,991.89	86,800.64
	(157,369.05)	(123,514.95)	(100,452.11)
Target age (years)	9.38	8.88	8.01
Target size (# of employees)	2,102.48	96.50	711.16
Percent if acquirer/target in same level-1 category	15.56%	11.86%	15.47%
Percent if acquirer/target in same level-1 & level-2	2.22%	2.54%	3.44%
Percent if acquirer/target in same country	66.67%	67.80%	68.48%
Percent if acquirer/target in same state	22.96%	31.36%	37.25%
Wide Definition: Level-1			
# of M&A deals	15	66	521
Percent if target is VC funded	33.33%	27.27%	31.29%
If VC funded, $ raised ($MM)	27.71	21.54	29.58
	(20.68)	(30.40)	(87.48)
Percent if target is publicly traded	6.67%	6.06%	5.57%
If publicly traded, market value ($MM)	2,268.13	106,947.16	97,663.53
	(nan)	(151,234.49)	(107,925.71)
Target age (years)	8.25	10.19	8.27
Target size (# of employees)	37.50	87.87	1,025.35
Percent if acquirer/target in same level-1 category	0.00%	7.58%	16.12%
Percent if acquirer/target in same level-1 & level-2	0.00%	1.52%	3.26%
Percent if acquirer/target in same country	66.67%	75.76%	66.99%
Percent if acquirer/target in same state	13.33%	34.85%	33.21%

Note: Standard deviations in parentheses. Market value and $ raised in millions of US dollars.

TABLE B.8. Summary of Acquirer Attributes (GAFAM with children)

	Singleton	Initial	Follow-on
Narrow Definition: Level-1/Level-2			
# of M&A deals	135	118	349
Percent if acquirer is public non-PE	100.00%	100.00%	100.00%
Percent if acquirer's level-1 category is Application software	0.74%	0.00%	0.00%
Percent if acquirer's level-1 category is IT services & distribution	0.00%	0.00%	0.00%
Percent if acquirer's level-1 category is Internet content & commerce	59.26%	55.08%	54.73%
Percent if acquirer's level-1 category is Technology portfolio investors	0.00%	0.00%	0.00%
Percent if acquirer's level-1 category is not the above four	40.00%	44.92%	45.27%
Acquirer age by time of merger (years)	21.08	21.23	26.78
Acquirer market value if public ($MM)	644,859.11	364,971.73	697,365.96
	(593,379.18)	(276,285.10)	(509,989.59)
Wide Definition: Level-1			
# of M&A deals	15	66	521
Percent if acquirer is public non-PE	100.00%	100.00%	100.00%
Percent if acquirer's level-1 category is Application software	0.00%	0.00%	0.19%
Percent if acquirer's level-1 category is IT services & distribution	0.00%	0.00%	0.00%
Percent if acquirer's level-1 category is Internet content & commerce	46.67%	56.06%	56.05%
Percent if acquirer's level-1 category is Technology portfolio investors	0.00%	0.00%	0.00%
Percent if acquirer's level-1 category is not the above four	53.33%	43.94%	43.76%
Acquirer age by time of merger (years)	33.25	18.83	25.06
Acquirer market value if public ($MM)	935,885.02	289,169.98	653,320.29
	(854,309.92)	(211,040.48)	(507,745.36)

Note: Standard deviations in parentheses where applicable. Market values and $ raised in millions of US dollars.

TABLE B.9. HSR Thresholds and the Cumulative Value of Series (Public non-PE, Narrow)

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	3,711	118	113
# of series per acquirer	1.93	23.60	6.65
Avg. length per series (# of follow-on deals)	2.40	2.96	2.90
# of Series (no deal value crossing HSR threshold)	2,224	82	40
	(59.93%)	(69.49%)	(35.40%)
# of Series (only cumulative deal value crossing HSR threshold)	105	1	0
	(2.83%)	(0.85%)	(0.00%)
# of Series (both single and cumulative value crossings)	1,382	35	73
	(37.24%)	(29.66%)	(64.60%)
Avg. % of deals that would be investigated under single crossing	18.06%	7.73%	29.76%
Avg. % of deals that would be investigated under cumulative crossing	24.05%	13.34%	41.31%
Avg. differences in % of deals investigated cumulative vs. single	5.99%	5.61%	11.55%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	1,349	35	72
$0 <$ # of series with time gap ≤ 1 year	11	0	0
$1 <$ # of series with time gap ≤ 2 years	8	0	0
$2 <$ # of series with time gap ≤ 3 years	3	0	1
$3 <$ # of series with time gap ≤ 4 years	2	0	0
$4 <$ # of series with time gap ≤ 5 years	3	0	0
# of series with time gap > 5 years	6	0	0
# of series with deal gap $= 0$	1,349	35	72
# of series with deal gap $= 1$	15	0	1
# of series with deal gap $= 2$	9	0	0
# of series with deal gap $= 3$	6	0	0
# of series with deal gap $= 4$	0	0	0
# of series with deal gap ≥ 5	3	0	0

Note: The top 1% of public technology firms are defined by average market capitalization in our sample, excluding PE firms, GAFAM, acquirers that have never engaged in serial acquisitions, and those classified by S&P as non-technology companies. Since META went public during our sample period, and in these analyses we leverage firms' stock market symbols, we focus on the series undertaken while the firm was public. For comparison, we use the first single crossing and the first cumulative crossing of each series. The deal gap is calculated using deal serialness, defined as 0 for singletons, 1 for the initial deal in a series, 2 for the first follow-on, 3 for the second follow-on, and so on.

TABLE B.10. HSR Thresholds and the Cumulative Value of Series (Public non-PE, Wide)

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	3,940	66	91
# of series per acquirer	1.62	13.20	5.06
Avg. length per series (# of follow-on deals)	3.31	7.89	5.30
# of Series (no deal value crossing HSR threshold)	2,243	34	31
	(56.93%)	(51.52%)	(34.07%)
# of Series (only cumulative deal value crossing HSR threshold)	142	1	0
	(3.60%)	(1.52%)	(0.00%)
# of Series (both single and cumulative value crossings)	1,555	31	60
	(39.47%)	(46.97%)	(65.93%)
Avg. % of deals that would be investigated under single crossing	17.39%	9.85%	27.58%
Avg. % of deals that would be investigated under cumulative crossing	26.52%	30.35%	47.32%
Avg. differences in % of deals investigated cumulative vs. single	9.13%	20.49%	19.74%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	1,487	30	59
$0 <$ # of series with time gap ≤ 1 year	22	1	0
$1 <$ # of series with time gap ≤ 2 years	19	0	0
$2 <$ # of series with time gap ≤ 3 years	10	0	1
$3 <$ # of series with time gap ≤ 4 years	5	0	0
$4 <$ # of series with time gap ≤ 5 years	3	0	0
# of series with time gap > 5 years	9	0	0
# of series with deal gap $= 0$	1,487	30	59
# of series with deal gap $= 1$	27	1	0
# of series with deal gap $= 2$	18	0	0
# of series with deal gap $= 3$	12	0	1
# of series with deal gap $= 4$	4	0	0
# of series with deal gap ≥ 5	7	0	0

Note: The top 1% of public technology firms are defined by average market capitalization in our sample, excluding PE firms, GAFAM, acquirers that have never engaged in serial acquisitions, and those classified by S&P as non-technology companies. Since META went public during our sample period, and in these analyses we leverage firms' stock market symbols, we focus on the series undertaken while the firm was public. For comparison, we use the first single crossing and the first cumulative crossing of each series. The deal gap is calculated using deal serialness, defined as 0 for singletons, 1 for the initial deal in a series, 2 for the first follow-on, 3 for the second follow-on, and so on.

TABLE B.11. Summary of Parties Involved in Deals Above and Below the 200M HSR Threshold (Public non-PE, Narrow)

Metric	Below HSR Threshold			Above HSR Threshold		
	Singleton	Initial	Follow-On	Singleton	Initial	Follow-On
	Acquirer Attributes					
# of M&A deals	4,738	1,594	2,862	673	304	795
Percent if acquirer is public non-PE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Percent if acquirer's level-1 is Application software	15.60%	19.51%	22.85%	7.28%	7.89%	12.58%
Percent if acquirer's level-1 is IT services & distribution	7.39%	8.22%	9.82%	3.71%	6.25%	6.42%
Percent if acquirer's level-1 is Internet content & commerce	11.29%	10.79%	11.67%	9.06%	13.49%	14.09%
Percent if acquirer's level-1 is Technology portfolio investors	1.58%	0.19%	0.14%	2.67%	0.99%	0.50%
Percent if acquirer's level-1 is not the above four	64.14%	61.29%	55.52%	77.27%	71.38%	66.42%
Acquirer age by merger (years)	27.82	29.37	30.94	46.69	43.29	42.44
Acquirer market value if public ($MM)	11,547.00	16,208.30	25,661.46	44,380.22	46,128.00	74,031.80
	(57,048.04)	(51,120.44)	(113,202.06)	(124,443.40)	(87,874.54)	(182,377.70)
	Target Attributes					
Percent if target is VC funded	21.59%	25.78%	23.24%	19.32%	21.05%	22.26%
If VC funded, $ raised ($MM)	25.01	25.42	28.44	76.30	53.86	118.06
	(30.24)	(27.80)	(39.12)	(74.48)	(38.54)	(135.08)
Percent if target is publicly traded	13.40%	14.68%	15.72%	42.20%	45.72%	45.03%
If publicly traded, market value ($MM)	20,503.18	17,232.04	20,693.30	33,025.59	32,747.78	36,847.84
	(72,886.37)	(41,871.75)	(47,360.42)	(62,895.58)	(72,886.94)	(66,726.11)
Target age (years)	15.20	15.99	17.18	26.26	21.89	24.19
Target size (# of employees)	369.85	222.93	219.83	2405.10	3703.54	3334.91
Percent acquirer/target in same level-1 category	32.44%	53.01%	62.75%	35.22%	53.29%	63.14%
Percent acquirer/target in same level-1 & level-2	14.16%	29.92%	39.03%	11.59%	22.04%	33.84%
Percent acquirer/target in same country	60.51%	59.35%	53.14%	59.44%	60.53%	59.62%
Percent acquirer/target in same state	33.05%	28.23%	24.67%	27.19%	26.32%	22.14%
Percent acquirer/target in same city	8.17%	5.02%	4.09%	6.09%	4.61%	5.03%
Percent acquirer invested in target before	0.44%	0.13%	0.59%	0.89%	0.66%	0.75%

Note: Standard deviations in parentheses. Market values and $ raised in millions of US dollars.

TABLE B.12. Summary of Parties Involved in Deals Above and Below the 200M HSR Threshold (Public non-PE, Wide)

Metric	Below HSR Threshold			Above HSR Threshold		
	Singleton	Initial	Follow-On	Singleton	Initial	Follow-On
	Acquirer Attributes					
# of M&A deals	3,051	1,769	4,374	331	298	1,143
Percent if acquirer is public non-PE	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Percent if acquirer's level-1 is Application software	14.81%	17.92%	21.38%	7.55%	7.05%	11.11%
Percent if acquirer's level-1 is IT services & distribution	6.92%	7.24%	9.67%	3.02%	5.03%	6.12%
Percent if acquirer's level-1 is Internet content & commerce	10.23%	11.25%	12.12%	8.46%	9.06%	13.91%
Percent if acquirer's level-1 is Technology portfolio investors	2.13%	0.45%	0.21%	3.02%	1.34%	0.96%
Percent if acquirer's level-1 is not the above four	65.91%	63.14%	56.63%	77.95%	77.52%	67.89%
Acquirer age by merger (years)	26.36	28.24	31.30	45.12	43.98	44.05
Acquirer market value if public ($MM)	4,913.93	11,254.35	25,973.54	23,096.56	36,106.07	72,515.77
	(14,786.05)	(31,772.37)	(107,808.69)	(41,510.72)	(71,787.63)	(176,932.31)
	Target Attributes					
Percent if target is VC funded	19.60%	25.04%	24.19%	17.82%	18.46%	22.48%
If VC funded, $ raised ($MM)	22.55	26.43	27.85	78.39	62.83	104.00
	(27.32)	(28.34)	(36.83)	(92.62)	(47.42)	(120.40)
Percent if target is publicly traded	13.14%	15.09%	14.88%	40.18%	48.32%	44.09%
If publicly traded, market value ($MM)	16,730.12	26,121.94	19,422.70	36,645.90	33,981.89	34,737.66
	(63,158.27)	(82,401.44)	(45,435.00)	(77,642.30)	(62,009.12)	(64,236.25)
Target age (years)	15.11	15.92	16.55	26.89	23.07	24.31
Target size (# of employees)	393.40	249.77	249.82	2039.85	3409.24	3210.83
Percent acquirer/target in same level-1 category	25.43%	46.07%	59.14%	26.28%	45.97%	59.23%
Percent acquirer/target in same level-1 & level-2	16.29%	27.36%	29.36%	16.92%	19.46%	26.25%
Percent acquirer/target in same country	60.54%	60.20%	55.37%	61.93%	59.40%	59.14%
Percent acquirer/target in same state	34.74%	30.92%	25.49%	25.98%	32.21%	22.48%
Percent acquirer/target in same city	8.85%	5.65%	4.89%	6.04%	5.03%	5.25%
Percent acquirer invested in target before	0.56%	0.17%	0.46%	1.21%	0.34%	0.79%

Note: Standard deviations in parentheses. Market values and $ raised in millions of US dollars.

TABLE B.13. 200M HSR Thresholds and the Cumulative Value of Series (Public non-PE, Narrow)

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	3,711	118	113
# of series per acquirer	1.93	23.60	6.65
Avg. length per series (# of follow-on deals)	2.40	2.96	2.90
# of Series (no deal value crossing HSR threshold)	2,851 (76.83%)	94 (79.66%)	57 (50.44%)
# of Series (only cumulative deal value crossing HSR threshold)	97 (2.61%)	1 (0.85%)	2 (1.77%)
# of Series (both single and cumulative value crossings)	763 (20.56%)	23 (19.49%)	54 (47.79%)
Avg. % of deals that would be investigated under single crossing	8.91%	4.78%	18.40%
Avg. % of deals that would be investigated under cumulative crossing	12.87%	8.67%	30.88%
Avg. differences in % of deals investigated cumulative vs. single	3.96%	3.89%	12.48%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	743	23	53
$0 <$ # of series with time gap ≤ 1 year	5	0	0
$1 <$ # of series with time gap ≤ 2 years	5	0	0
$2 <$ # of series with time gap ≤ 3 years	5	0	1
$3 <$ # of series with time gap ≤ 4 years	2	0	0
$4 <$ # of series with time gap ≤ 5 years	2	0	0
# of series with time gap > 5 years	1	0	0
# of series with deal gap $= 0$	743	23	53
# of series with deal gap $= 1$	12	0	0
# of series with deal gap $= 2$	1	0	0
# of series with deal gap $= 3$	3	0	0
# of series with deal gap $= 4$	2	0	1
# of series with deal gap ≥ 5	2	0	0

Note: Top 1% public tech firms are defined based on average market capitalization in our sample, excluding PE firms, GAFAM, and all the acquirers classified as non-technology companies by S&P. We use the first single crossing and first cumulative crossing of each series for comparison. The deal gap is calculated using deal serialness, which is defined as 0 for singletons, 1 for initial in a series, 2 for the first follow-on, 3 for the second follow-on, etc.

TABLE B.14. 200M HSR Thresholds and the Cumulative Value of Series (Public non-PE, Wide)

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	3,940	66	91
# of series per acquirer	1.62	13.20	5.06
Avg. length per series (# of follow-on deals)	3.31	7.89	5.30
# of Series (no deal value crossing HSR threshold)	2,946 (74.77%)	42 (63.64%)	46 (50.55%)
# of Series (only cumulative deal value crossing HSR threshold)	132 (3.35%)	1 (1.52%)	3 (3.30%)
# of Series (both single and cumulative value crossings)	862 (21.88%)	23 (34.85%)	42 (46.15%)
Avg. % of deals that would be investigated under single crossing	8.13%	5.60%	15.96%
Avg. % of deals that would be investigated under cumulative crossing	14.29%	22.73%	34.73%
Avg. differences in % of deals investigated cumulative vs. single	6.17%	17.13%	18.77%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	821	22	40
$0 <$ # of series with time gap ≤ 1 year	5	0	0
$1 <$ # of series with time gap ≤ 2 years	11	0	0
$2 <$ # of series with time gap ≤ 3 years	7	0	1
$3 <$ # of series with time gap ≤ 4 years	6	0	1
$4 <$ # of series with time gap ≤ 5 years	4	0	0
# of series with time gap > 5 years	8	1	0
# of series with deal gap $= 0$	821	22	40
# of series with deal gap $= 1$	9	0	1
# of series with deal gap $= 2$	12	0	0
# of series with deal gap $= 3$	5	0	0
# of series with deal gap $= 4$	7	0	1
# of series with deal gap ≥ 5	8	1	0

Note: Top 1% public tech firms are defined based on average market capitalization in our sample, excluding PE firms, GAFAM, and all the acquirers classified as non-technology companies by S&P. We use the first single crossing and first cumulative crossing of each series for comparison. The deal gap is calculated using deal serialness, which is defined as 0 for singletons, 1 for initial in a series, 2 for the first follow-on, 3 for the second follow-on, etc.

Appendix C. Time gaps and data imputation HSR crossing

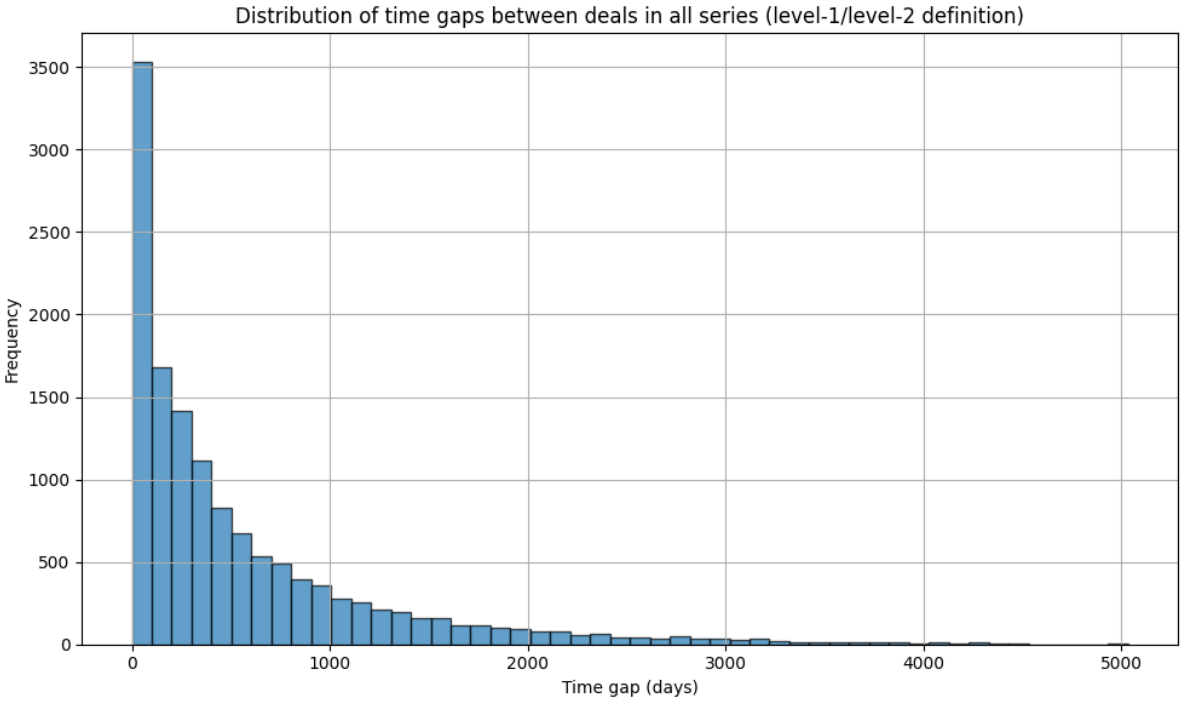


FIGURE C.1. Distribution of time gaps between deals in all series (level-1/level-2 definition)

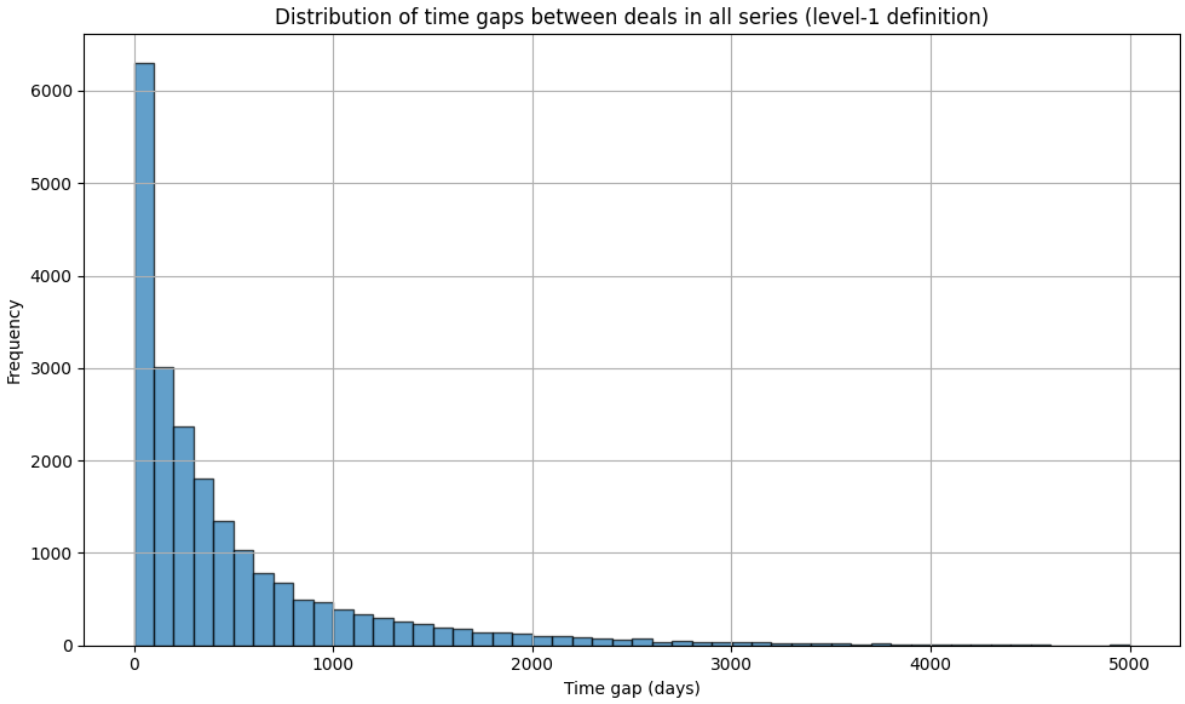


FIGURE C.2. Distribution of time gaps between deals in all series (level-1 definition)

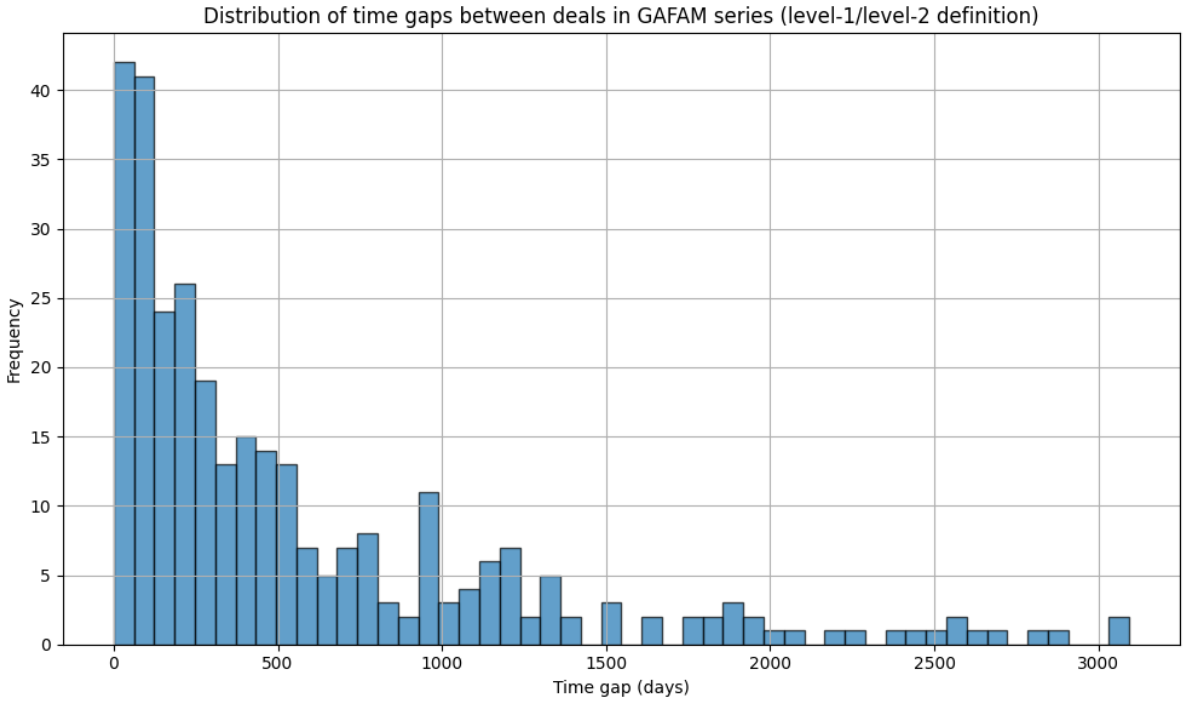


FIGURE C.3. Distribution of time gaps between deals in GAFAM series (level-1/level-2 definition)

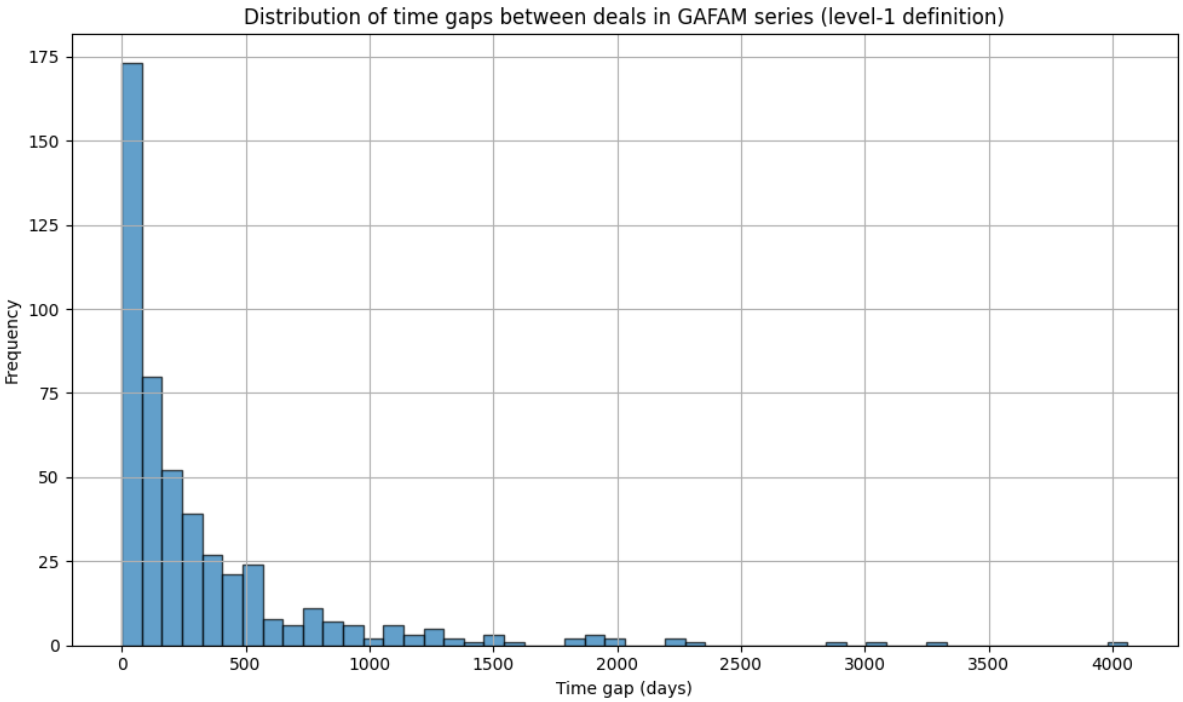


FIGURE C.4. Distribution of time gaps between deals in GAFAM series (level-1 definition)

TABLE C.1. HSR Thresholds and the Cumulative Value of Series (Average Imputation, Narrow)

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	6,755	101	102
# of series per acquirer	1.41	16.83	6.80
Avg. length per series (# of follow-on deals)	1.99	3.05	2.87
# of Series (no deal value crossing HSR threshold)	4,545	51	29
	(67.28%)	(50.50%)	(28.43%)
# of Series (only cumulative deal value crossing HSR threshold)	641	18	4
	(9.49%)	(17.82%)	(3.92%)
# of Series (both single and cumulative value crossings)	1,569	32	69
	(23.23%)	(31.68%)	(67.65%)
Avg. % of deals that would be investigated under single crossing	11.52%	9.22%	32.43%
Avg. % of deals that would be investigated under cumulative crossing	17.13%	21.09%	44.09%
Avg. differences in % of deals investigated cumulative vs. single	5.61%	11.87%	11.66%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	1,483	29	69
$0 <$ # of series with time gap ≤ 1 year	34	3	0
$1 <$ # of series with time gap ≤ 2 years	21	0	0
$2 <$ # of series with time gap ≤ 3 years	10	0	0
$3 <$ # of series with time gap ≤ 4 years	3	0	0
$4 <$ # of series with time gap ≤ 5 years	5	0	0
# of series with time gap > 5 years	13	0	0
# of series with deal gap $= 0$	1,483	29	69
# of series with deal gap $= 1$	41	2	0
# of series with deal gap $= 2$	20	0	0
# of series with deal gap $= 3$	12	1	0
# of series with deal gap $= 4$	1	0	0
# of series with deal gap ≥ 5	12	0	0

Note: Top 1% public tech firms are defined based on average market capitalization in our sample, excluding PE firms, GAFAM, and all the acquirers classified as non-technology companies by S&P. We use the first single crossing and first cumulative crossing of each series for comparison. The deal gap is calculated using deal serialness, which is defined as 0 for singletons, 1 for initial in a series, 2 for the first follow-on, 3 for the second follow-on, etc.

TABLE C.2. HSR Thresholds and the Cumulative Value of Series (Median Imputation, Narrow)

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	6,755	101	102
# of series per acquirer	1.41	16.83	6.80
Avg. length per series (# of follow-on deals)	1.99	3.05	2.87
# of Series (no deal value crossing HSR threshold)	4,884 (72.30%)	63 (62.38%)	31 (30.39%)
# of Series (only cumulative deal value crossing HSR threshold)	302 (4.47%)	6 (5.94%)	2 (1.96%)
# of Series (both single and cumulative value crossings)	1,569 (23.23%)	32 (31.68%)	69 (67.65%)
Avg. % of deals that would be investigated under single crossing	11.52%	9.22%	32.43%
Avg. % of deals that would be investigated under cumulative crossing	15.79%	16.95%	43.48%
Avg. differences in % of deals investigated cumulative vs. single	4.27%	7.73%	11.05%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	1,512	30	69
$0 <$ # of series with time gap ≤ 1 year	19	2	0
$1 <$ # of series with time gap ≤ 2 years	17	0	0
$2 <$ # of series with time gap ≤ 3 years	5	0	0
$3 <$ # of series with time gap ≤ 4 years	3	0	0
$4 <$ # of series with time gap ≤ 5 years	3	0	0
# of series with time gap > 5 years	10	0	0
# of series with deal gap $= 0$	1,512	30	69
# of series with deal gap $= 1$	26	2	0
# of series with deal gap $= 2$	13	0	0
# of series with deal gap $= 3$	6	0	0
# of series with deal gap $= 4$	1	0	0
# of series with deal gap ≥ 5	11	0	0

Note: Top 1% public tech firms are defined based on average market capitalization in our sample, excluding PE firms, GAFAM, and all the acquirers classified as non-technology companies by S&P. We use the first single crossing and first cumulative crossing of each series for comparison. The deal gap is calculated using deal serialness, which is defined as 0 for singletons, 1 for initial in a series, 2 for the first follow-on, 3 for the second follow-on, etc.

TABLE C.3. HSR Thresholds and the Cumulative Value of Series (Average Imputation, Wide)

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	8,691	65	85
# of series per acquirer	1.34	10.83	5.67
Avg. length per series (# of follow-on deals)	2.47	7.55	5.25
# of Series (no deal value crossing HSR threshold)	5,651	20	23
	(65.02%)	(30.77%)	(27.06%)
# of Series (only cumulative deal value crossing HSR threshold)	1,028	14	4
	(11.83%)	(21.54%)	(4.71%)
# of Series (both single and cumulative value crossings)	2,012	31	58
	(23.15%)	(47.69%)	(68.24%)
Avg. % of deals that would be investigated under single crossing	10.60%	11.68%	30.49%
Avg. % of deals that would be investigated under cumulative crossing	18.40%	42.80%	50.43%
Avg. differences in % of deals investigated cumulative vs. single	7.80%	31.12%	19.94%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	1,832	24	57
$0 <$ # of series with time gap ≤ 1 year	70	5	0
$1 <$ # of series with time gap ≤ 2 years	48	1	0
$2 <$ # of series with time gap ≤ 3 years	20	0	1
$3 <$ # of series with time gap ≤ 4 years	15	0	0
$4 <$ # of series with time gap ≤ 5 years	10	1	0
# of series with time gap > 5 years	17	0	0
# of series with deal gap $= 0$	1,831	24	57
# of series with deal gap $= 1$	71	2	0
# of series with deal gap $= 2$	47	2	0
# of series with deal gap $= 3$	23	0	1
# of series with deal gap $= 4$	15	0	0
# of series with deal gap ≥ 5	25	3	0

Note: Top 1% public tech firms are defined based on average market capitalization in our sample, excluding PE firms, GAFAM, and all the acquirers classified as non-technology companies by S&P. We use the first single crossing and first cumulative crossing of each series for comparison. The deal gap is calculated using deal serialness, which is defined as 0 for singletons, 1 for initial in a series, 2 for the first follow-on, 3 for the second follow-on, etc.

TABLE C.4. HSR Thresholds and the Cumulative Value of Series (Median Imputation, Wide)

	All Acquirers	GAFAM	Top 1% public tech firms
Panel A: All Series			
Total # of series	8,691	65	85
# of series per acquirer	1.34	10.83	5.67
Avg. length per series (# of follow-on deals)	2.47	7.55	5.25
# of Series (no deal value crossing HSR threshold)	6,186	25	26
	(71.18%)	(38.46%)	(30.59%)
# of Series (only cumulative deal value crossing HSR threshold)	493	9	1
	(5.67%)	(13.85%)	(1.18%)
# of Series (both single and cumulative value crossings)	2,012	31	58
	(23.15%)	(47.69%)	(68.24%)
Avg. % of deals that would be investigated under single crossing	10.60%	11.68%	30.49%
Avg. % of deals that would be investigated under cumulative crossing	16.63%	37.98%	50.20%
Avg. differences in % of deals investigated cumulative vs. single	6.04%	26.30%	19.71%
Panel B: Conditional on series with both single crossing and cumulative crossing			
# of series with time gap $= 0$	1,895	28	57
$0 <$ # of series with time gap ≤ 1 year	44	3	0
$1 <$ # of series with time gap ≤ 2 years	37	0	1
$2 <$ # of series with time gap ≤ 3 years	12	0	0
$3 <$ # of series with time gap ≤ 4 years	7	0	0
$4 <$ # of series with time gap ≤ 5 years	5	0	0
# of series with time gap > 5 years	12	0	0
# of series with deal gap $= 0$	1,895	28	57
# of series with deal gap $= 1$	44	0	0
# of series with deal gap $= 2$	32	0	1
# of series with deal gap $= 3$	13	0	0
# of series with deal gap $= 4$	12	2	0
# of series with deal gap ≥ 5	16	1	0

Note: Top 1% public tech firms are defined based on average market capitalization in our sample, excluding PE firms, GAFAM, and all the acquirers classified as non-technology companies by S&P. We use the first single crossing and first cumulative crossing of each series for comparison. The deal gap is calculated using deal serialness, which is defined as 0 for singletons, 1 for initial in a series, 2 for the first follow-on, 3 for the second follow-on, etc.