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Mitigating industry contagion effects from financial reporting fraud: A competitive dynamics perspective of non-errant rival firms exploiting product-market opportunities

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Abstract:

Existing studies show that financial reporting frauds by errant firms cause declines in stock market valuations for non-errant rival firms (i.e. industry contagion effects). We posit that contagion effects may be mitigated by investors' expectations of non-errant rivals exploiting product-market opportunities at the expense of errant firms. We apply the competitive dynamics literature to argue that non-errant rivals experience lower contagion effects when they have more available slack to engage in competitive actions. This effect is expected to strengthen when rival firms have previously deployed more resources for research and development and advertising investments or have higher prior market share growth to demonstrate effective deployments of available resources. These arguments are supported for contagion effects from reports of U.S. Securities and Exchange Commission investigations from 2001 to 2004. We contribute to research and practice by going beyond discussions on corporate governance to evaluations of key competitive attributes that investors assess when reacting to such frauds.

Keywords:

Available slack, competitive dynamics, contagion, financial reporting fraud, resource deployment

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Introduction

Fraudulent firm behaviors have witnessed increasing attention from researchers, practitioners, and government bodies over the past decades (Greve et al., 2010; Simpson, 2013). Financial reporting frauds are particularly salient to investors since such frauds have caused non-trivial financial losses to investors (Karpoff et al., 2008; Palmrose et al., 2004). Concerns over such frauds escalated at the turn of the century due to the financial reporting scandals at large listed corporations, such as Enron, Tyco, WorldCom, and very recently, Luckin Coffee and Wirecard, that led to a substantial erosion of confidence in capital markets and subsequent major reforms to restore trust in governance safeguards.

While earlier studies on financial reporting frauds focus on the consequences for the errant firms, subsequent studies examined the consequences for other firms associated with the errant firms. These studies examine various channels of association, including director interlocks (Cowen and Marcel, 2011; Fich and Shivdasani, 2007; Kang, 2008), industry ties (Akhigbe and Madura, 2008; Gleason et al., 2008; Paruchuri and Misangyi, 2015), and country-of-origin ties (Darrough et al., 2020; Kang and Chintakananda, 2019). A key finding is that financial reporting frauds result in negative spillover effects. In other words, when errant firms commit (or are alleged to have committed) such frauds, not only do these firms experience negative investor reactions, firms associated with these errant firms also experience a significant decline in market valuations. These negative spillovers of stock market valuations experienced by associated firms are referred to as contagion effects in this study.[1]

Contagion effects from financial reporting frauds have been found to vary across associated firms. Given that poor corporate governance practices have been associated with the incidence of financial reporting frauds (Beasley, 1996; Dunn, 2004; O'Connor et al., 2006), most studies examining contagion effects have adopted an agency theory perspective to explain why contagion effects vary across associated firms. Specifically, the causal mechanisms for contagion effects have largely centered around how associated firms are perceived to have a higher likelihood of engaging in the same fraud due to poor corporate governance (Akhigbe and Madura, 2008; Fich and Shivdasani, 2007; Kang, 2008). Thus, an agency perspective of contagion effects predicts that investors screen associated firms for observable governance structures, such as corporate boards and external auditors, and stronger contagion effects result from structures that signal weaker governance.

We posit that existing studies grounded in agency theory have led to a one-sided view of financial reporting fraud as a threat to associated firms. An agency lens comes with an assumption that top executives in associated firms are opportunistic agents and strong governance structures are required to prevent or detect financial reporting frauds in these firms (Dalton et al., 2007). However, instead of focusing on poor governance, investors may also assess whether associated firms have the resources to exploit product-market opportunities arising from an errant firm embroiled in a major scandal. These assessments of product-market opportunities can occur when associated firms compete in the same industry as the errant firm. Rival firms, unlike other embedded firms that an errant firm is associated with, can benefit from crises that weaken the errant firm in its product markets.

This study contributes to existing knowledge on contagion effects of financial reporting fraud by departing from an agency perspective and adopting an alternative perspective drawn from the literature on competitive dynamics. Specifically, we consider whether the contagion effects of financial reporting frauds may be mitigated by potential product-market opportunities for rivals of an errant firm. We argue that product-market opportunities arise because consumers may switch to products offered by non-errant rivals (Karpoff et al., 2008). Hence, non-errant rivals are in a unique position to strategically respond to and benefit from the financial reporting frauds of errant firms.

At the heart of competitive dynamics research is the notion that competition is an interactive or dynamic process of competitive moves among rivals (Chen and Miller, 2012, 2015; Smith et al., 2001). In particular, firms have been found to take competitive actions to exploit opportunities arising from unexpected negative outcomes experienced by other rivals (Guo et al., 2020). Competitive actions by non-errant rivals should cause investors to view industry associations as an opportunity for non-errant rivals to mitigate contagion effects.

The competitive dynamics literature highlights that firms are not equally adept in competitive actions (Chen and Miller, 2012). A key finding is that a firm's resources enable competitive actions that lead to positive outcomes (Ndofor et al., 2011; Sirmon et al., 2008; Smith et al., 2001). When combined with screening theory, the competitive dynamics perspective suggests that investors screen non-errant rivals for observable signals that correlate with the sought-after competitive attribute (Bergh et al., 2019; Connelly et al., 2011; Sanders and Boivie, 2004; Weiss, 1995). A key competitive attribute is the availability of slack resources since firms with available slack resources are quick to engage in more competitive actions to exploit product-market opportunities (Carnes et al., 2018; Ferrier, 2001; Haleblian et al., 2012).

Hence, our main hypothesis argues that non-errant rivals with more available slack resources will experience lower contagion effects because investors will view these rivals less negatively due to the potential exploitation of product-market opportunities from financial reporting fraud. We further argue that the effect of available slack resources is strengthened when these firms have previously deployed resources to create and capture value through investments in product innovation and marketing, respectively (Kornberger, 2017; Mizik and Jacobson, 2003). Finally, we argue that the effect of available slack resources also strengthens when non-errant rivals have growing market shares which signal prior effective resource deployments for competitive actions (Ferrier et al., 1999). We test and find support for these hypotheses on 1057 non-errant rival firms competing in the same industries as errant firms under Securities and Exchange Commission (SEC) investigations for financial reporting frauds from 2001 to 2004. Thus, our key contributions are to understand more comprehensively the broader and more complex consequences that follow a negative event, specifically, how observable competitive attributes of non-errant rivals (hereinafter *rival firms*) interact to mitigate contagion effects from financial reporting frauds.

In the following sections, we first explain why contagion effects occur with an emphasis on the categorization process. We then explain investors' screening for governance attributes before explaining why investors may also screen for competitive attributes, with supporting arguments from the competitive dynamics literature.

Contagion effects

Studies have found industry contagion effects from financial reporting frauds (Akhigbe et al., 2005; Akhigbe and Madura, 2008; Gleason et al., 2008; Paruchuri and Misangyi, 2015; Yu et al., 2015). Industry contagion from organizational misconduct can be explained by categorization theory (Greve et al., 2010). This theory suggests that stakeholders categorize actors or objects with similar characteristics such that each category is associated with what is defined as typical, or legitimate for that category's members (Mervis and Rosch, 1981). Cognitive categorization is a core psychological process used to reduce complexity and help cope with the strains of information processing (Kaplan, 2011; Porac and Thomas, 1994), and can influence investors' valuations since the quality of firms can be highly ambiguous (Fligstein, 2001; White, 1981; Zuckerman, 2004).

Two articles are particularly important to understand how categorization results in industry contagion (Jonsson et al., 2009; Yu et al., 2008). Yu et al. (2008) argue that misconduct (a form of

organizational crisis) triggers a sensemaking process where stakeholders apply "mental representations of categories" to assess whether rival firms exhibit similar misconduct, especially those that share the same organizational form as the errant firm. The broader assessment beyond the errant firm is justified because stakeholders want to manage the downside risks of engaging in exchanges with other errant firms. In contrast to Yu et al. (2008), Jonsson et al. (2009) attribute industry contagion to innocent firms losing normative legitimacy when categorized as being similar to an errant firm. The loss of normative legitimacy through categorization is so strong that contagion is not limited to firms with the same organizational form but also across organizational forms when other firms share similar characteristics with the errant firm.

The empirical evidence on industry contagion effects from financial reporting frauds suggests that investors are largely concerned with rival firms exhibiting specific and similar misconduct as the errant firm, and not the widespread industry contagion stemming from loss of normative legitimacy mentioned by Jonsson et al. (2009). For instance, Paruchuri and Misangyi (2015) found that contagion effects from financial misconduct were restricted to other firms within the industry, while firms outside the industry of errant firms were not affected. Hence, industry contagion effects from financial reporting frauds appear to result from categorization processes that account for the collective reputation of firms within an industry (Barnett and Hoffman, 2008). This collective reputation arises because the actions of one firm in an industry create expectations of similar actions by other firms in that industry. Reputational spillovers[2] occur because investors are concerned with the reputation of firms to objectively report financial information to shareholders (Cao et al., 2012) and that rival firms may be engaging in similar misleading accounting practices (Kedia et al., 2015). The concerns over the reliability and credibility of past and future earnings of rival firms lead investors to either lower their expectations of future earnings or apply a higher discount rate to future cash flows, thus decreasing the market value of these firms (Palmrose et al., 2004). For example, Enron's misleading accounting statements resulted in contagion effects for rival firms in the same industry that use similar accounting methods (Akhigbe et al., 2005).

Theoretical arguments of negative spillover effects from categorization generally acknowledge that weaker spillovers are likely to be observed when non-errant and errant firms have greater perceived differences (Bruyaka et al., 2018; Yu et al., 2008). For instance, Yu et al. (2008) suggest that while contagion effects can occur among firms placed within the same industry category, not all firms are equally likely to experience negative spillovers because they share different characteristics. Hence, investors screen for fine-grained differentiations and devalue rival firms if these firms have observable attributes that correlate with the likelihood of committing financial reporting fraud. In this way, investors circumscribe industry-level oversimplifying categorization with event- and firm-specific discernment.

Screening

An actor can screen for and prioritize various observable attributes by assigning them differential values (Bergh et al., 2019; Weiss, 1995). In particular, when stakeholders cannot access unambiguous information regarding the intrinsic quality of an entity, they screen the entity based on the presence of attributes assumed to be highly correlated with the unobservable characteristics of interest (Sanders and Boivie, 2004; Zhang and Wiersema, 2009). Screening theory has been applied in the context of equity investments, where the theory suggests that uncertainty about a firm's value can be reduced when investors screen observable attributes that the firm possesses. For example, several studies found that investors rely more on observable and credible firm attributes given the uncertainty of valuing firms at initial public offerings (Cohen and Dean, 2005; Higgins and Gulati, 2006; Sanders and Boivie, 2004).

One observable set of attributes that correlates with rival firms possibly engaging in financial reporting fraud is the corporate governance structures of these firms (Gleason et al., 2008; Paruchuri and Misangyi, 2015; Yu et al., 2015). There is evidence to suggest that poor corporate governance is a cause of financial reporting fraud (Beasley, 1996; DeChow et al., 1996; Dunn, 2004; Lavelle, 2002). The arguments are largely grounded in agency theory, which predicts that good governance structures mitigate agency problems (Dalton et al., 2007). Hence, strong internal board monitoring has been argued to mitigate industry contagion effects (Paruchuri and Misangyi, 2015; Yu et al., 2015). Strong board monitoring in rival firms dissuades managerial opportunism and so constitutes an observable attribute that increases investors' confidence. Conversely, when board monitoring is weak, investors are more likely to conclude that these firms are at risk of fraudulent financial reporting, resulting in stronger contagion effects. Similarly, external governance mechanisms, such as external auditors (Chaney and Philipich, 2002), can mitigate industry contagion from financial irregularities (Gleason et al., 2008; Yu et al., 2015).

In sum, the general argument of past studies suggests that investors' market reactions are guided by corporate governance attributes, such that weak governance in rival firms results in stronger contagion effects, while strong governance results in weaker contagion effects.

Competitive dynamics

The application of agency theory to understand contagion effects has led to a narrow perspective on the organizational attributes that investors screen for. Specifically, an agency perspective suggests that investors only view financial reporting fraud of errant firms as a threat to rival firms, such that the latter firms experience more or less contagion effects depending on the quality of their observable corporate governance structures. However, firms facing predicaments can drive competitive actions by rivals seeking to take advantage of opportunities that such predicaments bring. For instance, Guo et al. (2020) describe how T-Mobile and Sprint took swift competitive action to attract customers away from Verizon after it reported lower-than-expected earnings. Studies have shown that when a firm is facing a critical event, investors may have a favorable view of the firm's rivals, thus increasing the market valuations of these rivals (Burchard et al., 2021; Goldman et al., 2012; Lang and Stulz, 1992; Slovin et al., 1999). These positive reactions from investors are referred to as competitive effects because rivals of a firm in crisis are expected to derive economic benefits by virtue of increased relative competitiveness. Thus, the strength of contagion effects from financial reporting fraud is driven by two distinct but related considerations that guide investors' decisions. The first consideration, from an agency theory perspective, is whether rival firms can be trusted to not engage in similar fraud as the errant firm. The second consideration, from a competitive dynamics perspective, is whether rival firms can benefit from the errant firm's crisis. The strength of contagion effects is likely to weaken when observable cues for decision making suggest plausible economic benefits from competitive effects.

We argue that rival firms may derive economic benefits from product-market opportunities when the financial reporting frauds of errant firms are made known. Product-market opportunities from financial reporting frauds are available when consumers switch to products offered by rival firms. Studies have shown that exchange relationships, such as those with customers, may be disrupted as firms reassess their relationships with exchange partners that engaged in misconducts (Alexander, 1999; Jensen, 2006; Nalick et al., 2020; Piazza and Jourdan, 2018). Bruyaka et al. (2018) argue that partner defections may result from uncertainty in the "trustworthiness and commitment" (p. 446) of errant firms. Consistent with these arguments, Karpoff et al. (2008) suggest that market penalties following financial misrepresentations may be attributable to lost sales "because of an increased probability of cheating or the perception that the firm cannot support

warranties or supply compatible parts in the future" (p. 598). Furthermore, some studies provide evidence of consumers punishing a firm for its unjustifiable practices toward another group of stakeholders (Creyer and Ross, 1997; Sen et al., 2001). These studies provide evidence of misconduct reducing the general reputation of an errant firm (Greve et al., 2010) and is consistent with reputational spillovers across stakeholder groups (Boutinot et al., 2015). For instance, Knight and Greenberg (2002) demonstrated that consumer groups boycotted Nike's products when Nike was accused of engaging in unfair labor practices, thus increasing the competitive positions of Nike's rivals. As media information on negative events can influence decisions, such consumer boycotts are facilitated by a firm's misconduct made visible to multiple stakeholders by the media, enabling consumers to revise their perceptions of the firm and act on them (Carter, 2006; Mahon, 2002). Hence, consumers of errant firms may switch to products offered by rival firms even when the misconduct is not consumer fraud but financial reporting fraud that affects investors.

Rival firms pursuing product-market opportunities from customers of errant firms may have a higher chance of success for two reasons. First, competitive actions from such rivals may not receive much attention from errant firms who are likely preoccupied by corrective actions following financial reporting fraud (Farber, 2005; Gomulya and Boeker, 2014; Marcel and Cowen, 2014). Second, errant firms may not be in a good position to retaliate because their actual financial health is weaker than what was reported, and further exacerbated by an increase in cost of capital after fraudulent financial reporting (Hribar and Jenkins, 2004). According to Chen and Miller (1994), in the context of motivation to engage in competitive actions, "the expectancy that effort will lead to a positive outcome may be reflected by the perceived difficulty of engaging in retaliation" (p. 87). Hence, rival firms have an incentive to engage in competitive actions to seize market share because errant firms may have difficulty responding given the misconduct.

The above arguments suggest that investors may screen rival firms on competitive attributes that correlate with successful exploitation of product-market opportunities at the expense of errant firms. Rival firms with strong competitive attributes may be viewed more favorably by investors, thus alleviating the contagion effects for these firms.

Resource availability

The process of capturing errant firms' market share will depend first on whether rival firms have available resources to engage in competitive actions (Carnes et al., 2018; Ferrier, 2001; Haleblian et al., 2012). Market opportunities arising from an errant firm's financial reporting fraud are more likely to be exploited by rival firms who can quickly take advantage of market openings. Rival firms are on the lookout for market opportunities and will be quick to react when one presents itself (Dykes et al., 2018). We argue that rival firms with access to slack resources are better positioned to exploit market opportunities. Bourgeois (1981) defines organizational slack as "a cushion of actual or potential resources which allow an organization . . . to initiate changes in strategy with respect to the external environment" (p. 30). Previous studies show that slack resources positively affect market growth and firm performance (Bromiley, 1991; Daniel et al., 2004; Su et al., 2009; Weinzimmer, 2000). Slack resources not only enable firms to pursue more strategic options (Bromiley, 1991), but also take advantage of emergent market opportunities and experiment with innovation (Cyert and March, 1963; Nohria and Gulati, 1996).

The competitive dynamics literature suggests that resources engender positive firm outcomes because it enables firms to engage in competitive actions (Ndofor et al., 2011; Sirmon et al., 2008; Smith et al., 2001). For instance, Carnes et al. (2018) argue that slack resources increase a firm's competitive awareness, motivation, and capability to engage in competitive actions, thus improving firm outcomes. Firms with greater slack are able to quickly and effectively mobilize resources

to take strategic actions and respond to environmental opportunities as well as rivals' competitive actions (Ferrier, 2001; Haleblian et al., 2012; Uhlenbruck et al., 2017). The findings of these studies suggest that when market opportunities arise from an errant firm's financial reporting fraud, rival firms with more slack should be better positioned to mobilize necessary resources and respond faster, hence taking advantage of the situation. Thus, slack resources are a good indicator of a firm's ability to quickly take advantage of opportunities presented by an errant firm.

Nevertheless, not all types of slack resources enable rival firms to quickly engage in competitive actions. When compared with potential slack and recoverable slack, available slack is more accessible and flexible because they have not been committed to any specific expenditure (Bourgeois and Singh, 1983; Sharfman et al., 1988). Available slack resources are essential in explaining a firm's ability to take advantage of market opportunities in a timely manner. For example, Cheng and Kesner (1997) found that firms could redirect their available slack resources in a timely manner to exploit market opportunities arising from environmental changes.

In addition, a firm's available slack is likely to be an attribute that investors screen for. For instance, Baum (1996) found that available slack impacted stakeholders' perceptions; a high level was interpreted as an outcome of a firm's prior success and so an indication of future capability and dependability. Investors expect firms with better financial health from their prior success to have the ability to immediately take advantage of market opportunities. Indeed, Kim et al. (2008) found that different types of owners paid attention to available slack resources in their firms, albeit each may have different preferences as to how these resources ought to be employed within their firms. Therefore, available slack is an important indicator of a firm's future ability that investors pay attention to.

In summary, rival firms should be better positioned to quickly take advantage of market opportunities catalyzed by an errant firm's financial reporting fraud when the former has greater access to available slack resources. Investors are more likely to view rival firms with available slack as having the ability to take sales from an errant firm. Therefore, available slack should alleviate any contagion effect that may befall rival firms.

Hypothesis 1. Non-errant rival firms' access to available slack is positively associated with their abnormal returns when there is an investigation of financial reporting fraud against an errant firm in the same industry.

Resource deployment: value creation and value capture

Despite the importance of available slack to exploit product-market opportunities, rival firms may choose not to utilize such resources or use them for other purposes (Kim et al., 2008; Tan and Peng, 2003). While top executives do drive substantive competitive actions (Hambrick et al., 1996), they may become more complacent and less motivated to take competitive actions when firms are buffered by excess slack resources (Debruyne et al., 2010; Kim et al., 2008). Therefore, investors may also screen for observable indications that rival firms are willing to deploy their available slack to exploit the misconduct of an errant firm. Specifically, since the competitive actions of rival firms can increase market share, investors may appreciate rival firms that deploy resources for such actions. Thus, we expect investors to also screen for the prior resource deployments of rival firms and react more positively to their available slack when these firms also exhibit attributes indicating their preparedness to channel excess slack resources to exploit product-market opportunities.

Indeed, previous research has shown that resource deployment decisions have significant implications on firm outcomes (Chao and Kavadias, 2008; Klingebiel and Rammer, 2014). Competitive firms typically deploy more resources substantively on product innovation and marketing activities

to improve product service and quality (MacMillan and Day, 1988). In particular, research and development (R&D) activities have been described as value-creation mechanisms, while advertising activities have been described as value-capture mechanisms (Mizik and Jacobson, 2003). Investments in R&D and advertising activities indicate that a firm attempts to differentiate itself from competitors (Miller, 1988; Spanos et al., 2004) and take a market leadership position (Lieberman and Montgomery, 1988; Zahra and Covin, 1993). Thus, firms with resource deployments in R&D and advertising activities are also aware of relevant trends and other competitors' positioning and competitive actions.

Moreover, firms with strong marketing and innovation capabilities are found to take a leadership or pioneer position in markets (Berry, 2006; Smith and Grimm, 1987). This is because pioneering capabilities that allow firms to take actions earlier emerge from "technological foresight, perceptive market research, or skillful product or process development" (Lieberman and Montgomery, 1988: 49). For example, Haleblian et al. (2012) found that firms with higher investments in R&D and advertising activities acted faster in the industry merger wave.

Hence, resource deployments of rival firms may be viewed from two objectives: rival firms' preparedness to channel available slack toward (1) value creation through strategic resource deployment in R&D activities and (2) value capture through advertising activities. Effectively, a rival firm's R&D and advertising expenditures may serve as observable markers that investors screen for. We examine their effects in separate hypotheses.

Value creation. Historical investments in R&D can generate a strong source of competitive advantage when these resources are aligned with market opportunities (Grimm et al., 2006). Firms that emphasize R&D investments create value for customers by competing on developments in innovation and technology breakthrough (O'Brien, 2003). For example, Klingebiel and Rammer (2014) show that the allocation of R&D investments across a broader range of innovation projects enhances the performance of new-product sales. Moreover, strategic resource investments in skillful product or process development can create first-mover advantages to exploit market opportunities (Lieberman and Montgomery, 1988). Investors also pay attention to and respond positively to R&D projects as well as new-product announcements (Kelm et al., 1995). However, without access to available slack, rival firms with preparedness for value creation may not be able to quickly utilize necessary resources to take advantage of the fraud situation. Hence, it is when rival firms have both access to available slack resources and a preparedness for value creation through prior resource deployments in R&D investments that they can exploit market opportunities quickly and be more positively perceived by investors.

> *Hypothesis 2.* The positive association between non-errant rival firms' access to available slack and abnormal returns is strengthened when these firms show their preparedness through prior resource deployment to create value through R&D investments.

Value capture. Rival firms with available slack resources can also exploit market opportunities more effectively when they demonstrate preparedness for value capture, that is, when they emphasize advertising activities in their strategic resource deployment. Advertising activities help firms create awareness and knowledge of their products and help establish relationships with customers (Grimm et al., 2006; Lieberman and Montgomery, 1988). For example, Srinivasan et al. (2009) found that firm value and investor returns were enhanced when resources were invested in advertising.

An example of a rival firm's resource deployment for value capture in exploiting a market opportunity is Cablevision Systems Corporation. Following an SEC investigation of one of its

main competitors, Adelphia Communications Corporation, in the second quarter of 2002, Cablevision launched an extensive advertising campaign. In particular, Cablevision increased the advertising activities of its wholly owned subsidiary, Rainbow Media Holdings' Core Networks, which include AMC and Women's Entertainment. This advertising investment capitalized on Adelphia's misfortunes and resulted in an increase in net revenues and earnings during the fourth quarter of 2002 (Cablevision, 2003).

Similar to the arguments for value creation, rival firms with preparedness for value capture may not have the ability to quickly take advantage of the fraud situation without access to available slack. Accordingly, investors likely screen rival firms both for access to available slack resources and for preparedness in value capture through prior resource deployments in advertising activities. When both are present, the positive effect of available slack will be strengthened. Hence,

> *Hypothesis 3.* The positive association between non-errant rival firms' access to available slack and abnormal returns is strengthened when these firms show their preparedness through prior resource deployment to capture value through advertising investments.

Effective deployment of available resource

While rival firms' prior resource deployments in R&D and advertising activities reflect their preparedness in value creation and value capture, they do not necessarily provide any evidence of what rival firms have accomplished in the marketplace. Investors can derive a more complete assessment of rival firms' success in exploiting product-market opportunities by considering not only the observable resource deployments in R&D and advertising investments, but also a *demonstrated outcome* of market share growth as a signal of the firms' ability to effectively deploy available resources to win customers over from errant firms.

A primary objective of competition is to advance a firm's market position relative to its competitors, by gaining market share (Chen and MacMillan, 1992) and disrupting, outcompeting, or dethroning rivals. For instance, Ferrier et al. (1999) found that competitive actions by challengers could lead to higher market shares at the expense of market leaders. Indeed, research suggests that market share growth often reflects the outcome of a firm's competitive actions, especially when these actions are quick or varied, and when a firm has the acumen to understand its rivals (Baum and Bird, 2010; Larrañeta et al., 2014; Tsai et al., 2011). Furthermore, Shaffer and Zhang (2002) found that competitive actions targeted at individual customers, such as one-to-one promotions, may build market share for firms with high-quality products.

The above studies suggest that market share growth is a credible outcome that correlates with a rival firm's ability to effectively deploy available resources toward competitive actions to capture market opportunities. Furthermore, when rival firms demonstrate prior market share growth in the presence of available slack, investors are also assuaged of their concerns that excess resources may breed inefficiencies, inhibit risk taking, and reduce the likelihood for market actions (Hambrick et al., 1996; Jensen, 1986; Kim et al., 2008). Therefore, we argue that the positive effect of available slack will be strengthened when rival firms with available slack also show evidence of growing market shares.

> *Hypothesis 4.* The positive association between non-errant rival firms' access to available slack and abnormal returns is strengthened when these firms demonstrate effective deployment of available resource through prior market share growth.

Method

Data

We collected data on two groups of publicly listed US firms. The first group consists of errant firms, that is, non-financial firms investigated by the US SEC for financial reporting fraud, and the second group consists of rival firms located in the same primary four-digit Standard Industrial Classification (SIC) codes as the errant firms. We used the four-digit SIC codes to extract rival firms from Compustat as these firms are likely to be the closest competitors with errant firms (Barnett and King, 2008; Lang and Stulz, 1992; Paruchuri and Misangyi, 2015), and hence, most suited to test whether contagion effects can be mitigated by competitive attributes. To generate the first group of firms, we searched the Lexis–Nexis database for news reports of errant firms under SEC investigations from 2001 to 2004.[3] Our sample period is from 2001 to 2004 as financial reporting frauds received a lot of regulatory and public attention during this time with SEC enforcement releases peaking at 240 in 2003. Since the SEC is an enforcement agency whose primary mission is to protect investors and maintain the integrity of the securities market, financial reporting fraud investigations by the SEC are likely to trigger public interest and generate a response from investors.

We adopted two criteria for selecting errant firms to include in the study. First, an errant firm must have data at the Center for Research in Security Prices (CRSP) to compute investors' reaction to an SEC investigation. Second, errant firms must have experienced a significant decline in market value on the SEC investigation dates reported in the Lexis–Nexis database. This second criterion is to ensure that any negative event is salient enough that a negative contagion effect likely occurs, without which it becomes irrelevant to examine how that contagion can be mitigated. Specifying this criterion helps us to make our findings more reliable given our initial objective to examine what happens following a contagion event. That is, in the event our hypotheses are not supported, they are indeed so and not because we are examining a follow-up phenomenon when the initial phenomenon does not even exist.

A sample consisting of 42 errant firms from 25 industries met both criteria.[4] A financial-event study revealed that these 42 errant firms registered a statistically significant average cumulative abnormal return (CAR) of –19.03% over the (–1, 0) 2-day event window (see Appendix 1 for details). Using the same event dates from the 42 errant firms, we then conducted another financial-event study for the rival firms to determine the industry contagion effects, where on average the rival firms also experience a significant 1% decrease in their CARs (more when we discuss the dependent variable). In total, 2993 firm-date observations, representing 1057 rival firms, were included in the second financial-event study. These rival firms do not include the errant firms investigated by the U.S. SEC for financial reporting fraud.

Furthermore, some rival firms have repeated observations within the sample period since there are cases of multiple SEC investigations on different errant firms in the same industry within a year. This complication poses a concern for the regression analysis because the independent and moderating variables of the rival firms are invariant within each year since financial figures are reported on an annual basis. To resolve this problem, we computed the mean abnormal returns from reported SEC investigations within each year to derive for each rival firm an average abnormal return from contagion effects (see our "Dependent variable" section below). This firm-year observation not only facilitates a proper matching of dependent and independent variables since the latter are available on an annual basis but also removes the occurrence of repeated observations within the same year. As the reduction in the number of observations decreases statistical power, this aggregation is not only appropriate and necessary but also conservative. Below, we discuss the statistical control for this aggregation effect.

Dependent variable

Our dependent variable is the *investors*' *reaction* toward a rival firm, which is measured using the CARs from financial-event study analysis. A short 2-day event window of (–1, 0) was used because financial-event studies assume that markets are efficient and that financially relevant information will be quickly incorporated into stock prices, although we employ other event windows in our robustness check (McWilliams and Siegel, 1997; see Appendix 1 for detail).

On average, the financial-event study revealed that the 1057 rival firms, with 2993 firm-date observations, registered a statistically significant CAR of –1.03% over the (–1, 0) 2-day event window. This result is consistent with past studies (Gleason et al., 2008; Paruchuri and Misangyi, 2015) and suggests that rival firms experience a net contagion effect as a result of financial reporting fraud by errant firms in the industry. However, this does not mean that investors view rival firms as a homogeneous group, as argued in our hypotheses. We use the CARs as the dependent variable in the regression analyses to test all our hypotheses. Since the value of this dependent variable is small relative to the independent and control variables, we multiply this dependent variable with 1000 so that the regression coefficients become more readable. But, when plotting the interaction effects, we use the actual value of the dependent variable to capture the actual effect size.

Independent and moderating variables

Available slack is measured as an accounting variable to capture financial slack (Bromiley, 1991; Cheng and Kesner, 1997; Miller and Leiblein, 1996). This variable is the current ratio (current assets divided by current liabilities) and captures the ease of access to slack resources. This measure is widely used in management research (Daniel et al., 2004). Data to compute available slack were extracted from Compustat.

Prior resource deployment to R&D is measured as R&D expense divided by sales, while *prior resource deployment to advertising* is measured as advertising expense divided by sales (Andras and Srinivasan, 2003). These measures capture the ex-ante resource deployments from the latest 10K reports prior to the reported SEC investigations. To minimize effects of outliers, we followed common practice and winsorized the variables at a 5%-level in each tail, where all data below the fifth percentile were set to the fifth percentile, and data above the 95th percentile were set to the 95th percentile (Greene, 2003). *Prior market share growth* is measured as the annual growth in market share prior to the reported SEC investigations, where market share is defined as the sales revenue of a rival firm in its primary four-digit SIC industry divided by the total sales of all firms in that industry. These data were obtained from Compustat.

Control variables

First, we controlled for key characteristics of the errant firms. *Shareholders*' *reaction toward errant firm*, that is, the CAR of an errant firm, was included to control for the magnitude of the stock market penalties experienced by the firm. The CAR was computed from the financial-event study on errant firms. Similarly, as there may be multiple errant firms in a year, we averaged the abnormal returns for all errant firms investigated for each year and within each industry to derive their average abnormal returns within the year of occurrence. We also controlled for the errant firm's SEC investigation by including *accounting and auditing enforcement release*, a dummy variable that takes the value of 1 if the reported SEC investigation is followed by a SEC enforcement release and 0 otherwise.

Next, we included controls for the rival firms. *Firm size* was measured as the natural log of total assets. *Accounting firm performance* was measured as a standardized measure that includes return on assets, return on equity, and return on sales, while *non-accounting firm performance* was measured as Tobin's Q for each rival firm. These variables were included to control for their potential effects on investors' reactions. *Firm size* and *firm performance* variables were extracted from Compustat. A firm's status may influence its susceptibility to contagion effects (Jonsson et al., 2009; Yu et al., 2008). Hence, we controlled for the reputational *status* of the rival firm in a given year by checking whether or not it was included in the list of Fortune Most Admired Companies (Fombrun and Shanley, 1990). We created a dummy variable that takes the value of 1 if a rival firm is included in the Fortune list in an observation year and 0 otherwise. The data come from the *Fortune* magazine publication.

We also controlled for the quality of a rival firm's corporate governance structures. We included *board vigilance* of the rival firms, since the likelihood of financial fraud increases as the level of board vigilance decreases, which occurs with decreases in stock ownership by independent directors and proportion of independent directors (Beasley, 1996; DeChow et al., 1996). We computed the sum of the standardized values of these two governance variables of the rival firms: (1) the proportion of equity held by independent directors and (2) the proportion of independent directors on the board (Lane et al., 1998). Both ownership and director variables were expressed as a percentage over total equity shares or board size, respectively. We also included the *ownership of institutional investors* as a control because these are substitutes to board monitoring (Rediker and Seth, 1995). Institutional investors, as monitors of top executives, have been shown to reduce the likelihood of contagion effects from a governance perspective (Kang, 2008). This variable was expressed as a percentage over total equity shares. These corporate governance controls were extracted from the Corporate Library database or proxy statements of rival firms.

Rival firms with the same external auditor as the errant firm may experience more contagion effects due to concerns over undetected financial reporting fraud (Gleason et al., 2008). A dummy variable, *similarity in external auditor*, was coded as 1 if a rival firm has the same auditor as the errant firm in the same fiscal year, and otherwise coded as 0. We obtained the auditor information from the Audit Analytics database.

We controlled for *discretionary accrual* since it is a common way to manipulate earnings. We computed discretionary accruals of rival firms from the Jones model (Jones, 1991; Kothari et al., 2005). The Jones model of discretionary accrual was estimated each year using all firm-year observations reported in Compustat with the same four-digit SIC code: $TA_{it} = \beta_0 + \beta_1(1/Assets_{it-1}) + \beta_2 \Delta Sales_{it} + \beta_3 PPE_{it} + \varepsilon_{it}$ where TA_{it} is the total accruals for firm i at year t, $Assets_{it-1}$ is lagged total assets, $\Delta Sales_{it}$ is change in sales scaled by lagged total assets, and PPE_{it} is net property, plant, and equipment scaled by lagged total assets. ε_{it}, the residual, is the discretionary accrual for firm i in year t, where larger values indicate greater upward earnings management and lower earnings quality. The use of total assets as a deflator is intended to mitigate heteroskedasticity in residuals (Kothari et al., 2005). We obtained the data from Compustat.

Finally, to control for heterogeneity across industries, we included industry fixed effect using dummy variables that captured the industry of a rival firm. We included three dummy variables to control for year effects since the observations were drawn from 4 years (year 2001 was assigned as the reference year).

Model estimation technique

A rival firm may have more than one event date as the firm may be affected by more than one errant firm. Given that we annually aggregate different event dates for a rival firm, as explained above

when we discuss our data, each observation in our sample then represents a rival firm-year. Since our dependent variable, the CARs from the financial-event study, is a continuous measure, we used ordinary least square (OLS) regression which provides the best linear unbiased estimation (Greene, 2003). Due to instances of multiple observations for a given rival firm across the sample period, we used clustered robust standard error to account for the reduced independence of our observations for a given rival firm (Cohen et al., 2002). Continuous variables were centered prior to creating the interaction terms used to test Hypotheses 2–4.

Results

In Table 1, we report the descriptive statistics for all the variables of interest. Before listwise deletions of firms that contain any missing items, we have 1731 firm-year observations.

We report the regression results in Table 2, which includes the variable coefficients and standard errors. Model 1 in Table 2 includes only the control variables, Model 2 adds the main effects of the independent and moderating variables, and Model 3 adds the interaction effects. We test our hypotheses based on the full Model 3 that is also a statistically significant improvement from Model 2 at $p = 0.001$ based on likelihood-ratio test. The mean variance inflation factor (VIF) in this model is 2.54, indicating that multicollinearity is not an issue.

Hypothesis 1 posits that rival firms with access to available slack resources are more likely to be perceived favorably by investors and thus have higher CAR. The *available slack* variable indicates a significant effect for this hypothesis (positive coefficient at $p = 0.046$). This is consistent with Hypothesis 1.

Hypotheses 2 and 3 posit that the benefits of rival firms' access to available slack will be enhanced when these firms also have higher *prior resource deployment to R&D* and *prior resource deployment to advertising*, respectively. We tested these hypotheses by including the interactions between the rival firms' *available slack* and the respective resource deployment variables. The interaction results show that available slack resources are indeed more likely to increase rival firm CAR when the rival firm deployed more resources for R&D and advertising purposes prior to the reported SEC investigations ($p = 0.024$ and $p = 0.025$, respectively).

To confirm this effect, we plotted the interactions proposed in Hypotheses 2 and 3 in Figures 1 and 2. Figure 1 shows a visible effect of *available slack* depending on the level of *prior resource deployment to R&D activities*. Specifically, there is a stronger, positive association between available slack and rival firm CAR when more resources are allocated to R&D (i.e. one standard deviation above the mean) than when lesser resources are allocated to R&D (i.e. one standard deviation below the mean). Moreover, as shown in Figure 2, there is a visible reversal of the effect of *available slack* depending on the level of *prior resource deployment to advertising*. Available slack is negatively associated with rival firm CAR when lesser resources are allocated to advertising (i.e. one standard deviation below the mean) but becomes positively associated when resource deployment to advertisement is high (i.e. one standard deviation above the mean). These figures are consistent with the arguments that investors view rival firms less negatively in the context of industry contagion when these firms have available slack and the ability to exploit product-market opportunities through prior resource deployment decisions in R&D and advertising activities. Hence, hypotheses 2 and 3 receive consistent support.

Hypothesis 4 posits that the benefits of rival firms' access to available slack will also be enhanced when rival firms demonstrate their ability to effectively deploy available resources through prior market share growth. We tested this hypothesis by including the interaction between the rival firms' *available slack* and *prior market share growth*. The results show that available

Table 1. Descriptive statistics and correlations.

	Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Shareholders' reaction toward rival firm	–0.01	0.05														
2	Shareholders' reaction toward errant firm	–22.73	9.97	0.05													
3	Accounting and auditing enforcement releases	0.29	0.45	0.00	–0.27												
4	Firm size	1502.19	6570.46	–0.06	0.11	0.01											
5	Accounting firm performance	0.82	194.16	0.04	–0.04	–0.01	–0.01										
6	Non-accounting firm performance	1.98	1.96	0.00	0.12	–0.22	–0.17	–0.01									
7	Status	0.04	0.19	0.02	–0.02	0.06	0.35	–0.00	0.02								
8	Board vigilance	0.00	1.51	0.02	–0.03	0.08	0.04	–0.01	–0.09	0.02							
9	Ownership of institutional investors	12.51	13.18	–0.05	–0.03	–0.05	0.21	–0.02	–0.05	0.01	0.03						
10	Similarity in external auditor	0.23	0.35	–0.04	0.11	–0.07	0.09	0.02	0.02	0.00	0.01	0.06					
11	Discretionary accruals	–0.12	0.35	0.05	0.04	0.17	–0.32	0.05	0.07	–0.09	0.03	–0.13	–0.08				
12	Available slack	3.69	5.19	0.03	0.11	–0.17	–0.07	–0.05	0.03	–0.07	–0.00	0.05	0.02	0.07			
13	Prior resource deployment to R&D	–3.56	7.03	0.03	–0.22	0.26	0.08	0.01	–0.20	0.04	0.01	0.09	0.04	–0.20	–0.28		
14	Prior resource deployment to advertising	0.01	0.02	–0.00	–0.00	0.03	–0.07	–0.01	0.06	0.04	–0.02	–0.06	0.01	0.11	–0.04	–0.00	
15	Prior market share growth	–454.85	972.89	0.01	0.22	0.16	0.03	0.00	–0.03	–0.01	0.01	–0.09	–0.02	0.19	0.09	–0.19	0.03

R&D: research and development; SD: standard deviation.

Means and standard deviations are reported in the original metric; correlations whose absolute values are greater than 0.048 are significant at $p < 0.05$. Correlations with year and industry dummies are not included. There are 1731 firm-year observations with 1046 unique firms before any listwise deletions.

Table 2. Regression models.

	Shareholders' reaction toward rival firm								
	Model 1			Model 2			Model 3		
	β	*SE*	*p*-value	β	*SE*	*p*-value	β	*SE*	*p*-value
Shareholders' reaction toward errant firm	0.77	0.21	0.000	0.80	0.23	0.000	0.75	0.23	0.001
Accounting and auditing enforcement releases	6.29	3.57	0.079	7.20	4.15	0.083	7.23	4.15	0.082
Firm size	–1.15	0.74	0.123	–0.99	0.76	0.189	–1.04	0.75	0.166
Accounting firm performance	8.91	12.06	0.460	9.63	12.52	0.442	13.73	12.18	0.260
Non-accounting firm performance	–0.91	0.69	0.187	–1.25	0.68	0.066	–1.29	0.68	0.058
Status	5.98	3.99	0.134	7.21	4.11	0.080	8.14	4.16	0.051
Board vigilance	2.02	1.14	0.076	1.66	1.19	0.162	1.53	1.19	0.200
Ownership of institutional investors	–0.15	0.09	0.106	–0.15	0.10	0.113	–0.17	0.10	0.084
Similarity in external auditor	–8.51	3.94	0.031	–7.30	4.04	0.071	–6.43	4.04	0.112
Discretionary accruals	1.92	5.07	0.704	4.42	5.07	0.383	5.51	4.98	0.269
Available slack				0.23	0.27	0.200	0.53	0.31	0.046
Prior resource deployment to R&D				1.02	1.70	0.549	0.66	1.77	0.711
Prior resource deployment to advertising				–2.41	1.55	0.121	–2.12	1.52	0.162
Prior market share growth				–1.87	2.26	0.408	–0.80	2.32	0.732
Available slack × prior resource deployment to R&D							0.33	0.17	0.024
Available slack × prior resource deployment to advertising							0.87	0.44	0.025
Available slack × prior market share growth							1.08	0.32	0.001
Constant	15.12	9.57	0.115	13.27	9.93	0.182	12.15	9.94	0.222
Year fixed effect	Included			Included			Included		
Industry fixed effect	Included			Included			Included		
Observations	1501			1426			1426		
R-squared	0.035			0.037			0.044		
R-squared change				0.002			0.007**		
F	2.58***			2.55***			2.98***		

R&D: research and development; SE: standard error.
Clustered robust standard errors are reported. One-tailed tests are for directional hypotheses.
***$p < 0.001$, **$p < 0.01$.

slack resources are indeed more likely to increase rival firm CAR when the rival firm had higher prior market share growth ($p = 0.001$).

The interaction plot in Figure 3 also confirms this relationship, where available slack is viewed more favorably when the rival firm demonstrates high prior market share growth (i.e. one standard deviation above the mean) when compared with low prior market share growth (i.e. one standard deviation below the mean). This provides clear support for Hypothesis 4.

Effect size

Altogether, our hypotheses are broadly supported, as indicated in both the regression models and interaction plots. Two out of three interaction plots show cross-over interaction effects, thus

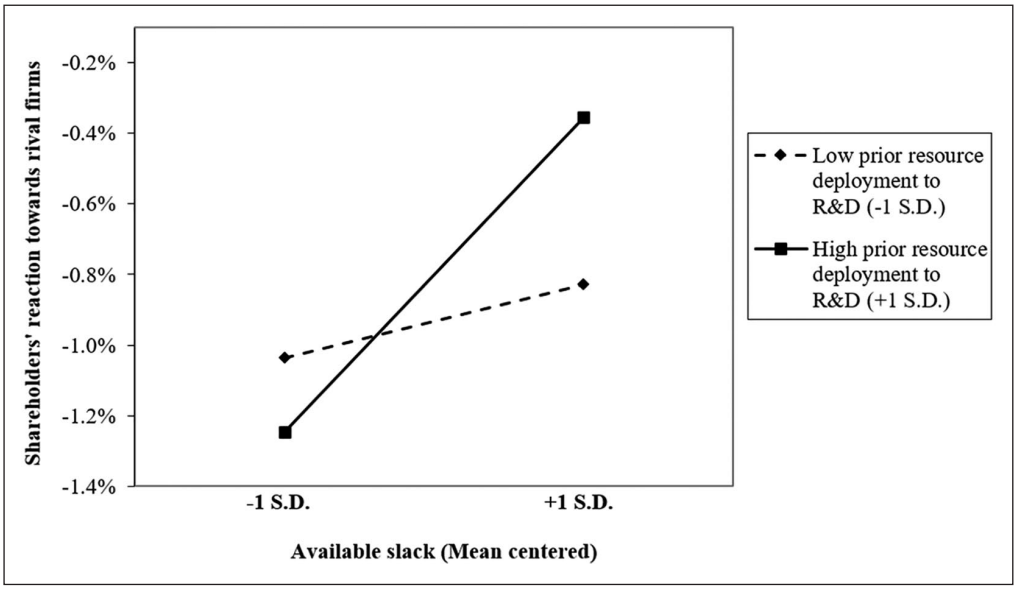

Figure 1. Moderation effect of prior resource deployment to R&D on available slack.

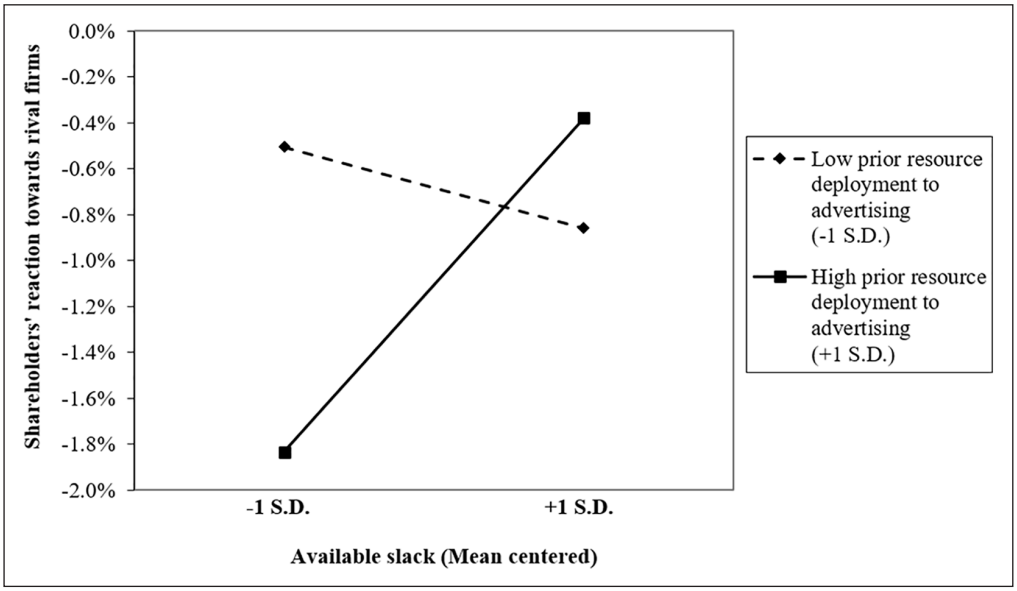

Figure 2. Moderation effect of prior resource deployment to advertising on available slack.

indicating visible and substantive effects that align with our hypotheses. We note that as available slack increases from one standard deviation below to one standard deviation above the mean, the CAR of rival firms increases by 0.21% when a rival firm allocates fewer resources toward R&D but increases by 0.90% when a rival firm allocates more resources toward R&D, resulting in a 0.69% increase if a rival firm's slack resources and prior resource deployment to R&D activities both increase from one standard deviation below to one standard deviation above the mean.

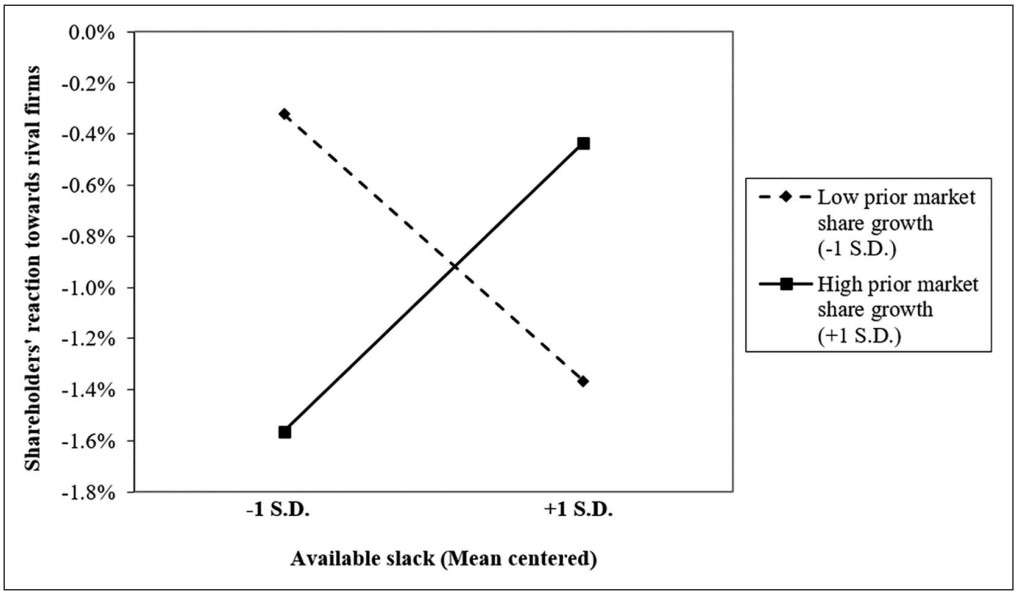

Figure 3. Moderation effect of prior market share growth on available slack.

Regarding the effect of prior resource deployment to advertising, as available slack increases from one standard deviation below to one standard deviation above the mean, the CAR of rival firms decreases by 0.36% when a rival firm allocates fewer resources toward advertising but increases by 1.45% when a rival firm allocates more resources toward advertising, resulting in a 1.81% increase if a rival firm's slack resources and prior deployment to advertising both increase from one standard deviation below to one standard deviation above the mean.

Regarding the effect of prior market share growth, as available slack increases from one standard deviation below to one standard deviation above the mean, the CAR of rival firms decreases by 1.05% when a rival firm's prior market share growth is low but increases by 1.13% when a rival firm's prior market share growth is high, resulting in a 2.18% increase if a rival firm's slack resources and prior market share growth both increase from one standard deviation below to one standard deviation above the mean.

Overall, contagion effects reduced by the interactions of available slack and measures of prior resource deployment as well as prior market share growth show an effect size that ranges from 0.69% to 2.18%. This effect size is larger than that documented by Barnett and King (2008), who found industry firms suffered an average loss of 0.30% following an industrial accident. Adding the three moderators posited by Hypotheses 2, 3, and 4 also increases the R-squared change to 0.7%, which is 16% of the total R-squared of 4.4% explained in the full Model 3. Furthermore, as the average market size of a public firm is to the tune of billions of US dollars (Karpoff and Lott, 1993), a change in CAR of even 1% equates to tens if not hundreds of millions of U.S. dollars. This shows the material importance of the three moderating variables in explaining the total variance.[5]

Robustness checks and additional analyses

First, as the availability of slack resources may depend on other factors, this variable presents some potential endogeneity that may confound our conclusions despite the inclusion of several control

variables and fixed effects in our regression analyses. To test for this potential endogeneity, we conducted the following analyses.

The estimation process was separated into two stages. In the first stage, the outcome variable was the variable that may suffer from endogeneity concern (i.e. *available slack*), while in the second stage, the outcome variable is the *investors' reaction*. We then ran the Durbin-Hausman-Wu test to check for the endogeneity of the available slack by comparing instrumental variable (IV) estimates to OLS estimates (Greene, 2003).[6]

In the first stage, we included an instrumental variable that predicts the availability of slack resources, that is, correlated with the outcome in the first stage but not with the outcome in the second stage (Greene, 2003). This instrument is the average long-term debt in an industry. This industry average may affect a firm's propensity to take on long-term debt instead of short-term debt or current liability, which is a component of slack resources. However, long-term debt levels in an industry should not affect short-term market reactions that we captured through CARs because such information should be quite well known and has been incorporated in firm stock prices. The results of our analysis show that this instrument indeed significantly influences available slack ($p=0.000$) but does not significantly influence investors' reactions ($p=0.872$). The Durbin-Hausman-Wu test (Greene, 2003) also suggests that our model does not suffer from any significant endogeneity concern and all our earlier conclusions hold.

Second, we further confirmed the consistency of our findings through a number of additional robustness checks. We tried alternative measures of accounting firm performance, using return on assets, return on equity, and return on sales separately instead of the standardized summation measure that includes these variables. We also measured firm size using firm revenue instead of assets. The results remain largely the same. We controlled for the industry effect using either four-digit SIC codes or two-digit SIC codes. Instead of entering the measures of prior resource deployments to R&D and advertising separately, we added up their standardized measures in one construct and reanalyzed all our hypotheses. Our conclusions remain supported.

Third, we included a broader set of control variables to further guard our findings from omitted variable bias. Specifically, we included the following variables in the models: (1) proportion of sales in primary industry for errant firm, (2) proportion of sales in primary industry for rival firm, (3) prior irregularity, (4) CEO-Chairman duality, (5) average multiple directorships, and (6) ownership of inside directors. Our conclusions remain supported. Appendix 2 shows the results with the broader set of control variables.

Fourth, we widened our event study window to examine the effect of the negative news from 1 day prior to the reported SEC investigation to 1 day after the report, that is from $t=-1$ to $t=+1$, instead of only from $t=-1$ to $t=0$. Altogether, we still find strong support for the interaction between slack resources and prior R&D activities ($p=0.007$). The interaction effect between slack resources and prior advertising activities is not significant but remains positive ($p=0.269$). The interaction between slack resources and prior market share growth is still positive and significant ($p=0.001$). This change of significance level could be because the negative news has been substantially incorporated by the market by day 0 and other noise may come in on day 1.

Finally, we conducted additional analyses to examine whether rival firms take more actions after the reported SEC investigation to exploit the misconduct of errant firms. We collected firm competitive action data for 30 randomly selected rival firms as identified in errant firms' annual reports. Competitive actions for each rival firm were extracted from the Lexis–Nexis database for the 2 years before and after the SEC investigations of the respective errant firms. Following previous literature, we define competitive actions as externally directed, specific, and observable moves initiated by a firm to enhance its competitive position (Ferrier et al., 1999; Smith et al., 1991). We

manually classified news articles and newswires according to the types of actions related to value-creation and value-capture mechanisms.

We found a significant difference in t-test results ($p = 0.033$) for more marketing and advertising actions within 2 years following the event date as compared to within 2 years before the event date, which is in line with our arguments for value-capture mechanisms. For competitive actions related to a value-creation mechanism, we did not find any significant difference in t-test results for new-product actions between within 2 years after the event date and within 2 years before ($p = 0.730$). This is possibly because launching new products may take more time to plan after news of negative events. However, we found a significant difference in t-test results ($p = 0.012$) for more acquisitions within 2 years after the event date when compared to within 2 years before. Acquisitions can substitute for R&D activities that create value since acquiring firms gain access to technology, knowledge, and capabilities for new-product developments and subsequent innovations, that is, "buy" instead of "build" (e.g. Ahuja and Katila, 2001; Makri et al., 2010). Although not all news articles provided clear purposes for the acquisitions, some acquisition objectives explicitly include acquisition for technology and development of new products (e.g. acquisitions by Abbott Laboratories).

Discussion

Do competitive attributes of rival firms reduce contagion effects from errant firms following reports of financial reporting fraud? This is our primary research question. Although the effect of fraudulent actions by a firm has received scholarly attention, less attention has been devoted to understanding the effect of such actions on rival firms in the same industry, especially whether contagion effects can be mitigated by the competitive attributes of these firms.

We argue that contagion effects may be mitigated by investors' expectations of rival firms exploiting product-market opportunities at the expense of errant firms. Investors respond less negatively toward rival firms with competitive attributes that are consistent with their expectations of these firms launching competitive actions to exploit the misconduct of an errant firm. The idea of investors' screening rival firms for observable signals that correlate with the sought-after competitive attribute enables us to develop arguments that capture the nuances of what investors assess when reacting to reports of financial reporting fraud. We draw on the competitive dynamics literature to guide our arguments on the competitive attributes that matter to investors.

We found that rival firms' resource availability, measured as available slack, reduced the contagion effects experienced by these firms. We attribute this finding to investors' expectations that available slack enables more competitive actions to exploit product-market opportunities, an expectation that is consistent with the findings of empirical studies (Carnes et al., 2018; Ferrier, 2001; Haleblian et al., 2012). This finding reveals that investors seem more rational than we perhaps perceive. While it is true that investors make rather sweeping attributions as reflected in the categorization process that leads to contagion effects, they also appear to be rational enough (with a good dose of faith too) to respond less negatively to rival firms if they believe that such firms have available slack resources to quickly exploit product-market opportunities arising from errant firms' financial reporting fraud.

In addition to rival firms' available slack resources, our results also show substantive interaction effects to suggest that a more nuanced model of investors' screening process is at play. First, we found that investors reacted more positively to rival firms' access to available slack when these firms had prior resource deployments in R&D or advertising investments. In other words, the effect of available slack on reducing contagion effects is stronger when rival firms also have observable attributes that suggest the channeling of slack resources to exploit product-market opportunities through the firms' prior resource deployment decisions. This is an important finding because it

validates what we know about slack resources. While Daniel et al. (2004) found that slack resources were associated with better outcomes, the authors cautioned that a curvilinear relationship could not be ruled out because excess slack "could also prevent managers from responding to changing environmental demands" (p. 572). In the context of our study, while contagion effects may have been reduced by rival firms' available slack, investors appear to also look for signals to suggest that rival firms have been actively deploying resources to create and capture value in product markets. Hence, prior resource deployments in R&D or advertising investments provide some assurance to investors that rival firms will utilize available slack by deploying resources to exploit product-market opportunities from the misconduct of errant firms. These findings are consistent with additional analyses using news reports of competitive actions before and after the reported SEC investigations. Rival firms appear to significantly increase their value creation and value capture activities (especially marketing and advertising actions) after the reported SEC investigation, adding qualitative evidence that further corroborates the regression results.

Second, we also found that investors reacted more positively to rival firms' access to available slack when these firms had demonstrated evidence of prior market share growth. This finding is also consistent with the potentially deleterious effects of excess slack. For instance, Nohria and Gulati (1996) found that too much slack diminished discipline over innovative projects and did not always lead to good outcomes. In the context of our study, this means that rival firms may not always effectively utilize slack resources through resource deployments. Our results suggest that investors appear to think likewise. The interaction effect between available slack and prior market share growth produces the strongest effect size among the three interactions that we examine. In fact, when prior market share growth is low, available slack does not reduce contagion effects but increases it (i.e. reduces CAR further). This effect is consistent with investors seeking some assurance that available slack will be effectively deployed by rival firms and not channeled in unproductive ways due to agency problems (Jensen, 1986; Kim et al., 2008). Prior market share growth by rival firms is a good signal for effective deployment of slack resources since exploiting product-market opportunities involves increasing market share at the expense of errant firms.

Overall, we contribute to studies on contagion effects from financial reporting fraud by including considerations of competitive attributes, thus complementing past studies that examine how contagion effects are affected by the quality of corporate governance in rival firms. Our consideration of competitive attributes models a nuanced screening of rival firms by investors, using theoretical arguments backed by the literature on competitive dynamics. In doing so, we also contribute to the literature on slack resources. Specifically, our results suggest that investors respond positively to a firm's slack resources *only* when the firm has attributes that signal effective deployment of such resources to create and capture value from market opportunities. This finding suggests that slack resources by itself may not be enough to generate favorable investors' reactions for rival firms following a financial misconduct by errant firms. The crossover interaction effects that we observe in Figures 2 and 3 further confirm that the main effect for available slack would have been masked if not for a nuanced consideration of our moderating factors.

Implications for practice

Industry contagion effects from financial reporting fraud are of interest to various stakeholders for several reasons. First, these effects are of interest to investors because of the wealth implications on investments. The effect sizes that we document for contagion effects and their mitigation through competitive effects are not trivial. This sizable impact underscores the importance of reducing the contagion effects we examine here.

Second, the results are likely to be of interest to corporate leaders. While we know more about the corrective actions that errant firms take following a misconduct (Hersel et al., 2019; Schembera and Scherer, 2017), there is less guidance on how rival firms can respond to the misconduct of errant firms (Desai, 2011). This study provides practical insights on how rival firms can mitigate contagion effects following financial reporting fraud in the industry. Although corporate leaders have less control over industry factors, such is not the case with firm-level factors. This study suggests that investors expect corporate leaders to take advantage of product-market opportunities by quickly deploying slack resources when available. Hence, our results point to another benefit of retaining available slack: a firm that does so is favorably perceived by investors as having the ability to quickly take advantage of an opportunity when one arises.

Similarly, our study demonstrates the importance of observable value creation and value capture mechanisms as well as market share growth as attributes that investors pay attention to. Corporate leaders can act in accordance with investors' expectations and reformulate their resource deployment decisions to enhance firms' preparedness for value creation and value capture by making investments in R&D and advertising activities to increase market share growth. These practical actions are beneficial, especially in the presence of slack resources, by easing investors' concern over excess slack reducing a firm's responsiveness or being ineffectively deployed. These actions also have the benefit of reducing industry contagion effects from financial reporting fraud by positively influencing investors' assessments of slack resources available to the firm.

Limitations and future research

The scope of this study has limitations that offer opportunities for future research. In using financial-event study methodology (McWilliams and Siegel, 1997), we used a short event window without confounding events so that the abnormal returns of rival firms could be attributed solely to contagion effects from a reported SEC investigation. However, the tradeoff is that the longer term implications for the rival firms were not included. Future research can then examine the longer term implications of industry contagion effects. For instance, Farber (2005) found that investors responded positively to governance improvements by fraudulent firms. If this is the case, contagion effects felt by rival firms may be temporary and disappear when errant firms implement board reforms to regain investors' trust. Likewise, investors' expectations of corporate actions to mitigate contagion effects may be transient. Future research may examine the intensity and effectiveness of competitive actions that rival firms take to wrestle market share away from firms engaged in misconduct. Future research may also broaden the scope of inquiry to include other types of critical events, such as corporate bankruptcies or corporate acquisitions, and offer some insights on the possible heterogeneity across different event types.

Conclusion

Overall, the results of this study highlight the importance of modeling industry contagion effects from financial reporting fraud to account for anticipated product-market interventions that can reduce the drop in stock market valuations. The results show that investors respond less negatively when rival firms have specific competitive attributes. Contagion effects can be mitigated when investors expect that rival firms with available slack resources will exploit product-market opportunities to improve their competitive positions. The effect of available slack is strengthened when investors also observe prior resource deployments in R&D (for value creation) and advertising (for value capture), as well as prior market share growth as evidence of effective deployments of available slack. An understanding of the different competitive attributes that investors pay attention to sheds light on how industry

contagion effects can be mitigated, as well as help researchers to better understand the broader and more complex consequences that may follow a negative event in an industry.

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Notes

1. Negative spillover effects are not restricted to contagion effects as defined in this study. Negative spillovers from financial reporting frauds may also come in the form of more stringent loan contract terms or other negative outcomes for associated firms (Files and Gurun, 2018; Jensen, 2006). However, we focus on contagion effects through stock market devaluations because financial reporting frauds are "a significant threat to the existence and efficiency of capital markets" (Amiram et al., 2018: 732). Hence, we assess the impact on associated firms from the viewpoint of investors.
2. The constructs of reputation and legitimacy are distinct (Bitektine, 2011). Reputation is traditionally rooted in economics and "captures differences in perceived or actual quality," while legitimacy has a social logic that refers to "the level of social acceptability bestowed upon a set of activities or actors" (Washington and Zajac, 2005: 283–284). Although distinct, they are not independent. For instance, while Barnett and King (2008) refer to a shared reputation within an industry, they note that a damaged reputation may threaten the industry's legitimacy. We refer to reputational spillovers because we focus on the market reactions of investors (a specific stakeholder) and highlight their concern with the quality of financial reports of rival firms. This focus aligns better with reputation as a signal of quality (Piazza and Castellucci, 2013), fits closer to reputation as "being known for something" by specific stakeholders (Lange et al., 2010: 157), and is consistent with reputation judgments in an environment of opportunistic behaviors (Bitektine, 2011). Our approach is also consistent with prior studies that refer to "reputational penalties" or "reputational spillovers" when examining investors' reactions to corporate scandals for errant or associated firms (Alexander, 1999; Cao et al., 2012; Kang, 2008; Karpoff and Lott, 1993). Other studies that discuss the differences between reputation and legitimacy (as well as status, a related social construct) include Pollock et al. (2019), George et al. (2016), and Deephouse and Carter (2005).
3. We do not use the Securities and Exchange Commission (SEC) enforcement releases to construct our sample because these releases include enforcements against individuals, financial firms, and other non-publicly listed firms (such as audit firms). More importantly, SEC enforcement releases may not be the first public report of an SEC investigation for financial reporting fraud. Hence, contagion effects around the dates of enforcement releases may not capture investors' initial reactions. Furthermore, the sample will be biased since these releases do not cover all firms investigated by the SEC but only those that the SEC selects for enforcement purposes (Dechow et al., 2011).

4. We started out with 139 non-financial firms reported to be under SEC investigation in the Lexis–Nexis database from 2001 to 2004. We dropped five firms due to the presence of confounding events on the reported dates. Another 17 firms were dropped as data were not available in either the Center for Research in Security Prices (CRSP) or Compustat databases. Finally, we excluded 75 firms because these did not experience a significant decline in market value on the reported dates of the SEC investigations.
5. This study does not aim to select variables that maximize R-squared or the proportion explained in cumulative abnormal return (CAR) variance. As such, we focus on the additional proportion of R-squared explained by our hypotheses.
6. This is unlike the Heckman (1979) test which applies when there is a sample selection bias.

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Appendix 1

We followed the methodology used by Kang (2008) to measure an abnormal stock return in a financial-event study. The abnormal return (AR) is the actual ex post return on the share price of a firm minus the normal return on day t:

$$AR_{it} = R_{it} - E\,(R_{it})$$

where AR_{it} is the abnormal return on the share price for firm i on event date t, R_{it} is the actual ex post return on the share price for firm i on event date t, and $E(R_{it})$ is the normal return on the share price for firm i on event date t. The normal return, $E(R_{it})$, is defined as the expected return if the event of interest (i.e. SEC investigations of financial reporting fraud) had not taken place. To compute the normal return, an estimation window that is typically prior to and does not overlap with the event window is required (McWilliams and Siegel, 1997). We set the estimation window at 200 trading days starting from 10 days prior to the event window. We computed the normal return using a market model of the normal share price behavior. The market model is a statistical model that relates the return of any given share to the return of a specified market portfolio:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

where α_i is the intercept term, β_i is the systematic risk of firm i, R_{mt} is the rate of return on a market portfolio of shares on event date t, and ε_{it} is the error term with $E(\varepsilon_{it}) = 0$ and $var(\varepsilon_{it}) = \sigma_\varepsilon^2$. We used the value-weighted CRSP index as the market portfolio to derive α_i and β_i of the market model. We then computed the abnormal stock return after determining the normal return, $E(R_{it})$, from the market model. The abnormal stock returns for each day in the event window are then summed up to arrive at the CAR over the event window, which is 1 day prior to the SEC investigation and the day of SEC investigation. Observations with confounding announcements from 1 day prior to 1 day after the event date were excluded from the analyses (McWilliams and Siegel, 1997).

Appendix 2

Proportion of sales in primary industry for errant firm was computed as an errant firm's sales revenue in its primary industry divided by the firm's total sales. *Proportion of sales in primary industry for rival firm* was computed as a rival firm's sales revenue in its primary industry divided by the firm's total sales. *Prior irregularity* was a dummy that takes the value of 1 if a rival firm has committed earnings restatement in the past 3 years and 0 otherwise. *CEO-Chairman duality* was a dummy variable that takes the value of 1 if the CEO of the rival firm is also the Chairman of that firm, and 0 otherwise. *Average multiple directorships* was the average number of board appointments in other firms across all the members of a rival firm's board of directors. *Ownership of inside directors* was expressed as a percentage of executive equity ownership over total equity shares.

Shareholders' reaction toward rival firm.

	β	*SE*	*p*-value
Shareholders' reaction toward errant firm	0.73	0.23	0.002
Accounting and auditing enforcement releases	6.52	4.21	0.121
Proportion of sales in primary industry for errant firm	–0.10	0.11	0.380
Firm size	–0.89	0.80	0.263
Accounting firm performance	12.60	12.23	0.303
Non-accounting firm performance	–1.21	0.68	0.077
Proportion of sales in primary industry for rival firm	–0.05	0.12	0.655
Status	7.68	4.14	0.064
Prior irregularity	2.43	4.85	0.616
CEO-Chairman duality	–1.92	2.71	0.478
Board vigilance	1.59	1.23	0.197

(Continued)

Appendix 2. (Continued)

	β	*SE*	*p*-value
Average multiple directorships	–1.38	1.53	0.369
Ownership of institutional investors	–0.15	0.10	0.143
Ownership of inside directors	–2.27	6.31	0.719
Similarity in external auditor	–6.03	4.10	0.141
Discretionary accruals	6.25	5.04	0.215
Available slack	0.53	0.32	0.046
Prior resource deployment to R&D	0.68	1.81	0.709
Prior resource deployment to advertising	–1.69	1.55	0.278
Prior market share growth	–0.74	2.40	0.758
Available slack × prior resource deployment to R&D	0.33	0.17	0.025
Available slack × prior resource deployment to advertising	0.82	0.44	0.033
Available slack × prior market share growth	1.05	0.32	0.001
Constant	28.27	18.03	0.117
Year fixed effect	Included		
Industry fixed effect	Included		
Observations	1413		
R-squared	0.047		
R-squared change	0.006**		
F	2.66***		

R&D: research and development; SE: standard error.
Clustered robust standard errors are reported.
***$p < 0.001$, **$p < 0.01$.