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doi: <https://doi.org/10.57709/35143510>

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*The Effects of Information Acquisition on Mergers and Acquisitions:
Evidence from SEC EDGAR Web Traffic*

BY

XIAOYU WANG

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Doctor of Philosophy

In the Robinson College of Business

Of

Georgia State University

GEORGIA STATE UNIVERSITY
ROBINSON COLLEGE OF BUSINESS
2023

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ACCEPTANCE

This dissertation was prepared under the direction of the *Xiaoyu Wang* Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

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ABSTRACT

*The Effects of Information Acquisition on Mergers and Acquisitions:
Evidence from SEC EDGAR Web Traffic*

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Xiaoyu Wang

04/19/2023

Committee Chair: *Omesh Kini*

Major Academic Unit: *Finance*

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The Effects of Information Acquisition on Mergers and Acquisitions: Evidence from SEC EDGAR Web Traffic

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April 18, 2023

Abstract

I test the impact of information acquisition (proxied by SEC EDGAR web traffic) on market informativeness about deal value creation in mergers and acquisitions (M&As). Information acquisition about merging firms, industry rivals, and supply-chain firms enhance short-term market reactions informativeness about long-term merger operating synergies. The effects are more pronounced among M&As with more sophisticated investors, new information, and pre-merger information asymmetry. Furthermore, information acquisition about merging firms improves the market's assessment of financial synergies. In addition, non-deal related firms with more downloads experience an increase in subsequent takeover probability. The evidence from difference-in-differences analysis and instrumental approach analysis suggests potential casual effects of information acquisition on market reaction informativeness. Overall, this paper demonstrates that information acquisition improves the market's assessment of value creation in M&As.

JEL Classification: G14, D81, G34

Keywords: Information acquisition, stock market reaction, market efficiency, mergers and acquisitions

¹ I am grateful to Omesh Kini (Chair), Mark Chen, Chip Ryan, Sean Cao, Lixin Huang, Baozhong Yang, Alan Moreira, Matthew Serfling, Tao Shu, Kai Li, Iftekhar Hasan, and Ron Masulis for helpful suggestions. I also thank seminar discussants and participants at Global Finance Conference (2021), Dayton Summer Finance Workshop (2021), Financial Management Association Meetings (2021), American Finance Association Meetings Ph.D. Poster Session (2022), Atlanta Rising Scholar Symposium in Finance (2022), Midwest Finance Association Meetings (2022), Chinese University of Hongkong (Shenzhen), Fordham University, Fudan University, Peking University HSBC Business School, University of Memphis, University of New South Wales, University of South Florida, University of St. Thomas, and Simon Fraser University for their valuable comments. All errors are my own. Please send all correspondence to Joanna (Xiaoyu) Wang, J. Mack Robinson College of Business of Georgia State University, 35 Broad Street NW Atlanta, GA, 30303. E-mail: xwang58@gsu.edu.

1. Introduction

Mergers and acquisitions (M&As) are major corporate events that have widespread consequences for merging firms (Alexandridis, Antypas, and Travlos, 2017) as well as firms economically related to them (Eckbo, 1983; Stillman, 1983; Fee and Thomas, 2004; Shahrur, 2005).² The short-term stock market reactions to merger announcements have been widely used by economists as estimates of the value created by these deals (Andrade, Mitchell, and Stafford, 2001; Moeller, Schlingemann, and Stulz, 2007; Fich, Nguyen, and Officer, 2018). Many other studies rely on market reactions to merger lawsuits and anti-trust regulations in M&As to generate policy implications (Ellert, 1976; Wier, 1983; MacKinlay, 1997).³ The implicit assumption is that the market will capitalize any value implications of these deals into stock prices upon deal announcement. As such, the short-term market reaction should be a good predictor of future merger synergies. Some studies, however, suggest that short-term market reactions do not reflect long-term merger outcomes (e.g., Ben-David, Bhattacharya, and Jacobsen, 2020; Malmendier, Moretti, and Peters, 2018; Dasgupta, Harford, and Ma, 2019; Rosen, 2006; Bouwman, Fuller, and Nain, 2009).⁴ These findings cast doubt on whether the stock market reaction to a merger announcement is a reliable indicator of long-term merger value-creation.

The extent of information acquisition by market participants upon deal announcements can have a bearing on the relation between short-term market reactions and long-term merger outcomes. Investors who

² For example, in 2021, the total value of US mergers and acquisitions was 2.9 trillion US dollars, accounting for almost 60% of all deals worldwide.

³ In addition, economic institutions, courts, and security litigants use event studies to estimate investor loss in corporate fraud and economic damages in mergers (Bhagat and Romano 2002; Dunbar and Sen, 2009).

For details in the security litigation rule 10b-5, see:

https://www.law.cornell.edu/wex/rule_10b-5

For examples in the security legislation, see:

<https://law.justia.com/cases/federal/district-courts/FSupp/979/1021/1447005/>

⁴ For instance, Malmendier, Moretti, and Peters (2018) find that contest winners have worse long-term performance, and announcement-period abnormal returns fail to identify this underperformance. Other studies document that short-term market reactions could be relevant to factors unrelated to merger value-creation, such as earnings per share (Dasgupta, Harford, and Ma, 2019) and market conditions (Rosen, 2006; Bouwman, Fuller, and Nain, 2009). In addition, most of these papers only focus on the acquirer's announcement returns. In this paper, I use combined abnormal stock return as a more reasonable proxy for market expectations of potential deal value-creation.

trade on stocks without information can cause stock prices to deviate from true fundamental values (Shleifer and Summers, 1990; De Long, Shleifer, Summers, and Waldmann, 1990; Shleifer and Vishny, 1997; Bloomfield, O'Hara, and Saar, 2009). Acquiring merger-related information facilitates market expectations about the value created by a deal. However, information acquisition is costly because it requires investors to devote considerable time and effort to collect and process the information (Grossman and Stiglitz, 1980; Diamond and Verrecchia, 1981; Verrecchia, 1982). Relatedly, estimating merger synergies from stock prices can be misleading when information acquisition is costly. Thus, it is important to understand the information content of market prices when evaluating merger synergies.

This paper uses SEC EDGAR web traffic to empirically quantify the information acquired by market participants about merger deals, which can potentially improve our understanding of the extent to which stock market reactions to deal announcements are reliable indicators of value creation in these deals. Specifically, this study seeks to answer the following questions: (i) Does increased information acquisition around the merger announcement make stock price changes better indicators of long-term merger synergies? (ii) Which type of investors gathers information and contributes to the informativeness of stock prices? (iii) What information is acquired to improve market informativeness? (iv) Are information acquisition effects more pronounced when ex-ante information asymmetry exists between market investors and firm insiders? (v) Does information acquisition on merger-related firms inform investors about these firms' future takeover opportunities?

Based on the efficient market hypothesis, stock price reactions to announcements of various corporate events are expected to capture the value impact of these events (Fama, Fisher, Jensen, and Roll, 1969). An underlying assumption of this argument is that the market is informationally efficient at least in the semi-strong form (Fama, 1970, 1976). However, the assumption is undermined when available information is not fully acquired by the market. Prior studies find that increased information acquisition can improve firm-level stock price efficiency (Ko and Huang, 2007; Drake, Roulstone, and Thornock, 2015; Chen, Ma, Martin, and Michaely, 2022). In mergers and acquisitions, some information that can be used to predict

future performance in combined firms, even though publicly available, may not be reflected in stock prices.⁵ Increased information acquisition will improve the ability of short-term stock price changes to capture long-run deal value creation. I, therefore, hypothesize that information acquisition about merging firms improves market informativeness about deal synergies, thus strengthening the relation between short-term market reactions and long-term merger performance.

Information acquisition about rivals, suppliers, and customers of merging parties can also facilitate the market's assessment of deal synergies achieved by combined firms. Specifically, deal synergies can be gained or lost from changes in collusion probability among rivals and rents extracted along the supply chain (Eckbo, 1983; Stillman, 1983; Fee and Thomas, 2004; Shahrur, 2005). Additionally, information diffusion occurs through economic links (Hou, 2007; Tookes, 2008; Foster 1981; Clinch and Sinclair, 1987; Han and Wild, 1990; Pyo and Lustgarten, 1990; Asthana and Mishra, 2001; Ramnath, 2002; Thomas and Zhang, 2008). Hence, information about rivals, suppliers, and customers of merging firms can provide industry-specific or supply-chain-specific information for merger valuation purposes.

The effects of information acquisition on stock market reactions could also vary with investor sophistications, the types of information acquired, and pre-merger information asymmetry between investors and firm insiders. First, institutional investors can better understand complex financial information than retail investors (Lakonishok, Shleifer, and Vishny, 1992). Traders with superior information processing skills can convert news into valuable information for trading (Kandel and Pearson, 1995). Consistent with this view, Drake, Johnson, Roulstone, and Thornock (2020) find that the information

⁵ Information acquisition can be affected by several determinants. Theoretical studies predict that the arrival of new information (Kim and Verrecchia, 1997), limited attention (Hirshleifer and Teoh, 2003), acquisition cost, and expected trading benefits (Grossman and Stiglitz, 1980; Diamond and Verrecchia, 1981) affect investors' incentives or ability to acquire information. The variation in information acquisition across deals can be affected by the characteristics of the merging firms. In this paper, I exploit determinants of investors' information acquisition, including deal level valuation uncertainty proxied by the percentage of stock to finance the deal, potential value creation proxied by relative size (Servaes, 1991), merging firm's information environment proxied by target and acquirer size, market valuation proxied by BM ratio, and merging firms' valuation uncertainty proxied by target and acquirer's short interests and stock volatility. Table Appendix A4 reports the estimates of multivariate regression on the determinants of deal-level information acquisition (Panel A).

acquisition activity of more sophisticated institutional users (e.g., hedge funds, investment banks) are more strongly associated with future performance than those of less sophisticated retail users. In addition, institutional investors may make larger trades which have bigger impacts on price.⁶ Therefore, I expect that information acquisition by institutional investors will have a relatively stronger impact on the informativeness of stock market reactions to deal announcements. Second, market investors have access to both previously disclosed information and newly released merger-related information when deals are announced. Some previously disclosed information might have already been processed by investors. However, new filings reported around the deal announcement provides additional information that has not been incorporated into stock prices. Hence, one should expect that the relation between information acquisition and stock price informativeness are stronger for deals with more new information. Third, investors have more incentives to acquire information for firms with opaque information environment due to potential trading benefits. The market informativeness about firm fundamentals should improve more if ex-ante stock prices are less informed. Thus, the effects of information acquisition will be stronger when merging firms have large pre-merger information asymmetry.

Investors' information acquisition activities can have spillover effects on merger propagation among non-deal firms in the post-merger period. Information acquired from merging firms also helps investors understand other investment opportunities in non-deal firms. Mergers frequently occur in waves (Mitchell and Mulherin 1996; Harford, 2005) through economic links within the same industry (Song and Walkling, 2000; Cai, Song, and Walkling, 2011) and between different industries (Galbraith, 1952; Ahern and Harford, 2014). With information revealed from merger events about fundamental changes in the merging and merger-related industries, investors can exploit benefits by trading stocks of other non-deal firms that are likely to participate in merger activities subsequently. Conditional on information acquisition from merging firms, investors may also collect information from non-deal firms to explore potential investment

⁶ Furthermore, empirical studies find that stocks held by institutions are more efficiently priced (Boehmer and Kelley, 2009), better governed (Chung and Zhang, 2011), and have lower agency costs (Wang and Nanda, 2011) than stocks held by retail investors, which suggest that institutional traders are better informed.

opportunities. In addition, Drake, Johnson, Roulstone, and Thornock (2020) and Lee and So (2017) document that investors' expectations for firms' prospects can be inferred from their effort allocation or information acquisition behavior. Information acquisition from non-deal firms, thus, should improve and reflect market expectations of future takeover probabilities of these firms.⁷ Overall, I expect that the likelihood of subsequent mergers in non-deal firms increases with the intensity of information acquisition on these firms.

Many market participants gather and process financial information from SEC EDGAR filings⁸ and there are several advantages of using the EDGAR web traffic as a proxy for information acquisition. First, compared to other sources of information, SEC filings provide comprehensive information for market investors in a timely manner and a standardized format.⁹ In contrast, both the timing and contents of news announced on public media or commercial websites are selective and voluntarily disclosed. Second, EDGAR web traffic can better capture market informativeness than other trading-based measures (e.g., informed trading, stock price synchronicity). Investors' information gathering activities could explain subsequent trading behaviors. More importantly, the EDGAR web traffic data allows us to track the IP address, filing date, firm CIKs, and form identifier of each filing download request. These details can help researchers identify which group of investors acquired the information, the time of information released, and the types of information acquired.

The empirical analyses start with the effects of information acquisition on the relation between stock market reactions to the merger announcement and deal synergies measured by changes in the operating performance (industry-adjusted ROA) of merged firms in one-, two-, and three-years after the merger. The

⁷ I define related non-deal firms as those who experience information acquisition by merger-related investors. I define merger-related investors as IP users who have downloaded at least one filing by either the target or the acquirer within a [-5, +5] day window around deal announcements.

⁸ These market participants include retail investors (Drake, Roulstone, and Thornock, 2015), financial analysts (Gibbons, Iliev, and Kalodimos, 2021), institutional investors (Chen, Cohen, Gurun, Lou, and Malloy, 2020), hedge funds (Crane, Crotty, and Umar, 2022), and the Federal Reserve (Li, Lind, Ramesh, and Shen, 2018).

⁹ For instance, the SEC requires firms to report specific filings (e.g., 8-K) within four days of the occurrence of any material event.

main sample consists of 1,524 deals announced from 2003 to 2016, including mergers, acquisitions of majority interests, and acquisitions of assets among US public targets and acquiring firms. The information acquisition measure is the number of unique IP users who download SEC filings from both target and acquiring firms (scaled by total market downloads¹⁰) within the [-5, +5] day window around merger announcements.¹¹ The regression results suggest that the relation between combined cumulative abnormal stock returns (CAR) and post-merger change in operating performance gets stronger with more download activities.¹² Additional results show that download activities are positively correlated with trading volumes in both target and acquiring firms around deal announcements, confirming that information acquisition affects market informativeness through trading activities.

Though the above results suggest that information acquisition facilitates the market's assessment of deal synergies, they do not establish a causal link between information acquisition and the informativeness of stock market reactions. The first potential concern is that stock price movements can precede information acquisition activities, which raises the possibility of reverse causality. For example, target stock price movements around the deal announcement can attract investors to gather information about merger events. To address this concern, I exploit a difference-in-differences analysis using the staggered adoption of SEC eXtensible Business Reporting Language (XBRL) between 2009 and 2011 as a series of exogenous shocks to information processing costs.¹³ In 2009, the SEC issued a mandate requiring firms to report their filings in XBRL format, which was phased in three stages between 2009 and 2011.¹⁴ The tagged data reported in XBRL filings make it easier for investors to read and process information.¹⁵ This exogenous decrease in

¹⁰ The market downloads also count unique IP users.

¹¹ Results hold for various robust measures. Details are reported in the robustness section.

¹² The results hold for various alternative measures of merger performance, such as changes in capital expenditures, changes in return on assets without industry benchmark adjustment, and changes in operating margin.

¹³ According to the SEC (2009), XBRL adoption standardizes corporate filings and makes them easier to download and process, thus increasing information processing efficiency (<https://www.sec.gov/rules/final/2009/33-9002.pdf>).

¹⁴ The SEC launched a voluntary interactive data program to encourage firms to prepare reports in the XBRL format since 2005. The mandated XBRL rule applies to firms with public equity over \$5 billion in 2009, firms over \$700 million in 2010, and all remaining public firms in 2011.

¹⁵ There are advantages of collecting and analyze data in the XBRL format. First, XBRL filings are reported in a standard language, which permits investors to collect information from financial statements with less time and

information processing costs will increase investors' incentives to collect more information and improve their ability to process information. The results show that the relation between market reactions and long-term deal synergies are strengthened when the merger is announced in the post-XBRL-adoption period and when both merging firms adopted the rule. The results do not fully rule out the possibility that stock price changes may affect information acquisition activities, but they suggest directional causal effects of information acquisition on the informativeness of the stock market's reaction to a merger.

The second endogeneity concern is the omitted variable bias. For example, unobserved time-varying shocks can simultaneously affect firms' information acquisition as well as changes in stock prices. For instance, technological changes in industries can trigger mergers (Mitchell and Mulherin, 1996), and firms' technological innovations can increase production efficiency and firm value (Kogan, Papanikolaou, Seru, and Stoffman, 2017). Concurrently, new technologies attract attention and induce market participants to acquire more information. Thus, a positive technological shock (good news about firm innovation) around merger announcements can cause increases in stock prices and information acquisition simultaneously. To address this concern, I implement an instrumental variable approach using a two-stage least squares (2SLS) regression approach. I use the following instrumental variables: 1) average number of market-adjusted downloads around deal announcements in non-deal industries that are connected with the merging firms through previous common downloading activity and 2) number of amendments to past mandatory disclosures separately by acquiring firms and target firms. The distraction to investors measured by download activities in non-deal industries may reduce investors' efforts to acquire and process value-related information about merging firms.¹⁶ In addition, firms that issue a larger number of amendments are more likely to experience changes in their information environment, leading to higher valuation uncertainty and larger expected trading benefits from information acquisition. Hence, higher pre-merger firm amendments

processing efforts. Second, XBRL data can be easily transformed into Excel or SQL, which enables simpler and more efficient data analysis.

¹⁶ The exclusion condition is also satisfied because non-deal industries' download activities are unlikely to affect investors informativeness about merger synergies.

should be positively correlated with information acquisition activities around deal announcements. The empirical results show that downloading activity in non-deal industries negatively predict downloading activity in merging firms and the acquiring firm's past filing amendments positively predict download activity in merging firms. In the second stage, I find results consistent with OLS estimates, which allows me to again conclude that greater downloading activity in merging firms enhances the relation between short-term market reactions and changes in long-term operating performance. Thus, the 2SLS analysis suggests a causal relation between information acquisition activities and market informativeness on deal synergies.¹⁷

I then test the effects of information acquisition about economically linked firms (e.g., rivals, suppliers, and customers) on the relation between CAR and changes in industry-adjusted ROA. Merger-related information comes not only from merging firms but also from other related firms. Since deal synergies can be affected by changes in market position or collusion among supply-chain firms, information about economically linked firms should also improve the market's understanding of the potential for value creation in the combined firms. Consistent with the prediction, I find that information acquisition about merger-related firms also strengthens the relation between stock market reactions and post-merger changes in operating performance.

To explore the heterogeneity of information acquisition across mergers with different investor sophistications, I use a unique dataset that contains the IP addresses of institutional investors to identify download activities by these investors.¹⁸ I find that information acquisition only significantly strengthens the relation between combined CAR and the change in post-merger operating performance when deals are the subject of more institutional downloads. The results suggest that institutional investors facilitate the incorporation of information into merging firms' stock prices.

¹⁸ I identify institutional IP users using the GeoLite2 database.
<https://www.maxmind.com/en/accounts/457688/geoip/downloads>

Next, I study the difference between the effects of new versus stale information about mergers available to the market. To identify mergers with more new information, I first divide the sample based on whether the focal deal is the initial bid in the target industry during the prior 12 months. The positive effects of information acquisition on market efficiency in a deal are likely to be stronger if the focal deal is the first in the target industry because information about the merger and its product-market effects will be relatively new to the market. Second, I divide the sample based on whether investors download more (above the sample median) newly issued filings. The effects of information acquisition are likely to be stronger if more of the filings downloaded are recently reported to the SEC. Consistent with these expectations, the results suggest that information acquisition significantly improves the market's understanding of deal synergies when the information is new.

To test whether market reaction informativeness varies with the pre-merger information environment, I investigate the heterogeneity across deals with different levels of pre-merger information asymmetry. I exploit four different measures of information asymmetry from the literature, including filings readability (Campbell, Chen, Dhaliwal, Lu, and Steele, 2014), short interest (Senchack and Starks, 1993), analyst dispersion (Drobetz, Grüniger, and Hirschvogel, 2010), and analyst coverage (Derrien and Kecskés, 2013) in the subsample analyses. Intuitively, firms with lower filings readability, less short interest, large analyst dispersion, and low analyst coverage should have large information asymmetry between investors and firm insiders. Dividing the sample based on each of these four proxies, I find that the effects of information acquisition are stronger when target and acquiring firms have large information asymmetries in the pre-merger period.

To deepen our insights into the role of information acquisition in mergers and acquisitions, I test whether information acquisition activities improve the market's understanding of financial synergies achieved through mergers. A decrease in the cost of capital will increase the value of the combined firms. Hence, the market reaction should decrease as the cost of capital changes around merger completion, and increased information acquisition should strengthen this negative relation. Following Gebhardt, Lee, and

Swaminathan (2001), I use quarterly data to construct the benchmark-adjusted changes in the cost of capital of the merged firms. Consistent with the argument that information acquisition improves the market's understanding of deal financial synergies, I find that the information acquired about merging firms makes the relation between combined CAR and the change in post-merger benchmark-adjusted implied cost of capital of the combined firms more negative.

Lastly, I test whether non-deal firms' information acquisition around focal merger announcements can affect future takeover activities. When merger events reveal information about fundamental changes in the merging firms' industries, investors update their beliefs about the likelihood of non-deal firms' subsequent merger activities. I expect the probability of "related" non-deal firms participating in subsequent takeovers increases with the intensity of information acquisition from these firms. I find a significant positive correlation between information acquisition activities in non-deal firms and their future takeover probabilities over the one-, two-, and three years after the focal merger. Overall, the evidence supports the view that information acquisition reveals the market's anticipation of future takeovers.

This paper contributes to several strands of literature. First, it adds to the merger literature by providing provides a possible explanation of the inconsistency between the estimates of event studies and long-term merger outcomes. Andrade, Mitchell, and Stafford (2001), Moeller, Schlingemann, and Stulz (2007), Malmendier and Tate (2008), Savor and Lu (2009), Netter, Stegemoller, and Wintoki (2011), Fich, Nguyen, and Officer (2018), and Malmendier, Moretti, and Peters (2018), among many other studies, use stock market reactions as a measure of value creation in mergers and acquisitions but generally do not consistently document a positive correlation between market reactions and deal value-creation measured by long-term performance in acquiring firms.¹⁹ Consequently, this paper documents that insufficient information acquisition may explain the imprecise market reaction to corporate events.

¹⁹ Many other studies also find that stock prices do not reflect all available information, including papers that examine the post-earnings-announcement drift (Bernard and Thomas, 1989), accruals anomaly (Sloan, 1996), predictable events (Chang, Hartzmark, Solomon, and Soltes, 2017), financial reports (Cohen, Malloy, and Nguyen, 2020), and parent-subsidiary valuation arbitrage (Lamont and Thaler, 2003).

This paper adds to the studies on market information acquisition. From the information supply side, the literature shows that greater information production increases price informativeness (Bai, Philippon, and Savov, 2016; Gao and Huang, 2020). From the information demand side, market participants such as retail investors (Drake, Roulstone, and Thornock, 2015), financial analysts (Gibbons, Iliev, and Kalodimos, 2021), institutional investors (Chen, Cohen, Gurun, Lou, and Malloy, 2020), and hedge funds (Crane, Crotty, and Umar, 2022) acquire information and improve the efficiency of price formation. Bauguess, Cooney, and Hanley (2018) show that investors' information acquisition from EDGAR SEC affects IPO pricing. Unlike these studies, this paper uses mergers and acquisitions as a laboratory and provides evidence that information acquisition improves the market's ability to assess deal value creation. Consistent with the existing studies on the important role of institutional investors in price efficiency (Kandel and Pearson, 1995; Boehmer and Kelley, 2009; Drake, Johnson, Roulstone, and Thornock, 2020), this paper provides supportive evidence that institutional investors' information acquisition improves the market valuation of mergers.

This paper augments existing research on the determinants of mergers. Prior studies use predictive models to estimate a firm's likelihood of being a potential target firm. Most studies focus on firm-specific characteristics such as size, financial ratios, valuation, management inefficiencies, growth-resource mismatches, and economic disturbances (Gort, 1969; Palepu, 1982; Dietrich and Sorensen, 1984). Some more recent literature emphasizes the learning effects in mergers. Song and Walking (2000) document that the market reacts positively to target rivals with expectations on their future takeover probabilities. Bernard, Blackburne, and Thornock (2020) find that information flows between rivals predict their subsequent merger activities. This paper contributes to the literature by providing additional evidence that information acquisition activities in mergers can reflect and update market beliefs about non-deal firms' future takeover probabilities.

Lastly, this paper also sheds lights on the application of event studies in policy making and litigation. Many studies rely on market reactions to merger lawsuits and anti-trust regulations in M&As to generate

policy implications (Ellert, 1976; Wier, 1983; MacKinlay, 1997). Event studies have been widely used as a measurement of the impact upon stock prices of policy decisions, thus playing an important role in the decision-making process of corporate laws and shareholder lawsuits. (Bhagat and Romano 2002). Litigants use event studies to determine loss and damage in security litigation (Dunbar and Sen, 2009). However, there are increasing questions about the validity of the event study in different situations (Brav, and Heaton, 2015). By documenting the effects of investors' information acquisition on the informativeness of stock reactions to corporate events, this paper provides another important economic consideration (i.e., investors' informativeness) when litigates and policy makers use event studies to estimate impacts.

The rest of the paper is organized as follows. Section 2 describes the data and the construction of key variables. Section 3 reports the empirical analyses. Section 4 reports robustness tests. Section 5 concludes.

2. Data, Sample, and Variable Construction

2.1 SEC EDGAR data

The SEC EDGAR log file data contains daily filing download information from 2003 to 2017. Each daily log file provides the date and time of each download request by IP address. The daily server log dataset provides the SEC Central Index Key (CIK) under which filings are downloaded by investors, the IP address of each user, and the type of filings downloaded.²⁰ I focus on short-term download activities for two reasons. First, information acquired long before a deal announcement may be used by merging firms in their merger decisions. For example, acquirers may conduct search activities in the target selection process. In this case, download activities do not contribute to the market reaction to deal announcements. Second, download activities long after the deal announcement may be driven by other events that are less relevant to the merger.

Investors have access to various sources of information such as business media, SEC EDGAR filings,

²⁰ The typical IP address consists of four octets (e.g., “123.456.789.tba”), and the last octet is not published by SEC for the sake of privacy.

Bloomberg, and Google Search. Financial statements reported by the firm provide very useful and detailed information for various types of market participants, including financial analysts (Gibbons, Iliev, and Kalodimos, 2021), institutional investors (Chen, Cohen, Gurun, Lou, and Malloy, 2020), hedge funds (Crane, Crotty, and Umar, 2022), and the Federal Reserve (Li, Lind, Ramesh, and Shen, 2018).²¹ A key advantage of SEC EDGAR download data is that it provides the IP address and accession number (file identifier) of each download, which permits me to identify the group of investors who requested the filings, the filing date, and the types of filings requested. As reported in Appendix Table A2, merging firms disclose merger-related filings (e.g., 8-K, 425, 4, DEFA14A) on EDGAR in the [-5, +5] day window around deal announcements. Investors download both previously reported filings and newly issued filings around deal announcements. The merger-related filings around deal announcements constitute new information for the market. In addition, investors may view the information in past financial statements in an entirely new light when the merger is announced. Figures (in Appendix) A1 to A3 illustrate the time-series distribution of downloaded filings issue date in the past 24 months before deal announcements. A majority of filings downloaded are issued within several months before each deal announcement. However, as shown in Figure A2, investors also download many filings that were issued more than one year before the merger. Overall, SEC filings provide rich information for investors' merger valuations.

To study the relation between information acquisition and the informativeness of market reactions to mergers, I construct the information acquisition measure, *Deal ESV (EDGAR Searching Volume)*, using the number of unique IP users who download the filings of merging firms within a [-5, +5] day event window around each deal announcement. To eliminate the concern that certain systematic factors could deflate or inflate the total number of downloads for deals announced, I further adjusted the download measure by the raw number of downloads scaled by market downloads within the same window. Similarly, I construct

²¹ Drake, Roulstone, and Thornock (2015) show that information acquisition activities via EDGAR are positively correlated with mentions in the business press and Google searches, but the correlation is less than 0.5. This evidence suggests that EDGAR downloading activity provides a unique look at financial information acquisition that is distinct from proxies used in prior research (Da, Engelberg, and Gao, 2011; Johnman, Vanstone, and Gepp, 2018).

Rival ESV as the (market-adjusted) downloads of filings in three-digit SIC industry rival firms and *Customer/Supplier ESV* as the (market-adjusted) downloads of filings in supply-chain firms reported in Compustat Customer Segment data.²² Deals announced close to each other may have overlapping event windows, within which download activities may be related to any of the deals. To ensure that investors' download activities about non-deal firms (i.e., rival firms and supply-chain firms) are merger-related, I require that investors who download non-deal firms' filings must also download at least one filing of either the target or acquiring firm within the event window. Finally, following Lee, Ma, and Wang (2015), I exclude download activities that are likely to be performed by "robot" IP users who visit more than 50 firms in a day.

2.2 Mergers and acquisitions data

The information about mergers and acquisitions is from the SDC merger and acquisition database. The sample period spans from 2003 (the earliest year that the EDGAR web traffic data covers) to 2016. Following the literature, I require that: the transaction value is no less than one million US dollars; both target and acquirer are public US firms; the percent of target shares the acquirer is seeking to own after the transaction is larger than 50%; the percentage of shares held by the acquirer before the announcement is less than 15%. I restricted the deals to mergers, acquisitions of majority interests, and acquisitions of assets. Further, I require both the target and acquirer firms to have financial information in Compustat and CRSP before the deal announcement year. The final sample contains 1,524 deal announcements. Stock market reactions to mergers are measured by the cumulative abnormal weighted average return (*CAR*) of the target and acquiring firms (weighted by market capitalization on -42 day) within a [-5, +5] day window around deal announcements. The *CAR* is estimated from the market model with a window from the -42 day to the -294 day relative to deal announcement dates. Deal synergy, or the post-merger performance, is measured

²² Compustat Historical Segments data provides business and geography details, product information, and customer data for over 70% of the companies in the Compustat North American (NA) database. Companies are required to report information on their major customers under the Financial Accounting Standards Board (FASB) Statement of Financial Accounting Standards (SFAS) No. 131 and under rules put forth by the Securities and Exchange Commission (SEC).

as the net change of industry-adjusted operating performance (*ROA*) from year $t-1$ to $t+3$ around deal completion. *ROA* (return on assets) is calculated as the ratio of operating income before depreciation and amortization (*oibdp*) to total assets. The return on assets for the combined firm in any post-merger period is the return on assets for the acquiring firm. The return on assets for the combined firm in year $t-1$ is calculated as the weighted average return on assets for the target and acquiring firm, weighted by the total assets. The pre-merger performance in combined firms in year $t-1$ is calculated as the weighted average return on assets in the target and acquiring firm, weighted by the total assets. I also construct deal-level changes in the cost of capital as a measure of merger financial synergies. *AICC* is the net change in the benchmark-adjusted cost of capital. The quarterly implied cost of capital (equity) is estimated using Compustat/IBES/CRSP quarterly data following Gebhardt, Lee, and Swaminathan (2001). For each target and acquiring firms' cost of capital, I subtract the average cost of capital of benchmark portfolio firms selected from separately matching on the target and acquirer (3-digit SIC) industry, size, BM ratio, and quarterly downloads in the year before a deal announcement. The net changes in this measure are computed in the same manner as I computed the net change in *ROA*. Deal-level control variables include *Diversifying* deal indicator; *Relative Size* between target and acquiring firms; the percentage (in decimals) of shares traded in the transaction (*Stock (Pct)*); *Hostile* indicator; the percentage (in decimals) of target shares the acquirer held six months prior to the deal announcement (*Toehold*); *Acquirer (Target) Mkt_cap*; *Acquirer (Target)* book to market ratio; *Acquirer (Target) ROA*; and *Acquirer (Target) Cash*. Detailed variable definitions are reported in Appendix Table A1.

2.3 Summary statistics

Figure 1 illustrates EDGAR download activities around M&A announcements. Figures 1A and 1B illustrate the average raw number of daily downloads of SEC filings from the target and acquiring firms around deal announcements. Industry peer firms are defined as firms operating in the same three-digit SIC industry as either the acquirer or the target firm. Figures 2A and 2B illustrate the average number of daily downloads for firms operating in the target and the acquiring firms' industries. Figure 3 reports the average

downloads from supplier and customer firms (excluding merging firms). Download activities experience a spike for merging firms and their rivals, customers, and suppliers around deal announcements. This pattern suggests that investors' demand for information about potential changes caused by mergers is triggered by the financial news media when deal announcements become public information. Table 1 reports the summary statistics of the deal-level sample. Raw numbers of downloads in the 11-day window around deal announcements are reported in Panel A. On average, there are 674,806 downloads of SEC filings requested in all firms around each deal announcement. There are 515 downloads of filings for merging firms and 2,066 downloads of filings in total for rival firms of the merging parties. I identify institutional downloads using the GeoLite2 database. There are on average 15 unique institutional IP users who download merging firms' filings around deal announcements. Panel B reports the downloads scaled by the total number of market downloads. To address the concern that market movement affects the intensity of download activity, I use the scaled measures as my main measure of information acquisition in later sections.²³

Table A3 in Appendix reports the summary statistics of different types of filings downloaded in a [-5, +5] day window around deal announcements. Among all filings downloaded each day, only a small portion of them are regularly issued filings (i.e., 10-Ks and 10-Qs). Above 90% of filings downloaded prior to deal announcements are previously issued filings, but market attention significantly shifts to newly issued filings after deal announcements. For both newly issued and previously issued filings, investors download fewer regular filings than other types of filings (i.e., filings likely to be merger-related, such as 8-Ks).

Table 2 reports the deal statistics of the sample. About 40.6% of deals are diversifying deals in which the target is operating in a different three-digit SIC industry than the acquirer. On average, acquirers financed 37.2% of each deal with stock. The relative size measured by the market capitalization between target and acquiring firms is 45%. The acquirer and target firm's financial information, including Acquirer

²³ I use the market adjusted download measure as the main measure of information acquisition in this paper. Previous literature also considers abnormal downloads (adjusted for firms' previous download), which generate similar results for the main tests in this paper. However, market adjusted measure is appropriate in this setting because any download activities (both normal and abnormal downloads) happened around deal announcement should contribute to market informativeness about deal value-creation.

(Target) size, BM ratio, ROA, and cash scaled by total assets are obtained from the Compustat database. The average size measured by the natural logarithm of market capitalization is 8.099 for acquirers and 5.969 for targets. This corresponds to an average of 2.425 billion dollars market capitalization for target firms and 20.197 billion dollars for acquiring firms. The mean pre-merger *ROA* is 0.10 for acquiring firms, while it is 0.036 for target firms.

3. Empirical Tests

3.1. Deal-level information acquisition and stock market reactions

Information acquisition can improve the market's assessment of deal synergies, thus increasing the efficiency of the market's reaction to merger announcements. The efficiency of market reactions is captured by the correlation between the combined announcement-period abnormal returns of the merging firms and proxies for takeover synergies. The information acquisition measure includes downloads of filings for both merging firms, which are the main contributor to abnormal download activities around deal announcements. I first explore the effects of deal-level information acquisition on market reaction efficiencies in mergers and acquisitions. The regression that I estimate is from the following specification:

$$CAR_i = a + b*\Delta Post\text{-}merger\ performance_i + c*EDGAR\ searching\ volume_i + d*\Delta Post\text{-}merger\ performance_i * EDGAR\ searching\ volume_i + f*controls_i + e_j \quad (1)$$

Where the dependent variable *CAR* is the combined cumulative abnormal returns around merger announcements. $\Delta Post\text{-}merger\ performance$ is the net change in industry-adjusted operating performance from year t-1 to t+3 around deal completion. This specification is similar to that of DeLong and DeYoung (2007), who use the ex-post financial performance as a noisy proxy for actual investor knowledge about deal value creation upon deal announcement. Although the dependent variable *CAR* predates the independent variable (i.e., $\Delta Post\text{-}merger\ performance$), investors price the deal based on expected merger performance, which should be the same as post-merger merger performance if the market is fully efficient. If the market is not fully efficient, the relation may be weaker because some information reflected in post-

merger performance is not known to investors upon deal announcement. The objective of the baseline regression is to test whether information acquisition proxied by *EDGAR searching volume* could strengthen the causation between investors' knowledge about deal quality and market reactions.

[Insert Table 3 here]

Table 3 reports the estimates of the relation between investors' download activities and stock market reactions to merger announcements, conditional on the deal synergies measured by the post-merger change in long-term performance. The sample contains completed deals only. The dependent variable, *Combined CAR*, is the weighted average cumulative abnormal returns (*CAR*) in target and acquiring firms within a [-5, +5] day window around deal announcements and estimated from the market model. The weights are the market capitalization of the target and acquiring firms on day -42 relative to the announcement date. The *Deal ESV* is the total number of downloads from both merging firms around a deal announcement normalized by the market downloads within the same window. The main variables of interest are interactions of *Deal ESV* and deal synergies. The synergy measure, ΔROA , is the net change in the industry-adjusted operating performance in combined firms from t-1 to t+1, t+2, and t+3 years separately reported in Columns (1) through (3). I further add deal-level control variables including *Diversifying Deal*, *Relative size*, *Stock paid in the deal (%)*, *Hostile and Toehold*, and acquirer and target characteristics, including *size*, *BM*, *ROA*, and *cash*.

As shown in Table 3, the significant positive coefficients on the interaction of event downloads and post-merger performance suggest that information acquisition about merging firms enhances the correlation between proxies for deal synergy and stock market reaction around merger announcements. On average, a one standard deviation increase in the intensity of information acquisition results in a 0.436 increase in the relation between market reactions and deal synergies gained in the three years after the merger.²⁴ In untabulated results, I do not find a significant relation between the market reaction to deal announcements and

²⁴ Calculated as the coefficient estimate on the interaction term (4.313) multiplied by the standard deviation of deal-level information acquisition variable (0.101).

deal value creation proxied by post-merger performance.²⁵ I further explore the relation between EDGAR searching volume and trading volume in Appendix Table A5. A positive relation exists for both the pre-announcement period (Panel A) and post-announcement period (Panel B), implying that information acquisition may cause investors' trading activities and increase stock price informativeness for the merger. Investors' SEC Edgar searching volume may be correlated with firm characteristics, which may directly impact the market reaction informativeness. To pin down the effects of information acquisition, I run a horse race regression by also including the interaction terms between long-term post-merger performance and several merging firms' characteristics. The results are shown in Appendix Table A6. All regressions include both the interaction between ΔROA and *Deal ESV* and the interaction between ΔROA and other firm characteristics that can affect market reaction informativeness, such as firm size proxied by market capitalization, analyst coverage, and firm institutional ownership in the pre-announcement period. Consistent with the results in Table 3, the coefficient on the interaction between ΔROA and *Deal ESV* remains significantly positive, suggesting that the effects of download activities are not purely driven by these observed firm characteristics. Overall, the results support the view that information acquisition about merging firms enhances the efficiency of the market's reaction to the merger.²⁶

3.2. Endogeneity concerns

Endogeneity concerns arise from two possibilities. First, the stock market's reaction may trigger information acquisition activity, which raises concerns over reverse causality. The other possibility is that the information acquisition activities may coincide with changes in the merging firms' stock prices due to unobserved industry characteristics. For instance, a positive industry shock could make the intensity of

²⁵ I also compare the statistical differences for R-squared in two subsamples divided based on the intensity of information acquisition activities across deals. The subsample regressions regarding the relation between short-term announcement return and long-term merger outcomes generate a significantly higher R-squared (with F-stats 15.28) for deals with more (above median) information acquisition.

²⁶ The combined cumulative abnormal return will account for both potential value gains from the merger and market beliefs about the likelihood of merger completion. To isolate market expectations effects, I further re-examine the baseline regression on the subsample of deals with a high probability of being completed. Specifically, I exclude hostile deals and competing bids, and I find that previous results are largely unaffected.

information acquisition and firms' stock prices increase at the same time. To alleviate the reverse causality concerns, I conduct a difference-in-differences analysis using the staggered adoption of XBRL. The SEC launched a voluntary interactive data program to encourage firms to prepare reports in the XBRL format since 2005. The mandated XBRL rule applies to firms with public equity over \$5 billion in 2009, firms over \$700 million in 2010, and all remaining public firms in 2011. The staggered XBRL adoptions from 2009 to 2011 required firms to report filings in XBRL format, which is easier to read and process. This exogenous decrease in information processing costs may have increased the intensity of information acquisition from firms that adopted the rule.

The difference-in-differences analysis is conducted on the sample of deals announced around these rule changes. The first difference is the deal announcement in the post- and pre-XBRL period, which captures the variation of deal-level information acquisition after the rule change. The second difference is the treated and control group, which captures the variation across merging firms that were shocked by the XBRL adoption. After the XBRL adoption, the information obtained from standardized filings issued by treated firms can be better processed due to reduced information acquisition costs. Thus, I expect a positive effect of XBRL adoption on the informativeness of market reactions in treated mergers after the shock. To test the above prediction, I estimate the following regression:

$$CAR_i = a + b*\Delta Post\text{-}merger\ performance_i + c*Post + d*\Delta Post\text{-}merger\ performance_i*Post + f*controls_i + e_j \quad (2)$$

I construct a *Post* dummy to indicate the staggered treatment of deals. Specifically, the *Post* dummy equals one if the deal is announced in the post-XBRL period and both merging firms first issued their XBRL filings either in 2009, 2010, or 2011. The *Post* dummy equals zero if the deal is announced before any shocks or after all shocks, and that involves any merging firms issuing their first XBRL filings before 2009 or after 2011.

[Insert Table 4 here]

The empirical results are reported in Table 4. Columns (1) to (3) of Table 4 report the results of the staggered difference-in-differences analysis. The significant positive coefficients on the interaction between *Post* and $\Delta ROA_{t-1, t+3}$ suggest that the stock market informativeness in treated deals in the post-XBRL period. The evidence suggests a potential causal link between information acquisition and the informativeness of stock market reactions to mergers.

To address the omitted variable bias, I construct two sets of instrumental variables as proxies for information acquisition activities in mergers. First, I use the market-adjusted downloads in non-deal industries during the merger announcement period as an instrument to predict the information acquisition on merging firms. In this context, non-deal industries are all industries other than the acquiring firm and target firm industries that are connected with the merging firms only through previous common downloading activity. Information acquired (filings downloaded) in non-deal industries can divert investors' attention, leading to a decrease in information acquisition on the merging firms. The instrument satisfies the exclusion condition because non-deal industry downloads should not affect the market's response to a merger event. Thus, I expect to find a negative relation between non-deal market-adjusted downloads and *Deal ESV*. Second, I use the number of amendments to all mandatory filings separately issued by target and acquiring firms over the past three years as instruments for information acquisition around deal announcements. The intuition is that firms that issue a greater number of amendments are more likely to experience changes in their information environment, leading to high valuation uncertainty and high expected trading benefits from information acquisition activities. Hence, higher pre-merger firm amendments should be positively correlated with information acquisition activities around deal announcements. The instruments also satisfy the exclusion restrictions because firm amendments issued before mergers do not provide information about deals and are unlikely to affect announcement returns.

[Insert Table 5 here]

Table 5 reports the regression results of the OLS regression in Column (1) and 2SLS analysis in Columns (2) to (4). The OLS regression results are the same as in Column (1) in Table 3 and are reported

here for reference purposes. Since the variable of interest in the second stage is the interaction between *Deal ESV* and $\Delta ROA_{t-1, t+3}$, two first-stage regressions are separately estimated and reported in Columns (2) and (3). In Column (2), the dependent variable is *Deal ESV* and, in Column (3), the dependent variable is $Deal\ ESV \times \Delta ROA_{t-1, t+3}$. In Column (4), the instrumented interaction between *Deal ESV* and $\Delta ROA_{t-1, t+3}$ predicts the *Combined CAR* measured over a [-5, +5] day window around deal announcements. All regressions include deal-level control variables, merging firm characteristics, year fixed effects, and acquirer (target) industry fixed effects. Three instruments are used in the two first-stage regression models – *Non-Deal Industry ESV*, which is the average number of downloads in non-deal industries over the [-5, +5] event-day window around deal announcements scaled by the market downloads; and *Acquirer (Target) Amendments* measured as the natural logarithm of the total number of amendments filed by acquirers (targets) in the three years before the deal announcement.

In Column (2), I find that downloads from non-deal industries are negatively correlated with information acquisition about merging firms. In addition, pre-merger amendments issued by acquiring firms positively predict information acquisition around deal announcements. The second stage results in Column (4) show that the coefficient on the instrumented interaction between *Deal ESV* and $\Delta ROA_{t-1, t+3}$ is significantly positive at the 10% level. This result is consistent with the equivalent coefficient in the OLS regression. It further helps to rule out alternative possibilities that can give rise to endogeneity concerns and suggests potential causal effects of information acquisition on the efficacy of market reactions to merger announcements.

3.3. Information sharing across economically linked firms

As shown in Figures 2 and 3 in the data section, investors acquire information both from merging firms and other economically linked firms. Information acquisition on industry rivals can improve market informativeness about the post-merger market structure and competitive position of combined firms. Download activities about customers and suppliers of merging firms also provide information for investors to assess post-merger performance in combined firms. To explore whether information acquisition in non-

deal firms also facilitates market understanding of deal quality, I test the effects of downloads of filings from economically related firms on market reactions around merger announcements.

[Insert Table 6 here]

The results are reported in Table 6. Columns (1) and (2) report the effects of downloads of filings from rival firms on the relation between combined announcement returns and the post-merger performance of the combined firms. Columns (3) and (4) report the effects of downloads in supply-chain firms on the relation between combined announcement returns and the post-merger performance of the combined firms. *Rival ESV* measures information acquisition about the industry rivals (i.e., firms from the same 3-digit SIC industry excluding merging firms). *Rival ESV(Restricted)* measures information acquisition about the industry rivals of merging firms, excluding downloads of filings from target and acquiring firms if the merger is a focal deal. *Supply-chain ESV* measures information acquisition about customers or suppliers of merging firms. Suppliers and Customers are identified from the Compustat Customer segment data, where firms report their major customers yearly. *Supply-chain ESV(Restricted)* measures information acquisition about customers or suppliers of merging firms, excluding downloads of filings from target and acquiring firms if the merger is diversifying.²⁷ The significantly positive coefficients show that information acquisition about both merging firms and merger-related firms positively explains the relation between stock market reactions and post-merger operating performance. This evidence confirms the argument that information acquisition improves the market's assessment of merger performance and that the information comes not only from merging firms but also from merger-related firms.

3.4. Heterogeneity of investor sophistication, information, and pre-merger information asymmetry

To explore the effects of heterogeneity in information acquisition by differentially sophisticated investors and by information novelty, I conduct several sub-sample analyses to exploit the process of price

²⁷ Since Compustat only report major customers, some supply-chain business ties cannot be observed. To address the potential misclassification issue, I further exclude diversifying deals in Column (4).

discovery by different groups of investors. Compared to retail investors, institutional investors are more sophisticated and better equipped to process information from SEC filings. Hence, I expect institutional investors to be able to better learn and incorporate information into stock prices.

[Insert Table 7 here]

The subsample analysis is reported in Table 7. Using the GeoLite2 database to identify institutional IP users, I calculate the *Institutional ESV* and divide the sample based on the proportion of institutional downloads. The results in Columns (1) and (2) show that information acquisition significantly increases the relation between combined CAR and post-merger changes in industry-adjusted ROA only when deals are the subject of a larger (above the median) proportion of institutional downloads. This evidence supports the view that stock prices incorporate institutional investors' information.

I also examine whether new or newly released information available to the market is more likely to move stock prices. I use two methods to distinguish between new and stale information acquisition around the merger: (1) the information is new if the deal is the first bid in the target industry in the past 12 months; (2) the information is new if the deal experiences above the median number of downloads of newly issued filings (i.e., filings issued within a [-5, +5] day window around the deal announcement).

[Insert Table 8 here]

Table 8 reports the results on the subsamples with relatively new and old information. Column (1) reports the relation between download activities and stock market reactions for the subsample of deals that represent the first bids in the target industry in a given year. Column (2) reports the relation between download activities and stock market reactions for the subsample of deals that are not the first bids in the target industry in a given year. Column (3) reports the effects of the information acquisition on stock market reactions for the subsample of deals that experience above the median downloads of newly issued filings (i.e., filings issued within a [-5, +5] day window around a deal announcement). Column (4) reports the effects of the information acquisition on stock market reactions for the subsample of deals that experience

below the median downloads of newly issued filings. The coefficients on the interaction between downloads and post-merger performance in Columns (1) and (3) are significantly positive, suggesting that the acquisition of relatively new information, rather than stale information, about the merger enhances the relation between *Combined CAR* and changes in industry-adjusted *ROA*. The evidence in this section implies that market investors learn new information which is then incorporated into stock prices.

Next, I explore the heterogeneity across deals with different levels of information asymmetry in the pre-merger period. If ex-ante merging firms have large information asymmetry, any incremental information learned by the market should result in a significant improvement in stock market informativeness. Thus, I expect that the effects of information acquisition are more pronounced when merging firms have large information asymmetry before the merger. I use four different measures as proxies for the level of information asymmetry that exists between market investors and firm insiders, including filings readability, short interest, analyst dispersion in earnings forecasts, and analyst coverage. As shown in the literature, firms with less readable filings (Campbell, Chen, Dhaliwal, Lu, and Steele, 2014), less short interest (Senchack and Starks, 1993), large analyst dispersion (Drobtetz, Grüninger, and Hirschvogel, 2010), and fewer analyst coverage (Derrien and Kecskés, 2013) are likely to have larger information asymmetry.

[Insert Table 9 here]

Table 9 reports the regression results for subsamples divided based on four different measures of pre-merger information asymmetry. The subsamples are divided based on whether both target and acquirer firms have high (above median) information asymmetry measured by four different proxies defined as follows: *Filings readability* is measured by the *Bog index* from Bonsall et al. (2017). A higher *Bog index* indicates more complex filings and less readability. *Short interest* is the level of monthly short interest reported from the Compustat database. *Analyst dispersion* is measured as the standard deviation of analysts' earnings estimates in the year before deal announcements. *Analyst coverage* counts the number of analysts following the target (acquiring) firm in the year before deal announcements. Consistent with the previous

prediction, coefficients on the interaction terms in Columns (2), (4), (5), and (8) are all significantly positive, suggesting that information acquisition positively affects the stock market informativeness when both merging firms have large information asymmetry in the pre-merger period proxied by less readable filings, less short interest, large analyst dispersion, and fewer analyst coverage.

3.5. *Alternative sources of deal synergies*

This section investigates other sources of deal synergies. The value created by a merger can be achieved in different ways. One way is through an increase in operating efficiency, and another can be through a reduce in the cost of capital. An increase in operating efficiency can generate higher profits through an increase in revenues and/or a reduction in costs, thus increasing a firm's future cash flow. A decrease in the cost of capital reduces the required rate of return for a firm's investment, thus increasing firm value. To explore whether information acquired about merging firms facilitates market understanding of financial synergies gained through the merger, I test the information acquisition effects on the relation between *Combined CAR* and changes in the benchmark-adjusted cost of capital.

[Insert Table 10 here]

The results are reported in Table 10. ΔICC is the net change in the adjusted cost of capital. The quarterly implied cost of capital (equity) is estimated using Compustat/IBES/CRSP quarterly data following Gebhardt, Lee, and Swaminathan (2001). The net changes in the implied cost of capital are then calculated either from $q-4$ to $q+4$, $q-4$ to $q+8$, or $q-4$ to $q+12$ quarters around deal announcements. I also construct benchmark portfolio firms by separately matching on the target and acquirer (3-digit SIC) industry, size, BM ratio, and quarterly downloads in the year before a deal announcement. I then calculate the adjusted cost of capital as the differences between changes in *ICC* for merged firms and average changes in *ICC* for matched portfolio firms.²⁸ The significant negative coefficients on the interaction term between *Deal ESV*

²⁸ The *ICC* of combined firms in the quarter before deal announcement is the sum of target and acquirer *ICC* weighted by their total assets.

and ΔICC in Columns (1) through (3) show that *Deal ESV* enhances the negative relation between stock returns and cost of capital in the combined firms. The evidence confirms that information acquisition improves the market understanding of financial synergies among merging firms.

3.6. Subsequent takeover probabilities of non-deal firms

In this section, I examine whether information acquisition helps to explain the propagation of mergers. Merger-related information includes under-exploited investment opportunities, expected changes in market structures, and production efficiencies that can be gained through the merger but were not identified beforehand. If information acquisition facilitates the market assessment of future takeover probability, download activities should reflect aggregate-level beliefs about firms that can be realized through similar acquisitions in the future.

[Insert Table 11]

Table 11 reports the estimates of the effects of information acquisition on non-deal firms' subsequent takeover probabilities in the post-announcement period. For each deal, the sample consists of all non-deal firms whose filings are downloaded by merger-related IP users. I define merger-related IP users as those who viewed at least one filing from the merging firms. In Columns (1) through (3), the dependent variable, $Prob(M\&As)$, equals one if the firm announced any deal within a 12/24/36-month period after the date the focal merger was announced. The *Firm ESV* is the natural logarithm of total downloads of a firm's filings within a [-5, +5] day window around the deal announcement.²⁹ The results show a significant positive relation between non-deal firms' downloads and the likelihood of them announcing a deal in the future, indicating that information acquisition activities reflect aggregate beliefs about non-deal firms' future takeover probabilities in the post-merger period.

4. Robustness Checks

4.1 Robust measures

In this section, I examine the robustness of the information acquisition measurement. I construct different measures of information acquisition, including the raw number of EDGAR downloads, benchmark adjusted downloads, and abnormal downloads. The raw number of downloads captures the intensity of all types of information acquired by market investors around deal announcements. The literature (Da, Engelberg, and Gao, 2011; Drake, Roulstone, and Thornock, 2012) defines abnormal downloads relative to a firm's normal downloads in the past period. I, thus, include a measure of adjusted downloads by using the raw number of downloads scaled by the median number of downloads in the previous quarter. In addition, to better identify firm-level abnormal downloads, I construct two sets of benchmark portfolio firms for each merging firm. The two measures of abnormal downloads are firm characteristics benchmark portfolio adjusted measure and past-year downloads benchmark portfolio adjusted measure. In the former case, the benchmark portfolio consists of firms that are similar (+/-20%) in firm size, stock returns, and trading volume to merging firms in the prior year, and, in the latter case, the benchmark portfolio consists of firms that have similar (+/-20%) downloads as the merging firms in the prior year. After I constructed abnormal (adjusted) downloads for each target and acquirer, I count the sum of the target and acquirer's adjusted (abnormal) downloads as deal-level information acquisition measures.

[Insert Table 12 here]

Table 12 reports results using alternative proxies for information acquisition on the relation between stock market reactions around M&A announcements and post-merger operating performance. I re-estimate the regression specifications in Equation (1) with these alternative information acquisition measures. As shown in Table 12, all the coefficients on the interaction between $\Delta ROA_{t-1, t+3}$ and different measures of download activities are consistently significantly positive, confirming that information acquisition about merging firms improves the market efficiency of deal pricing.

Information acquisition can be affected by various determinants. The results in Appendix Table A4 show that investors acquire more information in deals with large relative size and stock transactions. They also acquire more information for merging firms with high BM ratios, firm size, short interests, and stock volatility. Since these characteristics may affect the stock market reaction informativeness directly, I further investigate whether abnormal information acquisition provides incremental explanatory power in market reactions. In Appendix Table A4 Panel B, I re-examine the baseline regression by replacing my main variable of information acquisition with another alternative measure of information acquisition, *Residual ESV*, the predicted residuals from regression estimated in the determinants model. The results still hold, suggesting that the effects of information acquisition are unlikely to be driven by other observed firm and deal characteristics.

4.2. Information learning versus attention

The measure used in the aforementioned tests mainly captures information acquisition in the short-term around deal announcements. One might argue that information acquisition serves as a measure of short-term market attention instead of learning behavior. Nevertheless, to rule out the alternative theory of short-term attention, I construct a sample of firms with similar names to both the target and acquiring firms. I exclude merging firms and peer firms to ensure that these non-deal firms do not provide merger-related information. If the information acquisition measure captures market attention, firms with similar names may draw a level of attention comparable to that of merging firms and experience the same effects on market reaction. If the download measure captures information learning behavior, firms that have similar names may draw equal attention but should not experience any changes in real outcomes.

[Insert Table 13 here]

Table 13 replicates the previous tests in Table 3 and Table 10 using the sample of firms with similar names. For each deal, I separately match the names of the target and the acquirer with those of all other firms from SEC EDGAR. Next, I require the Levenstein distance between each pair to be smaller than a threshold of 3. The economic outcomes are constructed in the same way as previous tests. *Firm ESV* is the

natural logarithm of the total number of downloads within a $[-5, 5]$ day window around a deal announcement. In Table 13, the coefficients on the variable of interests are all statistically indistinguishable from zero, suggesting that firms with similar names do not experience market learning around deal announcements. The overall evidence rules out the short-term attention explanation.

5. Concluding Remarks

This paper studies the effects of information acquisition on market efficiencies in mergers and acquisitions. Using the SEC EDGAR web traffic data, I measure information acquisition activities as the intensity of downloads of SEC filings for merging firms and other non-deal firms around merger announcements. I find that greater information acquisition around merger announcements improves the consistency between stock market reactions and long-term takeover performance. Specifically, deal-level download activities significantly enhance the correlation between combined announcement-period abnormal returns and the post-merger operating performance of combined firms. These effects are more pronounced in deals with more sophisticated investors, novel information, and larger pre-merger information asymmetry. Further, I find that information acquisition from rivals, customers, and suppliers also facilitates market informativeness about deal value-creation. By acquiring and processing information from SEC filings, investors became more informed about different aspects of combined firms' outcomes, including changes in operating performance, incremental cash flows, profitability, and cost of capital. Information acquisition activities are positively correlated with non-deal firms' future takeover probabilities. By exploiting staggered XBRL adoption in a difference-in-differences framework as well as a 2SLS regression setting, I document results that imply a causal link between information acquisition on the relation between market reactions and deal synergies.

This paper has implications for drawing inferences about deal value creation from short-term market reactions. A large body of literature uses short-term announcement returns as an indicator of shareholder value creation due to the event. The results in this paper suggest that this inference can be drawn without

bias only when the market reacts in informed ways. If investors do not acquire information about the merger, the market reactions could be inconsistent with the true deal synergies.

Overall, this paper provides empirical evidence to show that information acquisition improves market efficiency and transparency in takeover markets. This paper contributes to the literature by providing a novel measure of information acquisition, which has not been quantified in studies of mergers and acquisitions. These findings also offer a potential explanation for the inconsistency between short-term market returns and long-term firm performance. Based on my findings, empirical inferences drawn from market reactions to corporate events should consider the role of market informativeness. Lastly, this paper also generates policy implications for litigation consultants who use short-term market reactions to assess economic damages and study regulatory effects on merging or merger-related firms.

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Figure 1. Information Acquisition around M&A Deal Announcements for Merging Firms

These figures illustrate EDGAR download activities about merging firms around deal announcement dates for M&As. Figure 1A illustrates the average number of daily downloads of SEC filings from each acquiring firm. Figure 1B illustrates the average number of daily downloads of SEC filings from each target firm.

Figure 1A. Daily downloads for acquiring firms

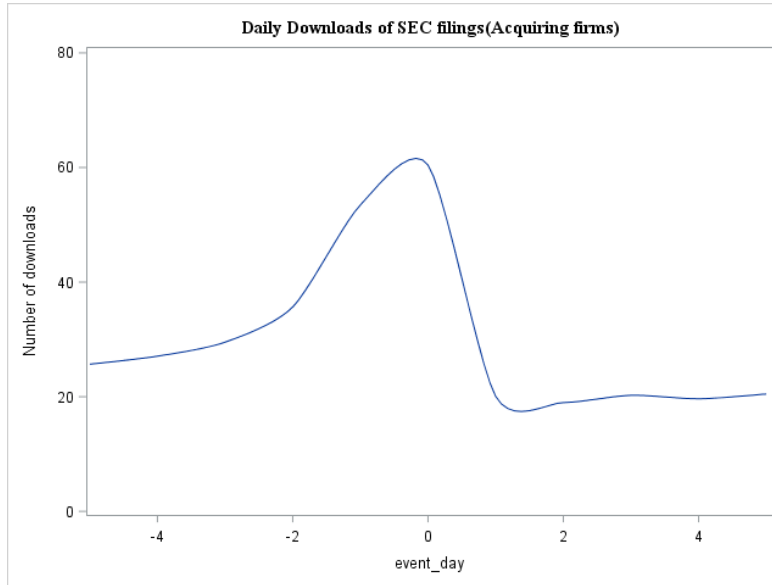


Figure 1B. Daily downloads for target firms

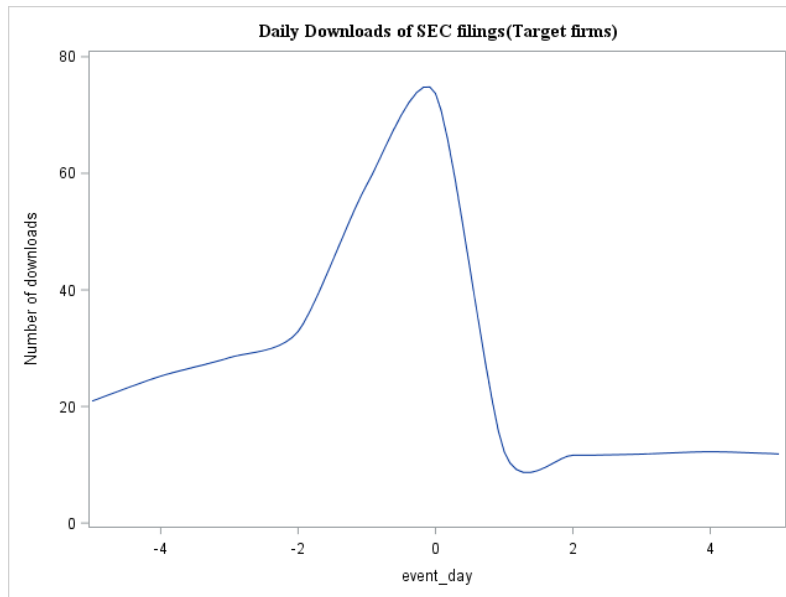


Figure 2. Information Acquisition around M&A Deal Announcements for Rival Firms

These figures illustrate EDGAR download activities from rival firms around M&A announcements. Figure 2A illustrates the average number of total daily downloads of SEC filings from the acquirer's industry (3-digit SIC) rival firms. Figure 1B illustrates the average number of daily downloads of SEC filings from each target's industry (3-digit SIC) rival firms.

Figure 2A. Daily downloads for acquirer industry rivals

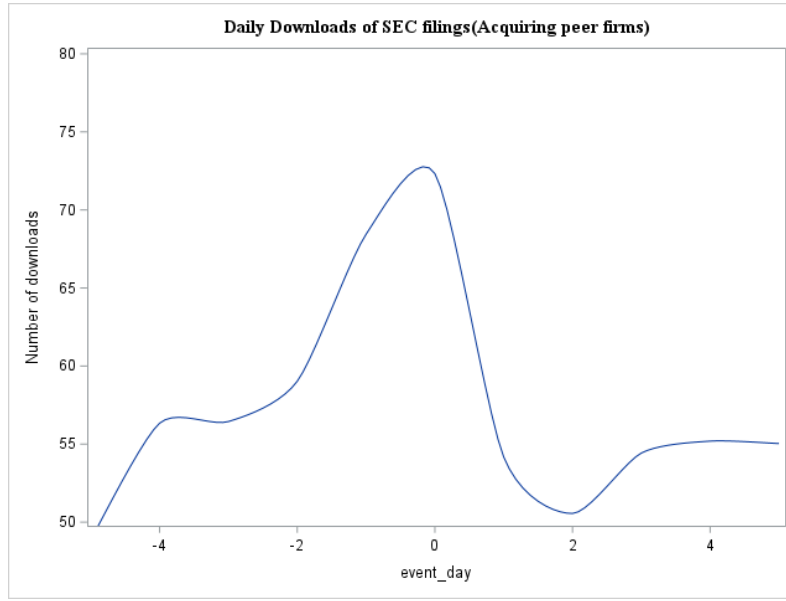


Figure 2B. Daily downloads for target industry rivals

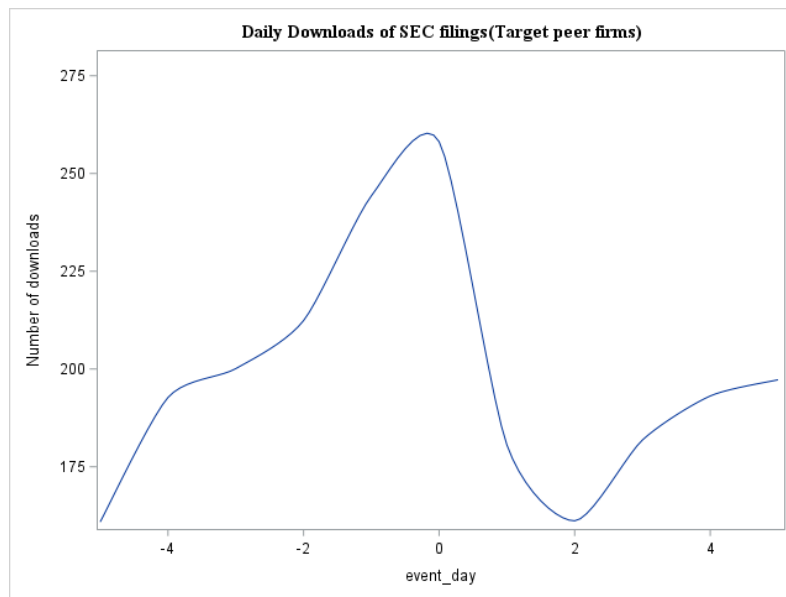


Figure 3. Information Acquisition around M&A Deal Announcements for Supply-Chain Firms

These figures illustrate EDGAR download activities from supply-chain firms around M&A announcements. The figure illustrates the average number of daily downloads of SEC filings from each customer or supplier of merging firms.

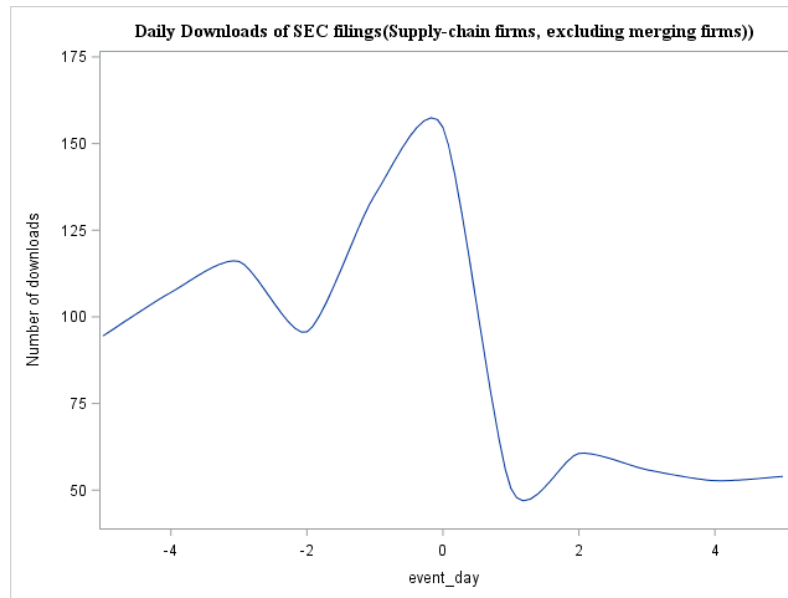


Table 1. Summary Statistics of Download Activities

This table reports the summary statistics of deal-level download activities in a [-5, +5] event-day window around deal announcements. The download activities are restricted to IP users who have at least one download of merging firms' filing within the event window. Panel A reports the raw number of downloads (unique IP), and Panel B reports the percentage of downloads scaled by market downloads. *Market ESV (Raw)* is the total number of unique IP users that downloaded filings issued by any firm within the event window. *Deal ESV (Raw)* is the total number of unique IP users that downloaded filings issued by merging firms. *Rival ESV (Raw)* is the total number of unique IP users that downloaded filings issued by industry (3-digit SIC) rivals of merging firms. *Customer/Supplier ESV (Raw)* is the total number of unique IP users that download filings issued by customers or suppliers of by merging firms. The customer/supplier information is from the Compustat segment customer dataset. *Institutional ESV (Raw)* is the total number of unique institutional (US public firms) IP users that downloaded filings issued by any firm. *Deal ESV* is the total number of unique IP users that downloaded filings issued by merging firms in a [-5, +5] event-day window around deal announcements scaled by the market ESV. *Rival ESV* is the total number of unique IP users that downloaded filings issued by industry (3-digit SIC) rivals of merging firms scaled by the market ESV. *Customer/Supplier ESV* is the total number of unique IP users that downloaded filings issued by customers or suppliers of merging firms scaled by the market ESV. The customer/supplier information is from the Compustat segment customer dataset. *Institutional ESV* is the total number of unique institutional (US public firms) IP users that downloaded filings issued by any firm scaled by the market ESV. The institutional IP addresses are from the GeoLite2 database. Detailed variable definitions are reported in Appendix Table A1.

| Variables | N | Mean | Median | Std. Dev. | p10 | p90 |
|------------------------------------|-------|------------|------------|------------|------------|-------------|
| <i>Raw measure</i> | | | | | | |
| <i>Market ESV (Raw)</i> | 1,524 | 674805.750 | 466271.000 | 524261.560 | 209206.000 | 1502626.000 |
| <i>Deal ESV (Raw)</i> | 1,524 | 515.462 | 291.000 | 625.489 | 51.000 | 1245.000 |
| <i>Rival ESV (Raw)</i> | 1,524 | 2066.196 | 1169.500 | 2744.040 | 0.000 | 5108.000 |
| <i>Customer/Supplier ESV (Raw)</i> | 1,524 | 35.749 | 1.000 | 108.985 | 0.000 | 88.000 |
| <i>Institutional ESV (Raw)</i> | 1,524 | 14.828 | 6.000 | 24.867 | 0.000 | 40.000 |
| <i>Scaled measure</i> | | | | | | |
| <i>Deal ESV</i> | 1,524 | 0.080 | 0.055 | 0.101 | 0.017 | 0.167 |
| <i>Rival ESV</i> | 1,524 | 0.405 | 0.272 | 0.783 | 0.000 | 0.897 |
| <i>Customer/Supplier ESV</i> | 1,524 | 0.006 | 0.000 | 0.020 | 0.000 | 0.017 |
| <i>Institutional ESV</i> | 1,524 | 0.003 | 0.001 | 0.005 | 0.000 | 0.008 |

Table 2. Summary Statistics of M&A Deals and Merging Firms

This table reports the summary statistics of deal characteristics and merging firms' characteristics. *Combined CAR* is the combined cumulative abnormal returns of target and acquiring firms in a [-5, 5] day window around deal announcements. The return is estimated from the market model with a window from the -42 day to the -294 day relative to the date the deal is announced. *Diversifying* equals one if the target and acquirer are from two different (3-digit SIC) industries. *Relative Size* is the ratio of the target's market capitalization to the acquirer's market capitalization. *Stock (Pct)* is the percentage (in decimals) of shares traded in the transaction. *Hostile* equals one if the deal attitude is hostile. *Toehold* is the percentage (in decimals) of target shares the acquirer held six months prior to the deal announcement. *Acquirer (Target) Mkt_cap* is the natural log of market capitalization. *Acquirer (Target) BM* is the book value of equity scaled by the market value of common equity. *Acquirer (Target) ROA* is the ratio of operating income before depreciation and amortization (oibdp) to total assets. *Acquirer (Target) Cash* is the ratio of cash to total assets. ΔROA is the net changes in return on assets in combined firms from the year $t-1$ to the year $t+3/t+2/t+1$. The return on assets in combined firms in year $t-1$ is calculated as the weighted average return on assets in target and acquiring firms, weighted by the total assets. ΔICC is the changes in the adjusted implied cost of capital (equity) from -4 to +4/+8/+12 quarters around deal completion. The implied cost of capital (ICC) is following Gebhardt, Lee, and Swaminathan (2001) estimated at the quarterly level. The value is benchmarked with the average ICC of portfolio firms obtained from size, industry, BM ratio, and quarterly downloads matching at $t-4$ quarter. Detailed variable definitions are reported in Appendix Table A1.

| Variables | N | Mean | Median | Std. Dev. | P10 | p90 |
|---|-------|-----------|----------|-----------|---------|-----------|
| <i>Combined CAR</i> | 1,524 | 0.0261 | 0.0155 | 0.0699 | -0.0434 | 0.1124 |
| <i>Diversifying</i> | 1,524 | 0.406 | 0.000 | 0.491 | 0.000 | 1.000 |
| <i>Relative Size</i> | 1,524 | 0.450 | 0.065 | 1.318 | 0.012 | 0.920 |
| <i>Stock (Pct)</i> | 1,524 | 0.372 | 0.000 | 0.421 | 0.000 | 1.000 |
| <i>Hostile</i> | 1,524 | 0.013 | 0.000 | 0.114 | 0.000 | 0.000 |
| <i>Toehold</i> | 1,524 | 0.001 | 0.000 | 0.005 | 0.000 | 0.000 |
| <i>Acquirer Mkt_cap</i> | 1,524 | 8.099 | 7.925 | 2.089 | 5.415 | 11.059 |
| <i>Acquirer Mkt_cap (raw) in Millions</i> | 1,524 | 20518.160 | 2763.190 | 42688.566 | 223.789 | 63481.621 |
| <i>Acquirer BM</i> | 1,524 | 0.493 | 0.450 | 0.312 | 0.165 | 0.898 |
| <i>Acquirer ROA</i> | 1,524 | 0.100 | 0.104 | 0.101 | 0.017 | 0.213 |
| <i>Acquirer Cash</i> | 1,524 | 0.161 | 0.085 | 0.177 | 0.017 | 0.439 |
| <i>Target Mkt_cap</i> | 1,524 | 5.969 | 5.812 | 1.883 | 3.627 | 8.509 |
| <i>Target Mkt_cap (raw) in Millions</i> | 1,524 | 2400.575 | 333.340 | 6838.911 | 36.587 | 4960.212 |
| <i>Target BM</i> | 1,524 | 0.631 | 0.508 | 0.533 | 0.158 | 1.177 |
| <i>Target ROA</i> | 1,524 | 0.036 | 0.060 | 0.193 | -0.110 | 0.195 |
| <i>Target Cash</i> | 1,524 | 0.223 | 0.114 | 0.239 | 0.017 | 0.619 |
| $\Delta ROA_{t-1, t+1}$ | 1,087 | -0.104 | -0.001 | 1.191 | -0.575 | 0.496 |
| $\Delta ROA_{t-1, t+2}$ | 1,014 | -0.102 | -0.004 | 1.196 | -0.526 | 0.318 |
| $\Delta ROA_{t-1, t+3}$ | 950 | -0.158 | -0.006 | 1.491 | -0.716 | 0.595 |
| $\Delta ROE_{t-1, t+3}$ | 560 | -0.097 | 0.039 | 5.908 | -1.570 | 1.492 |
| $\Delta Operating\ margin_{t-1, t+3}$ | 565 | 0.084 | 0.002 | 0.646 | -0.095 | 0.145 |
| $\Delta Price\ markup_{t-1, t+3}$ | 566 | -0.002 | 0.002 | 1.318 | -0.744 | 0.640 |
| $\Delta ICC_{q-4, q+4}$ | 268 | 0.036 | 0.021 | 0.091 | -0.018 | 0.121 |
| $\Delta ICC_{q-4, q+8}$ | 277 | 0.030 | 0.019 | 0.092 | -0.016 | 0.104 |
| $\Delta ICC_{q-4, q+12}$ | 280 | 0.025 | 0.017 | 0.106 | -0.041 | 0.114 |

Table 3. Information Acquisition in M&As and Stock Market Reactions

This table reports regression results regarding the impact of information acquisition around merger announcements on stock market reactions within the same event window. The dependent variable, *Combined CAR*, is the combined cumulative abnormal returns of target and acquiring firms in a [-5, +5] day window around deal announcements. ΔROA is the net changes in return on assets in combined firms from the year $t-1$ to the year $t+3/t+2/t+1$. *Deal ESV* is the total downloads for merging firms in a [-5, +5] event-day window around deal announcements scaled by the market downloaded. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Appendix Table A1. All regressions include acquirer industry (3-digit SIC), target industry (3-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| Variables | (1) | (2) | (3) |
|-------------------------|-----------------------|-----------------------|-----------------------|
| | <i>t-1, t+3</i> | <i>t-1, t+2</i> | <i>t-1, t+1</i> |
| <i>ΔROA * Deal ESV</i> | 4.3132** (1.526) | 3.1267** (1.389) | 4.0741** (1.722) |
| <i>ΔROA</i> | -0.0011 (0.002) | -0.0013* (0.001) | -0.0018** (0.001) |
| <i>Deal ESV</i> | 5.3581 (3.374) | 5.9677* (3.207) | 6.6096* (3.061) |
| <i>Diversifying</i> | -0.0102 (0.006) | -0.0047 (0.005) | -0.0033 (0.004) |
| <i>Relative Size</i> | 0.0036 (0.002) | 0.0028 (0.002) | 0.0018 (0.002) |
| <i>Stock (Pct)</i> | -0.0242*** (0.008) | -0.0282*** (0.007) | -0.0315*** (0.008) |
| <i>Hostile</i> | 0.0307 (0.020) | 0.0386 (0.027) | 0.0456* (0.023) |
| <i>Toehold</i> | 0.0288 (0.492) | 0.1708 (0.525) | 0.0337 (0.485) |
| <i>Acquirer Mkt_cap</i> | -0.0148*** (0.002) | -0.0153*** (0.002) | -0.0144*** (0.002) |
| <i>Acquirer BM</i> | -0.0012 (0.017) | -0.0021 (0.016) | -0.0023 (0.014) |
| <i>Acquirer ROA</i> | 0.0675 (0.041) | 0.0696* (0.038) | 0.0790** (0.029) |
| <i>Acquirer Cash</i> | -0.0288* (0.016) | -0.0345** (0.014) | -0.0407** (0.015) |
| <i>Target Mkt_cap</i> | 0.0090*** (0.002) | 0.0086*** (0.002) | 0.0075*** (0.002) |
| <i>Target BM</i> | 0.0062 (0.007) | 0.0062 (0.006) | 0.0061 (0.006) |
| <i>Target ROA</i> | -0.0425 (0.049) | -0.0433 (0.048) | -0.0362 (0.046) |
| <i>Target Cash</i> | 0.0050 (0.024) | 0.0061 (0.022) | 0.0174 (0.020) |
| Observations | 838 | 901 | 971 |
| R-squared | 0.361 | 0.350 | 0.354 |
| Acquiring industry FE | Yes | Yes | Yes |
| Target industry FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |

Table 4. Difference-in-Differences Analysis – Information Acquisition around Staggered XBRL Adoption

This table reports the regression results of staggered difference-in-differences analyses around the adoption of XBRL in 2009, 2010, and 2011. *Post* equals one if the deal is announced after 2009/2010/2011 and both target and acquirer first issued SEC filings in XBRL format in 2009/2010/2011. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Appendix A1. Robust standard errors are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| VARIABLES | (1) | (2) | (3) |
|-------------------------------------|----------------------|-----------------------|-----------------------|
| | <i>Combined CAR</i> | | |
| <i>ΔROA_{t-1, t+3} Post</i> | 0.0115* (0.006) | 0.0112* (0.006) | 0.0108* (0.006) |
| <i>Post</i> | 0.0189*** (0.007) | 0.0193*** (0.007) | 0.0123* (0.006) |
| <i>ΔROA_{t-1, t+3}</i> | -0.0047 (0.004) | -0.0046 (0.004) | -0.0061 (0.004) |
| <i>Diversifying</i> | | -0.0037 (0.007) | -0.0049 (0.006) |
| <i>Relative Size</i> | | -0.0087*** (0.002) | 0.0055* (0.003) |
| <i>Stock (Pct)</i> | | -0.0124 (0.008) | -0.0317*** (0.009) |
| <i>Hostile</i> | | 0.0035 (0.033) | -0.0009 (0.031) |
| <i>Toehold</i> | | 0.0618 (0.355) | -0.1292 (0.336) |
| <i>Acquirer Mkt_cap</i> | | | -0.0207*** (0.003) |
| <i>Acquirer BM</i> | | | -0.0214** (0.010) |
| <i>Acquirer ROA</i> | | | 0.0604 (0.039) |
| <i>Acquirer Cash</i> | | | -0.0401* (0.022) |
| <i>Target Mkt_cap</i> | | | 0.0154*** (0.003) |
| <i>Target BM</i> | | | 0.0126** (0.006) |
| <i>Target ROA</i> | | | 0.0369* (0.022) |
| <i>Target Cash</i> | | | 0.0044 (0.018) |
| Observations | 508 | 508 | 508 |
| R-squared | 0.022 | 0.051 | 0.180 |

Table 5. Information Acquisition and Stock Market Reactions - 2SLS-IV Approach

This table reports regression results using both the OLS model and the two-stage least-squares (2SLS) model regarding the impact of information acquisition around merger announcements on stock market reactions within the same event window. The results reported in Column (1) are estimated from the OLS model as from Column (1) of Table 3. Three instruments used in the regression include *Non-Deal Industry ESV*, average downloads non-deal industries in [-5, +5] event-day window around deal announcements scaled by the market downloads; and *Acquirer (Target) Amendments* measured as the natural logarithm of the total number of amendments filed by acquirers (targets) in three years before deal announcements. The dependent variable in Column (2) is download activities in merging firms (*Deal ESV*). The dependent variable in Column (3) is the interaction between *Deal ESV* and $\Delta ROA_{t-1, t+3}$. In Column (4), the instrumented interaction between *Deal ESV* and $\Delta ROA_{t-1, t+3}$ predicts the *Combined CAR* in a [-5, +5] day window around deal announcements. *Combined CAR* is the combined cumulative abnormal return of target and acquiring firms in [-5, +5] day window around deal announcements. $\Delta ROA_{t-1, t+3}$ is the net changes of return on assets in combined firms from the year t-1 to the year t+3. The target and acquirer's return on assets in year t-1 are weighted by total assets at the beginning of the year. *Deal ESV* is the total number of unique IP users that download filings issued by merging firms in [-5, +5] event-day window around deal announcements scaled by the market ESV. Continuous variables are winsorized at the 1% and 99% levels. All independent variables are scaled by 1000. Detailed variable definitions are reported in Appendix A1. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| | (1) | (2) | (3) | (4) |
|--|---------------------|-----------------------|---|---------------------|
| Model | OLS | 2SLS | | |
| VARIABLES | <i>Combined CAR</i> | <i>Deal ESV</i> | <i>Deal ESV</i> * $\Delta ROA_{t-1, t+3}$ | <i>Combined CAR</i> |
| | | 1st stages | | 2nd stage |
| <i>Deal ESV</i> * $\Delta ROA_{t-1, t+3}$ | 4.3132** (1.526) | | | 12.1681* (6.734) |
| <i>Deal ESV</i> | -0.0011 (0.002) | | | 26.6289 (18.413) |
| <i>Non-Deal Industry ESV</i> | | -0.2914** (0.121) | -0.4001*** (0.093) | |
| <i>Acquirer Amendments</i> | | 0.0903** (0.039) | -0.0261 (0.107) | |
| <i>Target Amendments</i> | | -0.0131 (0.054) | 0.0874 (0.083) | |
| <i>Non-Deal Industry ESV</i> * $\Delta ROA_{t-1, t+3}$ | | -0.0726*** (0.024) | 0.3438*** (0.114) | |
| $\Delta ROA_{t-1, t+3}$ | 5.3581 (3.374) | 0.0847*** (0.026) | 0.1202 (0.144) | -0.0057 (0.004) |
| <i>Diversifying</i> | -0.0102 (0.006) | 0.0613 (0.050) | -0.0718 (0.094) | -0.0075 (0.006) |
| <i>Relative Size</i> | 0.0036 (0.002) | 0.0704 (0.044) | -0.0036 (0.018) | 0.0022 (0.003) |
| <i>Stock (Pct)</i> | -0.0242*** | 0.1610 | -0.02609 | -0.0248** |

| | | | | |
|--|------------|------------|-----------|------------|
| | (0.008) | (0.104) | 0.107 | (0.010) |
| <i>Hostile</i> | 0.0307 | 0.0495 | 0.3428*** | 0.0026 |
| | (0.020) | (0.082) | (0.126) | (0.016) |
| <i>Toehold</i> | 0.0288 | 0.0037 | 1.1754 | 0.4337 |
| | (0.492) | (3.444) | (2.640) | (0.491) |
| <i>Acquirer Mkt_cap</i> | -0.0148*** | 0.0775*** | -0.0135 | -0.0132*** |
| | (0.002) | (0.024) | (0.041) | (0.002) |
| <i>Acquirer BM</i> | -0.0012 | 0.1243 | -0.0270 | -0.0132 |
| | (0.017) | (0.148) | (0.175) | (0.020) |
| <i>Acquirer ROA</i> | 0.0675 | 0.3983 | -0.5587 | -0.0037 |
| | (0.041) | (0.285) | (0.433) | (0.036) |
| <i>Acquirer Cash</i> | -0.0288* | -0.0757 | 0.6939* | -0.0444* |
| | (0.016) | (0.305) | (0.415) | (0.021) |
| <i>Target Mkt_cap</i> | 0.0090*** | 0.2581*** | -0.0772* | 0.0026 |
| | (0.002) | (0.035) | (0.040) | (0.006) |
| <i>Target BM</i> | 0.0062 | 0.0825 | -0.0732 | 0.0120* |
| | (0.007) | (0.072) | (0.120) | (0.007) |
| <i>Target ROA</i> | -0.0425 | -0.6330*** | 0.1428 | 0.0316 |
| | (0.049) | (0.232) | (0.200) | (0.021) |
| <i>Target Cash</i> | 0.0050 | -0.2508 | -0.0200 | 0.0257 |
| | (0.024) | (0.241) | (0.251) | (0.018) |
| Observations | 838 | 649 | 649 | 649 |
| R-squared | 0.361 | 0.722 | 0.0667 | 0.034 |
| Acquirer industry FE | Yes | Yes | Yes | Yes |
| Target industry FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Anderson Rubin Wald F-statistic | | | | 6.06*** |
| Cragg-Donald Wald F statistic (Weak identification test) | | | | 7.877 |
| Kleibergen-Paap rk Wald F statistic (Weak identification test) | | | | 4.052 |
| First-Stage F-Statistics | | | | |
| <i>Deal ESV</i> | | | | 18.31*** |
| <i>Deal ESV* $\Delta ROA_{t-1, t+3}$</i> | | | | 5.22** |

Table 6. Information Acquisition in Rivals, Customers, and Suppliers

This table reports regression results regarding the impact of information acquisition around merger announcements on stock market reactions within the same event window. The dependent variable, *Combined CAR*, is the combined cumulative abnormal returns of target and acquiring firms in [-5, +5] day-window around deal announcements. *ROA* is the net changes of return on assets in combined firms from the year t-1 to the year t+3. The target and acquirer's return on assets in year t-1 are weighted by total assets at the beginning of the year. All download measures (*X*) are scaled by the market download within the same event window. *Rival ESV* measures information acquisition about industry (3-digit SIC) rivals of merging firms. *Rival ESV(Restricted)* measures information acquisition about industry (3-digit SIC) rivals of merging firms, excluding downloads from target and acquiring firms if the merger is the focal deal. *Supply-chain ESV* measures information acquisition about customers or suppliers of merging firms. *Supply-chain ESV(Restricted)* measures information acquisition about customers or suppliers of merging firms, excluding downloads from target and acquiring firms if the merger is diversifying. The customer/supplier information is from the Compustat segment customer dataset. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Appendix A1. All regressions include acquirer industry (3-digit SIC), target industry (3-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| Variables | (1) | (2) | (3) | (4) |
|-------------------------------|-----------------------|-------------------------------|-------------------------|--------------------------------------|
| | | | <i>Combined CAR</i> | |
| Download measure (<i>X</i>) | <i>Rival ESV</i> | <i>Rival ESV (Restricted)</i> | <i>Supply-chain ESV</i> | <i>Supply-chain ESV (Restricted)</i> |
| $\Delta ROA_{t-1, t+3} * X$ | 0.8054** (0.366) | 1.0530** (0.452) | 22.8090** (9.784) | 25.0591*** (7.766) |
| $\Delta ROA_{t-1, t+3}$ | -0.0009 (0.002) | -0.0017 (0.003) | 0.0005 (0.002) | 0.0025 (0.003) |
| <i>X</i> | 1.0870 (0.692) | 1.3000 (0.809) | 13.4889 (16.292) | 43.8614* (23.688) |
| <i>Diversifying</i> | 0.0004 (0.004) | -0.0104 (0.006) | -0.0109 (0.006) | 0.0000 (0.000) |
| <i>Relative Size</i> | 0.0053*** (0.001) | 0.0036 (0.002) | 0.0033 (0.002) | 0.0009 (0.003) |
| <i>Stock (Pct)</i> | -0.0354*** (0.008) | -0.0248** (0.009) | -0.0226** (0.008) | -0.0260*** (0.007) |
| <i>Hostile</i> | 0.0377*** (0.012) | 0.0320 (0.023) | 0.0316 (0.022) | 0.0339 (0.020) |
| <i>Toehold</i> | -0.0807 (0.173) | -0.0141 (0.312) | -0.0100 (0.327) | -0.0763 (0.401) |
| <i>Acquirer Mkt_cap</i> | -0.0198*** (0.003) | -0.0150*** (0.003) | -0.0145*** (0.003) | -0.0146*** (0.004) |
| <i>Acquirer BM</i> | -0.0127 (0.010) | -0.0050 (0.017) | -0.0042 (0.017) | 0.0046 (0.019) |
| <i>Acquirer ROA</i> | 0.0511 | 0.0599 | 0.0578 | 0.0662 |

| | | | | |
|-----------------------|-----------|-----------|-----------|----------|
| | (0.032) | (0.037) | (0.036) | (0.040) |
| <i>Acquirer Cash</i> | -0.0311* | -0.0322* | -0.0344** | -0.0403* |
| | (0.015) | (0.017) | (0.016) | (0.022) |
| <i>Target Mkt_cap</i> | 0.0136*** | 0.0095*** | 0.0102*** | 0.0091** |
| | (0.002) | (0.003) | (0.003) | (0.003) |
| <i>Target BM</i> | 0.0072 | 0.0067 | 0.0070 | 0.0060 |
| | (0.005) | (0.007) | (0.007) | (0.007) |
| <i>Target ROA</i> | -0.0159 | -0.0425 | -0.0458 | -0.0529 |
| | (0.034) | (0.052) | (0.050) | (0.056) |
| <i>Target Cash</i> | -0.0070 | 0.0032 | 0.0049 | -0.0078 |
| | (0.016) | (0.025) | (0.025) | (0.024) |
| Observations | 950 | 838 | 838 | 516 |
| R-squared | 0.185 | 0.358 | 0.350 | 0.287 |
| Acquiring industry FE | Yes | Yes | Yes | Yes |
| Target industry FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |

Table 7. Institutional Information Acquisition in M&As and Market Reactions

This table reports regression results for subsamples. Columns (1) and (2) report the results of the information acquisition effects on stock market reactions with *High* (above the median) and *Low* (below the median) institutional downloads (unique IP users). Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Appendix A1. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| Variables | (1) | (2) |
|-------------------------------------|----------------------|-----------------------|
| <i>Subsample</i> | <i>Combined CAR</i> | |
| | <i>High</i> | <i>Low</i> |
| $\Delta ROA_{t-1, t+3}^* Deal\ ESV$ | 8.3109** (3.786) | 2.1971 (2.562) |
| $\Delta ROA_{t-1, t+3}$ | -0.0046 (0.004) | -0.0001 (0.003) |
| <i>Deal ESV</i> | 9.1701 (11.840) | 1.3983 (1.928) |
| <i>Diversifying</i> | -0.0070 (0.010) | -0.0204** (0.009) |
| <i>Relative Size</i> | 0.0007 (0.002) | 0.0040 (0.004) |
| <i>Stock (Pct)</i> | -0.0104 (0.015) | -0.0317* (0.015) |
| <i>Hostile</i> | 0.0270 (0.028) | 0.1411*** (0.028) |
| <i>Toehold</i> | 0.9870** (0.395) | 0.0000 (0.000) |
| <i>Acquirer Mkt_cap</i> | -0.0074** (0.003) | -0.0186*** (0.005) |
| <i>Acquirer BM</i> | -0.0309 (0.030) | 0.0250 (0.019) |
| <i>Acquirer ROA</i> | 0.0179 (0.060) | 0.1325* (0.061) |
| <i>Acquirer Cash</i> | -0.0515* (0.024) | -0.0326 (0.028) |
| <i>Target Mkt_cap</i> | 0.0027 (0.005) | 0.0113** (0.005) |
| <i>Target BM</i> | 0.0104 (0.007) | -0.0017 (0.010) |
| <i>Target ROA</i> | -0.0237 (0.035) | -0.0821* (0.043) |
| <i>Target Cash</i> | 0.0151 (0.020) | -0.0263 (0.044) |
| Observations | 388 | 311 |
| R-squared | 0.421 | 0.467 |
| Acquiring industry FE | Yes | Yes |
| Target industry FE | Yes | Yes |
| Year FE | Yes | Yes |
| Statistical differences test | (1) – (2) | |
| Differences | 5.139*** | |
| T-statistics | (2.661) | |

Table 8. New vs. Stale Information Acquisition Effects on Market Reactions

This table reports regression results for subsamples. Column (1) reports the results of the information acquisition effects on stock market reactions for the subsample of deals which are the first bids in the target industry in a given year. Column (2) reports the results of the information acquisition effects on stock market reactions for the subsample of deals that are not the first bids in the target industry in a given year. Column (3) reports the results of the information acquisition effects on stock market reactions for the subsample of deals that experience above the median downloads of newly issued filings (i.e., filings issued within a [-5, +5] day window around deal announcements). Column (4) reports the results of the information acquisition effects on stock market reactions for the subsample of deals that experience below the median downloads of newly issued filings. The dependent variable, *Combined CAR*, is the combined cumulative abnormal returns of target and acquiring firms in [-5, +5] day window around deal announcements. *Deal ESV* measures information acquisition about merging firms, scaled by the market download within the same event window. $\Delta ROA_{t-1, t+3}$ is the net changes of return on assets in combined firms from the year t-1 to the year t+3. The target and acquirer's return on assets in year t-1 are weighted by total assets at the beginning of the year. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Appendix A1. All regressions include acquirer industry (3-digit SIC), target industry (3-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| VARIABLES | (1) | (2) | (3) | (4) |
|-------------------------------------|---|--|-----------------------|-----------------------|
| | <i>Combined CAR</i> | | | |
| | Mergers in the target industry 1st bid | Downloads of newly issued filings > 1st bid | > Median | < Median |
| $\Delta ROA_{t-1, t+3} * Deal\ ESV$ | 41.3212** (16.375) | 3.5413 (2.991) | 7.3077* (4.072) | 1.8297 (2.023) |
| $\Delta ROA_{t-1, t+3}$ | -0.0384* (0.019) | -0.0008 (0.003) | -0.0055 (0.004) | 0.0015 (0.001) |
| <i>Deal ESV</i> | -9.1195 (18.610) | 8.6736 (8.303) | 9.3352 (10.103) | 2.0357 (2.420) |
| <i>Diversifying</i> | 0.1370*** (0.042) | -0.0132 (0.008) | -0.0158 (0.009) | -0.0060 (0.011) |
| <i>Relative Size</i> | -0.0020 (0.013) | 0.0040* (0.002) | 0.0053 (0.004) | 0.0038 (0.004) |
| <i>Stock (Pct)</i> | -0.0535 (0.044) | -0.0163* (0.008) | -0.0290* (0.014) | -0.0120 (0.011) |
| <i>Hostile</i> | 0.2631*** (0.037) | 0.0400 (0.049) | 0.0182 (0.018) | 0.0716*** (0.022) |
| <i>Toehold</i> | 0.3286 (1.127) | 0.1755 (0.443) | -0.1757 (0.875) | -0.8584 (0.537) |
| <i>Acquirer Mkt_cap</i> | -0.0175 (0.014) | -0.0130*** (0.002) | -0.0166*** (0.005) | -0.0109*** (0.003) |
| <i>Acquirer BM</i> | 0.0534 (0.043) | -0.0022 (0.016) | -0.0483 (0.029) | 0.0440*** (0.014) |
| <i>Acquirer ROA</i> | -0.0284 (0.209) | 0.0698 (0.041) | -0.0413 (0.041) | 0.1226*** (0.028) |
| <i>Acquirer Cash</i> | -0.0250 (0.120) | -0.0405** (0.017) | -0.0467 (0.037) | -0.0032 (0.040) |
| <i>Target Mkt_cap</i> | 0.0106 (0.015) | 0.0068** (0.003) | 0.0105 (0.007) | 0.0076*** (0.002) |
| <i>Target BM</i> | -0.0549*** (0.017) | 0.0183** (0.008) | 0.0116 (0.014) | 0.0031 (0.009) |
| <i>Target ROA</i> | -0.0784 (0.206) | -0.0419 (0.047) | -0.0227 (0.034) | -0.0698 (0.052) |

| | | | | |
|------------------------------|--------------------|--------------------|---------------------|---------------------|
| <i>Target Cash</i> | -0.0730 (0.144) | -0.0126 (0.028) | 0.0432** (0.015) | -0.0769* (0.041) |
| Observations | 156 | 599 | 391 | 331 |
| R-squared | 0.799 | 0.228 | 0.508 | 0.382 |
| Acquiring industry FE | Yes | Yes | Yes | Yes |
| Target industry FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |
| Statistical differences test | (1) – (2) | | (3) – (4) | |
| Differences | 37.780*** | | 5.478*** | |
| T-statistics | (11.191) | | (2.998) | |

Table 9. Pre-Merger Information Asymmetry and Information Acquisition Effects on Market Reactions

This table reports regression results for subsamples of deals with different level of pre-merger information asymmetry. The dependent variable, *Combined CAR*, is the combined cumulative abnormal returns of target and acquiring firms in [-5, + 5] day window around deal announcements. *Filings readability* is measured by the *Bog index* from Bonsall et al. (2017); that is, a higher *Bog index* implies lower filings readability. *Short interest* is the level of monthly short interest reported from Compustat database. *Analyst dispersion* is measured as the standard deviation of analysts' earnings estimates in the year prior to deal announcements. *Analyst coverage* counts the number of analysts following the target (acquiring) firm in the year prior to deal announcements. The sample is divided into subsamples based on whether both target and acquirer firms have high (above median) information asymmetry measured by four different proxies defined previously. *Deal ESV* measures information acquisition about merging firms, scaled by the market download within the same event window. $\Delta ROA_{t-1, t+3}$ is the net changes of return on assets in combined firms from the year t-1 to the year t+3. The target and acquirer's return on assets in year t-1 are weighted by total assets at the beginning of the year. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Appendix A1. All regressions include acquirer industry (3-digit SIC), target industry (3-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| VARIABLES | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|----------------------------|----------------------|-----------------------|-----------------------|---------------------------|-----------------------|-------------------------|------------------------|
| | <i>Combined CAR</i> | | | | | | | |
| | <i>Filings readability</i> | | <i>Short interest</i> | | <i>Analyst dispersion</i> | | <i>Analyst coverage</i> | |
| | High | Low | High | Low | High | Low | High | Low |
| <i>Deal ESV</i> * $\Delta ROA_{t-1, t+3}$ | 17.7418 (11.078) | 3.3820** (1.498) | 1.3943 (3.056) | 61.9801** (23.533) | 7.0186*** (2.111) | -3.3855 (12.742) | 0.8202 (3.031) | 57.9593*** (13.971) |
| $\Delta ROA_{t-1, t+3}$ | 0.0008 (0.007) | -0.0013 (0.002) | 0.0016 (0.002) | -0.0274*** (0.009) | -0.0048* (0.003) | 0.0066 (0.005) | 0.0001 (0.002) | -0.0243*** (0.007) |
| <i>Deal ESV</i> | 23.5264** (9.611) | 3.0570 (2.367) | 5.1902 (5.674) | -22.4180 (16.739) | 7.3838 (4.292) | -3.7479 (11.744) | 3.6080 (5.579) | -22.1178** (10.232) |
| <i>Diversifying</i> | -0.0109 (0.013) | -0.0105 (0.006) | -0.0100 (0.007) | -0.0211 (0.013) | -0.0119* (0.007) | -0.0106 (0.013) | -0.0039 (0.007) | -0.0127 (0.011) |
| <i>Relative Size</i> | -0.0059 (0.004) | 0.0009 (0.003) | 0.0049* (0.003) | -0.0008 (0.011) | 0.0017 (0.003) | 0.0070* (0.003) | 0.0040 (0.002) | 0.0042 (0.035) |
| <i>Stock (Pct)</i> | -0.0225 (0.020) | -0.0238** (0.009) | -0.0218** (0.008) | -0.0045 (0.024) | -0.0302** (0.011) | -0.0148 (0.010) | -0.0291*** (0.009) | 0.0013 (0.020) |
| <i>Hostile</i> | -0.0393 (0.055) | 0.0161 (0.015) | 0.0319** (0.014) | 0.0716** (0.031) | 0.0202 (0.013) | 0.1080*** (0.031) | 0.0313* (0.016) | 0.0488 (0.048) |
| <i>Toehold</i> | 0.1330 (0.523) | -0.2947 (0.485) | 0.1040 (0.534) | 0.0000 (0.000) | -0.7055 (0.832) | 1.5534** (0.560) | 0.2519 (0.622) | 0.0000 (0.000) |
| <i>Acquirer Mkt_cap</i> | -0.0144*** (0.004) | -0.0110** (0.004) | -0.0146*** (0.003) | -0.0161** (0.007) | -0.0160*** (0.003) | -0.0102*** (0.003) | -0.0150*** (0.003) | -0.0091 (0.007) |
| <i>Acquirer BM</i> | 0.0081 (0.024) | -0.0164 (0.021) | -0.0138 (0.024) | 0.0074 (0.036) | 0.0036 (0.015) | -0.0542 (0.035) | -0.0186 (0.020) | 0.0314 (0.031) |

| | | | | | | | | |
|------------------------------|--------------------|----------------------|---------------------|----------------------|-----------------------|----------------------|----------------------|----------------------|
| <i>Acquirer ROA</i> | 0.0092 (0.174) | 0.0602 (0.038) | 0.0210 (0.065) | 0.2104*** (0.068) | 0.0954* (0.048) | -0.2090** (0.069) | 0.0232 (0.062) | 0.2004*** (0.056) |
| <i>Acquirer Cash</i> | 0.0780 (0.052) | -0.0506** (0.023) | -0.0379* (0.018) | 0.0569** (0.026) | -0.0650*** (0.020) | 0.0294 (0.045) | -0.0629** (0.024) | 0.0889*** (0.029) |
| <i>Target Mkt_cap</i> | 0.0053 (0.003) | 0.0040 (0.004) | 0.0070* (0.004) | 0.0168* (0.008) | 0.0094*** (0.003) | 0.0029 (0.006) | 0.0106** (0.004) | 0.0111 (0.009) |
| <i>Target BM</i> | 0.0081 (0.008) | 0.0070 (0.007) | -0.0062 (0.007) | 0.0315** (0.014) | 0.0099 (0.007) | 0.0145 (0.010) | -0.0002 (0.009) | 0.0194* (0.009) |
| <i>Target ROA</i> | -0.0578 (0.132) | -0.0321 (0.039) | -0.0567 (0.044) | 0.0406 (0.059) | -0.0438 (0.049) | -0.0428 (0.051) | -0.0467 (0.042) | -0.0354 (0.061) |
| <i>Target Cash</i> | -0.0227 (0.077) | 0.0013 (0.028) | -0.0062 (0.023) | 0.0484 (0.037) | 0.0075 (0.023) | -0.0212 (0.037) | 0.0113 (0.016) | -0.0501 (0.053) |
| Observations | 222 | 491 | 549 | 222 | 629 | 167 | 523 | 224 |
| R-squared | 0.448 | 0.361 | 0.386 | 0.526 | 0.395 | 0.430 | 0.388 | 0.396 |
| Acquiring industry FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Target industry FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Statistical differences test | (1) – (2) | | (3) – (4) | | (5) – (6) | | (7) – (8) | |
| Differences | -14.360*** | | -60.586*** | | 10.404 | | -57.139*** | |
| T-statistics | (4.447) | | 13.474 | | 1.604 | | 16.058 | |

Table 10. Information Acquisition and Financial Synergies

This table reports regression results regarding the impact of information acquisition around merger announcements on stock market reactions within the same event window. *ΔICC* is the changes in the adjusted implied cost of capital (equity) from -4 to +4/+8/+12 quarters around deal completion. The implied cost of capital (ICC) is following Gebhardt, Lee, and Swaminathan (2001) estimated at the quarterly level. The value is benchmarked with the average ICC of portfolio firms obtained from size, industry, BM ratio, and quarterly downloads matching at *q*-4 quarter. The *Deal ESV* is the total number of downloads in target and acquiring firms scaled by market downloads. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Appendix A1. All regressions include acquirer industry (3-digit SIC), target industry (3-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| Variables | (1) | (2) | (3) |
|-------------------------|-----------------------|-----------------------|-----------------------|
| Window (Quarter) | [-4, +4] | [-4, +8] | [-4, +12] |
| <i>ΔICC*Deal ESV</i> | -1.8904*** (0.424) | -1.7760*** (0.292) | -1.8821*** (0.311) |
| <i>ΔICC</i> | 0.1338* (0.073) | 0.1899** (0.070) | 0.1905*** (0.060) |
| <i>Deal ESV</i> | 0.1908*** (0.025) | 0.1853*** (0.022) | 0.1756*** (0.033) |
| <i>Diversifying</i> | -0.0184 (0.015) | -0.0201 (0.015) | -0.0222 (0.016) |
| <i>Relative Size</i> | 0.0032 (0.004) | 0.0034 (0.003) | 0.0035 (0.003) |
| <i>Stock (Pct)</i> | -0.0002 (0.017) | -0.0017 (0.015) | -0.0034 (0.017) |
| <i>Toehold</i> | 0.2460 (0.827) | 0.2329 (0.746) | 0.2553 (0.721) |
| <i>Acquirer Mkt_cap</i> | -0.0151*** (0.003) | -0.0162*** (0.003) | -0.0161*** (0.003) |
| <i>Acquirer BM</i> | -0.0299* (0.015) | -0.0375** (0.014) | -0.0421*** (0.012) |
| <i>Acquirer ROA</i> | -0.0263 (0.082) | -0.0093 (0.087) | -0.0061 (0.079) |
| <i>Acquirer Cash</i> | 0.0215 (0.061) | 0.0128 (0.058) | 0.0035 (0.056) |
| <i>Target Mkt_cap</i> | 0.0061 (0.004) | 0.0074** (0.003) | 0.0078** (0.003) |
| <i>Target BM</i> | 0.0268* (0.014) | 0.0277** (0.013) | 0.0291** (0.012) |
| <i>Target ROA</i> | 0.0320 (0.059) | 0.0397 (0.056) | 0.0240 (0.055) |
| <i>Target Cash</i> | -0.0176 (0.033) | -0.0034 (0.034) | -0.0082 (0.034) |
| Observations | 229 | 238 | 241 |
| R-squared | 0.440 | 0.427 | 0.419 |
| Acquiring industry FE | Yes | Yes | Yes |
| Target industry FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |

Table 11. Information Acquisition and Subsequent Takeover probability

This table reports the estimates of information acquisition effects on non-deal firms' subsequent takeover probability in the post-announcement period. In Panel A, the dependent variable, $Prob(M\&A)_{t+1/2/3}$, equals one if the firm announced any deal within 12/24/36 months after the focal merger announcement date. *Firm ESV* is the total number of downloads within a [-5, +5] day window around deal announcements. *Mkt_cap* is the natural log of market capitalization. *BM* is the book value of equity scaled by the market value of common equity. *ROA* is the ratio of operating income before depreciation and amortization (oibdp) to total assets. *Cash* is the ratio of cash to total assets. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Appendix A1. All regressions include deal and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| VARIABLES | (1) <i>Prob(M&A) t+1</i> | (2) <i>Prob(M&A) t+2</i> | (3) <i>Prob(M&A) t+3</i> |
|----------------|---------------------------------|---------------------------------|---------------------------------|
| Firm ESV | 0.0048*** (0.001) | 0.0075*** (0.001) | 0.0092*** (0.001) |
| <i>Mkt_cap</i> | 0.0034*** (0.001) | 0.0050*** (0.001) | 0.0066*** (0.001) |
| <i>BM</i> | -0.0019* (0.001) | -0.0028* (0.002) | -0.0021 (0.002) |
| <i>ROA</i> | 0.0126*** (0.001) | 0.0234*** (0.003) | 0.0314*** (0.004) |
| <i>Cash</i> | 0.0249* (0.013) | 0.0507* (0.024) | 0.0622** (0.026) |
| Observations | 2,828,504 | 2,828,504 | 2,828,504 |
| R-squared | 0.014 | 0.022 | 0.028 |
| Deal FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |

Table 12. SEC EDGAR Downloads and Market Reactions around M&As – Alternative Measures

This table reports the information acquisition effects by using alternative measures around merger announcements on stock market reactions within the same event window. The dependent variable, *Combined CAR*, is the combined cumulative abnormal return of target and acquiring firms in a [-5, +5] day window around deal announcements. $\Delta ROA_{t-1, t+3}$ is the net changes of industry-adjusted return on assets in combined firms from the year t-1 to the year t+3. The target and acquirer's return on assets in year t-1 are weighted by total assets at the beginning of the year. *Deal ESV (Raw)* is the total number of unique IP users that downloaded filings issued by merging firms. *Adj_ESV_last_qtr_med* is the abnormal downloads in thousands, adjusted for the median of the past quarter. *Adj_ESV_benchmark1* is the difference between the number of downloads from target and acquiring firms and downloads of portfolio benchmarks matched on firm size, stock return, and trading volume in year t-1, then scaled by merging firms' last quarter mean. *Adj_ESV_benchmark2* is the number of downloads from target and acquiring firms adjusted (divided) by portfolio benchmarks matched on firm downloads in year t-1. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Appendix A1. All regressions include acquirer industry (3-digit SIC), target industry (3-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| Download Measure (X) | (1) <i>Deal ESV (Raw)</i> | (2) <i>Adj_ESV_last_qtr_med</i> | (3) <i>Adj_ESV_benchmark1</i> | (4) <i>Adj_ESV_benchmark2</i> |
|-----------------------------|------------------------------|------------------------------------|----------------------------------|----------------------------------|
| $\Delta ROA_{t-1, t+3} * X$ | 0.0034* (0.002) | 0.0094** (0.004) | 0.0034*** (0.001) | 0.0002** (0.000) |
| $\Delta ROA_{t-1, t+3}$ | -0.0001 (0.002) | -0.0001 (0.002) | -0.0091*** (0.002) | -0.0037 (0.002) |
| <i>X</i> | 0.0106 (0.010) | 0.0156 (0.015) | -0.0019 (0.003) | -0.0002 (0.000) |
| <i>Diversifying</i> | -0.0108 (0.007) | -0.0106 (0.007) | -0.0091 (0.005) | -0.0128 (0.008) |
| <i>Relative Size</i> | 0.0029 (0.002) | 0.0040 (0.002) | 0.0019 (0.003) | -0.0009 (0.003) |
| <i>Stock (Pct)</i> | -0.0205** (0.008) | -0.0229** (0.009) | -0.0182* (0.009) | -0.0205** (0.008) |
| <i>Hostile</i> | 0.0389 (0.027) | 0.0357 (0.025) | 0.0119 (0.014) | 0.0466 (0.028) |
| <i>Toehold</i> | 0.2732 (0.548) | 0.3004 (0.567) | 1.1016* (0.511) | 0.1531 (0.612) |
| <i>Acquirer Mkt_cap</i> | -0.0149*** (0.003) | -0.0148*** (0.003) | -0.0131*** (0.003) | -0.0136*** (0.003) |
| <i>Acquirer BM</i> | -0.0014 (0.018) | -0.0019 (0.018) | -0.0244 (0.018) | 0.0104 (0.014) |
| <i>Acquirer ROA</i> | 0.0664 (0.042) | 0.0466 (0.034) | 0.0216 (0.048) | 0.0805* (0.041) |
| <i>Acquirer Cash</i> | -0.0330* (0.018) | -0.0351* (0.018) | -0.0281 (0.018) | -0.0318 (0.018) |

| | | | | |
|-----------------------|-----------|-----------|----------|----------|
| | (0.016) | (0.016) | (0.020) | (0.019) |
| <i>Target Mkt_cap</i> | 0.0082*** | 0.0086*** | 0.0102** | 0.0080** |
| | (0.002) | (0.002) | (0.004) | (0.004) |
| <i>Target BM</i> | 0.0054 | 0.0074 | 0.0163* | -0.0039 |
| | (0.007) | (0.007) | (0.008) | (0.007) |
| <i>Target ROA</i> | -0.0434 | -0.0188 | 0.0193 | -0.0520 |
| | (0.050) | (0.034) | (0.020) | (0.048) |
| <i>Target Cash</i> | 0.0090 | 0.0205 | 0.0167 | -0.0048 |
| | (0.025) | (0.019) | (0.022) | (0.028) |
| Observations | 792 | 770 | 476 | 633 |
| R-squared | 0.365 | 0.368 | 0.395 | 0.407 |
| Acquiring industry FE | Yes | Yes | Yes | Yes |
| Target industry FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |

Table 13. Attention or Learning? - Information Acquisition in Firms with Similar Names

This table shows the results of re-examining the information acquisition effects on stock market reactions and market anticipation of future deals. The sample contains non-deal firms who have similar names to merging firms. For each deal, name matching is conducted between the names of merging firms (the target and the acquirer) and all other firms from SEC EDGAR, excluding event firms and peer firms. The Levenstein distances between matched firms and merging firms are smaller than the threshold of three. Columns (1) to (6) report the information acquisition effects on stock market reactions. *Firm ESV* is the natural log of total number of downloads within a [-5, +5] day window around deal announcements. *Mkt_cap* is the natural log of market capitalization. *BM* is the book value of equity scaled by the market value of common equity. *ROA* is the ratio of operating income before depreciation and amortization (oibdp) to total assets. *Cash* is the ratio of cash to total assets. Continuous variables are winsorized at the 1% and 99% levels. Detailed variable definitions are reported in Appendix A1. All regressions include deal and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| | (1) | (2) |
|---------------------|-------------------------|-------------------------|
| VARIABLES | | |
| Synergy Measure (X) | $\Delta ROA_{t-1, t+3}$ | $\Delta ICC_{t-1, t+3}$ |
| <i>Firm ESV</i> *X | -0.0795 (0.045) | -0.0000 (0.000) |
| <i>Firm ESV</i> | 0.0010 (0.003) | 0.0016 (0.004) |
| <i>X</i> | 0.1464*** (0.045) | 0.0000 (0.000) |
| <i>Mkt_cap</i> | -0.0025 (0.003) | -0.0016 (0.003) |
| <i>BM</i> | 0.0149 (0.009) | 0.0157 (0.010) |
| <i>ROA</i> | 0.0226 (0.037) | -0.0266 (0.029) |
| <i>Cash</i> | 0.0125 (0.025) | 0.0271 (0.031) |
| Observations | 555 | 431 |
| R-squared | 0.295 | 0.280 |
| Deal FE | Yes | Yes |
| Year FE | Yes | Yes |

Appendix A

Figure A. The Timing of the Information Acquisition Relative to the SEC Filing Date

This figure illustrates the timing pattern of filings downloaded in a [-5, +5] event-day window around deal announcements. The x-axis counts the number of months from the filings issue date to the download date. The y-axis illustrates the number of unique IP users who download filings around the merger announcement date. Figure A1 illustrates the distribution of all filings downloaded. Figure A 2 and 3 illustrates the distribution of regular filings (i.e., 10-K, 10-Q) and other types of filings downloaded.

Figure A1. Time series distribution of all filings

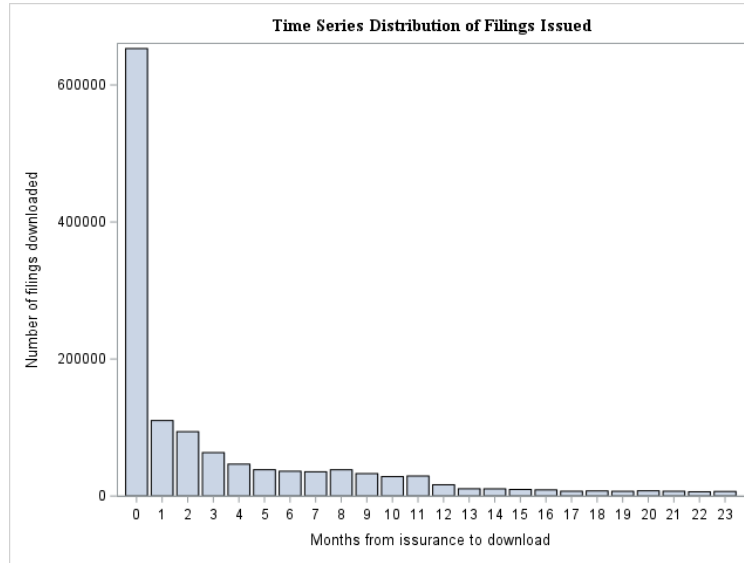


Figure A2. Time series distribution of regular filings (i.e., 10-K, 10-Q)

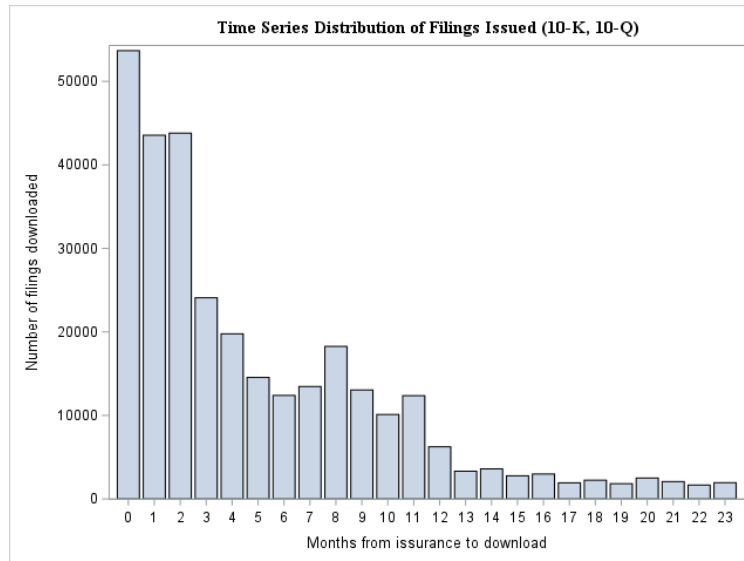


Figure A3. Time series distribution of other types of filings

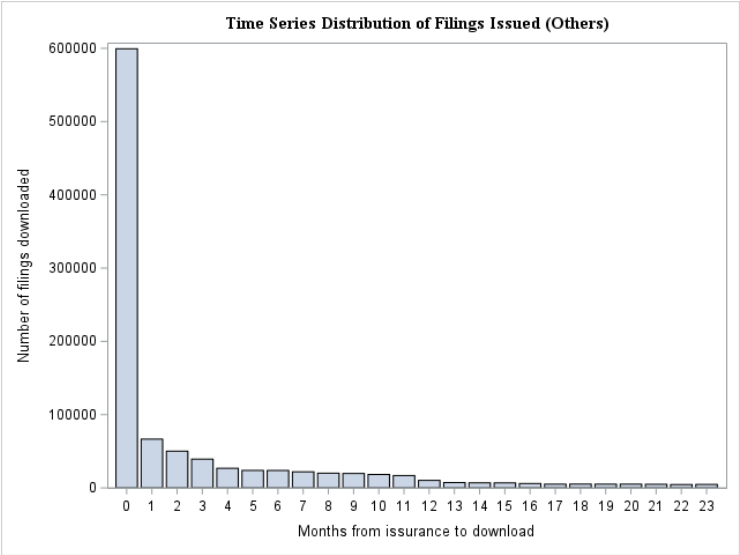


Table A1. Variable Index

| Variables | Definition |
|-------------------------------------|---|
| <i>Acquirer (Target) Amendments</i> | The natural logarithm of the total number of amendments filed by acquirers (targets) in the three years before deal announcements. |
| <i>Analyst coverage</i> | The number of analysts following the acquiring (target) firm in the year prior to deal announcements. |
| <i>Acquirer ESV</i> | The total number of unique IP users that downloaded filings issued by acquiring firms in a [-5, +5] event-day window around deal announcements scaled by the market ESV |
| <i>Acquirer Volume</i> | The total trading volume of the acquiring firm |
| <i>Adj_ESV_benchmark1</i> | The difference between the number of downloads from target and acquiring firms and downloads of portfolio benchmarks matched on firm size, stock returns, and trading volume in year t-1, then scaled by merging firms' last quarter mean |
| <i>Adj_ESV_benchmark2</i> | The number of downloads from target and acquiring firms adjusted (divided) by portfolio benchmarks matched on firm downloads in year t-1 |
| <i>Adj_ESV_last_qtr_med</i> | The abnormal downloads, in thousands, adjusted for the median of the prior quarter |
| <i>Analyst dispersion</i> | The standard deviation of analysts' earnings estimates in the year prior to deal announcements. |
| <i>BM</i> | The book value of equity scaled by the market value of common equity |
| <i>Cash</i> | The ratio of cash to total assets |
| <i>Combined CAR</i> | The combined cumulative abnormal returns of target and acquiring firms in a [-5, +5] event-day window around deal announcements |
| <i>Customer/Supplier ESV</i> | The total number of unique IP users that downloaded filings issued by customers or suppliers of merging firms scaled by the market ESV |
| <i>Customer/Supplier ESV (Raw)</i> | The total number of unique IP users that downloaded filings issued by customers or suppliers of merging firms |
| <i>Deal ESV</i> | The total number of unique IP users that downloaded filings issued by merging firms scaled by the market ESV |
| <i>Deal ESV (Raw)</i> | The total number of unique IP users that downloaded filings issued by merging firms |
| <i>Deal Volume</i> | The total trading volume of the target and acquiring firms |
| <i>Diversifying</i> | Equals one if the target and acquirer are from two different (3-digit SIC) industries |
| <i>Filings readability</i> | The Bog index from Bonsall et al. (2017). |
| <i>Firm ESV</i> | The total number of downloads within a [-5, +5] day window around deal announcements |
| <i>Hostile</i> | Equals one if the deal attitude is hostile |
| <i>Non-Deal Industry ESV</i> | Average downloads in non-deal industries over the [-5, +5] event-day window around deal announcements scaled by the market downloads |
| <i>Institutional ESV</i> | The total number of unique institutional (US public firms) IP users that downloaded filings issued by any firm scaled by the market ESV |
| <i>Institutional ESV (Raw)</i> | The total number of unique institutional (US public firms) IP users that downloaded filings issued by any firm |
| <i>Market ESV (Raw)</i> | The total number of unique IP users that downloaded filings issued by any firm within the event window |

| | |
|--------------------------------------|---|
| <i>Mkt_cap</i> | The natural log of market capitalization |
| <i>Prob(M&A)</i> | Equals one if the firm announced any deal within 12/24/36 months after the focal merger announcement date |
| <i>Relative Size</i> | The ratio of the target's market capitalization to the acquirer's market capitalization |
| <i>Rival ESV</i> | The total number of unique IP users that downloaded filings issued by industry (3-digit SIC) rivals of merging firms scaled by the market ESV |
| <i>Rival ESV (Raw)</i> | The total number of unique IP users that downloaded filings issued by industry (3-digit SIC) rivals of merging firms |
| <i>Rival ESV (Restricted)</i> | Information acquisition about industry (3-digit SIC) rivals of merging firms, excluding downloads from target and acquiring firms if the merger is the focusing (non-diversifying) deal |
| <i>ROA</i> | The ratio of operating income before depreciation and amortization (oibdp) to total assets |
| <i>Short interest</i> | The level of monthly short interest reported from Compustat database. |
| <i>Stock (Pct)</i> | The percentage (in decimals) of shares traded in the transaction |
| <i>Supply-chain ESV (Restricted)</i> | Information acquisition about customers or suppliers of merging firms, excluding downloads in target and acquiring firms if the merger is diversifying |
| <i>Target ESV</i> | The total number of unique IP users that download filings issued by target firms in a [-5, +5] event-day window around deal announcements scaled by the market ESV |
| <i>Target Volume</i> | The total trading volume of the target firm |
| <i>Toehold</i> | The percentage (in decimals) of target shares the acquirer held six months prior to the deal announcement |
| <i>Volatility</i> | The standard deviation of daily stock return in the year before deal announcements. |
| <i>ΔICC</i> | The changes in adjusted implied cost of capital (equity) from -4 to +4/+8/+12 quarters around deal completion. The target (acquirer)'s implied cost of capital (equity) is calculated following Gebhardt, Lee, and Swaminathan (2001), using analyst forecasted EPS and industry ROE, then adjusted for benchmark of firms within industry, similar firm size (+/-20%), and BM ratio (+/-20%). The implied cost of capital (equity) before the merger is the weighted average of the target's and acquirer's implied cost of capital (equity), where the weights are their respective total assets. |
| <i>ΔROA</i> | The net changes in return on assets of the combined firm from year $t-1$ to year $t+1/2/3$. The return on assets for the combined firm in any post-merger period is the return on assets on the acquiring firm. The return on assets for the combined firm in year $t-1$ is calculated as the weighted average return on assets for the target and acquiring firm, weighted by the total assets. |

Table A2. Statistics of the Information Acquisition Activities by Filing type

This table reports the distribution of filing types of all download activities for the full sample. The definition of each form type is from the SEC EDGAR website. Panel A reports only the top 10 filing types that are most frequently downloaded. Panel B reports the statistics of the top 10 most frequently reported types of filings in merging firms. All activities are restricted within a (-5, +5) day window around deal announcements.

Panel A. Distribution of frequently downloaded filing types for the full sample

| Form Type | Definition | Classification | Frequency |
|-----------------|--|--------------------------------|-----------|
| <i>10-K</i> | Annual report pursuant to Section 13 and 15(d) | Firm-specific report/statement | 18.23% |
| <i>8-K</i> | Current report filing | Merger-related(occasionally) | 17.32% |
| <i>10-Q</i> | Quarterly report pursuant to Section 13 or 15(d) | Firm-specific report/statement | 14.12% |
| <i>DEF 14A</i> | Definitive proxy statements | Merger-related | 7.14% |
| <i>4</i> | Statement of changes in beneficial ownership of securities | Merger-related | 6.47% |
| <i>425</i> | Filing under Securities Act Rule 425 of certain prospectuses and communications in connection with business combination transactions | Merger-related | 1.69% |
| <i>SC 13G/A</i> | Schedule filed to report acquisition of beneficial ownership of 5% or more of a class of equity securities by passive investors and certain institutions | Merger-related | 1.45% |
| <i>DEFA14A</i> | Definitive additional proxy soliciting materials including Rule 14(a)(12) material Note: Submission type DEFA14A can be filed as part of Form 8-K. For filers subject to 8-K filing requirements, we recommend the use of the 8-K combined form type as the easiest method for fulfilling your filing requirement for both forms | Merger-related | 1.43% |
| <i>424B3</i> | Prospectus filed pursuant to Rule 424(b)(3) | Firm-specific report/statement | 1.34% |
| <i>S-1/A</i> | Pre-effective amendment | Firm-specific report/statement | 1.37% |
| Total | | | 70.56% |

Panel B. Distribution of frequently reported filing types for the full sample

| Form Type | Definition | Classification | Frequency |
|-----------|--|--------------------------------|-----------|
| 425 | Filing under Securities Act Rule 425 of certain prospectuses and communications in connection with business combination transactions | Merger-related | 26.50% |
| 8-K | Current report filing | Merger-related(occasionally) | 22.58% |
| 4 | Statement of changes in beneficial ownership of securities | Merger-related | 22.07% |
| DEFA14A | Definitive additional proxy soliciting materials including Rule 14(a)(12) material | Merger-related | 9.02% |
| SC TO-C | Written communication relating to an issuer or third-party tender offer | Merger-related | 2.59% |
| SC14D9C | Written communication by the subject company relating to a third-party tender offer | Merger-related | 1.90% |
| 10-Q | Quarterly report pursuant to Section 13 or 15(d) | Firm-specific report/statement | 1.61% |
| SC 13D/A | Schedule filed to report acquisition of beneficial ownership of 5% or more of a class of equity securities | Merger-related | 1.51% |
| SC 13G/A | Schedule filed to report acquisition of beneficial ownership of 5% or more of a class of equity securities by passive investors and certain institutions | Merger-related | 1.51% |
| DFAN14A | Definitive additional proxy soliciting materials filed by non-management including Rule 14(a)(12) material | Firm-specific report/statement | 1.44% |
| Total | | | 90.74% |

Table A3. Summary Statistics of Filings Issued:

This table reports the summary statistics of filings issued and downloaded in a [-5, +5] event-day window around deal announcements. *Event Day* is the day relevant to the merger announcement date. Panel A reports the total number of filings downloaded, percentage of regular filings (10-K and 10-Q) and other types of filings, newly issued filings (filings issued from 5 days before to 5 days after the date announced), and previously issued filings (filings issued before -5 days relevant to the announcement date). Panel B reports the total number of filings downloaded, the percentage of regular filings among all newly issued filings, the percentage of other types of filings among all newly issued filings, the percentage of regular filings among all previously issued filings, and the percentage of other types of filings among all previously issued filings.

| Event Day | All Downloads | 10K/10Q (%) | Others (%) | Newly issued (%) | Previously issued (%) |
|-----------|---------------|-------------|------------|------------------|-----------------------|
| -5 | 77,124 | 31.70% | 68.30% | 3.53% | 96.47% |
| -4 | 76,537 | 32.45% | 67.55% | 5.94% | 94.06% |
| -3 | 78,379 | 31.55% | 68.45% | 6.89% | 93.11% |
| -2 | 73,181 | 32.68% | 67.32% | 8.04% | 91.96% |
| -1 | 81,741 | 32.12% | 67.88% | 9.38% | 90.62% |
| 0 | 334,934 | 24.97% | 75.03% | 33.56% | 66.44% |
| 1 | 282,565 | 19.60% | 80.40% | 47.50% | 52.50% |
| 2 | 167,479 | 20.48% | 79.52% | 46.97% | 53.03% |
| 3 | 146,099 | 20.21% | 79.79% | 43.31% | 56.69% |
| 4 | 126,929 | 21.35% | 78.65% | 43.74% | 56.26% |
| 5 | 108,447 | 22.95% | 77.05% | 41.85% | 58.15% |

| Event Day | All Downloads | Newly issued: 10-K/10-Q (%) | Newly issued: Others (%) | Previously issued: 10-K/10-Q (%) | Previously issued: Others |
|-----------|---------------|-----------------------------|--------------------------|----------------------------------|---------------------------|
| -5 | 77,124 | 13.37% | 86.63% | 32.38% | 67.62% |
| -4 | 76,537 | 16.62% | 83.38% | 33.46% | 66.54% |
| -3 | 78,379 | 13.62% | 86.38% | 32.88% | 67.12% |
| -2 | 73,181 | 11.64% | 88.36% | 34.54% | 65.46% |
| -1 | 81,741 | 16.00% | 84.00% | 33.80% | 66.20% |
| 0 | 334,934 | 2.40% | 97.60% | 36.38% | 63.62% |
| 1 | 282,565 | 1.87% | 98.13% | 35.65% | 64.35% |
| 2 | 167,479 | 2.61% | 97.39% | 36.33% | 63.67% |
| 3 | 146,099 | 3.17% | 96.83% | 33.24% | 66.76% |
| 4 | 126,929 | 3.47% | 96.53% | 35.28% | 64.72% |
| 5 | 108,447 | 4.45% | 95.55% | 36.28% | 63.72% |

Table A4. Determinants of Deal-Level Information Acquisition

This table reports the estimates of multivariate regression regarding the determinants of deal-level information acquisition (Panel A), and the effects of abnormal information acquisition estimated from the determinants model (Panel B). *Deal ESV* is the total number of unique IP users that downloaded filings issued by merging firms in a [-5, +5] event-day window around deal announcements scaled by the market downloads. *Relative Size* is the ratio of the target's market capitalization to the acquirer's market capitalization. *Acquirer (Target) Mkt_cap* is the natural log of market capitalization. *Acquirer (Target) BM* is the book value of equity scaled by the market value of common equity. *Acquirer (Target) Short interest* is the level of monthly short interest reported from Compustat database. *Acquirer (Target) volatility* is the standard deviation of daily stock return in the year before deal announcements. In Panel B, *Residual ESV* is the predicted residuals from regression estimated in Panel A. All independent variables in Panel A are scaled by 1000. All regressions include year fixed effects. T-statistics are reported right to the coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

Panel A. Multivariate analysis of determinants of deal-level downloads

| VARIABLES | <i>Deal ESV</i> |
|--------------------------------|-----------------------|
| <i>Relative Size</i> | 0.0584* (0.0287) |
| <i>Stock (Pct)</i> | 0.3088* (0.1568) |
| <i>Acquirer BM</i> | 0.2734** (0.0986) |
| <i>Target BM</i> | 0.1321* (0.0629) |
| <i>Acquirer Mkt_cap</i> | 0.0821*** (0.0239) |
| <i>Target Mkt_cap</i> | 0.2169*** (0.0376) |
| <i>Acquirer short interest</i> | 0.0000* (0.0000) |
| <i>Target short interest</i> | 0.0000*** (0.0000) |
| <i>Acquirer volatility</i> | -1.7072 (2.7905) |
| <i>Target volatility</i> | 2.6521* (1.3939) |
| Observations | 1,358 |
| R-squared | 0.4726 |
| Year FEs | Yes |

Panel B. Abnormal ESV from determinants model and stock market reactions

| VARIABLES | (1) <i>Combined CAR</i> |
|---|----------------------------|
| $\Delta ROA_{t-1, t+3}$ * <i>Residual ESV</i> | 4.7969** (2.070) |
| $\Delta ROA_{t-1, t+3}$ | -0.0027** (0.001) |
| <i>Residual ESV</i> | 44.1606** (18.027) |
| <i>Diversifying</i> | -0.0067 (0.006) |
| <i>Relative Size</i> | 0.0003 (0.002) |
| <i>Stock (Pct)</i> | -0.0383*** (0.012) |
| <i>Hostile</i> | 0.0385** (0.017) |
| <i>Toehold</i> | 0.1175 (0.442) |
| <i>Acquirer Mkt_cap</i> | -0.0185*** (0.003) |
| <i>Acquirer BM</i> | -0.0271 (0.017) |
| <i>Acquirer ROA</i> | 0.0326 (0.033) |
| <i>Acquirer Cash</i> | -0.0461*** (0.015) |
| <i>Target Mkt_cap</i> | -0.0009 (0.006) |
| <i>Target BM</i> | 0.0037 (0.008) |
| <i>Target ROA</i> | -0.0016 (0.026) |
| <i>Target Cash</i> | 0.0281* (0.015) |
| Observations | 797 |
| R-squared | 0.3629 |
| Acquiring industry FE | Yes |
| Target industry FE | Yes |
| Year FE | Yes |

Table A5. Information Acquisition and Trading Volume Around Deal Announcements

This table reports regression results regarding the relation between information acquisition and trading volume in deal firms. Panel A reports the relation between information acquisition and trading volume in a [-42, 0] day window before deal announcements. *Deal ESV* is the total number of unique IP users that downloaded filings issued by merging firms in a [-42, 0] event-day window around deal announcements scaled by the market ESV. *Acquirer ESV* is the total number of unique IP users that downloaded filings issued by acquiring firms in a [-42, 0] event-day window around deal announcements scaled by the market ESV. *Target ESV* is the total number of unique IP users that downloaded filings issued by target firms in a [-42, 0] event-day window around deal announcements scaled by the market ESV. *Deal Volume* is the total trading volume in target and acquiring firms in [-42, 0] event-day window around deal announcements. *Acquirer Volume* is the total trading volume in acquiring firms in [-42, 0] event-day window around deal announcements. *Target Volume* is the total trading volume in target firms in a [-42, 0] event-day window around deal announcements. Panel B reports the relation between information acquisition and trading volumes in a [+1, +126] day-window before deal announcements. *Deal ESV* is the total number of unique IP users that downloaded filings issued by merging firms in a [+1, +126] event-day window around deal announcements scaled by the market ESV. *Acquirer ESV* is the total number of unique IP users that downloaded filings issued by acquiring firms in a [+1, +126] event-day window around deal announcements scaled by the market ESV. *Target ESV* is the total number of unique IP users that downloaded filings issued by target firms in a [+1, +126] event-day window around deal announcements scaled by the market ESV. *Deal Volume* is the total trading volume in target and acquiring firms in a [+1, +126] event-day window around deal announcements. *Acquirer Volume* is the total trading volume in acquiring firms in a [+1, +126] event-day window around deal announcements. *Target Volume* is the total trading volume in target firms in a [+1, +126] event-day window around deal announcements. Continuous variables are winsorized at the 1% and 99% levels. All regressions include acquirer industry (3-digit SIC), target industry (3-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

Panel A. Pre-announcement information acquisition and trading volume

| Variables | (1) <i>Deal Volume</i> | (2) <i>Acquirer Volume</i> | (3) <i>Target Volume</i> |
|-------------------------|---------------------------|-------------------------------|-----------------------------|
| Download measure (X) | <i>Deal ESV</i> | <i>Acquirer ESV</i> | <i>Target ESV</i> |
| <i>X</i> | 4.4688*** (1.477) | 2.6826*** (0.823) | 2.9395* (1.515) |
| <i>Diversifying</i> | 0.0001 (0.000) | 0.0000 (0.000) | 0.0001 (0.000) |
| <i>Relative Size</i> | 0.0004 (0.000) | 0.0002 (0.000) | 0.0003** (0.000) |
| <i>Stock (Pct)</i> | -0.0001 (0.000) | -0.0000 (0.000) | -0.0001 (0.000) |
| <i>Hostile</i> | -0.0005 (0.001) | -0.0001 (0.000) | -0.0004 (0.000) |
| <i>Toehold</i> | -0.0064 (0.036) | -0.0060 (0.019) | -0.0008 (0.018) |
| <i>Acquirer Mkt_cap</i> | 0.0007*** (0.000) | 0.0003*** (0.000) | 0.0006*** (0.000) |
| <i>Acquirer BM</i> | 0.0012*** (0.000) | 0.0005** (0.000) | 0.0008*** (0.000) |
| <i>Acquirer ROA</i> | -0.0003 (0.001) | -0.0000 (0.001) | -0.0004 (0.001) |
| <i>Acquirer Cash</i> | 0.0017** (0.001) | 0.0009** (0.000) | 0.0007 (0.000) |
| <i>Target Mkt_cap</i> | 0.0000 (0.000) | 0.0001* (0.000) | 0.0000 (0.000) |
| <i>Target BM</i> | 0.0003 (0.000) | 0.0002 (0.000) | 0.0002 (0.000) |

| | | | |
|-----------------------|-------------------|-------------------|-------------------|
| <i>Target ROA</i> | 0.0005 (0.001) | 0.0001 (0.000) | 0.0002 (0.000) |
| <i>Target Cash</i> | 0.0004 (0.001) | 0.0001 (0.000) | 0.0003 (0.000) |
| Observations | 1,283 | 1,283 | 1,283 |
| R-squared | 0.590 | 0.597 | 0.543 |
| Acquiring industry FE | Yes | Yes | Yes |
| Target industry FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |

Panel B. Post-announcement information acquisition and trading volume

| Variables | (1) <i>Deal Volume</i> | (2) <i>Acquirer Volume</i> | (3) <i>Target Volume</i> |
|-------------------------|---------------------------|-------------------------------|-----------------------------|
| Download measure (X) | <i>Deal ESV</i> | <i>Acquirer ESV</i> | <i>Target ESV</i> |
| <i>X</i> | 11.1824*** (2.102) | 7.8548*** (1.749) | 7.2947*** (1.919) |
| <i>Diversifying</i> | -0.0002 (0.001) | 0.0001 (0.000) | -0.0001 (0.000) |
| <i>Relative Size</i> | 0.0012 (0.001) | 0.0005 (0.000) | 0.0009** (0.000) |
| <i>Stock (Pct)</i> | 0.0001 (0.001) | 0.0001 (0.000) | 0.0003 (0.000) |
| <i>Hostile</i> | -0.0054 (0.004) | -0.0020 (0.002) | -0.0028* (0.001) |
| <i>Toehold</i> | -0.0007 (0.109) | -0.0069 (0.057) | 0.0044 (0.055) |
| <i>Acquirer Mkt_cap</i> | 0.0024*** (0.000) | 0.0010*** (0.000) | 0.0017*** (0.000) |
| <i>Acquirer BM</i> | 0.0047*** (0.001) | 0.0019*** (0.001) | 0.0027*** (0.001) |
| <i>Acquirer ROA</i> | -0.0036 (0.003) | 0.0001 (0.002) | -0.0023 (0.002) |
| <i>Acquirer Cash</i> | 0.0048* (0.002) | 0.0028* (0.001) | 0.0021 (0.001) |
| <i>Target Mkt_cap</i> | 0.0001 (0.000) | 0.0003** (0.000) | 0.0002 (0.000) |
| <i>Target BM</i> | 0.0015* (0.001) | 0.0009** (0.000) | 0.0008* (0.000) |
| <i>Target ROA</i> | 0.0007 (0.002) | -0.0001 (0.001) | 0.0003 (0.001) |
| <i>Target Cash</i> | 0.0006 (0.003) | 0.0003 (0.001) | 0.0007 (0.001) |
| Observations | 1,350 | 1,350 | 1,350 |
| R-squared | 0.614 | 0.613 | 0.579 |
| Acquiring industry FE | Yes | Yes | Yes |
| Target industry FE | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes |

Table A6. Merging Firm Characteristics, Information Acquisition, and Stock Market Reactions

This table reports results in horse race regressions regarding the impact of both merging firms' characteristics and information acquisition on stock market reactions within the same event window. Continuous variables are winsorized at the 1% and 99% levels. Acquirer (Target) Institutional Ownership is the percentage share of acquirer (target) stocks held by institutional investors reported in 13F filings (data obtained from Refinitiv). Detailed variable definitions are reported in Appendix Table A1. All regressions include acquirer industry (3-digit SIC), target industry (3-digit SIC), and year fixed effects. Robust standard errors, clustered at the year level, are reported in parentheses below coefficient estimates. *, **, and *** denote statistical significance at 10%, 5%, and 1%, respectively.

| VARIABLES | (1) | (2) | (3) | (4) |
|--|---------------------|-----------------------|---------------------|----------------------|
| | <i>Combined CAR</i> | | | |
| $\Delta ROA_{t-1, t+3} * Deal\ ESV$ | 6.0484** (2.373) | 6.1284** (2.414) | 5.3409** (1.992) | 8.4393*** (2.411) |
| $\Delta ROA_{t-1, t+3} * Acquirer\ Mkt_cap$ | -0.0005 (0.001) | | | -0.0032 (0.002) |
| $\Delta ROA_{t-1, t+3} * Target\ Mkt_cap$ | 0.0003 (0.001) | | | 0.0021 (0.001) |
| $\Delta ROA_{t-1, t+3} * Acquirer\ Coverage$ | | 0.0025 (0.002) | | 0.0090 (0.006) |
| $\Delta ROA_{t-1, t+3} * Target\ Coverage$ | | -0.0019 (0.002) | | -0.0077** (0.003) |
| $\Delta ROA_{t-1, t+3} * Acquirer\ Institutional\ Ownership$ | | | 0.0008 (0.002) | 0.0011 (0.002) |
| $\Delta ROA_{t-1, t+3} * Target\ Institutional\ Ownership$ | | | 0.0051 (0.005) | 0.0135* (0.007) |
| <i>Acquirer Coverage</i> | | -0.0194*** (0.006) | | -0.0179** (0.006) |
| <i>Target Coverage</i> | | 0.0033 (0.004) | | 0.0032 (0.005) |
| <i>Acquirer Institutional Ownership</i> | | | -0.0000 (0.001) | 0.0002 (0.001) |
| <i>Target Institutional Ownership</i> | | | -0.0036 (0.006) | -0.0012 (0.006) |
| $\Delta ROA_{t-1, t+3}$ | -0.0005 (0.006) | -0.0062 (0.006) | -0.0051 (0.004) | -0.0093 (0.008) |
| <i>Deal ESV</i> | 6.2273 (3.746) | 5.6097 (3.585) | 5.8467 (3.995) | 5.6861 (3.710) |
| <i>Acquirer Mkt_cap</i> | -0.0148*** | -0.0070* | -0.0152*** | -0.0084** |

| | | | | |
|-----------------------|------------|-----------|-----------|-----------|
| | (0.002) | (0.004) | (0.003) | (0.003) |
| <i>Target Mkt_cap</i> | 0.0087*** | 0.0069** | 0.0094*** | 0.0080** |
| | (0.002) | (0.003) | (0.003) | (0.003) |
| <i>Diversifying</i> | -0.0104 | -0.0123* | -0.0106 | -0.0122* |
| | (0.006) | (0.006) | (0.006) | (0.007) |
| <i>Relative Size</i> | 0.0031 | 0.0023 | 0.0045** | 0.0039* |
| | (0.002) | (0.002) | (0.002) | (0.002) |
| <i>Stock (Pct)</i> | -0.0245*** | -0.0190** | -0.0247** | -0.0210** |
| | (0.008) | (0.007) | (0.008) | (0.007) |
| <i>Hostile</i> | 0.0326 | 0.0329 | 0.0344 | 0.0316 |
| | (0.023) | (0.021) | (0.023) | (0.025) |
| <i>Toehold</i> | 0.0398 | 0.0565 | -0.1142 | -0.0615 |
| | (0.501) | (0.453) | (0.521) | (0.488) |
| <i>Acquirer BM</i> | -0.0007 | 0.0022 | -0.0030 | 0.0048 |
| | (0.018) | (0.017) | (0.018) | (0.018) |
| <i>Acquirer ROA</i> | 0.0663 | 0.0598 | 0.0644 | 0.0529 |
| | (0.041) | (0.040) | (0.042) | (0.042) |
| <i>Acquirer Cash</i> | -0.0300* | -0.0237 | -0.0303* | -0.0181 |
| | (0.015) | (0.015) | (0.015) | (0.015) |
| <i>Target BM</i> | 0.0059 | 0.0051 | 0.0077 | 0.0053 |
| | (0.007) | (0.006) | (0.007) | (0.007) |
| <i>Target ROA</i> | -0.0413 | -0.0413 | -0.0386 | -0.0363 |
| | (0.049) | (0.047) | (0.050) | (0.045) |
| <i>Target Cash</i> | 0.0059 | 0.0079 | 0.0041 | 0.0094 |
| | (0.024) | (0.024) | (0.025) | (0.024) |
| Observations | 838 | 838 | 828 | 828 |
| R-squared | 0.364 | 0.376 | 0.366 | 0.385 |
| Acquiring industry FE | Yes | Yes | Yes | Yes |
| Target industry FE | Yes | Yes | Yes | Yes |
| Year FE | Yes | Yes | Yes | Yes |