The Dark Side of Company Information Search: Evidence from M&A Targets

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Abstract

Existing studies have documented various benefits of information search, but company information search can also lead to unintended consequences. Analyzing M&A targets' digital footprints in the pre-announcement period, we find that the targets' information searching is negatively associated with target announcement cumulative abnormal returns. This suggests that the targets' engagement in gathering information entails costs for shareholders. Our findings are robust to a battery of additional tests and two identification strategies to control for potential endogeneity bias. Information searching targets also capture lower takeover premiums, which reinforces the prediction that information search activities are not in the target shareholders' best interest. Moreover, the negative relationship between information search and target announcement returns is stronger for targets with higher bankruptcy risks and higher CEO ownership, while target-acquirer social ties mitigate this negative effect. Overall, the results provide novel evidence on the negative wealth effects of targets' information search behavior.

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"Outlook Group from time to time searched for a potential acquirer, but did not identify any party that was interested in acquiring Outlook Group at a price the Outlook Group Board considered appropriate". - Outlook Group Corp.

"In many cases, M&A is initiated by the seller." - Welch et al. (2020, p.5)

1. Introduction

Economic agents can extract decision-relevant information from corporate disclosures and incorporate it into their business decisions and investment activities. The existing literature suggests that there are substantial benefits captured by searching firms in the context of portfolio strategies. For example, mutual funds generate positive returns by tracking a specific set of firms and trading along with insider transactions (Chen et al., 2020). Hedge funds identify profitable trades from peers' portfolio disclosures and generate significant returns by mimicking peers' investment strategies (Cao et al., 2021). Investment performance of venture capital firms is associated with their analysis of public information disclosed by industry peers (Gibbons, 2023). In terms of corporate investment, firms in the market for corporate control also have incentives to obtain useful and complete information, aiming to make good decisions and maximize shareholder wealth. For mergers and acquisitions (M&A) decisions, Bernard et al. (2020) find that acquirers seek information about the private target's public peers to conduct assessments, which helps mitigate potential deal uncertainty. Consistent with the value-creation role of information search, Bernard et al. (2020) suggest that information flows among firms can create a channel that facilitates corporate learning and aids M&A decision making.

However, in contrast to the various benefits of information search in the context of portfolio strategies (Chen et al., 2020; Cao et al., 2021) and corporate investment (Bernard et al., 2020), company information search activities may also entail costs for their shareholders. In this study, we focus on M&A target firms and investigate whether and how a target's information search in the pre-announcement period affects shareholder value. Target firms make necessary and important decisions and may have varied incentives to search for information in the pre-announcement period. For example, a target may

seek information about other companies in order to explore possible opportunities in the bidding stage of a deal. After potential bidders reveal themselves, the target may attempt to obtain information from the bidder's filings. The target may also search for the bidder's peers to assess the bidder's purchasing power. Before accepting an offer, the target is faced with decisions regarding the offer price, the method of payment, etc. All these decisions at different stages may be contingent on relevant information being available to and gathered by the target. Therefore, understanding the impact of target firms' information searching behavior is not trivial.

There are two competing explanations for whether the information search by target firms in the pre-announcement period increases or decreases shareholder wealth. The *information advantage* hypothesis predicts that information acquired by targets from corporate filings equips them with an advantage (Grossman and Stiglitz, 1980) and increases their bargaining power, thereby enhancing shareholder value. In particular, we posit that the information gathered increases the target's confidence about the "next best alternative" (Whinston, 2003) in the early stages of a deal. This may create a pseudo-competitive atmosphere in which bidders are potentially misled about the extent of the competitive environment and thus increase the bid price. Moreover, the target may compare a bidder's performance with that of the bidder's peers, which will advance the target's comprehension of the bidder's prospects, profitability, and most importantly, its purchasing power. The target that engages in information gathering and screening may also identify the bidder that values the target the most. Collectively, information searching can lead to better outcomes for the target's shareholder wealth.

A counterargument to the above prediction is the *desperate target's curse* hypothesis, which suggests that the target's information search is accompanied by shareholder wealth destruction for at least two reasons. First, recent research shows that target firms, especially those that are underperforming and facing operational challenges, increasingly adopt a target-initiated merger strategy by actively engaging in a complex process of identifying and negotiating with potential bidders (Eckbo, 2009;

Heitzman, 2011; Masulis and Simsir, 2018). A target's proactive information search, which indicates desperation, may signal diminished synergy potential and raise concerns among bidders, leading to inferences about detrimental characteristics of the target (Marquardt and Zur, 2015; Akerlof, 1970; Myers and Majluf, 1984). Given the inherent information asymmetry between bidders and targets, bidders tend to respond to such signaling by employing risk-mitigating strategies, such as discounting the offer price or demanding concessions, resulting in a lower valuation of the target.

Second, a target firm's information-searching efforts, regardless of its financial and qualitative status, may signal management's commitment to deal completion and an increased propensity to accept offers, thereby influencing the perceptions and negotiation approaches of potential bidders. Prior research highlights the central role of target CEO incentives, as evidenced by target CEO ownership and retirement preferences, in shaping both the likelihood of merger activity and the associated takeover premiums (Fidrmuc and Xia, 2017; Jenter and Lewellen, 2015). Recognizing these salient merger incentives of target managers, potential bidders may recalibrate their negotiation strategies, which subsequently reduces the bargaining leverage of information-seeking targets and leads to potentially less favorable valuations and erosion of shareholder value.

We distinguish between these two competing explanations by analyzing the effects of the target's *ex ante* information search on the target's cumulative abnormal returns (CARs) around the M&A announcement date. If target firms gain an information advantage through information search, the wealth effects for these target shareholders should be significantly positive. Conversely, if target firms' digital footprints are costly to shareholders, these targets should experience lower CARs around the announcement dates. Following prior research (e.g., Bernard et al., 2020; Chen et al., 2020; Cao et al., 2021), we capture target firms' digital footprints by exploiting targets' use of corporate filings on the SEC EDGAR website.[1] We seek to capture the information search activities of targets involved in both

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[1] Target firms' information search activities on the SEC EDGAR website are by no means the only information-gathering behavior of the target, but they likely capture the firms' efforts in acquiring decision-relevant information.

same-industry and cross-industry M&A deals. Thus, our sample of searched firms includes all the other firms, except for the target itself, in the Compustat universe.

Using a sample of M&A deals announced between 2004 and 2016, where both the target and acquirer are public US firms, we find that target announcement CARs are negative and significantly related to the target's information search volume in the pre-announcement period. This is consistent with the *desperate target's curse* hypothesis that the target's efforts in obtaining information in the pre-announcement period are likely to negatively affect shareholders' interests. In particular, a one standard deviation increase in the target's information search volume leads to -1.45% in the target's three-day CARs around the announcement date, which translates into an average loss of over $195 million for the target firms in our sample. The three-day CARs for information searching targets are significantly lower, at -4.8%, than for non-searching targets. The results are robust to alternative measures of information search, different event windows for measuring CARs, the entropy balanced design to address potential sample selection bias, Oster (2019)'s test to address the omitted variable problem, and a sample with only completed M&A deals.

We then employ two identification strategies to establish causality. First, we exploit reductions in import tariffs as a quasi-natural experiment. Reduced import tariffs facilitate the entry of foreign firms into the domestic market, which shrinks investment opportunities (Fresard, 2010), hampers information flows between the acquirer and its rivals (Bernard et al., 2020), and leads to more takeover defense mechanisms adopted by targets (Cremers et al., 2008). We expect that targets will be less likely to engage in M&A transactions in the climate of tariff reductions. If a target reveals itself as not a trend-follower by searching for information *ex ante*, its searching behavior may signal that the target is more desperate and lead to negative consequences for target shareholders' wealth. Indeed, we find that information search by the target is more likely to reduce announcement CARs when the firm is exposed to reduced tariff rates.

Second, we employ two-stage least squares (2SLS) regressions to complement our results and further mitigate endogeneity concerns. In the spirit of Liu (2020), we construct an instrumental variable that captures the intra-industry trend of information searches undertaken by the target's peer firms. The instrument should affect target CARs only through its effect on the target's information search volume. Consistent with our conjecture, the instrument has a significantly positive relationship with the target's information search volume in the first stage model. Next, we regress target CARs against the instrumented information search measure and find that the coefficient of interest continues to be significantly negative.

Finally, we examine the channels through which the target's information search affects shareholder value. First, we find that information search is associated with lower takeover premiums received by target firms, suggesting that information search activities weaken the target's bargaining position and result in the firm's inability to capture higher value for shareholders. This evidence reinforces the *desperate target's curse* hypothesis. Second, we find that targets with a higher bankruptcy risk (Altman, 1983; Masulis and Simsir, 2018) and greater CEO ownership (Fidrmuc and Xia, 2017) are more likely to experience adverse effects of information search on target announcement CARs, suggesting that target financial distress and managerial motivation exacerbate the negative effects of information search on target shareholder wealth. Third, we find that social connections (e.g., Bailey et al., 2018a; 2018b) between the target and acquirer mitigate the negative effect of information search on CARs, suggesting that information transferred through social ties leads to better outcomes for target shareholders.

This study makes several important contributions. First, we contribute to the literature on the information search behavior of market participants. Recent studies have examined the information searching activities of investors, auditors, analysts, and regulators (e.g., Drake et al., 2015; Hallman et al., 2022; Gibbons et al., 2021; Bozanic et al., 2017; Fox and Wilson, 2022). In contrast, our study

considers company information search in the M&A setting, which has received very limited attention. The only exception is Bernard et al. (2020), who examine the relationship between firm-pair information flows and the acquirer's investment decisions. Our study focuses on the target's perspective and explores how the target firm's information search activities in the pre-announcement period shape M&A outcomes.

Second, this paper adds to the emerging literature on the economic consequences of corporate learning. Previous evidence on information flows points to a learning channel that facilitates better decision making in the contexts of acquirer investment (Bernard et al., 2020) and fund portfolio strategies (Chen et al., 2020; Cao et al., 2021). In contrast, we suggest that while firms may benefit from information search, their digital footprints may be costly and lead to unintended consequences. Our results provide novel evidence on the dark side of M&A targets' information search, where the negative relationship between targets' information search and their CARs indicates an economically significant loss for target shareholders.

Finally, this study also contributes to the broader takeover literature. Welch et al. (2020) review existing studies on the pre-announcement phase of M&A and call for more evidence on target firm behavior in the period leading up to deal completion. Our study responds to this call and opens the door to understanding the wealth implications of target pre-announcement activities for shareholders. This paper also complements prior research that examines how target firm performance (Masulis and Simsir, 2018) and target managers' motivation affect the characteristics and outcomes of M&A transactions (e.g., Hartzell et al., 2004; Jenter and Lewellen 2015; Fidrmuc and Xia, 2017).

The remainder of this paper is organized as follows. Section II discusses the relevant literature and hypothesis development. Section III presents the sample construction. Section IV reports the empirical results and additional tests. Section V concludes our findings.

2. Related literature and hypothesis development

2.1 Related literature

Market participants' information search on the SEC EDGAR website has attracted considerable interest. For example, Drake et al. (2015) document that investors are more likely to access a firm's filings following corporate events (e.g., restatements, earnings announcements, and acquisition announcements), and that their efforts in information search play a positive role in the price discovery process. Compared with retail investors, institutional investors' information search strongly predicts future firm performance, suggesting that sophisticated investors' information-gathering activities reveal their private expectations (Drake et al., 2020). Furthermore, Lee et al. (2015) define firms that appear in chronologically adjacent searches as "search-based peers" (SBPs) and find that SBPs capture a high degree of similarity among firms and dominate traditional industry peers in explaining multiple dimensions. This finding points to the collective wisdom of investors in gathering information.

Conceptually, SEC EDGAR users can incorporate information gathered from filings they have reviewed into their business activities. For instance, the filings of non-client peer firms provide useful information to auditors, including industry trends and solutions to challenging audit events and issues. Drake et al. (2019) define this process as auditor disclosure benchmarking. By searching information about non-client peer firms, auditors ensure that their client's financial disclosures are consistent with industry reporting conventions, especially when the client's operating environment is uncertain and risky.

In addition, the information search by the Internal Revenue Service (IRS) has been studied in prior research and is referred to as IRS attention by Bozanic et al. (2017). Building on this concept, Fox and Wilson (2022) find that signals of firm restatement or management weakness lead to an increase in IRS attention. This evidence suggests that information in public filings enhances the regulator's understanding of firms' operating status and facilitates regulatory activities. Analysts, on the other hand, not only review current or historical disclosures but also perform more time-consuming analyses of firms'

filings (Gibbons et al., 2020). In particular, a 1% increase in the number of filings accessed is associated with a 1.45% lower forecast error than peer analysts, indicating that analysts can translate the information they gather into higher forecast accuracy.

Similarly, investment firms need information to inform their portfolio choices and trading strategies. For example, mutual fund managers persistently track and follow the buying and selling transactions of corporate insiders (Chen et al., 2020). More importantly, tracked insider transactions possess strong operational and return predictability. Compared to a non-tracked stock, a tracked stock that a manager follows to purchase generates an annualized abnormal return of more than 12%, and its outperformance persists. This evidence suggests that managers can accurately identify information-rich insider trades and extract profitable strategies. Similarly, hedge fund firms look at the filings of their peers and mimic the peers' profitable portfolios (Cao et al., 2021). In particular, the risk-adjusted return difference between "copycatted" trades and other stock positions disclosed by the copycatted firms is 5.5% per year. This finding suggests that investment firms' information search involves sophisticated research and strategic investigation that helps them identify profitable positions in peer disclosures. Venture capital firms also benefit from information search. In particular, venture capital firms expect that industry information can help them better identify investment opportunities, and thus search for industry peers' filings to inform their investment selection for most deals (Gibbons, 2023). Specifically, peers' filings viewed by a venture capital firm are positively associated with a future investment exit via acquisition.

Firms also have incentives to search for information to facilitate their investment decisions. Bernard et al. (2020) document that a firm's information search is positively related to its acquisition of a searched firm, which suggests the strong predictive power of acquirer-target information flows for future M&A decisions. In particular, a one standard deviation increase in acquirer information search is related to up to a 61% increase in the likelihood of acquiring the target in the following year. This finding

adds to the acquirer-focused view of corporate activities in the M&A context but leaves the other side of M&A transactions unexamined. In other words, target behavior in the pre-announcement period remains a black box to researchers.

Anecdotally, a target may engage in activities that seek merger opportunities. For example, the merger proxy statement filed dated June 9, 2006 by Outlook Group Corp., a contract packaging company, discloses that *"Outlook Group from time to time searched for a potential acquirer, but did not identify any party that was interested in acquiring Outlook Group at a price the Outlook Group Board considered appropriate"*. Welch et al. (2020, p.5) also point out that *"in many cases, M&A is initiated by the seller"*. However, the fundamental question of how pre-announcement information gathering by targets affects M&A outcomes remains largely unanswered. Since the target is the party that ultimately makes the decision to accept an offer, it is important to study the effects of the target's information search behavior prior to the announcement of the deal.

2.2 Hypothesis development

A firm's takeover decisions can be influenced by the characteristics of its counterparty. For example, acquirers are more likely to offer an equity payment to mitigate the cost of overpayment when targets have higher information asymmetry (Hansen, 1987) or information risk (Raman et al., 2013). Alternatively, target shareholders are more likely to opt for negotiation over an auction to sell the firm if they can identify *ex ante* the bidder who values the target firm the most (Marquardt and Zur, 2015). Thus, in a frictionless market, a firm's M&A decisions should not be influenced by firms other than the counterparty. However, recent studies show how firms react to intra-industry M&As. For example, the acquirer's peers tend to imitate and seek merger opportunities to maintain their competitive status (e.g., Palepu, 1986; Tunyi, 2021). Target peers, on the other hand, adopt defensive mechanisms (Servaes and Tamayo, 2014) and voluntarily disclose negative information (Chen et al., 2022) to resist control threats. Peer firms are also strategically selected in a target's comparable firm valuation analysis to facilitate

merger outcomes (e.g., Eaton et al., 2021a). These findings underscore the importance of considering firms beyond the M&A counterparty when studying corporate decisions in the M&A context.

Therefore, we conjecture that the target may seek information about other firms to aid its decision making. To begin with, the target may explore potential merger opportunities by absorbing new information about other firms in the early stages of an M&A. After a bidder emerges in either the informal or formal negotiation process, the target is expected to preemptively gather detailed information about the potential counterparty from all sources, which may go beyond the public filings per se. Since the acquirer and the target are often, if not always, conservative in disclosing useful information to each other during the private negotiation phase, useful information can be a game changer in this wheeling and dealing stage. Given the important role that firms other than the counterparty play in firms' M&A decisions, the target also has various motivations to seek information about other firms, including but not limited to the target's peers, the bidder's peers, or a firm which the target believes is relevant to its decision making, to obtain a complete picture of possible opportunities. We then develop two hypotheses to examine the wealth effects of target firms' information search activities.

Information advantage hypothesis

Bernard et al. (2020) highlight the importance of the information gathered by acquirers in circumstances where the product similarity between the acquirer and target is low (i.e., firm-pair information asymmetries are high). In other words, public information is essential when the level of uncertainty about the deal structure and the risks perceived by acquirers is high. Moreover, managers obtain information about private targets' public peers to conduct a risk assessment, which underscores the supportive role of acquired information in mitigating potential uncertainty. These findings demonstrate the wisdom of managers in collecting and screening useful information and point to a plausible learning channel that facilitates their decision marking. A similar learning mechanism may also exist when targets collect relevant information *ex ante*. More importantly, we expect that, in contrast to

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firms that do not engage in information gathering and evaluation, target firms engaging in information search in the pre-announcement period may better assemble the mosaic of information and evaluate available opportunities. This may ultimately lead to positive outcomes for target shareholders.

In the early stages of a takeover, targets' information search may create a pseudo-competitive atmosphere that misleads bidders as to the extent of the competitive environment. In particular, targets may conduct an *ex ante* information search for prospective bidders while keeping preliminary discussions between two parties under the table. Informal discussions with a potential buyer are expected to present the target firm with an outside option, i.e., "the next best alternative" (Whinston, 2003). In other words, it can broaden the pool of candidates for target managers to select the best transaction partner and increase their bargaining power in the subsequent negotiation process. From the bidders' perspective, they may perceive higher competitive pressure, even if it is invisible.[2] This is consistent with the preemptive-bidding theory that the takeover premiums are affected by both actual and potential competition (e.g., Fishman, 1988; Dimopoulos and Sacchetto, 2014). Potential competition still exists even if a potential bidder does not submit a formal bid in the bidding process. Such invisible competition may convey a biased signal, stimulating bidders' urge to beat an imaginary opponent by overbidding.

After a bidder is revealed and the counterparties move onto the formal negotiation process, the information obtained by the target may create a comparative advantage (Grossman and Stiglitz, 1980), which equips the target with confidence throughout the private merger period. Specifically, comparing a bidder's performance to that of its peers can improve the target's understanding of the bidder's prospects, profitability, and most importantly, purchasing power. All of the information gathered by the target can be used as a negotiating tool. Armed with more information, the target may have considerable leverage (Graebner and Eisenhardt, 2004) in determining the transaction price, retention or removal of executives,

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[2] Similarly, in the auditing context, Hallman et al. (2022) use non-incumbent auditors' accesses of companies' public filings to proxy an on-going bidding process. They find that auditor quality increases in the presence of competitive pressure, and such improvement remains for years even when the bidding process ultimately does not result in an auditor change.

and possible restructuring plans in the subsequent negotiation process (Walsh,1989; Wulf, 2004). In addition, the information gathered may reduce the target's negotiation costs, assist the target in deterring speculative bids (Marquardt and Zur, 2015), and identify bidders who value the target the highest.

This line of argument is referred to as the *information advantage* hypothesis, which predicts that collected information facilitates corporate learning and equips targets with heightened bargaining power, thereby enhancing shareholder wealth.

H1a. Target information search increases target shareholder wealth

Desperate target's curse hypothesis

Notwithstanding the previous discussion, targets' *ex ante* information search may be counterproductive. Our analyses of information search are based on the premise that the targets' information search captures managerial motivations and concurrent corporate actions, including the extent to which the target attempts to search for another firm by gathering all available information beyond public filings (Gibbons et al., 2021). There are at least two reasons why target information searching can entail unintended costs for shareholders.

First, target firms often engage in a meticulous process of identifying potential bidders before soliciting their interest and subsequently entering into negotiations (Eckbo, 2009). Recent empirical evidence highlights that an increasing proportion of deals are target-initiated (Boone and Mulherin, 2007; Heitzman, 2011; Masulis and Simsir, 2018). Such deal-initiating targets have been documented as underperforming firms with operational difficulties (Graebner and Eisenhardt, 2004), low-quality accounting information (Marquardt and Zur, 2015), and evident financial distress (Masulis and Simsir, 2018). Similar to target firms that self-select into an acquisition, an information-searching target can be characterized as a desperate firm that is struggling with operational and financial sustainability. As a result, a target's proactive information search in the pre-announcement period may raise concerns among potential bidders, leading them to infer potentially detrimental characteristics of the target. Such

information-searching behavior may signal to bidders a diminished synergy potential compared to counterparts that do not engage in similar information exploration. Given the inherent information asymmetry between bidder and target, bidders are inclined to mitigate the risk of adverse selection through mechanisms such as discounting the offer price or demanding additional concessions, resulting in a lower valuation of the target (Akerlof 1970; Myers and Majluf, 1984).[3]

Second, independent of the quality and financial status of the target firm, information searching efforts by a target firm could signal to potential bidders the commitment of the target's managers to pursue a deal and an increased propensity to accept an offer. The existing literature provides empirical evidence that targe CEO incentives, as manifested through target CEO ownership and retirement preferences, significantly influence the probability and the premium associated with merger activity. Fidrmuc and Xia (2017) document that target CEO ownership increases the likelihood of target deal initiation and the associated takeover premiums for such target-initiated deals. Jenter and Lewellen (2015) also find that target CEO retirement preferences increase the probability of a successful takeover bid, without compromising the associated takeover premiums. To the extent that potential bidders recognize the strong merger incentives of target managers and adjust their negotiation strategies accordingly, targets that engage in such information searches are expected to have diminished bargaining leverage. This, in turn, is expected to lead to less favorable bid valuations, potentially eroding target shareholder value. We refer to this as the *desperate target's curse* hypothesis.

H1b. *Target information search decreases target shareholder wealth*

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[3] According to information asymmetry theories, the seller inherently possesses a nuanced understanding of its intrinsic value, future prospects, and most importantly, potential risks (Hansen, 1987; Marquez and Yilmaz, 2008; Officer et al., 2009). Thus, an adverse selection problem arises as the buyer assume the seller must be peddling a "lemon". A typical and optimal strategy the buyer adopts to avoid adverse problems is offering a discounted price.

3. Data and sample

3.1 Sample selection

We obtain information about takeover deals from the Thomson Reuters' Securities Data Company (SDC) Platinum database. The initial sample includes 2,906 deals between 2004 and 2016, where both the target and the bidder must be US public firms. First, we remove 302 deals that are labeled as neither complete nor withdrawn and 30 deals where the deal value is less than $1 million. Next, we remove 1,210 deals where the unique company identifier (i.e., GVKEY or PERMNO) of the target firm is missing. We then combine financial statement data from Compustat, stock price data from CRSP, and governance data from BoardEx and ExecuComp. 83 deals are removed due to missing financial data required to estimate the regression models. This results in a sample of 1,281 deals. Table 1 outlines the sample construction.

[Insert Table 1 Here]

Panel A of Table 2 demonstrates the frequency of deals partitioned by year. The percentage of merger deals varies substantially across years, decreasing from a high of 11.71% in 2007 to a low of 4.29% in 2011. This is consistent with the notion that a sixth merger wave started in 2003 and ended in late 2007 (Alexandridis et al., 2012). We also present the target industry distribution of deals in Panel B of Table 2, based on the two-digit Standard Industrial Classification (SIC) codes. We find that approximately 19.67% and 14.36% of the deals are carried out in the depository institutions industry and business services industry, respectively.

[Insert Table 2 Here]

3.2 Information search data

We identify the digital footprints of target firms using the SEC EDGAR Log File data. The EDGAR Log File data records retrievals of SEC filings from January 1, 2003, through June 30, 2017. Each record includes the requesting user's IP address, the disclosing firm's SEC identifier (also known

as CIK), the time of access, and the accession number of the filing viewed. We perform three main steps to identify the digital footprints of target firms. First, we use Chen et al. (2020)'s linking table to decipher the anonymized IP addresses.[4] Second, we match the IP address for each target firm in our sample using the WHOIS dataset.[5] Third, we use the WHOWAS data[6] to validate the dataset we constructed for each target and the firms that the target searches. Target firms with changes in IP addresses since 2003 are removed to reduce the probability of errors that assign an IP address to the wrong owner. Incomplete requests and those staying on index pages are also excluded. We also require that the filing viewing activity takes place within 12 months prior to the announcement date, in the expectation that this will increase the likelihood that the information searching behavior is relevant to the merger decision-making of the target firm. This procedure is illustrated in Figure 1.

[Insert Figure 1 Here]

4. Main results

4.1 Summary statistics

Table 3 presents descriptive statistics for the firm-level attributes of both the target and the acquirer in the pre-announcement period. Panel A reports the variable of interest, i.e., *Target Information Search* (the volume of target information search measured as the natural logarithm of one plus the total number of filings viewed by a target firm within 12 months prior to the announcement date). The average *Target Information Search* is 0.413, which is equivalent to the average number of filings viewed by a target in our sample of 0.51. Panel B reports that the mean CARs range from 0.169 to 0.173 when we use (−1, +1) and (−2, +2) windows, respectively. Panel C reports firm-level characteristics of target and acquirer firms. Compared to acquirers, target firms are, on average, smaller firms with weaker financial performance in terms of *Market-to-Book* and *Return-on-Assets*. Panel D reports the characteristics of the

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[4] To protect filing-requestors' privacy, SEC remove the last octet of each IP address. See Chen et al. (2020) for the mapping between hidden octet and actual octet of IP addresses.
[5] The WHOIS dataset tracks the most recent ownership information of IP addresses in North America.
[6] The WHOWAS dataset maintains the historical ownership information of IP addresses in North America.

M&A transactions in our sample. More than 68% of the deals span across industries (*Diversify Deal*), and over 39% of the deals are purely arranged with cash (*Cash Payment*).

[Insert Table 3 Here]

4.2 The wealth effects of the target's information search

To investigate the wealth effects of the target's information search, we estimate the following OLS regression model at the M&A transaction level:

$$CAR_i = \alpha_i + \beta_1 Target\ Information\ Search\ Volume_i + \beta_2 Acquirer\ Size_i +$$

$$\beta_3 Target\ Size_i + \beta_4 Acquirer\ Market\text{-}to\text{-}Book_i + \beta_5 Target\ Market\text{-}to\text{-}Book_i +$$

$$\beta_6 Acquirer\ Return\text{-}on\text{-}Assets_i + \beta_7 Target\ Return\text{-}on\text{-}Assets_i + \beta_8 Acquirer\ Leverage_i +$$

$$\beta_9 Target\ Leverage_i + \beta_{10} Hostile\ Deal_i + \beta_{11} Diversify\ Deal_i + \beta_{12} Multiple\ Bidders_i +$$

$$\beta_{13} Cash\ Payment_i + \beta_{14} Toehold_i + \beta_{15} Tender\ Offer_i + \varepsilon_i$$

(1)

where *CAR* is the target cumulative abnormal returns for the $(-1, +1)$ window and the $(-2, +2)$ window around the takeover announcement, respectively.[7] Our focus is on the coefficient β_1 for *Target Information Search Volume*, which measures the number of filings accessed by the target.[8]

Several variables are controlled in the model. First, we control for firm characteristics (at the end of the fiscal year prior to the announcement date) of both the target and the acquirer, including firm size (*Size*, the log of market value of equity), market-to-book ratio (*Market-to-Book*, market value of equity divided by book value of equity), return on assets (*Return-on-Assets*, net income divided by total assets), and debt-to-assets ratio (*Leverage*, liabilities divided by assets). Second, we control for deal characteristics, including *Hostile Deal* (an indicator variable coded as one if the deal is hostile, and zero otherwise), *Diversify Deal* (an indicator variable coded as one if the acquirer and target have different

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[7] We employ two models, i.e., the market model and the Carhart four-factor model, to obtain the expected returns for CARs. The CRSP equally weighted return is used as the market return.

[8] These filings are filed by firms other than the target in the Compustat universe.

two-digit SIC codes, and zero otherwise), *Multiple Bidder* (an indicator variable coded as one if there are competing bidders, and zero otherwise), *Cash Payment* (an indicator variable coded as one if the payment is all cash, and zero otherwise), *Toehold* (an indicator variable for the acquirer's pre-announcement ownership of target, coded as one if the acquirer owns a non-zero percentage of the target's shares prior to the announcement date, and zero otherwise), and *Tender Offer* (an indicator variable coded as one if there is a tender offer, and zero otherwise). We also include target industry fixed effects to control for time-invariant industry characteristics and year fixed effects to control for macroeconomic factors that affect all firms.

We focus on target firms' share price reactions around the deal announcement date to examine how targets' information search in the pre-announcement period affects target shareholder wealth. The estimation results of model (1) are presented in Table 4. Columns (1) to (4) show a negative and statistically significant relationship between the target information search volume and the target CARs around the deal announcement date. For example, the coefficient on *Target Information Search Volume* is -0.011 in column (1), indicating that the three-day target CARs decrease by 1.1% in the presence of targets' information search activities. The economic effect is not trivial. A one standard deviation increase in target information search volume is associated with an 8.6% decrease in target CARs centered on the announcement date. This negative impact translates into over $195 million for a target firm in our sample. Our results support the *desperate target's curse* hypothesis, which predicts that target information search has a material adverse effect on shareholder wealth.[9]

[Insert Table 4 Here]

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[9] Among the control variables, the coefficients on target size (*Target Size*) are negative and statistically significant at the 1% level. This evidence suggests that larger target firms are more likely to suffer from lower CARs. In contrast, both the coefficients on the acquirer size (*Acquirer Size*) and ROA (*Acquirer Return-on-Assets*) are positive and statistically significant with the target CARs, suggesting that target shareholders are better off when the firm is targeted by a larger, more profitable acquirer. All-cash deals and tender offers also have positive and significant effects on target shareholder wealth, consistent with the findings of Huang and Walkling (1987).

4.3 Identification: A quasi-natural experiment using tariff rate reductions

As an identification strategy, we exploit a plausible exogenous shock, tariff rate reductions. This strategy addresses concerns that our main results are driven by some unobservable firm or deal characteristics. Bernard et al. (2020) document a statistically significant reduction in acquirers' search for rivals' filings after tariff rate reductions. This effect supports the notion that tariff reductions increase product market competition, leading to fewer investment opportunities (Fresard, 2010) for the acquirer firm and its rivals and discouraging information flows among firms.

Similarly, target firms reduce their exposure to the market for corporate control by adopting more takeover defenses with the presence of tariff reductions (Cremers et al., 2008). Therefore, we predict that, with reduced import tariffs, target firms are less likely to search for information in the pre-announcement period. When this prediction applies to the scenario in which a target does search for information, it is reasonable to expect that the negative signals sent by such search behavior are likely to be more salient. In other words, information searching reveals the target's willingness to sell, which leads to negative outcomes for the target's shareholder wealth.

Following Pierce and Schott (2011), Huang et al. (2017), and Glaeser and Landsman (2021), we use tariff rate reductions in the target and acquirer industries as a source of plausibly exogenous variation in information search. Specifically, we include an interaction term between *Target Information Search Volume* and *Tariff Reductions* as an explanatory variable in the regression models. Panel A of Table 5 reports the results. The coefficient on the interaction term is statistically significant and negative in columns (1) to (4), consistent with our prediction that information search is more likely to play a negative role on target shareholder wealth in the presence of import tariff reductions.

4.4 Identification: Two-stage least squares (2SLS) analysis

While our main results point to a negative effect of target information search on target CARs, the wealth effects may not be explained by target information search activities alone. In this section, we use

a two-stage least squares (2SLS) approach to mitigate the endogeneity concern that other unobservable characteristics affect targets' information search activities and have an impact on target CARs. We construct our instrumental variable by measuring the intra-industry information search trend generated by the target's peers. Similar to the concept of concurrent transaction proposed by Liu (2020), intra-industry deals in our setting are defined as M&A transactions announced within the target's industry 12 months prior to the target's deal announcement date. Our instrument is the percentage of intra-industry deals in which the target's peers conduct information search, measured as the number of deals in which the target's peers conduct information search in the corresponding pre-announcement period divided by the total number of intra-industry deals.

There are two reasons to expect that a target's information search activities are related to the intra-industry information search trend. First, when a target's industry peers engage in information gathering in the pre-announcement period, the signals are observed by the target and motivate the target to mimic by undertaking information searching (DiMaggio and Powell, 1983). Second, the information searching activities conducted by peer firms can send a shock to the industry (Chen et al., 2022) and change the industry landscape, motivating targets to evaluate their current standing (Song and Walking, 2000; Eckbo, 2009) by searching for useful commercial contexts in corporate filings. As such, the target's information search activities should be associated with the intra-industry information search trend, which satisfies the relevance condition. However, the intra-industry information search should not directly affect the M&A outcomes of the target firm. In other words, the instrument should be associated with the target's announcement CARs only through its effect on the target's information search activities, which satisfies the exclusion condition.

Column (1) of Table 5, Panel B reports the first-stage regression of target information search volume (*Target Information Search Volume*) on the instrument. The coefficient on the *Intra-industry Information Search* is positive and statistically significant (5.040). This is consistent with our rationale

discussed previously that the intra-industry information search trend is positively associated with the focal target's information search activities. Columns (2) to (5) present the second-stage regressions of the target CARs on the fitted value of *Target Information Search Volume*. The coefficients are all negative (ranging from -0.013 to -0.012) and significant, indicating that target information search is associated with lower announcement CARs after accounting for endogeneity.

Overall, the analyses of these two identification strategies suggest that our results are unlikely to be driven by potential selection bias and endogeneity issues. These results reinforce our findings that the target's information-gathering effort decreases shareholder wealth, consistent with the *desperate target' curse* hypothesis.

[Insert Table 5 Here]

5. Possible channels through which searching impacts shareholder wealth

5.1 Takeover premiums

Our findings so far are consistent with the *desperate target's curse* hypothesis. We further investigate the channels through which the target's *ex ante* information search may affect target shareholder wealth. First, we test whether target information search is associated with lower takeover premiums. Extensive studies show a relationship between increased target bargaining power and higher takeover premiums. For example, Cotter et al. (1997) find that independent outside directors who engage in pre-announcement bargaining are more likely to maximize shareholder value and receive higher premiums. Marshall and Anderson (2009) examine a change in takeover legislation in New Zealand and document that a shift in bargaining power from acquirer firms to targets is associated with higher takeover premiums. In our setting, the *desperate target's curse* hypothesis predicts that information search should weaken the target's bargaining position, leading to lower takeover premiums offered by the bidder.

To test this conjecture, we replace the dependent variable in model (1) with takeover premiums. Eaton et al. (2021b) find that traditional windows (e.g., -20, -42, -63 event days) widely used in

previous studies may lead to underestimated premiums and advocate using longer windows to measure premiums. Accordingly, we measure *Premiums1* (*Premiums2*) as the offer price minus the stock price of a target 63 trading days (105 trading days) prior to the announcement divided by that stock price. The results are presented in Table 6. The coefficient of *Target Information Search Volume* is -0.012 and -0.015 in columns (1) and (2), respectively, indicating that information search activities are related to lower premiums received by target firms. The economic significance is nontrivial. For example, a one standard deviation increase in the volume of information search by targets reduces takeover *Premiums2* by approximately 5.52%, which corresponds to an average reduction of $125 million for a target.

[Insert Table 6 Here]

5.2 Target bankruptcy risk

Third, we investigate whether the target's financial distress explains the negative effect of the target's information search on target CARs. A long-standing literature documents the target's inferior financial performance as a motive to sell the firm (e.g., Shrieves and Stevens, 1979; Pastena and Ruland, 1986). Specifically, poorly performing targets attempt to redeploy their assets (e.g., Shrieves and Stevens, 1979) and rescue the firm from economic weaknesses, including negative abnormal returns (e.g., Kini et al., 2004), operating underperformance (Palepu, 1986), and low valuations (Bates, Becher, and Lemmon, 2008), by actively seeking buyers. In a recent study, Masulis and Simsir (2018) examine more than 1,600 U.S. deals from 1997 to 2012 and find that targets with higher bankruptcy risk, as indicated by a lower Altman's (1968) Z-score, are more likely to initiate a deal.

We use Altman's (1983) bankruptcy score to capture the financial distress of targets. We expect that information-seeking targets with higher bankruptcy risk may be deemed more desperate to sell. As such, these targets are more likely to experience the negative impact of the pre-announcement information search.[10] To test this prediction, we include the target's Z-score (*Z-score*) and interact it with

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[10] We also use Altman (1968)'s Z-score in our regression models. The untabulated results are consistent with those reported in Table 7.

the target's information search volume (*Target Information Search Volume*) in the regressions. The control variables are similar to those in model (1). The results are presented in Panel A of Table 7. The coefficients on *Target Information Search × Z-score* are consistently positive (0.007) and significant at the 1% level from columns (1) to (4). This finding suggests that the targets with higher Z-scores (i.e., lower bankruptcy risk) are better off in terms of shareholder value even if they conduct *ex ante* information search. In other words, the negative signal sent by targets is perceived as more desperate when the firm faces higher bankruptcy risk, which is more likely to reduce target shareholders' wealth.

5.3 Target CEO ownership

Fourth, we focus on managerial incentives and examine the role of target CEO ownership in our setting. As discussed above, seeking merger opportunities is more prevalent when target firms have poor financial prospects and weak competitive performance (Masulis and Simsir, 2018). However, target managers without ownership stakes are less likely to initiate a deal (Eckbo et al., 2016; Pastena and Ruland, 1986). Possible reasons are that a large proportion of target managers are dismissed in the post-merger period, and it is rare for CEOs to find a new position of similar rank (e.g., Martin and McConnel, 1991; Agrawal and Walking, 1994). In other words, career concerns may make executives reluctant to accept an attractive offer (Jenter and Lewellen, 2015). Ownership stakes, on the other hand, align target mangers' interests with those of shareholders, which may motivate target managers to seek buyers, especially when the target's financial performance has deteriorated. In particular, Fidrmuc and Xia (2017) examine over 1,000 completed US takeovers from 2005 to 2011 and show that deals initiated by targets have higher CEO ownership stakes.

Thus, we posit that targets with higher CEO ownership are more likely to seek buyers in the pre-announcement period. Stronger incentives to sell may make these targets more likely to search for information from all available sources. Inevitably, the signals sent by these firms may be perceived as more desperate, leading to unintended consequences that are less likely to be in the best interests of target

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shareholders. Empirically, we include CEO ownership (*CEO Ownership*) and the interaction term *Target Information Search Volume × CEO Ownership* in the regressions. The coefficients on the interaction term are negative and significant at the 1% level from columns (1) to (4) in Panel B of Table 7, indicating that CEO ownership exacerbates the negative effects of target information search and reduces target shareholders' gains.

5.4 Social connectedness between the target and acquirer

Finally, we investigate the role of the social connectedness between targets and acquirers. Previous research demonstrates that M&As do not take place in a social vacuum. For example, Cai and Sevilir (2012) find that board connectedness facilitates M&A transactions, which indicates a channel through which information is shared between the acquirer and the target. The enhanced communication between the two firms translates into an information advantage, leading to greater value creation.[11] Similarly, we follow the notion developed in the theory of social networks that social connections diffuse knowledge and that individuals within the network can acquire and extend knowledge from their peers (e.g., Glaeser, 1999). Thus, we posit that target-acquirer connectedness can facilitate information transfer that alleviates the information asymmetry between two firms, which in turn mitigates the unintended negative effects of targets' information search activities.

To test this prediction, we use a novel measure, the Social Connectedness Index (SCI) (Bailey et al., 2018a; 2018b), to capture the social connectedness between the target and the acquirer. The SCI measures the friendship links of Facebook users and offers a comprehensive social network of geographic connectedness in the US. Accordingly, in our test, the SCI captures the relative likelihood that two Facebook users in the counties where the target and the acquirer are headquartered, respectively, are connected as friends. We interact the social connectedness index (*Social Connectedness Index*) with the

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[11] In contrast, Ishii and Xuan (2014) use networks between the acquirer and target firms' directors and senior executives to measure acquirer-target social ties. They find that social ties reduce the announcement CARs of both the acquirer and the combined entity, which indicates that social ties lead to poorer decision-making and destroy shareholder value.

targets' information search volume (*Target Information Search Volume*) in the regressions to examine the role of the target-acquirer SCI. The results presented in Panel C of Table 7 are consistent with our prediction. We find significantly positive coefficients (0.007) on *Target Information Search Volume ×* *Social Connectedness Index*. This evidence suggests that social connections between the target and the acquirer reduce the negative impact of the target's search behavior on shareholder value.

[Insert Table 7 Here]

6. Additional tests

6.1 Target information searching, acquirer announcement returns, and other M&A attributes

In this section, we supplement our findings by conducting a variety of additional and robustness tests. One might expect the acquirer to benefit from the target's desperate information-seeking activities. One of the possible outcomes is that the acquirer can capture shareholder value around the announcement date if the target searches for information in the pre-announcement period. Thus, we first examine acquirer announcement returns (*ACAR*) and conduct univariate tests by dividing the main sample into two subgroups based on the presence of target information searching activities. We compare CARs around the announcement date for both the targets and acquirers in Panel A of Table 8. Consistent with the desperate target hypothesis, announcement CARs of information-searching targets are significantly lower than their counterparts. However, the difference in announcement CARs for acquirers is insignificant. We further re-estimate model (1) by replacing the dependent variable with the acquirer's announcement CARs (*ACAR*). Consistent with the univariate test, the results in Panel B indicate that the acquirer does not realize higher announcement CARs in the deal where the target engages in information-searching *ex ante*.

In addition, we investigate the effects of target information search on other M&A attributes, based on the notion that, even though the acquirer may not be better off if the target searches for information *ex ante*, the acquirer may gain benefits in terms of other aspects of M&A deals. Accordingly, we replace

the dependent variable in model (1) with the number of financial advisors hired by the acquirer and the target, respectively, and the termination fees paid by the acquirer and the target, respectively. The results are presented in Panels C and D. We find that the number of financial advisors hired by the acquirer is lower when its counterpart is an information-seeking target. In addition, the volume of termination fees paid by the target to the acquirer, conditional on the deal not being completed, is higher when the target searches information in the pre-announcement period. A one standard deviation increase in the target's information search volume leads to an increase of 1.5% in the termination fees paid by the target, or approximately $0.898 million.

[Insert Table 8 Here]

6.2 Alternative explanations: The market pricing of target information search prior to the announcement date

Given that a target's information searching activities signal the search firm's intent to sell, one can argue that the target's information searching behavior itself may be an event that is priced by the market. Because we focus on the wealth effects of the target's information search around the acquisition announcement date, our previously documented results may fail to capture the gains that could occur on the search days or, more broadly, during the run-up period, which could last for months. Under such circumstances, the target could still earn the same premiums or even higher premiums, but a significant portion of the gains would occur prior to the announcement.

To capture the possible run-up performance of the target, we examine the wealth effects of *Target Information Search Volume* on target CARs for several event windows *prior to* the announcement date, namely $(-252, -1), (-189, -1), (-126, -1), (-63, -1), (-21, -1)$. To supplement this test, we also replace the variable of interest in model (1) with an indicator of target information search (*Target Information Search Dummy*). The results presented in Panels A and B of Table 9 consistently show that target

information search activities do not trigger investor reactions and thus are not priced into the market during this broad period before the announcement date.

We further conduct a standard event study for various event windows around the target's information search dates. In particular, we examine the stock market reactions in the pre-event window $(-20, -1)$, the event period (0) and $(0, 1)$, and the post-event period $(2, 20)$, $(21, 40)$, $(41, 60)$. The results in Panel C of Table 9 show no significant stock market reactions before, during, and after these event windows around the information search dates. This evidence mitigates the concerns that the negative impact of target information search activities on target shareholder wealth around the announcement date is due to the market pricing of target information search and the realization of the target takeover premium *prior to* the takeover announcement dates.

[Insert Table 9 Here]

6.3 Robustness analyses

Alternative measures of target information search

In this sub-section, we conduct additional tests to confirm the robustness of our empirical results. First, as a validation test, we compare the volume of target information search in the period from 12 months prior to the announcement date to the announcement date, i.e., (-12 months, 0), with that in two other windows, namely (-36 months, -24 months) and (-24 months, -12 months). Panel A of Table 10 shows that the volume of target information search activities in the (-12 months, 0) window is significantly larger than that in the other two windows. This suggests that target firms search for more filings closer to the announcement date, alleviating the concern that target information search activities captured in our main results are not statistically different from those in other time periods.

One might expect that the volume of information search can be better proxied by the number of specific firms searched by the target. In other words, if the *desperate target's curse* hypothesis holds, a target would be perceived as more acquisitive if it searches for multiple firms rather than multiple filings

filed by one firm. Therefore, instead of using the variable that captures the number of filings accessed by targets (*Target Information Search Volume*), we employ an alternative variable that measures the number of specific firms searched by the target in model (1). In particular, *Target Information Searched Firms* is the natural logarithm of one plus the total number of other firms searched by a target firm within 12 months prior to the announcement date.

One could also argue that a dummy variable that captures information search activities is a less noisy measure, because it directly captures the existence of search behavior by targets. In other words, in terms of the effects on target shareholder wealth, there would be no difference between a target that accesses only one filing and another that searches multiple filings. Therefore, we replace the information search volume variable in model (1) with an information search dummy. *Target Information Search Dummy* is an indicator variable coded as one if a target searches for other firms, and zero otherwise. This indicator variable may be better able to remove the noise that arises from corporate filings incrementally searched by a target.

Panels B and C of Table 10 report the results of the above two tests. Consistent with the baseline results, we find evidence supporting the *desperate target's curse* hypothesis. In particular, the coefficients on *Target Information Searched Firms* from columns (1) to (4) in Panel A are -0.012, suggesting that a one standard deviation increase in the number of other firms searched by a target is related to a 9.39% decrease in target announcement CARs. The negative effects of information search on target shareholder wealth are stronger when we use the information search dummy as an independent variable. For example, the coefficient on *Target Information Search Dummy* in column (3) is -0.049. This indicates that CARs are 4.9% lower in the presence of target information search than in the absence of information search. On average, the cost of this effect translates into a loss of approximately $868.92 million for target shareholders.

We also re-estimate model (1) by replacing the independent variable with *Target Abnormal Information Search Volume*. Following Bernard et al. (2020), we measure the target's abnormal information search volume as the number of filings viewed by the target firm minus the information search volume conducted by a propensity score-matched non-target firm in the target's industry. The treatment and control firms are matched on firm size, market-to-book ratio, leverage, ROA, PPE, cash flows, and firm age. Panel D of Table 10 provides evidence that is consistent with our main results.

Alternative event windows

Second, we consider alternative event windows to estimate both the independent variable and the dependent variable in model (1). In particular, we go back to 180 days and 90 days prior to the announcement date to capture the information search activities of the target firm (*Target Information Search Volume)*. The results shown in Panels E and F of Table 10 are consistent with the baseline results, indicating that our results are not sensitive to the choice of information search windows. We also use longer event windows (7-day, 11-day, 22-day) to estimate target CARs in order to capture the widely-documented pre-announcement price run-up (e.g., Schwert, 1996). The coefficients on *Target Information Search Volume* range from -0.059 to -0.057 and continue to be significant at the 1% level in Panel G of Table 10. This evidence suggests that our results remain robust to alternative event windows for measuring target CARs.

Tests of omitted variable problem: Oster (2019) test

Third, to further mitigate concerns about omitted variable issues, we run the tests suggested by Oster (2019) and report the results in Panel H of Table 10. Column (1) shows that the "true" β_1 is likely bounded at [-0.008, -0.011], which falls within the 99.5% confidence interval for the coefficient on *Target Information Search Volume* and does not include zero. Therefore, the estimated β_1 coefficient presented in Table 4 is unlikely to be driven by unobservable factors that are at least as important as the observable variables controlled in our main analysis. Moreover, the absolute value of δ in column (1) is

greater than 23, indicating that unobservable factors must be more than twenty-three times as important as the observable controlled covariates to produce no effect of *Target Information Search* on target announcement CARs. Overall, the results of the Oster (2019) tests suggest that our results are unlikely to be driven by possible unobservable factors given the covariates and fixed effects controlled in the baseline analysis.

Self-selection bias: The entropy-balancing approach

Fourth, we re-estimate the regressions using entropy-balanced samples to mitigate possible self-selection bias caused by firm and deal characteristics associated with target information search. Entropy balancing ensures that the mean, variance, and skewness of all covariates are not statistically different by reweighting observations in both the treatment (*Target Information Search Dummy* = 1) and control groups (*Target Information Search Dummy* = 0) (Hainmueller, 2012). The results reported in Panel I are consistent with the *desperate target's curse* hypothesis.

The sample of completed M&A transactions

Fifth, we restrict our sample to completed transactions (i.e., 1,114 deals) and re-estimate model (1) to address a potential concern that our results are driven by unobservable systematic differences between successful and withdrawn M&A transactions. Panel J of Table 10 shows negative and significant coefficients on *Target Information Search Volume*, suggesting that the negative effect of information search on target CARs remains robust in the case of successful deals.

Additional control variables

Sixth, we re-estimate the regression models by adding additional control variables to mitigate the concern that our results may be driven by the other deal-level or firm-level characteristics which are not controlled for in model (1). The results reported in Panels K and L show that our results are robust to the inclusion of the number of target financial advisors and target corporate governance characteristics (i.e., target female CEO, target CEO duality, and target institutional ownership) are included in model (1).

Accounting for the merger waves

Finally, in Panel M, we remove year fixed effects and interact an indicator variable *Merger Wave* with *Target Information Search Volume*. Given that firms are generally eager to engage in M&A transactions during the merger wave period, we expect that the desperation signal sent by the target's information search activities is more likely to be overlooked. Consistent with our expectation, the coefficient on the interaction term is significantly positive, indicating that the negative effect of target information search on target announcement CARs is mitigated by the effects of a merger wave.

[Insert Table 10 Here]

7. Conclusion

Despite extensive evidence underscoring various benefits of information search behaviors among different market participants, the specific information-seeking activities of M&A targets in the context of pre-announcement activities remain unexplored. As a result, the link between target firms' information-seeking efforts and their impact on target shareholder wealth remains unclear. In this study, we focus on the digital footprints of M&A targets on the SEC EDGAR website. We posit that an information searching target can leverage an information advantage, which potentially strengthens its negotiating position and increases shareholder wealth. However, there is also the possibility that the target's commitment to obtaining information and concurrent corporate actions may inadvertently convey a signal of desperation, thereby weakening its bargaining power and reducing shareholder wealth.

Using target CARs around acquisition announcements as a proxy for target shareholder wealth, we show that the volume of target information search is associated with a statistically significant and economically important reduction in target shareholder wealth. Our results are robust to identification strategies that employ tariff rate reductions as exogenous shocks and an instrumental variable approach. Subsequent analyses show that target firms with high levels of information search in the pre-

announcement period receive significantly lower takeover premiums, shedding light on how target information search makes an M&A transaction worse for shareholders. We also find that target firms with higher bankruptcy risk and CEO ownership are perceived as more desperate, which invariably undermines shareholder value. Conversely, information disseminated through social networks appears to compensate for the negative effect of target search behavior and mitigate potential target shareholder losses.

Unlike recent research documenting the benefits of firms' information search (e.g., Chen et al., 2020; Cao et al., 2021; Bernard et al., 2020), our study uncovers the potential shareholder costs embedded in M&A targets' digital footprints, which provides novel evidence on the dark side of company information search activities. It is important to emphasize, however, that our findings do not negate the potential positive effects of information search in shaping target firms' M&A decisions. This research primarily highlights the unintended effects of information search on shareholder wealth around M&A announcements. The long-term implications of such information search on outcomes in the post-announcement period and subsequent relevant corporate decisions remain largely unknown and merit future research.

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Appendix A. Variable Definition

Variable name	Description	Source
Target information search measures		
Target Information Search Volume	The natural logarithm of one plus the total number of filings viewed by a target firm within 12 months prior to the announcement date.	The SEC EDGAR Log File data
M&A outcomes		
CAR	The cumulative abnormal percentage return for the target over the event window (−1 +1) and (−2, +2). In particular, CAR1 is measured using the market model, and CAR2 is measured using the four-factor model. The CRSP equally weighted return is used as the market return.	CRSP
Premiums	The offer price in SDC relative to target stock price either 63 or 105 trading days prior to the M&A announcement.	SDC, CRSP
Target and acquirer firm characteristics		
Size	The log of the market value of equity, at the end of the fiscal year prior to the announcement date.	Compustat
Market-to-Book	Net income divided by assets, at the end of the fiscal year prior to the announcement date.	Compustat
Return-on-Assets	The ratio of market to book value, at the end of the fiscal year prior to the announcement date.	Compustat
Leverage	The ratio of debt to assets, at the end of the fiscal year prior to the announcement date.	Compustat
Deal characteristics		SDC
Hostile Deal	An indicator variable coded as one if the deal is hostile, and zero otherwise.	SDC
Diversify Deal	An indicator variable coded as one if the acquirer and target have different two-digit SIC codes, and zero otherwise.	SDC
Multiple Bidders	An indicator variable coded as one if there are competing bidders, and zero otherwise.	SDC
Cash Payment	An indicator variable coded as one if there the deal is arranged with purely cash, and zero otherwise.	SDC
Toehold	An indicator variable of acquirer's pre-announcement ownership of target coded as one if the acquirer owns a non-zero percentage of target's stock prior to the announcement date, and zero otherwise.	SDC
Tender Offer	An indicator variable coded as one if it is a tender offer, and zero otherwise.	SDC
Variables for identification strategies, cross-sectional tests, and additional tests		

Variable name	Description	Source
Tariff Reductions	An indicator variable coded as one in the year of tariff reductions in both the target and acquirer industries, and thereafter. Following Huang et al. (2017), this paper defines tariff reductions as occurred when the tariff decreases compared to the prior year by more than three times the median tariff rate reduction and is not preceded or followed by a tariff increases greater than 80% of the reduction. Note that we have a relatively small M&A sample, one-digit SIC level is used in measuring industry-level tariff reductions.	Pierce and Schott (2011), Huang et al. (2017), Glaeser and Landsman (2021), the United States International Trade Commission (USITC)
Intra-industry Information Search	For each observation, the instrument variable Intra-industry Information Search is the percentage of intra-industry deals where the target's peers search for information on the SEC EDGAR Website. We define the intra-industry deals as M&A transactions announced 12 months prior to the target firm's announcement date within the target firm's industry.	The SEC EDGAR Log File data, SDC
CEO Ownership	The total proportion of shares outstanding owned by the target CEO, at the end of the fiscal year prior to the announcement date.	BoardEx, ExecuComp
Z-score	Altman (1983, p.122)'s Z-score, at the end of the fiscal year prior to the announcement date.	Compustat
Social Connected Index	The natural logarithm of one plus the social connectedness index between the target and acquirer, at the end of the fiscal year prior to the announcement date.	Bailey et al. (2018a; 2018b)
ACAR	The cumulative abnormal percentage return for the acquirer over the event window $(-1 +1)$ and $(-2, +2)$. In particular, CAR1 is measured using the market model, and CAR2 is measured using the four-factor model. The CRSP equally weighted return is used as the market return.	CRSP
Acquirer Financial Advisors	The natural logarithm of one plus the total number of financial advisor(s) hired by the acquirer.	SDC
Target Financial Advisors	The natural logarithm of one plus the total number of financial advisor(s) hired by the target.	SDC
Acquirer Termination Fees	The natural logarithm of one plus the value for termination fees ($ million) paid by the target.	SDC
Target Termination Fees	The natural logarithm of one plus the value for termination fees ($ million) paid by the target.	SDC
Target Information Search Dummy	An indicator variable coded as one if a target searches for other firms in the Compustat universe within 12 months prior to the announcement date, and zero otherwise.	The SEC EDGAR Log File data
Target Information Searched Firms	The natural logarithm of one plus the total number of other firms searched by a target firm within 12 months prior to the announcement date.	The SEC EDGAR Log File data
Target Abnormal Information Search Volume	The number of filings viewed by a target firm less that by a propensity-score matched, non-target control firm within the	The SEC EDGAR Log File data, Compustat

Variable name	Description	Source
	target's industry. The treatment and control firm are matched by firm size, market-to-book ratio, leverage, ROA, PPE, cash flows, and firm age.	
Target Female CEO	An indicator variable coded as one if a CEO is a female, and zero otherwise.	BoardEx, ExecuComp
Target CEO Duality	An indicator variable coded as one if a CEO also serves as the chairperson on the board, and zero otherwise.	BoardEx, ExecuComp
Target Institutional Ownership	The number of shares held by institutional shareholders to the total number of target firm shares outstanding.	Thomson Financial Institutional (13f) Holdings database
Merger Wave	An indicator variable coded as one for the year from 2003 to 2007 (i.e., the sixth merger wave), and zero otherwise.	Alexandridis et al. (2012)

Figures 1.

The target searches for
other firms

−12 months   The announcement date   Complete or withdrawal
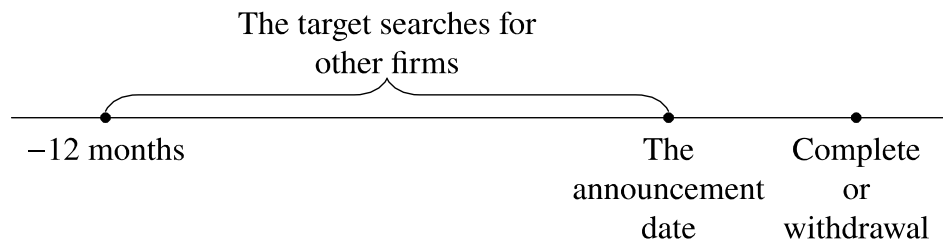
Table 1. Sample construction

Selection Criteria	Number of deals
M&A deal with US public acquirers and targets announced between 2004 and 2016	2,906
Less: Deal status is neither complete nor withdrawal	(302)
Less: Deal value is less than 1 million	(30)
	2,574
Less: Firms without GVKEY and Permno	(1,210)
Less: Observations with missing values	(83)
Final sample	1,281

This table reports the formation process of the sample. First, 2,906 deals where both the target and acquirer are public US firms are drawn from the SDC database. Next, we require the deal status to be either completed or withdrawn and the deal value is over $1 million, this results in 2,574 deals. Further, deals with missing GVKEY or Permno for the target (1,210 deals) are excluded. After combining accounting data from Compustat, stock price data from CRSP, and governance data from BoardEx and ExecuComp, we remove 83 deals with missing financial data. This results in a sample of 1,281 deals.

Table 2. Sample distribution by year and industry

Panel A: Frequency of M&A transactions by announcement year

Year	Number	Percentage
2004	144	11.24%
2005	130	10.15%
2006	132	10.30%
2007	150	11.71%
2008	100	7.81%
2009	82	6.40%
2010	89	6.95%
2011	55	4.29%
2012	75	5.85%
2013	63	4.92%
2014	90	7.03%
2015	87	6.79%
2016	84	6.56%
Total	1,281	100%

Panel B: Frequency of M&A transactions by target industry

Industry	Name	Observations	Percentage
60	Depository Institutions	252	19.67%
73	Business Services	184	14.36%
36	Electronic & Other Electrical Equipment & Components	110	8.59%
38	Measuring, Photographic, Medical, & Optical Goods, & Clocks	95	7.42%
28	Chemicals and Allied Products	94	7.34%
35	Industrial and Commercial Machinery and Computer Equipment	54	4.22%
48	Communications	47	3.67%
13	Oil and Gas Extraction	40	3.12%
67	Holding and Other Investment Offices	30	2.34%
49	Electric, Gas and Sanitary Services	29	2.26%
63	Insurance Carriers	27	2.11%
87	Engineering, Accounting, Research, and Management Services	27	2.11%
80	Health Services	26	2.03%
62	Security & Commodity Brokers, Dealers, Exchanges & Services	21	1.64%
20	Food and Kindred Products	18	1.41%
27	Printing, Publishing and Allied Industries	16	1.25%
37	Transportation Equipment	15	1.17%
	Other industries combined	196	15.30%
Total		1,281	100%

This table reports sample distribution for the sample period of 2004 to 2016. Panel A shows the frequency of deals by announcement year. Panel B shows the frequency of deals by target industry based on two-digit Standard Industrial Classification (SIC) codes.

Table 3. Summary statistics

Variables	Mean	Std. Dev.	Min	P50	Max
Panel A: The target information search variable					
Target Information Search Volume	0.413	1.322	0.000	0.000	5.951
Panel B: Target cumulative abnormal returns (CARs) around the deal announcement					
CAR1(−1, +1)	0.169	0.227	−0.193	0.106	1.124
CAR2(−1, +1)	0.169	0.226	−0.197	0.106	1.125
CAR1(−2, +2)	0.173	0.231	−0.200	0.116	1.146
CAR2(−2, +2)	0.173	0.230	−0.205	0.113	1.148
Panel C: Target and acquirer firm characteristics					
Acquirer Size	8.378	2.042	2.405	8.318	10.925
Target Size	6.354	1.827	3.346	6.353	13.163
Acquirer Market-to-Book	3.067	4.125	−9.556	2.125	30.716
Target Market-to-Book	2.582	3.574	−11.104	1.904	22.054
Acquirer Return-on-Assets	0.032	0.098	−0.572	0.032	0.254
Target Return-on-Assets	−0.034	0.207	−1.138	0.011	0.267
Acquirer Leverage	0.607	0.248	0.085	0.598	1.058
Target Leverage	0.576	0.290	0.053	0.574	1.245
Panel D: Deal characteristics					
Hostile Deal	0.012	0.111	0.000	0.000	1.000
Diversify Deal	0.687	0.464	0.000	1.000	1.000
Multiple Bidders	0.069	0.254	0.000	0.000	1.000
Cash Payment	0.399	0.490	0.000	0.000	1.000
Toehold	0.044	0.206	0.000	0.000	1.000
Tender Offer	0.133	0.340	0.000	0.000	1.000

This table reports summary statistics of target information search measures and M&A transaction variables for the sample period of 2004 to 2016. Panel A presents the variable of interest *Target Information Search*. Panel B presents target CARs for the (−1, +1) window and the (−2, +2) window around the takeover announcement. Panel C presents the firm-level characteristics of the target and acquirer. Panel D presents the transaction-level characteristics. Definitions of the variables are presented in Appendix A.

Table 4. The wealth effects of target information search volume on target CARs

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	−0.011**	−0.011**	−0.011**	−0.011**
	(−2.471)	(−2.403)	(−2.397)	(−2.353)
Acquirer Size	0.013***	0.013***	0.011**	0.012**
	(2.669)	(2.721)	(2.200)	(2.287)
Target Size	−0.023***	−0.024***	−0.022***	−0.023***
	(−3.886)	(−3.972)	(−3.540)	(−3.666)
Acquirer Market-to-Book	0.003	0.003	0.002	0.003
	(1.417)	(1.499)	(1.175)	(1.281)
Target Market-to-Book	−0.002	−0.002	−0.002	−0.002
	(−0.848)	(−0.815)	(−0.811)	(−0.776)
Acquirer Return-on Assets	0.136*	0.140*	0.174**	0.176**
	(1.667)	(1.709)	(2.075)	(2.082)
Target Return-on Assets	−0.054	−0.057	−0.062	−0.066
	(−0.994)	(−1.050)	(−1.088)	(−1.143)
Acquirer Leverage	0.058	0.065*	0.050	0.052
	(1.507)	(1.673)	(1.262)	(1.321)
Target Leverage	0.056	0.048	0.062	0.057
	(1.440)	(1.233)	(1.570)	(1.425)
Hostile Deal	0.089	0.093	0.039	0.049
	(1.537)	(1.601)	(0.775)	(0.946)
Diversify Deal	0.010	0.009	0.012	0.011
	(0.655)	(0.571)	(0.772)	(0.673)
Multiple Bidders	−0.021	−0.022	−0.022	−0.023
	(−1.060)	(−1.111)	(−1.048)	(−1.093)
Cash Payment	0.047***	0.044***	0.044***	0.041**
	(2.805)	(2.626)	(2.600)	(2.442)
Toehold	−0.034	−0.032	−0.043*	−0.043*
	(−1.338)	(−1.256)	(−1.669)	(−1.685)
Tender Offer	0.068***	0.069***	0.073***	0.074***
	(2.865)	(2.899)	(3.003)	(3.032)
N	1,281	1,281	1,281	1,281
Adjusted R-squared	0.101	0.102	0.094	0.095
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

This table reports the effect of target information search on target CARs around the deal announcement. The dependent variable is target CARs for the (−1, +1) window in Columns (1) and (2) and target CARs for the (−2, +2) window in Columns (3) and (4). In particular, the expected returns for *CAR1* is obtained from a market model (columns (1) and (3)) and that for *CAR2* is obtained from a Carhart four-factor model (columns (2) and (4)). Definitions of the variables are presented in Appendix A. The numbers reported in parentheses are based on heteroscedasticity-robust standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% level (two-sided), respectively.

Table 5. Identification strategies

Panel A: A quasi-natural experiment – Tariff rate reductions

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	−0.011**	−0.011**	−0.011**	−0.011**
	(−2.453)	(−2.386)	(−2.372)	(−2.337)
Tariff Reductions	−0.074**	−0.074**	−0.064*	−0.068*
	(−1.981)	(−1.998)	(−1.702)	(−1.821)
Target Information Search Volume × Tariff Reductions	−0.039*	−0.038**	−0.038*	−0.034**
	(−1.948)	(−1.965)	(−1.907)	(−2.016)
Acquirer Size	0.013**	0.013***	0.011**	0.011**
	(2.549)	(2.601)	(2.094)	(2.179)
Target Size	−0.023***	−0.024***	−0.022***	−0.022***
	(−3.829)	(−3.914)	(−3.491)	(−3.612)
Acquirer Market-to-Book	0.003	0.003	0.002	0.002
	(1.352)	(1.433)	(1.119)	(1.222)
Target Market-to-Book	−0.002	−0.002	−0.002	−0.002
	(−0.761)	(−0.727)	(−0.736)	(−0.700)
Acquirer Return-on Assets	0.130	0.134	0.170**	0.171**
	(1.593)	(1.634)	(2.012)	(2.014)
Target Return-on Assets	−0.058	−0.061	−0.066	−0.069
	(−1.066)	(−1.121)	(−1.148)	(−1.204)
Acquirer Leverage	0.063	0.069*	0.054	0.056
	(1.632)	(1.797)	(1.368)	(1.430)
Target Leverage	0.054	0.047	0.061	0.056
	(1.413)	(1.207)	(1.546)	(1.401)
Hostile Deal	0.092	0.095	0.041	0.051
	(1.564)	(1.630)	(0.810)	(0.984)
Diversify Deal	0.011	0.010	0.013	0.012
	(0.740)	(0.656)	(0.843)	(0.748)
Multiple Bidders	−0.021	−0.022	−0.021	−0.022
	(−1.019)	(−1.073)	(−1.006)	(−1.058)
Cash Payment	0.046***	0.043***	0.043**	0.041**
	(2.768)	(2.589)	(2.562)	(2.407)
Toehold	−0.030	−0.028	−0.040	−0.040
	(−1.171)	(−1.092)	(−1.522)	(−1.528)
Tender Offer	0.067***	0.068***	0.072***	0.073***
	(2.836)	(2.871)	(2.978)	(3.005)
N	1,281	1,281	1,281	1,281
Adjusted R-squared	0.103	0.104	0.095	0.097
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel B: Two stage least square (2SLS) analysis

	First Stage	Second Stage			
	Target Information Search Volume	*CAR1(−1, +1)*	*CAR2(−1, +1)*	*CAR1(−2, +2)*	*CAR2(−2, +2)*
	(1)	(2)	(3)	(4)	(5)
Target Information Search Volume		−0.013*	−0.013*	−0.012*	−0.012*
		(−1.928)	(−1.847)	(−1.778)	(−1.729)
Acquirer Size	0.026	0.013***	0.013***	0.011**	0.012**
	(1.273)	(2.691)	(2.742)	(2.216)	(2.304)
Target Size	0.029	−0.023***	−0.024***	−0.022***	−0.023***
	(1.056)	(−3.842)	(−3.931)	(−3.509)	(−3.635)
Acquirer Market-to-Book	−0.002	0.003	0.003	0.002	0.003
	(−0.188)	(1.415)	(1.498)	(1.175)	(1.281)
Target Market-to-Book	−0.003	−0.002	−0.002	−0.002	−0.002
	(−0.269)	(−0.848)	(−0.815)	(−0.811)	(−0.777)
Acquirer Return-on Assets	−0.123	0.136*	0.140*	0.174**	0.176**
	(−0.525)	(1.675)	(1.717)	(2.084)	(2.091)
Target Return-on Assets	0.086	−0.054	−0.057	−0.062	−0.065
	(0.500)	(−0.991)	(−1.049)	(−1.090)	(−1.145)
Acquirer Leverage	0.093	0.059	0.065*	0.050	0.052
	(0.494)	(1.522)	(1.687)	(1.272)	(1.330)
Target Leverage	0.408**	0.057	0.049	0.063	0.058
	(2.220)	(1.480)	(1.268)	(1.599)	(1.452)
Hostile Deal	−0.003	0.088	0.092	0.039	0.048
	(−0.015)	(1.524)	(1.590)	(0.765)	(0.937)
Diversify Deal	−0.055	0.010	0.009	0.012	0.010
	(−0.686)	(0.643)	(0.561)	(0.766)	(0.668)
Multiple Bidders	0.099	−0.020	−0.022	−0.021	−0.022
	(0.604)	(−1.012)	(−1.068)	(−1.019)	(−1.066)
Cash Payment	−0.021	0.047***	0.044***	0.044***	0.041**
	(−0.292)	(2.810)	(2.631)	(2.607)	(2.448)
Toehold	0.050	−0.034	−0.032	−0.043*	−0.043*
	(0.317)	(−1.345)	(−1.262)	(−1.678)	(−1.694)
Tender Offer	0.070	0.069***	0.069***	0.073***	0.074***
	(0.698)	(2.897)	(2.929)	(3.026)	(3.053)
Intra-industry Information Search	5.040***				
	(16.749)				
N	1,281	1,281	1,281	1,281	1,281
Adjusted R-squared	0.472	0.017	0.018	0.011	0.013
Target Industry FE	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES

This table reports the results from two identification strategies. Panel A presents the regression analysis of target CARs on the target information search interacting with plausibly exogenous cuts in tariff at the acquirer and target industry level. Panel B presents the results of the 2SLS regressions of target CARs on target information search, with *Intra-industry Information Search* as the instrument. The first stage uses a Logit regression to generate the fitted (instrumented) value of *Target Information Search* in the second stage. Definitions of the variables are presented in Appendix A. The numbers reported in parentheses are based on heteroscedasticity-robust standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% level (two-sided), respectively.

Table 6. The effects of target information search volume on takeover premiums

	Premiums1	Premiums2
	(1)	(2)
Target Information Search Volume	−0.012**	−0.015**
	(−2.044)	(−2.175)
Acquirer Size	0.016**	0.028***
	(2.417)	(3.673)
Target Size	−0.036***	−0.046***
	(−4.396)	(−4.965)
Acquirer Market-to-Book	0.000	0.004*
	(0.117)	(1.847)
Target Market-to-Book	−0.009***	−0.011***
	(−3.022)	(−3.155)
Acquirer Return-on Assets	0.101	0.136
	(0.843)	(1.045)
Target Return-on Assets	0.166**	0.279***
	(1.989)	(3.218)
Acquirer Leverage	0.109*	−0.025
	(1.815)	(−0.373)
Target Leverage	0.105*	0.144**
	(1.962)	(2.540)
Hostile Deal	0.083	0.127
	(0.972)	(1.267)
Diversify Deal	0.016	0.016
	(0.755)	(0.646)
Multiple Bidders	0.079*	0.029
	(1.917)	(0.619)
Cash Payment	0.056**	0.030
	(2.397)	(1.191)
Toehold	−0.033	−0.053
	(−0.729)	(−0.939)
Tender Offer	0.062**	0.088***
	(2.183)	(2.706)
N	1,137	1,137
Adjusted R-squared	0.109	0.113
Target Industry FE	YES	YES
Year FE	YES	YES

This table reports the effect of target information search on takeover premiums. *Premiums1* (*Premiums2*) as the offer price minus the stock price of a target 63 trading days (105 trading days) prior to the announcement divided by that stock price. The numbers reported in parentheses are based on heteroscedasticity-robust standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% level (two-sided), respectively. Definitions of the variables are presented in Appendix A.

Table 7. Cross-sectional tests

Panel A: Target bankruptcy risk

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	−0.026***	−0.025***	−0.026***	−0.025***
	(−3.995)	(−3.867)	(−4.106)	(−3.970)
Z-score	0.002	0.002	0.004	0.003
	(0.263)	(0.234)	(0.623)	(0.513)
Target Information Search Volume ×Z-score	0.007***	0.007***	0.007***	0.007***
	(2.768)	(2.712)	(2.771)	(2.739)
Controls	YES	YES	YES	YES
N	820	820	820	820
Adjusted R-squared	0.098	0.098	0.098	0.098
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel B: Target CEO ownership

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	−0.003	−0.002	−0.003	−0.002
	(−0.437)	(−0.356)	(−0.551)	(−0.434)
CEO Ownership	0.289	0.282	0.263	0.249
	(1.252)	(1.218)	(1.094)	(1.034)
Target Information Search Volume × CEO Ownership	−0.291***	−0.286***	−0.291***	−0.301***
	(−2.838)	(−2.808)	(−2.795)	(−2.910)
Controls	YES	YES	YES	YES
N	672	672	672	672
Adjusted R-squared	0.123	0.118	0.115	0.111
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel C: Social connections between the target and acquirer

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	−0.073**	−0.073**	−0.072**	−0.070**
	(−2.330)	(−2.413)	(−2.372)	(−2.324)
Social Connectedness Index	0.000	0.000	0.001	0.002
	(0.033)	(0.034)	(0.347)	(0.366)
Target Information Search Volume × Social Connectedness Index	0.007**	0.007**	0.007**	0.007*
	(1.973)	(2.064)	(1.993)	(1.953)

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Controls	YES	YES	YES	YES
N	1,121	1,121	1,121	1,121
Adjusted R-squared	0.093	0.094	0.088	0.089
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

This table reports the results from cross sectional tests. Panel A presents the results of target firms' bankruptcy risk measured by Z-score. Panel B presents the results of ownership percentage by target CEOs. Panel C presens the results of the socially connected index between the target and acquirer. The numbers reported in parentheses are based on heteroscedasticity-robust standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% level (two-sided), respectively. Definitions of the variables are presented in Appendix A.

Table 8. Target information searching, acquirer announcement returns, and other M&A attributes

Panel A: Univariate tests of target and acquirer firm announcement CARs for information searching targets vs. non information searching targets

Variable	Target Information Search=0 Mean	Target Information Search=1 Mean	Diff_Mean	t value	p value
Target CARs around the announcement date					
CAR1(−1, +1)	0.174***	0.133***	0.040**	1.968	0.049
CAR2(−1, +1)	0.173***	0.134***	0.039*	1.913	0.056
CAR1(−2, +2)	0.177***	0.137***	0.040*	1.919	0.055
CAR2(−2, +2)	0.177***	0.137***	0.039*	1.895	0.058
Acquirer CARs around the announcement date					
ACAR1(−1, +1)	-0.005***	0.001	-0.005	-1.032	0.302
ACAR2(−1, +1)	-0.005***	0.000	-0.005	-1.092	0.275
ACAR1(−2, +2)	-0.005***	0.001	-0.005	-0.958	0.338
ACAR2(−2, +2)	-0.005***	-0.000	-0.005	-0.863	0.389

Panel B: Wealth effects of target information search on acquirer CARs

	ACAR1(−1, +1)	ACAR2(−1, +1)	ACAR1(−2, +2)	ACAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	0.000	0.000	0.001	0.001
	(0.272)	(0.290)	(0.689)	(0.628)
Controls	Yes	Yes	Yes	Yes
N	1,277	1,277	1,277	1,277
Adjusted R-squared	0.067	0.066	0.069	0.069
Target Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

Panel C: Target information search and the number of financial advisors hired by the acquirer and the target

	Acquirer Financial Advisors	Target Financial Advisors
	(1)	(2)
Target Information Search Volume	-0.015*	0.000
	(-1.693)	(0.055)
Controls	Yes	Yes
N	1,281	1,281
Adjusted R-squared	0.276	0.153
Target Industry FE	Yes	Yes
Year FE	Yes	Yes

Panel D: Target information search and termination fees paid by the acquirer or the target to its counterparty if the deal is not completed

	Acquirer Termination Fees	Target Termination Fees
	(1)	(2)
Target Information Search Volume	0.028	0.035**
	(0.777)	(2.353)
Controls	Yes	Yes
N	287	976
Adjusted R-squared	0.837	0.840
Target Industry FE	Yes	Yes
Year FE	Yes	Yes

This table reports the results from additional tests focusing on target information search and additional M&A attributes. Panel A presents the results of a univariate test of target and acquirer firm announcement CARs for information searching targets vs. non information searching targets. Panel B presents the results of the wealth effects of target information search volume on acquirer CARs. In particular, the expected returns for *ACAR1* is obtained from a market model and that for *ACAR2* is obtained from a Carhart four-factor model. Panel C presents the results of the effects of target information search volume on the number of financial advisors hired by the acquirer and target. Panel D presents the results of the effects of target information search volume on termination fees paid by the acquirer and target to its counterpart, if the deal is not completed. The numbers reported in parentheses are based on heteroscedasticity-robust standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% level (two-sided), respectively. Definitions of the variables are presented in Appendix A.

Table 9. The market pricing of target information search prior to the announcement date

Panel A: Market pricing of target information search prior to the announcement date

	CAR1 (−252, −1)	CAR2 (−252, −1)	CAR1 (−189, −1)	CAR2 (−189, −1)	CAR1 (−126, −1)	CAR2 (−126, −1)	CAR1 (−63, −1)	CAR2 (−63, −1)	CAR1 (−21, −1)	CAR2 (−21, −1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Target Information Search Volume	0.009	0.013	0.003	0.005	-0.006	-0.004	-0.007	-0.006	-0.001	-0.000
	(0.739)	(1.077)	(0.271)	(0.541)	(-0.728)	(-0.546)	(-1.338)	(-1.091)	(-0.295)	(-0.162)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255
Adjusted R-squared	0.055	0.048	0.063	0.056	0.050	0.049	0.041	0.041	0.032	0.041
Target Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Market pricing of target information search (dummy variable) prior to the announcement date

	CAR1 (-252, -1)	CAR2 (-252, -1)	CAR1 (-189, -1)	CAR2 (-189, -1)	CAR1 (-126, -1)	CAR2 (-126, -1)	CAR1 (-63, -1)	CAR2 (-63, -1)	CAR1 (-21, -1)	CAR2 (-21, -1)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Target Information Search Dummy	0.030	0.047	0.018	0.030	-0.015	-0.003	-0.020	-0.014	-0.008	-0.007
	(0.510)	(0.791)	(0.363)	(0.620)	(-0.417)	(-0.074)	(-0.855)	(-0.580)	(-0.655)	(-0.533)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255	1,255
Adjusted R-squared	0.055	0.047	0.063	0.056	0.050	0.048	0.041	0.040	0.032	0.041
Target Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Target CARs around information searching dates

Variable	Mean	t value	p value
Run-up period			
Days (-20, -1)	-0.004	-1.220	0.223
Days (-20, -1)	-0.004	-1.328	0.184

Event period			
Days (0)	0.000	0.510	0.610
Days (0)	0.001	0.984	0.325
Days (0, 1)	0.001	0.754	0.451
Days (0, 1)	0.001	0.933	0.351
Post-event period			
Days (2, 20)	0.001	0.249	0.804
Days (2, 20)	-0.000	-0.142	0.887
Days (21, 40)	0.001	0.346	0.730
Days (21, 40)	-0.001	-0.223	0.824
Days (41, 60)	0.005	1.590	0.112
Days (41, 60)	0.004	1.217	0.224

This table reports the results from additional tests focusing on Target CARs prior to and around the announcement date. Panel A presents the results of the market pricing of target information search volume prior to the announcement date. Panel B presents the results of the market pricing of target information search (dummy variable) prior to the announcement date. Panel C presents the results of target CARs around information searching dates. The numbers reported in parentheses are based on heteroscedasticity-robust standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% level (two-sided), respectively. Definitions of the variables are presented in Appendix A.

Table 10. Robustness Tests

Panel A: Univariate test of target information search variables

Difference	Mean	Std Dev	p-value
Target Information Search Volume (−12 months, 0) − Target Information Search Volume (−36 months, −24 months)	0.063***	0.838	0.008
Target Information Search Volume (−12 months, 0) − Target Information Search Volume (−24 months, −12 months)	0.036**	0.579	0.026

Panel B: The number of firms being searched

	CAR1(−1, +1)	*CAR2(−1, +1)*	*CAR1(−2, +2)*	*CAR2(−2, +2)*
	(1)	(2)	(3)	(4)
Target Information Searched Firms	−0.012**	−0.012**	−0.012**	−0.012**
	(−2.261)	(−2.206)	(−2.238)	(−2.198)
Controls	YES	YES	YES	YES
N	1,281	1,281	1,281	1,281
Adjusted R-squared	0.100	0.101	0.094	0.095
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel C: Target information search dummy variable

	CAR1(−1, +1)	*CAR2(−1, +1)*	*CAR1(−2, +2)*	*CAR2(−2, +2)*
	(1)	(2)	(3)	(4)
Target Information Search Dummy	−0.048**	−0.046**	−0.049**	−0.048**
	(−2.477)	(−2.396)	(−2.506)	(−2.448)
Controls	YES	YES	YES	YES
N	1,281	1,281	1,281	1,281
Adjusted R-squared	0.101	0.102	0.094	0.095
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel D: Target abnormal information search

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR1(−2, +2)
	(1)	(2)	(3)	(4)
Target Abnormal Information Search Volume	-0.006**	-0.006**	-0.007**	-0.007**
	(-2.075)	(-2.001)	(-2.224)	(-2.175)
Controls	YES	YES	YES	YES
N	1,281	1,281	1,281	1,281
Adjusted R-squared	0.100	0.101	0.094	0.095
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel E: 180-day information searching window

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	−0.013**	−0.012**	−0.012**	−0.012**
	(−2.423)	(−2.374)	(−2.286)	(−2.266)
Controls	YES	YES	YES	YES
N	1,281	1,281	1,281	1,281
Adjusted R-squared	0.101	0.102	0.094	0.095
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel F: 90-day information searching window

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	−0.015**	−0.014**	−0.014**	−0.014**
	(−2.284)	(−2.232)	(−2.148)	(−2.124)
Controls	YES	YES	YES	YES
N	1,281	1,281	1,281	1,281
Adjusted R-squared	0.100	0.101	0.093	0.094
Target Industry FE	YES	YES	YES	YES

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Year FE	YES	YES	YES	YES

Panel G: Longer windows to measure target CARs

	CAR1(−3, +3)	CAR2(−3, +3)	CAR1(−5, +5)	CAR2(−5, +5)	CAR1(−20, +1)	CAR2(−20, +1)
	(1)	(2)	(3)	(4)	(5)	(6)
Target Information Search Volume	−0.058***	−0.057***	−0.059***	−0.058***	−0.059**	−0.058**
	(−2.886)	(−2.850)	(−2.826)	(−2.817)	(−2.533)	(−2.510)
Controls	YES	YES	YES	YES	YES	YES
N	1,281	1,281	1,281	1,281	1,281	1,281
Adjusted R-squared	0.098	0.099	0.099	0.100	0.111	0.112
Target Industry FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES

Panel H: Tests of omitted variable problem: Oster (2019) test

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR1(−2, +2)
	(1)	(2)	(3)	(4)
β Bound	[-0.008, -0.011]	[-0.008, -0.011]	[-0.008, -0.011]	[-0.008, -0.011]
99.5% CI	[-0.024, 0.002]	[-0.023, 0.002]	[-0.024, 0.002]	[-0.023, 0.002]
δ (1.3×R-squared)	-23.222	-24.111	-18.885	-20.188

Panel I: Self-selection bias: The entropy-balancing approach

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	−0.011***	−0.011***	−0.011***	−0.011***
	(−2.868)	(−2.820)	(−2.656)	(−2.637)
Controls	YES	YES	YES	YES
N	1,281	1,281	1,281	1,281
Adjusted R-squared	0.144	0.142	0.134	0.131

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel J: The sample of completed M&A transactions

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR2(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	−0.010*	−0.009*	−0.009*	−0.009*
	(−1.951)	(−1.886)	(−1.724)	(−1.718)
Controls	YES	YES	YES	YES
N	1,114	1,114	1,114	1,114
Adjusted R-squared	0.091	0.093	0.084	0.085
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel K: Target financial advisors

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR1(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	-0.011**	-0.011**	-0.011**	-0.011**
	(-2.474)	(-2.410)	(-2.399)	(-2.359)
Target Financial Advisors	0.052***	0.051**	0.062***	0.059***
	(2.613)	(2.576)	(3.046)	(2.929)
Controls	YES	YES	YES	YES
N	1,281	1,281	1,281	1,281
Adjusted R-squared	0.104	0.105	0.099	0.099
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel L: Target firm corporate governance characteristics

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR1(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	-0.011**	-0.011**	-0.011**	-0.011**
	(-2.485)	(-2.417)	(-2.434)	(-2.388)
Target Female CEO	-0.003	-0.002	0.001	0.001
	(-0.097)	(-0.063)	(0.028)	(0.030)
Target CEO Duality	-0.022*	-0.022*	-0.027**	-0.026**
	(-1.703)	(-1.691)	(-2.027)	(-1.990)
Target Institutional Ownership	-0.029	-0.031	-0.030	-0.032
	(-1.234)	(-1.322)	(-1.279)	(-1.363)
Controls	YES	YES	YES	YES
N	1,281	1,281	1,281	1,281
Adjusted R-squared	0.102	0.103	0.096	0.097
Target Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Panel M: Accounting for the merger waves

	CAR1(−1, +1)	CAR2(−1, +1)	CAR1(−2, +2)	CAR1(−2, +2)
	(1)	(2)	(3)	(4)
Target Information Search Volume	-0.016***	-0.016***	-0.015***	-0.015***
	(-2.968)	(-2.878)	(-2.723)	(-2.705)
Merger Wave	-0.056***	-0.057***	-0.058***	-0.059***
	(-4.384)	(-4.436)	(-4.467)	(-4.508)
Target Information Search Volume × Merger Wave	0.018**	0.017*	0.016*	0.015*
	(1.999)	(1.886)	(1.717)	(1.683)
Controls	YES	YES	YES	YES
N	1,281	1,281	1,281	1,281

Adjusted R-squared	0.092	0.093	0.086	0.087
Target Industry FE	YES	YES	YES	YES

This table reports the results from a battery of robustness tests. Panel A presents the results from the univariate test of target information search variables measured in multiple windows. Panel B presents the results from the regression models where *Target Information Searched Firms* is the independent variable. Panel C presents the results from the regression models where *Target Information Search Dummy* is the independent variable. Panel D presents the results from the regression models where *Target Abnormal Information Search Volume* is the independent variable. Panel E and F present the results from the regression models where shorter information search windows (180-day and 90-day, respectively) are used to capture target firms' searching activities. Panel G presents the results from the regression models where target CARs are measured with longer windows. Panel H presents the results from the Oster (2019) method to mitigate omitted variable issues. Panel I presents the results from regression models where an entropy balancing sample is used. Panel J presents the results from the regression models where the sample is constructed by completed deals only. Panel K presents the results from the regression models where *Target Financial Advisor* is controlled for. Panel L presents the results from the regression models where target firm corporate governance characteristics (i.e., *Target Female CEO*, *Target CEO Duality*, *Target Institutional Ownership*) are controlled for. Panel M presents the results from the regression models where the effects of the merger wave is examined. The numbers reported in parentheses are based on heteroscedasticity-robust standard errors. ***, **, and * indicate significance at the 1%, 5%, and 10% level (two-sided), respectively. Definitions of the variables are presented in Appendix A.