The informational consequences of good and bad mergers

Journal of Corporate Finance 78 (2023) 102310

Contents lists available at ScienceDirect

Journal of Corporate Finance

journal homepage: www.elsevier.com/locate/jcorpfin

The informational consequences of good and bad mergers

Samer Adra [a], Leonidas G. Barbopoulos [b,*]

[a] University of Sheffield, United Kingdom
[b] University of Edinburgh, United Kingdom

ARTICLE INFO

Editor: M Bennedsen

JEL codes:
G14
G31
G34

Keywords:
Stock price informativeness
Endogenous information production
Mergers and acquisitions
Analyst coverage

ABSTRACT

We study the information production dynamics in financial markets in response to Mergers and Acquisitions (M&As) announcements. We find that acquirers with low levels of pre-announcement stock price informativeness experience a substantial increase in their corresponding post-announcement stock price informativeness in response to positive Cumulative Abnormal Returns (CAR). We show that this increase is due to the enhanced prospect of deal completion. By contrast, high levels of acquirer pre-announcement stock price informativeness limit traders' incentives to search for, and acquire, new information. We also find that similar dynamics apply to the changes in acquirers' analyst coverage. Emphasizing the important role of information acquisition costs in influencing informed trading, a positive acquirer CAR increases the acquiring firm's post-announcement stock price informativeness in M&As involving public rather than private and subsidiary targets. Overall, we show that M&As have important informational consequences beyond their immediate effects on stock prices.

1. Introduction

Inspired by the classical emphasis on the information production facilitated in secondary markets (Hayek, 1945), a large literature that has emerged in recent decades shows that the degree of a given firm's stock price informativeness plays a key role in guiding subsequent investment decisions (Durnev et al., 2004; Chen et al., 2007; Bakke and Whited, 2010; Subrahmanyam and Titman, 1999; Dow and Gorton, 1997). Despite the prevalence of a rich theoretical literature focusing on endogenous information production in secondary markets (Dow et al., 2017; Strobl, 2014), to this date empirical studies of how a firm's investments shape its subsequent informational environment are relatively sparse (Das et al., 2006; Dow et al., 2017). In this paper we are set to empirically test key theoretical predictions from the information production literature by examining how Mergers and Acquisitions (M&As) affect the acquiring firm's stock price informativeness in the post-announcement period. Specifically, we empirically test the theoretical predictions of the Dow et al. (2017) model in the realm of M&As.

The main objective of the Dow et al. (2017) model is to examine the endogenous choice of information production by equity investors regarding firms whose investment decisions are highly dependent on the stock market's feedback. A key insight of the Dow et al. (2017) model is that informed trading in a given firm's shares increases with the ex-ante profitability of the firm's investments. In particular, as high expected returns increase the likelihood that the firm will proceed with investments, the value of the firm's shares becomes more sensitive to the information collected by equity investors. This increases the equity investors' propensity to collect relevant information about the firm's business prospects, which ultimately enriches the firm's information environment in the

* Corresponding author.
E-mail addresses: samer.adra@sheffield.ac.uk (S. Adra), leonidas.barbopoulos@ed.ac.uk (L.G. Barbopoulos).

https://doi.org/10.1016/j.jcorpfin.2022.102310
Received 12 July 2021; Received in revised form 7 September 2022; Accepted 4 October 2022
Available online 14 October 2022

secondary market.

Dow et al. (2017) argue that M&As, due to their valuation-challenging and informationally demanding nature, as well as their strong influence on stock returns, offer a direct avenue to test the theoretical predictions of their model. By exploring the potential implications of their model on M&As, Dow et al. specifically predict that "price informativeness of the acquirer's stock after the announcement of the acquisition will be higher if the market reaction to the announcement is more positive" (pp. 899). We directly test this prediction by examining how the market's initial reaction to a given M&A announcement, as represented by the acquirer's Cumulative Abnormal Returns (CAR) around the announcement date, influences various proxies of informed trading in the acquirer's shares in the post-announcement period.

In testing this prediction, we recognize the importance of both the heterogenous distribution of informed trading in the acquirer's shares before the deal announcement (Baruch et al., 2017; Brennan et al., 2018), and the potential influence that this heterogeneity has on the gains and costs of information production on the margin (Grossman and Stiglitz, 1980; Dow et al., 2017; Kyle, 1985; Chen et al., 2022). In line with the marginal analysis of production decisions, Grossman and Stiglitz (1980) show that informed trading increases when its marginal gains potential is high. Prior research further shows that such gains are more pronounced when the financial assets are subject to limited market attention (Adra and Barbopoulos, 2018; Grossman and Stiglitz, 1980; Li and Yu, 2012).

In the context of our M&A-focused analysis, this condition holds true when the level of the acquiring firm's stock price informativeness prior to a given M&A announcement is relatively low, leaving significant room for equity investors to expand resources on information-based trading. By contrast, when the level of pre-announcement price informativeness is relatively high, there is limited incentive for further information search and acquisition, which alienates information-seeking investors.

Building on these theoretical insights, we predict that high acquirer CAR in the announcement period triggers an increase in the post-announcement price informativeness of the acquirer's shares when the marginal gains from information search and acquisition are relatively high, i.e., when the level of acquirer pre-M&A announcement stock price informativeness is relatively low. In line with Dow et al. (2017), we predict that the increase in stock price informativeness is attributed to the improved prospects of the deal's completion. In particular, we predict the rise in stock price informativeness to be concentrated between the deal's formal announcement date and its ultimate resolution. By contrast, when the level of pre-announcement stock price informativeness is relatively high, there is limited incentive for further information production by information-driven investors in the post-announcement period.

Our analysis of a comprehensive sample of domestic U.S. M&As announced between 1990 and 2016 provides strong empirical support for our predictions. Our primary proxy for stock price informativeness is the degree of price non-synchronicity proposed by Roll (1988) and applied in various studies (Adra and Barbopoulos, 2018; Bakke and Whited, 2010; Chen et al., 2007; Morck et al., 2013; Ouyang and Szewczyk, 2018). Consistent with our predictions, we find that acquirers receiving a strong positive CAR at the time of a given deal's announcement experience a subsequent increase in their corresponding stock price informativeness, compared to acquirers receiving a low or negative CAR. These effects are concentrated in the group of acquirers with low pre-announcement levels of stock price informativeness, where the marginal gains from information search and acquisition are relatively high.

Our main conclusion holds after employing two alternative proxies of stock price informativeness. The first proxy is the version of the microstructure-based Probability of Informed Trading (PIN) (Easley et al., 2002, 1997; Yan and Zhang, 2014) estimated by Brown and Hillegeist (2007). The second proxy is the Multimarket Information Asymmetry (MIA) developed by Johnson and So (2018) using the trading dynamics in the stock and options markets. *PIN* and *MIA* are estimated at quarterly and daily frequencies, respectively, which allows us to assess the evolution of price informativeness in a given acquirer's shares over different windows following a given deal's announcement. Lastly, as predicted by the Dow et al. (2017) model, the increase in stock price informativeness is driven by the increased prospects of deal completion after a positive market reaction. Along these lines, we find that the largest part of the growth in the acquirer's stock price informativeness is realized in the period leading to the deal's resolution.

We expand our analysis by examining the extent to which the acquirer CAR varies with specific deal and target characteristics. A key prediction from the Grossman and Stiglitz (1980) model is that stock price informativeness decreases when the fixed costs of informed trading are high. In the context of M&As, we predict that such fixed costs are significantly high in M&As involving private and subsidiary target firms. Put simply, relative to public companies, private companies are subject to weaker accounting reporting standards, which increase informational opacity and complicates the valuation process (Adra and Barbopoulos, 2019; Draper and Paudyal, 2006; Officer et al., 2009). The valuation of divested subsidiaries, in turn, is subject to similar informational challenges due to the requirement to isolate the subsidiary's business prospects from those of the parent company (Barbopoulos and Adra, 2016; Datar et al., 2001; Officer, 2007). Along these lines, equity investors' detailed investigations of specific valuations of private and subsidiary targets have limited spillover effects beyond the deal, as the targets' shares are not publicly traded. We therefore expect the costs of such investigations to deter investors from expanding their information search for private or subsidiary target M&As. Our results provide strong support for this conjecture. Emphasizing the relevance of public targets' stock price informativeness in shaping our results, we find that the positive effect of acquirer CAR on the acquirer's post-announcement stock price informativeness increases with the target firms' pre-announcement stock price informativeness within the subsample of public target M&As.

Finally, we extend our analysis to assess how the magnitude of acquirer CAR influences the number of analysts who follow the acquiring firm in the post-announcement period. We also examine how such effects vary with the level of pre-announcement acquirer analyst coverage. Extant evidence suggests that analysts tend to follow firms with strong underlying growth prospects (Das et al., 2006; McNichols and O'Brien, 1997). As M&As can significantly affect the growth prospects of acquiring firms (Fuller et al., 2002; Moeller et al., 2005; Nguyen and Phan, 2017), Das et al. (2006) show that analysts who follow publicly listed targets are more likely to follow the acquirer in the post-announcement period when the deal is associated with a positive CAR.

Our findings extend the conclusions of Das et al. (2006) by showing that the dynamics affecting the distribution of acquirer stock

price informativeness in the aftermath of M&As also affect the level of the acquirer's analyst coverage. In particular, acquirers with relatively low levels of pre-announcement analyst coverage experience a considerable rise in analyst coverage in the aftermath of a strong positive acquirer CAR. Specifically, a 10% increase in the acquirer CAR is, on average, associated with an up to 5% rise in the growth of the number of analysts that follow the acquirer in the post-announcement period relative to the pre-announcement period. Such effects are highly non-linear: the growth in analyst coverage exceeds 40% when the acquirer CAR exceeds one standard deviation in our sample.

We further show that the effect of high announcement period CAR on analyst coverage is largely driven by target firms' analysts migrating to the acquiring firm in the post-announcement period. While this reinforces our contribution, it is aligned with prior emphasis by Tehranian et al. (2014) on the importance of the transition of analyst coverage from the target to the acquirer.

Our results add a new dimension to the M&A literature by showing that the change in the acquirer's stock price informativeness is a direct by-product of the market's reaction to the deal announcement. The relevance of the firm's informational environment cannot be understated. In particular, the M&A literature is largely focused on the impact of M&As on shareholder wealth (Alexandridis et al., 2017) and examines the effect of a wide range of firm, deal, and other financial performance features on acquirer gains (Adra et al., 2020; Andre et al., 2004). However, both the level of acquirer stock price informativeness in the secondary market, as well as the level of acquirer analyst coverage, are key attributes of the firm's informational environment that are highly shaped by the market's reaction to M&As (i.e., the acquirer CAR). Such attributes are highly relevant for the firm's long-run sustainability.

With regards to the increased attention of equity investors, Subrahmanyam and Titman (1999) show that highly attentive equity investors can come across valuable, and perhaps previously overlooked, information about a company's growth prospects. Therefore, beyond being a mere sideshow reflecting information already available to corporate insiders, the prevailing equity prices allow managers to elicit new information that guides their subsequent investment decisions (Chen, 2007; Fresard, 2012).

The presence of strong analyst coverage, in turn, is highly consequential. In addition to conveying useful signals to equity investors about a firm's growth prospects (Hilary and Hsu, 2013; Joos et al., 2016; Tehranian et al., 2014), analysts contribute to the reduction of noise in the firm's share price (Schutte and Unlu, 2009), and provide effective outside scrutiny of the firm's performance (Bradley et al., 2017; Yu, 2008). Lastly, analyst coverage is found to also reduce auditing fees (Gotti et al., 2012).

The framework provided by our analysis reconciles the mixed insights from the established literature. While the rise in acquirer stock price informativeness prior to M&As announcements is predicted (Baruch et al., 2017; Brennan et al., 2018), studies such as Aktas et al. (2007) assume that such price informativeness declines after the announcements of M&As. Theoretically, however, Dow et al. (2017) predict that stock price informativeness can increase after formal corporate announcements when the corresponding market reaction predicts higher odds of the project's completion. Along similar lines, Brennan et al. (2018) suggest that equity investors can still trade based on public information after the deal's announcement.

By focusing on the marginal analysis based on the pre-announcement acquirer stock price informativeness and the various attributes of the deal, we provide the first explicit identification of the conditions that govern the degree of stock price informativeness following M&As announcements. In a broader sense, our paper is part of the emerging attempts aiming to empirically assess the predictions of theoretical information production models, such as Dow et al. (2017) and Chen et al. (2022).

We proceed as follows: in Section 2 we provide a background on the information amplification effects, its relevance to the market for corporate control, and our empirical predictions; in Section 3 we define and discuss our dataset; in Section 4 we present our results; and finally, in Section 5 we conclude.

2. The information amplification effects and empirical predictions

Building on the seminal work of Hayek (1945), equity markets are shown to successfully assimilate in stock prices the dispersed information about both the companies' growth prospects and the wider economy (Chen et al., 2007; Subrahmanyam and Titman, 1999). At both theoretical and empirical levels, stock prices are shown to aggregate the perspectives of traders who may have more (and better) information related to the company's prospects than the company's managers (Kau et al., 2008; Ouyang and Szewczyk, 2018; Subrahmanyam and Titman, 1999). Hence, equity markets – rather than being simple sideshows of the real economy (Morck et al., 1990) – are informationally effective to the point where they can guide corporate managers in making investment decisions.

Despite the high relevance of stock price informativeness, there is no reason to assume that its distribution is uniform across firms (Aslan et al., 2011). A rich set of theoretical models examines the endogenous choice of information production (Dow et al., 2017; Grossman and Stiglitz, 1980; Kyle, 1985). The underlying feature of these models is that, as in the case of regular goods and services, equity investors' propensity to increase their information search/acquisition and engage in information-based trading varies with the cost and benefit considerations on the margin. A key insight from the comparative static results of Grossman and Stiglitz (1980) is that the incentive for investing in information production is high when the number of equity traders interested in a given asset is low. Put simply, in the presence of a less informative price, those who invest in additional resources in information production can gain a significant edge compared to traders who don't.

As discussed in the Introduction section, the informationally challenging nature of M&As renders them an appropriate field for testing the theoretical predictions of information production models. The direct implication of the Grossman and Stiglitz (1980) model is that, other things held constant, acquirers with low pre-announcement stock price informativeness should experience a rise in their corresponding stock price informativeness after the announcement of M&As, as information-driven investors become highly incentivized to expand their information search to further assess a given deal's prospects and its implications on firm value.

Along these lines, Dow et al. (2017) further elaborate on how the sign of the market's initial assessment of investments influences the incentives for further information production in secondary markets. In their model, the firm's decision to proceed with an

investment partly depends on the information collected by equity investors and revealed in the stock price. Prior research on the market for corporate control supports this conjecture by showing that the decision to complete the deal depends, to a large extent, on an initial positive market reaction (Kau et al., 2008; Luo, 2005). However, equity investors' decision to invest significant resources in collecting additional information about the deal's prospect strongly depends on the project's expected profitability. The information collected about value-destroying projects has therefore limited speculative value, as such projects are unlikely to be completed (Strobl, 2014). Hence, a key prediction of the Dow et al. (2017) model is that the rise in informed trading is likely to be more pronounced for acquiring firms with a positive initial market response upon announcing their M&As.[1]

Applying the marginal considerations in information production from the Grossman and Stiglitz (1980) model to the realm of M&As, combined with the emphasis of Dow et al. (2017) on the stronger impact of positive market reaction on stock price informativeness, allows us to derive our main empirical prediction. Specifically, *we predict that a strong positive announcement-period market reaction to an acquiring firm's stock price increases this firm's post-announcement stock price informativeness when this firm's pre-announcement stock price informativeness is relatively low*. As predicted by the Dow et al. (2017) model, this rise in stock price informativeness is due to the increased odds of deal completion.

3. The dataset

3.1. M&A dataset

We employ a comprehensive M&A dataset that covers friendly domestic M&As announced by U.S. public companies between 1990 and 2016, and covered by the Securities Data Corporation (SDC). The starting year is chosen following the emphasis of Netter et al. (2011) on the superior coverage of M&A activity by SDC from early 1990s onwards. The ending year in the sample is chosen to allow for a sufficient period to execute analysis of the post-announcement variations in the acquirer's stock price informativeness and performance. We impose the following conventional restrictions on the sample:

1. The acquirer is a public (listed) firm.
2. The target is a public, private, or subsidiary firm.
3. The minimum deal value is $1 m.
4. The payment method used in the deal (cash, stock, a mix of both, or another payment method) is reported by SDC (i.e., deals with a 100% unknown method of payment are excluded from the sample).
5. The acquirer owns <10% of the target's shares before the deal and aims to control >50% of these shares via the acquisition.
6. The sample excludes restructurings, liquidations, bankruptcies, reverse takeovers, leveraged buyouts, going-private deals, and M&As involving firms in the government sector at either the acquirer or the target side.
7. The acquirer's stock price is reported by the Center for Research in Security Prices (CRSP) database for at least a year before, and a year after, the deal's announcement. The availability of the returns is essential to estimate the acquirer's level of non-synchronized trading (i.e., the stock price informativeness). We also require the acquirer's total assets, Tobin's Q, and Return-on-Assets to be available from COMPUSTAT for the same periods.

We also require that acquirers' returns for at least 30 weeks are available in CRSP for the year that precedes, and also for the year that follows, the year of a given deal's announcement. This requirement is necessary to facilitate the estimation of the degree of the acquirer's stock price informativeness before and after the announcement of M&A. Overall, 7105 deals satisfy the above sample selection criteria. Table 1 presents the annual distribution of our sample. In addition to the total number of deals (All), Panel A presents the annual distribution of deals based on the listing status of the target firm (i.e., public, private, or subsidiary), industry-diversifying M&As (i.e., acquirer and target having different first two-digit SIC codes), the deal's method of payment (i.e., cash, stock, or mixed), and withdrawn M&As. More than half of the deals covered in our sample (52.34%) involve private target firms. Moreover, 5.80% of the deals are withdrawn, which is slightly below the 8% figure reported by Luo (2005). At the industry level (Panel B), the largest share of the deals is in the hi-tech sector (24.74%), while the lowest share (1%) is in the real estate sector. In untabulated statistics, we find that 13.64% of the deals include a break-up fee agreement signed by the acquirer or the target, and 10.49% of the deals include deferred payments (earnout) provisions. Overall, the composition of our sample is similar to prior studies (see Adra et al. (2020)).

Table 2 presents the key descriptive statistics of the key (continuous) variables used in the paper. The main explanatory variable in our analysis is the acquirer's announcement period CAR, which is calculated as in Fuller et al. (2002). We estimate CAR as the sum of the daily differences between the company's returns and the returns of the corresponding market index (NYSE firms) over the 5-day event-window $(t-2, t+2)$ around the day of the deal's announcement (day $t=0$). Evidence suggests that M&As are value-increasing on average ($CAR = 2.51\%$). However, as in prior studies (Chang, 1998; Fuller et al., 2002; Kohers and Ang, 2001), untabulated results attribute this observation to the large shareholder gains associated with the acquisitions of unlisted (i.e., private and subsidiary) companies ($CAR = 2.89\%$ and $CAR = 3.75\%$ for private and subsidiary target deals, respectively) rather than public target acquisitions ($CAR = -0.43\%$).

We also report a wide range of variables used in prior studies. The acquirer's pre-acquisition Tobin's Q is calculated as the market

[1] The Dow et al. (2017) model has wide implications on business cycle analysis. Specifically, the model highlights an information amplification effect whereby a small deterioration in fundamentals can reduce the level of informed trading and future investments by firms.

Table 1
Annual distribution of the sample.

Panel A

Year	All	Public	Private	Subsidiary	Diversified	Cash	Stock	Mixed	Withdrawn
1990	133	34	50	49	71	36	47	50	13
1991	154	29	72	53	66	32	57	65	21
1992	205	34	110	61	92	51	74	80	15
1993	290	44	151	95	140	71	85	134	15
1994	376	79	198	99	170	94	118	164	32
1995	463	98	230	135	198	119	160	184	33
1996	429	84	235	110	188	97	167	165	37
1997	546	117	273	156	228	121	185	240	43
1998	533	121	289	123	221	133	163	237	37
1999	396	98	219	79	163	100	124	172	20
2000	265	46	164	55	103	66	96	103	15
2001	186	47	86	53	81	54	58	74	14
2002	162	16	90	56	56	64	25	73	9
2003	130	31	63	36	47	32	26	72	6
2004	184	33	106	45	63	97	24	63	8
2005	243	34	136	73	84	127	20	96	4
2006	256	31	145	80	101	146	12	98	3
2007	278	44	167	67	92	150	17	111	15
2008	252	43	138	71	90	137	15	100	18
2009	173	44	76	53	53	88	20	65	13
2010	194	36	93	65	62	126	10	58	9
2011	186	24	101	61	67	95	10	81	7
2012	199	34	100	65	73	107	9	83	5
2013	165	18	86	61	51	103	9	53	2
2014	230	36	126	68	73	115	21	94	9
2015	254	47	119	88	101	78	10	166	8
2016	223	43	96	84	89	64	8	151	1
N	7105	1345	3719	2041	2823	2503	1570	3032	412
%	100.00	18.93	52.34	28.73	39.73	35.23	22.10	42.67	5.80

Panel B

Year	Indus.	Health	Cons. Staples	Mater.	Media	Retail	Cons. Products	High Tech	Energy and Power	Telecom	Real Estate	Finance
1990	15	14	4	8	11	10	16	17	19	13	1	5
1991	21	25	6	13	5	6	15	18	28	10	2	5
1992	26	34	13	14	14	4	21	38	22	13	1	5
1993	39	50	14	17	26	17	29	36	26	12	8	16
1994	43	53	15	11	28	23	36	81	34	28	2	22
1995	37	77	18	25	45	29	54	86	38	33	5	16
1996	37	74	12	25	32	21	50	80	44	26	7	21
1997	46	65	19	29	45	27	70	124	54	31	8	28
1998	57	47	23	28	42	34	72	139	43	19	3	26
1999	46	32	8	13	34	20	59	107	34	23	3	17
2000	18	22	12	8	14	15	36	93	19	12	1	15
2001	12	16	6	3	9	11	24	67	12	14	2	10
2002	18	22	5	6	8	8	20	40	15	9	0	11
2003	7	24	2	1	5	9	19	40	7	8	1	7
2004	17	29	7	6	14	11	15	54	16	4	4	7
2005	20	42	9	8	12	12	26	80	11	10	3	10
2006	24	45	10	6	15	12	30	63	20	8	3	20
2007	22	51	10	9	14	13	25	80	23	16	2	13
2008	23	43	8	12	9	13	23	69	29	7	1	15
2009	15	34	2	8	5	3	17	67	8	8	1	5
2010	18	33	11	2	9	6	19	57	18	12	1	8
2011	20	36	8	14	7	6	16	52	15	7	2	3
2012	31	37	6	6	13	8	15	51	11	10	1	10
2013	21	39	9	8	11	8	12	44	5	3	0	5
2014	27	42	13	13	13	11	10	63	17	4	3	14
2015	35	51	11	13	21	11	21	58	18	5	0	10
2016	25	45	8	21	12	11	12	54	15	9	2	9
N	720	1082	269	327	473	359	762	1758	601	354	67	333
%	10.13	15.23	3.79	4.60	6.66	5.05	10.72	24.74	8.46	4.98	0.94	4.69

Panel A represents the annual distribution of U.S. domestic M&As between January 1st, 1990, and December 31st, 2016. For each year, we present the total number of deals, the target's listing status (public, private, or subsidiary), the number of diversified acquisitions (in which the acquirer and the target have different two-digit SIC codes), the number of deals that are fully settled in cash (Full Cash), the number of deals that are fully settled in stocks (Full Stock), the number of deals that are settled using a mix of cash and stocks or additional payment methods (Mixed), and the number of deals that are eventually withdrawn (Withdrawn). Panel B covers the yearly distribution of acquisitions based on the target's sector. The sectors covered by the SDC are: Industrials, Healthcare, Consumer Staples, Materials, Media and Entertainment, Retail, Consumer Products, Financials, High Technology, Energy and Power, Telecommunications, and Real Estate. *N* is the number of deals in each category. (%) is the percentage of deals in each category relative to the total number of deals.

Table 2
Descriptive statistics.

Variable	*N*	Mean	25th Percentile	Median	75th Percentile	SD
CAR (%)	7105	2.51	−3.03	0.83	6.03	14.70
Post_Info	7105	1.63	0.82	1.54	2.36	1.11
Pre_Info	7105	1.65	0.84	1.58	2.39	1.18
Δ*Info*	7105	−0.02	−0.85	−0.01	0.80	1.32
Tobin's Q	7105	2.81	1.676	2.219	3.165	1.96
Acquirer Size ($m)	7105	3930.79	57.78	242.08	1111.187	27,047.33
Stock Percentage (%)	7105	32.72	0.00	0.00	82.345	42.36
Number of Bidders	7105	1.02	1.00	1.00	1.00	0.17
Break-Up Fees (%)	7105	0.21	0.00	0.00	0.00	0.81
Toehold (%)	7105	0.02	0.00	0.00	0.00	0.38
Deal Value ($m)	7105	465.10	9.187	32.00	139.00	3499.44
Acquirer RoA (%)	7105	−1.93	−1.85	3.76	7.63	21.38
Relative Size	7105	0.48	0.05	0.15	0.44	0.78

This table represents descriptive statistics of each continuous variable in our original sample. For each variable, we report the total number of available observations, mean, 25th percentile, 50th percentile, 75th percentile, and the standard deviation (SD). All variables are winsorized at the 99th percentile. Please refer to Appendix 1 for a detailed description of the variables.

Table 3
Univariate analysis of the change in price non-synchronicity.

CAR Group	**(a)** $CAR < -1SD$	**(b)** $-1SD \leq CAR \leq 1SD$	**(c)** $CAR > 1SD$	**(c)-(a)**	**(c)-(b)**	**(b)-(a)**
			Panel A: *Pre_Info* < *Median*			
Δ*Info*	0.48*** ($N = 139$)	0.50*** ($N = 3016$)	0.82*** ($N = 398$)	0.34**	0.32***	0.02
			Panel B: *Pre_Info* ≥ *Median*			
Δ*Info*	−0.79*** ($N = 189$)	−0.55*** ($N = 2916$)	−0.46*** ($N = 447$)	0.33***	0.09	0.24**

This table presents the changes in the acquirer's level of price non-synchronicity after the deal's announcement under different groups defined by (a) the pre-announcement level of non-synchronicity, and (b) the magnitude of the market's reaction to the deal's announcement. Panel A presents the univariate analysis according to CAR-defined groups for deals where the acquirer's pre-announcement price non-synchronicity is lower than the median in the sample. In Panel B, this analysis is applied for deals where the acquirer's pre-announcement price non-synchronicity is higher than the median in the sample. The CAR-based groups are defined by negative CAR of more than a standard deviation in magnitude, levels between one standard deviation below 0 and one standard deviation above 0, and levels above a standard deviation. ***, **, and * represent significance at the 1%, 5% and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

value of equity plus book value of assets minus the book value of equity, divided by the recorded value of assets for the calendar year that precedes the year of the deal's announcement. The descriptive statistics for variables such as the acquirer's size, deal value, deal's relative size, percentage of the deal payment settled in stock, break-up fees as a percentage of the merging firms' valuations, and the level of pre-announcement toehold ownership of the target's shares by the acquirer are also reported. These statistics are consistent with descriptive statistics reported in prior studies (see Barbopoulos et al., 2020). In Appendix 1 we provide detailed descriptions of each variable.

3.2. Estimation of stock price informativeness and initial univariate results

In the context of Roll (1988) and other contributions, such as Chen et al. (2007), Durnev et al. (2003), and Morck et al. (2013), an increase in the part of the variation in returns that is not attributed to correlations with the market or industry returns can be attributed to non-synchronized trading by information-driven investors. One key advantage of the Roll (1988) approach is its intuitive and less

Table 4
Multivariate analysis of the variation in price non-synchronicity.

Dependent Variable	$\Delta Info$	$\Delta Info$	$\Delta Info$	$\Delta Info$
Sample used:	All	Excl. Multiple Bids	All	Excl. Multiple Bids
	(1)	(2)	(3)	(4)
CAR	0.006***	0.005**		
	(0.002)	(0.002)		
CAR × *Pre_Info*	−0.001**	−0.001*		
	(0.0005)	(0.0006)		
$CAR > 1SD$			0.398***	0.370***
			(0.083)	(0.019)
$(CAR > 1SD) \times Pre\_Info$			−0.113***	−0.094***
			(0.035)	(0.037)
$CAR < -1SD$			0.158	0.174
			(0.109)	(0.125)
$(CAR < -1SD) \times Pre\_Info$			−0.121***	−0.125***
			(0.046)	(0.053)
Pre_Info	−0.789***	−0.786***	−0.778***	−0.776***
	(0.013)	(0.014)	(0.015)	(0.015)
Break-Up Fees	0.033**	0.029**	0.011	0.008
	(0.017)	(0.012)	(0.016)	(0.018)
Earnout	0.060	0.083*	0.038	0.055
	(0.042)	(0.047)	(0.041)	(0.045)
ln(Deal Value)	−0.132***	−0.138***	−0.167***	−0.175***
	(0.008)	(0.009)	(0.008)	(0.009)
Tobin's Q	−0.055***	−0.048***	−0.070***	−0.069***
	(0.007)	(0.008)	(0.006)	(0.008)
Relative Size	0.022***	0.019****	0.116***	0.107***
	(0.006)	(0.006)	(0.015)	(0.017)
Full Stock	−0.010	−0.012	0.033	0.019
	(0.038)	(0.044)	(0.039)	(0.045)
Full Cash	−0.149***	−0.152***	−0.122***	−0.145***
	(0.044)	(0.047)	(0.032)	(0.036)
Private	0.015	0.029	−0.083**	−0.070
	(0.050)	(0.056)	(0.042)	(0.048)
Subsidiary	0.023	0.047	−0.038	−0.022
	(0.043)	(0.049)	(0.041)	(0.047)
Blockholder Formation	−0.039	−0.007	0.002*	0.002*
	(0.052)	(0.060)	(0.001)	(0.001)
Number of Bidders	0.098	0.068	0.109	0.072
	(0.074)	(0.087)	(0.080)	(0.096)
Acquirer RoA	−0.002***	−0.002***	−0.001	−0.001
	(0.0006)	(0.0007)	(0.001)	(0.001)
Toehold	0.007	−0.006	0.008	−0.003
	(0.033)	(0.037)	(0.023)	(0.027)
Diversified	0.057**	0.044	0.047*	0.032
	(0.026)	(0.030)	(0.027)	(0.030)
Intercept	1.951***	1.980***	2.060***	2.145***
	(0.105)	(0.121)	(0.111)	(0.129)
Industry Effects	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES
N	7105	5623	7105	5623
Adjusted R-Squared	0.23	0.24	0.25	0.26

The table presents four models explaining the impact of the announcement period CAR on the acquirer's information environment. Models (1) and (3) are estimated on the full sample of available observations. Models (2) and (4) are estimated on the subsample that excludes deals by acquirers with more than one announced deal per calendar year. The dependent variable is the change in the acquirer's level of price non-synchronicity after the deal's announcement relative to the level before the announcement. The standard errors reported in parentheses are corrected for heteroskedasticity. *N* indicates the number of observations. ***, **, and * represent significance at the 1%, 5% and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

assumptions-based nature compared to other, more sophisticated, measures based on finance-microstructure models (see Easley et al. (1997, 2002) for instance). Using weekly returns for the calendar year preceding, as well as the year following, the deal's announcement date, we estimate the following regression:

$$r_{i,t} - r_{f,t} = \alpha_1 + \alpha_2\left(r_{MKT,t} - r_{f,t}\right) + \alpha_3 r_{Sector,t} + \varepsilon_{i,t} \quad (1)$$

where $r_{i,\,t}$ is the weekly stock return of the acquirer in deal *i* over the specified pre- or post-announcement window, respectively, $r_{f,\,t}$ is the weekly return on the one-month U.S. treasury, $r_{MKT,\,t}$ is the weekly return on the NYSE index, and $r_{Sector,\,t}$ is the weekly stock return

on the corresponding Fama-French sector.

We calculate for the acquirer in deal i the price non-synchronicity for the calendar year that follows the deal's announcement as:

$$Post\_Info_i = ln\left(\frac{1 - R_i^2}{R_i^2}\right) \tag{2}$$

where R_i^2 measures the explanatory power of the regression specified in Eq. (1) based on post-announcement weekly data. Our analysis also employs the variable Pre_Info_i, which covers the pre-announcement degree of non-synchronized trading for the year that precedes the year of the deal's announcement. Our main dependent variable is $\Delta Info_i$ which is the difference between $Post\_Info_i$ and Pre_Info_i. Descriptive statistics of this variable are presented in Table 2.

Table 3 provides evidence from our initial univariate analysis that is generally supportive of our predictions. Our sample is divided evenly between deals having acquirers with relatively low *Pre_Info* (< Median) in Panel A and acquirers with relatively high *Pre_Info* (≥ Median) in Panel B. In each panel, we estimate the average $\Delta Info$ (=*Post_Info* − *Pre_Info*) for three groups defined by the acquirer CAR. The CAR-based groups are defined as follows: (a) by negative CAR of more than a standard deviation in magnitude, (b) between one standard deviation below 0 and one standard deviation above 0, and (c) above a standard deviation.

Two key findings are presented in Table 3 and are worth discussing. First, in line with our emphasis on the marginal analysis of information production decisions, deals with relatively low pre-announcement acquirer stock price informativeness (Panel A) experience post-announcement growth in price informativeness. By contrast, acquirers with high pre-announcement stock price informativeness (Panel B) experience noticeable declines in the corresponding price informativeness across the three CAR-based groups. Second, in line with the prediction of Dow et al. (2017), the rise in acquirer shares' price informativeness is more pronounced for acquirers with positive announcement period gains (CAR). Specifically, in the group of deals with low pre-announcement stock price informativeness (Panel A), acquirers with strong positive announcement period CAR (more than one standard deviation) experience considerably larger growth in stock price informativeness compared to acquirers receiving (a) a strong negative market reaction (=0.34), and (b) a relatively moderate market reaction (=0.32). The difference in the growth of stock price informativeness between the group of strong positive CAR and the remaining groups is equivalent to 20% of the average pre-announcement stock price informativeness.[2]

This suggests that a strong positive initial market reaction, despite the low pre-announcement stock price informativeness, is perceived by equity investors as a credible signal of future potential trading opportunities. In the context of Dow et al. (2017), the strong positive CAR suggests that the formal deal announcement conveys unanticipated and credible signals about the deal's high synergetic potentials, leading information-based investors to intensify their search for, and screening of, additional information. In the following section, we examine in great detail the determinants and the time frames of this rise in acquirer stock price informativeness.

It is also worth noting that the distribution of CAR for the groups of acquirers with low and high pre-announcement stock price informativeness is more skewed towards positive returns. For acquirers with low (high) pre-announcement stock price informativeness, deals that realize a CAR over one standard deviation represent roughly 11% (13%) of the sample. Further analysis suggests that this skewness is largely driven by deals with unlisted targets, which are known to be generally associated with high announcement period acquirer gains (Barbopoulos et al., 2020; Kohers and Ang, 2001; Officer et al., 2009).

4. Results and discussion

4.1. The impact of CAR on acquirer stock price informativeness

The evidence reported in Table 4 provides strong support for our main empirical prediction. Models (1) and (2) examine the variations in the acquirer's post-announcement level of stock price informativeness based on the following equation:

$$\Delta Info_i = \alpha_1 + \alpha_2 CAR_i + \alpha_3 CAR_i \times Pre\_Info_i + \sum_{j=1}^{k} \beta_j X_{ji} + \varepsilon_i \tag{3}$$

α_2, which we predict to be positive, presents the effect of CAR_i on the change in the acquirer's stock price informativeness, while α_3 captures how this effect varies with the acquirer pre-announcement stock price informativeness. We expect α_3 to be negative and significant to suggest that the effect of CAR_i on post-announcement stock price informativeness decreases (increases) with higher (lower) pre-announcement stock price informativeness. β_j is a vector of coefficients reflecting the effects of a diverse set of control factors.

Model (1) is estimated on the full sample, while Model (2) is estimated on a subsample that excludes acquirers that have announced more than one deal in a given calendar year, in order to avoid the conflating effects of multiple acquisitions. Both Models (1) and (2) show that the announcement period CAR_i is a positive predictor of the acquirer's post-announcement stock price informativeness when the level of pre-announcement stock price informativeness is low. This relation is significant at the<1% level. As evidenced by the negative coefficient of the Pre_Info_i variable, and in line with the emphasis on decreasing marginal gains from informed trading, the positive effect decreases with higher pre-announcement stock price informativeness.

[2] The average pre-announcement price informativeness in this group is 0.75, and the standard deviation is 0.6.

Table 5
Multivariate analysis of the acquirer's price non-synchronicity with emphasis on the target's information environment.

Dependent Variable	ΔInfo	ΔInfo	ΔInfo	ΔInfo
Sample used:	All	Excl. Multiple Bids	Public Target M&As	Public Excl. Multiple Bids
	(1)	(2)	(3)	(4)
CAR	0.012***	0.012***	0.007*	0.007*
	(0.003)	(0.003)	(0.004)	(0.004)
CAR × *Pre_Info*	−0.001*	−0.001*	−0.0008*	−0.0008*
	(0.0006)	(0.0006)	(0.0005)	(0.0005)
Pre_Info	−0.789***	−0.786***	−0.843***	−0.973***
	(0.013)	(0.014)	(0.031)	(0.041)
CAR × *Private*	−0.006**	−0.008***		
	(0.003)	(0.003)		
CAR × *Subsidiary*	−0.008***	−0.009***		
	(0.003)	(0.003)		
Private	−0.079**	−0.063		
	(0.042)	(0.049)		
Subsidiary	−0.027	−0.010		
	(0.043)	(0.048)		
CAR × *Pub_Targ_Info*			0.005***	0.004***
			(0.001)	(0.001)
Pub_Targ_Info			0.103***	0.009***
			(0.033)	(0.041)
Intercept	2.073***	2.158***	2.003***	1.988***
	(0.108)	(0.114)	(0.186)	(0.213)
Control Factors	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES
Adjusted R Squared	7105	5623	1136	937
N	0.39	0.39	0.42	0.41

The table presents four models explaining the impact of the announcement period CAR on the acquirer's information environment, with emphasis on how the CAR's effect varies with the target's information environment as represented by the listing status. The dependent variable is the change in the acquirer's level of price non-synchronicity after the deal's announcement relative to the level before the announcement. Model (1) is estimated on the full sample of available observations. Model (2) is estimated on the subsample that excludes deals by acquirers with more than one announced deal per calendar year. Models (3) and (4) are estimated on the subsample of public target acquisitions, and emphasize the relevance of the target's pre-acquisition price informativeness. The standard errors reported in parentheses are corrected for heteroskedasticity. *N* indicates the number of observations. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

To examine whether our effects are mainly driven by the stronger positive effects of large positive acquirer CAR_i (shown in Table 3), we present estimates in Table 4 based on the following specification:

$$\Delta Info_i = \alpha_1 + \alpha_2(CAR_i > 1SD) + \alpha_3(CAR_i > 1SD) \times Pre\_Info_i + \alpha_4(CAR_i < -1SD) + \alpha_5(CAR_i < -1SD) \times Pre\_Info_i + \sum_{j=1}^{k} \beta_j X_{ji} + \varepsilon_i \quad (4)$$

Eq. (4) explicitly disentangles the effects of large positive and negative acquirer CAR_i, using the intermediate CAR_i as the baseline case. Evidence from Model (3) (Table 4) confirms that the effect of large positive CAR_i on the acquirer post-announcement stock price informativeness is largely driven by the positive influence of high positive CAR_i, as predicted by the Dow et al. (2017) model. This evidence is aligned with our univariate results reported in Table 3, which show that the effect of high CAR_i on the acquirer's post-announcement stock price informativeness varies between 20% and 30% compared to its corresponding pre-announcement average. Emphasizing the decrease in the gains from informed trading opportunities on the margin with the degree of acquirer pre-announcement stock price informativeness, we find that both strong positive and negative acquirer CAR_i in the aftermath of high pre-announcement stock price informativeness are associated with a subsequent decrease in stock price informativeness. This result suggests that, other things held constant, strong market reactions for acquirers subject to high pre-announcement stock price informativeness leave limited room for further informed trading opportunities based on public information after the announcement.

In Appendix 2, we further address endogeneity concerns by re-estimating Models (1) and (2) from Table 4 by using an instrumental variable in a two-stage least square (2SLS) framework. Our main instrument for identifying wealth creation potentials in a given deal is the average acquirer CAR in deals announced in the three years preceding a given deal's announcement. This is guided by the Golubov et al. (2015) evidence reflecting strong underlying skills in the acquiring firm that influence the market's reaction to deal announcements, irrespective of the deal characteristics. We also provide additional evidence based on a subsample that does not include deals that overlap between the date acquirer's prior M&As and the window used to estimate the level of pre-announcement price

Table 6
Descriptive statistics of the additional information-related proxies.

Variable	*N*	Mean	25th Percentile	50th Percentile	75th Percentile	SD
Post_PIN (%)	5166	16.64	12.00	17.20	24.80	10.99
Pre_PIN (%)	5166	19.93	12.50	18.00	25.00	10.36
Post_MIA	1433	0.39	0.31	0.39	0.47	0.12
Pre_MIA	1433	0.38	0.29	0.38	0.45	0.12
Analysts Growth (%)	5159	16.59	−19.68	3.58	29.83	95.73

The table represents descriptive statistics of each additional proxy of the acquirer's information environment. For each variable, we report the total number of available observations, mean, 25th percentile, 50th percentile, 75th percentile, and the standard deviation (SD). All variables are winsorized at the 99th percentile.

informativeness. The overall evidence from this analysis shows a positive and larger effect of acquirer CAR on the post-announcement stock price informativeness, which further validates and supports our empirical prediction.[3]

Table 5 expands our analysis to cover how the change in informed trading varies with the target firm's listing status and informed trading levels. As discussed in the Introduction section, the fixed costs of information search and acquisition are considerably higher in deals involving private and subsidiary targets, hence reducing the effects of the initial market reaction on subsequent informed trading. The evidence from Models (1) and (2) (Table 5) strongly supports this conjecture by showing that the positive effect of CAR on Δ*Info* decreases in private and subsidiary target acquisitions relative to public target ones (i.e., baseline case). Models (3) and (4), which are estimated on the subsample that covers only M&As of public targets for which the pre-announcement stock price informativeness can be estimated, also support our main conjecture. In particular, the positive effect of the acquirer CAR on the acquirer post-announcement stock price informativeness increases significantly in deals where the target is subject to high (pre-announcement) stock price informativeness. This is aligned with the view that high informed trading in the target's shares reduces the costs of informed trading and incentivizes further information search by equity investors in response to a positive market reaction to a given deal's announcement.

4.2. Evidence with alternative informed trading proxies

Our main conclusion discussed in Section 4.1 suggests that acquirers with considerably low pre-announcement stock price informativeness experience a significant increase in post-announcement stock price informativeness following the announcement of wealth-creating M&As. We highlight the robustness of this conclusion by employing two additional proxies of informed trading. Our first alternative proxy for informed trading is the Probability of Informed Trading (*PIN*) measure estimated by Brown and Hillegeist (2007). These estimates are based on the Venter and De Jongh (2006) model, which relaxes the commonly used assumption that the arrivals of buy and sell orders are drawn from independent Poisson distributions. Instead, the arrival of these orders is modeled as a bivariate Inverse Gaussian Poisson process. These estimates are retrieved from Stephen Brown's website and become available with quarterly frequency from 1993 to 2010.[4] Table 6 provides the descriptive statistics of the acquirer's pre- and post-acquisition PINs, which are available for about 73% of our original sample.

Our second alternative proxy for informed trading is the Multimarket Information Asymmetry (*MIA*) measure developed by Johnson and So (2018). This measure exploits the trading dynamics between the options and equity markets to quantify the level of informed trading. The underlying assumption attached to this measure is that the relative trading levels between the options and equity markets are relatively stable in the absence of informed trading. While previous studies consider the options market as the only venue for information-driven investors (Cao et al., 2005; Roll et al., 2010), a distinctive feature of MIA is its treatment of abnormally high trading in one of these markets relative to the other as an indicator of significant informed trading activity.

The *MIA* of the acquirer in deal *i* on day *t* is calculated as:

$$MIA_{i,t} = \frac{\left|\frac{O_{i,t}}{S_{i,t}} - M_{i,t}\right|}{\frac{O_{i,t}}{S_{i,t}} + M_{i,t}} \tag{5}$$

$O_{i,t}$ is the volume of traded options of the shares of the acquirer in deal *i* on day *t*. $S_{i,t}$ is the volume of traded shares. $\frac{O_{i,t}}{S_{i,t}}$ is the option-to-stock volume ratio. $M_{i,t}$ is the average of $\frac{O_{i,t}}{S_{i,t}}$ in the absence of informed trading. The denominator is chosen to ensure that *MIA* is non-

[3] A Propensity Score Matching (PSM) analysis further validates our inferences, based on treatment effects estimated on a sample of comparable deals. Acquirers with low pre-announcement levels of price informativeness and a strong positive announcement period CAR experience significantly higher post-announcement price informativeness relative to comparable acquirers with low or negative CAR. The sharp increase in post-announcement price informativeness is roughly 20% higher relative to its corresponding pre-announcement level. Moreover, the application of the Rosenbaum (2002) sensitivity analysis suggests that our conclusions are relatively immune to the confounding effects of missing covariates. Specifically, a missing covariate should influence the odds of the deal receiving a strong positive CAR by >50% to alter our main conclusions. In contrast, higher pre-announcement acquirer price informativeness limits any additional post-announcement price informativeness. These results are unreported but available from authors upon request.

[4] We multiply the PINs by 100 to facilitate the interpretation of our results.

Table 7
Multivariate analysis of the variation in PIN and MIA.

Dependent Variable	Δ*PIN*	Δ*PIN*	Δ*PIN*	Δ*PIN*	Δ*MIA*	Δ*MIA*	Δ*MIA*	Δ*MIA*
Sample used:	All	Excl. Multiple Bids	All	Excl. Multiple Bids	All	Excl. Multiple Bids	All	Excl. Multiple Bids
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
CAR	0.048**	0.058***			0.002***	0.002*		
	(0.020)	(0.023)			(0.001)	(0.001)		
CAR × *Pre_PIN*	−0.003***	−0.003***						
	(0.001)	(0.001)						
Pre_PIN	−0.503***	−0.504***	−0.492***	−0.490***				
	(0.013)	(0.024)	(0.021)	(0.024)				
CAR > 1*SD*			5.648***	6.737***			0.148**	0.128**
			(1.089)	(1.273)			(0.068)	(0.061)
(*CAR* > 1*SD*) × *Pre_PIN*			−0.243***	−0.284***				
			(0.044)	(0.050)				
CAR < −1*SD*			1.270	1.393			0.019	0.012
			(1.989)	(2.234)			(0.014)	(0.016)
(*CAR* < −1*SD*) × *Pre_PIN*			0.011	0.013				
			(0.119)	(0.130)				
CAR × *Pre_PIN*					−0.008***	−0.007**		
					(0.002)	(0.003)		
Pre_MIA					−0.455***	−0.473***	−0.255***	−0.278***
					(0.027)	(0.031)	(0.025)	(0.029)
(*CAR* > 1*SD*) × *Pre_MIA*							−0.387**	−0.387**
							(0.168)	(0.168)
(*CAR* < −1*SD*) × *Pre_MIA*							−0.216**	−0.216**
							(0.111)	(0.111)
Break-Up Fees	−0.117	−0.122	−0.112	−0.093	0.007*	0.007*	0.003	0.003
	(0.139)	(0.160)	(0.133)	(0.154)	(0.004)	(0.004)	(0.003)	(0.003)
Earnout	0.523	0.108	0.415	0.114	0.011	−0.002	0.014**	0.014**
	(0.382)	(0.441)	(0.412)	(0.473)	(0.008)	(0.010)	(0.007)	(0.007)
ln(Deal Value)	−1.248***	−1.395***	−1.504***	−1.662***	−0.012***	−0.012***	−0.009***	−0.009***
	(0.072)	(0.086)	(0.086)	(0.101)	(0.002)	(0.002)	(0.001)	(0.001)
Tobin's Q	−0.589***	−0.622***	−0.686***	−0.732***	−0.006***	−0.006***	−0.005***	−0.006***
	(0.055)	(0.069)	(0.062)	(0.076)	(0.001)	(0.002)	(0.002)	(0.002)
Relative Size	0.319***	0.325***	0.510***	0.506***	0.006*	0.008*	0.009**	0.010**
	(0.088)	(0.103)	(1.141)	(1.173)	(0.003)	(0.005)	(0.005)	(0.005)
Full Stock	−0.684**	−0.750**	−0.843**	−0.986**	−0.001	−0.007	0.001	0.001
	(0.312)	(0.375)	(0.358)	(0.434)	(0.009)	(0.010)	(0.008)	(0.006)
Full Cash	−0.978***	−0.941**	−0.607*	−0.643*	−0.009	−0.004	−0.001	−0.001
	(0.374)	(0.439)	(0.317)	(0.372)	(0.009)	(0.010)	(0.006)	(0.006)
Private	−1.348***	−1.206**	−1.711***	−1.428***	0.015*	0.019**	0.005	0.005
	(0.428)	(0.499)	(0.399)	(0.471)	(0.008)	(0.010)	(0.006)	(0.004)
Subsidiary	−0.752**	−0.377	−1.074***	−0.746	0.014*	0.016*	0.009	0.009
	(0.372)	(0.435)	(0.394)	(0.457)	(0.007)	(0.009)	(0.006)	(0.006)
Blockholder Formation	0.030**	0.029**	0.023*	0.028*	−0.018*	−0.013	0.001	0.001
	(0.014)	(0.014)	(0.013)	(0.015)	(0.011)	(0.013)	(0.001)	(0.001)
Number of Bidders	0.167	0.243	0.138	0.358	0.004	0.003	0.010	0.013
	(0.548)	(0.679)	(0.465)	(0.594)	(0.013)	(0.014)	(0.010)	(0.010)
Acquirer RoA	−0.018***	−0.018***	−0.016***	−0.015**	0.001	0.001	−0.001	−0.001
	(0.005)	(0.006)	(0.007)	(0.008)	(0.001)	(0.001)	(0.001)	(0.001)
Toehold	−0.047	−0.112	−0.051	−0.121	0.004	0.006	0.003	0.001
	(0.292)	(0.347)	(0.301)	(0.360)	(0.006)	(0.007)	(0.003)	(0.003)
Diversified	0.256	0.177	0.195	0.109	0.004	0.003	0.005	0.005
	(0.224)	(0.263)	(0.358)	(0.310)	(0.005)	(0.006)	(0.004)	(0.004)
Intercept	14.943***	16.056***	17.631***	18.914***	0.222***	0.234***	0.141***	0.151***
	(0.869)	(1.048)	(1.036)	(1.235)	(0.023)	(0.027)	(0.022)	(0.026)
Industry Effects	YES	YES	YES	YES	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES	YES	YES	YES	YES
Adjusted R Squared	0.26	0.26	0.26	0.26	0.18	0.18	0.18	0.17
N	5166	4684	5166	4684	1433	1049	1433	1049

The table presents eight models explaining the impact of the announcement period CAR_i on the acquirer's information environment. The change in the acquirer's price informativeness is presented by the change in PIN in Models (1) to (4) and the change in MIA in Models (5) to (8). Models (1), (3), (5), and (7) are estimated on the full sample of available observations. Models (2), (4), (6), and (8) are estimated on the subsample that excludes deals by acquirers with more than one announced deal per calendar year. The standard errors reported in parentheses are corrected for heteroskedasticity. *N* indicates the number of observations. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

negative and that it is convergent to one in extreme cases when all trading is focused on either the options or the stock markets. We retrieve the daily *MIA* estimates from Travis Johnson's website. These estimates are available for a rich set of firms in the CRSP database between 1996 and 2016. We calculate the average *MIA* for the year that precedes the year of the deal's announcement. We label this variable as *Pre_MIA*. Similarly, the average *MIA* for the calendar year that follows the year of the deal's announcement is labeled as *Post_MIA*. The descriptive statistics in Table 6 show that the pre- and post-acquisition *MIA* are available for about 20% of the deals covered in our sample.

The evidence presented in Table 7 is generally aligned with the insights derived from Table 4. That is, evidence based on both *PIN* and *MIA* suggests that acquirers with low pre-announcement informed trading based on both measures experience a significant post-announcement increase in stock price informativeness in response to a positive CAR.

4.3. The immediate effects on stock price informativeness and the prospects of completion

A direct prediction of the Dow et al. (2017) model is that the increase in stock price informativeness in response to positive announcement period CAR is driven by the increased prospects of deal completion. We support this prediction based on evidence discussed in this section and also in Appendix 3.[5] In particular, we further expand our analysis of the post-announcement changes in stock price informativeness across two windows: (a) the period between two days after the deal's announcement and the expected date of deal resolution (completion or withdrawal), and (b) the period from the deal's completion to the 252 trading days after the deal's announcement. The average number of days to deal resolution in our sample is 68, which is lower than the 103 days reported in Giglio and Shue (2014).

In our estimates, ΔMIA_1 represents the differences between the average daily *MIA* during the 68-day window and the pre-announcement *MIA*. In turn, ΔPIN_1 represents the differences between the *PIN* level in the quarter that follows the quarter of the deal's announcement and the *PIN* level in the quarter preceding the deal's announcement. ΔMIA_2 represents the difference between *MIA* in the period from 68 to 252 days after the deal's announcement and the *MIA* level in the period from 2 to 68 days after the deal's announcement. ΔPIN_2, in turn, represents the difference between the average *PIN* in the second, third, and fourth quarter after the deal's announcement and the *PIN* level in the quarter that immediately follows this announcement. If the rise in informed trading in response to a positive CAR is largely driven by the increased prospects of deal completion, as predicted by Dow et al. (2017), the largest part of this rise should be pronounced in the period before the deal's formal resolution. Our findings reported in Table 8 supports this prediction.

The last four models in Table 8 examine the changes in daily *MIA* using windows with varying sizes.[6] In Models (9) and (10) we assess for each deal how the announcement period CAR influences the changes in *MIA* until the date of the deal's completion/withdrawal relative to the *MIA* level three days prior to the deal's announcement. In turn, in Models (11) and (12), we assess how the average *MIA* from the day of the completion/withdrawal to 252 after the deal's announcement changes relative to the pre-announcement *MIA*. To ensure that the 5-day CAR $(-2, +2)$ is realized before the deal's conclusion, we exclude from our sample the deals that are completed/withdrawn within the two days following the deal's announcement. The evidence from these models is supportive of our initial insights, suggesting that the positive influence of CAR on the acquirer's post-announcement stock price informativeness is largely attributed to the period prior to the deal's formal conclusion.

4.4. Effect on analyst coverage

To further examine the direct informational implications beyond conventional informed trading proxies, we proceed by collecting the acquirers' analyst-following data from the I/B/E/S database for the year of, and the year following, the deal's announcement. This data is available for 5159 deals in our sample. We construct the variable *Analyst Growth*, which measures the growth (in percentage terms) in the number of analysts who follow the acquiring firm from the year of the deal's announcement to the year that follows. If M&As that are positively perceived by the market increase the incentive for information production, we expect to find that more analysts will follow the acquirer in the year following the deal's announcement.

We examine how announcement period gains (CAR) influence the allocation of analysts across firms. Results reported in Table 9. In Model (1), we find that a one standard deviation increase (decrease) in the announcement period CAR predicts up to a 7% increase (decrease) in the number of analysts following the acquirer. This effect is halved, but remains weakly significant, in Model (2), which excludes multiple bids during the same year. The positive effect of the acquirer CAR on the growth of analysts-following the acquirer further testifies to the impact of value-creating M&As on the richness of the firm's information environment.

Emphasizing the requirement to account for the effect of discontinuities and non-linearities in the effect of CAR on analyst

[5] The main insight from Appendix 3 is that the negative effect of strong positive CAR on the likelihood of deal withdrawal is focused in the subsample of acquirers with low pre-announcement stock price informativeness.

[6] In alternative estimations, we examine how the changes in the acquirer's performance in the aftermath of M&As influence the acquirer's long-term price efficiency. Our proxy for the low-frequency acquirer-specific level of price informativeness is the relative efficiency measure developed by Dávila and Parlatore (2021). To measure firm-level operating performance, we follow an approach proposed by Ben-David et al. (2022) by estimating the acquirer-specific abnormal Return-On-Assets (RoA). The general conclusion from our estimation is that the improvement in corporate performance following M&As is associated with a subsequent increase in the pricing efficiency of the acquirer's shares. These results are unreported but available from authors upon request.

Table 8
Multivariate analysis of informed trading using small daily windows.

Dependent Variable:	ΔPIN_1	ΔPIN_1	ΔPIN_2	ΔPIN_2	ΔMIA_1	ΔMIA_1	ΔMIA_2	ΔMIA_2	$\Delta VarMIA_1$	$\Delta VarMIA_1$	$\Delta VarMIA_2$	$\Delta VarMIA_1$
Sample used:	All	Excl. Multiple Bids	All	Excl. Multiple Bids	All	Excl. Multiple Bids	All	Excl. Multiple Bids	All	Excl. Multiple Bids	All	Excl. Multiple Bids
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
CAR	0.093**	0.108***	−0.046	−0.053	0.002**	0.002***	0.001	0.001	0.003**	0.002***	0.000	0.001
	(0.039)	(0.043)	(0.034)	(0.039)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
CAR × *Pre_PIN*	−0.004***	−0.005***	0.001	0.001								
	(0.001)	(0.002)	(0.001)	(0.001)								
Pre_PIN	−0.400***	−0.403***	−0.052**	−0.053*								
	(0.026)	(0.030)	(0.025)	(0.030)								
CAR × *Pre_MIA*					−0.007***	−0.008***	−0.001	−0.001	−0.008***	−0.008***	−0.001	−0.001
					(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)	(0.001)	(0.003)
Pre_MIA					−0.199***	−0.225***	−0.070***	−0.049*	−0.289***	−0.267***	−0.057**	−0.061**
					(0.021)	(0.025)	(0.027)	(0.028)	(0.020)	(0.028)	(0.030)	(0.028)
Intercept	12.677***	12.983***	2.599**	3.061**	0.114***	0.128***	0.023	0.016	0.126***	0.132***	0.023	0.021
	(1.185)	(1.461)	(1.055)	(1.291)	(0.020)	(0.023)	(0.026)	(0.032)	(0.031)	(0.018)	(0.026)	(0.030)
Control Factors	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	5166	4684	5166	4684	1433	1049	1433	1049	1140	883	1140	883
Adjusted R-Squared	0.15	0.14	0.01	0.01	0.09	0.11	0.01	0.01	0.09	0.11	0.01	0.01

The table presents eight models examining how the CAR's effect on subsequent changes in the acquirer's price informativeness varies after the deal's announcement. The average period until the deal's resolution in our sample is 68 days, which is equivalent to roughly one quarter. In Models (1) and (2), based on quarterly PIN data, the dependent variable is the difference between the acquirer's PIN in the quarter following the announcement and the equivalent PIN level in the quarter preceding the announcement. In Models (3) and (4), the dependent variable is the difference between the acquirer's average PIN from the second to the fourth quarter after the announcement and the equivalent level in the first quarter after the announcement. In Models (5) and (6), the dependent variable is the difference between the acquirer's average daily MIA from 3 to 68 days after the announcement and the acquirer's pre-announcement MIA. In Models (7) and (8), the dependent variable is the difference between the acquirer's average MIA 68 to 252 days after the announcement and the equivalent level 3 days before the announcement. *N* indicates the number of observations. In Models (9) and (10), the dependent variable is the difference between (a) the acquirer's average daily MIA on a varying window from 3 days after the announcement to the day of the deal's conclusion (completion or withdrawal), and (b) the MIA level 3 days before the announcement. In Models (11) and (12), the difference between (a) the acquirer's average daily on a varying window from the day of the deal's conclusion (completion or withdrawal) to 252 days after the announcement, and (b) the MIA level 3 days before the announcement. To ensure that the changes in informed trading on these dynamic windows occur after the realization of the acquirer's CAR, we exclude deals that were completed within the two days that follow the acquisition's announcement. We also exclude deals that are completed/withdrawn after 252 trading days of the day of the deal's announcement. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 9
Multivariate analysis of the growth in analyst following.

Dependent Variable:	*Analyst_Growth*	*Analyst_Growth*	*Analyst_Growth*	*Analyst_Growth*	*Analyst_Growth*	*Analyst_Growth*
Sample used:	All	Excl. Multiple Bids	All	Excl. Multiple Bids	All	Excl. Multiple Bids
	(1)	(2)	(3)	(4)	(5)	(6)
CAR	0.468***	0.283*				
	(0.121)	(0.173)				
$CAR > 1SD$			11.627**	9.287*	64.488***	45.764*
			(5.041)	(5.023)	(21.644)	(25.242)
$(CAR > 1SD) \times ln(1 + Pre\_Analysts)$					−10.354***	−7.514**
					(3.422)	(3.067)
$CAR < -1SD$			−2.658	0.812	9.753	13.638
			(6.971)	(8.151)	(30.190)	(33.684)
$(CAR < -1SD) \times ln(1 + Pre\_Analysts)$					−2.466	−2.520
					(4.503)	(4.999)
$ln(1 + Pre\_Analysts)$					−18.501***	−20.335***
					(1.147)	(1.359)
Pre_Info	1.330	2.281	2.382*	3.028*	−4.205***	−3.827**
	(1.506)	(1.562)	(1.392)	(1.648)	(1.417)	(1.676)
Break-Up Fees	3.530**	3.224*	2.139	1.801	3.336*	2.810
	(1.760)	(1.722)	(2.061)	(2.388)	(2.022)	(2.331)
Earnout	0.698	4.268	0.974	2.797	2.297	4.651
	(4.552)	(5.116)	(4.312)	(5.218)	(4.275)	(5.078)
ln(Deal Value)	−2.643***	−2.457**	−2.935***	−4.036***	4.375***	5.288***
	(0.731)	(1.057)	(0.887)	(1.097)	(0.975)	(1.179)
Tobin's Q	−0.429	−0.404	−0.727	−0.172	1.124	2.187**
	(0.701)	(0.987)	(0.809)	(1.030)	(0.798)	(1.017)
Relative Size	2.211*	3.681*	7.815***	9.010***	0.339	1.710
	(1.361)	(1.990)	(2.214)	(2.783)	(2.197)	(2.748)
Full Stock	−7.532*	−13.172**	−7.830*	−11.594**	−15.333***	−18.096***
	(4.422)	(5.451)	(4.622)	(5.649)	(4.451)	(5.435)
Full Cash	−8.234*	−9.119*	−7.049*	−7.397*	2.497	2.410
	(4.508)	(5.611)	(3.653)	(4.398)	(3.579)	(4.301)
Private	−1.886	−3.933	−6.361	−6.989	7.220*	6.503
	(4.205)	(6.058)	(4.638)	(5.540)	(4.500)	(5.389)
Subsidiary	−1.707	−4.592	−7.629*	−8.211	1.112	0.516
	(3.849)	(5.405)	(4.554)	(5.400)	(4.446)	(5.259)
Blockholder Formation	0.150	−0.143	0.152	−0.138	−0.252	−0.575***
	(0.185)	(0.227)	(0.186)	(0.227)	(0.182)	(0.222)
Number of Bidders	−5.066	−5.546	−4.080	−4.738	−10.277	−9.177
	(5.454)	(8.767)	(7.225)	(8.877)	(7.043)	(8.641)
Acquirer RoA	−0.160	−0.147	−0.165*	−0.094	−0.193**	−0.164*
	(0.108)	(0.101)	(0.089)	(0.105)	(0.088)	(0.101)
Toehold	5.366	7.555**	5.920**	7.276**	5.502*	7.174**
	(7.481)	(3.605)	(3.098)	(3.592)	(3.020)	(3.493)
Diversified	−0.754	0.731	−0.165	0.562	−2.651	−1.402
	(2.748)	(3.634)	(2.862)	(3.432)	(2.791)	(3.339)
Intercept	29.734***	30.745**	28.942***	26.520**	120.484***	123.687***
	(10.519)	(13.126)	(10.913)	(13.783)	(12.429)	(14.458)
Industry Effects	YES	YES	YES	YES	YES	YES
Year Effects	YES	YES	YES	YES	YES	YES
N	5159	3976	5159	3976	5159	3976
Adjusted R-Squared	0.02	0.02	0.02	0.01	0.06	0.07

The table presents six models explaining the impact of the announcement period CAR on the growth in the number of analysts following the acquirer. Models (1), (3), and (5) are estimated on the full sample of available observations. Models (2), (4), and (6) are estimated on a subsample that excludes deals by acquirers with more than one announced deal per calendar year. Models (1) and (2) focus on the effects of continuous CAR levels while Models (4) to (6) focus on the impact of large positive and negative market reactions that exceed a standard deviation in magnitude. The standard errors reported in parentheses are corrected for heteroskedasticity. *N* indicates the number of observations. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

coverage, we separate the effect of strong positive and negative CAR using dummy variables in Models (3) and (4). The evidence from both models suggests that the positive effect of the continuous CAR variable of analyst coverage is largely driven by the positive influence of large positive CAR rather than the negative influence of large negative ones. Models (5) and (6) further show that the dynamics governing the variations of stock price informativeness are also applicable to the changes in analyst coverage.

Lastly, we explore the dynamics governing the analyst coverage of the acquirer in response of the market's assessment of the deal (i.

Table 10
The effect of the market's reaction on analyst retention from the target firm.

Dependent Variable:	*ln*(1 + *Targ_Analysts_Migrating*)	*ln*(1 + *Post_Analysts*)− *ln*(1 + *Targ_Analysts_Migrating*)
Sample used:	All	All
	(1)	(2)
CAR > 1*SD*	0.503**	0.080
	(0.207)	(0.349)
(*CAR* > 1*SD*) × *ln* (1 + *Pre_Analysts*)	−0.107***	−0.042
	(0.036)	(0.046)
CAR < − 1*SD*	−0.088	0.089
	(0.127)	(0.273)
(*CAR* < − 1*SD*) × *ln* (1 + *Pre_Analysts*)	0.014	−0.017
	(0.021)	(0.046)
ln(1 + *Pre_Analysts*)	0.127***	0.648***
	(0.017)	(0.035)
Pre_Info	−0.036***	−0.037
	(0.014)	(0.031)
Break-Up Fees	0.032***	0.032
	(0.013)	(0.031)
Earnout	0.188	0.531
	(0.124)	(0.421)
ln(Deal Value)	0.074***	−0.159***
	(0.011)	(0.025)
Tobin's Q	−0.009	0.044***
	(0.007)	(0.017)
Relative Size	−0.031***	0.057
	(0.012)	(0.040)
Full Stock	−0.028	−0.115
	(0.039)	(0.080)
Full Cash	0.037	−0.156**
	(0.042)	(0.080)
Number of Bidders	0.015	−0.071
	(0.047)	(0.077)
Acquirer RoA	−0.001*	−0.001
	(0.000)	(0.002)
Toehold	0.017	−0.061
	(0.024)	(0.065)
Diversified	−0.091***	0.038
	(0.029)	(0.060)
Intercept	−0.626***	1.782***
	(0.106)	(0.244)
Industry Effects	YES	YES
Year Effects	YES	YES
N	1221	1221
Adjusted R-Squared	0.26	0.63

This table presents two models explaining the shift of analyst coverage from the target (prior to the deal-announcement date) to the acquirer (after the deal-announcement date). Model (1) explains the number of analysts who covered the target in the year preceding the deal's announcement and subsequently followed the acquirer in the year following this announcement. Model (2) explains the different between the aggregate level of post-announcement analyst coverage of the acquirer and the newly added analysts retained from the target. The standard errors reported in parentheses are corrected for heteroskedasticity. *N* indicates the number of observations. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

e., the CAR). Results are reported in Table 10. In particular, we focus on the subsample of public-to-public acquisitions to assess the extent to which the target analysts shift their coverage to the acquirer after the deal, based on the data reported in the I/B/E/S database. Table 10 presents two models in which we keep the same functional form as in Model (5) of Table 9. In Model (1), the dependent variable is the natural logarithm of one plus the number of analysts who (a) followed the target (and not the acquirer) before the deal's announcement and, (b) have shifted their coverage to the acquirer (from the public target) in the year following the deal's announcement.

Model (1) provides two key insights. First, high positive CAR is significantly associated with an increase in the number of target analysts shifting their coverage to the acquirer in the post-announcement period. This is aligned with prior evidence by Tehranian et al. (2014). Second, in line with our emphasis on the diminishing gains from information production, we show that a high level of pre-announcement analyst coverage reduces the target analysts' incentives to follow the acquirer after the deal. The dependent variable in Model (2) is the difference between the aggregate level of acquirer analyst coverage in the post-announcement period and the level of acquirer analyst coverage retained from the target firm (from the pre- to the post-announcement period). The main insight from this model is that neither the level of CAR nor its interaction with the acquirer pre-announcement level of analyst coverage

explain this difference. Accordingly, the most significant part of the rise in analyst coverage in response to positive CAR is largely attributed to the new analysts who previously covered the target firm. Moreover, these analysts are the most responsive to the level of pre-acquisition analyst coverage in determining whether they will shift their coverage to the acquiring firm.

5. Conclusion

We assess how the market's reaction to Mergers and Acquisitions (M&As) influence the acquiring firm's stock information environment by focusing on the variation in two key attributes of the acquiring firm: the information production in the secondary market, and the level of analyst coverage. Building on insights from the theoretical literature on information production (Dow et al., 2017; Grossman and Stiglitz, 1980), we provide robust evidence showing that a positive initial acquirer stock market reaction to a given M&A increases the post-announcement stock price informativeness in the acquiring firm that is subject to limited pre-announcement stock price informativeness. We find that this effect is largely driven by the increased prospects of deal completion, as predicted by Dow et al. (2017). Such information production in response to the positive market reaction is also more pronounced when the target firm is publicly traded rather than an unlisted (i.e., private and subsidiary) one, as the fixed costs of information production are relatively higher for unlisted firms.

Our analysis of the level of analyst following suggests similar dynamics, as acquirers with a low pre-announcement degree of analyst coverage experience significantly higher analyst coverage after strong positive initial reactions to their deals. Overall, our paper provides novel insights into the dynamics governing the link between pre- and post-announcement information production in M&As. Overall, we find that M&As have important informational consequences beyond their immediate effects on stock prices.

Data availability

Data will be made available on request.

Acknowledgements

We are grateful for helpful comments and suggestions from Morten Bennedsen (the editor), Anthony Saunders, Jeffrey Wurgler, and participants at finance seminar series of the University of Liverpool, University of Sheffield, University of Cardiff, Pontifical Catholic University of Parana in Brazil, Sao Paolo, and the Financial Management Association 2020 annual (virtual) meeting. For a thorough proof reading of the paper, we thank Micaela Maftei. Any remaining errors are ours

Appendix 1. Variables' definitions

Variable	Definition	Source
CAR (%)	The acquirer's 5-day $(t-2, t+2)$ announcement period cumulative abnormal returns. The abnormal return each day is the difference between the firm's returns and the value-weighted returns of NYSE firms.	CRSP + Authors' Estimations
$CAR > 1SD$	Dummy = 1 if CAR exceeds one standard deviation in our sample, and 0 otherwise.	CRSP + Authors' Estimations
$CAR < -1SD$	Dummy = 1 if CAR is smaller than the product of minus one times the level of CAR standard deviation in our sample, and 0 otherwise.	CRSP + Authors' Estimations
$\widehat{CAR}_1$	The acquirer's average CAR in deals announced over the prior three years preceding the deal's announcement.	CRSP + Authors' Estimations
$\widehat{CAR}_2$	The acquirer's average CAR in deals announced in the third year preceding the deal's announcement	CRSP + Authors' Estimations
Post_Info	The acquirer's degree of non-synchronized trading in the year that follows the deal's announcement.	CRSP + Authors' Estimations
Pre_Info	The acquirer's degree of non-synchronized trading in the year that precedes the deal's announcement.	CRSP + Authors' Estimations
$\Delta Info$	*Post_Info* − *Pre_Info*	CRSP + Authors' Estimations
Post_PIN (%)	The acquirer's average probability of informed trading in the year following the year of the deal's announcement.	Stephen Brown's Website
Pre_PIN (%)	The acquirer's average probability of informed trading in the calendar year preceding the year of the deal's announcement.	Stephen Brown's Website
ΔPIN	*Post_PIN* − *Pre_PIN*	Stephen Brown's Website
Post_MIA	The average MIA of the acquirer during the year (+3;+252) that follows the year of the deal's announcement.	Travis Johnson's Website
Pre_MIA	The average MIA of the acquirer during the year (−3;-252) that precedes the year of the deal's announcement.	Travis Johnson's Website
ΔMIA	*Post_MIA* − *Pre_MIA*	Travis Johnson's Website

(*continued on next page*)

(*continued*)

Variable	Definition	Source
Pre_Analysts	The number of analysts who follow the acquirer in the calendar year preceding the year of the acquisition.	I/B/E/S
Post_Analysts	The number of analysts who follow the acquirer in the calendar year that follows the year of the acquisition.	I/B/E/S
Trg_Analysts_Migrating	The number of analysts who covered the target in the year preceding the deal's announcement and subsequently followed the acquirer in the year following this announcement.	I/B/E/S
Analyst_Growth (%)	The growth in the number of analysts following the acquirer from the year of the deal's announcement to the year that follows this announcement.	I/B/E/S
Earnout	Dummy = 1 if the deal includes a deferred payment (earnout), and 0 otherwise.	SDC
Tobin's Q	The acquirer's Tobin's Q in the calendar year preceding the year of the deal's announcement.	Compustat
Toehold (%)	The percentage of the target's shares held by the acquiring firm 6 months before the deal's announcement.	SDC
Diversified	Dummy = 1 if the acquirer and the target have different two-digit SIC codes, and 0 otherwise (Focused).	SDC
Blockholder Formation	Dummy = 1 if the share of a private target acquisition settled in stocks exceeds 5% of the combined equity value of the merging firms, and 0 otherwise.	SDC
Deal Value ($m)	The total value of the transaction in millions of dollars.	SDC
Acquirer RoA (%)	The acquirer's Return on Assets (RoA) in the calendar year preceding the year of the deal's announcement.	Compustat
Relative Size	The deal value divided by the acquirer's pre-acquisition market valuation.	SDC
Full Stock	Refers to the group of deals fully settled in stocks.	SDC
Full Cash	Refers to the group of deals fully settled in cash.	SDC
Mixed	Refers to the group of deals settled in a mix of cash and stock, or alternative payment methods.	SDC
Public	Dummy = 1 if the target is a public firm, and 0 otherwise.	SDC
Private	Dummy = 1 if the target is a private firm, and 0 otherwise.	SDC
Subsidiary	Dummy = 1 if the target is a subsidiary firm, and 0 otherwise.	SDC
Acquirer Size ($m)	The value of the acquirer's total assets in the calendar year preceding the year of the deal's announcement.	Compustat
Stock Percentage (%)	The percentage of the deal payment that is settled in stock.	SDC
Number of Bidders	The number of bidders expressing interest in the target at the time of the deal's announcement.	SDC
Pub_Targ_Info	The pre-announcement level of informed trading in the shares of the public targets in the sample.	CRSP + Authors' Estimations
Break-Up Fees (%)	The total value of termination fee payments committed by the acquirer and the target, as a percentage of the combined value of the merging firms (Deal Value + Acquirer Size).	SDC
Withdrawn	Dummy = 1 if the deal is withdrawn, and 0 otherwise.	SDC
ΔPIN_1	The difference between (a) the acquirer's PIN in the quarter following the announcement, and (b) the PIN level in the quarter preceding the announcement.	Stephen Brown's Website
ΔPIN_2	The difference between (a) the acquirer's average PIN from the second to the fourth quarter after the announcement, and (b) the PIN level in the first quarter after the announcement.	Stephen Brown's Website
ΔMIA_1	The difference between (a) the acquirer's average daily MIA from 3 to 68 days after the announcement, and (b) the MIA level 3 days before the announcement.	Travis Johnson's Website
ΔMIA_2	The difference between (a) the acquirer's average daily MIA 68 to 252 days after the announcement, and (b) the MIA level 3 days before the announcement.	Travis Johnson's Website
$\Delta VarMIA_1$	The difference between (a) the acquirer's average daily MIA on a varying window from 3 days after the announcement to the day of the deal's conclusion (completion or withdrawal), and (b) the MIA level 3 days before the announcement.	Travis Johnson's Website
$\Delta VarMIA_2$	The difference between (a) the acquirer's average daily on a varying window from the day of the deal's conclusion (completion or withdrawal) to 252 days after the announcement, and (b) the MIA level 3 days before the announcement.	Travis Johnson's Website

Appendix 2. Addressing endogeneity based on instrumental variables

Dependent Variable	ΔInfo	ΔInfo	ΔInfo
Sample used:	All	Excl. Multiple Bids	Excl. Overlaps
	(1)	(2)	(3)
$\widehat{CAR}_1$	0.019***	0.019***	
	(0.007)	(0.007)	
$\widehat{CAR}_1 \times$ *Pre_Info*	−0.001**	−0.001*	
	(0.005)	(0.007)	
$\widehat{CAR}_2$			0.015***
			(0.006)
$\widehat{CAR}_2 \times$ *Pre_Info*			−0.001**
			(0.005)
Pre_Info	−0.801***	−0.794***	−0.847***
	(0.015)	(0.017)	(0.013)
Intercept	2.137***	2.232***	2.871***
	(0.117)	(0.109)	(0.119)
Control Factors	YES	YES	YES
Industry Effects	YES	YES	YES
Year Effects	YES	YES	YES
Adjusted R-Squared	0.38	0.39	0.34
N	6323	5008	4512

The three models reported in this table replicate the specification of Model (1) in Table 4. In Models (1) and (2), the announcement period CAR being instrumented via $\widehat{CAR}_1$, which is the acquirer's average CAR in deals announced over the prior three years. Model (3) is estimated on a subsample that ensures no overlap between the instrument and the pre-announcement informed trading levels. The announcement period CAR is instrumented in Model (3) via $\widehat{CAR}_2$, which is the acquirer's average CAR in deals announced exclusively in the third year preceding the deal's announcement. To satisfy the no-overlap condition on this subsample, we require that the acquiring firms do not announce deals two years prior to the M&A announcement. The overall evidence suggests a positive and significant effect that is three to four times larger than the effects documented without using an instrument.

Appendix 3. The likelihood of deal withdrawal

Dependent Variable	Withdrawn = 1 Completed = 0	Withdrawn = 1 Completed = 0
Sample	Low *Pre_Info*	High *Pre_Info*
	(1)	(2)
(*CAR* > 1*SD*)	−0.699**	0.194
	(0.327)	(0.202)
(*CAR* < − 1*SD*)	−0.112	0.029
	(0.376)	(0.309)
Pre_Info	0.114	0.006
	(0.153)	(0.086)
Intercept	−0.911**	−1.282***
	(0.459)	(0.411)
Control Variables	YES	YES
Industry Effects	YES	YES
Year Effects	YES	YES
N	3552	3553
Pseudo R-Squared	0.21	0.14

The two Logit models presented in this table predict the likelihood of deal withdrawal based on the magnitude of the announcement period CAR. Model (1) is estimated on the group of deals with lower-than-median levels of acquirer pre-announcement price informativeness. Model (2) is estimated on the group of deals with higher-than-median acquirer pre-announcement price informativeness. The control variables are the same as the ones used in Model (1) (Table 4). ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively. Please refer to Appendix 1 for an accurate description of the variables.

References

Adra, S., Barbopoulos, L.G., 2018. The valuation effects of investor attention in stock-financed acquisitions. J. Empir. Financ. 45, 108–125.
Adra, S., Barbopoulos, L.G., 2019. Liquidity and information asymmetry considerations in corporate takeovers. Eur. J. Financ. 25, 724–743.
Adra, S., Barbopoulos, L., Saunders, A., 2020. The impact of monetary policy on M&A outcomes. J. Corp. Finan. 62, 101529.
Aktas, N., De Bodt, E., Declerck, F., Van Oppens, H., 2007. The PIN anomaly around M&A Announcements. J. Financ. Mark. 10, 169–191.
Alexandridis, G., Antypas, N., Travlos, N., 2017. Value Creation from M&As: new evidence. J. Corp. Finan. 45, 632–650.
Andre, P., Kooli, M., L'Her, J.-F., 2004. The long-run performance of mergers and acquisitions: evidence from the Canadian stock market. Financ. Manag. 33, 27–43.
Aslan, H., Easley, D., Hvidkjaer, S., O'hara, M., 2011. The characteristics of informed trading: implications for asset pricing. J. Empir. Financ. 18, 782–801.
Bakke, T.-E., Whited, T.M., 2010. Which firms follow the market? An analysis of corporate investment decisions. Rev. Financ. Stud. 23, 1941–1980.
Barbopoulos, L., Adra, S., 2016. The earnout structure matters: takeover premia and acquirer gains in earnout financed M&As. Int. Rev. Financ. Anal. 45, 283–294. https://doi.org/10.1016/j.irfa.2016.04.007.
Barbopoulos, L.G., Adra, S., Saunders, A., 2020. Macroeconomic news and acquirer returns in M&As: the impact of investor alertness. J. Corp. Finan. 64, 101583.
Baruch, S., Panayides, M., Venkataraman, K., 2017. Informed trading and Price discovery before corporate events. J. Financ. Econ. 125, 561–588.
Ben-David, I., Bhattacharya, U., Jacobsen, S.E., 2022. The (Missing) Relation Between Announcement Returns and Value Creation. Natl. Bur. Econ. Res. No. w27976 https://www.nber.org/papers/w27976.
Bradley, D., Gokkaya, S., Liu, X., 2017. Are all analysts created equal? Industry expertise and monitoring effectiveness of financial analysts. J. Account. Econ. 62, 179–206.
Brennan, M.J., Huh, S.-W., Subrahmanyam, A., 2018. High-frequency measures of informed trading and corporate announcements. Rev. Financ. Stud. 31, 2326–2376.
Brown, S., Hillegeist, S.A., 2007. How disclosure quality affects the level of information asymmetry. Rev. Acc. Stud. 12, 443–477.
Cao, C., Chen, Z., Griffin, J.M., 2005. Informational content ofoOption volume prior to takeovers. J. Bus 78 (3), 1073–1109.
Chang, S., 1998. Takeovers of privately held targets, methods of payment, and bidder returns. J. Financ. 53, 773–784. https://doi.org/10.1111/0022-1082.315138.
Chen, S.-S., 2007. Does monetary policy have asymmetric effects on stock returns? J. Money, Credit, Bank. 39, 667–688.
Chen, Q., Goldstein, I., Jiang, W., 2007. Price Informativeness and investment sensitivity to stock Price. Rev. Financ. Stud. 20, 619–650.
Chen, D., Ma, Y., Martin, X., Michaely, R., 2022. On the fast track: information acquisition costs and information production. J. Financ. Econ. 143 (2), 794–823.
Das, S., Guo, R., Zhang, H., 2006. Analysts' selective coverage and subsequent performance of newly public firms. J. Financ. 61, 1159–1185.
Datar, S., Frankel, R., Wolfson, M., 2001. Earnouts: the effects of adverse selection and agency costs on acquisition techniques. J. Law Econ. Org. 17, 201–238. https://doi.org/10.1093/jleo/17.1.201.

Dávila, E., Parlatore, C., 2021. Identifying Price Informativeness. Work. Pap.
Dow, J., Gorton, G., 1997. Stock market efficiency and economic efficiency: is there a connection? J. Financ. 52, 1087–1129.
Dow, J., Goldstein, I., Guembel, A., 2017. Incentives for information production in markets where prices affect real investment. J. Eur. Econ. Assoc. 15, 877–909.
Draper, P., Paudyal, K., 2006. Acquisitions: private versus public. Eur. Financ. Manag. 12, 57–80. https://doi.org/10.1111/j.1354-7798.2006.00310.x.
Durnev, A., Morck, R., Yeung, B., Zarowin, P., 2003. Does greater firm-specific return variation mean more or less informed stock pricing? J. Account. Res. 41, 797–836.
Durnev, A., Morck, R., Yeung, B., 2004. Value-enhancing capital budgeting and firm-specific stock return variation. J. Financ. 59, 65–105.
Easley, D., Kiefer, N., O'Hara, M., 1997. The information content of the trading process. J. Empir. Financ. 4, 159–186.
Easley, D., Hvidkjaer, S., O'Hara, M., 2002. Is information risk a determinant of asset returns? J. Financ. 57, 2185–2221.
Fresard, L., 2012. Cash savings and stock price informativeness. Rev. Financ. Stud. 16, 985–1012.
Fuller, K., Netter, J., Stegemoller, M., 2002. What do returns to acquiring firms tell us? Evidence from firms that make many acquisitions. J. Financ. 57, 1763–1793. https://doi.org/10.1111/1540-6261.00477.
Giglio, S., Shue, K., 2014. No news is news: do markets underreact to nothing? Rev. Financ. Stud. 27, 3389–3440.
Golubov, A., Yawson, A., Zhang, H., 2015. Extraordinary acquirers. J. Financ. Econ. 116, 314–330.
Gotti, G., Han, S., Higgs, J.L., Kang, T., 2012. Managerial stock ownership, analyst coverage, and audit fee. J. Acc. Audit. Financ. 27, 412–437.
Grossman, S.J., Stiglitz, J.E., 1980. On the impossibility of informationally efficient markets. Am. Econ. Rev. 70, 393–408.
Hayek, F.A., 1945. The use of knowledge in society. Am. Econ. Rev. 35, 519–530.
Hilary, G., Hsu, C., 2013. Analyst forecast consistency. J. Financ. 68, 271–297.
Johnson, T.L., So, E.C., 2018. A simple multimarket measure of information asymmetry. Manag. Sci. 64, 1055–1080.
Joos, P., Piotroski, J.D., Srinivasan, S., 2016. Can analysts assess fundamental risk and valuation uncertainty? An empirical analysis of scenario-based value estimates. J. Financ. Econ. 121, 645–663.
Kau, J.B., Linck, J.S., Rubin, P.H., 2008. Do managers listen to the market? J. Corp. Finan. 14, 347–362.
Kohers, N., Ang, J., 2001. The take-over market for privately held companies: the US experience. Camb. J. Econ. 25, 723–748. https://doi.org/10.1093/cje/25.6.723.
Kyle, A., 1985. Continuous auctions and insider trading. Econometrica 53, 1315–1335.
Li, J., Yu, J., 2012. Investor attention, psychological anchors, and stock return predictability. J. Financ. Econ. 104, 401–419.
Luo, Y., 2005. Do insiders learn from outsiders? Evidence from mergers and acquisitions. J. Financ. 60, 1951–1982.
McNichols, M., O'Brien, P.C., 1997. Self-selection and analyst coverage. J. Account. Res. 35, 167–199.
Moeller, S.B., Schlingemann, F.P., Stulz, R.M., 2005. Wealth destruction on a massive scale? A study of acquiring-firm returns in the recent merger wave. J. Financ. 60, 757–782.
Morck, R., Shleifer, A., Vishny, R.W., Shapiro, M., Poterba, J.M., 1990. The stock market and investment: is the market a sideshow? Brook. Pap. Econ. Act. 157–215.
Morck, R., Yeung, B., Yu, W., 2013. R2 and the economy. Annu. Rev. Financ. Econ. 5, 143–166.
Netter, J., Stegemoller, M., Wintoki, M.B., 2011. Implications of data screens on merger and acquisition analysis: a large sample study of mergers and acquisitions from 1992 to 2009. Rev. Financ. Stud. 24, 2316–2357.
Nguyen, N.H., Phan, H.V., 2017. Policy uncertainty and mergers and acquisitions. J. Financ. Quant. Anal. 52, 613–644.
Officer, M.S., 2007. The Price of corporate liquidity: acquisition discounts for unlisted targets. J. Financ. Econ. 83, 571–598. https://doi.org/10.1016/j.jfineco.2006.01.004.
Officer, M.S., Poulsen, A.B., Stegemoller, M., 2009. Target-firm information asymmetry and acquirer returns. Rev. Financ. 13, 467–493. https://doi.org/10.1093/rof/rfn017.
Ouyang, W., Szewczyk, S.H., 2018. Stock price informativeness on the sensitivity of strategic M&A investment to Q. Rev. Quant. Finan. Acc. 50, 745–774.
Roll, R., 1988. R2. J. Financ. 43, 541–566.
Roll, R., Schwartz, E., Subrahmanyam, A., 2010. O/S: The relative trading activity in options and stock. J. Financ. Econ. 96, 1–17.
Rosenbaum, P., 2002. Observational Studies, Springer Series in Statistics. Springer, New York, New York, NY. https://doi.org/10.1007/978-1-4757-3692-2.
Schutte, M., Unlu, E., 2009. Do security analysts reduce noise? Financ. Anal. J. 65, 40–54.
Strobl, G., 2014. Stock-based managerial compensation, price informativeness, and the incentive to overinvest. J. Corp. Finan. 29, 594–606.
Subrahmanyam, A., Titman, S., 1999. The going-public decision and the development of financial markets. J. Financ. 54, 1045–1082.
Tehranian, H., Zhao, M., Zhu, J.L., 2014. Can analysts analyze mergers? Manag. Sci. 60, 959–979.
Venter, J.H., De Jongh, D.C., 2006. Extending the EKOP model to estimate the probability of informed trading. Stud. Econ. Econ. 30, 25–39.
Yan, Y., Zhang, S., 2014. Quality of PIN estimates and the PIN-return relationship. J. Bank. Financ. 43, 137–149.
Yu, F.F., 2008. Analyst coverage and earnings management. J. Financ. Econ. 88, 245–271.