



Guidi, M., Sogiakas, V., Vagenas-Nanos, E. and Verwijmeren, P. (2020) Spreading the sin: an empirical assessment from corporate takeovers. *International Review of Financial Analysis*, 71, 101535. (doi: [10.1016/j.irfa.2020.101535](https://doi.org/10.1016/j.irfa.2020.101535))

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Deposited on 12 June 2020

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# Spreading the Sin: An Empirical Assessment from Corporate Takeovers

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## Abstract

An acquisition of a company involved in socially undesirable activities can have important value implications. On the one hand, stocks in sin industries can be undervalued, and positive wealth effects might be created through risk sharing and a halo effect. On the other hand, acquiring sin stocks could increase litigation risk and the chance of product boycotts, and could hurt relations with employees and other stakeholders. Moreover, many investors avoid investments in sin stocks by applying negative screening. This article empirically establishes that shareholders of acquirer firms on average discount sin acquisitions. The negative wealth effects are stronger in countries with a greater focus on corporate social responsibility and for deals that are more likely to receive public attention. The article concludes that the costs of “sin” are considerable.

**JEL Codes:** G30, G34, G14

**Keywords:** Corporate social responsibility, socially responsible investing, mergers and acquisitions, sin stocks

## **1. Introduction**

There is wide discrepancy on the impact that “sin stocks” have on investors’ returns (Hong and Kacperczyk, 2009; Statman and Glushkov, 2009; Wang and Xie, 2009; Cai, Jo, and Pan, 2012; Deng, Kang, and Low, 2013). In principle, Merton (1987) points out that shunned “sin stocks” are undervalued because of limited risk sharing due to investors’ negative screening. The price of “sin stocks” will then be impacted by both idiosyncratic and systematic risk (Hong and Kacperczyk, 2009). A high risk premium due to idiosyncratic “sin stock” risk, such as tobacco firms, may be attributed to higher expropriation risk due to a higher likelihood of customer, regulator and state litigation (Beneish et al., 2008). Fabozzi et al. (2008), Statman and Glushkov (2009) and Trinks and Scholten (2017) claim that investing in controversial “sin stocks” can generate extra risk-adjusted returns. Similarly, Renneboog et al. (2008) show that many socially responsible funds underperform.

On the other hand, Derwall et al. (2005) and Kempf and Osthoff (2007) show that investors could benefit by tilting their portfolios to socially responsible companies. A significant problem with positive screening, however, is that it can be viewed as a purely mechanical device to reach a diversification quota (Statman and Glushkov, 2009). There are also studies that find no effects. Humphrey and Tan (2014) show that excluding “sin stocks” from a portfolio has no impact on the risk or return of the portfolio. Bauer et al. (2005) find that socially responsible investment funds yield returns similar to traditional funds.

This article examines whether involvement in socially undesirable activities creates or destroys value by focusing on the “sin stock” merger and acquisition market. The mergers and acquisitions market provides a good setting, as takeovers are large corporate investments with important value implications. There are many mergers and acquisitions that create value (Jensen and Ruback, 1983; Chang, 1998; Mulherin and Boone, 2000), and there are many that destroy value (Ravenscraft and Scherer, 1987; Fowler and Schmidt, 1988; Andrade, Mitchell,

and Stafford, 2001; Moeller, Schlingemann, and Stulz, 2005; Malmmedier and Tate, 2008). A firm may acquire low CSR firms when it is able to provide credible commitments to a high standard through maintaining explicit and implicit agreements (Wang and Xie, 2009; Deng, Kang, and Low, 2013), which will mitigate CSR decoupling (Sauerwald and Su, 2019) from the halo effect (Hong and Liskovich, 2015). A halo effect is a psychologically recognized cognitive bias based on a judgment of an entity's character or its investments that is influenced by a general impression or first impression, or both, of the entity, whilst having limited information about the entity itself or its investment (Hong and Liskovich, 2015). In other words, the halo effect will overcome the need for management to provide investors with a costly signal showing credible commitment to keeping to explicit and implicit agreements, e.g. not to undertake CSR decoupling. Firms that integrate low CSR firms can potentially be rewarded with an increase in value due to risk-sharing and their ability to signal ex-ante their "good intentions" to not be "patronizing", i.e. not to undertake CSR decoupling and to keep to explicit and implicit social norms. Although the pursuit of value might drive mergers and acquisitions, errors in perception or judgment by managers may cause managers to acquire "sin stock" investments that do not add value.

The fact that mergers and acquisitions are large, unscheduled events increases their usefulness in measuring wealth effects. The announcement of an acquisition of a company engaged in socially undesirable activities provides a shock to the perceived corporate social responsibility of the acquirer. After controlling for other firm and deal characteristics, the change in the stock price of the acquirer upon the acquisition announcement thus provides insights into how the marginal shareholder values investment in socially undesirable activities. Examining mergers and acquisitions in a corporate social responsibility context is also interesting because many stakeholders are impacted by the decision to merge, as it is one of the most important corporate investment decisions that a firm can make.

Studying merger and acquisitions further helps in addressing reverse causality. The direction between CSR and firm performance is not clear in the literature. Is there a relation because well-performing firms are prepared to engage in higher CSR activities or does an engagement in CSR activities increase firm value? Mergers and acquisitions are unscheduled, one-off corporate events that offer the appropriate setting to examine the impact of engaging in socially undesirable activities, as the change in the stock price when the news on the sin acquisition comes out represents the change in firm value. More insight into causality provides an important contribution to the literature. If one would simply compare the performance of firms engaged in socially undesirable activities to the performance of firms not engaged in these activities, then it is hard to establish causality and thus the implications of engaging in these activities. For example, observing a negative relation between socially undesirable activities and firm performance could simply mean that firms with better expected future performance reduce their socially undesirable activities, rather than that these socially undesirable activities drive performance (McGuire et al., 1988; Waddock and Graves, 1997). In our setup, this concern is less important due to a focus on announcement effects around largely unexpected events. The stock price change of the acquirer at the time of the takeover announcement indicates how the marginal shareholder of the acquirer values the acquisitions.

To capture socially undesirable activities, we examine shareholder reactions to takeovers of companies operating in “sin industries,” such as the tobacco, gambling and alcohol industries, and we compare these reactions with the reactions to other (diversifying) acquisitions. As indicated above, acquiring “sin stocks” could have both advantages and disadvantages for the shareholders of the acquiring firm. On the one hand, acquirer shareholders could benefit financially. Hong and Kacperczyk (2009), for example, argue that stocks in sin industries are undervalued and therefore good investment choices. Positive wealth effects can especially be created when acquiring investors are impacted by the Halo effect

(cognitive bias) or can enhance risk sharing benefits from geographical diversification and political capture through the merger of a sin company with a non-sin company. Indeed, for the tobacco industry, Beneish et al. (2008) find evidence in line with takeovers reducing expected expropriation costs. On the other hand, the “price of sin” could be high. Acquiring sin stocks could increase litigation risk and the chance of product boycotts, and could hurt relations with employees and other stakeholders (Hong and Kacperczyk, 2009; Grougiou et al., 2016). A range of investors, such as pension funds, banks, insurance companies, universities, religious funds and ethical funds, avoid investments in sin stocks by applying negative screening (Hong and Kacperczyk, 2009). This screening does not, however, necessarily decrease prices, as other investors could take their place. Indeed, many mutual funds, hedge funds and independent investment advisors do not apply negative screening. In the end, the wealth implications of acquiring sin firms is an empirical question that we attempt to address in this article.

We construct a sample of worldwide mergers to compare acquisitions of sin firms to acquisitions of non-sin firms. Since the sin and non-sin samples differ both in terms of sample size and other characteristics, we employ a Mahalanobis matching methodology and create a matched sample of acquisitions of non-sin firms that are similar in a variety of observable firm- and deal-specific characteristics. We take into account the diversifying nature of sin acquisitions and further control for a wide range of firm and deal characteristics, such as the form of payment. Our main result is that the market reacts more negatively to acquisitions of sin firms than to acquisitions of other firms. On average, the discount assigned to acquisitions of sin firms represents a decrease in market value of 1.4%, which represents \$18 million per acquisition.

Our article contributes to the literature by showing that the price of sin is substantial. Our evidence is in line with the notion that negative screening has important consequences. Our study complements studies that focus on socially and environmentally responsible

investments that create value (Aktas et al., 2011). Deng, Kang and Low (2013) study the importance of the corporate social responsibility of acquirers, rather than targets, and find a positive relation with merger announcement returns. We exploit the fact that a single acquirer could acquire both a sin and a non-sin firm. We conduct tests in which we keep the acquirer constant and find that, also in that setup, shareholders discount acquisitions of firms in sin industries. We further find that the disapproval effect (discussed more fully below) for sin acquisitions is stronger in countries that operate in relatively high corporate social responsibility (CSR) environments. Interestingly, the effects are also stronger for domestic and for large acquisitions, which are more likely to attract public attention and media coverage. Overall, our study highlights that companies should think twice about investing in socially undesirable activities, even when focusing on a shareholder wealth maximization perspective.

## **2. Related Studies and Hypotheses Development**

Various motives have been put forward to explain why mergers and acquisition occur. M&As could be motivated by synergy gains (Jensen and Ruback, 1983), by the agency theory of empire building (Jensen, 1986) or by hubris (Roll, 1986). Synergy gains relate to economies of scale or scope, or the better use of capabilities held by a target (Ravenscraft and Scherer, 1987). There can be opportunities for firms to leverage their current capabilities or to acquire such capabilities from targets (Anand and Delios, 2002; Arikian and McGahan, 2010; Capron, Dussauge, and Mitchell, 1998; Karim and Mitchell, 2000; Vermeulen and Barkema, 2001; Zollo and Singh, 2004). Through synergies, the value of the new merged firm should exceed the sum of the value of the two stand-alone entities (Jensen and Ruback, 1983). Jensen's (1986) agency theory suggests that corporate managers are motivated by their private benefits of control and undertake M&As for their own personal utility. They tend to overinvest as part of empire building strategies, at the expense of stockholders. The hubris hypothesis (Roll, 1986)

suggests that markets are rational, and that managers engage in acquisitions with an overly optimistic attitude, believing that due to their own abilities, they can create value through potential synergies. Malmendier and Tate (2008) and Doukas and Petmezas (2007) show that overconfident CEOs overestimate their abilities to generate abnormal returns for their shareholders and can lead to CSR decoupling (Sauerwald and Su, 2019). They tend to overpay for target firms, resulting in (economic and social) value destruction for acquirers' shareholders.

We examine how investors perceive acquisitions of socially irresponsible firms. Unlike neoclassical finance, where investors aim to maximize utilitarian benefits, behavioural finance claims that investors seek both utilitarian and expressive benefits from their investments. Expressive benefits include social values and religious beliefs (Statman, 2000). Hood et al. (2014) argue that social norms play an important role in stock allocation in financial markets. Their ownership allocation data suggest that women, for example, prefer to include stocks of companies with progressive labour policies for minorities in their portfolios.

To have an effect on ownership allocation, investors have to decide what to classify as socially irresponsible stocks. Although increasingly detailed information is available on companies' activities and processes, investors are subject to information processing constraints (Sims, 2003, 2006). Schwartz (2003) argues that even ethical mutual funds do not have clear screening practices. One thing that is clear, though, is that many investors are not investing in sin stocks (Dukes, 2008; Fabozzi et al., 2008). Cai et al. (2012) examine whether a firm in a controversial industry, such as the tobacco, gambling or alcohol industries, can be socially responsible. They find that firms in sin industries that engage in CSR activities enhance firm value. However, Palazzo and Richter (2005) claim that CSR activities in the tobacco industry only happen for marketing reasons, while in reality these companies cause damage to a large

number of people every year. In this article, we examine the impact of the relatively straightforward differentiation between acquisitions of sin and non-sin stocks.

Approval and disapproval effects are related to investors having a single or a plurality of objective functions. In other words, some investors (and managers) will have what Jacques Derrida calls a hierarchical ordering mindset, whereby a single objective function of wealth maximization is of primary importance and CSR is of secondary importance, i.e. the latter is an add-on. Managers and investors that have a plurality of (economic and moral) values will not treat wealth maximization or CSR as more important than the other. In other words, there is less likelihood of CSR decoupling when there is no hierarchical ordering, i.e. a single (economic) objective function.

Investors' approval and disapproval in relation to the "marriage" of the manager to the firm is affected by managerial discretion. Two important and related managerial discretion issues are information impactedness and the halo effect. These issues impact on investors' ability to perceive non-sin firm management's "good" intentions in relation to an investment to acquire a sin firm that does not consistently breach implicit agreements, i.e. does not undertake CSR decoupling. Information impactedness is a major issue of managerial discretion, since information provided by management to investors and other stakeholders may be biased or filtered. In other words, managerial discretion can hide management's true intentions in relation to fulfilling implicit agreements (e.g. CSR decoupling) and thus, investors cannot be sure that a non-sin firm's acquisition investment of a sin firm is a "good" risk. Prior et al. (2008) find a positive relationship between CSR activities and management earnings. However, their findings show that engaging in CSR in order to disguise earnings management is not sustainable.

The important impact on the "marriage" contract between the firm (investors) and managers is largely due to imperfect information on the ex-post hidden behaviour (moral

hazard) of managers. These issues may be mitigated by the quality of the “search”, “experience” and “credence” goods (Brinig and Alexeev, 1995). For instance, “search” goods’ qualities can easily be examined ex-ante, whilst “experience” goods’ qualities can be examined ex-post but can lead to sellers’ (managers’) monopoly. “Credence” goods’ qualities may never be determined but can be perceived to be a “good or bad” risk since they are influenced by costly product quality signalling due to imperfect information. Imperfect information is costly for the party with less information to achieve information parity, and it is difficult to distinguish between agents who disclose impacted information to which they have access in an opportunistic manner from those who make good faith representations (Williamson, 1973). Thus, investors may be compelled to withdraw their equity in a specific institution since managers can easily provide distorted, biased and very selective information on breaches of essential (economic and moral) variable value limits. This can hide management’s intention, thus making the sin investment not a “good” risk for investors who have a plurality of (economic and moral) values and who expect implicit agreements to be fulfilled. Investors may be prone to a cognitive judgment bias (Halo effect), in which an entity’s or its product’s good quality can be influenced by a general (or first) positive impression of the entity, with little actual knowledge of specific product quality or behaviour. In other words, the Halo effect will overcome the need for a costly signal from management to investors. Investors’ own cognitive bias formed by a general positive impression of the acquirer distorts investors’ view with little knowledge of a sin acquisition’s quality by incorrectly judging such an acquisition to be a “good risk”.

Furthermore, management can use the halo effect to extrapolate the acquirer’s CSR rating to increase the perceived value of the “sin” investment without improving the sin firm’s commitment to fulfil implicit agreements and stakeholders’ social values (Hong and Liskovich, 2015). Investors and other stakeholders are provided with the signal that, in general, an entity

does “care” about social, environmental and governance issues. Thus, investors might over-extrapolate the entity’s so-called “good” intentions to not undertake CSR decoupling and thus provide so-called high-quality products/services that will on paper fulfil implicit social, environmental and governance agreements. This extrapolation generates the halo effect as an example of brand equity. One conceptual view of brand equity is that it represents the stakeholder’s plurality of (economic and moral) values in relation to a high-quality product (e.g. Apple Plc’s electronic tablet (iPad) or its shares), above that of an otherwise identical product (i.e. electronic tablet or technology firm shares without the Apple brand name). That is, CSR investors will value firms that are perceived lower-quality brand name that have less adherence to implicit agreements and social values, e.g. those firms that do not use an ethically approved supply chain that is verified by an impartial third party (Leuthesser, Kohli and Harich, 1995). The halo effect’s relation to brand equity suggests a dual causality. That is, a generally positive attitude towards an entity’s or product’s quality causes a positive belief about the specific quality characteristics of the same or other connected entity or product, and vice-versa. Putting this brand equity on the line could be either a “good” or “bad” risk. In general, acquiring a sin firm might hurt the brand equity of the acquiring firm.

Following the above discussion, combined with the mixed evidence on the value of corporate social responsibility in earlier work, the hypotheses that the market reaction to acquisitions of sin stocks is neutral or positive are plausible. However, as many “socially aware” investors might decide to sell upon the announcement of the acquisition of a sin company, and thus create downward pressure on stock prices, our main hypothesis is that stock prices decline. This hypothesis relates strongly to the stakeholder value maximization view.

**H1** The acquirer’s cumulative abnormal returns around the announcement date are more negative for sin acquisitions than for acquisitions of other companies.

There is a great deal of heterogeneity in socially responsible investing around the world. Cultural, ideological and religious differences and differences in values and social norms contribute to this heterogeneity (Sandberg et al., 2009). Scandinavian countries rank very high in terms of corporate social responsibility and responsible investing (Bengtsson, 2008; Scholtens and Sievanen, 2013). Durand et al. (2013) examine sin stocks in seven countries (Australia, India, Japan, South Korea, Malaysia, New Zealand and Singapore) and find that social norms discouraging investing in sin stocks vary significantly among these countries. Pre-established mindsets relate to the halo effect, as investigated by Hong and Liskovich (2015), in which there is a bias caused by the trend of human beings to process and interpret information by simplifying information on the assumption that the decisions made are objective and logical. Kumar et al. (2011) report a geographic variation in the perception of ethics, and thus in how investments in unethical companies will be perceived. Overall, social norms seem to depend on the mindset of investors, and we predict that when social and environmental norms are higher and negative screening is more important, the wealth effects of sin acquisitions are more pronounced.

**H2** The acquirer's cumulative abnormal returns around the announcement date for sin acquisitions are more negatively pronounced in countries with high social and environmental norms.

Rhee and Valdez (2009) argue that reputational damage is more pronounced for highly visible events. For acquisitions that take place within the same country, i.e. domestic acquisitions, investors are more likely to be aware of the acquisition and the operations of the target firm than for acquisitions of foreign target firms. The asymmetric effect between

domestic and cross-border M&A deals is considered by Boeh (2011). There is evidence that cross-border deals cost more and are executed quicker, reflecting the incorporation of processes that account for the asymmetric information in this type of M&As. The heterogeneity between bidders and acquirers, specifically with respect to the deal completion length, is also studied in Dikova et al. (2010). Their findings suggest that information of past successful deals could be beneficial for acquisitions in less distant countries but does not suffice for internationally different institutions. However, institutional uncertainty due to cultural differences and the associated procedural complexities do not deter managers from initiating an acquisition deal. Ellis et al. (2011) suggest that size-related experience has an asymmetric effect on M&A performance. Experience with small deals negatively affects the performance of big deals due to the complexity of the process and the difficulty of transferring the practices of experience to small deals. Underestimation of potential cultural differences increases the adverse impact of the deal. Morosini and Singh (1994) argue that cultural compatibility between bidders and acquirers could potentially improve cross-border post-acquisition performance. Stahl and Voight (2008) investigate in depth the conflict of how cultural differences in M&A processes affect their performance and conclude that there exists heterogeneity in the effects of cultural differences on sociocultural integration, synergy integration and realization of shareholder value. Domestic acquisitions relate to smaller differences and informational asymmetries and, as mentioned, investors are more likely to be aware of the acquisition. Acquisitions of large target firms also typically attract more media attention. The third hypothesis states:

**H3** The acquirer's cumulative abnormal returns around the announcement date for sin acquisitions are more negatively pronounced for deals that attract more attention, such as domestic acquisitions and acquisitions of large target firms.

### 3. Data and Methods

We collect a sample of worldwide mergers and acquisitions from 1985 to 2015. The acquirer must be a listed company and the target must be either listed, private or a subsidiary. The data are obtained from Thomson ONE. For deals to be included in the sample, we follow Fuller et al. (2002) and apply the following restrictions: the bidder needs to acquire at least 50% of the target's shares, the deal value needs to be at least \$1 million, and the relative size of the deal over the market value of the bidder needs to be at least 1%. Following Harford and Uysal (2014), we exclude companies that operate in the financial (SIC 6000-6999) and utility (SIC 4900-4999) sectors. Deals for which bidders' Datastream codes (company identifiers) are missing or deals for which data to estimate cumulative abnormal returns are not available are also excluded.

Statman and Glushkov (2009) classify sin stocks as companies associated with tobacco, alcohol, gambling, firearms, military or nuclear operations. It is imperative for this study to accurately identify sin and non-sin firms. For that reason, we obtain information from three different sources to identify in which industry companies operate: SIC codes, Datastream Level 5 classifications and classifications from Thomson ONE. Based on the Fama-French 48 industry classification code, companies whose SIC codes belong in Group 4: 2080-2085 (Alcohol), Group 5: 2100-2199 (Tobacco) and Group 26: 3760-3769, 3795-3795, 3480-3489 (Guns/Defence) are classified as sin stocks. In addition, based on Level 5 Sector Name classification in Datastream, companies that are listed as belonging in industries such as Brewers, Distillers and Vintners, Tobacco, and Gambling and Defence are also classified as sin stocks. As a third source, we look at the Acquiror All VEIC Descriptions and Acquiror All VEIC Codes variables provided by Thomson ONE. Companies for which the description is Wine and Liquors (code: 7310), Casino and Gambling (code: 7125), Nuclear Energy (code:

6599) or Military Electronics (excluding communications) (code: 3810) are classified as sin. All other companies that do not belong to the groups described above are classified as non-sin.

The focus of this study is on non-sin firms that acquire sin target firms (sin acquisitions). Following the above restrictions and criteria, we find 186 such transactions. The acquirers in these deals are listed in the United Kingdom (61 deals), the United States (42), Australia (17), Japan (13), or in countries with fewer than ten such deals (Austria, Canada, China, Finland, France, Greece, Hong Kong, India, Ireland, Italy, Malaysia, Mexico, the Netherlands, Norway, Poland, Portugal, Saudi Arabia, Singapore, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan and Thailand). We also collect 23,600 deals for which both the bidder and the target are classified as non-sin firms (Non-sin acquisitions) and belong to different industries. The total sample is 23,786 deals. Table 1 presents the number of sin and non-sin acquisitions over time. We observe that acquisitions increase over time and note that deals cluster during the 1999-2000 dot.com bubble and the 2006-07 merger wave.

[Insert Table 1 about here]

We compare our sample of sin acquisitions to acquisitions where both acquirer and target are non-sin companies. However, the two subsamples differ substantially in sample size. The sin acquisitions subsample consists of 186 deals, while the non-sin acquisitions subsample consists of 23,600 deals. The sin acquisitions subsample consists, by definition, of diversifying deals, i.e. the bidder and the target belong to different industries (a bidder from a non-sin industry acquires a target from a sin industry). For this reason, in the non-sin acquisitions subsample, we focus only on diversifying deals. Several studies argue that diversifying deals create no or negative value for bidders' shareholders (Jensen and Ruback, 1983; Harford, 1999). Roll (1986) attributes the failure of value creation to managerial hubris, while Jensen (1986) argues that diversifying deals only serve the benefits of managers. Moeller et al. (2004) show that diversifying deals often fail, especially for large acquirers that are more likely to be

affected by hubris. A deal is classified as diversifying if the first two digits of the bidder's SIC code are different from the first two digits of the target's SIC code (Doukas and Kan, 2004). Table 2 shows the descriptive statistics of the various variables employed in the study for the sin and non-sin subsamples. The statistics show that the two samples not only differ in sample size but also across several characteristics (columns 1 and 2). For example, the market value of bidders of sin acquisitions (\$1,275 mil) is lower than the market value of those of non-sin ones (\$1,980 mil). Also, the two subsamples differ in terms of relative size, leverage and Tobin's Q, among other variables. For this reason, in order to create a matched sample of "regular" acquisitions, we adopt the minimum Mahalanobis distance matching technique (De Maesschalck et al., 2000). This technique deals with selection bias based on observable characteristics by minimizing the number of standard deviations in a multidimensional space between sin acquisitions and regular acquisitions. From the large pool of regular diversifying acquisitions over our sample period (23,600 deals), we match one, three and ten regular acquisitions to each sin acquisition. This matching is based on a number of bidder and deal characteristics. The definitions of all variables in this study are described in the appendix and include bidders' size, relative size of the deal, whether the deal is domestic or cross-border, the percentage of cash financing, bidders' free cash flows, leverage, Tobin's Q, whether the bidder had a toehold in the target firm, whether the target is a high tech company, the targets' public status and whether it was a rumoured deal or not.

Columns 3, 4 and 5 of Table 2 show the average values of the variables for matched deals from the regular acquisitions for 1 to 1, 1 to 3 and 1 to 10 neighbouring matching, respectively. Following the matching process, we end up with subsamples that have very similar characteristics. The size of the bidding firms for both types of target firms is around \$1,300 million, while the size of the target relative to the bidder is around 30%. Similarly, for

the other firm and deal characteristics, the subsamples exhibit comparable values. Our results remain robust when we perform matching on 1 to 1, 1 to 3 and 1 to 10 neighbouring deals.

[Insert Table 2 about here]

Table 3 provides the Pearson correlation matrix for the above characteristics for the overall sample of 23786 deals, which indicates there are no multicollinearity issues. Furthermore, we obtain similar results when we match on a different set of variables, such as matching only on the continuous variables market value, relative size, free cash flow and leverage.

[Insert Table 3 about here]

## **4. Empirical Findings**

### *4.1. Cross-sectional Analyses*

Table 4 presents the cross-sectional regression analysis results. The dependent variable is bidders' cumulative abnormal returns over a window of three days, from one day before the announcement to the day after the announcement ( $CARs(-1,+1)$ ) in the first three models. The last three models show bidders' cumulative abnormal returns over a window from the announcement day to two days after ( $CARs(0,+2)$ ). In untabulated results, we confirm that the findings are robust to alternative windows, such as  $CARs(-2,+2)$ . To estimate abnormal returns, we follow Fuller et al. (2002) and estimate market adjusted abnormal returns. The main independent variable is a sin acquisition dummy, which is a dummy variable that takes the value of one for sin acquisitions and zero for regular acquisitions. The M&A literature shows that there are several factors that can affect bidder performance. In the regression analysis, we control for bidder size, measured as the market value of the acquirer four weeks prior to the announcement date. Moeller et al. (2004) show that large bidders suffer losses around the announcement date. We also include the relative size of the deal, which is the ratio of the deal

value over the market value of the bidder. Fuller et al. (2002) and Croci et al. (2010) show that bidders' cumulative abnormal returns are positively related to the relative size of the deal. We further control for whether the deal is a domestic or cross-border (Goergen and Renneboog, 2004). The method of payment and the target public status (i.e. private or public target firms) play a significant role in explaining bidders' announcement abnormal returns. Travlos (1987) shows that public stock acquisitions generate negative abnormal returns, while Chang (1998) shows that deals for private target firms generate positive announcement abnormal returns, especially when stock is employed as a method of financing the deal. Other control variables used in prior literature are bidder's free cash flows, leverage and Tobin's Q (Faccio and Masulis, 2005); a toehold dummy (Betton et al., 2009); a high-tech dummy (Kohers and Kohers, 2000) and a rumour dummy (Jarrell and Poulsen, 1989). The construction of variables is described in detail in the appendix. Adamsson and Hoepner (2015) and Oikonomou et al. (2012) argue that sector-wide controls are important to capture industry-wide effects. Salaber (2013) and Bereskin et al. (2018) study religion and cultural similarity effects and account for sector-wide effects by employing industry fixed effects in their analyses. We follow a similar approach and include industry and year fixed effects throughout our analysis.<sup>1</sup>

In Model (1) of Table 4, sin acquisitions are matched 1 to 1 with non-sin acquisitions. Similarly, in Models (2) and (3), matching takes place for 1 to 3 and 1 to 10 neighbouring non-sin matched deals. We find that the sin acquisition dummy variable carries a negative and significant coefficient in all specifications, indicating that the market reacts less favourably to sin acquisitions. This finding provides support for a market disapproval effect for this type of acquisition. The least negative effect of -1.4% , in model (3), is still economically meaningful. The average market value of the bidders is \$1,275 million, meaning that acquiring a sin versus

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<sup>1</sup> A variable that could also be important to include relates to the composition of the board of directors. Although quantifying board composition is not easily done within an international sample, we do consider this an interesting avenue for future research.

a non-sin firm results in an average decrease of market value of \$18 million. Similarly, in Models (4)-(6), where the dependent variable is  $CARs(0,+2)$ , the sin acquisition dummy remains negative. Note that in Model (5), the  $p$ -value of the sin acquisition dummy is 0.130, and we can only reject the null there with 87% confidence. The rest of the control variables exhibit coefficients that are consistent with prior literature. The coefficient of the log of bidders' market value is negative, suggesting that larger bidders generate lower announcement abnormal returns, consistent with Moeller et al. (2004). The coefficient of the relative size variable is positive and statistically significant in most specifications, confirming prior evidence by Fuller et al. (2002) about the positive association between relative size and bidders' cumulative abnormal returns. Regarding the domestic dummy, the percentage of cash used in financing the acquisition, and the free cash flows variables, there is mixed evidence. Tobin's  $Q$ , which proxies for managerial quality, is positively associated with announcement abnormal returns (Faccio and Masulis, 2005). The public acquisition dummy carries a negative coefficient, as expected (Travlos, 1987).

In addition to Mahalanobis matching, we also present results when the two subsamples, i.e. sin and non-sin acquisitions, are entropy balanced. Entropy balancing is a data processing method that allows for covariate balance among various observable characteristics for the sin and non-sin acquisitions groups. Entropy balancing adjusts inequalities with respect to the first moment of the variables that have been employed in the multivariate analysis between the two subsamples. It is based on a maximum entropy reweighting scheme that calibrates unit weights so that the reweighted sin and non-sin groups satisfy the large set of variables used in this analysis (Hainmueller, 2012). In Panel B of Table 4, we present results after the matched subsamples are entropy balanced with respect to the first moment on all the variables used in the multivariate analysis in Panel A. The sin acquisition dummy variable remains negative and statistically significant in all six specifications.

[Insert Table 4 about here]

#### 4.2. Cross-Country Analysis

Our sample of mergers and acquisitions includes deals across many different countries. Investors' sensitivity to social responsibility issues might vary around the world. If the market disapproval hypothesis holds, then we expect the effects to be more pronounced in countries that are ranked higher in terms of CSR. We divide countries into two groups based on a sustainability index that captures social, environmental and governance profiles around the world ([http://www.robecosam.com/images/Country\\_Ranking\\_Update\\_October\\_2016.pdf](http://www.robecosam.com/images/Country_Ranking_Update_October_2016.pdf)). Robecosam is an investment specialist focused exclusively on sustainable investing, which provides reliable data for a large set of countries. Although sustainability is hard to measure accurately and thus any score will be imperfect, we believe that the scores are still informative about CSR and allow for comparison among countries. We split countries depending on whether their sustainability ranking is above (14 countries) or below the median (15 countries). A first interesting observation is that the proportion of sin acquisitions as compared to the total number of deals is lower (0.48%) for the above-median CSR countries than those below the median (0.83%). This may indicate that in countries where investors' awareness of CSR is higher (Sandberg et al., 2009), acquirers buy proportionately fewer sin target firms. Models 1 and 2 of Table 5 present the regression analysis results per group of countries. The results in Table 4 show that the sin acquisition dummy carries a negative and statistically significant coefficient for the above-median (high) CSR countries, while it is almost zero and insignificant for below-median (low) CSR countries. The difference in coefficients between Models 1 and 2 is statistically significant ( $p$ -value = 0.034). These findings indicate that in regions where CSR awareness is higher, the market disapproval effect is more pronounced, in line with the

second hypothesis. We focus on the high CSR countries in the remainder of the analyses, as this is where interesting effects can be observed.

For robustness, we employ alternative measures of the environmental and governmental performance of countries across the world. We obtain data from the World Bank, which is a reliable source that provides data for all countries across the globe. The environmental index we use is based on each country's sensitivity around carbon dioxide emission. The governmental index that we use is based on the perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. As data is provided on an annual basis, we average the annual observations per country and use that to rank countries from low to high sensitivity. Again, we split countries into two groups, High and Low. Results are presented in Models (3) and (4) for the environmental index and Models (5) and (6) for the governmental index. Matching takes place for 1 to 10 neighbouring non-sin acquisitions. The findings show that the sin acquisition dummy is more negative and more significant for the high group subsample, indicating that the disapproval effect on CSR decoupling will be more pronounced in countries where more investors have a plurality of economic and social values compared to countries where most investors have a single economic value objective function that prioritizes private wealth maximization. Results are robust to 1 to 1 and 1 to 3 neighbouring matching. In Panel B, we present results when the sin and non-sin acquisitions samples are entropy balanced in the first moment, and the findings remain robust.

[Insert Table 5 about here]

#### *4.3. Domestic and large deals*

Hypothesis 3 states that the phenomenon should be more pronounced for domestic rather than cross-border deals and for large rather than small deals, as these acquisitions typically attract

more media and investor attention. Table 6 reports the results. Models (1) and (2) depict the results for domestic and cross-border acquisitions, respectively. The effect of the sin acquisition dummy variable is negative and significant for domestic acquisitions. The effect is negative and insignificant for cross-border deals. The difference in coefficients between domestic and cross-border deals is marginally statistically significant ( $p$ -value = 0.089).

Models 3 and 4 of Table 6 portray the results for relatively large and small deals. Besides attracting more attention, large deals also have a greater impact on acquirers than small deals. Hence, the wealth effect of acquiring sin target firms should be more pronounced for acquisitions of larger target firms. We measure target size as the size of the deal value over the market value of the acquirer, so as to reflect the importance of the acquisition to the acquirer. We find that the sin acquisition dummy variable carries a negative and significant coefficient for large deals, while the coefficient for relatively small deals is almost zero and insignificant. The difference in coefficients is statistically significant ( $p$ -value = 0.000). These findings indicate that the disapproval effect of acquisitions of sin targets is more pronounced for large deals, in line with our third hypothesis. The findings are robust to matching sin acquisitions with either 1 or 3 neighbouring matched non-sin deals. In Panel B, we show that the results remain robust when the sin and non-sin acquisition groups are entropy balanced.

[Insert Table 6 about here]

#### *4.4. Keeping the Acquirer Constant*

One may argue that bidders that acquire sin target firms are acquirers with idiosyncratic unobservable characteristics. To address this issue, we follow a similar approach as Fuller et al. (2002) and identify bidders who acquire multiple target firms, including both non-sin targets and sin targets. In this way, we keep the bidder characteristics constant and we can more

directly examine the impact of acquiring sin targets. Again, we control for a range of deal characteristics and time-varying firm characteristics. Table 7 reports the results of this test.

In Model 1 of Table 7, the coefficient of the sin acquisition variable is negative and significant, which indicates that for a bidder that acquires both sin and non-sin target firms, the market reacts less favourably to acquisitions of sin target firms. Model 2 in Table 7 presents the results when we exclude deals of non-sin targets by an acquirer that took place in a period after the acquirer took over a sin target, as the bidder might also be considered “sinful” after acquiring a sin target. This modification makes our results even stronger.

[Insert Table 7 about here]

To study this issue further, we perform a difference-in-difference test. We focus on firms that first perform a non-sin acquisition and then a sin acquisition, and match with acquirers performing non-sin acquisitions. In untabulated results, we find that the first difference (between the non-sin acquisition of the firm that acquires a sin firm afterwards and a regular non-sin acquisition) is very close to zero, highlighting that the reaction to the non-sin acquisition is the same for the control firm and for the focal firm. The second difference, which represents the difference between the sin and non-sin acquisition, is negative, in line with our conclusion that the market disapproves of sin deals. In a regression framework, where we re-estimate model (3) of Table 4 with the difference-in-difference variable and the same set of control variables, we find a significantly negative effect of sin acquisitions, as expected, again highlighting the negative wealth reaction to acquisitions of sin firms. Hence, our results do not appear to be driven by unobservable acquirer characteristics.

#### *4.5. Acquisition Premium*

Potentially, the lower announcement returns for sin acquisitions are driven by bidders overpaying for such deals. As an additional test, we examine whether premiums paid for sin

targets are significantly different than premiums paid for non-sin targets. We follow Fu et al. (2013) and calculate target premiums as the target cumulative abnormal returns for a window of 42 days prior to the acquisition announcement up to the completion date [CARs (-42, CD)]. The completion date is different for various deals and the average completion duration in our sample is 61 days. We observe no statistical difference in the premium. In Table 8, in a regression framework, we use the premium as the dependent variable and find that the sin acquisition variable is highly statistically insignificant for all subsamples previously used. When we measure the premium as the offer price over the target price four weeks prior to the announcement, we obtain similar results. Controlling for premiums in our earlier regressions also does not change our results. Hence, the negative wealth effects for sin acquisitions are not driven by a difference in premium. Overpayment is unlikely to drive our findings.

[Insert Table 8 about here]

## **5. Discussion and conclusions**

We examine whether acquirer shareholders discount acquisitions of firms operating in sin industries. In general, our findings show that the market reacts less favourably to sin acquisitions as compared to a matched sample of conventional deals.

Our findings relate to the disapproval effect towards CSR decoupling, in which high CSR investors have a plurality of economic and social values, i.e. various objective functions. Investors' disapproval is impacted by the "marriage" of the manager to the firm. Important managerial discretion issues are information impactedness and the halo effect. These can affect investors' ability to perceive non-sin firm management's "good" intentions in relation to a sin firm investment in which implicit agreements may be breached. One major issue with managerial discretion is that it enables management to provide biased and filtered information on sin firm investments and, thus, CSR decoupling. In other words, managerial discretion can

hide management's true intentions in relation to fulfilling implicit agreements, and investors cannot be sure if the sin firm investment is a "good" or a "bad" risk. A non-sin firm investor will then view a sin firm investment with uncertainty and could perceive the sin firm investment to lead to a breach of implicit agreements relating to the investors' social values. The above argument is consistent with the finding that the market reaction is more negative for sin firm acquisitions than for acquisitions of non-sin firms. Moreover, the disapproval effect on CSR decoupling will be more pronounced in countries where more investors have a plurality of economic and social values compared to countries where most investors have a single economic value objective function that prioritizes private wealth maximization. Our results are consistent with these predictions.

Arguably, firms that decide to acquire sin stocks are those in which management is not particularly interested in CSR, and where the hierarchical focus is on wealth maximization (single objective function). One might expect that these firms' investors may think the same way. However, our evidence shows that even for these firms, the marginal investor disapproves of sin acquisitions that provide CSR decoupling. Overall, our results suggest that companies should think twice about investing in socially undesirable activities, even when management's main perspective is on wealth maximization.

## References

- Adamsson, H., and Hoepner, A. (2015). The 'price of sin' aversion: Ivory tower illusion or real investable alpha? working paper.
- Aktas, N., de Bobt, E., and Cousin, J. (2011). Do financial markets care about SRI? Evidence from mergers and acquisitions. *Journal of Banking and Finance*, 35, 1753-1761.
- Anand, J, and Delios, A. (2002). Absolute and relative resources as determinants of international acquisitions. *Strategic Management Journal*, 23, 119-134.
- Andrade, G., Mitchell, M., and Stafford, E. (2001). New evidence and perspectives on mergers. *Journal of Economic Perspectives*, 15, 103-120.
- Arikan, A., M., and McGahan, A., M. (2010). The development of capabilities in new firms. *Strategic Management Journal*, 31, 1-18.
- Bauer, R., Koedijk, K., and Otten, R. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of Banking and Finance*, 29, 1751-1767.
- Beneish, M., D., Jansen, I., Lewis, M., and Stuart, N. (2008). Diversification to mitigate expropriation in the tobacco industry. *Journal of Financial Economics*, 89, 136-157.
- Bengtsson, E. (2008). Socially responsible investing in Scandinavia – a comparative analysis. *Sustainable Development and Socially Responsible Finance and Investing*, 16, 155-168.
- Bereskin, F., Byun, S. K., Officer, M., and Oh, J. (2018). The effect of cultural similarity on mergers and acquisitions: Evidence from corporate social responsibility. *Journal of Financial and Quantitative Analysis*, 53, 1995-2039.
- Betton, S., Eckbo, E., and Thorburn, K. (2009). Merger negotiations and the toehold puzzle. *Journal of Financial Economics*, 91, 158-178.
- Boeh., K., K. (2011). Contracting costs and information asymmetry reduction in cross-border M&A. *Journal of Management Studies*, 48, 568-590.
- Brinig, M., and Alexeev, M. (1995). Fraud in courtship: Annulment and divorce. *European Journal of Law and Economics*, 2, 45-62.
- Cai, Y., Jo, H., and Pan, C. (2012). Doing well while doing bad? CSR in controversial industry sectors. *Journal of Business Ethics*, 108, 467-480.
- Capron, L., Dussauge, P., and Mitchell, W. (1998). Resource redeployment following horizontal acquisitions in Europe and North America. *Strategic Management Journal*, 19, 631-661.
- Chang, S. (1998). Takeovers of privately held targets, methods of payment, and bidder returns. *The Journal of Finance*, 53, 773-784.
- Croci, E., Petmezas, D., and Vagenas-Nanos, E. (2010). Managerial overconfidence in high and low valuation markets and gains to acquisitions. *International Review of Financial Analysis*, 19, 368-378.

- De Maesschalck, R., Jouan-Rimbaud, D., and Massart, D. L. (2000). The Mahalanobis distance. *Chemometrics and Intelligent Laboratory Systems*, 50, 1-18.
- Deng, X., Kang, J., and Low, B. (2013). Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of Financial Economics*, 110, 87-109.
- Derwall, J., Guenster, N., Bauer, R., and Koedijk, K. (2005). The eco-efficiency premium puzzle. *Financial Analysts Journal*, 61, 51-63.
- Dikova, D., Sahib, P., R., and Witteloostuijn, A. (2010). Cross-border acquisition abandonment and completion: The effect of institutional differences and organizational learning in the international business service industry, 1981-2001. *Journal of International Business Studies*, 41, 223-245.
- Doukas, J. A., and Kan, O. B. (2004). Excess cash flows and diversification discount. *Financial Management*, 33, 71-88.
- Doukas, J., and Petmezas, D. (2007). Acquisitions, overconfident managers and self-attribution bias. *European Financial Management*, 13, 531-577.
- Dukes, B. (2008). Personal values and stock values: A survey. Working Paper, Texas Tech University, 2008.
- Durand, R., Koh, S., and Tan, P. (2013). The price of sin in the Pacific-Basin. *Pacific-Basin Finance Journal*, 21, 899-913.
- Ellis, K., Reus, T., Lamont, B. and Ranft, A. (2011). Transfer effects in large acquisitions: how size-specific experience matters. *Academy of Management Journal*, 54, 1261- 1276.
- Fabozzi, F., Ma, K. C., and Oliphant, B. (2008). Sin stock returns. *Journal of Portfolio Management*, 35, 82-94.
- Faccio, M., and Masulis, R., W. (2005). The choice of payment method in European mergers and acquisitions. *The Journal of Finance*, 60, 1345-1388.
- Fowler, L., L., and Schmidt, D., R. (1988). Determinants of tender offer post-acquisition financial performance. *Strategic Management Journal*, 10, 339-350.
- Fu, F., Lin, L., and Officer, M., S. (2013). Acquisitions driven by stock overvaluation: Are they good deals? *Journal of Financial Economics*, 109, 24-39.
- Fuller, K., Netter, J., and Stegemoller, M. (2002). What do returns to acquiring firms tell us? Evidence from firms that make many acquisitions. *The Journal of Finance*, 57, 1763-1793.
- Grougiou, V., Dedoulis, M., and Leventis, S. (2016). Corporate social responsibility reporting and organizational stigma: the case of “sin” industries. *Journal of Business Research*, 69, 905-914.
- Harford, J., and Uysal, V., B. (2014). Bond market access and investment. *Journal of Financial Economics*, 112, 147-163.

- Harford, J. (1999). Corporate cash reserves and acquisitions. *The Journal of Finance*, 54, 1969-1997.
- Hainmueller, J. (2012). Entropy balancing for causal effects: A multivariate reweighting method to produce balanced samples in observational studies. *Political Analysis*, 20, 25-46.
- Hong, H. and Kacperczyk, M. (2009). The price of sin: The effects of social norms on markets. *Journal of Financial Economics*, 93, 15-36.
- Hong, H., and Liskovich, I. (2015). Crime, punishment and the halo effect of corporate social responsibility. NBER Working Paper No. w21215.
- Hood, M., Nofsinger, J., and Varma, A. (2014). Conservation, discrimination, and salvation: investors' social concerns in the stock market. *Journal of Financial Services Research*, 45, 5-37.
- Humphrey, J., and Tan, D. (2014). Does it really hurt to be responsible? *Journal of Business Ethics*, 122, 375-386.
- Jarrell, G.A. and Poulsen, A.B. (1989). Stock trading before the announcement of tender offers: Insider trading or market anticipation? *Journal of Law, Economics, and Organization*, 5(2), 225-248.
- Jensen, M., C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American Economic Review*, 76, 323-329.
- Jensen, M., C., and Ruback, R., S. (1983). The market for corporate control: The scientific evidence. *Journal of Financial Economics*, 11, 5-50.
- Karim, S., and Mitchell, W. (2000). Path-dependent and path-breaking change: Reconfiguring business resources following acquisitions in the U.S. medical sector, 1978-1995. *Strategic Management Journal*, 21, 1061-1081.
- Kempf, A., and Osthoff, P. (2007). The effect of socially responsible investing on portfolio performance. *European Financial Management*, 13, 908-922.
- Kohers, N., and Kohers, N. (2000). Takeovers of technology firms: Expectations vs. reality. *Financial Management*, 30, 35-54.
- Kumar, A., Page, J., and Spalt, O. (2011). Religious beliefs, gambling attitudes, and financial markets outcome. *Journal of Financial Economics*, 2011, 671-708.
- Leuthesser, L., Kohli, C., and Harich, K. (1995). Brand equity: The halo effect measure. *European Journal of Marketing*, 29, 57-66.
- Malmedier, U., and Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction., *Journal of Financial Economics*, 89, 20-43.
- McGuire, J., Sundgren, A. and Schneeweis, T. (1988). Corporate social responsibility and firm financial performance. *Academy of Management Journal*, 31, 854-72.

- Merton, R. (1987). A simple model of capital market equilibrium with incomplete information. *Journal of Finance* 42, 483-510.
- Moeller, S., B., Schlingemann, F., P., and Stulz, R., M. (2004). Firm size and the gains from acquisitions. *Journal of Financial Economics*, 73, 201-228.
- Moeller, S., B., Schlingemann, F., P., and Stulz, R., B. (2005). Wealth destruction on a massive scale? a study of acquiring firm returns in the recent merger wave. *The Journal of Finance*, 60, 757-782.
- Morosini, P., and Singh, H. (1994). Post-cross-border acquisitions: Implementing 'national culture-compatible' strategies to improve performance. *European Management Journal*, 12, 390-400.
- Mulherin, J., H., and Boone, A., L. (2000). Comparing acquisitions and divestitures. *Journal of Corporate Finance*, 6, 117-139.
- Oikonomou, I., Brooks, C., and Pavelin, S. (2012). The impact of corporate social performance on financial risk and utility: A longitudinal analysis. *Financial Management*, 41, 483-515.
- Palazzo, G., and Richter, U. (2005). CSR business as usual? The case of the tobacco industry. *Journal of Business Ethics*, 61, 387-401.
- Ravenscraft, D., J., and Scherer, F., M. (1987). Mergers, sell-offs and economic efficiency, The Brookings Institution, Berkeley, CA (1987). *International Journal of Industrial Organization*, 6, 401-405.
- Renneboog, L., Horst, J., T., and Zhang, C. (2008). The price of ethics and stakeholder governance: The performance of socially responsible mutual funds. *Journal of Corporate Finance* 14, 302-322.
- Rhee, M., and Valdez, E. (2009). Contextual factors surrounding reputation damage with potential implications for reputation repair. *Academy of Management Review*, 34, 146-168.
- Prior, D., Surroca, J. and Tribo, J. (2008). Are socially responsible managers really ethical? Exploring the relationship between earnings management and corporate social responsibility. *Corporate Governance: An International Review*, 16, 160-177.
- Roll, R. (1986). The hubris hypothesis of corporate takeovers. *The Journal of Business*, 59, 197-216.
- Salaber, J. (2013). Religion and returns in Europe. *European Journal of Political Economy*, 32, 149-160.
- Sandberg, J., Juravle, C., Hedesstrom, T., and Hamilton, I. (2009). The heterogeneity of socially responsible investment. *Journal of Business Ethics*, 87, 519-533.
- Sauerwald, S. and Su, W. (2019). CEO overconfidence and CSR decoupling. *Corporate Governance: An International Review*, 1-18.

- Scholtens, B., and Sievanen, R. (2013). Drivers of socially responsible investing: A case study of four nordic countries. *Journal of Business Ethics*, 115, 605-616.
- Schwartz, M. (2003). The "Ethics" of ethical investing. *Journal of Business Ethics*, 43, 195-213.
- Sims, C., A. (2003). Implications of rational inattention. *Journal of Monetary Economics*, 50, 665-690.
- Sims, C., A. (2006). Rational inattention: Beyond the linear-quadratic case, *American Economic Review*, American Economic Association, 96, 158-163.
- Statman, M. (2000). Socially responsible mutual funds. *Financial Analysts Journal*, 56, 30-39.
- Statman, M., and Glushkov, D. (2009). The wages of social responsibility. *Financial Analysts Journal*, 65, 33-46.
- Stahl, G. K. and Voigt, A. (2008). Do cultural differences matter in mergers and acquisitions? A tentative model and meta-analytic examination. *Organization Science*, 19, 160-176.
- Travlos, N. (1987). Corporate takeover bids, methods of payment, and bidding firms' stock returns. *Journal of Finance*, 42, 943-963.
- Trinks, R., and Scholtens, B. (2017). The opportunity cost of negative screening in socially responsible investing. *Journal of Business Ethics*, 140, 193-20.
- Vermeulen, F., and Barkema, H. (2001). Learning through Acquisitions. *Academy of Management Journal*, 44, 457-76.
- Waddock, S., A., and Graves, S., B. (1997). The corporate social performance-financial performance link. *Strategic Management Journal*, 18, 303-319.
- Wang, C., and Xie, F. (2009). Corporate governance transfer and synergistic gains from mergers and acquisitions. *Review of Financial Studies*, 22, 829-858.
- Williamson, O., E. (1973). Markets and hierarchies: Some elementary considerations. *The American Economic Review*, 63, 316-325.
- Zollo, M., and Singh, H. (2004). Deliberate learning in corporate acquisitions: Post-acquisition strategies and integration capability in U.S. bank mergers. *Strategic Management Journal*, 25, 1233-1256.

**Table 1. Number of deals per year**

This table shows the number of deals per year over the sample period of 1985 to 2015. The sample is split into Sin and Non-Sin acquisitions. Sin acquisitions are classified as those for which a non-sin bidder acquires a sin target firm, and Non-Sin acquisitions are classified as those for which a non-sin bidder acquires a non-sin target firm. The last column depicts the total number of deals per year.

<b>Year</b>	<b>Sin Acquisitions</b>	<b>Non-Sin Acquisitions</b>	<b>Total</b>
1985	1	123	124
1986	0	209	209
1987	2	294	296
1988	5	469	474
1989	5	561	566
1990	4	488	492
1991	5	382	387
1992	1	469	470
1993	5	571	576
1994	8	738	746
1995	2	732	734
1996	3	954	957
1997	12	1,221	1233
1998	17	1,262	1279
1999	4	1,146	1150
2000	8	1,339	1347
2001	9	911	920
2002	5	822	827
2003	7	718	725
2004	4	993	997
2005	6	1,053	1059
2006	7	1,248	1255
2007	15	1,296	1311
2008	5	913	918
2009	8	651	659
2010	12	791	803
2011	7	793	800
2012	4	513	517
2013	6	484	490
2014	2	684	686
2015	7	772	779
<b>Total</b>	<b>186</b>	<b>23,600</b>	<b>23786</b>

**Table 2. Descriptive Statistics**

This table presents the mean values for the various variables employed in the study, as described in the appendix. Sin acquisitions are deals for which a non-sin acquirer takes over a target sin firm. Column 2 (All) shows the mean value of the variables for the full sample. Columns 3, 4, and 5 depict the mean value of the variables for the matched sample with 1 to 1, 1 to 3 and 1 to 10 neighbouring matching. The matched sample consists of deals for which both the bidder and the target are non-sin firms. Matching occurs through a minimum distance Mahalanobis technique based on the control variables as described in the appendix.

	(1)	(2)	(3)	(4)	(5)
	All	All	nm 1-1	nm 1-3	nm 1-10
	Sin Acquisitions	Non-Sin Acquisitions	Non-Sin Acquisitions	Non-Sin Acquisitions	Non-Sin Acquisitions
Market value	1275	1980	1335	1330	1390
Relative size	0.346	0.409	0.309	0.286	0.267
Domestic	0.796	0.731	0.801	0.797	0.796
Percentage Cash	0.346	0.419	0.384	0.376	0.367
Free cash flow	2.287	1.299	1.937	2.243	2.474
Leverage	0.340	0.209	0.334	0.333	0.332
Tobin's Q	2.845	6.583	2.729	2.753	2.593
Toehold	0.054	0.031	0.054	0.054	0.054
High Tech	0.065	0.217	0.059	0.059	0.060
Public	0.156	0.126	0.156	0.154	0.149
Private	0.468	0.557	0.468	0.468	0.469
Rumour	0.016	0.013	0.016	0.016	0.016
N	186	23600	186	558	1860

**Table 3. Correlation matrix**

This table presents the Pearson's correlation matrix for the various variables employed in the study for the overall sample.

	Log(Market value)	Relative size	Domestic	Percent Cash	FCF	Leverage	TobinsQ	Toehold	HighTech	Public	Private	Rumour
Log(Market value)	1											
Relative size	-0.0273	1										
Domestic	-0.0468	0.0059	1									
Percent Cash	0.0546	-0.0499	-0.0391	1								
FCF	0.0154	-0.0261	0.0038	0.0323	1							
Leverage	0.0182	-0.0232	-0.0017	0.0097	-0.0016	1						
TobinsQ	-0.0021	0.0092	-0.0068	-0.0118	-0.0016	-0.1104	1					
Toehold	0.028	-0.0041	0.0119	-0.0155	0.0525	0.0089	-0.0026	1				
HighTech	0.0527	-0.0165	0.0139	-0.0019	-0.0084	-0.0473	-0.0016	-0.0358	1			
Public	0.1805	0.03	0.0367	0.0285	0.021	0.0213	-0.0049	0.1921	-0.0001	1		
Private	-0.1202	-0.0112	0.0307	-0.0598	-0.0172	-0.0289	0.0105	-0.0875	0.0615	-0.4287	1	
Rumour	0.1495	0.0138	-0.023	0.0272	0.0185	0.0142	-0.0017	0.0292	-0.0094	0.1104	-0.0927	1

**Table 4. Regression Analysis**

This table reports the estimates of OLS regressions of bidding firms' cumulative abnormal returns on deal- and firm-specific explanatory variables. The main variable of interest is the Sin acquisition dummy, which takes the value of one if a non-sin bidder acquires a sin target firm, and zero if a non-sin bidder acquires a non-sin target firm. In Models (1), (2) and (3), the dependent variable is cumulative abnormal returns for a window of -1 to +1 days around the announcement day [CARs(-1,+1)], while in Models (4), (5) and (6), the dependent variable is cumulative abnormal returns for a window of 0 to +2 days around the announcement day [CARs(0,+2)]. In Models (1) and (4), sin acquisitions are matched 1 to 1 with non-acquisitions, in Models (2) and (5), sin acquisitions are matched 1 to 3 with non-acquisitions, and in Models (3) and (6), sin acquisitions are matched 1 to 10 with non-acquisitions. In Panel B, the sin and non-sin acquisitions subsamples are entropy balanced. Standard errors are reported below the coefficients. The superscripts \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% levels, respectively. In all regressions, we control for year and industry fixed effects. N denotes the number of observations.

Panel A						
	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)	Model (6)
	nm 1-1	nm 1-3	nm 1-10	nm 1-1	nm 1-3	nm 1-10
	CARs(-1,+1)	CARs(-1,+1)	CARs(-1,+1)	CARs(0,+2)	CARs(0,+2)	CARs(0,+2)
Sin acquisition	-0.022** (0.009)	-0.015* (0.008)	-0.014* (0.007)	-0.026*** (0.010)	-0.014 (0.009)	-0.016** (0.007)
Log(Market value)	0.001 (0.006)	-0.006 (0.004)	-0.013*** (0.003)	-0.002 (0.006)	-0.007 (0.005)	-0.013*** (0.003)
Relative size	0.002 (0.005)	0.010*** (0.004)	0.015*** (0.002)	-0.005 (0.005)	0.004 (0.004)	0.016*** (0.002)
Domestic	0.005 (0.011)	0.008 (0.008)	-0.003 (0.005)	-0.002 (0.011)	-0.000 (0.008)	-0.003 (0.005)
Percent Cash	-0.005 (0.010)	0.006 (0.007)	0.001 (0.004)	-0.007 (0.010)	0.007 (0.008)	0.002 (0.004)
FCF	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	-0.000 (0.000)
Leverage	0.027 (0.018)	-0.009 (0.014)	-0.008 (0.008)	-0.001 (0.018)	-0.014 (0.015)	-0.008 (0.009)
TobinsQ	0.000 (0.000)	0.001*** (0.000)	0.000* (0.000)	0.000 (0.000)	0.001*** (0.000)	0.000* (0.000)
Toehold	-0.026 (0.019)	-0.013 (0.015)	0.007 (0.009)	-0.004 (0.019)	-0.011 (0.016)	-0.000 (0.009)
HighTech	0.016 (0.023)	0.015 (0.016)	0.012 (0.009)	-0.006 (0.023)	-0.005 (0.018)	0.020** (0.009)
Public	-0.032** (0.014)	-0.018* (0.011)	-0.008 (0.006)	-0.023 (0.014)	-0.011 (0.012)	-0.009 (0.007)
Private	0.003 (0.009)	-0.003 (0.007)	-0.001 (0.004)	0.003 (0.010)	-0.004 (0.008)	-0.003 (0.004)
Rumour	0.012 (0.033)	0.003 (0.025)	-0.011 (0.015)	-0.024 (0.034)	-0.016 (0.027)	-0.015 (0.015)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	372	744	2046	372	744	2046
adj. R-sq	0.093	0.097	0.096	0.064	0.085	0.092

<b>Panel B: Entropy Balanced</b>						
Sin acquisition	-0.014*	-0.016**	-0.013**	-0.014*	-0.016*	-0.015**
	(0.008)	(0.007)	(0.007)	(0.008)	(0.008)	(0.007)
N	372	744	2046	372	744	2046

**Table 5. Cross Country Analysis**

This table reports the estimates of OLS regressions of bidding firms' cumulative abnormal returns on deal- and firm-specific explanatory variables. The main variable of interest is the Sin acquisition dummy, which takes the value of one if a non-sin bidder acquires a sin target firm, and zero if a non-sin bidder acquires a non-sin target firm. In all models, the dependent variable is cumulative abnormal returns for a window of -1 to +1 days around the announcement day [CARs(-1,+1)]. Countries are classified as High (Low) if their ranking is above (below) the median ranking value. For Models (1) and (2), we employ a sustainability ranking index provided by Robecosam, and for Models (3) and (4) as well as (5) and (6) we use environmental and governmental data provided by the World Bank. Sin acquisitions are matched 1 to 10 with non-acquisitions. In Panel B, the sin and non-sin acquisitions subsamples are entropy balanced. Standard errors are reported below the coefficients. The superscripts \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% levels, respectively. In all regressions, we control for year and industry fixed effects. N denotes the number of observations.

<b>Panel A: nm 1-10</b>						
	<b>Model (1)</b>	<b>Model (2)</b>	<b>Model (3)</b>	<b>Model (4)</b>	<b>Model (5)</b>	<b>Model (6)</b>
	<b>Sustainability</b>	<b>Sustainability</b>	<b>Environmental</b>	<b>Environmental</b>	<b>Governmental</b>	<b>Governmental</b>
	<b>High</b>	<b>Low</b>	<b>High</b>	<b>Low</b>	<b>High</b>	<b>Low</b>
Sin acquisition	-0.019**	0.009	-0.025***	-0.008	-0.024***	0.008
	(0.008)	(0.022)	(0.008)	(0.019)	(0.008)	(0.019)
Log(Market value)	-0.009***	-0.032**	-0.012***	0.005	-0.011***	-0.023**
	(0.003)	(0.013)	(0.003)	(0.010)	(0.003)	(0.010)
Relative size	0.029***	0.008	0.022***	0.006	0.023***	0.009*
	(0.004)	(0.007)	(0.005)	(0.006)	(0.004)	(0.005)
Domestic	-0.008*	0.003	-0.004	0.011	-0.009*	0.021
	(0.005)	(0.021)	(0.005)	(0.018)	(0.005)	(0.023)
Percent Cash	0.000	-0.018	-0.004	0.003	0.003	0.006
	(0.005)	(0.016)	(0.005)	(0.013)	(0.005)	(0.012)
FCF	0.000	0.002	0.000	-0.001	-0.000	0.000
	(0.000)	(0.006)	(0.000)	(0.002)	(0.000)	(0.000)
Leverage	-0.014	0.021	-0.017*	-0.016	-0.014	0.008
	(0.009)	(0.036)	(0.009)	(0.031)	(0.010)	(0.024)
TobinsQ	0.000	0.008	0.000	0.004	0.000***	0.008
	(0.000)	(0.008)	(0.000)	(0.009)	(0.000)	(0.008)
Toehold	0.012	-0.030	0.016	0.029	0.032**	-0.012
	(0.010)	(0.031)	(0.011)	(0.019)	(0.013)	(0.016)
HighTech	0.003	0.036	0.005	-0.008	-0.002	0.048**
	(0.011)	(0.024)	(0.011)	(0.022)	(0.012)	(0.024)
Public	-0.016**	-0.035	-0.030***	-0.026	-0.024***	0.003
	(0.007)	(0.027)	(0.008)	(0.018)	(0.008)	(0.017)
Private	0.002	-0.010	-0.003	0.002	0.001	-0.008
	(0.005)	(0.014)	(0.005)	(0.014)	(0.005)	(0.013)
Rumour	-0.024	-0.029	-0.008	-0.070*	-0.033*	-0.058

	(0.015)	0.059)	(0.016)	(0.042)	(0.019)	(0.043)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
N	1727	319	1661	330	1595	396
adj. R-sq	0.104	0.019	0.110	0.039	0.108	0.095

**Panel B: Entropy Balanced**

Sin acquisition	-0.015**	-0.001	-0.020***	0.001	-0.020***	-0.002
	(0.006)	(0.024)	(0.006)	(0.023)	(0.007)	(0.020)
N	1727	319	1661	330	1595	396

**Table 6. Cross-sectional Analysis**

This table reports the estimates of OLS regressions of bidding firms' cumulative abnormal returns for a window -1 to +1 days around the announcement day [CARs(-1,+1)] on deal- and firm-specific explanatory variables. The main variable of interest is the Sin acquisition dummy, which takes the value of one if a non-sin bidder acquires a sin target firm, and zero if a non-sin bidder acquires a non-sin target firm. Models (1) and (2) are run separately for domestic and cross-border deals. Models (3) and (4) are run for subsamples of deals with high and low relative size (RS), respectively. Deals for which the relative size is above (below) the median are classified as high (low). In Panel B, the sin and non-sin acquisitions subsamples are entropy balanced. Standard errors are reported below the coefficients. The superscripts \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% levels, respectively. In all regressions, we control for year and industry fixed effects. N denotes the number of observations.

<b>Panel A: nm 1-10</b>				
	<b>Model (1)</b>	<b>Model (2)</b>	<b>Model (3)</b>	<b>Model (4)</b>
	<b>Domestic</b>	<b>Cross Border</b>	<b>HighRS</b>	<b>LowRS</b>
Sin acquisition	-0.024** (0.010)	-0.008 (0.011)	-0.027** (0.013)	0.013* (0.008)
Log(Market value)	-0.010*** (0.003)	0.000 (0.006)	-0.015*** (0.005)	-0.001 (0.003)
Domestic			-0.007 (0.009)	-0.009** (0.004)
Relative size	0.029*** (0.005)	0.024* (0.013)	0.032*** (0.006)	0.179* (0.096)
Percent Cash	0.000 (0.006)	0.000 (0.008)	-0.003 (0.008)	0.001 (0.004)
FCF	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Leverage	-0.012 (0.011)	-0.046*** (0.017)	-0.002 (0.016)	-0.018** (0.008)
TobinsQ	0.000 (0.000)	0.001*** (0.000)	-0.000 (0.000)	0.001*** (0.000)
Toehold	0.015 (0.011)	-0.024 (0.019)	0.023 (0.016)	0.001 (0.010)
HighTech	0.014 (0.014)	-0.005 (0.015)	-0.013 (0.019)	0.004 (0.010)
Public	-0.018** (0.008)	-0.011 (0.013)	-0.021* (0.011)	-0.006 (0.009)
Private	0.006 (0.005)	-0.002 (0.008)	0.020** (0.008)	-0.005 (0.004)
Rumour	-0.019 (0.017)	-0.031 (0.027)	-0.026 (0.020)	-0.004 (0.025)
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
N	1346	381	863	863
adj. R-sq	0.112	0.165	0.167	0.078
<b>Panel B: Entropy Balanced</b>				
Sin acquisition	-0.019** (0.008)	-0.004 (0.013)	-0.042*** (0.010)	0.016** (0.006)

N	1346	381	863	863
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**Table 7. Bidders Acquiring Both Sin and Non-Sin Target Firms**

This table reports the results when we focus on bidders that acquire both a non-sin and a sin target firm. Models (1) and (2) present the estimates of OLS regressions of bidding firms' cumulative abnormal returns on deal- and firm-specific explanatory variables. The main variable of interest is the Sin acquisition dummy, which takes the value of one if a non-sin bidder acquires a sin target firm, and zero if a non-sin bidder acquires a non-sin target firm. In Model (2), we exclude deals of non-sin targets that take place in a period after the acquisition of a sin target by the same acquirer. Standard errors are reported below the coefficients. The superscripts \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% levels, respectively. In all regressions, we control for year and industry fixed effects. N denotes the number of observations.

CARs(-1,+1)		
Controlling for Same Bidder		
	Model (1)	Model (2)
	All	Excluding post-sin deals
Sin acquisition	-0.013* (0.007)	-0.024** (0.010)
Log(Market value)	-0.020*** (0.005)	-0.012* (0.007)
Relative size	-0.009 (0.008)	0.002 (0.012)
Domestic	-0.012 (0.008)	-0.013 (0.011)
Percent Cash	0.007 (0.008)	0.001 (0.011)
FCF	-0.000** (0.000)	-0.000 (0.000)
Leverage	-0.003 (0.014)	-0.004 (0.019)
TobinsQ	0.003** (0.001)	0.004** (0.002)
Toehold	-0.028* (0.015)	-0.014 (0.020)
HighTech	-0.084*** (0.025)	-0.094*** (0.031)
Public	-0.014 (0.012)	-0.025 (0.017)
Private	-0.018** (0.008)	-0.023* (0.012)
Rumour	0.002 (0.030)	-0.040 (0.047)
Industry FE	Yes	Yes
Year FE	Yes	Yes
N	385	218
adj. R-sq	0.303	0.394

**Table 8. Premium Analysis**

This table reports the estimates of OLS regressions of target premiums on deal- and firm-specific explanatory variables. Target premiums is estimated as the target cumulative abnormal returns for a window of 42 days prior to the acquisition announcement up to the completion date [CARs (-42, CD)]. The main variable of interest is the Sin acquisition dummy, which takes the value of one if a non-sin bidder acquires a sin target firm, and zero if a non-sin bidder acquires a non-sin target firm. Model (1) utilizes the whole sample, Model (2) focuses only on diversifying deals, and Models (3) and (4) are run in the High and Low CSR countries sub-groups, respectively. Models (5) and (6) are run separately for domestic and cross-border deals. Models (7) and (8) are run for subsamples of deals with high and low relative size (RS), respectively. Deals for which the relative size is above (below) the median are classified as high (low). Standard errors are reported below the coefficients. The superscripts \*\*\*, \*\* and \* indicate statistical significance at the 1%, 5% and 10% levels, respectively. In all regressions, we control for year and industry fixed effects. N denotes the number of observations.

	<b>Model (1)</b>	<b>Model (2)</b>	<b>Model (3)</b>	<b>Model (4)</b>	<b>Model (5)</b>	<b>Model (6)</b>	<b>Model (7)</b>	<b>Model (8)</b>
	<b>All</b>	<b>Diversifying</b>	<b>HighCSR</b>	<b>LowCSR</b>	<b>Domestic</b>	<b>Cross-Border</b>	<b>HighRS</b>	<b>LowRS</b>
	<b>Premium</b>	<b>Premium</b>	<b>Premium</b>	<b>Premium</b>	<b>Premium</b>	<b>Premium</b>	<b>Premium</b>	<b>Premium</b>
Sin acquisition	-0.014 (0.150)	-0.049 (0.178)	-0.045 (0.187)	-0.138 (0.660)	-0.045 (0.215)	0.105 (0.435)	-0.088 (0.384)	-0.021 (0.512)
Log(Market value)	-0.008 (0.013)	0.002 (0.022)	-0.000 (0.024)	-0.041 (0.094)	-0.019 (0.030)	0.044 (0.029)	-0.103** (0.047)	0.109*** (0.039)
Relative size	-0.026*** (0.009)	-0.031** (0.013)	-0.031** (0.013)	0.041 (0.079)	-0.078** (0.038)	-0.019** (0.008)	-0.050** (0.021)	-0.216 (1.111)
Domestic	-0.007 (0.025)	-0.019 (0.042)	-0.016 (0.045)	-0.328** (0.132)			-0.022 (0.100)	0.055 (0.061)
Percent Cash	0.093*** (0.024)	0.050 (0.040)	0.041 (0.043)	0.094 (0.107)	0.014 (0.054)	0.113** (0.051)	-0.049 (0.088)	-0.043 (0.061)
FCF	0.000 (0.000)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.000 (0.001)	-0.002 (0.006)	0.002 (0.005)
Leverage	-0.071* (0.042)	-0.150* (0.082)	-0.157* (0.086)	0.077 (0.261)	-0.130 (0.105)	-0.194* (0.116)	-0.098 (0.159)	-0.088 (0.132)
TobinsQ	-0.000 (0.001)	-0.001 (0.005)	-0.001 (0.005)	0.012 (0.038)	-0.001 (0.006)	0.003 (0.005)	-0.001 (0.012)	-0.003 (0.004)
Toehold	-0.097*** (0.035)	-0.091 (0.056)	-0.086 (0.061)	0.080 (0.127)	-0.099 (0.076)	-0.018 (0.074)	0.004 (0.166)	0.070 (0.113)

HighTech	0.034 (0.036)	0.002 (0.057)	0.017 (0.059)	0.040 (0.199)	0.013 (0.075)	0.060 (0.068)	-0.043 (0.111)	0.029 (0.079)
Rumour	-0.079* (0.045)	-0.094 (0.081)	-0.090 (0.088)	0.013 (0.205)	-0.077 (0.120)	-0.061 (0.079)	0.025 (0.170)	-0.303** (0.142)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4014	1872	1755	117	1364	391	850	439
adj. R-sq	0.029	0.005	0.005	0.172	0.001	0.064	-0.013	0.093

## Appendix 1. Definitions of Variables

This table presents the definitions for the various variables employed in the study.

Appendix	
Variable	Definition
CARs(-1,+1)	Bidders' cumulative abnormal returns over a window of three days (CARs(-1,+1)). To estimate abnormal returns, we follow Fuller et al. (2002) and estimate market adjusted abnormal returns.
Target CARs(-42,CD)	Targets' cumulative abnormal returns over a window of 42 days prior to the acquisition announcement up to the completion date of the deal. To estimate abnormal returns, we follow Fuller et al. (2002) and estimate market adjusted abnormal returns.
Sin acquisition	Dummy variable that takes the value of one if a non-sin bidder acquires a sin target firm, and zero if a non-sin bidder acquires a non-sin target firm.
Market value	The acquirer's market value of equity as measured prior to the announcement of the acquisition, in USD.
Relative Size	Value of the deal from Thomson Financial SDC divided by acquirer's market value of equity as measured prior to the announcement of the deal.
Domestic	Dummy variable that takes the value of one if the bidder and the target firm operate in the same country.
Percent Cash	Continuous variable that captures the percentage at which the deal has been paid in cash versus other payment.
FCF	Bidders' Free Cash Flows (FCF) is estimated as bidders' EBITDA (WC18198) minus interest expenses (WC01075) minus income tax (WC01451) minus capital expenditure (WC04601), scaled by the book value of total assets (WC02999).
Leverage	Leverage is defined as the book value of debt (sum of current and long-term debt) (WC03255) divided by the market value of assets [total book value of assets (WC02999) minus book value of equity (WC03995) plus market value of equity (MV)].
Tobin's Q	Tobin's Q is defined as the market value of assets (total book value of assets (WC02999) minus book value of equity (WC03995) plus market value of equity (MV)) over book value of assets (WC02999).
Toehold	Dummy variable that takes the value of one if the percentage of shares held prior to transaction is 5% or more, and zero otherwise.
Diversifying	Dummy variable that takes the value of one if the first two digits of the acquirers' SIC code are different from the first two digits of the targets' SIC code, and zero otherwise.
HighTech	Dummy variable that takes the value of one if the bidders' SIC code is one of the following: 3571, 3572, 3575, 3577, 3578, 3661, 3663, 3669, 3671, 3672, 3674, 3675, 3677, 3678, 3679, 3812, 3823, 3825, 3826, 3827, 3829, 3841, 3845, 4812, 4813, 4899, 7371, 7372, 7373, 7374, 7375, 7378, 7379, and zero otherwise.
Public	Dummy variable that takes the value of one if the target firm is listed, and zero otherwise, i.e. if private or a subsidiary.
Private	Dummy variable that takes the value of one if the target firm is private, and zero otherwise, i.e. if public or a subsidiary.
Rumour	Dummy variable that takes the value of one if the deal is flagged as rumoured in ThomsonOne and zero otherwise.

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Premium	Target premiums is estimated as the target cumulative abnormal returns for a window of 42 days prior to the acquisition announcement up to the completion date [CARs (-42, CD)].
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