

CREDIBILITY OF VOLUNTARY DISCLOSURE ON INTANGIBLE ASSETS

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ABSTRACT

Despite strong demand for information on firms' intangible assets (IA), voluntary disclosure on IA is often seen as inadequate and difficult to verify. The absence of formal oversight, coupled with managerial self-interest and proprietary disclosure cost, calls into question the credibility of such disclosure. This paper assesses IA voluntary disclosure by exploiting data from the mergers and acquisitions (M&As) setting where fair valuations of otherwise unobservable IA become observable. The paper finds a positive association between the extent of voluntary disclosure on IA and the value of IA. This result indicates that, on average, firms' voluntary disclosure on IA reflects the economic reality of the underlying assets. The paper addresses the sample selection concern using a Heckman two-stage model and a matched sample of non-acquired firms. Results from further tests suggest that the association is strongest for contract and technology IA, followed by marketing and customer-related IA, and that IA voluntary disclosure is linked to unrecognized but not recognized IA. The association between IA disclosure and IA value is constrained by low profitability, institutional investor presence, high litigation risk, and strong competition. Preliminary results indicate that firms with credible disclosure are associated with lower analyst EPS forecast error and dispersion, whereas cheap talk firms are associated with higher error and dispersion.

1. INTRODUCTION

Intangible assets (IA)¹ are increasingly regarded as an important driver of firm value (Lev, 2019; FASB, 2021). Over the past four decades, U.S. firms have reduced spending on tangible assets by half while quadrupling their investment in IA (Crouzet et al., 2022; Ewens et al., 2024). Capital market participants and academic researchers have sought to gauge the significance of IA using the ever-growing gap between firms' market capitalization and book value. As of January 2025, the combined market capitalization of the five largest U.S. firms is approximately \$15 trillion, while their aggregate book value of equity is less than \$1 trillion. The staggering \$14 trillion discrepancy is commonly attributed to unrecognized IA.

Under U.S. GAAP, while externally acquired IA are recognized upon acquisitions, reporting entities are not allowed to recognize internally generated IA as assets.² This non-recognition results in heightened information asymmetry between managers and investors, who require IA information to value the firm (Eberhart et al., 2004; Cohen et al., 2013; Hall et al., 2014). Given the limitations of mandatory financial reporting in providing useful information on IA,³ investors rely on managers' voluntary disclosure as a crucial source of information (Wyatt, 2008; Merkley, 2014). However, capital market participants and standard setters have expressed concerns about the inadequacy of IA-related information provided by managers

¹ U.S. GAAP defines IA as assets without physical substance, excluding goodwill and financial assets.

² *ASC paragraph 350-30-25-1*: An IA that is acquired either individually or with a group of other assets shall be recognized.

ASC paragraph 350-30-25-3: Costs of internally developing, maintaining, or restoring IA that are not specifically identifiable, that have indeterminate lives, or that are inherent in a continuing business or non-profit activity and related to an entity as a whole, shall be recognized as an expense when incurred.

The only exception to the non-recognition of internally generated IA is the capitalization of software development costs, which can be capitalized once they pass technological feasibility tests.

³ R&D expenditures reported in aggregate are not informative about the IA value creation process for capital market participants (Wyatt, 2008).

(FASB, 2021).⁴ Globally, accounting standard-setters are actively pursuing research and projects aimed at improving IA disclosure (FASB, 2023; IASB, 2024). A critical issue for voluntary disclosure, given the lack of formal oversight,⁵ is whether it reflects the underlying economic reality it claims to represent. The paper sheds light on this issue by examining (i) whether voluntary IA disclosure is associated with the economic value of the underlying IA; and (ii) the conditions under which voluntary IA disclosure is associated with IA value.

There are competing rationales regarding whether voluntary IA disclosure reflects IA value, as managers weigh the potential benefits of transparency against motivations for opportunism or withholding information. On the one hand, signaling theory suggests that managers whose interests align with their shareholders use their discretion to credibly signal private information and reduce information asymmetry (Healy & Palepu, 2001). On the other hand, voluntary disclosure on IA may not reflect the economic value for two distinct reasons. First, agency theory suggests that managers may make self-serving disclosure to gain private benefits (Fields et al., 2001), such as inflating the earning potential of IA to boost short term compensation. Second, proprietary cost theory suggests that managers may withhold IA disclosure to avoid revealing private information that could confer a competitive advantage to competitors (Cotter et al., 2011). Overall, theories provide ambiguous predictions for whether voluntary disclosure on IA faithfully reflects IA value.

To address this knowledge gap, the paper takes advantage of a unique setting in which the fair valuation of IA becomes observable, namely, when firms with IA become acquisition

⁴ The 2021 FASB survey revealed that 60 percent of the respondents indicated that additional qualitative IA disclosure would enhance their decision-making.

⁵ Information intermediaries (e.g. business analysts and journalists) could provide some assurance on management's voluntary disclosure on IA. However, such assurance is inconsistent and might not always be accessible to all users of financial reports equally. There lacks a practice similar to that of independent auditors' assurance of mandatory disclosure.

targets.⁶ Under ASC 805 *Business Combinations*, acquirers are required to recognize and report the acquisition-date fair value for each major class of the target's assets, including IA. As such, this fair value is the market price the acquirer pays for the IA.⁷ The valuation process undergoes rigorous due diligence by expert appraisers and is subject to auditor oversight as part of mandatory financial reporting (Lim et al., 2020; Beneish et al., 2022; Ewens et al., 2024).⁸ Most recently, Blann et al. (2025) provide evidence of the decision usefulness of IA fair value in M&A. They show that IA fair value has the ability to predict future cash flows and is used by financial statement users, as evidenced by analysts' forecast revisions and stock price reactions.

This thesis uses this market-based value of IA to examine the credibility⁹ of target's voluntary IA disclosure by testing whether the extent of disclosure is associated with IA value. This approach is consistent with Healy and Palepu's (2001) proposition which suggests mandatory financial reporting numbers can validate prior voluntary disclosure.¹⁰ Using a reliable numerical measure to authenticate previous corporate claims is also a technique commonly used in the academic literature (e.g., Michalisin, 2001; Balvers et al., 2016; Dikolli et al., 2022; Chen & Srinivasan, 2024; Baker et al., 2024). A positive association between IA disclosure and IA value suggests that managers use voluntary disclosure to credibly signal private information about IA. Conversely, the absence of such an association indicates that managers provide either cheap or inadequate signal regarding IA.

⁶ The terms "M&A," "acquisition," and "business combination" are used interchangeably.

⁷ *ASC paragraph 820-10-20*: Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date.

⁸ The IA valuation process is detailed in Section 2.1.1.

⁹ In this paper, credibility is defined as the ability of IA disclosure to be explained by the underlying IA value.

¹⁰ A common example in the literature is the verification of managers' voluntary revenues and earnings forecasts using actual realized amounts in mandatory reports.

To capture IA voluntary disclosure, this paper focuses on the language used in the Management Discussion and Analysis (MD&A) section of the target's 10-K documents (annual reports) pre-acquisition.¹¹ IA value is extracted from the acquirers' Purchase Price Allocation (PPA), located in the public acquirers' notes to the financial statements post-acquisition.¹² Using a sample of 1,080 acquisitions from 1996 to 2017,¹³ this paper finds that there is a significant positive association between firms' voluntary disclosure on IA and the economic value of IA. This suggests that firms' voluntary disclosure on IA, on average, is credible and reflects the underlying economic reality of those assets. Financial statement users can gauge the significance or materiality of the IA to the firm by paying attention to the extent to which IA is discussed by managers.

For robustness, the paper computes five alternative measures of IA disclosure using different term-weighting schemes that capture each IA's relative significance within the document corpus or industry. The main results are robust across all five alternative measures of IA disclosure. To address the potential sample selection concern from focusing on only acquired firms,¹⁴ the paper employs a Heckman two-stage least squares Model (Tucker, 2010). The bias correction term computed in the first stage, when included in the second-stage model, does not alter the positive association between IA disclosure and IA value. This indicates that sample selection bias does not affect the results. Further, the paper identifies a sample of comparable non-acquired firms and estimates their IA value, which is unavailable outside the

¹¹ The rationale for using the MD&A section is detailed in Section 2.1.1. The MD&A section is considered voluntary disclosure because it falls outside auditors' primary duties (Michalisin, 2001). Under Statement of Auditing Standards No. 8, auditors need only check the MD&A section for inconsistencies with the financial statements, not opine on matters outside accounting standards, such as IA, future plans, or business philosophy.

¹² This IA value reflects the target's overall IA capabilities, which are unlikely to change significantly during the short timeframe in which the acquisition is being finalized. For an average deal in the sample, there are six months between the target's last Form 10-K pre-acquisition (IA disclosure) and the acquisition announcement.

¹³ The sample period ends in 2017 due to the availability of IA value data provided by Ewens et al. (2024), discussed in Section 3.1. This sample size is common in the U.S. acquisition literature.

¹⁴ Acquisitions are not random events and acquirers may target firms with above-average IA capabilities. The endogeneity issue is further discussed in Section 4.3.

acquisition setting, by capitalizing R&D and SG&A expenditures. Using Ewens et al. (2024)'s capitalizing parameters, the credibility results remain consistent when tested using this non-acquired sample.

The positive association also remains consistent across all five major categories of IA as defined in ASC 805 *Business Combinations*, namely, marketing, customer, contract, technology, and other IA. Further tests show the strongest association is observed for technology and contract IA, followed by marketing, then customer-related IA. Additionally, the acquisition setting allows for the distinct identification of the target's IA not previously recognized on the balance sheet. Empirical analysis reveals that firms' IA voluntary disclosure is associated with the value of unrecognized IA, but not with recognized IA. This finding suggests that firms use voluntary disclosure as a means to signal the economic significance of IA beyond the balance sheet.

The next analysis examines five different textual characteristics of IA voluntary disclosure: specificity, risk, uncertainty, forward-looking, and sentiment. The results show that firms with higher IA value, particularly unrecognized IA value, provide more specific disclosure, controlling for the overall level of IA disclosure. This is encouraging as users seek detailed and verifiable information about unrecognized IA. Conversely, firms with more recognized IA tend to use less forward-looking language, consistent with the backward-looking nature of financial reporting. Analyses of risk, uncertainty, and sentiment reveal insignificant effects, suggesting that firms with higher IA value do not systematically vary the tone or uncertainty and risk language of their disclosure.

While the credible result is observed on average, the credibility of IA voluntary disclosure may be constrained by several factors. The paper examines four factors known to influence IA voluntary disclosure: (1) external information demand (Eng & Mak, 2003; Merkley, 2014); (2) internal governance and monitoring mechanisms (Cerbioni & Parbonetti,

2007; White et al., 2007); (3) presence of proprietary cost (Cotter et al., 2011); and (4) the skills of the manager providing the disclosure (Appleton et al., 2023). Cross-sectional analyses suggest that firms with lower profitability, higher institutional ownership, higher litigation risk, and greater competition provide less credible IA disclosure. Credibility does not appear to vary depending on corporate governance mechanisms such as board independence and stock-based incentives. The paper also examines CEO characteristics, including skills, specialist knowledge, and tenure, but these tests yield insignificant results. Given the limited sample size since target firms are typically small and often lack coverage in major data providers, the paper refrains from drawing strong inferences regarding governance and CEO characteristics.

Furthermore, the paper examines the capital market consequences of credible and non-credible IA disclosure. Two subsets of non-credible IA disclosure firms, whose IA disclosure and fair value severely mismatch, are identified. These are firms in the highest (lowest) disclosure tercile but the lowest (highest) value tercile.¹⁵ Preliminary results show that, relative to non-credible firms, credible IA disclosers subsequently exhibit lower analyst EPS forecast error and dispersion in the quarter and financial year immediately following the disclosure. In contrast, cheap talk firms, who are in the highest tercile of disclosure but the lowest tercile of value, have higher analyst EPS forecast error and dispersion in the same periods. Quiet firms, being in the lowest tercile of disclosure but the highest tercile of value, do not affect analyst EPS forecast error and dispersion.

This paper makes contributions to the academic literature. Firstly, it identifies an economic benchmark to examine disclosure on IA, which is challenging to find for most types of voluntary disclosure (Healy & Palepu, 2001). IA exemplify this challenge, since fair valuations of these assets are uncommon outside the acquisition setting. As a result, prior

¹⁵ This classification is common in the literature (e.g., Baker et al., 2024; Barrios et al., 2025 WP).

research has relied on stock prices or price reactions to evaluate IA voluntary disclosure (e.g., Gu & Li, 2003; Merkley, 2014; Chen & Srinivassan, 2024), capturing the value relevance or information content of IA disclosure. The *relevance* of information, however, is distinct from its *faithful representation*. As specified by the Conceptual Framework,¹⁶ for financial information is to be useful, it must be *both* relevant and faithfully represent what it purports to represent. While the relevance of IA disclosure is well-documented, evidence on faithful representation has been absent to date. This paper addresses this gap and advances the literature by documenting IA disclosure to be reflective of the assets' underlying economic reality.

Secondly, the findings on the varying levels of credibility across five IA categories, book versus non-book IA, and the textual characteristics of IA disclosure are novel and cannot be inferred from prior research. The paper also provides evidence on the conditions under which the association between IA disclosure and IA value varies in strength, highlighting there are limits to the credibility of IA voluntary disclosure. These insights provide timely guidance for standard-setting aimed at improving IA disclosure to enhance confidence in financial statements as a comprehensive source of entity information.

Thirdly, the paper holds relevance for standard-setters, regulators, practitioners, and users of accounting information. IA remain among the most controversial and complex issues faced by regulators worldwide, with FASB's first IA project dating back to the early 2000s (Lev, 2019).¹⁷ There is growing international interest in reassessing the accounting for IA, with disclosure favored over recognition and measurement (FASB, 2023; IASB, 2024). This paper responds to recent calls for formal assessment of whether existing IA voluntary disclosure is suboptimal, particularly for more descriptive evidence on IA voluntary disclosure (e.g.,

¹⁶ The Conceptual Framework outlines the objectives and criteria to guide accounting standard setting decisions.

¹⁷ Following the 2001 Special Report, the FASB proposed a project on disclosing unrecognized IA, which was removed from the agenda as inactive in 2004.

frequency and type) and its decision usefulness (such as credibility) (FASB, 2021; Appleton et al., 2023).

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Background and literature gap

2.1.1. *Disclosure of IA*

IA are productive assets that lack physical presence. A defining economic characteristic that distinguishes IA from other assets is their nonrivalry in use, enabling them to be used simultaneously across locations and processes, thereby driving substantial value through economies of scale and scope (Crouzet et al., 2022). Even though IA have emerged as an increasingly important class of assets, the accounting standards that govern them remain largely unchanged for the past 50 years.¹⁸ This stagnation has been criticized as outdated (Lev & Gu, 2016; Lev, 2019), and investors have repeatedly ranked IA as a high-priority financial reporting issue in need of reform (FASB, 2021; EFRAG, 2023). Current standard-setter discussions on improving the accounting for IA focus on two main areas: (i) disclosure, and (ii) recognition and measurement (Appleton et al., 2023). Users of the financial reports and standard setters indicate a preference for improved disclosure as opposed to the latter (FASB, 2023), which aligns with the focus of this paper on disclosure.

Companies typically disclose information on IA on a voluntary basis, and regulatory interventions have been limited and minimally effective (Crovini et al., 2022).¹⁹ In the U.S.,

¹⁸ The rule requiring immediate expensing of R&D costs traces back to SFAS No. 2 (1974, *Accounting for Research and Development Costs*).

¹⁹ For instance, the EU Directive 2014/95, implemented in 2017, requires disclosure of the business model, including IA; yet an EFRAG report finds 29% of companies remain non-compliant (Crovini et al., 2022). In Japan and Denmark, companies publish a separate Intellectual Capital Statement, but this practice has largely proven ineffective. Japanese firms often use the statement to list patents and trademarks (Amico, 2012), while the Danish initiative has failed to provide meaningful information to investors (Nielsen et al., 2017).

patents and trademarks are among the few IA that are publicly observable, owing to their publication and verifiability through the USPTO. For other IA, financial report recognition limits have shifted disclosure toward narrative formats, making narrative communication the primary channel (Holland, 2004). Investors value these narratives for the insights they provide into management's views on firms' value-creation, with IA regarded as a fundamental value driver (Beattie & Smith, 2013; Crovini et al., 2022). In the US, narrative disclosure is found in the MD&A section of Form 10-K.²⁰ This section is also suitable for IA voluntary disclosure as it provides a liability-free space for managers to disclose forward-looking information, a characteristic typical of IA (Appleton et al., 2023). Examples of how IA information is disclosed in the MD&A section are provided in Appendix A.

The academic literature examines IA disclosure broadly, using different terms for IA such as intangible capital, intellectual property, and organizational capital, encompassing well-researched IA such as patents, innovation, and R&D. Prior studies have investigated the drivers of IA disclosure (Jones, 2007; Kang & Gray, 2011a; Bellora & Guenther, 2013), the content of IA disclosure (Kang & Gray, 2011b, Castilla-Polo & Ruiz-Rodríguez, 2017), reasons for and against IA disclosure (van der Meer-Kooistra & Zijlstra, 2001; Castilla-Polo & Gallardo-Vázquez, 2016). Specifically for R&D disclosure, prior study also looks at textual characteristics, such tone and readability (Merkley, 2014). Other works investigate IA disclosure in specific settings, such as IPOs (Bukh et al., 2004) and seasoned equity offerings (Zufarov, 2025). Filip et al. (2022) and Filipovic & Wagner (2024) utilize the acquisition

²⁰ Form 10-K is the most important SEC filing, as it is public, comparable, accessible, and directly evaluated by investors (Michalisin, 2001; Glaeser & Lang, 2024). Annual reports are used as a reasonable proxy for overall corporate reporting (Lee, 2016). The SEC (2003, cited in Cannon et al., 2021) emphasizes the importance of MD&A disclosure to be "informative and transparent... to provide information about the quality of, and potential variability of, a company's earnings and cash flow." Company websites and press releases are susceptible to impression management (Li et al., 2021). In earnings calls, the management presentation segment resembles MD&A (Lee, 2016; Li et al., 2021), while the Q&A segment addresses IA only if prompted by analysts.

setting to show that acquisition announcement returns are lower when the acquirer extensively discusses IA.

Despite the voluntary nature of IA disclosure, IA-related information is increasingly relevant to investors (Barth et al., 2023). An extensive body of research, known as the value relevance literature, documents positive associations between IA-related information and firm value, stock returns, and future financial performance (for a review, see Wyatt, 2008). Notable examples of value-relevant IA include R&D expenditure (Griliches, 1981), R&D capital (Lev & Sougiannis, 1996), capitalized software assets post-feasibility test (Aboody & Lev, 1998), brand value (Barth et al., 1998; Kallapur & Kwan, 2004), patent quality (Hirschey et al., 2001), trademarks (Greenhalgh & Rogers, 2006), advertising expenses, and purchased IA (Barth et al., 2023; King et al., 2023; Masulis et al., 2023). With regard to IA voluntary disclosure, Gu and Li (2003) find that disclosure of innovation contains price-sensitive news and is positively associated with the firm's future sales growth, profitability, and stock returns. Merkley (2014) examines narrative R&D disclosure and finds that managers adjust R&D disclosure based on earnings performance to provide relevant information, and that such disclosure has information content. Chen and Srinivassan (2024) examine disclosure on digital technologies and find that such disclosure is associated with higher firm value and performance.

Capital market participants and standard setters (FASB, 2021, 2023; IASB, 2024) have repeatedly expressed the view that the level of IA information voluntarily provided by managers is not useful for firm valuation and decision-making. The fundamental qualitative characteristics of useful financial information, as specified by the Conceptual Framework, are *relevance* and *faithful representation* (FASB, 2018). While the relevance of IA information is widely accepted, faithful representation, however, remains a primary concern for regulators

and market participants (Wyatt, 2008).²¹ Further, the growing relevance of IA suggests that enhancing their representational faithfulness could be a productive avenue for improving their financial reporting (Barth et al., 2023). Wyatt (2008) directs future research towards identifying new economic benchmarks for evaluating the representational faithfulness (hereafter, credibility, as termed in Healy & Palepu (2001)) of IA information, which aligns with the focus of this paper.

Another stream of literature relies on stock price reactions to assess whether investors incorporate voluntarily disclosed IA information into their valuation of the firm. For instance, Amir and Lev (1996) find that for telecommunication firms, voluntary disclosure on market penetration and market size is more strongly related to stock price and stock returns than mandatory financial statement information, suggesting that investors perceive such disclosure as credible. Narayanan et al. (2000) find that voluntary disclosure of R&D projects that require government approval is highly credible to investors, who view the government as an external trustworthy source in situations of high uncertainty and information asymmetry. Gu and Li (2007) find that investors view the disclosure of innovation strategy as credible good news, especially when preceded by insider purchase transactions. They argue that informed insider trading serves as a credible signal of managers' private information, as it reflects insiders' superior knowledge of the firms' future prospects, which directly affects managers' personal wealth. Using experimental study designs, Cannon et al. (2021) find that customer retention strategy disclosure that include details are perceived as more credible. In essence, the above studies enhance our knowledge on the *perceived* credibility, which is a receiver-based construct concerning the audience's acceptance of information, rather than an objective criterion

²¹ Prior research has treated value relevance tests as a joint assessment of relevance and faithful representation, making it impossible to disentangle the two. For many IA, value relevance arises mainly from relevance rather than faithful representation (Wyatt, 2008; Barth et al., 2023). For example, reported R&D expense does not faithfully represent the value of R&D activities, so its value relevance primarily reflects relevance.

(Mercer, 2004). In contrast, this paper examines whether IA voluntary disclosure reflects the economic reality of the assets.

A common limitation of most studies surveyed above is their focus on specific IA and industries, leaving it unclear whether their findings translate to all IA. Because IA and their relevant industries are highly context-specific, studying all IA collectively to response to users and standard-setters' call for improved financial reporting is challenging. To the best of our knowledge, no research has yet tested the credibility of voluntary disclosure across all IA. The acquisition setting neatly facilitates direct credibility testing across various categories of IA and industries.

2.1.2. Evaluation of IA disclosure credibility using IA fair value in M&A context

Much of the evidence on the credibility of voluntary disclosure focuses on managers' forecasts (e.g., Hutton et al., 2012; Ball et al., 2012). While the accuracy of revenue and earnings forecasts can be easily computed by comparing the forecasts to the actual realized amount, finding a benchmark for verifying other forms of voluntary disclosure remains an onerous task (Healy & Palepu, 2001). IA exemplify this difficulty, as a readily obtainable fair valuation for such assets is rare, unlike that of tangible assets. Nevertheless, prior literature has had some success in identifying reliable external verification for disclosure on certain intangible capital that does not meet the definition of a controlled asset. For example, Michalisin (2001) validates annual report disclosure on innovativeness using trademarks and innovativeness scores from the 1988 Fortune Reputation Survey. Balvers et al. (2016) authenticate disclosure on customer satisfaction using subsequent American Customer Satisfaction Index scores. Dikolli et al. (2022) verify the classification of mutual funds as “sustainable” using the funds' actual voting records on ESG-related shareholder proposals. Chen and Srinivasan (2024) validate firms' digital activity disclosure using the proportion of IT workers. Baker et al. (2024) verify voluntary disclosure about commitments to employee diversity by comparing them to the

firms' actual hiring practices. This paper differs from the above studies in that it focuses on identifiable IA, thus more directly aligned with users and standard setters' call for improved financial reporting of IA.

The acquisition setting is one of the very few instances where the value of IA is measured and publicly disclosed. In practice, the IA valuation process in M&A is the result of the acquirer's due diligence. Independent appraisers determining fair value based on the highest and best use in the most advantageous market (Beneish et al., 2022). Given that IA typically do not have readily observable market prices, the most common valuation method is the discounted cash flow approach, akin to the methods used for tangible assets (AICPA, 2012; King, 2023; Masulis et al., 2023). Valuation experts validate forecasts of incremental cash flows attributable to IA through internal document reviews and discussions with management and development professionals (Crane & Dyson, 2009).²² Accounting standards require that the value assigned to each IA be on a stand-alone basis, excluding any anticipated merger synergies.²³ The methods and assumptions underlying IA valuation can be detailed in the PPA by the acquirers (Kimbrough, 2007). The validity of the PPA is further reinforced by its submission to both financial statement audits and rigorous reviews by the SEC²⁴ and the IRC tax authorities (Deloitte, 2015). Examples of how IA valuation is reported by the acquirer are provided in Appendix B.

The academic literature offers several approaches for estimating and measuring the value of a firm's IA (for a review, see Van Criekingen et al., 2022), typically done by capitalizing portions of the firm's R&D and SG&A expenditures (e.g., Corrado et al., 2009;

²² A discussion is provided in Kimbrough (2007, Appendix A) regarding the multiperiod excess earnings approach to value IA based on his discussions with valuation experts, guidance from AICPA (2001) and Mard et al. (2002).

²³ Synergies are included in goodwill, measured as the residual difference between the deal value and the fair value of the target's net identifiable assets.

²⁴ The SEC has in the past issued comment letters to acquiring companies requesting additional information about the PPA (Deloitte, 2015).

Hulten & Hao, 2008; Lev & Srivastava, 2019; Ewens et al., 2024). While these studies have advanced our understanding of IA measurement, this paper exploits the unique M&A setting to bypass researchers' estimation and instead directly observe the market-based economic value of IA. An emerging literature makes use of this IA valuation from M&A transaction and recognizes it as a faithful and fair valuation, either explicitly (Kimbrough, 2007; Ewens et al., 2024) or implicitly (Beneish et al., 2022;²⁵ Masulis et al., 2023). Most recently, Blann et al. (2025) document that the value of the target's IA, as reported by the acquirer, has the ability to predict future cash flows and is relied upon by financial statement users, thereby providing decision-useful information. Following these studies, this paper uses IA value obtained from M&A transaction as an objective benchmark to examine whether IA disclosure is driven by the underlying IA value.

2.2. Hypotheses development

2.2.1. Credibility of IA voluntary disclosure

The information asymmetry problem arises because managers possess superior information about their firm's future performance compared to outside investors. IA exacerbate this problem due to the lack of mandatory disclosure or measurement requirements (Glaeser & Lang, 2024). This creates demand for IA information, as capital market seeks managers' private information to accurately assess firm value (Healy & Palepu, 2001; Beyer et al., 2010). Without such disclosure, the market cannot distinguish between firms with "good" and "bad" IA, leading to average pricing that undervalues some good IA firms and overvalues bad firms, potentially causing capital misallocation and market failure (the "lemons problem," Akerlof,

²⁵ Beneish et al. (2022) use the ratio of a CEO's cash bonus to total compensation as a proxy for PPA manipulation incentives. Their results suggest that managerial incentives are unlikely to bias the PPA.

1970). Consequently, managers have incentives to voluntarily disclose IA information to mitigate information asymmetry (signaling theory, Spence, 1973).

There are several theoretical rationales for why voluntary disclosure of IA by managers is credible. Firstly, Crawford & Sobel (1982) establish that disclosure can be moderately credible if the incentives of managers and investors are not excessively misaligned. Next, Farrell and Gibbons (1989), Newman and Sansing (1993), and Gigler (1994) demonstrate that having multiple audiences with competing incentives, such as investors and competitors, can enhance the credibility of the manager's disclosure. The potential risk of litigation can also prompt managers to disclose information credibly (Skinner, 1994). Furthermore, Stocken (2000) demonstrates that in multi-period settings, reputational concerns in repeated games may be sufficient to ensure credible disclosure. Similarly, although a firm's IA may be unobservable initially, they eventually manifest in observable productivity, such as sales revenues or new products, thereby prompting managers to disclose credibly (the confirmation hypothesis, Ball et al., 2012). The literature also highlights several benefits of voluntary disclosure, including reduced cost of capital, improved stock liquidity, decreased uncertainty, and improved comparability across companies (Barry & Brown, 1986; Diamond & Verrecchia, 1991; Lang & Lundholm, 1993; Botosan, 1997; Leuz & Verrecchia, 2000; Verrecchia, 2001). Managers may be motivated to credibly disclose in order to reap these benefits. Lastly, in a survey by Graham et al. (2005), nearly three-fourths of CFO respondents stated that voluntary disclosure helps address gaps in the usefulness of mandatory financial disclosure.

Nevertheless, there are also reasons to question the credibility of managers' voluntary IA disclosure. Managers may act in their own interest rather than maximizing shareholder value (agency theory; Jensen & Meckling, 1976), raising concerns about the credibility of their voluntary disclosure (Healy & Palepu, 2001). Voluntary disclosure typically affords managers substantial discretion in determining the level of precision and detail provided (Bowen et al.,

2005; Aerts & Cormier, 2009). Amplifying this issue, Ward (2023) argues that IA exacerbates agency conflicts because it is largely unverifiable, highly firm-specific, and directly observable only by managers and employees. CEOs may present an overly positive narrative about their firm, driven either by self-serving incentives or by over-optimism regarding the firm's prospects. Moreover, it remains unclear whether firms or managers face meaningful compliance penalties for providing misleading voluntary disclosure or failing to disclose. Besides the opportunistic disclosure suggested by agency theory, prior studies have also identified proprietary cost as a factor that may prevent credible disclosure. The costs of IA disclosure include potential litigation, particularly for forward-looking information, and the risk of revealing proprietary information to competitors. If the expected costs outweigh the benefits, managers may choose not to disclose or to provide only minimal disclosure, which may also fail to reflect the economic value of IA.

In sum, given the contradictory theoretical predictions, whether voluntary disclosure on IA reflects the value of unobservable IA is unclear. This necessitates empirical testing. The first hypothesis is formally stated as follows:

Hypothesis 1: There is a positive association between the voluntary disclosure on IA and the economic value of IA.

2.2.2. Conditions affecting the credibility of IA voluntary disclosure

The association between IA disclosure and IA value may be constrained by several factors. To investigate this, the paper examines four factors known to influence voluntary disclosure: (1) the external demand for information faced by the firm (Eng & Mak, 2003; Jones, 2007; Merkley, 2014); (2) internal governance and monitoring mechanisms (Cerbioni & Parbonetti, 2007; White et al., 2007); (3) concerns over proprietary costs (Cotter et al., 2011); and (4) the skills of the manager who provides the disclosure (Appleton et al., 2023). While the findings

of prior studies generally infer that these factors affect the level of voluntary disclosure on IA, less is known about whether they alter the credibility of IA disclosure. For example, firms may disclose more (or less) about IA in response to these factors, but if the additional (reduced) disclosure no longer corresponds to the economic value of IA, credibility is reduced. Conversely, if the altered level of disclosure better reflects IA value, credibility is enhanced. The paper investigates whether the four factors that influence the level of IA voluntary disclosure also affect the disclosure's credibility. The second hypothesis is formally stated as follows:

Hypothesis 2: The association between voluntary IA disclosure and the economic value of IA is conditional on information demand, proprietary costs, corporate governance, and managerial skills.

3. RESEARCH DESIGN

3.1. Data and sample selection

Data on acquisitions is from Thomson's SDC Merger & Acquisition Database. The paper limits the analysis to U.S. public targets and acquirers. Consistent with prior research, the selection excludes deals involving related parties, such as repurchases, self-tenders, recapitalizations, and exchange offers (Dhaliwal et al., 2015; Srinivasan, 2020). Only completed deals with deal size of at least \$1 million are included to facilitate data availability. Additionally, acquirers must own less than 50% of the target before the offer and secure 100% ownership of the target at deal completion, indicating a change of control. Further, the paper requires both the targets and acquirers to be covered by COMPUSTAT database.

To capture IA disclosure, the paper retrieves all targets' 10-K filings²⁶ from SEC EDGAR website, then extracts the MD&A section.²⁷ Document comparisons are randomly performed to ensure the accuracy of the extractions. The paper mandates a minimum MD&A section length of 250 words to exclude 10-Ks where the MD&A is solely incorporated by reference (Bochkay & Levine, 2017). If there are duplicate filings in a target firm year, only the first filing is included.²⁸

Data on IA value from acquisitions' Purchase Price Allocations from 1996 to 2017 are from Ewens et al. (2024).²⁹ The paper requires the target's disclosure and financial data to pertain to the firm year preceding the acquisition announcement, resulting in target fiscal years spanning from 1995 to 2016. The institutional ownership data comes from WRDS Thomson Reuters Stock Ownership. The number of analysts is sourced from I/B/E/S. Patent-CRSP matched data is provided by Kogan et al. (2017)³⁰ and trademark data is from the USPTO.³¹ Board governance data is from BOARDEX, and managerial stock compensation data is obtained from EXECUCOMP. For the main tests, the paper necessitates data availability for all regression control variables, resulting in the main sample of 1,080 acquisitions. Panel A of Table 1 shows the sample construction process.

[insert Table 1]

²⁶ 10-K filings include 10-K405 filings, which is previously distinguished by a checkbox on the first page indicating the absence of a "disclosure of delinquent filers pursuant to Item 405." The SEC discontinued the Item 405 classification in 2003 due to confusion and inconsistency in its application. Given the irrelevance of this distinction to the paper, both form types are incorporated into the sample, collectively referred to as Form 10-Ks.

²⁷ MD&A sections are commonly presented as "Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations".

²⁸ Subsequent 10-K filings in a firm-year (10-K/As or amendments) are excluded because the focus is on *voluntary* IA disclosure. It is unlikely that firms will issue amendments on voluntarily disclosed information.

²⁹ <https://github.com/michaelebens/Purchased-intangibles>. Consistent with this data source, deals involving acquirers or targets within the resources, utilities, and financial services sectors are excluded from the analysis. The excluded SIC codes are 1000–1499, 2900–2999, 4900–4999, and 6000–6799.

³⁰ <https://github.com/KPSS2017/Technological-Innovation-Resource-Allocation-and-Growth-Extended-Data>

³¹ <https://www.uspto.gov/ip-policy/economic-research/research-datasets/trademark-case-files-dataset>

3.2. Variable measurement

3.2.1. IA disclosure

To measure IA voluntary disclosure, a dictionary of IA terms is developed based on ASC 805 *Business Combinations* to conduct frequency counts of the IA terms in the MD&A section. All five IA categories as defined by the accounting standard are considered: marketing-related, customer-related, contract-based, technology-based, and other and artistic-related³² IA. Appendix C details the IA dictionary and the process used to generate it.

Before conducting the frequency count, the MD&A text is preprocessed and cleaned using large-scale computational linguistics techniques. First, part-of-speech (POS) tagging assigns a grammatical category (e.g., noun, verb, adjective) to each word based on context and structure.³³ Next, the frequency of each IA terms in the dictionary is counted, but only for nouns identified by POS tagging. This avoids counting words with multiple grammatical functions and meanings,³⁴ and excludes proper nouns which can appear in entity names unrelated to voluntary IA disclosure.³⁵ The frequency count also includes basic extensions of the IA terms such as plural forms, hyphenated words, and relevant synonyms.³⁶

The IA disclosure measure (*IA_DISC*) is calculated as the number of MD&A sentences containing at least one IA term, multiplied by 100 and divided by the total number of MD&A sentences. At a high level, *IA_DISC* captures the proportion of MD&A devoted to IA discussion. It is reasonable to infer that the more frequently a firm discusses its IA, the more

³² Although ASC 805 *Business Combinations* classifies artistic-related IA as a separate category (see Appendix C, Panel B), none of the acquirers in the sample report artistic IA value separately, likely due to the materiality threshold and the rarity of such assets. Consequently, artistic-related IA disclosure is included within the “Other IA” category, consistent with how the acquirers report the asset value.

³³ The POS tagger function is the first step since it performs more effectively on pre-processed full text.

³⁴ For example, the word “permit” as a verb as opposed to the contract-related IA “permit”.

³⁵ For example, entity names can include “Innovation” or “Technologies”.

³⁶ For example, customer-related IA count includes terms such as “client,” “user,” “consumer,” “patient,” and “subscriber,” rather than solely “customer,” as recommended by Filipovic & Wagner (2021) and Filip et al. (2022). A comprehensive list of all IA terms captured is provided in Panel C of Appendix C.

material those IA are to the firm. If the firm frequently discusses non-existent or immaterial IA, or fail to disclose material IA, this is essentially non-credible disclosure and will be captured in the main test results.

Extracting meaning from text is indeed challenging, and while it is impossible to computationally quantify the full information content of IA voluntary disclosure, the method described above has several advantages. First, the IA dictionary is grounded in ASC 805 *Business Combinations*, ensuring consistency with recognized definitions and the same accounting standard acquirers use to report IA value. Second, targeting specific terms is simple yet one of the most powerful approaches to textual analysis (for a review, see Loughran & McDonald, 2016). This method captures relevant information while minimizing noise, albeit ignoring word sequence and context (i.e., the signal-to-noise trade-off in textual analysis). Third, IA voluntary disclosure meets two conditions outlined in Gentzkow et al. (2019) that make it particularly suitable for the dictionary-based approach: (i) strong prior information linking the text to the IA,³⁷ and (ii) no other “ground truth” measure exists. Notable prior research applying the dictionary method to capture disclosure includes studies on innovation, ethics, R&D, customer satisfaction, diversity, digital activities, and IA (Michalisin, 2001; Loughran et al., 2008; Merkley, 2014; Balvers et al., 2017; Filip et al., 2022; Baker et al., 2024; Chen & Srinivasan, 2024; Filipovic & Wagner, 2024).

To ensure that the *IA_DISC* measure performs as expected, the paper investigates industry-specific patterns. Panel B of Table 1 illustrates the *IA_DISC* measure by IA categories and industries using Fama-French 48 industry classification. First, marketing *IA_DISC* is particularly prominent in consumer product industries such as Candy & Soda, Beer & Liquor, and Tobacco Products, where brand recognition is critical. Second, customer *IA_DISC*, while

³⁷ The count of *nouns* denoting the *assets* enhances the construct validity of the IA disclosure measure. For example, the noun “trademark” unambiguously refers to the IA “trademark.”

generally low across industries, peaks in sectors such as Candy & Soda, Communication, and Business Services, where customer engagement is a key business driver. Contract *IA_DISC* is high in sectors such as Agriculture, Pharmaceutical Products, and Restaurants, Hotels, Motels, which rely on contractual agreements and franchises. Next, as anticipated, technology *IA_DISC* is high in industries such as Pharmaceutical Products, Business Services, and Computers, where innovation and technology are core elements. Lastly, artistic *IA_DISC* (tabulated within other *IA_DISC*) is prevalent in industries like Entertainment, Printing & Publishing, and Recreation, where creative IA are vital.

The IA disclosure measure is further validated by its association with observable indicators of firm successes in developing IA. For example, marketing-related *IA_DISC* is positively associated with the number of trademarks filed by the firm in the same fiscal year. Technology-based *IA_DISC* is positively associated with the number of patents, the number of patent citations, and R&D expenditure in the same fiscal year. Appendix D presents the results of the *IA_DISC* measure validation tests using panel data across all target firm-years.

To address the concern of assuming all IA terms are equally weighted and the measure operates at the single document level, the paper adjusts for the *significance* of each IA term within the entire corpus and within the firm's industry. To achieve this, various term weighting schemes are employed to calculate five alternative *IA_DISC* measures (*IA_DISC_ATL1* to *_ATL5*), detailed in Appendix E. These weighting schemes ensure that the rarer an IA term is within a corpus of documents or an industry, the greater the significance it is assigned (Loughran & McDonald, 2011; Li et al, 2021). Overall, the main *IA_DISC* measure and its five alternative measures, weighted or not weighted, exhibit correlations with one another and produce consistent empirical results.

Panel C of Table 1 provides an overview of the IA disclosure trend over the sample years. The measures for overall and each category *IA_DISC* increase from 1995 to 2016,

peaking in the 2000s. In 1995, IA sentences constituted 3.23% of an average MD&A, rising to 12.36% in 2016. Additionally, in untabulated statistics, the proportion of IA disclosing firms in the sample grew from 60% (9 out of 15 firms) in 1995 to 100% (23 out of 23 firms) in 2016.

To address concerns that 10-K filings are often generic and boilerplate, regulators emphasize the importance of specific disclosure. Additionally, uncertain, forward-looking, and risk-related are typical characteristics of some IA (Glaeser & Lang, 2023; Appleton et al., 2023). Recent research has also emphasized the importance of sentiment analysis (e.g., Frankel et al., 2022). Accordingly, the paper examines five textual characteristics of IA disclosure: specific (*SPECIFIC*), uncertain (*UNCERTAIN*), forward-looking (*FORWARD*), risk-related (*RISK*), and sentiment (*SENTIMENT*). These measures are defined as the proportion of MD&A sentences containing at least one IA term and the corresponding textual characteristic. Following Hope et al. (2016), specific terms include entity names, quantitative values, times, and dates. Uncertain terms are identified using the Loughran & McDonald Uncertainty dictionary;³⁸ forward-looking terms are from Li (2010); risk-related terms are from Ibrahim (2019). Finally, sentiment analysis is performed using the FinBERT Model (Huang et al., 2023), with the sentiment score calculated as the proportion of positive IA sentences minus the proportion of negative IA sentences.

3.2.2. *IA value*

The economic value of IA (*IA_VALUE*) is captured through the acquirer's PPA, typically located in Form 10-Ks or 10-Qs post-acquisition. Where available, the paper makes use of the monetary values assigned by the acquiring firm to each of the five IA categories.³⁹ The paper uses the IA value data from Ewens et al. (2024), which is comparable with those of Beneish et

³⁸ <https://sraf.nd.edu/loughranmcdonald-master-dictionary/>

³⁹ Out of the 1,080 firms in the main sample, 847 firms have detailed IA value breakdowns into the five IA categories provided by the acquirers.

al. (2022), Masulis et al. (2023), and King et al. (2023) who also utilize IA value from acquirer's PPA in their research, after taking into account the differences in sample constructions.

Panel D of Table 1 presents the IA value by IA types and industries. The industries with the highest *IA_VALUE* from acquisitions include Tobacco Products, Aircraft, and Pharmaceutical Products. By category, marketing *IA_VALUE* is notably high in Restaurants, Hotels, Motels, Aircraft, and Communication. Customer *IA_VALUE* is highest in Aircraft, Communication, and Retail. Contract *IA_VALUE* is prominent in Restaurants, Hotels, Motels, Personal Services, and Computers. Technology *IA_VALUE* is prominent in Pharmaceutical Products, Medical Equipment, and Electronic Equipment. Finally, other *IA_VALUE*, including artistic *IA_VALUE*, is high in industries such as Printing & Publishing, Communication, and Pharmaceutical Products.

Panel E of Table 1 presents the upward trend of *IA_VALUE* over the years, matching the well-documented growing significance of IA in the new economy. The yearly average *IA_VALUE*, as well as the values for each IA category, increased significantly from 1995 to 2016. In 1995, IA in acquisitions was worth, on average, \$125.34 million. By 2016, this figure had risen 15-fold to \$1.92 billion. Among all categories, unsurprisingly, technology IA shows the sharpest and most prominent increase in dollar value.

3.3. Research model

To test *Hypothesis 1*, the paper estimates the following multivariate regression model:

$$IA_DISC = \beta_0 + \beta_1 IA_VALUE + controls + Industry\ FE + Year\ FE + error\ term\ (1)$$

In Model (1), the dependent variable is the *IA_DISC* measure for the target firm-year prior to acquisition.⁴⁰ The independent variable, *IA_VALUE*, is the natural logarithm of one plus the value of the target firm's IA as disclosed in the acquirer's PPA. To find support for *Hypothesis 1*, the coefficient β_1 should be positive and significant, indicating that voluntary disclosure on IA reflects IA value.

Following prior research, the following controls documented to influence voluntary disclosure on IA are included: target's firm size (*TANG_ASSET*),⁴¹ firm age (*AGE*), leverage (*LEVERAGE*), growth opportunities (*TOBINS_Q*), profitability (*ROA*), institutional ownership (*INST_OWNER*), and number of analysts following (*ANALYST*) (Eng & Mak, 2003; Cerbioni & Parbonetti, 2007; White et al., 2007; Kang & Gray, 2011a).⁴² In addition to these controls, the paper also includes industry and year fixed effects to account for unobserved heterogeneity across industries and time-specific trends not captured by the control variables. All continuous control variables are winsorized at the 1% and 99% levels. Definitions of all variables used in the analyses are detailed in Appendix F.

⁴⁰ *IA_DISC* is modeled as the outcome, consistent with the idea that voluntary disclosure is a managerial decision. When IA are more economically valuable, firms disclose more IA information. IA value is *not* the outcome variable because it serves as an objective benchmark that is not influenced by managerial disclosure choice. In essence, the paper asks whether IA disclosure can be *explained* by IA value, rather than seeking to *predict* the value of IA using texts.

⁴¹ The target's tangible assets (*TANG_ASSET*) serve as a proxy for firm size to prevent double counting of the IA already recognized on the target's balance sheet prior to acquisition (IA previously acquired by the targets).

⁴² The target's pre-merger R&D expense is not included as a control to avoid multicollinearity with IA value, which includes the value of finished technologies and in-process R&D. The target's equity issuance indicator (e.g., Zufarov, 2025) is not included as a control since it is not relevant in the acquisition setting. Few target firms raise equity immediately prior to being acquired.

4. EMPIRICAL RESULTS

4.1. Descriptive statistics

Panel A of Table 2 presents descriptive statistics for the IA disclosure measure. An average MD&A section in the sample has 307 sentences,⁴³ of which approximately 44 sentences are IA-related (*IA_DISC*, 14.13%).⁴⁴ Disaggregating into the five IA categories, there are approximately 2 marketing-related (*IA_DISC_MKT*, 0.61%), 2 customer-related (*IA_DISC_CUST*, 0.49%), 10 contract-based (*IA_DISC_CTRCT*, 3.40%), 22 technology-based (*IA_DISC_Tech*, 7.08%), and 8 other IA sentences (*IA_DISC_OTH*, 2.56%). Examining the textual characteristics of IA disclosure, 16 IA sentences are specific disclosure (*SPECIFIC*, 5.14%), 8 contain uncertain language (*UNCERTAIN*, 2.66%), 9 are forward-looking (*FORWARD*, 2.93%), approximately 3 IA sentences are positive and 3 are negative resulting in a *SENTIMENT* score of 0.05, and 3 sentences are risk-related IA disclosure (*RISK*, 1.04%). Almost all firms in the sample (1,061 firms, or 98.24%) include at least one IA sentence in their MD&A section.

[insert Table 2]

Panel B of Table 2 presents the summary statistics for deal value, goodwill, and IA value in millions and as reported by the acquirer post-acquisition. The average deal is valued at \$1.8 billion, with more than \$1 billion allocated to goodwill and approximately \$713 million allocated to IA.⁴⁵ Of the IA value allocated to individual categories, 10% pertains to marketing,

⁴³ Or 4,700 words, which is comparable with Bochkay & Levine (2017) who also examine narrative disclosure in the MD&A section.

⁴⁴ Any minor discrepancies in percentages in this section are due to rounding.

⁴⁵ The remainder of the deal value (after subtracting the value of goodwill and IA) is net of the target's tangible assets acquired and liabilities assumed (see Figure 1: Components of PPA). The proportions of IA and goodwill as a percentage of deal value are comparable to that of King et al. (2023), although their deal value is smaller due to the inclusion of private targets.

28% to customer, 1% to contract, 41% to technology, and 20% to other IA.⁴⁶ In untabulated statistics, 84.35% of acquired targets have non-zero IA value. The target's IA value is then split into the portion previously recognized on the target's book (*BOOK_IA_VALUE*, \$88 million) and the unrecognized portion (*NON_BOOK_IA_VALUE*, \$640 million).⁴⁷

[insert Figure 1]

Panel C of Table 2 presents the characteristics of the target firms in the sample. On average, the public target firms have total assets of approximately \$992 million, with \$727 million attributed to tangible assets. The target firms are relatively young, with an average age of 11 years. These firms have a modest average leverage ratio of 0.16 and a mean Tobin's Q of 2.23. Target firms tend to be loss-making, with an average ROA of -0.05. Institutional ownership in these firms averages 53%, and board independence is high, with 90% of board members classified as independent. The target firms file, on average, 2.29 trademarks and 0.81 patents per firm year.

Table 3 presents the correlation coefficients among the variables. Firms with higher IA disclosure measures tend to be younger, smaller, have lower debt levels (higher equity), and are in a growth phase while operating at a loss. Targets with higher IA value are typically older, larger, more highly leveraged, growing, and profitable. Furthermore, there are strong positive correlations between IA disclosure and IA value across all IA and IA categories.

[insert Table 3]

⁴⁶ Calculated using the sample of 847 firms with a detailed IA value breakdown by category.

⁴⁷ The sum of book and non-book IA may exceed total IA value because, in the rare case where book IA exceeds the fair value of IA, non-book IA is set to zero while book IA remains unchanged.

4.2. Analyses on whether IA disclosure reflects IA value

Table 4 reports the regression results for testing *Hypothesis 1* using Model (1). In Panel A, Column (1) reports a positive and significant association between IA voluntary disclosure and the economic value of IA ($p < 0.01$). Columns (2) to (5) include additional controls for factors affecting IA disclosure, along with different combinations of year and industry fixed effects.⁴⁸ The association remains positive and significant in all columns ($p < 0.01$). In Panel B, Columns (1) to (5) employ five alternative measures of IA disclosure (*IA_DISC_ATL1* to *_ATL5*, detailed in Appendix E) as the dependent variables. All models in panel B include the main control variables, as well as year and industry fixed effects.⁴⁹ The significant positive association between IA disclosure and IA value remains robust across all alternative measures of disclosure ($p < 0.01$ in Columns (1) to (4); $p < 0.05$ in Column (5)). Overall, Table 4 results suggest that that firms' voluntary IA disclosure is on average credible, enabling financial report users to gauge the materiality of IA for the firm from managerial discussion.

[insert Table 4]

4.3. Addressing endogeneity

The paper acknowledges that acquisitions are not random events as acquisition targets may not represent the broader firm population. Further, acquirers may target firms with above-average IA capabilities (Phillips & Zhdanov, 2013; Bena & Li, 2014). Non-random sample selection represents a specific type of endogeneity, wherein the omitted variable pertains to the criteria by which firms were included in the sample. To address potential selection bias, the paper

⁴⁸ Singleton observations are kept in all regressions due to the small sample size.

⁴⁹ In untabulated result, the positive association remains consistent when using the natural log of the number of IA sentences as the dependent variable and controlling for the natural log of the number of non-IA sentences (e.g., Merkley, 2014). All untabulated statistics and results are available upon request.

employs two empirical approaches: (i) Heckman two-stage least squares model and (ii) using a sample of non-acquired firms and estimating IA value using Ewens et al. (2024) parameters.

The Heckman two-stage least squares model (1979) addresses potential selection bias by separating the selection process (firms being acquired) from the main relationship of interest (association between IA disclosure and IA value). In the first stage, a probit model predicts the likelihood of being acquired ($ACQUIRED=1$) including controls from Model (1). The results of the first-stage selection model are shown in Column (1) of Panel A, Table 5. From this, the inverse Mills ratio (IMR) is computed, capturing unobservable characteristics found in the main regression's error term that leads to the non-random sample selection endogeneity problem. The results of the second-stage regression including the IMR are shown in Column (2) of Panel A, Table 5. The inclusion of the IMR has no impact on the main results ($p < 0.05$), suggesting that the sample selection bias does not affect the association between IA disclosure and IA value.

[insert Table 5]

To further address the endogeneity issue, the paper identifies a sample of non-acquired firms with similar control characteristics to the target firms in the sample.⁵⁰ This approach eliminates the sample selection concern; however, as IA value is not available outside the acquisition setting, it necessitates an estimation of IA value. The paper employs the parameters from Ewens et al. (2024)⁵¹ to estimate IA value for non-acquired firms as follows:

⁵⁰ This approach could potentially be extended to examine credibility across all firm years with a valid MD&A section. However, due to the substantial computational time required for Python to process, clean, and conduct frequency counts, this paper limits the non-acquired sample to firms with similar characteristics as the target firms. The paper first calculates propensity scores using a method similar to the Heckman Stage 1. Then, the nearest-neighbor matching method is employed to restrict the matching to the region of common support. This ensures an overlap in propensity scores between the treated and control groups. This process yields a non-acquired sample of 32,397 observations with characteristics similar to the target firms in the main sample.

⁵¹ These parameters undergo rigorous validation tests and demonstrate performance comparable to or surpasses other commonly used measures across multiple applications.

$$IA_VALUE_EST_{i,t} = BOOK_IA_{i,t} + \sum_{k=0}^{10} (1 - \delta_G)^k R\&D_{i,t-k} + \sum_{k=0}^{10} (1 - \delta_S)^k \gamma_S SG\&A_{i,t-k}$$

where $IA_VALUE_EST_{i,t}$ is the IA value estimated for firm i at time t using Ewens et al. (2024) parameters. $BOOK_IA_{i,t}$ is the value of externally acquired IA already recognized on the balance sheet of firm i at time t . k is the number of periods prior to time t , ranging from 0 to 10. δ_G is the annual depreciation rate for R&D capital. $R\&D$ is the R&D expenditure of firm i at time $t-k$. δ_S is the annual depreciation rate for SG&A capital, assuming the value of 0.20. γ_S is the proportion of SG&A capital representing long-lived assets to be capitalized. $SG\&A$ is the SG&A expenditure of firm i at time $t-k$.

Panel B of Table 5 presents the regression results of IA disclosure on the estimated IA value (IA_VALUE_EST) using the sample of non-acquired firms. The associations reported in Columns (1) to (5), along different combinations of controls, year and industry fixed effects, remain positive and significant ($p < 0.10$ in Column (1); $p < 0.01$ in Columns (2) to (5)). This suggests that the result remains robust when using the non-acquired sample.

4.4. Additional analyses

4.4.1. IA disclosure and IA value by IA categories

Table 6 repeats the main test using Model (1) while disaggregating IA into five distinct categories, limiting the analysis to the 847 firms with a detailed breakdown of IA value. The main control variables, as well as year and industry fixed effects, are included in all tests. The results show significant positive associations across all categories of IA ($p < 0.10$ in Columns (3) and (5); $p < 0.01$ in Columns (1), (2), and (4)). This category-level analysis provides more granular evidence that further supports the credibility of IA disclosure.

[insert Table 6]

Results of the tests of differences between coefficients show that the association between disclosure and value is strongest for technology and contract IA, followed by marketing, and then customer-related IA. This pattern reflects differing levels of verifiability across IA categories. In particular, technology-related IA is closely monitored by the market (e.g., Hegde et al., 2018; Beyhaghi et al., 2022) and can be observable due to the publicity of patents via the USPTO. Contract-based IA is typically supported by legal documentation. Marketing-related IA, such as brand and trademark,⁵² are observable; however, their value and hence the credibility of their disclosure is less certain, based on reputation and future perception. Customer-related IA, such as customer base and customer relation,⁵³ are less verifiable since they are based on expected future relationships.

4.4.2. *IA disclosure and book versus non-book IA value*

In Table 7, the independent variable *IA_VALUE* is decomposed into recognized (*BOOK_IA_VALUE*) and unrecognized (*NON_BOOK_IA_VALUE*) components. Column (1) shows a significant positive association between *IA_DISC* and *NON_BOOK_IA_VALUE* ($p < 0.01$), but no association with *BOOK_IA_VALUE*. This suggests that IA disclosure reflects unrecognized IA rather than the recognized portion, consistent with the idea that managers use voluntary disclosure to convey information about IA not on the balance sheet.

[insert Table 7]

4.4.3. *Textual characteristics of IA disclosure*

Table 8 presents results from testing the regression specified in Model (1), using five different textual characteristics of IA disclosure as dependent variables, namely *SPECIFIC*, *UNCERTAIN*, *FORWARD*, *RISK*, and *SENTIMENT*. All models include the main control

⁵² In untabulated statistics, “brand” (56%) and “trademark” (22%) are the most discussed marketing-related IA

⁵³ In untabulated statistics, “customer base” (57%) and “customer relation” (20%) are the most discussed customer-related IA.

variables, year and industry fixed effects, as well as control for the overall level of IA disclosure (*IA_DISC*). In Panel A, Column (1) shows a positive and significant association between *SPECIFIC* IA disclosure and *IA_VALUE* ($p < 0.01$). This suggests that firms with higher IA value provide more specific IA disclosure. No significant association is observed between the other textual characteristics and the overall IA value. Panel B decomposes the independent variable *IA_VALUE* into *BOOK_IA_VALUE* and *NON_BOOK_IA_VALUE*. The earlier positive and significant association between *SPECIFIC* and *IA_VALUE* is concentrated within *NON_BOOK_IA_VALUE* ($p < 0.01$). This suggests that firms provide specific IA disclosure to signal the economic significance of unrecognized IA, not all IA. Additionally, in Column (3) *FORWARD* IA disclosure is negatively associated with *BOOK_IA_VALUE* ($p < 0.01$). This suggests that firms provide less forward-looking IA disclosure when more IA are recognized on the balance sheet. This result is consistent with the historical, backward-looking nature of financial reporting.

[insert Table 8]

4.5. Analyses on the conditions under which IA disclosure reflects IA value

While the paper documents a positive average association between IA disclosure and IA value, it is unlikely that all IA disclosure is credible and reflective of the underlying asset value. This section test *Hypothesis 2* by examining whether the four factors affecting the extent of IA voluntary disclosure also impact the credibility of such disclosure.⁵⁴ The main independent variable of interest in this section is the interaction term between each of the four factors and *IA_VALUE*. The sample size of the tests in this section may be limited due to data availability.

⁵⁴ The controls in the main model are selected based on the existing empirical literature, whereas the four factors and their proxies are drawn from disclosure theory. In untabulated results, when including all proxies for the four factors as controls in Model (1), the positive association between *IA_DISC* and *IA_VALUE* remain robust ($p < 0.01$), although the sample size drops substantially due to data availability.

4.5.1. Information demand

Firms disclose more information on IA when external demand for such information is higher. This paper examines three proxies for information demand: (i) low profitability, (ii) higher proportion of institutional shareholding, and (iii) more analysts following. Prior research has documented that these proxies are associated with greater IA voluntary disclosure (e.g., Eng & Mak, 2003; Jones, 2007; Merkley, 2014). However, it remains unclear whether the higher level of IA disclosure is also more credible.

Panel A of Table 9 presents results testing whether the association between IA disclosure and IA value varies in strength across the three proxies for information demand. For each proxy, the sample is split at the median, and indicators are coded to reflect higher value of information demand. In all columns, the main association between *IA_DISC* and *IA_VALUE* remains positive and significant. In Column (1), the main effect of *LOW_ROA* is positive and significant ($p < 0.01$), whereas the interaction term *LOW_ROA#IA_VALUE* is negative and significant ($p < 0.01$). These results suggest that, consistent with prior research, firms disclose more IA information to explain poor performance. However, the increased disclosure is less credible. The results remain robust when alternative cut-offs are used for the *LOW_ROA* indicator, such as industry-year median, year median, or a loss indicator. In Column (2), the main effect of *HIGH_INST_OWN* is positive and significant ($p < 0.01$), while the interaction term *HIGH_INST_OWN#IA_VALUE* is negative and significant ($p < 0.05$). These results indicate that firms with higher institutional ownership disclose more IA information consistent with prior research. However, the increased disclosure lacks credibility. This is consistent with institutional investors having greater resources to gather and analyze information both within and outside financial reports, reducing firms' need to publicly provide credible IA disclosure. In Column (3), both the main effect and the interaction term of *HIGH_ANALYST* are not

significant, suggesting that the number of analysts following does not mitigate the credibility of voluntary IA disclosure.

4.5.2. *Corporate governance*

To evaluate whether the agency concern reduces the credibility of IA voluntary disclosure, the paper investigates corporate governance mechanisms known to mitigate such concern. Specifically, the paper focuses on (i) the monitoring role of the board of directors and (ii) managerial stock-based incentives. Panel B of Table 9 presents results examining whether the association between IA disclosure and IA value differs across high and low levels of governance proxies. For each proxy, the sample is split at the median, with indicators coded to reflect stronger governance. In Columns (1) and (2), the main association between *IA_DISC* and *IA_VALUE* remains positive and significant. However, for both *HIGH_BOARD_INDEP* and *HIGH_STOCK_COMP*, neither the main effects nor the interaction terms are statistically significant. These null results are robust to using board size and board co-option (e.g., Coles et al., 2014) as alternative proxies for board monitoring, as well as pay-performance sensitivity (delta) and risk-taking incentive (vega) as alternative measures of managerial stock-based incentives. Overall, the results of this panel do not provide evidence that stronger governance enhances IA disclosure credibility. Given the reduced sample size, definitive inference is not drawn.

4.5.3. *Proprietary cost*

Proprietary cost is an important constraint on voluntary IA disclosure, as firms have incentives to withhold information that could weaken their competitive position (e.g., Dedman and Lennox, 2009). However, the academic literature highlights the complexity of proprietary costs and the challenges of accurately measuring them, given the difficulty of determining precisely which information undermines competitive advantage. To assess whether proprietary cost

considerations prevent managers from providing IA disclosure that reflects value, the paper examines two related proxies: (i) the presence of litigation risk and (ii) the intensity of product market competition.

Panel C of Table 9 reports result on whether the association between IA disclosure and IA value varies across proxies for proprietary cost. For each proxy, the sample is split at the median, with indicators coded to reflect higher values. Across all specifications, the baseline association between *IA_DISC* and *IA_VALUE* remains positive and significant. In Column (1), the main effect of *HIGH_LITIGATION* is positive and significant ($p < 0.01$), consistent with Houston et al. (2019), who show that the threat of legal action for inadequate or untimely disclosure can encourage greater voluntary disclosure. In contrast, the interaction term *HIGH_LITIGATION#IA_VALUE* is negative and significant ($p < 0.10$), suggesting that while litigation risk increases disclosure level, such disclosure is less credible. Columns (2) and (3) employ HHI market concentration and market similarity (Hoberg & Phillips, 2016) as proxies for market competition. Similar to the litigation risk results, the main effects of *HIGH_COMP* are positive and significant ($p < 0.01$), consistent with firms disclosing more IA information when competition is high to deter rivals. However, the negative and significant interaction terms ($p < 0.10$ in Column (2) and $p < 0.05$ in Column (3)) indicate that such disclosure is less credible in more competitive environments.

4.5.4. Managerial skill

To test whether the credibility of IA voluntary disclosure varies with the skill of the disclosing manager, the paper examines several CEO characteristics. In particular, the analysis employs measures of (i) managerial ability (Demerjian et al., 2012), (ii) specialist knowledge (Custodio et al., 2013), and (iii) tenure. Panel D of Table 9 presents the results. For each proxy, the sample is split at the median, with indicators coded to reflect higher level of skill. In Column (1), the baseline association between *IA_DISC* and *IA_VALUE* remains positive and significant,

whereas this association is not significant in Columns (2) and (3). This result may be due to smaller sample sizes leading to reduced statistical power when merging CEO-level data for small target firms. Turning to the moderating effects, Column (1) shows that the main effect of *HIGH_SKILL* is associated with greater *IA_DISC*, but the interaction term is not significant. This null result is robust to using an alternative managerial skill proxy from Daniel et al. (2020). In Columns (2) and (3), neither the main effects nor the interaction terms for specialist knowledge or long tenure are statistically significant. Overall, Panel D provides little evidence that the credibility of IA disclosure varies with managerial skill. However, given the limited sample size, we refrain from drawing strong inferences.

[insert Table 9]

4.6. Analyses on the consequences of credible and non-credible IA disclosure

The paper next divides the sample into credible and non-credible firms, with non-credible firms further categorized as “cheap talk” and “quiet” firms. Panel A of Table 10 visually represents the sample distribution by credible and non-credible classifications, based on IA disclosure and IA value terciles. Cheap talk firms are in the highest tercile of disclosure but the lowest tercile of value (*CHEAP_TALK* ==1); while quiet firms are the opposite, being in the lowest tercile of disclosure but the highest tercile of value (*QUIET* ==1). *NON_CREDIBLE* is an indicator set to one if the firm is classified as either cheap talk or quiet (*CHEAP_TALK* ==1 | *QUIET* ==1), and zero otherwise. *CREDIBLE* is an indicator set to one if the firm is not classified as cheap talk or quiet (*CHEAP_TALK* ==0 & *QUIET* ==0).

[insert Table 10]

Panel B of Table 10 reports the results on the consequences of credible and non-credible IA disclosure. In Columns (1) and (3), the indicator *CREDIBLE* is negatively associated with *Q1_FCAST_ERROR* ($p < 0.10$) and *Q1_FCAST_DISPERSION* ($p < 0.05$), respectively. These

results suggest that firms providing credible IA disclosure subsequently experience lower analyst EPS forecast error and dispersion in the quarter immediately following the disclosure, relative to firms with non-credible IA disclosure. In Columns (2) and (4), the indicator *CHEAP_TALK* is positively associated with *Q1_FCAST_ERROR* ($p < 0.10$) and *Q1_FCAST_DISPERSION* ($p < 0.05$). This indicates that firms engaging in cheap talk exhibit higher analyst forecast error and dispersion in the subsequent quarter. By contrast, the indicator *QUIET* is not statistically significant in Columns (2) and (4), suggesting that withholding IA disclosure has no effect on analyst forecast accuracy or dispersion. This pattern further supports the interpretation that IA voluntary disclosure influences analyst forecasts, since the absence of disclosure leaves forecasts unaffected. All results remain robust when using annual analyst EPS forecast error and dispersion as dependent variables, though the sample size is decreased.

5. CONCLUSION

Although there is strong demand for IA information, IA voluntary disclosure is largely considered insufficient and hard to verify, casting doubt on its credibility. By exploiting the asymmetric accounting treatment of internally generated versus externally acquired IA in the M&A setting, the paper shows that voluntary IA disclosure is positively associated with the assets' economic value. This association is robust across alternative measures and after addressing endogeneity. The result holds across all five IA categories, with the strongest effects for technology and contract IA. Evidence also suggests that firms use voluntary disclosure to signal IA economic significance beyond the balance sheet. Firms with higher unrecognized IA provide more specific disclosure, while firms with more recognized IA provide less forward-looking disclosure. Cross-sectional results indicate that lower profitability, higher institutional ownership, higher litigation risk, and greater competition mitigate IA disclosure credibility.

Credible IA disclosure is further associated with lower analyst EPS forecast errors and dispersion, whereas cheap talk firms experience higher errors and dispersion.

The paper highlights the potential of using mandatory financial reports to validate voluntarily disclosed information on hard-to-measure phenomena. While firms are classified as either credible or non-credible in this paper, in reality, credibility of disclosure is a spectrum. A limitation of the paper is its inability to capture this continuum. Moreover, the Conceptual Framework states that a perfectly faithful representation must be complete, neutral, and free from error; however, the paper only documents associations. These are avenues for future research.

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FIGURES & TABLES

Figure 1: Components of Purchase Price Allocation

This figure illustrates the components of the Purchase Price Allocation (PPA). The total purchase price is distributed across goodwill, tangible assets, IA, and liabilities. Examples of the PPA reported by the acquirer in practice are provided in Appendix D.

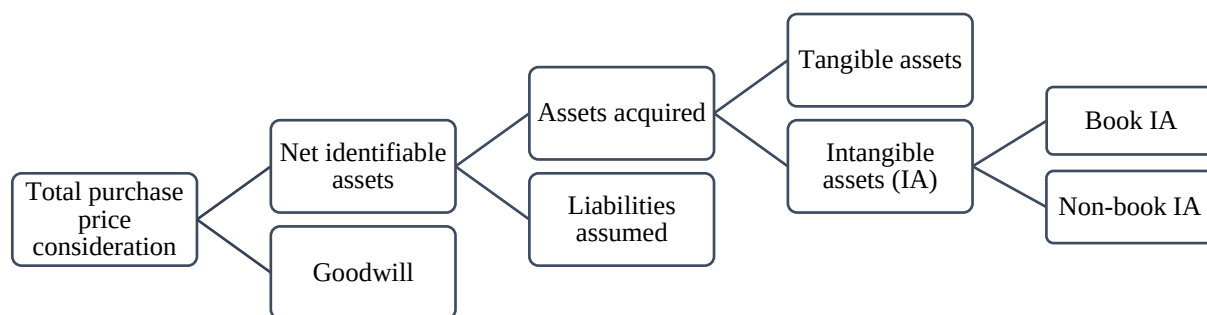


Table 1: Sample Construction and Distribution

This table presents the sample construction process, as well as the industry and year distribution of the main dependent and independent variables.

Panel A: Sample construction

This panel presents the sample construction process for the main sample and subsample. N is the number of acquisition transactions.

Description	N
SDC	
- Acquisitions that meet all conditions outlined in Section 3.1.	4,657
COMPUSTAT	
- GVKEY identifiers available for both targets and acquirers	3,772
Ewens et al. (2024) data	
- IA value data reported by acquirers available	1,455
EDGAR	
- A valid MD&A section from targets' Form 10-Ks can be identified	1,303
- Targets' Form 10-Ks must be from the COMPUSTAT fiscal year before the acquisition announcement	1,178
Main sample with available controls	1,080
- Sub-sample with available breakdown of IA value by categories	847

Panel B: Industry distribution of IA disclosure

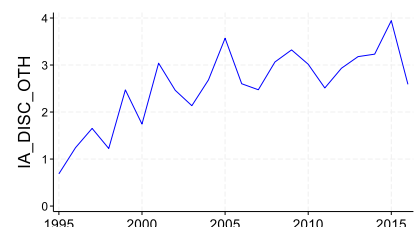
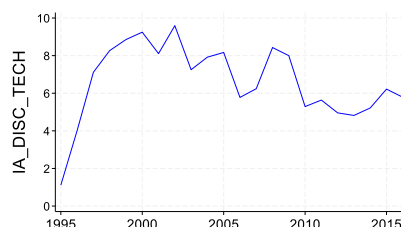
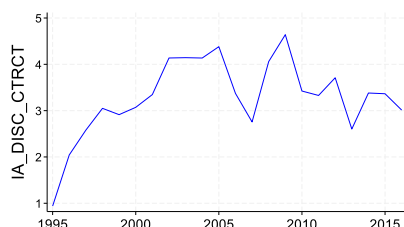
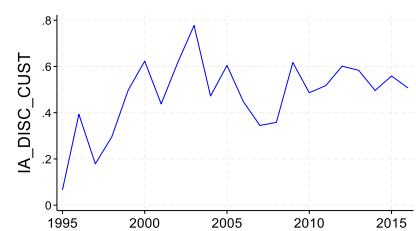
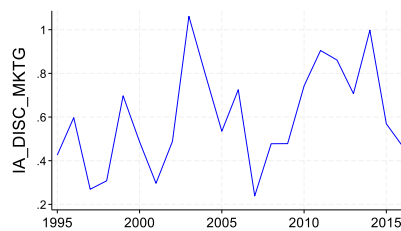
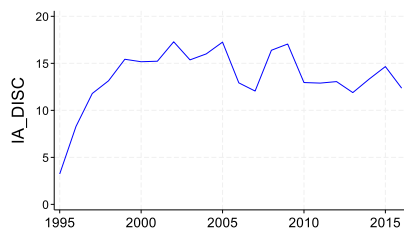
This panel presents the distribution of the IA disclosure measure across the Fama-French 48 industry classifications, disaggregated into five IA categories. For each IA category (column), the three industries with the highest *IA_DISC* measures are highlighted. Variable definitions are provided in Appendix F.

Fama-French 48 industry classification		N	<i>IA_DISC</i>	<i>IA_DISC</i> _MKTG	<i>IA_DISC</i> _CUST	<i>IA_DISC</i> _CTRCT	<i>IA_DISC</i> _TECH	<i>IA_DISC</i> _OTH
1	Agriculture	2	17.57	0.80	0.00	7.91	8.17	0.68
2	Food Products	15	8.37	2.65	0.20	2.42	1.27	1.83
3	Candy & Soda	1	20.00	13.33	4.44	2.22	0.00	0.00
4	Beer & Liquor	1	7.55	5.19	0.00	2.36	0.00	0.00
5	Tobacco Products	1	12.50	6.86	0.00	0.74	2.45	2.45
6	Recreation	5	8.86	1.08	0.18	1.57	2.69	3.34
7	Entertainment	13	17.49	0.35	0.05	4.03	2.96	10.10
8	Printing & Publishing	9	9.29	0.48	0.50	0.58	3.14	4.60
9	Consumer Goods	10	11.32	1.51	0.09	3.62	3.37	2.72
10	Apparel	18	10.70	3.12	0.28	4.53	0.48	2.28
11	Healthcare	29	6.88	0.30	0.38	2.11	2.81	1.27
12	Medical Equipment	65	13.03	0.32	0.19	2.68	7.38	2.46
13	Pharmaceutical Products	100	23.03	0.23	0.13	8.43	12.35	1.88
14	Chemicals	20	6.33	0.29	0.29	1.39	2.84	1.52
15	Rubber & Plastic Products	10	9.90	1.36	0.18	1.71	3.92	2.73
16	Textiles	1	6.25	1.79	0.00	4.46	0.00	0.00
17	Construction Materials	9	3.49	0.39	0.21	0.63	1.02	1.24
18	Construction	14	3.51	0.07	0.16	0.39	0.77	2.11
19	Steel Works	13	2.10	0.07	0.16	0.51	1.06	0.30
20	Fabricated Products	2	2.53	0.00	0.28	0.00	1.97	0.28
21	Machinery	34	8.27	0.31	0.20	1.26	4.21	2.29
22	Electrical Equipment	11	5.39	0.25	0.11	1.16	2.37	1.51
23	Automobiles & Trucks	7	5.15	0.30	0.42	0.92	1.57	1.94
24	Aircraft	3	3.86	0.00	0.46	0.61	1.47	1.32
25	Shipbuilding, Railroad Equipment	2	10.02	0.00	0.00	0.25	6.19	3.59
26	Defense	1	9.06	0.00	0.36	0.72	7.25	0.72
32	Communication	50	10.64	0.40	1.24	2.44	3.39	3.16
33	Personal Services	12	5.85	0.25	0.18	1.81	2.25	1.36
34	Business Services	253	20.82	0.71	0.94	5.20	11.11	2.87
35	Computers	89	17.07	0.39	0.52	2.46	10.81	2.88
36	Electronic Equipment	108	14.22	0.33	0.43	2.31	7.15	4.01
37	Measuring & Control Equipment	40	14.48	0.29	0.35	2.12	8.68	3.04
38	Business Supplies	12	6.59	1.32	0.15	1.51	1.75	1.85
39	Shipping Containers	2	1.84	0.00	0.28	0.56	0.86	0.14
40	Transportation	21	5.81	0.49	0.26	1.96	2.11	0.99
41	Wholesale	32	6.27	0.68	0.11	1.92	2.61	0.94
42	Retail	58	5.61	1.24	0.44	0.82	1.72	1.39
43	Restaurants, Hotels, Motels	7	8.02	0.44	0.04	5.67	1.24	0.63
Total:		1,080						

Panel C: Year distribution of IA disclosure

This panel presents the distribution of the IA disclosure measure across the years, disaggregated into five IA categories. For each IA category (column), the three years with the highest *IA_DISC* measures are highlighted. Variable definitions are provided in Appendix F.

Year	N	<i>IA_DISC</i>	<i>IA_DISC</i> _MKTG	<i>IA_DISC</i> _CUST	<i>IA_DISC</i> _CTRCT	<i>IA_DISC</i> _TECH	<i>IA_DISC</i> _OTH
1995	15	3.23	0.43	0.07	0.94	1.11	0.69
1996	35	8.29	0.60	0.39	2.04	4.01	1.24
1997	57	11.79	0.27	0.18	2.58	7.11	1.65
1998	70	13.15	0.31	0.30	3.05	8.27	1.23
1999	83	15.43	0.70	0.50	2.91	8.85	2.47
2000	61	15.17	0.49	0.62	3.07	9.25	1.74
2001	43	15.23	0.30	0.44	3.35	8.11	3.04
2002	50	17.30	0.49	0.62	4.14	9.59	2.46
2003	58	15.37	1.06	0.78	4.14	7.25	2.13
2004	69	16.01	0.80	0.47	4.14	7.92	2.68
2005	61	17.26	0.53	0.60	4.38	8.17	3.57
2006	72	12.92	0.73	0.45	3.37	5.78	2.60
2007	41	12.05	0.24	0.34	2.76	6.24	2.47
2008	42	16.39	0.48	0.36	4.06	8.43	3.07
2009	52	17.06	0.48	0.62	4.64	8.00	3.32
2010	29	12.96	0.74	0.49	3.42	5.29	3.02
2011	37	12.90	0.90	0.52	3.33	5.64	2.51
2012	38	13.06	0.86	0.60	3.71	4.96	2.93
2013	40	11.89	0.71	0.58	2.60	4.82	3.18
2014	56	13.32	1.00	0.50	3.38	5.22	3.23
2015	48	14.66	0.57	0.56	3.36	6.22	3.94
2016	23	12.36	0.47	0.51	3.01	5.79	2.59
Total:	1,080						



Panel D: Industry distribution of IA value

This panel presents the distribution of IA value (\$m) across the Fama-French 48 industry classifications, disaggregated into five IA categories. For each IA category (column), the three industries with the highest IA value are highlighted. Some firms (and hence, industries) do not have the breakdown of IA value by categories. Variable definitions are provided in Appendix F.

Fama-French 48 industry classification		N	IA VALUE	IA VALUE MKTG	IA VALUE CUST	IA VALUE CTRCT	IA VALUE TECH	IA VALUE OTH
1	Agriculture	2	375.50	50.50	7.50	0.00	168.00	149.50
2	Food Products	15	486.79	242.46	148.23	0.00	0.00	57.60
3	Candy & Soda	1	11.11					
4	Beer & Liquor	1	186.00	186.00	0.00	0.00	0.00	0.00
5	Tobacco Products	1	27,443.00					
6	Recreation	5	66.57	13.05	2.65	0.00	0.45	0.55
7	Entertainment	13	190.26	72.57	24.23	0.00	7.78	26.69
8	Printing & Publishing	9	1,578.11	94.39	284.57	0.00	0.41	1,440.79
9	Consumer Goods	10	208.57	124.11	39.92	0.00	65.36	0.84
10	Apparel	18	233.41	143.72	17.79	0.00	0.23	87.13
11	Healthcare	29	233.21	18.67	57.10	0.00	10.21	32.86
12	Medical Equipment	65	805.40	51.88	149.32	0.00	693.71	47.69
13	Pharmaceutical Products	100	2,196.16	17.52	90.51	0.90	1,801.82	492.90
14	Chemicals	20	854.18	132.63	196.26	10.00	66.54	288.06
15	Rubber & Plastic Products	10	1,241.31	0.00	3.60	0.00	5.46	0.00
16	Textiles	1	2.14	2.14	0.00	0.00	0.00	0.00
17	Construction Materials	9	84.84	28.87	35.26	0.00	6.53	0.00
18	Construction	14	44.53	11.29	22.05	0.00	0.23	0.00
19	Steel Works	13	152.86	30.74	60.53	0.00	7.33	8.67
20	Fabricated Products	2	0.00	0.00	0.00	0.00	0.00	0.00
21	Machinery	34	678.55	224.18	349.40	0.00	60.73	34.56
22	Electrical Equipment	11	195.12	32.91	104.21	0.00	67.65	17.96
23	Automobiles & Trucks	7	40.77	6.33	24.05	0.00	0.35	9.50
24	Aircraft	3	3,422.00	775.00	4,275.00	0.00	0.00	0.00
25	Shipbuilding, Railroad Equipment	2	0.00	0.00	0.00	0.00	0.00	0.00
26	Defense	1	164.00					
32	Communication	50	2,182.10	327.42	1,799.38	0.34	34.32	715.11
33	Personal Services	12	274.21	147.42	13.03	57.67	19.33	56.51
34	Business Services	253	322.74	29.02	145.26	3.04	81.92	86.63
35	Computers	89	452.61	30.37	68.83	12.29	168.61	130.28
36	Electronic Equipment	108	373.60	6.66	135.37	0.22	269.27	17.59
37	Measuring & Control Equipment	40	386.30	15.30	91.07	0.65	123.13	127.41
38	Business Supplies	12	485.36	138.43	364.42	0.06	74.14	5.37
39	Shipping Containers	2	81.00	0.00	0.00	0.00	0.00	0.00
40	Transportation	21	485.06	17.50	80.54	0.00	1.10	235.37
41	Wholesale	32	175.95	28.24	69.91	0.00	47.42	5.32
42	Retail	58	700.41	262.14	501.73	9.07	1.16	51.18
43	Restaurants, Hotels, Motels	7	1,517.34	1,295.99	0.00	121.50	1.59	329.43
Total:		1,080						

Panel E: Year distribution of IA value

This panel presents the distribution of IA value (\$m) across the years, disaggregated into five IA categories. For each IA category (column), the three years with the highest IA value are highlighted. Variable definitions are provided in Appendix F.

Year	N	IA_VALUE	IA_VALUE _MKTG	IA_VALUE _CUST	IA_VALUE _CTRCT	IA_VALUE _TECH	IA_VALUE _OTH
1995	15	125.34	0.00	0.00	0.00	12.27	5.98
1996	35	34.58	0.10	4.40	0.00	22.98	2.40
1997	57	69.08	0.00	0.39	0.00	37.14	2.43
1998	70	99.70	0.69	1.07	0.00	35.47	6.77
1999	83	213.96	19.84	5.07	0.00	59.54	128.20
2000	61	87.48	11.60	6.48	0.00	32.19	23.44
2001	43	119.81	2.73	9.84	0.10	29.59	1.05
2002	50	187.79	13.74	21.98	9.71	106.89	104.98
2003	58	404.94	94.57	263.44	0.71	31.97	88.83
2004	69	712.60	134.86	187.84	0.10	289.13	191.12
2005	61	536.94	35.76	301.65	6.01	227.93	79.26
2006	72	602.98	142.04	220.81	0.00	158.95	195.79
2007	41	551.57	32.44	214.53	0.07	98.65	107.05
2008	42	460.58	67.61	101.00	21.60	214.77	112.97
2009	52	559.12	14.59	294.13	2.65	87.98	148.96
2010	29	1,536.99	113.67	1,500.96	0.00	425.03	20.84
2011	37	655.40	121.14	129.26	0.00	391.90	76.15
2012	38	1,404.02	91.15	268.30	2.96	496.69	829.40
2013	40	3,746.79	321.32	846.70	6.21	2,151.83	704.91
2014	56	2,002.58	262.86	360.49	16.09	1,011.66	326.58
2015	48	1,453.41	151.59	432.04	0.00	901.67	284.71
2016	23	1,923.83	145.47	477.79	51.50	1,302.77	39.28
Total:	1,080						

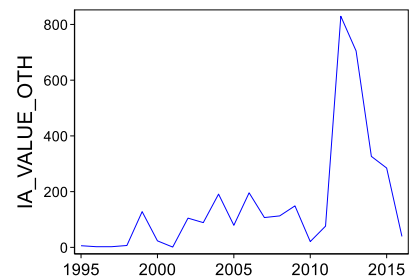
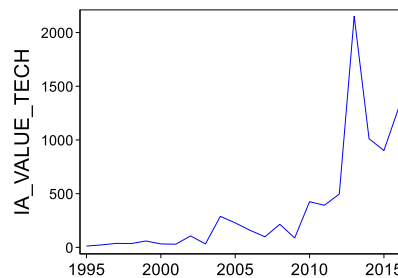
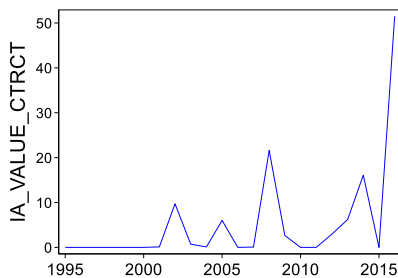
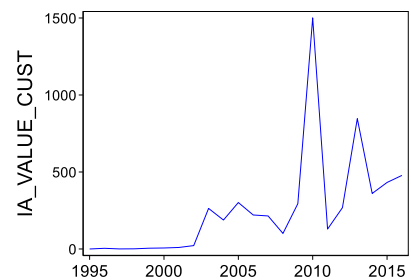
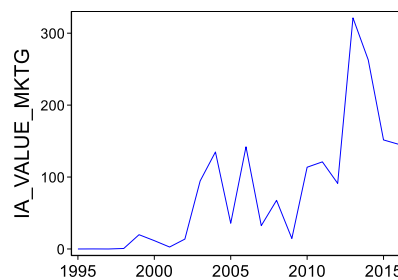
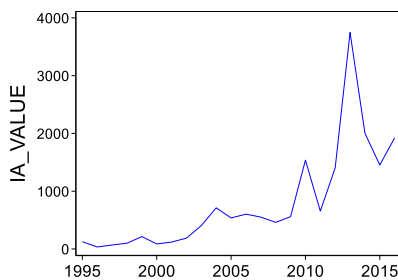


Table 2: Descriptive Statistics

This table provides descriptive statistics for all the variables used in the analysis. All continuous control variables are winsorized at the 1% and 99% percentiles. Variable definitions are provided in Appendix F.

Panel A: IA disclosure

Variable	N	Mean	SD	Min	P25	Median	P75	Max
<i>NUM_MDA_SENT</i>	1,080	307.28	173.40	24.00	186.50	286.00	394.00	2,849.00
<i>IA_DISC</i>	1,080	14.13	10.51	0.00	5.51	11.83	20.08	58.79
<i>IA_DISC_MKTG</i>	1,080	0.61	1.31	0.00	0.00	0.00	0.67	13.33
<i>IA_DISC_CUST</i>	1,080	0.49	0.83	0.00	0.00	0.00	0.70	7.25
<i>IA_DISC_CTRCT</i>	1,080	3.40	4.24	0.00	0.55	1.68	4.67	26.97
<i>IA_DISC_TECH</i>	1,080	7.08	6.55	0.00	1.58	5.46	11.07	41.47
<i>IA_DISC_OTH</i>	1,080	2.56	3.19	0.00	0.60	1.86	3.70	41.33
<i>SPECIFIC</i>	1,080	5.14	4.54	0.00	1.75	3.94	7.19	31.33
<i>UNCERTAIN</i>	1,080	2.66	2.65	0.00	0.74	1.86	3.55	16.01
<i>FORWARD</i>	1,080	2.93	2.95	0.00	0.82	1.99	4.08	21.52
<i>RISK</i>	1,080	1.04	1.22	0.00	0.00	0.68	1.50	11.73
<i>SENTIMENT</i>	1,080	0.05	1.56	-7.03	-0.57	0.00	0.77	8.89

Panel B: IA value (in \$millions)

Variable	N	Mean	SD	Min	P25	Median	P75	Max
<i>DEALVALUE</i> (\$m)	1,080	1,881.74	5,073.65	2.38	123.15	442.40	1,502.55	74,757.90
<i>GOODWILL</i> (\$m)	1,080	1,052.19	2,938.61	-0.01	30.64	177.78	817.92	39,549.70
<i>IA_VALUE</i> (\$m)	1,080	712.69	2,748.41	0.00	11.30	80.72	380.10	56,060.50
<i>IA_VALUE_MKTG</i> (\$m)	847	76.80	381.99	0.00	0.00	0.00	10.34	6,400.00
<i>IA_VALUE_CUST</i> (\$m)	847	211.63	1,143.28	0.00	0.00	0.00	46.20	19,803.00
<i>IA_VALUE_CTRCT</i> (\$m)	847	4.07	45.61	0.00	0.00	0.00	0.00	771.00
<i>IA_VALUE_TECH</i> (\$m)	847	308.23	2,153.30	0.00	0.00	9.00	74.80	54,310.00
<i>IA_VALUE_OTH</i> (\$m)	847	151.97	857.27	0.00	0.00	0.00	9.40	12,270.00
<i>BOOK_IA_VALUE</i> (\$m)	1,080	87.58	381.67	0.00	0.00	1.57	25.81	7,010.00
<i>NON_BOOK_IA_VALUE</i> (\$m)	1,080	640.06	2,606.39	0.00	7.64	67.03	312.02	54,373.70

Panel C: Target's characteristics

Variable	N	Mean	SD	Min	P25	Median	P75	Max
<i>ASSET</i> (\$m)	1,080	991.72	2,460.32	7.01	72.82	213.55	687.54	18,245.00
<i>TANG_ASSET</i> (\$m)	1,080	726.99	1,790.04	6.43	64.79	172.60	535.90	13,801.24
<i>AGE</i>	1,080	11.11	5.79	1.00	7.00	9.00	14.00	26.00
<i>LEVERAGE</i>	1,080	0.16	0.22	0.00	0.00	0.05	0.27	0.95
<i>TOBINS_Q</i>	1,080	2.23	1.83	0.60	1.18	1.65	2.50	13.15
<i>ROA</i>	1,080	-0.05	0.34	-1.97	-0.10	0.05	0.11	0.53
<i>INST_OWNER</i>	1,080	0.53	0.30	0.00	0.27	0.53	0.81	1.00
<i>ANALYST</i>	1,080	7.43	7.16	1.00	2.00	5.00	10.00	33.00
<i>BOARD_SIZE</i>	576	6.72	2.10	3.00	5.00	6.00	8.00	13.00
<i>BOARD_INDEP</i>	576	0.90	0.15	0.25	0.83	1.00	1.00	1.00
<i>STOCK_COMP</i>	349	0.44	0.28	0.00	0.23	0.49	0.64	0.97
<i>R&D</i>	1,080	0.11	0.15	0.00	0.00	0.05	0.15	0.78
<i>CAPEX</i>	1,080	0.04	0.05	0.00	0.02	0.03	0.06	0.26
<i>PPE</i>	1,080	0.18	0.18	0.00	0.06	0.11	0.25	0.83
<i>TRADEMARK</i>	1,080	2.29	4.76	0.00	0.00	0.00	2.00	34.00
<i>PATENT</i>	1,080	0.81	5.40	0.00	0.00	0.00	0.00	98.00
<i>CITE</i>	1,080	8.83	76.24	0.00	0.00	0.00	0.00	1,809.00

Table 3: Correlation Coefficient

This table presents the coefficients of correlation among the variables used in the analysis. Variable definitions are provided in Appendix F. *, +, # indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
1. <i>IA_DISC</i>	1										
2. <i>IA_DISC_MKTG</i>	0.120#	1									
3. <i>IA_DISC_CUST</i>	0.197#	0.099#	1								
4. <i>IA_DISC_CTRCT</i>	0.746#	0.033	0.025	1							
5. <i>IA_DISC_TECH</i>	0.872#	-0.058*	0.158#	0.496#	1						
6. <i>IA_DISC_OTH</i>	0.407#	0.061+	0.023	0.081#	0.116#	1					
7. <i>IA_VALUE</i>	0.084#	0.043	0.080#	0.080#	0.018	0.102#	1				
8. <i>IA_VALUE_MKTG</i>	-0.147#	0.245#	0.042	-0.106#	-0.226#	0.026	0.531#	1			
9. <i>IA_VALUE_CUST</i>	-0.103#	0.010	0.218#	-0.104#	-0.144#	0.049	0.577#	0.523#	1		
10. <i>IA_VALUE_CTRCT</i>	0.044	-0.018	0.019	0.092#	0.011	0.002	0.123#	0.080+	0.037	1	
11. <i>IA_VALUE_TECH</i>	0.311#	-0.135#	-0.016	0.226#	0.335#	0.085+	0.638#	0.058*	0.208#	0.041	1
12. <i>IA_VALUE_OTH</i>	0.074+	0.057*	0.066*	0.085+	0.012	0.075+	0.522#	0.225#	0.090#	0.048	0.135#
13. <i>TANG_ASSET</i>	-0.282#	0.002	-0.031	-0.183#	-0.317#	-0.020	0.486#	0.431#	0.416#	0.111#	0.129#
14. <i>AGE</i>	-0.244#	-0.021	-0.121#	-0.130#	-0.297#	0.026	0.294#	0.349#	0.333#	0.083+	0.061*
15. <i>LEVERAGE</i>	-0.302#	0.011	-0.069+	-0.184#	-0.330#	-0.054*	0.067+	0.086+	0.080+	-0.003	-0.205#
16. <i>TOBINS_Q</i>	0.243#	0.042	0.050*	0.163#	0.257#	0.020	0.229#	-0.004	-0.062*	-0.014	0.329#
17. <i>ROA</i>	-0.275#	-0.019	-0.099#	-0.172#	-0.304#	-0.011	0.134#	0.234#	0.219#	0.028	-0.058*
18. <i>INST_OWNER</i>	-0.117#	-0.013	-0.051*	-0.058*	-0.160#	0.047	0.528#	0.410#	0.399#	0.078+	0.271#
19. <i>ANALYST</i>	0.051*	0.020	0.121#	0.027	0.016	0.068+	0.512#	0.334#	0.345#	0.122#	0.343#
20. <i>BOARD_SIZE</i>	-0.214#	0.000	0.002	-0.101+	-0.214#	-0.132#	0.314#	0.193#	0.162#	0.090*	-0.033
21. <i>BOARD_INDEP</i>	0.048	-0.003	0.062	0.033	0.048	0.006	0.108#	-0.017	0.018	-0.037	0.167#
22. <i>STOCK_COMP</i>	0.167#	0.042	0.142#	0.088	0.136+	0.108+	0.237#	0.141+	0.122+	0.007	0.191#

Variable	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)
12. <i>IA_VALUE_OTH</i>	1										
13. <i>TANG_ASSET</i>	0.337#	1									
14. <i>AGE</i>	0.110#	0.325#	1								
15. <i>LEVERAGE</i>	0.066*	0.360#	0.080#	1							
16. <i>TOBINS_Q</i>	0.157#	-0.126#	-0.172#	-0.113#	1						
17. <i>ROA</i>	0.093#	0.314#	0.294#	0.125#	-0.271#	1					
18. <i>INST_OWNER</i>	0.287#	0.659#	0.419#	0.139#	-0.019	0.308#	1				
19. <i>ANALYST</i>	0.391#	0.601#	0.140#	0.101#	0.127#	0.154#	0.529#	1			
20. <i>BOARD_SIZE</i>	0.169#	0.482#	0.209#	0.294#	-0.146#	0.014	0.277#	0.279#	1		
21. <i>BOARD_INDEP</i>	-0.009	-0.009	0.119#	-0.147#	0.089+	-0.048	0.089+	0.108#	-0.153#	1	
22. <i>STOCK_COMP</i>	0.141+	0.250#	0.095*	-0.035	0.093*	0.063	0.273#	0.328#	0.206#	0.101	1

Table 4: IA disclosure and IA value (*Hypothesis 1*)

This table presents the results of the main test of credibility by testing *Hypothesis 1* using the regression described in Model (1).

Panel A: IA disclosure and IA value

Column (1) of Panel A reports the coefficients and t-statistics from the ordinary least squares (OLS) regressions of IA disclosure on IA value. Columns (2) to (5) incorporate controls for additional factors influencing IA disclosure, as well as year and industry fixed effects. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>IA_DISC</i>	(2) <i>IA_DISC</i>	(3) <i>IA_DISC</i>	(4) <i>IA_DISC</i>	(5) <i>IA_DISC</i>
<i>IA_VALUE</i>	0.596*** (3.41)	1.064*** (7.37)	0.985*** (7.51)	0.554*** (4.62)	0.511*** (4.69)
<i>TANG_ASSET</i>		-2.570*** (-10.03)	-2.549*** (-10.28)	-1.615*** (-6.48)	-1.692*** (-6.88)
<i>AGE</i>		-0.280*** (-4.53)	-0.292*** (-4.17)	-0.117** (-2.22)	-0.125** (-2.33)
<i>LEVERAGE</i>		-7.942*** (-5.00)	-7.308*** (-4.77)	-6.237*** (-4.82)	-5.754*** (-4.47)
<i>TOBINS_Q</i>		0.185 (0.92)	0.271 (1.37)	0.180 (1.05)	0.187 (0.96)
<i>ROA</i>		-4.833*** (-3.16)	-4.578*** (-2.94)	-3.087*** (-3.03)	-2.934*** (-2.95)
<i>INST_OWNER</i>		2.385* (1.79)	2.812** (2.27)	2.256 (1.71)	2.743** (2.18)
<i>ANALYST</i>		0.309*** (6.35)	0.296*** (6.33)	0.202*** (4.85)	0.204*** (4.99)
<i>_CONS</i>	11.667*** (12.99)	23.449*** (16.43)	23.384*** (19.24)	19.401*** (16.80)	19.718*** (18.34)
Year FE	No	No	Yes	No	Yes
Industry FE	No	No	No	Yes	Yes
N	1,080	1,080	1,080	1,080	1,080
Adj. R ²	0.02	0.27	0.29	0.40	0.41

Panel B: Alternative measures of IA disclosure and IA value

Columns (1) to (5) of Panel B employ five alternative measures of IA disclosure as the dependent variables. The main independent variable is the natural logarithm of one plus the value of IA. All models include the main control variables, as well as year and industry fixed effects, as described in Section 3.3. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>IA_DISC</i> <i>_ALT1</i>	(2) <i>IA_DISC</i> <i>_ALT2</i>	(3) <i>IA_DISC</i> <i>_ALT3</i>	(4) <i>IA_DISC</i> <i>_ALT4</i>	(5) <i>IA_DISC</i> <i>_ALT5</i>
<i>IA_VALUE</i>	0.032*** (3.27)	0.037*** (3.38)	0.015*** (3.94)	0.035*** (3.63)	0.062** (2.33)
<i>TANG_ASSET</i>	-0.131*** (-6.64)	-0.105*** (-5.50)	-0.042*** (-7.34)	-0.091*** (-6.07)	-0.113*** (-4.02)
<i>AGE</i>	-0.008* (-1.96)	-0.006 (-1.62)	-0.001 (-1.53)	-0.004** (-2.09)	-0.002 (-0.50)
<i>LEVERAGE</i>	-0.462*** (-4.21)	-0.412*** (-2.87)	-0.106*** (-3.13)	-0.267** (-2.49)	-0.504* (-2.03)
<i>TOBINS_Q</i>	0.018 (1.07)	0.021 (1.37)	0.009* (1.87)	0.008 (0.79)	0.034 (1.19)
<i>ROA</i>	-0.248** (-2.75)	-0.157*** (-3.08)	-0.049*** (-5.39)	-0.110*** (-3.95)	-0.023 (-0.30)
<i>INST_OWNER</i>	0.224** (2.34)	0.096 (0.94)	-0.001 (-0.04)	0.048 (0.88)	-0.014 (-0.10)
<i>ANALYST</i>	0.014*** (4.12)	0.008** (2.44)	0.001 (1.46)	0.006** (2.65)	-0.001 (-0.23)
<i>_CONS</i>	1.516*** (17.23)	1.249*** (14.89)	0.554*** (20.20)	0.921*** (13.25)	1.274*** (8.95)
Year & Industry FE	Yes	Yes	Yes	Yes	Yes
N	1,080	1,080	1,080	1,080	1,080
Adj. R ²	0.41	0.25	0.27	0.11	0.03

Table 5: Addressing endogeneity

This table reports the results of two empirical methods used to address the sample selection endogeneity problem.

Panel A: Heckman Two-Stage Least Square

This panel presents the results of the Heckman two-stage least squares estimation. Column (1) shows the results of the first-stage selection model described in Model (2). The dependent variable is a binary selection indicator that identifies acquired firm years. The sample includes 120,182 observations, representing all Compustat firm-years with non-missing controls. From the first stage, a bias correction term (*IMR*) is calculated for inclusion in the second stage. Column (2) presents the results of the second stage, testing the regression from Model (1) with the bias correction term added. The main control variables, as well as year and industry fixed effects, are included in both columns. Variable definitions are provided in Appendix F. Z-statistics in Column (1) and t-statistics in Column (2), based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) Heckman First Stage <i>ACQUIRED</i>	(2) Heckman Second Stage <i>IA_DISC</i>
<i>IA_VALUE</i>		0.028** (2.19)
<i>TANG_ASSET</i>	-0.086*** (-13.67)	-0.042 (-0.06)
<i>AGE</i>	0.003** (2.02)	-0.013 (-0.56)
<i>LEVERAGE</i>	0.076* (1.72)	-0.532 (-0.90)
<i>TOBINS_Q</i>	-0.031*** (-3.58)	0.050 (0.20)
<i>ROA</i>	-0.010 (-0.96)	-0.100 (-0.79)
<i>INST_OWNER</i>	0.477*** (14.06)	-0.301 (-0.08)
<i>ANALYST</i>	0.011*** (6.60)	0.003 (0.04)
<i>IMR</i>		-1.166 (-0.13)
<i>_CONS</i>	-2.846*** (-15.71)	4.084 (0.21)
Year & Industry FE	Yes	Yes
N	120,182	1,080
Pseudo/ Adj. R ²	0.05	0.40

Panel B: Sample of non-acquired firms

This panel presents the results of testing the regression described in Model (1) using a sample of 32,397 non-acquired firm-years. Column (1) reports the coefficients and t-statistics from the ordinary least squares (OLS) regressions of IA disclosure on the estimated IA value (Ewens et al., 2024, detailed in Section 4.3). Columns (2) to (5) incorporate controls for additional factors influencing IA disclosure, as well as year and industry fixed effects. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>IA_DISC</i>	(2) <i>IA_DISC</i>	(3) <i>IA_DISC</i>	(4) <i>IA_DISC</i>	(5) <i>IA_DISC</i>
<i>IA_VALUE_EST</i>	0.104* (1.79)	1.587*** (15.56)	1.612*** (16.75)	0.734*** (11.35)	0.783*** (12.11)
<i>TANG_ASSET</i>		-2.441*** (-19.23)	-2.466*** (-23.39)	-1.299*** (-13.41)	-1.357*** (-14.53)
<i>AGE</i>		-0.143*** (-4.54)	-0.177*** (-10.16)	-0.061*** (-4.88)	-0.065*** (-4.23)
<i>LEVERAGE</i>		-6.411*** (-9.79)	-6.526*** (-10.60)	-3.827*** (-9.89)	-3.915*** (-10.27)
<i>TOBINS_Q</i>		0.334*** (6.04)	0.325*** (7.10)	0.229*** (7.50)	0.224*** (7.38)
<i>ROA</i>		-0.215 (-0.94)	-0.028 (-0.14)	-0.175 (-0.90)	-0.116 (-0.61)
<i>INST_OWNER</i>		2.133*** (5.70)	1.808*** (7.22)	1.689*** (6.77)	1.683*** (7.51)
<i>ANALYST</i>		0.249*** (15.97)	0.247*** (16.98)	0.153*** (13.49)	0.155*** (13.74)
<i>_CONS</i>	11.956*** (23.04)	16.131*** (22.80)	16.783*** (34.53)	14.369*** (51.93)	14.496*** (47.06)
Year & Industry FE	Yes	Yes	Yes	Yes	Yes
N	32,397	32,397	32,397	32,397	32,397
Adj. R ²	0.00	0.18	0.20	0.39	0.39

Table 6: IA disclosure and IA value by IA categories

This table presents the results of testing the regression described in Model (1) using the sub-sample of 847 observations with available breakdown of IA value categories. Columns (1) to (5) report the results for each of the five IA categories separately: marketing-related, customer-related, contract-based, technology-based, and other IA. The main control variables, as well as year and industry fixed effects, are included in all tests. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>IA_DISC</i> <i>_MKTG</i>	(2) <i>IA_DISC</i> <i>_CUST</i>	(3) <i>IA_DISC</i> <i>_CTRCT</i>	(4) <i>IA_DISC</i> <i>_TECH</i>	(5) <i>IA_DISC</i> <i>_OTH</i>
<i>IA_VALUE_MKTG</i>	0.144*** (5.29)				
<i>IA_VALUE_CUST</i>		0.073*** (5.45)			
<i>IA_VALUE_CTRCT</i>			0.495* (1.95)		
<i>IA_VALUE_TECH</i>				0.519*** (4.35)	
<i>IA_VALUE_OTH</i>					0.096* (2.06)
<i>TANG_ASSET</i>	-0.053 (-0.92)	-0.080** (-2.50)	-0.416** (-2.63)	-0.984*** (-5.04)	-0.184* (-1.93)
<i>AGE</i>	0.000 (0.04)	-0.012** (-2.20)	0.014 (0.43)	-0.072* (-1.97)	-0.015 (-0.99)
<i>LEVERAGE</i>	-0.074 (-0.33)	-0.354*** (-3.11)	-2.303*** (-3.26)	-3.652*** (-5.59)	-0.861 (-1.27)
<i>TOBINS_Q</i>	0.017 (0.92)	-0.005 (-0.20)	0.106 (1.11)	0.117 (1.07)	-0.082 (-1.59)
<i>ROA</i>	-0.338 (-1.52)	-0.204** (-2.46)	-0.232 (-0.50)	-1.826** (-2.33)	-0.512 (-1.14)
<i>INST_OWNER</i>	-0.098 (-0.56)	-0.036 (-0.25)	0.865 (1.11)	2.283*** (3.49)	0.757* (1.73)
<i>ANALYST</i>	0.005 (0.80)	0.019*** (3.89)	0.046** (2.27)	0.076** (2.79)	0.009 (0.44)
<i>_CONS</i>	0.634*** (3.02)	0.815*** (5.41)	4.855*** (7.65)	10.490*** (12.53)	3.391*** (9.53)
Tests of differences between coefficients:					
<i>IA_VALUE_TECH</i> = <i>IA_VALUE_CTRCT</i>			0.01		
<i>IA_VALUE_TECH</i> = <i>IA_VALUE_MKTG</i>			10.26***		
<i>IA_VALUE_TECH</i> = <i>IA_VALUE_CUST</i>			15.38***		
<i>IA_VALUE_MKTG</i> = <i>IA_VALUE_CUST</i>			6.43**		
Year & Industry FE	Yes	Yes	Yes	Yes	Yes
N	847	847	847	847	847
Adj. R ²	0.26	0.20	0.26	0.47	0.20

Table 7: IA disclosure and book versus non-book IA value

This table presents results from testing the regression specified in Model (1) and reports coefficients and t-statistics from OLS regressions of IA disclosure on decomposed IA value. Column (1) includes IA value, separated into book and non-book portions, as the independent variables. The main control variables, as well as year and industry fixed effects, are included in all tests. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>IA_DISC</i>
<i>BOOK_IA_VALUE</i>	0.248 (1.17)
<i>NON_BOOK_IA_VALUE</i>	0.369*** (3.76)
<i>TANG_ASSET</i>	-1.714*** (-6.09)
<i>AGE</i>	-0.127** (-2.37)
<i>LEVERAGE</i>	-5.975*** (-4.25)
<i>TOBINS_Q</i>	0.245 (1.25)
<i>ROA</i>	-2.893** (-2.77)
<i>INST_OWNER</i>	2.643* (2.06)
<i>ANALYST</i>	0.202*** (4.81)
<i>_CONS</i>	20.048*** (16.54)
Year & Industry FE	Yes
N	1,080
Adj. R ²	0.40

Table 8: Textual characteristics of IA disclosure

This table reports the results of testing the regression described in Model (1), using five different textual characteristics of IA disclosure as the dependent variable.

Panel A: Textual characteristics of IA disclosure and IA value

This panel reports regression results of five different textual characteristics of IA disclosure on IA value. The main independent variable is the natural logarithm of one plus the value of IA. All models include the main control variables, as well as year and industry fixed effects. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>SPECIFIC</i>	(2) <i>UNCERTAIN</i>	(3) <i>FORWARD</i>	(4) <i>RISK</i>	(5) <i>SENTIMENT</i>
<i>IA_VALUE</i>	0.142*** (3.19)	-0.015 (-0.30)	-0.062 (-1.26)	0.009 (0.39)	0.023 (1.00)
<i>TANG_ASSET</i>	-0.058 (-0.65)	0.153** (2.64)	0.211*** (3.84)	0.066** (2.12)	-0.018 (-0.41)
<i>AGE</i>	0.086*** (5.18)	0.018* (1.83)	0.012 (1.35)	0.019** (2.47)	-0.006 (-0.59)
<i>LEVERAGE</i>	0.083 (0.23)	-0.113 (-0.36)	-0.110 (-0.32)	-0.006 (-0.04)	-0.149 (-0.73)
<i>TOBINS_Q</i>	-0.008 (-0.23)	-0.015 (-0.31)	0.015 (0.40)	0.019 (0.89)	-0.007 (-0.30)
<i>ROA</i>	0.532 (1.03)	-0.437** (-2.55)	-0.722** (-2.73)	-0.109 (-0.94)	0.316*** (3.06)
<i>INST_OWNER</i>	-0.844** (-2.29)	-0.338 (-1.12)	-0.260 (-0.87)	-0.304* (-2.03)	0.299 (1.11)
<i>ANALYST</i>	-0.017 (-1.51)	0.004 (0.48)	0.001 (0.06)	-0.005 (-0.88)	-0.001 (-0.14)
<i>IA_DISC</i>	0.376*** (16.38)	0.191*** (13.55)	0.214*** (13.97)	0.070*** (10.69)	-0.020** (-2.41)
<i>_CONS</i>	-0.796 (-1.49)	-0.809** (-2.69)	-1.005*** (-3.31)	-0.388** (-2.56)	0.300 (1.42)
Year & Industry FE	Yes	Yes	Yes	Yes	Yes
N	1,080	1,080	1,080	1,080	1,080
Adj. R ²	0.76	0.63	0.64	0.39	0.16

Panel B: Textual characteristics of IA disclosure and Book/ non-book IA value

This panel reports regression results of five different textual characteristics of IA disclosure on decomposed IA value. All columns include IA value, separated into book and non-book portions, as the independent variables. All models include the main control variables, as well as year and industry fixed effects. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>SPECIFIC</i>	(2) <i>UNCERTAIN</i>	(3) <i>FORWARD</i>	(4) <i>RISK</i>	(5) <i>SENTIMENT</i>
<i>BOOK_IA_VALUE</i>	-0.000 (-0.01)	-0.003 (-0.09)	-0.108*** (-3.70)	0.028 (1.69)	0.033 (1.02)
<i>NON_BOOK_IA_VALUE</i>	0.143*** (4.07)	-0.012 (-0.27)	-0.046 (-0.95)	0.011 (0.57)	0.022 (1.21)
<i>TANG_ASSET</i>	-0.044 (-0.51)	0.152** (2.53)	0.259*** (4.17)	0.050 (1.68)	-0.034 (-0.75)
<i>AGE</i>	0.087*** (5.21)	0.018* (1.88)	0.014 (1.51)	0.018** (2.46)	-0.007 (-0.63)
<i>LEVERAGE</i>	0.143 (0.38)	-0.113 (-0.37)	0.027 (0.08)	-0.041 (-0.25)	-0.187 (-0.90)
<i>TOBINS_Q</i>	-0.012 (-0.32)	-0.016 (-0.31)	0.000 (0.01)	0.021 (0.96)	-0.004 (-0.15)
<i>ROA</i>	0.523 (1.02)	-0.438** (-2.57)	-0.722** (-2.66)	-0.112 (-1.00)	0.313*** (3.09)
<i>INST_OWNER</i>	-0.865** (-2.38)	-0.336 (-1.12)	-0.215 (-0.70)	-0.318** (-2.10)	0.282 (1.02)
<i>ANALYST</i>	-0.018 (-1.64)	0.004 (0.47)	0.002 (0.24)	-0.006 (-1.00)	-0.002 (-0.23)
<i>IA_DISC</i>	0.376*** (16.55)	0.190*** (13.52)	0.215*** (14.36)	0.070*** (10.44)	-0.020** (-2.49)
<i>_CONS</i>	-0.844 (-1.66)	-0.809** (-2.60)	-1.190*** (-3.75)	-0.337** (-2.15)	0.355 (1.66)
Year & Industry FE	Yes	Yes	Yes	Yes	Yes
N	1,080	1,080	1,080	1,080	1,080
Adj. R ²	0.76	0.63	0.65	0.39	0.16

Table 9: Conditions of credibility (*Hypothesis 2*)

Table 9 reports the results of the cross-sectional analyses, showing the conditions under which the association between IA disclosure and IA value varies in strength.

Panel A: Information demand

This panel reports the results of regressing *IA_DISC* on the interaction between *IA_VALUE* and various proxies for information demand. The main independent variable of interest is the interaction variable. All models include the main control variables, as well as year and industry fixed effects. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>IA_DISC</i>	(2) <i>IA_DISC</i>	(3) <i>IA_DISC</i>
<i>IA_VALUE</i>	0.722*** (6.11)	0.809*** (4.16)	0.554*** (3.24)
<i>LOW_ROA</i>	4.604*** (6.25)		
<i>LOW_ROA#IA_VALUE</i>	-0.504*** (-3.06)		
<i>HIGH_INST_OWN</i>		3.463*** (3.09)	
<i>HIGH_INST_OWN#IA_VALUE</i>		-0.539** (-2.33)	
<i>HIGH_ANALYST</i>			1.801 (1.48)
<i>HIGH_ANALYST#IA_VALUE</i>			0.020 (0.08)
<i>TANG_ASSET</i>	-1.552*** (-6.70)	-1.654*** (-6.15)	-1.423*** (-5.53)
<i>AGE</i>	-0.142** (-2.77)	-0.112** (-2.19)	-0.111* (-1.88)
<i>LEVERAGE</i>	-5.398*** (-4.16)	-5.955*** (-4.55)	-5.845*** (-4.43)
<i>TOBINS_Q</i>	0.352* (1.77)	0.172 (0.90)	0.224 (1.18)
<i>ROA</i>		-2.887*** (-3.12)	-2.951** (-2.82)
<i>INST_OWNER</i>	3.116** (2.50)		2.561* (1.93)
<i>ANALYST</i>	0.181*** (4.23)	0.227*** (5.46)	
<i>_CONS</i>	16.614*** (17.26)	19.187*** (15.15)	18.618*** (14.41)
Year & Industry FE	Yes	Yes	Yes
N	1,080	1,080	1,080
Adj. R ²	0.41	0.41	0.40

Panel B: Corporate governance

This panel reports the results of regressing *IA_DISC* on the interaction between *IA_VALUE* and various proxies for corporate governance. The main independent variable of interest is the interaction variable. All models include the main control variables, as well as year and industry fixed effects. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>IA_DISC</i>	(2) <i>IA_DISC</i>
<i>IA_VALUE</i>	0.779** (2.85)	0.609** (2.14)
<i>HIGH_BOARD_INDEP</i>	1.936 (1.06)	
<i>HIGH_BOARD_INDEP#IA_VALUE</i>	-0.249 (-0.80)	
<i>HIGH_STOCK_COMP</i>		1.222 (0.47)
<i>HIGH_STOCK_COMP#IA_VALUE</i>		0.064 (0.16)
<i>TANG_ASSET</i>	-2.045*** (-6.31)	-2.262*** (-7.55)
<i>AGE</i>	-0.113* (-2.00)	-0.089 (-1.09)
<i>LEVERAGE</i>	-4.928** (-2.62)	-5.408 (-1.71)
<i>TOBINS_Q</i>	0.038 (0.16)	-0.239 (-1.18)
<i>ROA</i>	-5.052*** (-3.81)	2.992 (0.67)
<i>INST_OWNER</i>	3.705* (1.77)	-0.788 (-0.45)
<i>ANALYST</i>	0.153*** (3.61)	0.222*** (3.81)
<i>_CONS</i>	19.700*** (8.50)	23.519*** (7.98)
Year & Industry FE	Yes	Yes
N	576	349
Adj. R ²	0.38	0.40

Panel C: Proprietary cost

This panel reports the results of regressing *IA_DISC* on the interaction between *IA_VALUE* and various proxies for proprietary cost. The main independent variable of interest is the interaction variable. All models include the main control variables, as well as year and industry fixed effects. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>IA_DISC</i>	(2) <i>IA_DISC</i>	(3) <i>IA_DISC</i>
<i>IA_VALUE</i>	0.598*** (3.67)	0.701*** (4.57)	0.701*** (6.20)
<i>HIGH_LITIGATION</i>	9.135*** (5.80)		
<i>HIGH_LITIGATION#IA_VALUE</i>	-0.393* (-1.73)		
<i>HIGH_COMP_HHI</i>		3.680*** (3.64)	
<i>HIGH_COMP_HHI#IA_VALUE</i>		-0.331* (-1.75)	
<i>HIGH_COMP_SIMIL</i>			5.587*** (5.19)
<i>HIGH_COMP_SIMIL#IA_VALUE</i>			-0.591** (-2.68)
<i>TANG_ASSET</i>	-1.494*** (-6.40)	-1.771*** (-7.93)	-1.721*** (-8.02)
<i>AGE</i>	-0.106** (-2.21)	-0.093* (-1.73)	-0.085 (-1.63)
<i>LEVERAGE</i>	-5.119*** (-4.01)	-5.904*** (-4.62)	-5.303*** (-4.14)
<i>TOBINS_Q</i>	0.202 (1.06)	0.188 (0.92)	0.191 (0.91)
<i>ROA</i>	-2.566*** (-3.00)	-2.677** (-2.62)	-2.126** (-2.10)
<i>INST_OWNER</i>	2.845** (2.30)	2.375* (1.79)	2.359* (1.77)
<i>ANALYST</i>	0.171*** (4.98)	0.191*** (4.75)	0.203*** (4.71)
<i>_CONS</i>	14.359*** (10.00)	18.182*** (14.84)	17.342*** (15.12)
Year & Industry FE	Yes	Yes	Yes
N	1,080	1,056	1,065
Adj. R ²	0.44	0.42	0.42

Panel D: Managerial skill

This panel reports the results of regressing *IA_DISC* on the interaction between *IA_VALUE* and various proxies for managerial skill. The main independent variable of interest is the interaction variable. All models include the main control variables, as well as year and industry fixed effects. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>IA_DISC</i>	(2) <i>IA_DISC</i>	(4) <i>IA_DISC</i>
<i>IA_VALUE</i>	0.619*** (4.23)	0.006 (0.02)	0.203 (0.62)
<i>HIGH_SKILL</i>	3.535*** (2.99)		
<i>HIGH_SKILL#IA_VALUE</i>	-0.166 (-0.98)		
<i>SPECIALIST</i>		-3.478 (-1.12)	
<i>SPECIALIST#IA_VALUE</i>		0.502 (1.07)	
<i>LONG_TENURE</i>			-0.761 (-0.24)
<i>LONG_TENURE#IA_VALUE</i>			0.164 (0.36)
<i>TANG_ASSET</i>	-1.494*** (-4.34)	-2.262*** (-4.94)	-2.118*** (-4.92)
<i>AGE</i>	-0.135** (-2.22)	-0.169* (-1.91)	-0.066 (-0.69)
<i>LEVERAGE</i>	-4.440*** (-2.91)	-1.892 (-0.59)	-2.774 (-0.79)
<i>TOBINS_Q</i>	0.043 (0.20)	-0.328 (-0.98)	0.140 (0.67)
<i>ROA</i>	-3.359*** (-2.95)	4.864 (0.65)	-1.305 (-0.19)
<i>INST_OWNER</i>	1.877 (1.40)	-0.973 (-0.43)	-2.654 (-1.01)
<i>ANALYST</i>	0.189*** (3.63)	0.254*** (3.15)	0.276*** (3.55)
<i>_CONS</i>	17.515*** (10.72)	28.194*** (8.76)	24.714*** (7.63)
Year & Industry FE	Yes	Yes	Yes
N	921	277	249
Adj. R ²	0.40	0.36	0.36

Table 10: Consequences of credibility

This table reports the results on the consequences of credible and non-credible IA disclosure.

Panel A: Credible and non-credible classifications based on the tercile values of IA disclosure and IA value

This panel illustrates the classifications of the sample into credible and non-credible firms based on IA disclosure and IA value terciles. Credible firms, which exhibit alignment between their disclosure and IA value, form the majority of the sample (873 firms). The remaining 207 non-credible firms comprise of 110 cheap talk firms and 97 quiet firms. Cheap talk firms are in the highest tercile of disclosure but the lowest tercile of value. Quiet firms are in the lowest tercile of disclosure but the highest tercile of value.

		<i>IA_VALUE</i>		
		Low	Medium	High
<i>IA_DISC</i>	Low	<i>CREDIBLE</i>		<i>QUIET</i>
	Medium			
	High	<i>CHEAP_TALK</i>		

Panel B: Analyst forecast error and dispersion following credible and non-credible IA voluntary disclosure

This panel reports the results of regressing analyst EPS forecast error and dispersion in the quarter immediately following the disclosure on the *CREDIBLE*, *CHEAP_TALK*, and *QUIET* indicators. All models include the main control variables, as well as year and industry fixed effects. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Variable	(1) <i>Q1_FCAST</i> <i>_ERROR</i>	(2) <i>Q1_FCAST</i> <i>_ERROR</i>	(3) <i>Q1_FCAST</i> <i>_DISPERSION</i>	(4) <i>Q1_FCAST</i> <i>_DISPERSION</i>
<i>CREDIBLE</i>	-0.003* (-1.65)		-0.002** (-2.47)	
<i>CHEAP_TALK</i>		0.007* (1.65)		0.004** (2.22)
<i>QUIET</i>		0.000 (0.00)		0.001 (0.65)
<i>TANG_ASSET</i>	-0.004*** (-4.35)	-0.004*** (-4.07)	-0.002** (-2.69)	-0.002** (-2.55)
<i>AGE</i>	0.000* (1.87)	0.000* (1.87)	0.000 (0.60)	0.000 (0.67)
<i>LEVERAGE</i>	0.008 (1.33)	0.008 (1.37)	0.002 (0.88)	0.002 (0.98)
<i>TOBINS_Q</i>	-0.003*** (-3.69)	-0.003*** (-3.59)	-0.002*** (-3.99)	-0.002*** (-3.98)
<i>ROA</i>	-0.012* (-1.86)	-0.011* (-1.83)	-0.006 (-1.59)	-0.006 (-1.56)
<i>INST_OWNER</i>	-0.013** (-2.23)	-0.013** (-2.20)	-0.007 (-1.53)	-0.007 (-1.52)
<i>ANALYST</i>	-0.000** (-2.35)	-0.000** (-2.44)	-0.000 (-1.41)	-0.000 (-1.58)
<i>R_D</i>	0.005 (0.32)	0.004 (0.28)	0.001 (0.21)	0.001 (0.12)
<i>MISSING_R_D</i>	-0.000 (-0.13)	-0.000 (-0.08)	0.001 (0.61)	0.001 (0.65)
<i>AD</i>	-0.006 (-0.88)	-0.007 (-0.93)	0.030* (1.83)	0.030* (1.80)
<i>MISSING_AD</i>	0.001 (0.29)	0.001 (0.33)	0.001 (0.98)	0.001 (1.01)
<i>TRADING_VOL</i>	0.006*** (2.99)	0.006*** (2.97)	0.003** (2.11)	0.003** (2.12)
<i>SD_RET</i>	0.008 (0.55)	0.008 (0.52)	0.001 (0.07)	0.000 (0.03)
<i>_CONS</i>	-0.057** (-2.23)	-0.062** (-2.42)	-0.025* (-1.73)	-0.028* (-1.93)
Year & Industry FE	Yes	Yes	Yes	Yes
N	728	728	661	661
Adj. R ²	0.15	0.15	0.16	0.16

APPENDICES

Appendix A: Examples of IA voluntary disclosure

Below are excerpts of MD&A sections in 10-K documents with IA terms underlined:

3-Dimensional Pharmaceuticals Inc for the financial year ended December 31, 2001

“However, our present and future capital requirements depend on many factors, including:

- the level of research and development investment required to maintain and improve our technology position;
- our success rate or that of our collaborators in discovery and development efforts associated with milestones and royalties;
- the timing, willingness and success of our collaborators to commercialize our products, which would result in milestone payments and in royalties;
- costs of recruiting and retaining qualified personnel;
- costs of filing, prosecuting, defending and enforcing patent claims and other intellectual property rights;
- our need or decision to acquire or license complementary technologies or new targets, or acquire complementary businesses.”

PeopleSoft Inc for the financial year ended December 31, 2002

“Our intellectual property and proprietary rights may offer only limited protection. We consider certain aspects of our internal operations, and our software and documentation to be proprietary, and we primarily rely on a combination of patent, copyright, trademark and trade secret laws and other measures to protect our proprietary rights. Patent applications or issued patents, as well as trademark, copyright, and trade secret rights, may not provide significant protection or competitive advantage. We also rely on contractual restrictions in our agreements with customers, employees and others to protect our intellectual property rights.”

Pixar Inc for the financial year ended December 31, 2005

“In fiscal year 2006, we expect to spend approximately \$110 million to \$115 million, net of Disney’s film cost reimbursements, on capitalized film costs to fund our ongoing film projects under the Co-Production Agreement as well as Ratatouille and future projects, which will directly impact working capital.”

Appendix B: Examples of IA value in Purchase Price Allocation (PPA)

This appendix includes examples of PPA reported by acquirers, including the value allocated to IA.

The acquisition of Tivoli Systems Inc by IBM Corp on March 1, 1996

3. On March 1, 1996 the company acquired all outstanding shares of Tivoli Systems Inc. for approximately \$800 million (\$716 million in net cash). The company engaged a nationally recognized, independent appraisal firm to express an opinion on the fair market value of the assets acquired to serve as a basis for allocation of the purchase price to the various classes of assets. The company allocated the total purchase price as follows:

(Dollars in millions)

Tangible net assets	\$ 41
Identifiable intangible assets	60
Current software products	39
Purchased in-process research and development	417
Goodwill	280
Deferred tax liabilities related to identifiable intangible assets	(37)

Total	\$ 800
	=====

Purchased in-process research and development included the value of software products still in development stage and not considered to have reached technological feasibility. As a result of the valuation, the fairmarket value of the in-process research and development was determined to be \$417 million.

The acquisition of Allergan Inc by Actavis PLC on March 17, 2015

	Amount recognized as of the acquisition date	Weighted average useful lives (years)
<i>Definite lived assets</i>		
Restasis ®	\$ 3,970.0	4.0
Refresh® / Optive ®	2,720.0	7.6
Other Eye Care Products	6,690.0	4.2
Botox ®	22,570.0	8.0
Aczone ®	160.0	1.3
Other Skin Products	820.0	5.0
Other Aesthetics	6,370.0	6.0
Total CMP	43,300.0	6.7
Trade name	700.0	4.5
Customer relationships	1,050.5	3.4
Total definite lived assets	45,050.5	6.6
<i>In-process research and development</i>		
Eye Care	6,460.0	
Botox ®	810.0	
Aesthetics	2,620.0	
Other	1,120.0	
	11,010.0	
Total Intangible Assets	\$ 56,060.5	

Appendix C: IA Dictionary

Panel A: IA dictionary

This panel presents the IA dictionary derived from ASC 805 *Business Combinations*.

Marketing-related IA	Customer-related IA	Contract-based IA	Technology-based IA	Other IA
trademark	customer list	license	technology	intangible asset
brand	customer base	royalty	patent	intellectual property
logo	customer information	advertising contract	software	Artistic-related IA
private label	customer contract	construction contract	mask work	copyright
trade name	customer relationship	management contract	database	design
service mark	order backlog	service contract	title plant	play
trade dress		supply contract	trade secret	opera
masthead		operating lease	formula	ballet
domain name		permit	recipe	magazine
noncompetition		franchise	knowledge	newspaper
nondisclosure		operating right	research and development	music
		broadcast right	innovation	composition
		employment contract	invention	picture
		use right	discovery	video
		route authority		film
				television

Panel B: Generating the IA Dictionary from ASC 805 *Business Combinations*

This panel demonstrated the process of generating the IA dictionary from ASC 805 *Business Combinations*. The accounting standard provides guidance and examples of identifiable IA. The dictionary is built by reviewing the standard and extracting unambiguous IA-related nouns (underlined). Although the standard and the IA dictionary by extension are not exhaustive due to the firm-specific nature of IA, it encompasses the most commonly discussed and material IA for firms.

The accounting standard classifies artistic-related IA as a separate category, however, none of the acquirers in the sample report artistic IA value separately, likely due to the materiality threshold and the rarity of such assets. Consequently, artistic-related IA disclosure is included within the “Other IA” category, consistent with how the acquirers report the asset value.

The following terms were tallied but yielded a frequency count of zero in the sample, and, therefore, are not included: “collective mark,” “certification mark,” “standstill,” “literary work,” “song,” “lyric,” “advertising jingle,” “photograph.” The ambiguous term “book” is excluded from the IA dictionary due to “book value” being a commonly used term in corporate 10-K filings.

ASC 805 *Business Combinations*

805-20-55-13

The guidance is organized as follows:

- A. Marketing-related intangible assets
- B. Customer-related intangible assets
- C. Artistic-related intangible assets
- D. Contract-based intangible assets
- E. Technology-based intangible assets.

A. Marketing-Related Intangible Assets

805-20-55-14

Marketing-related intangible assets are primarily used in the marketing or promotion of products or services. Examples of marketing-related intangible assets are:

- a. Trademarks, trade names, service marks, collective marks, certification marks
- b. Trade dress (unique color, shape, package design)
- c. Newspaper mastheads
- d. Internet domain names
- e. Noncompetition agreements.

805-20-55-18

The terms brand and brand name, often used as synonyms for trademarks and other marks, are general marketing terms that typically refer to a group of complementary assets such as a trademark (or service mark) and its related trade name, formulas, recipes, and technological expertise.

B. Customer-Related Intangible Assets

805-20-55-20

Examples of customer-related intangible assets are:

- a. Customer lists

- b. Order or production backlog
- c. Customer contracts and related customer relationships
- d. Noncontractual customer relationships.

805-20-55-21

A customer list consists of information about customers, such as their names and contact information.

C. Artistic-Related Intangible Assets

805-20-55-29

Examples of artistic-related intangible assets are:

- a. Plays, operas, ballets
- b. Books, magazines, newspapers, other literary works
- c. Musical works such as compositions, song lyrics, advertising jingles
- d. Pictures, photographs
- e. Video and audiovisual material, including motion pictures or films, music videos, television programs.

D. Contract-Based Intangible Assets

805-20-55-31

Contract-based intangible assets represent the value of rights that arise from contractual arrangements. Customer contracts are one type of contract-based intangible asset. If the terms of a contract give rise to a liability (for example, if the terms of a customer contract are unfavorable relative to market terms), the acquirer recognizes it as a liability assumed in the business combination. Examples of contract-based intangible assets are:

- a. Licensing, royalty, standstill agreements
- b. Advertising, construction, management, service, or supply contracts
- c. Operating lease agreements of a lessor
- d. Construction permits
- e. Franchise agreements
- f. Operating and broadcast rights
- g. Servicing contracts such as mortgage servicing contracts
- h. Employment contracts
- i. Use rights such as drilling, water, air, timber cutting, and route authorities.

E. Technology-Based Intangible Assets

805-20-55-38

Examples of technology-based intangible assets are:

- a. Patented technology
- b. Computer software and mask works
- c. Unpatented technology
- d. Databases, including title plants
- e. Trade secrets, such as secret formulas, processes, recipes.

Panel C: IA Dictionary including plural forms, variations, and synonyms

This panel provides a comprehensive list of all IA terms captured, including plural forms of nouns, hyphenated words, and appropriate synonyms.

IA Dictionary	Terms captured	Source
Marketing-related IA		
trademark	trademark, trademarks trade-mark, trade-marks trade mark, trade marks	ASC 805
brand	brand, brands, branding	ASC 805
logo	logo, logos	Filipovic & Wagner (2021)
private label	private label, private labels	Filipovic & Wagner (2021)
trade name	trade name, trade names trading name, trading names business name, business names	ASC 805
service mark	service mark, service marks	ASC 805
collective mark	collective mark, collective marks	ASC 805
certification mark	certification mark, certification marks	ASC 805
trade dress	trade dress, trade dresses	ASC 805
masthead	masthead, mastheads	ASC 805
domain name	domain, domains	ASC 805
noncompetition	noncompete, noncompetes non-compete, non-competes non compete, non competes noncompetition, noncompetitions non-competition, non-competitions non competition, non competitions	ASC 805
nondisclosure	nondisclosure, nondisclosures non-disclosure, non-disclosures non disclosure, non disclosures confidentiality agreement, confidentiality agreements	Synonym
Customer-related IA		
customer list	customer list, customer lists client list, client lists user list, user lists consumer list, consumer lists patient list, patient lists subscriber list, subscriber lists	ASC 805
customer base	customer base, customer bases client base, client bases user base, user bases consumer base, consumer bases patient base, patient bases subscriber base, subscriber bases	Filipovic & Wagner (2021)
customer information	customer information client information user information consumer information patient information subscriber information	ASC 805

customer contract	customer contract, customer contracts client contract, client contracts user contract, user contracts consumer contract, consumer contracts patient contract, patient contracts subscriber contract, subscriber contracts	ASC 805
customer relationship	customer relationship, customer relationships customer relation, customer relations client relationship, client relationships client relation, client relations user relationship, user relationships user relation, user relations consumer relationship, consumer relationships consumer relation, consumer relations patient relationship, patient relationships patient relation, patient relations subscriber relationship, subscriber relationships subscriber relation, subscriber relations	ASC 805
order backlog	order backlog, order backlogs production backlog, production backlogs	ASC 805
Contract-based IA		
license	license, licenses, licensing	ASC 805
royalty	royalty, royalties	ASC 805
standstill	standstill, standstills	ASC 805
advertising contract	advertise contract, advertise contracts advertising contract, advertising contracts	ASC 805
construction contract	construction contract, construction contracts	ASC 805
management contract	management contract, management contracts managing contract, managing contracts	ASC 805
service contract	service contract, service contracts servicing contract, servicing contracts	ASC 805
supply contract	supply contract, supply contracts supplying contract, supplying contracts supplier contract, supplier contracts	ASC 805
operating lease	operating lease, operating leases	ASC 805
permit	permit, permits	ASC 805
franchise	franchise, franchises, franchising	ASC 805
operating right	operating right, operating rights	ASC 805
broadcast right	broadcast right, broadcast rights	ASC 805
employment contract	employment contract, employment contracts employee contract, employee contracts	ASC 805
use right	use right, use rights	ASC 805
route authority	route authority, route authorities	ASC 805
Technology-based IA		
technology	technology, technologies	ASC 805
patent	patent, patents, patenting	ASC 805
software	software	ASC 805
mask work	mask work, mask works	ASC 805
database	database, databases	ASC 805
title plant	title plant, title plants	ASC 805
trade secret	trade secret, trade secrets trade-secret, trade-secrets	ASC 805

formula	formula, formulas, formulae	ASC 805
recipe	recipe, recipes	ASC 805
knowledge	knowledge knowhow, know-how	Filipovic & Wagner (2021)
research and development	research and development, r&d	Filipovic & Wagner (2021)
innovation	innovation, innovations	Filipovic & Wagner (2021); Filip et al. (2022)
invention	invention, inventions	Filipovic & Wagner (2021)
discovery	discovery, discoveries	Filipovic & Wagner (2021)
Other IA		
intangible asset	intangible asset, intangible assets intangibles	ASC 805
intellectual property	intellectual property, intellectual properties	Synonym
Artistic-related IA		
copyright	copyright, copyrights	Filipovic & Wagner (2021)
design	design, designs	Filipovic & Wagner (2021)
play	play, plays	ASC 805
opera	opera, operas	ASC 805
ballet	ballet, ballets	ASC 805
magazine	magazine, magazines	ASC 805
newspaper	newspaper, newspapers	ASC 805
literary work	literary work, literary works	ASC 805
music	music	ASC 805
composition	composition, compositions	ASC 805
song	song, songs	ASC 805
lyric	lyric, lyrics	ASC 805
advertising jingle	advertising jingle, advertising jingles	ASC 805
picture	picture, pictures	ASC 805
photograph	photograph, photographs	ASC 805
video	video, videos	ASC 805
film	film, films	ASC 805
television	television, televisions	ASC 805

Appendix D: Validating the *IA_DISC* measure

This appendix presents the results of the *IA_DISC* measure validation tests, including the five alternative *IA_DISC* measures detailed in Appendix E. Panel A reports the association between marketing-related *IA_DISC* measures and the natural logarithm of one plus number of trademarks filed by the firm in the same fiscal year. Panels B to D report the association between technology-based *IA* disclosure measures and the natural logarithm of one plus number of patents, patent citations, and R&D expenditure in the same fiscal year. All models include the main control variables, as well as year and industry fixed effects, as described in Section 3.3. The panel data sample comprises 7,281 observations, which is larger than the main sample as it includes all target firm-years with a valid MD&A section. Variable definitions are provided in Appendix F. T-statistics, based on standard errors clustered by industry and year, are reported in parentheses below the coefficients. Statistical significance is indicated by *, **, and *** for the 10%, 5%, and 1% levels, respectively.

Panel A: Validating the marketing-related *IA_DISC* measure using trademarks

$$IA_DISC_MKTG_t = \beta_0 + \beta_1 LN_TRADEMARK_t + controls_t + Industry\ FE + Year\ FE + error\ term$$

Variable	(1) <i>IA_DISC</i> _MKTG	(2) <i>IA_DISC</i> _MKTG_ALT1	(3) <i>IA_DISC</i> _MKTG_ALT2	(4) <i>IA_DISC</i> _MKTG_ALT3	(5) <i>IA_DISC</i> _MKTG_ALT4	(6) <i>IA_DISC</i> _MKTG_ALT5
TRADEMARK	0.010*** (6.20)	0.020*** (6.01)	0.011*** (8.15)	0.001*** (6.33)	0.016*** (6.25)	0.038*** (5.04)
N	7,281	7,281	7,281	7,281	7,281	7,281
Adj. R ²	0.21	0.15	0.16	0.21	0.06	0.03
Controls & Constant	Yes	Yes	Yes	Yes	Yes	Yes
Year & Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Validating the technology-based *IA_DISC* measure using patents

$$IA_DISC_TECH_t = \beta_0 + \beta_1 LN_PATENT_t + controls_t + Industry\ FE + Year\ FE + error\ term$$

Variable	(1) <i>IA_DISC</i> _TECH	(2) <i>IA_DISC</i> _TECH _ALT1	(3) <i>IA_DISC</i> _TECH _ALT2	(4) <i>IA_DISC</i> _TECH _ALT3	(5) <i>IA_DISC</i> _TECH _ALT4	(6) <i>IA_DISC</i> _TECH _ALT5
PATENT	0.057*** (8.48)	0.042*** (8.99)	0.017*** (9.58)	0.008*** (10.24)	0.041*** (10.21)	0.045*** (8.43)
N	7,281	7,281	7,281	7,281	7,281	7,281
Adj. R ²	0.45	0.39	0.38	0.46	0.17	0.10
Controls & Constant	Yes	Yes	Yes	Yes	Yes	Yes
Year & Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Panel C: Validating the technology-based IA_DISC measure using patent citations

$$IA_DISC_TECH_t = \beta_0 + \beta_1 LN_CITE_t + controls_t + Industry\ FE + Year\ FE + error\ term$$

Variable	(1) IA_DISC_TECH	(2) $IA_DISC_TECH_ALT1$	(3) $IA_DISC_TECH_ALT2$	(4) $IA_DISC_TECH_ALT3$	(5) $IA_DISC_TECH_ALT4$	(6) $IA_DISC_TECH_ALT5$
<i>CITE</i>	0.034*** (10.83)	0.023*** (11.26)	0.009*** (12.44)	0.004*** (12.41)	0.022*** (10.96)	0.023*** (8.81)
N	7,281	7,281	7,281	7,281	7,281	7,281
Adj. R ²	0.46	0.39	0.39	0.47	0.18	0.10
Controls & Constant	Yes	Yes	Yes	Yes	Yes	Yes
Year & Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Panel D: Validating the technology-based IA_DISC measure using R&D expenditures

$$IA_DISC_TECH_t = \beta_0 + \beta_1 R\&D_t + controls_t + Industry\ FE + Year\ FE + error\ term$$

Variable	(1) IA_DISC_TECH	(2) $IA_DISC_TECH_ALT1$	(3) $IA_DISC_TECH_ALT2$	(4) $IA_DISC_TECH_ALT3$	(5) $IA_DISC_TECH_ALT4$	(6) $IA_DISC_TECH_ALT5$
<i>R&D</i>	0.927*** (9.91)	0.652*** (9.79)	0.189*** (6.96)	0.123*** (10.71)	0.286*** (5.83)	0.350*** (4.69)
<i>MISSING_R&D</i>	-0.250*** (-8.27)	-0.138*** (-7.84)	-0.033*** (-8.53)	-0.030*** (-8.83)	-0.114*** (-13.10)	-0.089*** (-7.44)
N	7,281	7,281	7,281	7,281	7,281	7,281
Adj. R ²	0.50	0.43	0.40	0.51	0.19	0.10
Controls & Constant	Yes	Yes	Yes	Yes	Yes	Yes
Year & Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

Appendix E: Calculation methods for the five alternative *IA_DISC* measures using various term weighting schemes

This appendix details the calculation of the primary and alternative *IA_DISC* measures using various term weighting schemes.

Measures	Term weighting schemes	Calculations
<i>IA_DISC</i>	sf	sentence frequency / number of sentences in the document * 100
<i>IA_DISC_ALT1</i>	tf	term frequency / document length * 100
<i>IA_DISC_ALT2</i>	tf.idf	term frequency * inverse document frequency / document length * 100
<i>IA_DISC_ALT3</i>	(Log) tf.idf	(1+ log (term frequency)) * inverse document frequency / document length * 100
<i>IA_DISC_ALT4</i>	tf.iif	term frequency * inverse industry frequency / document length * 100
<i>IA_DISC_ALT5</i>	tf.idf.iif	term frequency * inverse document frequency * inverse industry frequency / document length * 100

where:

- a document is an MD&A section in a 10-K filing.
- sf is the sentence frequency, measured as the count of sentences with at least one IA term.
- tf is the term frequency, measured as the count of IA terms.
- document length is the total number of words in the document, excluding non-alphabetic tokens and stop words.⁵⁵
- idf is the inverse document frequency, measured as $\log N/df$, with N representing the total number of documents in the corpus, df representing the number of the documents containing the IA term in the corpus.
- iif is the inverse industry frequency, measured as $\log N/df$, with N representing the total number of firm-year observations in the firm's industry, df representing the number of documents containing the IA term in that industry.

The paper constructs alternative measures of *IA_DISC* using different term weighting schemes. *IA_DISC_ALT1* reflects the importance of an IA term within a document, while *IA_DISC_ALT2* further adjusts for its rarity in the corpus using inverse document frequency. Following Li et al. (2021), *IA_DISC_ALT3* applies the log of term frequency. To capture industry variation since IA can be industry-specific, the paper also uses the inverse industry frequency, where *IA_DISC_ALT4* (*ALT5*) mirrors *IA_DISC_ALT1* (*ALT2*) but incorporates industry term rarity. Thus, the rarer an IA term in the corpus or industry, the higher the corresponding measure.

All *IA_DISC* measures, including the five alternatives, are highly correlated, as expected since they capture the same construct which is the extent of firms' voluntary IA disclosure. The academic literature finds mixed evidence on term weighting: Loughran and McDonald (2011) show improved regression fit, while Henry and Leone (2016) conclude that simple frequency measures already yield strong and replicable results. Overall, the main *IA_DISC* measure and its alternatives, weighted or unweighted, produce consistent empirical results.

⁵⁵ Stop words are frequently occurring words such as "the," "a," and "is," that are disregarded in textual analysis and information retrieval because they carry little semantic meaning. For a complete list of stop words, please refer to the Natural Language Toolkit (NLTK) library in Python.

Appendix F: Definition of Variables

This appendix contains definitions of the variables. Not listed in the table are the prefix *LN_* denotes the natural logarithm of one plus the value of the variable, prefix *HIGH_* and *LOW_* denote indicator variables above or below the median of the sample, and the suffixes *_ATL1* to *_ATL5* denotes the numbered alternative measures.

Panel A: IA disclosure

<i>Variable</i>	<i>Definition</i>
<i>NUM_MDA_SENT</i>	The number of MD&A sentences.
<i>IA_DISC</i>	The percentage of MD&A sentences containing at least one IA term.
<i>IA_DISC_MKTG</i>	The percentage of MD&A sentences containing at least one marketing-related IA term.
<i>IA_DISC_CUST</i>	The percentage of MD&A sentences containing at least one customer-related IA term.
<i>IA_DISC_CTRCT</i>	The percentage of MD&A sentences containing at least one contract-based IA term.
<i>IA_DISC_Tech</i>	The percentage of MD&A sentences containing at least one technology-based IA term.
<i>IA_DISC_OTH</i>	The percentage of MD&A sentences containing at least one artistic-related and other IA term.
<i>SPECIFIC</i>	The percentage of MD&A sentences containing at least one IA term and one specific term. Specific terms are entity names (e.g., persons, locations, organizations), quantitative values (e.g., percentages, dollar amounts), times, and dates, as defined by Hope et al. (2016).
<i>UNCERTAIN</i>	The percentage of MD&A sentences containing at least one IA term and one uncertain term. Uncertain terms are defined by Loughran & McDonald (2016).
<i>FORWARD</i>	The percentage of MD&A sentences containing at least one IA term and one forward-looking term. Forward-looking terms are defined by Li et al. (2010).
<i>RISK</i>	The percentage of MD&A sentences containing at least one IA term and one risk-related term. Risk-related terms are defined by Ibrahim (2019).
<i>SENTIMENT</i>	The percentage of MD&A sentences containing at least one IA term and classified as positive by the FinBERT Model (Huang et al., 2023) minus the percentage classified as negative.

Panel B: IA value

<i>Variable</i>	<i>Definition</i>
<i>DEALVALUE</i>	The value of the deal in the acquirer's Purchase Price Allocation (PPA).
<i>GOODWILL</i>	The value of goodwill in the acquirer's PPA.
<i>IA_VALUE</i>	The value of acquired IA in the acquirer's PPA.
<i>IA_VALUE_MKTG</i>	The value of acquired marketing-related IA in the acquirer's PPA.
<i>IA_VALUE_CUST</i>	The value of acquired customer-related IA in the acquirer's PPA.

<i>IA_VALUE_CTRCT</i>	The value of acquired contract-based IA in the acquirer's PPA.
<i>IA_VALUE_Tech</i>	The value of acquired technology-based IA in the acquirer's PPA.
<i>IA_VALUE_OTH</i>	The value of acquired other IA in the acquirer's PPA.
<i>BOOK_IA_VALUE</i>	The value of IA previously acquired by the target and reported on the target's balance sheet (Compustat "INTANO").
<i>NON_BOOK_IA_VALUE</i>	The value of internally generate IA not reported on the target's balance sheet (<i>IA_VALUE</i> - <i>BOOK_IA_VALUE</i>)
In regression analyses, all <i>IA_VALUE</i> variables are the natural logarithm of one plus the reported value to reduce skewness.	

Panel C: Target's characteristics

Variable	Definition
<i>ASSET</i>	Firm's total asset (Compustat "AT").
<i>TANG_ASSET</i>	Firm's tangible asset (Compustat "AT - INTAN"). In regression analyses, this variable is the natural logarithm of one plus the reported value.
<i>AGE</i>	Firm age (the number of years since a firm's first appearance in Compustat, or its IPO if the IPO occurred first).
<i>LEVERAGE</i>	The ratio of long-term debt over total asset (Compustat "DLTT/AT").
<i>TOBINS_Q</i>	Tobin's Q ratio (Market value of equity plus total assets minus book value of equity divided by total assets) (Compustat "(PRCC_F * CSHO + AT - CEQ) / AT").
<i>ROA</i>	The ratio of earnings before interest and tax over last year's total asset (Compustat "EBIT/AT").
<i>INST_OWNER</i>	The percentage of a firm's shares owned by institutional investors, averaged over the 4 quarters of a fiscal year.
<i>ANALYST</i>	Number of analysts following the firm.
<i>R&D</i>	R&D expense scaled by total asset (Compustat "XRD/AT").
<i>MISSING_R&D</i>	An indicator set to one if missing R&D expense (Compustat "XRD"), zero otherwise.
<i>SG&A</i>	Selling, general, and administrative expense scaled by total asset (Compustat "XSGA/AT").
<i>AD</i>	Advertising expense scaled by total asset (Compustat "XAD/AT").
<i>MISSING_AD</i>	An indicator set to one if missing advertising expense (Compustat "XAD"), zero otherwise.
<i>TRADEMARK</i>	Number of trademarks the firm filed in a fiscal firm year.
<i>PATENT</i>	Number of patents the firm filed in a fiscal firm year.
<i>CITE</i>	Number of citations received by filed and eventually granted patents in a firm year.
<i>ACQUIRED</i>	An indicator set to one if the firm-year represents the last year the acquired firm appears on Compustat, and zero otherwise.
<i>IMR</i>	The inverse Mills ratio, calculated as the normal density function over the normal cumulative distribution.
<i>IA_VALUE_EST</i>	Estimated IA value by capitalizing prior flows of R&D and SG&A expenditures using Ewens et al. (2024)'s parameters.
<i>HIGH_BOARD_INDEP</i>	An indicator set to one if the proportion of independent directors on the board is above the sample median, 0 otherwise.

<i>HIGH_STOCK_COMP</i>	An indicator set to one if the average proportion of executives' stock-based compensation is above the sample median, 0 otherwise. The average proportion of stock-based compensation per firm year is calculated as the sum of the Black-Scholes value of stock options and restricted stock grants divided by total compensation.
<i>HIGH_LITIGATION</i>	An indicator set to one if the firm's primary SIC code is in high-litigation-risk industries according to Koh et al. (2014): 2833–2836 (biotechnology), 3570–3577 or 7370–7374 (computers), 3600–3674 (electronics), or 5200–5961 (retailing), zero otherwise.
<i>HIGH_COMP_HHI</i>	An indicator set to one if the firm's HHI Market Concentration (Hoberg & Phillips, 2016) is below the sample median (i.e., lower concentration, more firms in the market, higher competition), 0 otherwise.
<i>HIGH_COMP_SIMIL</i>	An indicator set to one if the firm's Market Similarity (Hoberg & Phillips, 2016) is above the sample median (i.e., higher similarity with competitors, higher competition), 0 otherwise.
<i>HIGH_SKILL</i>	An indicator set to one if the CEO's Managerial Ability measure (Demerjian et al., 2012) is above the sample median, 0 otherwise.
<i>SPECIALIST</i>	An indicator set to one if the CEO's General Ability Index (Custodio et al., 2013) is below the sample median (i.e., low general ability is a specialist), 0 otherwise.
<i>LONG_TENURE</i>	An indicator set to one if the CEO's tenure is above the sample median, 0 otherwise.
<i>CHEAP_TALK</i>	An indicator set to one if the firm falls within the highest tercile of IA disclosure but the lowest tercile of IA value, zero otherwise.
<i>QUIET</i>	An indicator set to one if the firm falls within the lowest tercile of IA disclosure but the highest tercile of IA value, zero otherwise.
<i>NON-CREDIBLE</i>	An indicator set to one if $CHEAP_TALK == 1 \mid QUIET == 1$, zero otherwise.
<i>CREDIBLE</i>	An indicator set to one if $CHEAP_TALK == 0 \ \& \ QUIET == 0$, zero otherwise.
<i>TRADING_VOL</i>	The natural log of stock daily trading volume aggregated over the fiscal year.
<i>SD_RET</i>	The standard deviation of monthly stock returns over the fiscal year.
