

## **What a Relief: How do Firms Respond to Competitors' Listing Delays? \***

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This Version: February, 2020

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\* We thank Lin Lv and Baolin Li for their able research assistance. We remain responsible for any errors and omissions.

## **What a Relief: How do Firms Respond to Competitors' Listing Delays?**

### **Abstract**

We examine how existing public firms (“incumbent firms”) respond to the listing delays of their competitors. Using regulation-induced initial public offering (IPO) suspensions in China that expose firms already approved for an IPO to indeterminate listing delays, we find that, in response to the declining expectation of imminent threat, incumbent firms reduce their defensive moves. Specifically, they reduce aggressive M&As activities, tighten working capital management to enhance operating efficiency, and engage in less aggressive management disclosure, which lead to an improvement in the overall financial performance. The main results are more pronounced for incumbent firms that encounter greater competitive pressure from other public rivals, face severer threat from the IPO competitor, and hold a dominant position in their industry. After IPO suspensions are over and competitors resume their listing process, incumbent firms appear to regain defensive stance only via aggressive disclosure, but do not change their investment and operating activities. Our paper sheds new light on the dynamic interactions among product market competitors.

Key words: Dynamic competition; initial public offerings; defensive moves

## 1. Introduction

An extensive literature has shown that capital market access via an initial public offering (IPO) provides issuing firms significant competitive advantages including relaxed financial constraints, greater investment flexibility, enhanced product credibility, and reduced information asymmetry (Ritter, 1991; Jain and Kini, 1994; Chemmanur et al., 2010; Hsu et al., 2010; Ritter 2011). These advantages expose existing public firms (“incumbent firms”) that compete with IPO firms in the same market to a higher level of competitive threat. Scholars have long been interested in the IPO peer effects, i.e., how new IPOs affect the performance of incumbent firms (Braun and Larrain, 2009; Hsu et al., 2010). Hsu et al. (2010), for example, show that following a successful IPO in their industry, incumbent firms experience significant deterioration in their operating performance.

These prior studies, however, implicitly assume a static relation between incumbent firms and their IPO peers, i.e., incumbent firms passively suffer from the negative spillover effect of competitor’s IPO and do not actively engage in defensive moves in response to heightened competitive threat. Theory, however, appears to suggest otherwise. For example, models of deterring entry have shown that incumbents actively defend against new entrants through reputation building (Milgrom and Roberts, 1982) or signal jamming via investment, operating activities, and disclosure (Fudenberg and Tirole, 1986; Darrough and Stoughton, 1990; Wagenhofer, 1990).

Drawing upon the existing theory, in this study we examine how incumbent firms dynamically engage in defensive actions surrounding competitors’ IPO by leveraging uncertainty in their listing process. The IPO process, especially in China, is often lengthy, and entails substantial uncertainty about whether and how long the IPO could be completed due to regulation, market condition, and/or firm-specific factors (Hsu et al., 2010; Shi et al., 2018; Cong and Howell, 2019). Hence, during the course of competitor’s listing process, incumbent firms may face changing expectations about when the rival firm could be listed and the probability of an imminent competitive threat. Such dynamically changing expectation enables us to examine how incumbent firms engage in defensive actions in response to competitor’s listing progress.

An important concern is that the rival firm’s IPO is likely endogenous, which makes

causal inferences difficult to draw. To establish causality, we take advantage of policy-induced IPO suspension events in China that expose firms already approved for an IPO to indeterminate listing delays (although they are usually listed eventually) and use these events as exogenous shocks. As discussed in details in the next section, unlike the disclosure-centric, registration-based IPO system in the United States, China has been opting for an administration-centric, approval-based system (Yang, 2013; Piotroski and Zhang, 2014). Firms seeking a public listing must go through a multi-step, tightly controlled administrative process governed by the China Securities Regulatory Commission (CSRC). From time to time, the CSRC engage in IPO suspensions, which are typically unpredictable, exogenous administrative intervention by the government and are unrelated to IPO applicant's own characteristics (Shi et al., 2018; Cong and Howell, 2019). As such, they create exogenous shocks to a rival firm's IPO process that change incumbent firms' expectation of an imminent threat from the rival firm's successful IPO.

We capitalize on this setting to examine how incumbent firms strategically respond to the listing delay of their IPO competitors. The effect is not clear *ex ante*. On the one hand, one stream of theoretical literature suggests that incumbent firms would engage in predatory behavior, that is, they continue to defend against weakened competitors, making them even weaker in order to gain more future profits (Fudenberg and Tirole 1986; Bolton and Scharfstein 1990; Grieser and Liu, 2019). These theories imply that when rival firms face a listing delay, incumbent firms would continue their aggressive defensive actions.

On the other hand, however, another stream of theoretical literature suggests that defensive moves are often costly (Milgrom and Roberts, 1982; Verrecchia, 1983, 1990; Clinch and Verrecchia, 1997; Horen, 2005; Huang et al., 2016). For example, Milgrom and Roberts (1982) note that defending via aggressive investment activities is usually costly and is not an optimal strategy. Defending via the provision of favorable credit policy to secure favorable relationship with upstream and downstream partners can also be costly as it will jeopardize a firm's working capital situation, especially when it is financially constrained (Horen, 2005). Defending via the disclosure of forward-looking good news also entails significant costs, including information processing costs and proprietary costs. For example, rival firms could exploit the proprietary firm information disclosed by the incumbent firm to

harm the incumbent’s competitive advantage (Aobdia, 2015; Verrecchia, 2001; Cheng and Lo, 2006). Therefore, these arguments imply that when a competitor faces an indeterminate listing delay and the competitive threat is temporarily lifted, incumbent firms may curtail the costly defensive moves.

To test these competing hypotheses, we conduct a number of difference-in-differences (DiD) analyses within a five-quarter window (from quarter-2 to quarter+2) around the beginning of each IPO suspension event. Because IPO applicants that have been approved by the CSRC face varying time-to-final listing, each suspension event naturally partitions these firms into two groups based on the ultimate listing outcome – firms that are successfully listed before the suspension, and firms that are caught by the suspension and thus have to postpone their listing until the suspension ends. More specifically, we define “non-suspended firms” as those that are on schedule and successfully listed on the stock market within 12 months prior to the IPO suspension. Among latter group of firms that are delayed by the suspension, we keep firms that are approved in the 12 months prior to the suspension, delayed by the suspension, but are eventually listed within 12 months after the suspension ends. We label these firms as “suspended firms”. We then define the treatment firm as incumbent firm whose biggest IPO competitor in the year before suspension is a “suspended firm”. Control firm is the incumbent firm whose biggest IPO competitor in the year before suspension is a “non-suspended firm”. Following Hsu et al., (2010), we only keep the biggest IPO competitor, which is measured by the average assets in the three pre-IPO years to minimize cross-IPO contamination of the results.

We identify a firm’s competitor based on the degree of product similarity between them upon a text-based analysis of the firm’s product descriptions in the annual report as proposed by Hoberg and Phillips (2016). This method is widely used in the market competition literature (e.g., Foucault and Fresard, 2014; Grieser and Liu, 2019). The core idea is that closeness in the product space reflects the degree to which a given firm is similar to its competitors as well as the level of competition between them.<sup>1</sup> We provide detailed

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<sup>1</sup> We choose this classification scheme over traditional industry classification for three reasons. Firstly, public companies in China frequently change their product offerings and expand into new industry territories. They are required to disclose accurate and up-to-date information about such changes in their annual reports. Therefore,

description of the empirical procedure in Section 3.2 and in Appendix 2.

We examine how incumbent firms' behavior changes surrounding the IPO suspension of their competitors along three dimensions – investment activities (M&As in particular), operating activities, as well as disclosure behavior. We begin by examining M&As (M&As). The DiD analyses show that, after imminent competitive threat is lifted due to the rival's listing delay, incumbent firms engage in substantially fewer acquisition activities. They are also more careful in choosing the acquisition targets and are no longer rushing to close the deal. Moreover, existing firms are also less likely to over pay for these deals.

Next, we examine how incumbent firms' operating activities change surrounding the IPO suspension of their competitors. In particular, we examine their working capital management efficiency and cash management. We find that in the face of declining expectation of imminent competitive pressure, incumbent firms are no longer under strong pressure to attract clients and maintain a stable relationship with them via the provision of favorable credit terms. Instead, incumbent firms appear to tighten its credit policy as manifested by a reduction of accounts receivable and an increase in turnover rate, which result in more efficient working capital management and healthier cash flow situation.

We then examine how incumbent firms' disclosure behavior changes surrounding the IPO suspension of their competitors. The DiD analyses show that while the total number of management forecasts issued by incumbent firms does not change significantly after rival firm's IPO suspension, these forecasts appear to become much less overly-optimistic, which implies that incumbent firms no longer need to defend their position by releasing overly-upbeat news in order to boost investor confidence in the firm.

Improvements in investment activities, operating activities, and disclosure practice should enhance the overall financial performance of incumbent firms. We examine four performance related variables – sales, return-on-equity (ROE), sales growth, and earnings growth. We find robust evidence that incumbent firms experience a significant performance

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text-based analysis of product similarity enables us to capture the dynamic changes of firm's product mix and industry presence. Second, text-based classification scheme captures cross-industry relatedness with the trend of firm operational diversification. Third, text-based classification scheme also captures within-industry heterogeneity so that we can measure the intensity of competition between two firms within the same industry based on product similarity.

improvement after rival firms incur a listing delay.

To ensure the validity of our findings and to rule out alternative explanations, we conduct a rich set of robustness tests. First, the validity of DiD analysis hinges critically upon the satisfaction of the parallel trend assumption. Therefore, we test and provide empirical evidence that this assumption is not violated. Second, we conduct a placebo test to check the validity of our identification strategy based on the IPO suspension events. Specifically, we intentionally change the event time and use a “placebo event time” which is 18 months before each actual IPO suspension and repeat the main analyses. We no longer observe any significant results. Third, we attempt to rule out an alternative explanation that the documented findings are due to reduced market attention. We entertain the possibility that when a rival firm files for an IPO, it could also generate more market attention to the incumbent firms that could seize the opportunity to hype up the stock price via new acquisition activities and the disclosure of optimistic forecasts. However, when rival’s IPO is suspended, market attention to the incumbent firms declines, which leads to reduced incentives to hype up the stock price via acquisitions and optimistic disclosure. To test this conjecture, we examine changes in the incumbent firm’s analyst coverage surrounding the competitor’s IPO suspension, and do not find any significant results. Finally, we consider whether enhanced financial performance is due to greater earnings management as opposed to real operational improvement. We find no evidence of increased accrual-based or real earnings management by incumbent firms after the competitor’s listing delay.

We further investigate how the incumbent firm’s strategic responses to the competitor’s IPO suspension vary in the cross-section. We find that the main effects are more pronounced for incumbent firms that encounter greater competitive pressure from other public firm peers, face higher severity of threats from the IPO competitor, and hold a dominant position in their industry.

Since regulation-induced IPO suspensions are temporary and suspended rival firms eventually become listed after the suspension ends, a natural follow-up question arises: do incumbent firms regain their defensive stance when the suspension is over? To explore this issue, we examine how existing firms’ behavior change after the end of IPO suspension when the CSRC resumes IPO review meetings and the suspended firms re-initiate preparation for

listing. Interestingly, we find no evidence of any significant changes in incumbent firms' investment and operating activities. There is, however, some evidence that incumbent firms begin to increase the disclosure of overly-optimistic news again. One plausible explanation is that rival firms have already experienced a significant loss in their competitive advantage due to listing delays. For example, Cong and Howell (2019) find that suspension-induced listing delays have significantly adverse effect on a firm's innovation activity, tangible investment, and return on sales. The effect endures even after the firm is finally listed on the public market. Thus, rival firms are no longer considered as serious threats to incumbent firms, which thereby reduce the needs to engaging in costly defensive acts again when rival firms resume the IPO process.

Our study contributes to several strands of literature. First, it adds to the broad IPO literature and IPO peer effect literature in particular. Prior studies on IPO peer effects (e.g., Hsu et al., 2010) typically examine US IPOs, which usually suffer from endogeneity problems, such as IPO firm's timing to list, omitted variables like industry policies and market conditions. We overcome this challenge by leveraging regulation-induced IPO suspensions in China as exogenous shocks. Moreover, prior studies implicitly assume a static relation between IPO firms and incumbent firms, and that incumbent firms passively suffer from the negative IPO spillover effect. Our paper takes the perspective (based on theoretical models) that there is a dynamic and interactive relation between incumbent firms and their IPO rivals. The unique IPO suspension setting in China used in this study enables us to examine how incumbent firms engage in defensive actions surrounding the competitor's IPO process in response to changing expectation of imminent competitive threat.

Our paper also contributes to the growing literature on competition strategy. Theoretical models and empirical evidence suggest that, in order to defend against new entrants entering the market, competition from potential entrants prompts firms to increase investments to build reputation of tough, provide more trade credit to lock in customers, and increase optimistic disclosures to release good news (Milgrom and Roberts, 1982; Fudenberg and Tirole 1986; Darrough and Stoughton 1990; Wagenhofer 1990; Horen, 2005). We add to this steam of literature by empirically examining a firm's dynamic decision-making adjustment process when facing changing expectation of imminent competitive pressure in



the capital market setting. We find that firms strategically reduce defensive moves when the competitive threat of new entrant declines.

Our paper also extends the literature on product market competition by providing a new dimension, i.e., capital market competition. Prior studies mainly focus on the influence of firms' real operation activities on rival firms (Chevalier, 1995; Hoberg et al., 2014; He and Huang, 2017; Huang et al., 2016). For example, Hoberg et al. (2014) use product market fluidity, which is measured by similarities in investment opportunities, as a proxy for product market competition. Huang et al. (2016) use import tariff rate reductions as exogenous events, which is bad news for the sales of domestic firms in U.S and increases product market competition. Our paper adds a new dimension to this literature by studying the impact of the firm's competitiveness in the capital markets on its product market competitors, which is a real impact of capital market activities.

The rest of the paper proceeds as follows. Section 2 provides institutional background on the IPO process in China. Section 3 describes sample selection and presents summary statistics. Section 4 discusses our identification strategy. Section 5 reports main empirical results. Section 6 provides additional analyses. Section 7 concludes the paper.

## **2. Institutional Background**

### *2.1 The IPO Process in China*

Since the inauguration of Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE) in the early 1990's, China's capital markets have experienced dramatic growth in the last three decades. According to the Wind Database, 3,760 firms are listed on the main trading board of SSE and SZSE by the end of 2019, with a combined market capitalization of approximately RMB 58 trillion (USD 8.4 trillion), making China's capital markets the second largest one in the world.

Unlike the disclosure-centric, registration-based IPO system in the United States, China has been opting for an administration-centric, approval-based system (Yang, 2013; Piotroski and Zhang, 2014; Shi et al., 2018). Firms seeking a public listing must go through a multi-step, tightly controlled administrative process governed by the CSRC. On average, it takes approximately three years for a firm to complete the listing process that involves four

major steps:

First, going public firms hires a qualified investment bank, an accounting firm, and a law firm to help it navigate through the complexities of the IPO process, including restructuring the firm into a qualified stock share limited company and making sure the firm's financial reporting and corporate governance are in full compliance with the CSRC's requirement (Yang, 2013).<sup>2</sup> This process can take one to three years to complete.

Second, the firm and the investment bank (underwriter) jointly file a formal IPO application with the CSRC. The firm then enters an IPO queue and the application would go through a compliance review on a first-come, first-serve basis.

Third, when the firm completes the compliance review and reaches the front of the IPO queue, the Stock Issuance Examination and Verification Committee (the "Committee") of the CSRC holds a review meeting to determine whether the firm meets the regulatory requirements and is eligible for an IPO.<sup>3</sup> The committee includes both government officials and private sector professionals (e.g. auditors, lawyers, bankers, mutual fund managers, and scholars). There are 7 members in each review meeting and five or more affirmative votes are required for approval. The approval rate varies from 60% - 90% over time (Yang, 2013; Liu et al., 2013).<sup>4</sup> This step takes one year on average with significant variance among IPO applicants.

Fourth, after obtaining the Committee's approval, the firm waits for the approval document and then prepares for the final stage of the listing process. Specifically, the firm and its underwriter need to prepare the IPO prospectus, conduct the "road show" to build the book. The share subscription day is then determined through negotiation with the stock exchange. The firm needs to publish a listing statement at least three days prior to the subscription day. From the CSRC approval to finally listing, it takes the firm two to five months in general. The approval document is valid only for 6 months before 2013 and 12 months after 2013, so the IPO applicant often tries to go public as soon as possible.

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<sup>2</sup> See Piotroski and Zhang (2014) for details of the CSRC's requirement.

<sup>3</sup> The details and results of the review meetings can be found at <http://www.csrc.gov.cn/pub/zjhppublic/>.

<sup>4</sup> The approval rate is based on the results of the review meetings disclosed on the CSRC website.

## 2.2 The IPO Suspensions

Because the IPO process is lengthy and is subject to extensive administrative review by the CSRC, firms applying for a public offering are therefore exposed to substantial listing uncertainty. One major source of such uncertainty is regulation-induced IPO suspensions. There have been 9 IPO suspensions in the history of China's capital markets (Shi et al. 2018).<sup>5</sup> The durations of each suspension varies from 4 to 13 months. During the suspension period, IPO review meetings are cancelled so that no new IPO applications would be approved. More importantly, firms that have already been approved by the CSRC before the suspension may face a pending listing and have to postpone their access to the capital market (although they ultimately get listed).

There are many reasons for the IPO suspensions. One main reason is to maintain the stability of the capital markets. IPO suspension for this purpose is usually announced during a bear market, since the CSRC believes that too many new issues will draw capital, thus putting downward pressure on the stock prices of existing public firms (Tian, 2011; Packer and Spiegel, 2016; Shi et al., 2018). Another main reason is to facilitate the capital market reform (Piotroski and Zhang, 2014). From time to time, the CSRC launches new capital market policies and protocols, which take time to pilot and implement. For example, the IPO suspension in 2004 was due to the market-based pricing mechanism reform.

While related to the state of the market, these IPO suspensions were not scheduled and were widely viewed as unexpected. Moreover, because the IPO process takes a long time, so IPO applicants have little ability to predict the market conditions or the capital market reform *ex ante* and time their IPO progress (Guo and Zhang, 2012). The suspensions thus generate plausibly exogenous listing delay among firms already approved to go public.

## 3. Sample Selection, Variable Measurement, and Summary Statistics

### 3.1 Sample Selection

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<sup>5</sup> The reasons and details of the IPO suspensions could be found from the following sources: (1) "A Review of China IPO Suspensions", Security Daily, June 19 2013, retrieved from [http://epaper.zqrb.cn/html/2013-06/19/content\\_362206.htm](http://epaper.zqrb.cn/html/2013-06/19/content_362206.htm). (2) "A Review of nine IPO Suspensions in China A-share market", Finance Daily, July 14 2015, retrieved from <http://www.mrcjcn.com/n/49812.html>.

Our sample selection process starts with firms that filed for an IPO on the main board, small and medium-sized enterprises (SME) board, and the ChiNext board of Shanghai and Shenzhen stock exchanges during the period of 2004-2016. We retrieve the names of these firms and their IPO prospectus from the CSRC's website. Information on the approval status (date of approval/denial by the CSRC) and the listing date of successful IPOs are obtained from the Wind Database. IPO suspension information is hand-collected from official announcements and news articles.

Since we are interested in how incumbent firms strategic responses to the competitor's listing delays and each IPO suspension is only temporary, we therefore focus on incumbent firms' quarterly performance data. Incumbent firms' financial information, management disclosure and investment activities are obtained from the CSMAR database. To construct text-based competition relationships, we collect incumbent firms' annual reports from the information disclosure platform designated by the CSRC (<http://www.cninfo.com.cn/new/index>). We then exclude incumbent firms without suspension-affected IPO competitors in the text-based network.

After excluding financial firms, firms with missing financial information, and firms with special treatment status, the final sample ends up with 21,627 firm-quarter observations from 2,280 public firms.<sup>6</sup>

### *3.2 Text-based Identification of Competitors*

Our empirical tests call for the identification of incumbent firms' IPO competitors. Following Hoberg and Phillips (2016), we identify a competitor based on the degree of product similarity between them upon a text-based analysis of firm's product descriptions in the annual report. The core idea is that closeness in the product space reflects the degree to which a given firm is similar to its competitors and the level of competition between them.

This method has been widely used in the market competition literature. Foucault and Fresard (2014), for example, use this classification scheme to study the effects of competitors' stock price informativeness on the firm's investment activities. Grieser and Liu (2019) use

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<sup>6</sup> The Shanghai and Shenzhen stock exchanges would give "special treatment" status to publicly listed companies with unusual financial or other conditions (e.g., net profit being negative for two consecutive fiscal years), that are prone to significant delisting risk.

this classification scheme to study the relation between firm investment activities and competitors' financial constraints. In this study, we choose this classification scheme over traditional industry classification for several additional reasons. First, public companies in China frequently change their product offerings and expand into new industry territories. They are required to disclose timely and accurate information about these changes in their annual reports. Therefore, text-based analysis of product similarity enables us to capture the dynamic changes of firm's product mix and industry presence. Second, text-based classification scheme captures cross-industry relatedness with the trend of firm operational diversification. Third, text-based classification scheme also captures within-industry heterogeneity so that we can measure the intensity of competition between two firms within the same industry based on their product similarity.

We provide detailed description of the empirical process and a series of validation tests in Appendix 2. Following Hoberg and Phillips (2016), we begin by downloading the annual reports of all public firms and identify the "Report of the Directors" section of the annual report that provides detailed business descriptions. If this section is not available, we use the "Overview of Business" section instead. After identifying text related to the firm's business descriptions, we parse all words and keep words that are related to the firm's business and products, which results in a database (i.e., product market space) of 12,802 unique words. We vectorize the product market vocabulary so that each year a given firm  $i$ 's vocabulary can be represented by a vector, with each element being populated by one if firm  $i$  uses the given word, and zero if it does not. We then assign pairwise similarity scores based on the cosine similarity between two firms' vectorized product descriptions. The cosine similarity between two firms is higher when their product market descriptions are more similar. This similarity measure ranges from zero (no similarity) to one (perfect similarity).

Following Hoberg and Phillips (2016), we label firms  $i$  and  $j$  as a "membership pair" if, for a given classification, they are in the same industry. We determine the threshold generating industries with the same fraction of membership pairs as Wind-3 industries (Chinese equivalent of the SIC3 industries), so that we can compare our industries to Wind-3 industries in an unbiased fashion. The mean threshold value for our sample is 0.2893. Firm  $j$  is classified as a competitor of firm  $i$  if the similarity score between them is higher than the

threshold value. Our final text-based network of firms includes 2,376,346 competitor-pair-year observations and each firm has an average of 175 competitors.

### 3.3 Variable Measurement

#### 3.3.1 Measuring M&As

We examine three firm-level variables and three deal-level variables related to the incumbent firm's M&A activities. The first firm-level variable,  $Ln(AcqNumber)$ , measures the total number of M&As, and is calculated as the natural logarithm of one plus the firm's total number of M&As (set to zero if missing) in a fiscal quarter. The second firm-level variable,  $Ln(AcqNumber\_Bidder)$ , measures the number of M&As for which the firm is a bidder. It is calculated as the natural logarithm of one plus the firm's total number of M&As as a bidder (set to zero if missing) in a fiscal quarter. The third firm-level variable,  $Ln(AcqExpenses\_Bidder)$ , measures the size of M&As for which the firm is a bidder. It is calculated as the natural logarithm of one plus the total amount that the firm pays for the M&A activities (set to zero if missing) in a fiscal quarter.

As for deal-level variables, only successful deals for which the firm is a bidder are considered. The first deal-level variable,  $Ln(Deal\_ClosingTime)$ , measures the duration of each deal. It is calculated as the natural logarithm of one plus the number of months between the beginning and completion announcements associated with the acquisition deal. The second deal-level variable,  $Ln(Deal\_AcqExpense)$ , measures the size of each M&As deal, and is calculated as the natural logarithm of one plus total expenses involved in a deal. The third deal-level variable,  $Dummy(Deal\_AcqPremium)$ , is a dummy variable that equals one if price paid for the deal is higher than the underlying asset value, and zero otherwise.

#### 3.3.2 Measuring Operating Activities

Following prior studies (e.g., Barrot, 2016; Lin and Ye, 2018), we examine three measures related to a firm's operating activities. The first variable,  $AR/R$ , is calculated as the firm's accounts receivable scaled by revenue. Higher proportion of accounts receivable as a percentage of sales implies less bargaining power with upstream and downstream partners in the supply chain (Horen, 2005; Barrot, 2016). The second variable,  $Ln(AR/R\ Turnover)$  is the

accounts receivable turnover, which is calculated as the natural logarithm of one plus firm's revenue divided by accounts receivable for the period. Accounts receivable turnover reflects the firm's effectiveness in collecting its receivables owed by clients (Murfin and Njoroge, 2015). The third variable, *OperatingCashFlow*, is defined as firm's net cash flow from operating activities divided by total assets. Operating cash flow reflects the financing constraints of firm's operating activities (Lin and Ye, 2018).

### 3.3.3 Measuring Disclosure Behavior

Following the management disclosure literature (e.g., Ajinkya, 2005; Li and Zhang, 2015; Chen et al., 2019), we examine three variables that capture different aspects of a firm's disclosure behavior. The first variable, *Ln(MgmtForecasts)*, measures the total number of management forecasts and is calculated as one plus the natural logarithm of the firm's total management earnings forecasts issued in a fiscal quarter. The second variable, *Dummy(Optimism\_Analyst)*, is a dummy variable that equals one if the firm issues overly-optimistic earnings forecast in a fiscal quarter and zero otherwise. A forecast is classified as overly-optimistic if the point forecast (or the lower bound estimate of the range forecast) exceeds the consensus analyst forecast issued in the same fiscal quarter for the same forecast period. The third variable, *OptimismRatio\_Analyst*, measures the percentage of overly-optimistic forecasts and is calculated as the number of overly-optimistic forecasts divided by the total number of the firm's management earnings forecasts issued in a fiscal quarter.

### 3.3.4 Measuring Firm Performance

We examine four variables related to firm performance. *Sales* is calculated as the natural logarithm of firm's revenue; Return-on-equity ratio *ROE* captures the firm's profitability; *SalesGrowth* is defined as the annual percentage change of the firm's operating revenue; *EarningsGrowth* is defined as the annual percentage change of firm's net profit. Both growth measures reflect the firm's growth opportunities. These variables have been widely used in a number of earlier studies (e.g., Hsu et al., 2010).

### *3.3.5 Measuring Control Variables*

We control for a vector of firm characteristics that may affect its performance. We provide detailed variable definitions in Appendix 1. We compute all variables for a given firm over a fiscal quarter. In the main analyses, control variables include firm age (measured by the natural logarithm of one plus the number of years since the firm becomes publicly listed), firm size (measured by the natural logarithm of total assets), leverage (measured by total debt to total assets ratio), growth opportunities (measured by market-to-book ratio and percentage change of sales), equity ownership (measured by a dummy variable that equals one if the firm is government controlled or owned), corporate governance (measured by the number of directors on the board), profitability (measured by the return-on-assets ratio), cash holding (measured by cash scaled by total assets), analyst coverage (measured by the natural logarithm of number of analysts covering the firm), institutional ownership (measured by the percentage of outstanding shares held by institutional investors), and an indicator for loss (measured by a dummy variable that equals one if the firm net profit is less than zero).

### *3.4 Summary Statistics*

Table 1 provides summary statistics of variables used in the main analyses. To minimize the effect of outliers, we winsorize all continuous variables at the 1<sup>st</sup> and 99<sup>th</sup> percentiles. On average, a firm in our sample has a natural logarithm of number of M&A activities as a bidder of 0.11, a natural logarithm of M&A expenses as a bidder of 2.17. The average accounts receivable (scaled by the revenue) of our sample firms is 1.04 and the average operating cash flow is 0.01. The average number of management earnings forecasts is 0.23, among which 12.0% are optimistic forecasts. The average natural logarithm of sales is 19.77, the average ROE is 0.02, the average sales growth is 0.13 and the average earnings growth is -0.002. Regarding control variables, an average firm has a natural logarithm of age of 2.07, a natural logarithm of assets of 21.88, a leverage ratio of 44.8%, a market-to-book ratio of 2.07, ROA of 0.01, cash holding of 0.18, SOE of 0.45, 8.9 directors, and 19.4% of institutional ownership. 16.9% of firms in our sample are loss firms.



## 4. Empirical Strategy

### 4.1 Quasi-natural Experiments

As discussed in Section 2.2, our identification strategy uses policy-induced IPO suspensions as plausible exogenous shocks. These IPO suspensions generate plausibly exogenous listing delay among firms that have already been approved to go public.

Among 9 IPO suspensions in the history of China's capital markets, only four are used in this study, which are from August 26, 2004 to January 23, 2005, from September 16, 2008 to July 9, 2009, from November 16, 2012 to December 30, 2014 and from July 4, 2015 to November 6, 2015 (see Appendix 1 for details about these events). We exclude four suspension events before 2004 because detailed information about the approval and listing of IPO applicants was not publicly available. We also exclude another short suspension between May 25, 2005 and June 2, 2006, as it began only four months after a preceding suspension that ended in January 23, 2005, and may therefore confound our findings.

### 4.2 Identifying Treatment and Control Firms

Because IPO applicants that have been approved by the CSRC face varying time-to-final listing, each suspension event naturally partitions these firms into two groups based on the ultimate listing outcome – firms that are successfully listed before the suspension begins, and firms that are caught by the suspension and thus have to postpone their listing. More specifically, we define “non-suspended firms” as those that are on schedule and successfully listed on the stock market within twelve months prior to the IPO suspension. Among latter group of firms that are delayed by the suspension, we keep firms that are approved in the twelve months prior to the IPO suspension, caught in the suspension, but are eventually listed within twelve months after the suspension ends. We label these firms as “suspended firms”. We exclude firms that have been unable to list in a year after the IPO suspension, because their listing delay may be due to their own characteristics rather than the IPO suspension.<sup>7</sup>

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<sup>7</sup> For example, the firm named Qiaodan Sports was approved by the Public Offering Review Committee of CSRC on November 25, 2011. However, on February 23, 2012, US basketball star Michael Jordan filed a lawsuit against Qiaodan Sports, asking for the cancellation of 78 registered trademarks of Qiaodan Sports, which made Qiaodan Sports delay to list. Although Qiaodan Sports subsequently experienced the 2012 IPO

Because we are interested in the peer effects of listing delay, that is, how incumbent firms respond to the listing delay of their competitor, we define treatment firms as incumbent firms that have at least one rival firm in the year before suspension that is a “suspended firm”. We define control firms as incumbent firms that have at least one rival firm in the year before suspension that is a “non-suspended firm”. We discuss the text-based approach that identifies rival firms in Section 3.2.

In some cases an incumbent firm may have more than one competitor that applies for IPO during the same time period. We cannot use all these IPOs because they are not isolated in time and an incumbent firm may have two competitors, one of which is a suspended firm and the other one is a non-suspended firm. Thus, the challenge is to choose IPOs for which the results are not contaminated by the impact of other IPOs competing with the same incumbent firm in the same IPO suspension. Following Hsu et al. (2010), we only keep the largest IPO competitor that is measured by the average asset size in three pre-IPO years in order to minimize cross-IPO contamination of the results.

Another concern is that some non-suspended firms will list in the two quarters before the IPO suspension, which may confound the behavior of the control firms. We therefore require the listing time of non-suspended firms not to coincide with our examination window (i.e., 5 quarters surrounding the suspension). Following our selection criteria, we obtain 263 IPO events, including 164 suspended firms and 99 non-suspended firms.

### 4.3 Specification

To assess how incumbent firms respond to exogenous shocks to competitors’ listing process, we estimate the following model:

$$Y_{i,t+1} = \alpha + \beta \text{AfterTreat}_{i,t} + \gamma \text{Control}_{i,t} + \text{Quarter}_t + \text{Firm}_i + \varepsilon_{i,t}$$

where  $i$  indexes firm and  $t$  indexes time. We examine five-quarter window (from quarter-2 to quarter+2) around the beginning of each IPO suspension. The dependent variable is the incumbent firm’s investment activities, operating activities, disclosure behavior, or firm performance. The main variable of interest is *AfterTreat*, which is a dummy variable that

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suspension, the main reason of delay is not the IPO suspension.

equals one if the incumbent firm is in the treatment group and the time is after IPO suspension, and zero otherwise. *Control* is a vector of firm characteristics discussed in Section 3.2.5. *Quarter* and *Firm* capture quarter and firm fixed effects, respectively. Robust standard errors are clustered at the firm level.

## 5. Main Results

### 5.1 M&As

Table 2 presents the results of the DiD tests on how suspension-induced listing delay of competitors affects incumbent firms' M&As. Panel A reports the results of firm-level analyses. In column (1) and (2) in which the dependent variable is number of M&As  $\ln(\text{AcqNumber})$  and  $\ln(\text{AcqNumber\_Bidder})$  respectively, the coefficient estimate on *AfterTreat* is both negative and significant at the 5% level. In column (3) in which the dependent variable is total amount paid for M&As  $\ln(\text{AcqExpenses\_Bidder})$ , the coefficient estimate on *AfterTreat* is negative and significant at the 1% level. Together, these findings suggest that when competitors face an indeterminate IPO delay and the new entrant threat is temporarily lifted, incumbent firms appear to reduce the amount of M&As activities.

Table 2, Panel B reports the results of deal-level analyses. In column (1) in which the dependent variable is  $\ln(\text{Deal\_ClosingTime})$ , the coefficient estimate on *AfterTreat* is positive and statistically significant at the 1% level, suggesting that the time to completing an acquisition deal has lengthened substantially after the rival firm's IPO is suspended. In column (2) in which the dependent variable is  $\ln(\text{Deal\_AcqExpense})$ , the coefficient estimate on *AfterTreat* is negative and significant, indicating that the size of each deal becomes smaller after the rival firm's IPO delay. In column (3) in which the dependent variable is  $\text{Dummy}(\text{Deal\_AcqPremium})$ , the coefficient estimate on *AfterTreat* is negative and significant at the 1% level, suggesting that incumbent firms pay a lower premium for each deal after the rival firm's IPO delay.

Overall, the findings in Table 2 suggest that incumbent firms appear to be engaging in aggressive M&As activities in response to the competitor's IPO in order to defend their competitive position. Once the imminent pressure is alleviated due to the rival firm's listing delay, incumbent firms will reduce defensive moves as reflected by fewer acquisitions. They

are also more careful in choosing the acquisition targets and are no longer rushing to close the deal, thereby leading to longer deal completion time. Moreover, incumbent firms are also less likely to over pay for these deals.

### 5.2 Operating Activities

Table 3 presents the results of the DiD tests on how competitors' suspension-induced listing delay affects incumbent firms' operating activities. In column (1) in which the dependent variable is *AR/R*, the coefficient estimate on *AfterTreat* is negative and significant at the 1% level. This finding suggests that incumbent firms reduce accounts receivable after rival firm's IPO delay. In column (2) in which the dependent variable is *Ln(AR/R Turnover)*, the coefficient estimate on *AfterTreat* is positive and significant at the 5% level, which suggests that the collection of accounts receivable accelerates and the efficiency of capital usage improves when the threat of new entrants is temporarily alleviated. In column (3) in which the dependent variable is *OperatingCashFlow*, the coefficient estimate on *AfterTreat* is positive and significant at the 5% level, which suggests that incumbent firms' operating cash flow situation experiences substantial improvement, which is consistent with the trend of accounts receivable (i.e., reduction in accounts receivable increases operating cash flow).

Taken together, findings reported in Table 3 suggest that in the face of declining expectation of imminent competitive pressure, incumbent firms are no longer under strong pressure to attract clients and maintain a stable relationship with them via the provision of favorable credit terms. Instead, incumbent firms appear to tighten their credit policy as reflected by a reduction in accounts receivable and an increase in the turnover rate, which result in more efficient working capital management and healthier cash flow situation.

### 5.3 Management Disclosure

Table 4 presents the regression results of the DiD tests on how suspension-induced listing delay of competitors affects incumbent firms' disclosure behavior. In column (1), in which the dependent variable is total number of management earnings forecasts *Ln(MgmtForecasts)*, the coefficient estimate on *AfterTreat* is negative but insignificant, indicating that incumbent firms do not appear to change the total amount of management

forecasts surrounding rival firm's IPO delay. However, in column (2) in which the dependent variable is forecast optimism *Dummy(Optimism\_Analyst)*, the coefficient estimate on *AfterTreat* is negative and significant at the 5% level, suggesting that while the quantity of disclosure does not change, incumbent firm's earnings forecasts appear to become less overly-optimistic. We observe a similar finding in column (3) in which the dependent variable is the proportion of overly-optimistic forecasts.

Together, the findings suggest that while the total number of management forecasts issued by incumbent firms does not change after rival firm's IPO suspension, these forecasts appear to become much less overly-optimistic, which imply that incumbent firms no longer need to defend their position by releasing overly-upbeat news in order to boost investor confidence in the firm.

#### *5.4 Firm Performance*

As shown above, incumbent firms respond to listing delays of rival firms due to IPO suspension by reducing their defensive moves as manifested in less aggressive and value-destroying investment activities, enhanced working capital management and operating efficiency, as well as less aggressive disclosure practice. We expect that these efforts to improve the firm's financial performance.

We test this conjecture and report the results in Table 5. In column (1) and (2) in which the dependent variable is total sales and ROE, respectively, the coefficient estimate on *AfterTreat* are both positive and significant at the 1% level, suggesting that incumbent firms experience a substantial improvement in sales and profitability level following rival firm's IPO suspension. In column (3) and (4) in which the dependent variable is sales growth and earnings growth respectively, the coefficient estimate on *AfterTreat* is also positive and significant at the 1% level. These finding support our conjecture that a reduction in costly (and potentially value-destroying defensive moves) will improve incumbent firm's financial performance.

## **6. Additional Tests**

### *6.1 Robustness Tests*

We conduct a rich set of robustness tests to ensure the validity of our findings and to rule out alternative explanations.

#### *6.1.1 Test of the “parallel trend” assumption*

The validity of our DiD analysis hinges critically upon the satisfaction of the parallel trend assumption. In this subsection we test whether this assumption is satisfied. We follow Bertrand and Mullainathan (2003) and Acharya et al. (2013) in decomposing each IPO suspension event into separate time periods: *Pre (-1)* is a dummy variable that equals one for treatment firms in one quarter before the IPO suspension and is zero otherwise; *Current* is a dummy variable that equals one for treatment firms in the quarter of IPO suspension and is zero otherwise; and *Post (+1)* is a dummy variable that equals one for treatment firms in one quarter after the IPO suspension and is zero otherwise. Finally, *Post (>=2)* is a dummy variable that equals one for treatment firms in two and more quarters after the IPO suspension and is zero otherwise.

Table 6 reports the results of the parallel trend test. As shown, pre-existing patterns of firm behavior and performance are not correlated with IPO suspension, as evidenced by insignificant coefficient on *Pre (-1)* across all panels. This suggests that the parallel trend assumption in our analyses is not violated. Furthermore, we find a significant impact of the rival firm’s IPO delay on incumbent firms’ behavior and performance, as evidenced by significant coefficient estimates on time period indicators after the event.

#### *6.1.2 Placebo tests*

To further strengthen our identification attempts, we conduct a placebo test to corroborate the validity of our identification test based on the IPO suspension events. Our DiD results hinge on the comparison between treatment firms (i.e., whose competitors face a suspension-induced listing delay) and control firms (i.e., whose competitors are successfully listed before the IPO suspension), which means that one should not expect to observe similar results if we artificially change the “event time” (i.e., date of the IPO suspension).

To test this conjecture, we identify a “placebo event time” which is 18 months before each actual IPO suspension event and examine a five-quarter window (from quarter-2 to

quarter+2) surrounding the placebo IPO suspension event. We choose 18 months out of two considerations. On the one hand, we want to ensure that the “placebo event time” is not too close to the real event time, which would incorporate too much noise. On the other hand, however, because the time interval between two consecutive IPO suspensions is not very long, we want to select a “placebo event time” that does not overlap with the previous IPO suspension.<sup>8</sup>

We repeat our main analyses using the placebo event time and report the results in Table 7. As shown, the coefficient estimates on *AfterTreat* are no longer significant across all panels, which suggests that our main findings results are unlikely driven by chance.

### 6.1.3 Changes in analyst coverage

Our main findings suggest that incumbent firms would reduce aggressive M&A activities and disclosure behavior in response to declining expectation of imminent threat induced by rival firm’s IPO delay. However, a plausible alternative explanation for these finding is reduced market attention. That is, when a rival firm files for an IPO, it likely also generates more market attention to incumbent firms that compete with it. Incumbent firms may seize this opportunity to hype up the stock price via new M&As and the disclosure of overly-upbeat forecasts. However, when the rival firm’s IPO is suspended, market attention to incumbent firms is also likely to dampen, and they no longer have incentives to hype up the stock price via acquisitions and optimistic disclosure, thereby leading to a reduction in these two activities.

To test this conjecture, we examine changes in incumbent firms’ analyst coverage (which is a commonly used proxy for market attention) surrounding the competitor’s IPO suspension. We construct two analyst coverage-related variables, which have been widely used in a number of earlier studies (e.g., He and Tian, 2013). The first variable,  $Ln(ReportNumber)$ , measures the number of analyst reports issued for the firm. The second variable,  $Ln(AnalystNumber)$ , measures the number of analysts covering the firm. We report the results in Table 8. The dependent variable in columns (1) and (2) is  $Ln(ReportNumber)$

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<sup>8</sup> As an alternative test, we also tried other placebo event time including 16 months and 20 months before each actual IPO suspension, the results are qualitatively unchanged.

and  $\ln(\text{AnalystNumber})$  respectively. As shown, the coefficient estimate on *AfterTreat* is insignificant in both columns, suggesting that analyst coverage for incumbent firms does not change surrounding the rival firm's IPO delay. These findings help us rule out the alternative explanation of reduced market attention.

#### 6.1.4 Real performance improvement or greater earnings management?

Our empirical findings suggest that incumbent firms incur a significant performance improvement after their competitors experience an indeterminate listing delay. We interpret the findings as improved investment and operating performance due to a reduction in costly defensive moves. A plausible alternative explanation, however, is that the observed performance improvement is due to greater earnings management. To address this concern, we examine whether incumbent firm's earnings management activities change surrounding competitors' IPO suspension.

Prior accounting research shows that firms can boost performance by engaging in accrual-based and/or real earnings management (e.g., Teoh et al., 1998; Roychowdhury, 2006; Gong et al., 2008). We measure accrual-based earnings management (*AEM*) using Dechow et al., (1995) model, and real earnings management (*REM*) using Roychowdhury (2006) model. We also decompose real earnings management into three components: abnormal cash flow of operating activities (*AB\_CFO*), abnormal cost of production (*AB\_PROD*), and abnormal discretionary charges (*AB\_DISEXP*).

We report the results in Table 9. Column (1) reports the result of accruals earnings management, and Ccolumns (2) - (5) report the results of real earnings management and its sub-components. We find consistent results across all five columns that the coefficient estimates on *AfterTreat* is statistically insignificant, suggesting that documented performance improvement surrounding rival firm's IPO delay is not due to greater earnings management activities by the incumbent firm.

## 6.2 Cross-Sectional Analyses

Our main analyses show that when competitors face an indeterminate listing delay and the expectation of imminent competitive threat is reduced, incumbent firms would



respond by cutting back on costly defensive moves and adjusting their investment activities, operating activities and management disclosure that lead to better firm performance. In this section, we further investigate how our main results vary in the cross-section.

### 6.2.1 *Competitive pressure from other publicly listed rivals*

The first contingent factor that we examine is the intensity of competition from other publicly listed rivals. We posit that when the incumbent firm faces more intensive competition with other existing public firm peers, which implies a high competitive pressure from other peers and hence a higher cost of defensive moves, they are more likely to reduce defensive moves against new entrants following their IPO delay, and re-orient their focus and resources on the competition with other public rivals.

To test this conjecture, we define a dummy variable, *HighComp*, that equals one if the competitive intensity between incumbent firm and its existing public rivals is above the median value among all rivals, and zero otherwise. We measure competitive intensity as the pairwise cosine similarity in product market descriptions between two firms as developed by Hoberg and Phillips (2016). We partition the sample by *HighComp* and repeat the main analyses separately for each of the two subsamples.

We report the results in Table 10. We continue to observe significant changes in M&As, operating activities, disclosure practice, as well as firm performance for the subsample of incumbent firms that face highly intense competition with their public rivals. However, results are no longer significant for subsample of incumbent firms that face low intensity of competition with their publicly listed peers. Following Cleary (1999), we test the significance of the difference in the coefficient estimates between these two subsamples by following a bootstrapping procedure when calculating p-values of the F test.<sup>9</sup> The results show that the differences in the coefficient estimates between the two groups are significant at the 1% level. These findings support our conjecture that incumbent firms facing high competitive pressure from other public rivals are more likely to reduce defenses after new

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<sup>9</sup> We use this approach because traditional tests (i.e., the Chow test or the standard Wald test) are generally designed for testing changes in parameters across time series data where one assumes no heteroscedasticity in residuals. Panel data, with emphasis on cross-sectional variation, likely violate the assumption.

entrant's IPO delay.

### 6.2.2 Severity of threat from rival IPO

The second contingency factor that we consider is the severity of new entrant threat. When the rival firm's IPO imposes greater danger to incumbent firms and significantly weakens their competitive advantages, incumbent firms engage in more substantial defensive moves *ex ante*. Thus, when the competitor's IPO is delayed, we are expected to observe a larger decline in the incumbent firm's defensive actions.

To test this conjecture, we construct a dummy variable, *HighEntrantThreat*, that equals one if the rival's average revenue three years before the IPO application is higher than the median value among all IPO applicants, and zero otherwise. We partition the sample by *HighEntrantThreat* and re-conduct the main analyses separately for each of the two subsamples.

We report the results in Table 11. Similar to the findings in Table 10, we continue to observe significant results on M&As, operating activities, disclosure practice, as well as firm performance for the subsample of incumbent firms that face greater danger induced by the rival's IPO. However, results are no longer significant for subsample of incumbent firms that are less threatened by the rival's IPO. The test shows that the differences in the coefficient estimates between the two groups are significant at the 1% level. These findings support our conjecture that incumbent firms facing high competitive pressure from the rival's IPO are likely to engage in larger defenses, and when the threat is temporarily lifted, the reduction in defensive move is more pronounced.

### 6.2.3 Incumbent firm's industry dominance

The third contingent factor that we examine is the incumbent firm's industry position. We posit that incumbent firms that are dominant players in their industry are less worried about heightened threat associated with the rival's IPO, and thus are more likely to reduce defensive moves after rival firm experiences a listing delay.

To test this conjecture, we construct a dummy variable *HighDominance* that equals one if the incumbent firm's average revenue two quarters before the IPO suspension is higher

than the median value among all incumbent firms in our sample, and zero otherwise. We again partition the sample by *HighDominance* and re-conduct the main analyses separately for each of the two subsamples.

We report the results in Table 12. Consistent with our conjecture, we continue to observe significant results on M&As, operating activities, disclosure practice, as well as firm performance for the subsample of incumbent firms that are dominant players in their industry. However, results are less significant for the subsample of incumbent firms that are less dominant in their industry. The coefficient estimates between the two subsamples are significant at the 1% level. The findings are consistent with our conjecture.

### *6.3 What Happens After the End of IPO Suspension?*

Because listing delay is temporary and suspended rival firms resume the listing process after the end of suspension and eventually become listed, a natural follow-up question arises: do incumbent firms regain its defensive stance when their competitor's IPO suspension is over?

To explore this issue, we examine how incumbent firms' behavior change after the end of IPO suspension (ending dates are provided in Appendix 1) when the CSRC resumes IPO review meetings and the suspended firms re-initiate preparation for listing. We use the same treatment group and control group as in the main analyses and repeat the DiD analyses. We report the results in Table 13.

Interestingly, we find no evidence of any significant changes in incumbent firms' investment and operating activities. There is, however, some evidence that incumbent firms begin to increase the disclosure of overly-optimistic news again. One plausible explanation is rival firms have already experienced a significant loss in their competitive advantage due to listing delay. For example, Cong and Howell (2019) find that suspension-induced listing delay has significantly adverse effect on issuing firm's innovation activity, tangible investment and return on sales. The effect endures even after the firm is finally listed. Thus, rival firms are no longer considered as serious threats to incumbent firms, and thereby reducing the need to engaging in costly defensive acts again when rival firms resume the IPO process. Between changes in real investment/operational activities and disclosure policy, the

latter is obviously less costly and easier to achieve.

## **7. Conclusion**

In this study, we examine how incumbent firms strategically respond to the listing delays of their competitors. Using four regulation-induced IPO suspensions in China that expose firms already approved for an IPO to indeterminate listing delays as exogenous shocks to competition threat from rivals, we find consistent evidence that incumbent firms reduce their defensive moves in response to the declining expectation of imminent threat. Specifically, incumbent firms reduce aggressive M&As activities, tighten working capital management and enhance operating efficiency, and engage in less aggressive management disclosure, which lead to an improvement in the overall financial performance. These findings are robust to a number of robustness tests. The documented effects are more pronounced for incumbent firms that encounter greater competitive pressure from other public rivals, face higher severity of threat from the IPO competitor, and hold a dominant position in their industry. After IPO suspensions are over and competitors begin to resume the listing process, incumbent firms appear to regain defensive stance only via aggressive disclosure, but there is no change in their investment and operating activities. Our paper sheds new light on the dynamic interactions among product market competitors.

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**Table 1: Summary Statistics**

This table reports the summary statistics of main variables used in subsequent analyses.

Variable	Mean	Median	S.D.	N
<b>Measures of M&amp;As</b>				
<i>Ln(AcqNumber)</i>	0.117	0.000	0.313	21,627
<i>Ln(AcqNumber_Bidder)</i>	0.109	0.000	0.304	21,627
<i>Ln(AcqExpenses_Bidder)</i>	2.169	0.000	5.992	21,627
<i>Ln(Deal_ClosingTime)</i>	1.596	1.609	0.78	1,240
<i>Ln(Deal_AcqExpense)</i>	17.57	17.91	3.29	3,582
<i>Dummy(Deal_AcqPremium)</i>	0.133	0.000	0.339	3,931
<b>Measures of operating activities</b>				
<i>AR/R</i>	1.044	0.782	0.943	21,627
<i>Ln(AR/R Turnover)</i>	1.097	0.820	0.821	21,514
<i>OperatingCashFlow</i>	0.009	0.009	0.032	21,627
<b>Measures of management disclosure</b>				
<i>Ln(MgmtForecasts)</i>	0.225	0.000	0.344	15,660
<i>Dummy(Optimism_Analyst)</i>	0.143	0.000	0.350	4,804
<i>OptimismRatio_Analyst</i>	0.120	0.000	0.306	4,804
<b>Measures of firm performance</b>				
<i>Sales</i>	19.770	19.670	1.319	21,627
<i>ROE</i>	0.016	0.015	0.038	21,627
<i>SalesGrowth</i>	0.127	0.007	0.709	21,627
<i>EarningsGrowth</i>	-0.002	-0.154	1.618	21,627
<b>Measures of earnings management</b>				
<i>AEM</i>	0.002	0.002	0.045	20,654
<i>REM</i>	0.001	-0.001	0.146	20,111
<i>AB_CFO</i>	0.000	0.001	0.041	20,616
<i>AB_PROD</i>	0.001	-0.001	0.135	20,111
<i>AB_DISEXP</i>	0.000	-0.002	0.024	20,497
<b>Measures of analyst coverage</b>				
<i>Ln(ReportNumber)</i>	0.880	0.693	0.967	21,627
<i>Ln(AnalystNumber)</i>	0.800	0.693	0.869	21,627
<b>Measures of control variables</b>				
<i>Age</i>	2.071	2.197	0.766	21,627
<i>Size</i>	21.880	21.700	1.253	21,627
<i>Leverage</i>	0.448	0.449	0.220	21,627
<i>MB</i>	2.073	1.512	1.743	21,627
<i>ROA</i>	0.009	0.008	0.017	21,627
<i>CashHolding</i>	0.181	0.142	0.135	21,627
<i>SOE</i>	0.454	0.000	0.498	21,627
<i>BoardSize</i>	8.900	9.000	1.824	21,627
<i>InstOwnership</i>	0.194	0.005	0.494	21,627
<i>Loss</i>	0.169	0.000	0.375	21,627



**Table 2: Difference-in-Differences Analysis of M&As**

This table reports results of the DiD tests on how suspension-induced listing delay of competitors affects incumbent firms' M&As activities. Panel A reports the results of firm-level analyses, and Panel B reports the results of deal-level analyses. Definitions of variables are provided in Appendix 3. Quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

**Panel A: Firm-level Analysis**

<i>Dep. Var=</i>	<i>Ln(AcqNumber)</i>	<i>Ln(AcqNumber_Bidder</i>	<i>Ln(AcqExpenses_Bidd</i>
	<i>)</i>	<i>er)</i>	
	(1)	(2)	(3)
<i>AfterTreat</i>	-0.014** (0.007)	-0.016** (0.007)	-0.373*** (0.135)
<i>Age</i>	0.034** (0.014)	0.033** (0.014)	0.669** (0.260)
<i>Size</i>	0.011 (0.007)	0.006 (0.007)	0.177 (0.137)
<i>Leverage</i>	-0.061** (0.027)	-0.064** (0.026)	-1.560*** (0.497)
<i>MB</i>	0.012*** (0.003)	0.011*** (0.003)	0.203*** (0.056)
<i>ROA</i>	0.139 (0.172)	0.082 (0.167)	0.714 (3.258)
<i>CashHolding</i>	0.139*** (0.035)	0.162*** (0.034)	2.247*** (0.656)
<i>SalesGrowth</i>	0.001 (0.004)	0.002 (0.004)	-0.004 (0.071)
<i>SOE</i>	-0.014 (0.018)	-0.015 (0.017)	-0.179 (0.325)
<i>BoardSize</i>	0.000 (0.003)	-0.000 (0.003)	0.029 (0.057)
<i>Constant</i>	-0.214 (0.151)	-0.091 (0.147)	-3.145 (2.881)
Firm and Quarter FE	Included	Included	Included
Observations	19,347	19,347	19,347
R <sup>2</sup>	0.17	0.17	0.17

**Panel B: Deal-level Analysis**

<i>Dep. Var=</i>	<i>Ln(Deal_ClosingTime</i> <i>)</i>	<i>Ln(Deal_AcqExpense</i> <i>)</i>	<i>Dummy(Deal_AcqPremium</i> <i>)</i>
	(1)	(2)	(3)
<i>AfterTreat</i>	0.344*** (0.105)	-0.395* (0.210)	-0.060*** (0.021)
<i>Age</i>	0.612*** (0.207)	0.902** (0.416)	-0.041 (0.042)
<i>Size</i>	-0.466*** (0.123)	-0.130 (0.217)	-0.021 (0.022)
<i>Leverage</i>	-0.556 (0.456)	-1.384 (0.918)	0.312*** (0.090)
<i>MB</i>	-0.057 (0.035)	0.224** (0.090)	0.008 (0.009)
<i>ROA</i>	0.611 (3.060)	-9.678 (6.377)	-0.876 (0.593)
<i>CashHolding</i>	0.709 (0.436)	-0.983 (1.040)	-0.165 (0.104)
<i>SalesGrowth</i>	-0.133*** (0.050)	0.392*** (0.101)	-0.005 (0.010)
<i>SOE</i>	-0.433 (0.415)	-0.179 (0.660)	-0.044 (0.067)
<i>BoardSize</i>	-0.086* (0.051)	0.104 (0.084)	0.014 (0.009)
<i>Constant</i>	11.596*** (2.787)	17.035*** (4.487)	0.341 (0.460)
Firm and Quarter FE	Included	Included	Included
Observations	1,240	3,582	3,931
R <sup>2</sup>	0.86	0.56	0.49

**Table 3: Difference-in-Differences Analysis of Operating Activities**

This table reports results of the DiD tests on how suspension-induced listing delay of competitors affects incumbent firms' operating activities. Definitions of variables are provided in Appendix 3. Quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

<i>Dep. Var=</i>	<i>AR/R</i>	<i>Ln(AR/R Turnover)</i>	<i>OperatingCashFlow</i>
	(1)	(2)	(3)
<i>AfterTreat</i>	-0.031*** (0.012)	0.020** (0.008)	0.001** (0.001)
<i>Age</i>	0.216*** (0.023)	-0.051*** (0.017)	-0.005*** (0.001)
<i>Size</i>	0.044*** (0.015)	-0.013 (0.012)	-0.001 (0.001)
<i>Leverage</i>	0.025 (0.056)	0.074* (0.042)	-0.011*** (0.003)
<i>MB</i>	-0.027*** (0.006)	0.020*** (0.003)	0.000 (0.000)
<i>ROA</i>	-1.428*** (0.366)	1.226*** (0.252)	0.002 (0.018)
<i>CashHolding</i>	-0.199*** (0.058)	0.207*** (0.042)	-0.041*** (0.003)
<i>SalesGrowth</i>	0.019** (0.009)	-0.005 (0.006)	0.000 (0.000)
<i>SOE</i>	0.113*** (0.043)	-0.026 (0.032)	-0.000 (0.002)
<i>BoardSize</i>	-0.006 (0.006)	-0.005 (0.004)	0.000 (0.000)
<i>Constant</i>	0.400 (0.311)	1.083*** (0.238)	0.041*** (0.014)
Firm and Quarter FE	Included	Included	Included
Observations	19,347	19,246	19,347
R <sup>2</sup>	0.76	0.84	0.29

**Table 4: Difference-in-Differences Analysis of Management Disclosure**

This table reports results of the DiD tests on how suspension-induced listing delay of competitors affects incumbent firms' disclosure behavior. Definitions of variables are provided in Appendix 3. Quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

<i>Dep. Var=</i>	<i>Ln(MgmtForecasts)</i>	<i>Dummy(Optimism_Analyst)</i>	<i>OptimismRatio_Analyst</i>
	(1)	(2)	(3)
<i>AfterTreat</i>	-0.006 (0.007)	-0.044** (0.019)	-0.034** (0.017)
<i>Age</i>	-0.082*** (0.017)	-0.042 (0.046)	-0.012 (0.042)
<i>Size</i>	0.008 (0.009)	0.043** (0.021)	0.040** (0.020)
<i>Leverage</i>	0.059* (0.033)	0.023 (0.074)	0.012 (0.069)
<i>MB</i>	0.003 (0.003)	0.009 (0.007)	0.009 (0.006)
<i>ROA</i>	0.304 (0.258)	3.199*** (0.494)	2.709*** (0.448)
<i>CashHolding</i>	-0.082** (0.034)	-0.003 (0.088)	-0.001 (0.079)
<i>SalesGrowth</i>	0.001 (0.004)	0.011 (0.009)	0.013 (0.009)
<i>SOE</i>	0.018 (0.030)	-0.091 (0.058)	-0.085 (0.053)
<i>BoardSize</i>	-0.005 (0.004)	-0.004 (0.009)	-0.004 (0.008)
<i>Ln(AnalystNumber)</i>	-0.007* (0.004)	0.029** (0.011)	0.014 (0.010)
<i>InstOwnership</i>	0.002 (0.005)	0.018 (0.015)	0.012 (0.014)
<i>Loss</i>	0.039*** (0.010)	0.034* (0.019)	0.022 (0.018)
<i>Constant</i>	0.078 (0.201)	-0.663 (0.439)	-0.652 (0.415)
Firm and Quarter FE	Included	Included	Included
Observations	14,357	4,465	4,465
R <sup>2</sup>	0.56	0.49	0.47

**Table 5: Difference-in-Differences Analysis of Firm Performance**

This table reports results of the DiD tests on how suspension-induced listing delay of competitors affects incumbent firms' overall performance. Definitions of variables are provided in Appendix 3. Quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

<i>Dep. Var=</i>	<i>Sales</i>	<i>ROE</i>	<i>SalesGrowth</i>	<i>EarningsGrowth</i>
	(1)	(2)	(3)	(4)
<i>AfterTreat</i>	0.033*** (0.010)	0.003*** (0.001)	0.068*** (0.016)	0.108*** (0.037)
<i>Age</i>	0.065*** (0.019)	-0.008*** (0.001)	-0.005 (0.026)	0.064 (0.061)
<i>Size</i>	0.631*** (0.016)	0.001 (0.001)	-0.077*** (0.022)	-0.011 (0.038)
<i>Leverage</i>	0.283*** (0.051)	0.013*** (0.004)	0.145* (0.081)	-0.104 (0.144)
<i>MB</i>	0.059*** (0.004)	0.004*** (0.000)	0.016** (0.007)	0.014 (0.014)
<i>SOE</i>	-0.088** (0.037)	-0.010*** (0.003)	0.064 (0.048)	-0.149 (0.102)
<i>BoardSize</i>	0.025*** (0.005)	0.000 (0.000)	-0.008 (0.008)	0.003 (0.016)
<i>Constant</i>	5.205*** (0.333)	-0.004 (0.025)	1.818*** (0.452)	0.516 (0.785)
Firm and Quarter FE	Included	Included	Included	Included
Observations	19,347	19,347	19,347	19,347
R <sup>2</sup>	0.91	0.31	0.19	0.14

**Table 6: Robustness Test – Parallel Trend Assumption**

This table reports results of parallel trend assumption test. *Pre (-1)* is a dummy variable that equals one for treatment firms in one quarter before the IPO suspension and zero otherwise; *Current* is a dummy variable that equals one for treatment firms in the quarter of the IPO suspension and zero otherwise; *Post (+1)* is a dummy variable that equals one for treatment firms in one quarter after the IPO suspension and zero otherwise; *Post (>=2)* is a dummy variable that equals one for treatment firms in two and more quarters after the IPO suspension and zero otherwise. Definitions of other variables are provided in Appendix 3. Control variables, quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

**Panel A: DiD Analysis of M&As**

<i>Dep. Var=</i>	<i>Ln(AcqNumber)</i>	<i>Ln(AcqNumber_Bidder</i>	<i>Ln(AcqExpenses_Bidde</i>
	(1)	(2)	(3)
<i>Pre (-1)</i>	0.001 (0.011)	-0.001 (0.010)	0.100 (0.200)
<i>Current</i>	-0.005 (0.010)	-0.004 (0.010)	-0.159 (0.202)
<i>Post (+1)</i>	-0.012 (0.010)	-0.014 (0.009)	-0.295 (0.182)
<i>Post (&gt;=2)</i>	-0.034** (0.015)	-0.040*** (0.014)	-0.827*** (0.296)
<i>Constant</i>	-0.214 (0.151)	-0.092 (0.147)	-3.132 (2.880)
Controls	Included	Included	Included
Firm and Quarter FE	Included	Included	Included
Observations	19,347	19,347	19,347
R <sup>2</sup>	0.17	0.17	0.17

**Panel B: DiD Analysis of Operating Activities**

<i>Dep. Var=</i>	<i>AR/R</i>	<i>Ln(AR/R Turnover)</i>	<i>OperatingCashFlow</i>
	(1)	(2)	(3)
<i>Pre (-1)</i>	-0.017 (0.017)	-0.008 (0.012)	0.000 (0.001)
<i>Current</i>	-0.033* (0.018)	0.037*** (0.013)	0.002* (0.001)
<i>Post (+1)</i>	-0.042** (0.018)	0.003 (0.012)	0.001 (0.001)
<i>Post (&gt;=2)</i>	-0.016 (0.021)	0.015 (0.014)	0.001 (0.001)
<i>Constant</i>	0.398 (0.311)	1.084*** (0.238)	0.041*** (0.014)
Controls	Included	Included	Included
Firm and Quarter FE	Included	Included	Included

Observations	19,347	19,246	19,347
R <sup>2</sup>	0.76	0.84	0.29

**Panel C: DiD Analysis of Management Disclosure**

<i>Dep. Var=</i>	<i>Ln(MgmtForecasts)</i>	<i>Dummy(Optimism_Analyst)</i>	<i>OptimismRatio_Analyst</i>
	(1)	(2)	(3)
<i>Pre (-1)</i>	-0.006 (0.009)	0.012 (0.021)	0.008 (0.018)
<i>Current</i>	0.005 (0.010)	-0.056* (0.029)	-0.055** (0.025)
<i>Post (+1)</i>	-0.026** (0.012)	-0.024 (0.028)	-0.017 (0.026)
<i>Post (&gt;=2)</i>	0.002 (0.013)	-0.050 (0.037)	-0.023 (0.033)
<i>Constant</i>	0.066 (0.201)	-0.669 (0.439)	-0.650 (0.415)
Controls	Included	Included	Included
Firm and Quarter FE	Included	Included	Included
Observations	14,357	4,465	4,465
R <sup>2</sup>	0.56	0.49	0.47

**Panel D: DiD Analysis of Firm Performance**

<i>Dep. Var=</i>	<i>Sales</i>	<i>ROE</i>	<i>SalesGrowth</i>	<i>EarningsGrowth</i>
	(1)	(2)	(3)	(4)
<i>Pre (-1)</i>	-0.017 (0.015)	-0.001 (0.001)	-0.037 (0.025)	-0.065 (0.056)
<i>Current</i>	0.074*** (0.016)	0.006*** (0.002)	0.166*** (0.026)	0.201*** (0.060)
<i>Post (+1)</i>	0.032** (0.014)	0.001 (0.001)	-0.014 (0.022)	-0.028 (0.051)
<i>Post (&gt;=2)</i>	-0.047** (0.023)	0.003** (0.001)	0.020 (0.029)	0.150** (0.069)
<i>Constant</i>	5.199*** (0.332)	-0.004 (0.025)	1.810*** (0.452)	0.505 (0.784)
Controls	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included
Observations	19,347	19,347	19,347	19,347
R <sup>2</sup>	0.91	0.31	0.19	0.15

**Table 7: Robustness Test - Placebo Tests**

This table reports results of four placebo tests on how suspension-induced listing delay of competitors affects incumbent firms' M&As, operating activities, management disclosure, and overall performance. We artificially assign the placebo event time to 18 months before the actual starting date of each IPO suspension and examine 5 quarters (2 quarters before and two quarter after) surrounding the placebo event time. Definitions of variables are provided in Appendix 3. Control variables as well as quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

**Panel A: DiD Analysis of M&As**

<i>Dep. Var=</i>	<i>Ln(AcqNumber)</i>	<i>Ln(AcqNumber_Bidder)</i>	<i>Ln(AcqExpenses_Bidder)</i>
	(1)	(2)	(3)
<i>AfterTreat</i>	0.007 (0.007)	0.007 (0.007)	0.116 (0.140)
<i>Constant</i>	-0.468** (0.193)	-0.326* (0.192)	-9.596*** (3.685)
Controls	Included	Included	Included
Firm and Quarter FE	Included	Included	Included
Observations	16,440	16,440	16,440
R <sup>2</sup>	0.18	0.18	0.18

**Panel B: DiD Analysis of Operating Activities**

<i>Dep. Var=</i>	<i>AR/R</i>	<i>Ln(AR/R Turnover)</i>	<i>OperatingCashFlow</i>
	(1)	(2)	(3)
<i>AfterTreat</i>	-0.013 (0.011)	-0.006 (0.010)	-0.001 (0.001)
<i>Constant</i>	0.212 (0.317)	0.959*** (0.310)	0.087*** (0.019)
Controls	Included	Included	Included
Firm and Quarter FE	Included	Included	Included
Observations	16,440	16,352	16,440
R <sup>2</sup>	0.79	0.85	0.30

**Panel C: DiD Analysis of Management Disclosure**

<i>Dep. Var=</i>	<i>Ln(MgmtForecasts)</i>	<i>Dummy(Optimism_Analyst)</i>	<i>OptimismRatio_Analyst</i>
	(1)	(2)	(3)
<i>AfterTreat</i>	-0.002 (0.007)	0.019 (0.016)	0.012 (0.015)
<i>Constant</i>	0.073 (0.266)	-0.733 (0.594)	-0.580 (0.567)
Controls	Included	Included	Included
Firm and Quarter FE	Included	Included	Included
Observations	13,021	3,196	3,196
R <sup>2</sup>	0.48	0.51	0.49



**Panel D: DiD Analysis of Firm Performance**

<i>Dep. Var=</i>	<i>Sales</i>	<i>ROE</i>	<i>SalesGrowth</i>	<i>EarningsGrowth</i>
	(1)	(2)	(3)	(4)
<i>AfterTreat</i>	-0.018 (0.011)	-0.001 (0.001)	-0.017 (0.017)	0.008 (0.037)
<i>Constant</i>	6.029*** (0.406)	0.041 (0.026)	1.884*** (0.493)	1.387 (0.927)
Controls	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included
Observations	16,440	16,440	16,440	16,440
R <sup>2</sup>	0.91	0.32	0.19	0.15

**Table 8: Robustness Test – Difference-in-Differences Analysis of Analyst Coverage**

This table reports results of the DiD tests on how suspension-induced listing delay of competitors affects incumbent firms' analyst coverage. Definitions of variables are provided in Appendix 3. Quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

<i>Dep. Var=</i>	<i>Ln(ReportNumber)</i>	<i>Ln(AnalystNumber)</i>
	(1)	(2)
<i>AfterTreat</i>	0.001 (0.015)	0.000 (0.013)
<i>Age</i>	-0.091*** (0.029)	-0.103*** (0.026)
<i>Size</i>	0.314*** (0.015)	0.274*** (0.013)
<i>Leverage</i>	0.138*** (0.052)	0.100** (0.047)
<i>MB</i>	0.139*** (0.006)	0.123*** (0.005)
<i>ROA</i>	5.733*** (0.370)	5.174*** (0.330)
<i>CashHolding</i>	0.310*** (0.068)	0.279*** (0.060)
<i>SalesGrowth</i>	-0.008 (0.007)	-0.005 (0.006)
<i>SOE</i>	-0.119*** (0.033)	-0.108*** (0.030)
<i>BoardSize</i>	0.008 (0.006)	0.006 (0.005)
<i>Constant</i>	-6.549*** (0.310)	-5.663*** (0.277)
Firm and Quarter FE	Included	Included
Observations	19,347	19,347
R <sup>2</sup>	0.65	0.66

**Table 9: Robustness Test – Difference-in-Differences Analysis of Earnings Management**

This table reports results of the DiD tests on how suspension-induced listing delay of competitors affects incumbent firms' earnings management activities. Definitions of variables are provided in Appendix 3. Quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

<i>Dep. Var=</i>	<i>Accrual_Based Earnings Management</i>		<i>Real Earnings Management</i>		
	<i>AEM</i>	<i>REM</i>	<i>AB_CFO</i>	<i>AB_PRO D</i>	<i>AB_DISEX P</i>
	(1)	(2)	(3)	(4)	(5)
<i>AfterTreat</i>	0.002 (0.001)	0.000 (0.004)	-0.001 (0.001)	-0.001 (0.004)	-0.000 (0.000)
<i>Age</i>	0.003 (0.002)	0.008 (0.005)	-0.004* (0.002)	0.005 (0.005)	0.001 (0.001)
<i>Size</i>	-0.000 (0.002)	-0.008 (0.007)	0.001 (0.001)	-0.012* (0.006)	-0.005*** (0.001)
<i>Leverage</i>	0.008 (0.006)	0.012 (0.031)	-0.020*** (0.006)	-0.007 (0.027)	0.000 (0.004)
<i>MB</i>	0.003*** (0.000)	0.001 (0.001)	-0.000 (0.000)	0.002 (0.001)	0.001*** (0.000)
<i>ROA</i>	0.034 (0.038)	0.178 (0.119)	0.009 (0.031)	0.138 (0.110)	-0.050*** (0.014)
<i>CashHolding</i>	0.059*** (0.006)	0.066*** (0.016)	-0.049*** (0.005)	0.009 (0.015)	-0.007*** (0.002)
<i>SalesGrowth</i>	-0.002** (0.001)	0.003 (0.004)	0.001 (0.001)	0.002 (0.003)	-0.002*** (0.000)
<i>SOE</i>	-0.003 (0.004)	0.000 (0.012)	0.001 (0.003)	-0.001 (0.011)	-0.002 (0.002)
<i>BoardSize</i>	0.000 (0.001)	-0.002 (0.002)	0.000 (0.000)	-0.001 (0.002)	0.001* (0.000)
<i>Constant</i>	-0.021 (0.032)	0.159 (0.133)	0.007 (0.028)	0.254** (0.122)	0.088*** (0.019)
Firm and Quarter FE	Included	Included	Included	Included	Included
Observations	18,537	18,414	18,515	18,414	18,417
R <sup>2</sup>	0.14	0.09	0.15	0.09	0.36

**Table 10: Cross-Sectional Test – Competitive Pressure from Other Public Rivals**

This table reports the results of the heterogeneity tests on how suspension-induced listing delay of competitors affects incumbent firms' M&As, operating activities, management disclosure, and overall performance. *HighComp* is a dummy variable that equals one if the competitive intensity between the firm and other public rivals is above the median among all rivals, and zero otherwise, where competitive intensity is the pairwise cosine similarity in product market descriptions between two firms as developed by Hoberg and Phillips (2016). Definitions of other variables are provided in Appendix 3. Control variables, quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

**Panel A: Heterogeneity Analysis of M&As**

<i>Dep. Var=</i>	<i>Ln(AcqNumber)</i>		<i>Ln(AcqNumber_Bidder)</i>		<i>Ln(AcqExpenses_Bidder)</i>	
	<i>HighComp=</i>	<i>HighComp=</i>	<i>HighComp=</i>	<i>HighComp=</i>	<i>HighComp=</i>	<i>HighComp=</i>
	<i>1</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>0</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>AfterTreat</i>	-0.029*** (0.010)	-0.001 (0.010)	-0.029*** (0.010)	-0.005 (0.010)	-0.657*** (0.190)	-0.139 (0.200)
<i>Constant</i>	-0.243 (0.202)	-0.204 (0.233)	-0.092 (0.196)	-0.113 (0.234)	-3.797 (3.868)	-2.857 (4.398)
Controls	Included	Included	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included	Included	Included
Observations	9,505	9,298	9,505	9,298	9,505	9,298
R <sup>2</sup>	0.16	0.19	0.16	0.18	0.16	0.18
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001		<0.001	

**Panel B: Heterogeneity Analysis of Operating Activities**

<i>Dep. Var=</i>	<i>AR/R</i>		<i>Ln(AR/R Turnover)</i>		<i>OperatingCashFlow</i>	
	<i>HighComp=</i>	<i>HighComp=</i>	<i>HighComp=</i>	<i>HighComp=</i>	<i>HighComp=</i>	<i>HighComp=</i>
	<i>1</i>	<i>0</i>	<i>1</i>	<i>0</i>	<i>1</i>	<i>0</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>AfterTreat</i>	-0.045*** (0.016)	-0.012 (0.018)	0.030** (0.012)	0.005 (0.011)	0.003*** (0.001)	-0.000 (0.001)
<i>Constant</i>	0.486 (0.374)	-0.082 (0.574)	1.272*** (0.340)	1.280*** (0.302)	0.058*** (0.018)	0.026 (0.023)
Controls	Included	Included	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included	Included	Included
Observations	9,505	9,298	9,416	9,288	9,505	9,298
R <sup>2</sup>	0.73	0.78	0.84	0.85	0.28	0.29
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001		<0.001	

**Panel C: Heterogeneity Analysis of Management Disclosure**

<i>Dep. Var=</i>	<i>Dummy(Optimism_Analyst)</i>		<i>OptimismRatio_Analyst</i>	
	<i>HighComp=1</i>	<i>HighComp=0</i>	<i>HighComp=1</i>	<i>HighComp=0</i>
	(1)	(2)	(3)	(4)
<i>AfterTreat</i>	-0.079*** (0.030)	-0.029 (0.029)	-0.060** (0.026)	-0.024 (0.026)
<i>Constant</i>	-0.565 (0.731)	-1.153 (0.814)	-0.356 (0.664)	-1.154 (0.784)
Controls	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included
Observations	2,006	2,130	2,006	2,130

R <sup>2</sup>	0.50	0.48	0.49	0.44
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001	

**Panel D: Heterogeneity Analysis of Firm Performance**

<i>Dep. Var=</i>	<i>Sales</i>		<i>ROE</i>		<i>SalesGrowth</i>		<i>EarningsGrowth</i>	
	<i>HighComp=</i>	<i>HighCom</i>	<i>HighComp=</i>	<i>HighCom</i>	<i>HighComp</i>	<i>HighComp</i>	<i>HighComp</i>	<i>HighComp</i>
	<i>1</i>	<i>p=0</i>	<i>1</i>	<i>p=0</i>	<i>=1</i>	<i>=0</i>	<i>=1</i>	<i>=0</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>AfterTreat</i>	0.054*** (0.015)	-0.000 (0.014)	0.006*** (0.001)	-0.001 (0.001)	0.091*** (0.023)	0.033 (0.020)	0.143*** (0.051)	0.070 (0.057)
<i>Constant</i>	4.783*** (0.442)	5.868*** (0.513)	-0.016 (0.031)	0.044 (0.040)	1.805*** (0.631)	1.796*** (0.602)	-0.119 (1.039)	1.579 (1.243)
Controls	Included	Included	Included	Included	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included	Included	Included	Included	Included
Observations	9,505	9,298	9,505	9,298	9,505	9,298	9,505	9,298
R <sup>2</sup>	0.89	0.92	0.28	0.36	0.18	0.20	0.14	0.15
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001		<0.001		<0.001	

**Table 11: Cross-Sectional Test –Severity of IPO Rival’s Threat**

This table reports the results of the heterogeneity tests on how suspension-induced listing delay of competitors affects incumbent firms’ M&As, operating activities, management disclosure, and overall performance. *HighEntrantThreat* is a dummy variable that equals one if the new entrant’s average revenue three years before the IPO application is higher than the median value among all IPO applicants, and zero otherwise. Definitions of other variables are provided in Appendix 3. Control variables, quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

**Panel A: Heterogeneity Analysis of M&As**

Dep. Var=	<i>Ln(AcqNumber)</i>		<i>Ln(AcqNumber_Bidder)</i>		<i>Ln(AcqExpenses_Bidder)</i>	
	<i>HighEntrantThr</i>	<i>HighEntrantThr</i>	<i>HighEntrantThr</i>	<i>HighEntrantThr</i>	<i>HighEntrantThr</i>	<i>HighEntrantThr</i>
	<i>eat=1</i>	<i>eat=0</i>	<i>eat=1</i>	<i>eat=0</i>	<i>eat=1</i>	<i>eat=0</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>AfterTreat</i>	-0.030** (0.012)	-0.000 (0.011)	-0.034*** (0.012)	-0.002 (0.010)	-0.645*** (0.232)	-0.035 (0.199)
<i>Constant</i>	-0.393 (0.261)	-0.234 (0.232)	-0.252 (0.261)	-0.074 (0.222)	-4.932 (5.066)	-7.085 (4.510)
Controls	Included	Included	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included	Included	Included
Observations	8,785	9,711	8,785	9,711	8,785	9,711
R <sup>2</sup>	0.23	0.23	0.23	0.23	0.22	0.23
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001		<0.001	

**Panel B: Heterogeneity Analysis of Operating Activities**

Dep. Var=	AR/R		Ln(AR/R Turnover)		OperatingCashFlow	
	HighEntrantThr	HighEntrantThr	HighEntrantThr	HighEntrantThr	HighEntrantThr	HighEntrantThr
	<i>eat=1</i>	<i>eat=0</i>	<i>eat=1</i>	<i>eat=0</i>	<i>eat=1</i>	<i>eat=0</i>
	(1)	(2)	(3)	(4)	(5)	(6)
<i>AfterTreat</i>	-0.081*** (0.018)	-0.010 (0.019)	0.041*** (0.012)	0.010 (0.011)	0.003*** (0.001)	-0.000 (0.001)
<i>Constant</i>	-0.065 (0.647)	-0.345 (0.553)	2.399*** (0.460)	1.702*** (0.356)	0.131*** (0.027)	0.002 (0.024)
Controls	Included	Included	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included	Included	Included
Observations	8,784	9,707	8,740	9,650	8,785	9,711
R <sup>2</sup>	0.82	0.78	0.89	0.87	0.35	0.32
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001		<0.001	

**Panel C: Heterogeneity Analysis of Management Disclosure**

Dep. Var=	Dummy(Optimism_Analyst)		OptimismRatio_Analyst	
	HighEntrantThreat=1	HighEntrantThreat=0	HighEntrantThreat=1	HighEntrantThreat=0
	(1)	(2)	(3)	(4)
<i>AfterTreat</i>	-0.072** (0.035)	-0.026 (0.034)	-0.061* (0.032)	-0.017 (0.031)
<i>Constant</i>	-1.811* (1.069)	-1.008 (1.074)	-1.627* (0.975)	-0.697 (1.014)
Controls	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included
Observations	2,071	2,218	2,071	2,218



R <sup>2</sup>	0.56	0.54	0.55	0.52
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001	

**Panel D: Heterogeneity Analysis of Firm Performance**

<i>Dep. Var=</i>	<i>Sales</i>		<i>ROE</i>		<i>SalesGrowth</i>		<i>EarningsGrowth</i>	
	<i>HighEntra</i> <i>ntThreat=1</i>	<i>HighEntra</i> <i>ntThreat=0</i>	<i>HighEntra</i> <i>ntThreat=1</i>	<i>HighEntra</i> <i>ntThreat=0</i>	<i>HighEntra</i> <i>ntThreat=1</i>	<i>HighEntra</i> <i>ntThreat=0</i>	<i>HighEntra</i> <i>ntThreat=1</i>	<i>HighEntra</i> <i>ntThreat=0</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>AfterTreat</i>	0.082*** (0.017)	0.037** (0.015)	0.007*** (0.001)	0.002 (0.001)	0.102*** (0.028)	0.083*** (0.024)	0.091** (0.040)	0.207*** (0.060)
<i>Constant</i>	4.432*** (0.616)	6.382*** (0.603)	0.063 (0.042)	0.020 (0.048)	1.786** (0.851)	3.577*** (0.855)	1.724** (0.834)	1.655 (1.461)
Controls	Included	Included	Included	Included	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included	Included	Included	Included	Included
Observations	8,952	9,898	8,953	9,904	8,951	9,897	8,953	9,904
R <sup>2</sup>	0.93	0.91	0.40	0.36	0.23	0.22	0.21	0.19
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001		<0.001		<0.001	

**Table 12: Cross-Sectional Test – Incumbent Firm’s Industry Dominance**

This table reports the results of the heterogeneity tests on how suspension-induced listing delay of competitors affects incumbent firms’ M&As, operating activities, management disclosure, and overall performance. *HighDominance* is a dummy variable that equals one if existing public firm’s average revenue two quarters before IPO suspension is higher than the median among all existing public firms, and zero otherwise. Definitions of other variables are provided in Appendix 3. Control variables, quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

**Panel A: Heterogeneity Analysis of M&As**

Dep. Var=	<i>Ln(AcqNumber)</i>		<i>Ln(AcqNumber_Bidder)</i>		<i>Ln(AcqExpenses_Bidder)</i>	
	<i>HighDominance</i>	<i>HighDominance</i>	<i>HighDominance</i>	<i>HighDominance</i>	<i>HighDominance</i>	<i>HighDominance</i>
	=1	=0	=1	=0	=1	=0
	(1)	(2)	(3)	(4)	(5)	(6)
<i>AfterTreat</i>	-0.015 (0.010)	-0.012 (0.010)	-0.020** (0.010)	-0.010 (0.009)	-0.467** (0.197)	-0.254 (0.185)
<i>Constant</i>	-0.388* (0.211)	-0.008 (0.233)	-0.214 (0.210)	0.085 (0.214)	-6.295 (4.055)	1.468 (4.412)
Controls	Included	Included	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included	Included	Included
Observations	9,682	9,511	9,682	9,511	9,682	9,511
R <sup>2</sup>	0.17	0.17	0.17	0.17	0.16	0.18
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001		<0.001	

**Panel B: Heterogeneity Analysis of Operating Activities**

Dep. Var=	AR/R		Ln(AR/R Turnover)		OperatingCashFlow	
	HighDominance =1	HighDominance =0	HighDominance =1	HighDominance =0	HighDominance =1	HighDominance =0
	(1)	(2)	(3)	(4)	(5)	(6)
<i>AfterTreat</i>	-0.028** (0.014)	-0.020 (0.019)	0.022** (0.011)	0.012 (0.012)	0.003*** (0.001)	-0.000 (0.001)
<i>Constant</i>	0.193 (0.380)	2.125*** (0.534)	1.137*** (0.328)	0.369 (0.354)	0.045** (0.019)	0.017 (0.022)
Controls	Included	Included	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included	Included	Included
Observations	9,682	9,511	9,642	9,450	9,682	9,511
R <sup>2</sup>	0.75	0.74	0.86	0.79	0.27	0.30
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001		<0.001	

**Panel C: Heterogeneity Analysis of Management Disclosure**

Dep. Var=	Dummy(Optimism_Analyst)		OptimismRatio_Analyst	
	HighDominance=1	HighDominance=0	HighDominance=1	HighDominance=0
	(1)	(2)	(3)	(4)
<i>AfterTreat</i>	-0.091** (0.036)	-0.043* (0.024)	-0.084** (0.035)	-0.031 (0.021)
<i>Constant</i>	-1.208 (1.012)	-0.584 (0.611)	-1.105 (0.974)	-0.589 (0.565)
Controls	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included
Observations	1,484	2,722	1,484	2,722

R <sup>2</sup>	0.52	0.47	0.51	0.44
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001	

**Panel D: Heterogeneity Analysis of Firm Performance**

<i>Dep. Var=</i>	<i>Sales</i>		<i>ROE</i>		<i>SalesGrowth</i>		<i>EarningsGrowth</i>	
	<i>HighDominance=1</i>	<i>HighDominance=0</i>	<i>HighDominance=1</i>	<i>HighDominance=0</i>	<i>HighDominance=1</i>	<i>HighDominance=0</i>	<i>HighDominance=1</i>	<i>HighDominance=0</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>AfterTreat</i>	0.057*** (0.014)	0.008 (0.015)	0.004*** (0.001)	0.002* (0.001)	0.064*** (0.019)	0.070*** (0.025)	0.059** (0.029)	0.138** (0.055)
<i>Constant</i>	4.577*** (0.473)	6.166*** (0.462)	-0.014 (0.035)	-0.031 (0.034)	1.366** (0.549)	2.137*** (0.813)	-0.140 (0.588)	1.729 (1.324)
Controls	Included	Included	Included	Included	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included	Included	Included	Included	Included
Observations	9,682	9,511	9,682	9,511	9,682	9,511	9,682	9,511
R <sup>2</sup>	0.85	0.73	0.33	0.29	0.16	0.20	0.16	0.15
<i>p</i> -values of the test on coefficient equality between two subsamples	<0.001		<0.001		<0.001		<0.001	

**Table 13: Incumbent Firm's Response after the End of IPO Suspension**

This table reports results of the DiD tests on how incumbent firms' investment, operation, disclosure and performance change surrounding the end of IPO suspension (2 quarters before and 2 quarters after the ending date). The ending dates of four IPO suspension events are provided in Appendix 1. Definitions of variables are provided in Appendix 3. Control variables, quarter and firm fixed effects are included in all regressions but the coefficients are not reported. Robust standard errors clustered by firm are displayed in parentheses. \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

**Panel A: DiD Analysis of M&As**

<i>Dep. Var=</i>	<i>Ln(AcqNumber)</i>	<i>Ln(AcqNumber_Bidder)</i>	<i>Ln(AcqExpenses_Bidder)</i>
	(1)	(2)	(3)
<i>AfterTreat</i>	-0.009 (0.008)	-0.008 (0.008)	-0.213 (0.157)
<i>Constant</i>	0.017 (0.146)	0.040 (0.134)	4.583 (2.800)
Controls	Included	Included	Included
Firm and Quarter FE	Included	Included	Included
Observations	20,261	20,261	20,261
R <sup>2</sup>	0.18	0.18	0.18

**Panel B: DiD Analysis of Operating Activities**

<i>Dep. Var=</i>	<i>AR/R</i>	<i>Ln(AR/R Turnover)</i>	<i>OperatingCashFlow</i>
	(1)	(2)	(3)
<i>AfterTreat</i>	-0.018 (0.013)	-0.004 (0.009)	-0.001 (0.001)
<i>Constant</i>	0.426 (0.305)	1.363*** (0.235)	0.086*** (0.013)
Controls	Included	Included	Included
Firm and Quarter FE	Included	Included	Included
Observations	20,261	20,177	20,261
R <sup>2</sup>	0.77	0.85	0.29

**Panel C: DiD Analysis of Management Disclosure**

<i>Dep. Var=</i>	<i>Ln(MgmtForecasts)</i>	<i>Dummy(Optimism_Analyst)</i>	<i>OptimismRatio_Analyst</i>
	(1)	(2)	(3)
<i>AfterTreat</i>	0.005 (0.007)	0.044*** (0.014)	0.034*** (0.013)
<i>Constant</i>	0.412* (0.220)	-0.593 (0.373)	-0.637* (0.352)
Controls	Included	Included	Included
Firm and Quarter FE	Included	Included	Included
Observations	15,771	4,637	4,637
R <sup>2</sup>	0.58	0.49	0.48

**Panel D: DiD Analysis of Firm Performance**

<i>Dep. Var=</i>	<i>Sales</i>	<i>ROE</i>	<i>SalesGrowth</i>	<i>EarningsGrowth</i>
	(1)	(2)	(3)	(4)
<i>AfterTreat</i>	-0.001 (0.012)	0.000 (0.001)	-0.029* (0.017)	-0.018 (0.040)
<i>Constant</i>	4.942*** (0.309)	-0.032 (0.022)	1.730*** (0.401)	-0.166 (0.776)
Controls	Included	Included	Included	Included
Firm and Quarter FE	Included	Included	Included	Included
Observations	20,261	20,261	20,261	20,261
R <sup>2</sup>	0.91	0.32	0.19	0.15

## Appendix 1: IPO Suspension Events Used in This Study

<b>Suspension Period</b>	<b>Main Reasons</b>
2004.08.26 - 2005.01.23	In December 2004, the China Securities Regulatory Commission (CSRC) issued the Notice on Several Issues on the Trial Implementation of the Inquiry System for Initial Public Offering of Stocks. The notice stipulates that the IPO firm and its sponsoring institution should determine the offering price by way of cumulative bidding and inquiry to institutional investors. This regulation marks the initial establishment of a market-based pricing mechanism for China's initial public offerings. The IPOs were suspended until this regulation was formally launched.
2008.09.16 - 2009.07.09	The United States Subprime Mortgage Crisis triggered the international financial crisis, leading to the collapse of global stock prices. In September 2008, Lehman Brothers filed for bankruptcy protection. Spillover effects resulted in a record low of 1802.33 points of A-share market on September 18, 2008. Under this context, IPOs were suspended.
2012.11.16 - 2013.12.30	Despite the good performance of indices in Europe and the US, A-share market had been falling since August 2009, making it the worst performing market among the major economies for three years. In addition, CSRC started the biggest inspection of financial reporting for IPO firms. Under this context, IPOs were suspended.
2015.07.04 - 2015.11.06	Since June 2015, A-share market had experienced an instable slump, dropping from more than 5,100 points to around 3,800 points in just 20 days. The IPO suspension is one of several measures undertaken by CSRC to boost the market.

Note: Sourced from (1) "A Review of China IPO Suspensions", Security Daily, June 19 2013, retrieved from [http://epaper.zqrb.cn/html/2013-06/19/content\\_362206.htm](http://epaper.zqrb.cn/html/2013-06/19/content_362206.htm). (2) "A Review of nine IPO Suspensions in China A-share market", Finance Daily, July 14 2015, retrieved from <http://www.mrcjcn.com/n/49812.html>.

## Appendix 2: Identification of Competing Firms and Validation Tests

This section describes how we identify a firm’s competitors upon text-based analysis of its product descriptions in the annual report, as well as the results of a number of validation tests.

### 2.1 Identification of competing firms

Our identification of competing firms is based on the degree of product similarity between two firms that is proposed by Hoberg and Phillips (2016). The core idea is that closeness in the product space reflects the degree to which a given firm is similar to its competitors and the level of competition between them.

Following Hoberg and Phillips (2016), we begin by downloading the annual reports of all public firms (excluding financial firms and special treatment firms) between 2003 and 2017 from public disclosure platform designated by the China Securities Regulatory Commission (<http://www.cninfo.com.cn/new/index>). The “Report of the Directors” section of the annual report provides detailed business descriptions. If this section is not available, we use the “Overview of Business” section instead. The CSRC stipulates that firms must provide accurate and up-to-date business descriptions in the annual report that reflect the business reality of the year. This enables us to capture the dynamic changes of firm’s product composition and industry presence across years.

After identifying the text related to the firm’s business descriptions, we parse all words using the THULAC tool and exclude common words as well as words that are not nouns or proper nouns. Then we manually select and keep words that are related to the firm’s business and products, which results in a database (i.e., product market space) of 12,802 unique words. We vectorize the product market vocabulary so that each year a given firm  $i$ ’s vocabulary can be represented by a vector, with each element being populated by one if firm  $i$  uses the given word, and zero if it does not. We then assign pairwise similarity scores based on the cosine similarity between two firms’ vectorized product descriptions. The cosine similarity between two firms ( $i$  and  $j$ ) is higher when two firms’ product market descriptions are more similar. This similarity measure ranges from 0 (no similarity) to 1 (perfect similarity).

$$\text{Product Cosine Similarity}_{i,j} = (V_i \cdot V_j) / (|V_i| \cdot |V_j|)$$

Following Hoberg and Phillips (2016), we label firms  $i$  and  $j$  as a “membership pair” if, for a given classification, they are in the same industry. We determine the threshold generating industries with the same fraction of membership pairs as Wind-3 industries (Chinese equivalent of the SIC-3 industries), so that we can compare our industries to Wind-3 industries in an unbiased fashion. The mean threshold value for our sample is 0.2893. Firm  $j$  is classified as a competitor of firm  $i$  if the similarity score between them higher than the threshold value.

### 2.2 Validation tests

To ensure our product-similarity-based measure properly identifies the firm’s competitors, we conduct a series of validation tests. We construct a variable  $LnCosMean$ ,



which measures the average level of competition facing a firm in a given year and is calculated as the natural logarithm of one plus the average pairwise similarities between the firm and all of its rivals in a given year. The average value of *LnCosMean* is 0.296 with a standard deviation of 0.019 for our sample.

### 2.2.1 Competition and Disclosure

Hoberg and Phillips (2016) show that firms with more rivals, especially rivals with high similarity, are more likely to disclose competitive pressure in the Management’s Discussion and Analysis section of their 10-K. We test whether this relationship holds for our competition measure (i.e., *LnCosMean*).

Following the spirit of Hoberg and Phillips (2016) and for each firm year, we construct two measures of disclosure of competitive pressure – *CompFrequency* (defined as the frequency of the word “competition” multiplied by 100, scaled by total number of words in the “Report of the Directors” or “Overview of Business” section), and *CompRelatedFrequency* (defined as the frequency of the word “competition”, “market share” and “industry concentration” multiplied by 100, scaled by total number of words in the “Report of the Directors” or “Overview of Business” section).

Table A2.1 reports the results of the relationship between *LnCosMean* and disclosure intensity of competition. Coefficient on *LnCosMean* is positive and significant in both columns, which is consistent with the findings of Hoberg and Phillips (2016) that firms facing higher competitive pressures are more likely to disclose such information in the annual reports.

**Table A2.1 Competition and Disclosure**

<i>Dep. Var =</i>	<i>CompFrequency</i>	<i>CompRelatedFrequency</i>
	(1)	(2)
<i>LnCosMean</i>	0.133*** (0.041)	0.155*** (0.050)
<i>Age</i>	-0.003** (0.001)	-0.006*** (0.002)
<i>Size</i>	-0.005*** (0.001)	-0.004** (0.001)
<i>Leverage</i>	-0.014*** (0.004)	-0.025*** (0.005)
<i>MB</i>	0.004*** (0.001)	0.004*** (0.001)
<i>SOE</i>	0.002 (0.003)	0.003 (0.004)
<i>BoardSize</i>	0.001*** (0.000)	0.001** (0.001)
<i>Constant</i>	0.098*** (0.024)	0.105*** (0.032)
Firm and Quarter FE	Included	Included
Observations	23,317	23,317
R <sup>2</sup>	0.35	0.37

Note: \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

### 2.2.2 Competition and Cross-Industry Variation

Hoberg and Phillips (2016) show that text-based industry classification captures more across-industry variation and is more informative than traditional industry classification such as the SIC codes. We test whether this proposition holds for our competition measure (i.e., *LnCosMean*).

Specifically, we compare the informativeness of industry classifications based on the extent to which they generate higher levels of cross-industry variation in profitability (*ROA*, *ROE*), sales growth (*SalesGrowth*) and investment activities (*AssetGrowth*, *FixedInvestGrowth*). Because we hold fixed the degree of granularity in the classifications we compare, we conclude that a classification generating a higher degree of across industry variation is more informative. Following Hoberg and Phillips (2016), we first compute a given firm’s industry value of a given characteristic as the mean of the given characteristic among its industry peers for each year and then compute across-industry variation as the standard deviation of these industry characteristics across all firm-year observations in our sample.

We report the results in Table A2.2. As shown, the standard deviation of profitability (*ROA*, *ROE*), sales growth (*SalesGrowth*) and investment activities (*AssetGrowth*, *FixedInvestGrowth*) in text-based industry classification are higher than those in Wind-3 industry classification, which is consistent with the findings of Hoberg and Phillips (2016) that text-based industry classifications more informative than wind-3 industry classification.

**Table A2.2 Competition and Across-Industry Variation**

	<i>ROA</i>	<i>ROE</i>	<i>SalesGrowth</i>	<i>AssetGrowth</i>	<i>FixedInvestGrowth</i>
Text-Based Industry Classification	0.021	0.038	0.181	0.133	0.793
Wind-3 Industry Classification	0.019	0.033	0.150	0.116	0.529

### 2.2.3 Competition and Firm Performance

Porter (2008) shows that a firm can maintain competitive advantage in the product market after successfully controlling costs, and obtain a long-term stable excess profit. Lieberman et al. (1988) also note that firms with competitive advantages in the product market generally have better performance. We test whether this relationship holds for our competition measure (i.e., *LnCosMean*).

We examine two measures of firm performance - *Sales* (defined as the natural logarithm of firm revenue) and *MarketShare* (defined as firm revenue as a percentage of industry revenue based on Wind-3 Industry Classification). Based on the findings of the prior studies, if the product market is highly competitive, firms are expected to have lower sales and market share.

We report the results in Table A2.3 below. Consistent with our conjecture, the coefficient estimate on *LnCosMean* is negative and significant in both columns, which indicates that firms facing higher competitive pressures have worse firm performance.

**Table A2.3 Competition and Firm Performance**

<i>Dep. Var =</i>	<i>Sales</i>	<i>MarketShare</i>
	(1)	(2)
<i>LnCosMean</i>	-0.526** (0.250)	-0.025* (0.013)
<i>Age</i>	0.068*** (0.010)	-0.000 (0.001)
<i>Size</i>	0.817*** (0.007)	0.013*** (0.000)
<i>Leverage</i>	0.187*** (0.028)	0.005*** (0.002)
<i>MB</i>	-0.110*** (0.007)	-0.001*** (0.000)
<i>SOE</i>	0.042** (0.017)	-0.000 (0.001)
<i>BoardSize</i>	0.007** (0.003)	0.000 (0.000)
<i>Constant</i>	3.278*** (0.161)	-0.229*** (0.009)
Firm and Quarter FE	Included	Included
Observations	23,292	23,293
R <sup>2</sup>	0.92	0.86

Note: \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

#### 2.2.4 Firm Innovation and Competition

Hoberg et al. (2016) show that firms' innovation activities can bring them competitive advantages in the product market. Lieberman et al. (1988) also find that firms can obtain product market competitive advantage through technology innovation. We test whether this relationship holds for our competition measure (i.e., *LnCosMean*).

We construct two measures of innovation activities: *LnPatent\_Apply* (defined as the natural logarithm of one plus the number of patent applications) and *LnPatent\_Grant* (defined as the natural logarithm of one plus the number of patents granted).

Table A2.4 below reports the regression results. We multiply the dependent variables by 100 for the ease of presentation. Coefficient estimate on *LnPatent\_Apply* and *LnPatent\_Grant* are negative and significant, which is consistent with the findings of prior studies that firms with more innovation obtain product market competitive advantage and face less competition.

**Table A2.4 Firm Innovation and Competition**

<i>Dep. Var =</i>	<i>LnCosMean</i>	
	(1)	(2)
<i>LnPatent_Apply</i>	-0.036*** (0.011)	
<i>LnPatent_Grant</i>		-0.024**

		(0.011)
<i>Age</i>	0.061*	0.057*
	(0.031)	(0.031)
<i>Size</i>	0.115***	0.110***
	(0.029)	(0.029)
<i>Leverage</i>	-0.135	-0.135
	(0.101)	(0.101)
<i>MB</i>	-0.040*	-0.040*
	(0.023)	(0.024)
<i>SOE</i>	-0.060	-0.060
	(0.076)	(0.076)
<i>BoardSize</i>	-0.014	-0.014
	(0.010)	(0.010)
<i>Constant</i>	26.360***	26.460***
	(0.586)	(0.584)
Firm and Quarter FE	Included	Included
Observations	18,360	18,360
R <sup>2</sup>	0.68	0.68

Note: \*\*\*, \*\*, and \* denote significance at the 1, 5, and 10 percent levels, respectively.

### Appendix 3: Definition of Variables

Variable	Definition
<b>Measures of M&amp;As</b>	
$Ln(AcqNumber)_t$	Number of M&As, defined as the natural logarithm of one plus firm $i$ 's total number of M&As (set to 0 if missing) in fiscal quarter $t$ .
$Ln(AcqNumber\_Bidder)_t$	Number of M&As as a bidder, defined as the natural logarithm of one plus firm $i$ 's total number of M&As as a bidder (set to 0 if missing) in fiscal quarter $t$ .
$Ln(AcqExpenses\_Bidder)_t$	Size of M&As as a bidder, defined as the natural logarithm of one plus firm $i$ 's total M&As expenses for which the firm is a bidder (set to 0 if missing) in fiscal quarter $t$ .
$Ln(Deal\_ClosingTime)$	Closing time for each M&As deal, defined as the natural logarithm of one plus the number of months between the start and completion of the deal. Only successful deals for which firm $i$ is a bidder are considered.
$Ln(Deal\_AcqExpense)$	Size of each M&As deal, defined as the natural logarithm of one plus the total expenses associated with the deal. Only successful deals for which firm $i$ is a bidder are considered.
$Dummy(Deal\_AcqPremium)$	A dummy variable that equals one if price paid for the deal is higher than its underlying asset value, and zero otherwise. Only successful deals for which firm $i$ is a bidder are considered.
<b>Measures of operating activities</b>	
$AR/R_t$	Accounts receivable, defined as firm $i$ 's accounts receivable divided by revenue, measured at the end of fiscal quarter $t$ .
$Ln(AR/R\ Turnover)_t$	Accounts receivable turnover, defined as the natural logarithm of one plus firm $i$ 's revenue divided by accounts receivable, measured at the end of fiscal quarter $t$ .
$OperatingCashFlow_t$	Operating cash flow, defined as firm $i$ 's net cash flow from operating activities divided by book value of total assets, measured at the end of fiscal quarter $t$ .
<b>Measures of management disclosure</b>	
$Ln(MgmtForecasts)_t$	Number of management earnings forecasts, defined as one plus the natural logarithm of firm $i$ 's management earnings forecasts issued in fiscal quarter $t$ .
$Dummy(Optimism\_Analyst)_t$	A dummy variable that equals one if firm $i$ 's management earnings forecasts issued in fiscal quarter $t$ exceed consensus analyst forecasts issued in fiscal quarter $t$ about the same forecast period, and zero otherwise.
$OptimismRatio\_Analyst_t$	Percentage of optimistic forecasts, defined as the number of management earnings forecasts issued by firm $i$ in fiscal quarter $t$ that exceed consensus analyst forecasts for the same forecast period, divided by the total number of management earnings forecasts issued in fiscal quarter $t$ .

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**Measures of firm performance**

<i>Sales<sub>t</sub></i>	Sales, defined as the natural logarithm of firm <i>i</i> 's revenue, measured at the end of fiscal quarter <i>t</i> .
<i>ROE<sub>t</sub></i>	Return on equity, defined as firm <i>i</i> 's net income before depreciation divided by book value of equity, measured at the end of fiscal quarter <i>t</i> .
<i>SalesGrowth<sub>t</sub></i>	Sales growth, defined as the firm <i>i</i> 's sales measured at the end of fiscal quarter <i>t</i> , minus the sales measured at the end of fiscal quarter <i>t-1</i> , divided by the sales measured at the end of fiscal quarter <i>t-1</i> .
<i>EarningsGrowth<sub>t</sub></i>	Earnings growth, defined as the firm <i>i</i> 's net income measured at the end of fiscal quarter <i>t</i> , minus the net income measured at the end of fiscal quarter <i>t-1</i> , divided by the net income measured at the end of fiscal quarter <i>t-1</i> .

**Measures of earnings management**

<i>AEM<sub>t</sub></i>	Dechow et.al(1995) measure of discretionary accruals, constructed as the residual of the following model estimated for each industry and year-quarter: $TA_{it}/AT_{it-1} = \beta_0 + \beta_1(1/AT_{it-1}) + \beta_2 (\Delta REV_{it} - \Delta REC_{it}) / AT_{it-1} + \beta_3 PPE_{it}/AT_{it-1} + \varepsilon_{it}$ , where $TA_{it}$ is net income minus cash flows from operating activities for firm <i>i</i> in quarter <i>t</i> , scaled by lagged total assets $AT_{it-1}$ ; $\Delta REV_{it} - \Delta REC_{it}$ is the change in sales minus the change in accounts receivable; $PPE_{it}$ is property, plant, and equipment.
<i>REM<sub>t</sub></i>	Roychowdhury(2006) measure of real earnings management, defined as the residual of the cost of production model minus the residual of the operational cash flow model and the residual of the discretionary cost model, scaled by lagged total assets for firm <i>i</i> in quarter <i>t</i> .
<i>AB_CFO<sub>t</sub></i>	Roychowdhury(2006) measure of abnormal cash flow of operating activities, constructed as the residual of the following model estimated for each industry and year-quarter: $CFO_{it}/AT_{it-1} = \beta_0 + \beta_1(1/AT_{it-1}) + \beta_2 (S_{it} / AT_{it-1}) + \beta_3 (\Delta S_{it} / AT_{it-1}) + \varepsilon_{it}$ , where $CFO_{it}$ is cash flow from operating activities for firm <i>i</i> in quarter <i>t</i> , scaled by lagged total assets $AT_{it-1}$ ; $S_{it}$ is operating revenue; $\Delta S_{it}$ is the change in operating revenue.
<i>AB_PROD<sub>t</sub></i>	Roychowdhury(2006) measure of abnormal cost of production, constructed as the residual of the following model estimated for each industry and year-quarter: $PROD_{it}/AT_{it-1} = \beta_0 + \beta_1(1/AT_{it-1}) + \beta_2 (S_{it} / AT_{it-1}) + \beta_3 (\Delta S_{it} / AT_{it-1}) + \beta_4 (\Delta S_{it-1} / AT_{it-1}) + \varepsilon_{it}$ , where $PROD_{it}$ is the sum of the cost of goods sold and the increase in inventory for firm <i>i</i> in quarter <i>t</i> , scaled by lagged total assets $AT_{it-1}$ ; $S_{it}$ is operating revenue; $\Delta S_{it}$ is the change in operating revenue; $\Delta S_{it-1}$ is the lagged change in operating revenue.
<i>AB_DISEXP<sub>t</sub></i>	Roychowdhury(2006) measure of abnormal discretionary charges, constructed as the residual of the following model estimated for each industry and year-quarter: $DISEXP_{it}/AT_{it-1} = \beta_0 + \beta_1(1/AT_{it-1}) + \beta_2 (S_{it-1} / AT_{it-1}) + \varepsilon_{it}$ , where $DISEXP_{it}$ is the sum of sales expenses and administrative expenses for firm <i>i</i> in quarter <i>t</i> , scaled by lagged total assets $AT_{it-1}$ ; $S_{it-1}$ is lagged operating revenue.

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**Measures of analyst coverage**

$Ln(ReportNumber)_t$  Number of analyst reports, defined as the natural logarithm of one plus total number of analyst reports issued for firm  $i$  in fiscal quarter  $t$ .

$Ln(AnalystNumber)_t$  Analyst coverage, defined as the natural logarithm of one plus the number of analysts issuing earnings forecasts for firm  $i$  in fiscal quarter  $t$ .

**Measures of control variables**

$Age_t$  Firm age, defined as one plus the natural logarithm of the difference between fiscal year  $t$  and firm  $i$ 's IPO year.

$Size_t$  Firm size, defined as the natural logarithm of firm  $i$ 's book value of total assets, measured at the end of fiscal quarter  $t$ .

$Leverage_t$  Leverage ratio, defined as firm  $i$ 's book value of debt divided by book value of total assets, measured at the end of fiscal quarter  $t$ .

$MB_t$  Market-to-book ratio, calculated as firm  $i$ 's [market value of equity plus book value of assets minus book value of equity minus balance sheet deferred taxes (set to 0 if missing)] divided by book value of assets at the end of fiscal quarter  $t$ .

$ROA_t$  Return on assets, defined as firm  $i$ 's net income before depreciation divided by book value of total assets, measured at the end of fiscal quarter  $t$ .

$CashHolding_t$  Cash holding, defined as firm  $i$ 's cash divided by book value of total assets, measured at the end of fiscal quarter  $t$ .

$SOE$  A dummy variable that equals one if firm  $i$  is government controlled or owned, and zero otherwise. State ownership includes central and provincial government ownership.

$BoardSize_t$  Board size, defined as the number of directors on firm  $i$ 's board in fiscal year  $t$ .

$InstOwnership_t$  Institutional ownership, defined as the percentage of outstanding shares held by institutional investors of firm  $i$  in fiscal quarter  $t$ .

$Loss_t$  A dummy variable that equals one if firm  $i$ 's net profit is less than zero in fiscal quarter  $t$ , and zero otherwise.

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