The value of academics: Evidence from academic independent director resignations in China[1]

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Abstract: In this paper, we use academic independent director resignations induced by the introduction of the Regulation 11 prohibiting academics from holding positions in Chinese public companies to examine their contribution to firm value. We document a negative market reaction to the issuance of the Regulation 11 and to the academic director resignations. The negative market reaction to academic director resignations is sizeable, hold with respect to a matched sample of non-academic director resignations and in a multivariate regression setting further controlling for the influence of firm and board characteristics. We next use heterogeneity in the market response to academic director resignations to study what the market values in academic directors. We find supportive evidence of monitoring, advising, and networking value contributions. Finally, we examine the long-term consequences of academic resignations on firm value. We document a decrease in firm profitability in the two years following the resignations. We find convergent results when we examine the long-term returns of firms experiencing the loss of at least one academic director. Overall, our results are consistent with a positive contribution of academic independent directors to firm value.

JEL: G30, G34, G38

Key words: independent directors, academics, professors, board, value, firm performance, China

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1. Introduction

An important stream of the finance literature studies how heterogeneity among outside directors affects the efficacy of board of directors and ultimately firm performance (e.g., Fich and Shivdasani 2006; Anderson et al. 2011; Duchin et al. 2010; Estélyi and Nisar 2016; Frijns et al. 2016; Adams et al. 2018; Bernile et al. 2018).

Among the pool of outside directors, an important category is academics. In the U.S., for instance, about one third of outside directors consists of academics. Academics stand out for several reasons. Academics are trained to be independent and critical thinkers with their own opinions and judgements (Jiang and Murphy 2007). Because they are less likely to be influenced by others, they could be better monitors of management decisions. As independent experts in their area of expertise, academic directors may also facilitate board access to external knowledge and bring new perspectives in the boardroom (e.g., Forbes and Milliken 1999; Audretsch and Lehmann 2006). As a result, they could be valuable advisors too. Finally, academics bring their scientific network and social connections to the boardroom, which may facilitate the recruitment of qualified directors as well as talented graduates, and give access to university resources (e.g., Lynall et al. 2003; Trautman 2012; Chahine and Goergen 2013). While academics may add value to the boardroom, it is an open question whether they add more value than other types of independent directors. Relative to other independent directors, academics may not have sufficient professional expertise and not have enough exposure to real-word business decisions. They are also more likely to be captured by the additional income they derive from directorships (Francis et al. 2015).

Whether academic independent directors contribute positively to firm value is thus an empirical question, which has received little attention so far. Fich (2005) provides evidence that stock

markets do not necessarily react to the academic backgrounds of director appointees. In a more recent study, Francis et al. (2015) find that companies with directors from academia are positively associated with firm and investment performance and with a more efficient CEO monitoring. In a related study, White et al. (2014) document that the market reaction to the appointment of academic directors varies from positive to negative depending on director and firm characteristics. Finally, Fedaseyeu et al. (2018) find that academic experience is not related to total compensation per directorship, which suggests that firms do not value specifically more the academic directors. This body of empirical evidence so far has been rather mixed and yields contradictory conclusions on the value of academic directors.

A major empirical challenge faced by researchers when assessing the contribution of academic directors to firm value is that directorships are endogenously determined (e.g., Hermalin and Weisbach 2003; Raheja 2005; Harris and Raviv 2006; Wintoki et al. 2012). For instance, some companies might be more likely than others to appoint outside academic directors because of specific needs for expertise, social connections, networks, or reputation (White et al. 2014). Likewise, prior literature shows that an important portion of directors resign from firms with weak boards and financial performance and they leave while publicly criticizing the firm (Dewally and Peck 2010). As a result, in normal times, academic appointments (resignations) cannot be deemed to be exogenous to firms' profiles and performance. The market reaction such appointments elicit is thus unlikely to be informative of the actual contribution of academic directors to firm value[2]. To assess the value of academic directors, one would ideally need to use variations in the number of academic directors in a firm's boardroom that are

[2] The assessment of the effect of academic directors on a firm's policies and performance is subject to the same caveat.

exogenous to the firm's characteristics. In this paper, we do so by taking advantage of a quasi-natural experiment of academic independent director resignations in China.

We utilize the Regulation 11, issued by the Chinese Ministry of Education, on the 3rd of November 2015, that prohibits university employees from holding director positions in Chinese public companies. To that extent, we collect information on the resignations of 2,617 independent directors from Chinese public companies over the 2013-2017 period. In the six months following the issuance of the Regulation 11, 330 academics resigned, which represents 60% of the resignations of independent directors over this period versus 34% over the 2013/1-2015/10 period. The number of academic resignations is sensibly the same (324), if we exclude resignations that cannot be attributed to the Regulation 11 (e.g., health and family issues).

To test whether academic independent directors contribute to firm value, we examine how the market reacts to the resignations of academic directors in the six months following the issuance of the Regulation 11 that can arguably be attributed to the Regulation. Consistent with a positive market valuation of the role of academics in the boardroom that has been documented by some studies, we find an average negative market reaction to academic director resignations of about -0.77%. This market reaction is significant and sizeable relative to the average unconditional market reaction to independent director resignations of -0.10% over our sample period. When we compare the market reaction to academic director resignations induced by the Regulation 11 to the market reaction to contemporaneous resignations by non-academic directors comparable in experience, gender, and age, and belonging to firms operating in the same industry, we still document a significant negative difference. Furthermore, in a multivariate regression setting, where we further control for the influence of board and firm

characteristics, we also find that academic director resignations induced by the issuance of the Regulation 11 are associated with a strong negative market reaction.

When we consider the overall market reaction to the issuance of the Regulation 11 itself, we observe that it is negative. Interestingly, this market reaction does not depend on whether a firm will actually lose an academic director in the six months following the issuance of the Regulation 11. This suggests that the market cannot precisely foresee which academic directors are going to resign and when[3]. It thus leaves room for a market reaction at the time of the actual resignation, which we document in this paper. Taken together, our results indicate a negative market response to plausibly exogenous academic independent director resignations, which is consistent with a positive contribution of academics directors to firm value.

To further examine what the market values in academic directors, we consider the heterogeneity in the market response to academic director resignations due to differences among directors, boards, and firms' characteristics. We use prior literature to guide our choice of potential heterogeneity sources (e.g., Dewally and Peck 2010; Adams and Ferreira 2009; Anderson et al. 2011; White et al. 2014; e.g., Francis et al. 2015).

We first document evidence of a positive market valuation of a monitoring contribution of some academics. We find that resignation by *pure academics*, i.e., academics having as unique employer their university and as unique profession academics, elicit a stronger market reaction.

[3] The Regulation 11 is a clarification of the Rule 18 issued by the Communist Party of China on October, 19, 2013, which is part of an anti-corruption campaign, and prohibits government officials above a certain rank from holding positions in public firms (Hope et al. 2017). As we show in the paper, while the Regulation 11 aimed to ensure that officials above a certain rank (8), who are working in institutions monitored by the Ministry of Education, cannot hold a directorship in a Chinese public company, it triggered a sizeable number of resignations of academic directors, who are not holding any meaningful administrative position (rank<8) or no administrative position at all. We do not document a significant difference in the market reaction to the resignations of academics with and without administrative positions, which alleviates the concern that our results could be mostly driven by official-like academic resignations.

Arguably, *pure academics* should be less exposed to conflict of interests, and the stronger market reaction can be interpreted as the market valuing the specific monitoring contribution of this type of academics (White et al. 2014). We also document a stronger market reaction to academic resignations when the board size is bigger, the percentage of independent board member is lower and when the CEO also holds the position of the chairman of the board. These findings are consistent with a positive market valuation of the monitoring role of academics in settings where it is much needed, that is when CEO power is stronger, boardroom coordination is harder, and the monitoring of the remaining directors is weaker (e.g., Jensen 1993; Cotter et al. 1997; Eisenberg et al. 1998; Cheng 2008; Nguyen and Nielsen 2010; Baldenius et al. 2014). We also find that academic resignations elicit stronger market reactions in firms with relatively high free cash flows and high growth opportunities, consistent with the market reacting to a loss of a valuable source of monitoring in firms where it could have a material impact on firm value (Jensen 1986).

Second, we document mixed evidence of a positive market valuation of the advising contribution of some academics. We do not find a much stronger market reaction for larger and more complex firms or for firms intensive in R&D, although for these firms outside expertise should be more valuable (e.g., Boone et al. 2007; Coles et al. 2008; Linck et al. 2008; White et al. 2014). Moreover, we do not document a stronger market reaction to the resignations of academics holding a business degree, a law degree, an engineering degree, or a PhD degree[4]. Possibly, in the Chinse context, academics could have an advising contribution that slightly differs from the one expected for the U.S. market. We do find, however, a markedly stronger market reaction to the resignations of academics, who graduated from foreign universities. This

[4] We also do not find significant differences in the market reaction to academic director resignation when we look at the intersection of firms with a greater need for outside expertise and resignations of academic directors more likely to bring such an expertise. Due to sample constraints, in our empirical analysis, we concentrate on one-dimensional partitions of our sample of academic independent director resignations.

finding is consistent with an advising contribution of these academics. Prior literature shows that directors with foreign experience transmit knowledge about management practices and corporate governance to firms, which in turn influences their performance and foreign investments (e.g., Masulis et al. 2012; Giannetti et al. 2015).

Third, we document mixed evidence on the positive market valuation of the networking contribution of academic directors. Within the group of academics with administrative positions, we find a much stronger market reaction to the resignations of academics occupying top administrative positions such as national and provincial leadership ones. This results is consistent with a positive valuation of the political connections attached to high administrative positions, which can grant firms some advantages such as preferential lending, government bailout, legal protection, or government contract (e.g., Faccio 2006; Li et al. 2008; Goldman et al. 2009; Wu et al. 2012; Goldman et al. 2013; Cull et al. 2015; Wang 2015; Fan 2016). When we look at the group of academics directors occupying top university administrative positions (university president to faculty deputy-dean), we do not find a stronger market reaction relative to the other academic directors. This result suggests that, in the Chinese context, the market does not seem to value the loss of the academic network that could facilitate hiring of talented graduates or accessing university resources (e.g., Lynall et al. 2003).

Consistent with some contributions of academics directors to the monitoring, advising, and networking roles of the board, we expect to find a tangible negative effect of the exogenous resignation of academic directors on firm performance over time. We first use a difference-in-differences regression setting to examine the effect of the loss of one or more academic independent directors on firm performance. We document a significant decrease in profitability (ROA) of about 1% over the two years following the resignations for firms losing at least one

academic director with respect to firms losing at least one non-academic independent director in the aftermath of the Regulation 11.

We complement this analysis by examining the long-term returns of a portfolio consisting of firms which experience the resignation of one or more academic directors induced by the issuance of the Regulation 11. As argued by Edmans (2011), long-term returns suffer fewer reverse causality issues than profits and are more directly linked to shareholder value, capturing all the channels through which losing an academic directors may harm shareholders value. Although we document a negative market response to academic director resignations at the time of the issuance of the Regulation 11 and to the actual resignations, this does not preclude that the market, in the short-term, fail to fully incorporate the value the firm has lost because of the resignations. As for other intangibles, we suspect that a decrease in board monitoring, advising or networking ability takes time to materialize in tangible outcomes that push the market to revise its expectations. We thus expect to find, on average, significant negative returns for our portfolio when we consider a longer horizon. We provide the market with ample opportunity to react to the resignations by building the portfolio at the end of the six-month period following the issuance of the Regulation 11. We document an average value-weighted monthly return markedly lower than the market return (-1.45% monthly) over the 18 months following the portfolio formation. Controlling for standard return factors, we further document a significant alpha of 1.10% (0.48%) in excess of the CAPM model (Carhart four-factor model). As discussed by (Edmans 2011), these results can be interpreted both as an evidence of the contribution of academic directors to firm value and as an evidence of the market mispricing their contribution in the short-term.

Our paper makes several contributions to the literature. First, it adds to the literature on board heterogeneity arguing that some directors are better than others at fulfilling their role. We show that next to other types of outside directors, such as women directors (e.g., Adams and Ferreira 2009; Farrell and Hersch 2005), former CEO directors (e.g., Fahlenbrach et al. 2011), experts (e.g., Minton et al. 2014), foreign directors (e.g., Masulis et al. 2012), or executive of financial institutions (e.g., Booth and Deli 1999), academic directors bring some value to the boardroom. Using a setting where academics resignations are plausibly exogenous to firm characteristics, we expand previous evidence on the contribution of academic directors to firm value (e.g., Fich 2005; White et al. 2014; e.g., Francis et al. 2015; Fedaseyeu et al. 2018).

Second, we complement the body of research on corporate governance in China[5]. Liu and Lu (2007) and Lo et al. (2010) examine the relation between earnings management and corporate governance in China. Chen et al. (2006) study whether boardroom characteristics have an effect on corporate financial fraud in China. Liu et al. (2014) examine the effect of board gender diversity on firm performance for Chinese listed firms. Liu et al. (2015) provide the first comprehensive and robust evidence on the relationship between board independence and firm performance in China. Giannetti et al. (2015) study the impact of directors with foreign experience on firm performance in China. McGuinness et al. (2017) assess the influence of board gender on the CSR performance of Chinese listed companies. We contribute to this growing body of knowledge by examining whether academic independent directors add value to the boardroom in the Chinese context and by providing supportive evidence that they do.

While our findings suggest that academic independent directors represent valuable assets to improve the corporate governance of Chinese public companies, our identification strategy

[5] See Jiang and Kim (2015) for a modern overview of corporate governance in China.

relies on an important wave of resignations of these directors commanded by the Communist Party of China. The intended effect of the Rule 18 and of its clarification (Regulation 11) is to prohibit official-like directors to sit on the board of Chinese public companies. As we document in our paper, an unintended effect of the Regulation 11 is the resignations of academic independent directors, who are holding low or no administrative positions at all. A third contribution of our paper is thus to point to a potential detrimental side-effect of the Rule 18, that is the exclusion of a valuable pool of directors from the independent director job market. This highlights a potential limitation of the structuration of the boards of Chinese public companies mostly through regulation. It could result in boards, whose structure may not match the specific needs of companies[6].

Finally, we would like to acknowledge some limitations of our work. First, our findings apply to China. While the Chinese stock markets has experienced important developments over the last decades, they still differ in many aspects to more established stock markets. There are strong institutional specificities of China that invite to be cautious when drawing inferences for other stock markets. More specifically, in our case, there are some discussions with respect to the exact role of independent directors and their influence on firms as many Chinese firms apparently adhere to the minimum prescribed percentage of independent directors, which could be a sign of box-ticking exercise (e.g., Jiang et al. 2017; Jiang and Kim 2015).

The rest of the paper is as follows. Section 2 covers the data sources and the sample construction. Section 3 explains our identification strategy. Section 4 reports and discusses our results. Section 5 concludes.

[6] As discussed by Jiang and Kim (2015), board structure in China appears mostly be the outcome of regulations and not based on firm-specific characteristics.

2. Data sources and sample construction

2.1 Data sources

We collect accounting and financial data for Chinese public companies from DataStream, board and director data from the Wind database, independent director resignation announcement dates from the Shanghai Stock Exchange (SSE) and Shenzhen Stock Exchange (SZSE)'s websites, and data on the ranking of Chinese Universities from the XDF's and Academic Ranking of World Universities' (AWRU)'s websites.

2.2 Sample construction

Our starting point is the whole universe of independent director resignations from Chinese public companies with A-shares listed either on the Shanghai Stock Exchange or/and on the Shenzhen Stock Exchange over the 2013-2017 period. We manually collect the official announcement dates of the resignations on the stock exchanges' websites. We then restrict our sample to resignations for which we are able to collect relevant data on board, and director control variables. This procedure leaves us with a sample of 2,617 independent director resignations (2,114 unique directors) from 1,591 unique firms over the 2013-2017 period. We classify a director as *academic* if at least one of her professions, as listed in the Wind database, is an academic profession (e.g., lecturer, senior lecturer, assistant professor, professor).

[Insert Figure 1 about here]

As shown by Figure 1, independent director resignations over our sample period are clustered around two periods that correspond to the aftermath of the Rule 18 (issued on the 19/01/2013) and of its clarification, the Regulation 11 (issued on the 3/11/2015). In the next section, we

discuss our identification strategy of plausibly exogenous resignations of academic independent directors utilizing the issuance of the Regulation 11.

3. Identification strategy

To assess the value academic independent directors bring to the boardroom, we use resignations of academic independents directors plausibly exogenous to firm characteristics. We utilize the Regulation 11, issued by the Chinese Ministry of Education, on the 3rd of November 2015, which prohibits academics from holding director positions in Chinese public companies and triggered an important wave of academic director resignations.

The Regulation 11 is a clarification of the Rule 18 issued by the Communist Party of China on October, 19, 2013, which is part of an anti-corruption campaign, and prohibits government officials above a certain rank from holding positions in public firms (Hope et al. 2017). The Regulation 11 extends this prohibition specifically to university employees. It primarily targets staff members, who have a rank comparable to government officials (rank >= 8, see Appendix C).

A first potential concern with our identification strategy is that the effect of official and academic resignations could be overlapping, which would limit the inference on the value of academic directors based on market reaction to designation over a specific time period. As shown in Figures 2 and 3, when we split independent director resignations into non-academic and academic director resignations, we observe that the bulk of the non-academic resignations is concentrated in the aftermath of the Rule 18, while the bulk of the academic resignations is concentrated in the aftermath of the Regulation 11. As shown in Figure 3, academics who happen to also be government officials have already resigned in the aftermath of the Rule 18, which explained the marked increase in the number of academic resignations in the last quarter

of 2014. These observations partially alleviate the concern of an overlapping effect of official and academic resignations. In addition, as shown in Figure 3, the Regulation 11 specifically triggered an important wave of academic resignations. In the six months following the issuance of the Regulation 11 (2015/11 to 2016/4), 330 academics resigned, which represents 60% of the resignations of independent directors over this period versus 34% over the 2013/1-2015/10 period. In the following period (2016/5 to 2017/12) this percentage goes back to 35%, highlighting the specificity of the high number of academic director resignations occurring in the 6 months following the issuance of the Regulation 11. Table 1 reports the exact number of academic and non-academic resignations by month. It can be seen that the number of academic resignations culminates at 197, in December 2015, in the month following the issuance of the Regulation 11, while there was only 11 academic resignations in October 2015, the month preceding the issuance of the Regulation 11. These observations provide reasonable assurance that the market reactions to the academic director resignation following the issuance of the Regulation 11 are not affected by the cofounding effect of official resignations and can provide a better picture of the value of academic directors.

[Insert Figure 2 & 3 about here]

[Insert Table 1 about here]

A second potential concern with our identification strategy is that, among the group of resigning academic directors, an overwhelming portion of the directors could be official-like academics, since they are the ones primarily targeted by the Regulation 11. Because some academics are not strictly speaking officials of high ranks, they would not have resigned as a consequence of the issuance of the Rule 18 but would have resigned following the Regulation

11 that clarifies that the Rule 18 also applies to academics. If this is the case, the inference we would draw for the value of academics in China would reflect more the contribution of official-like directors than the actual contribution of academics. When we single out academics without administrative positions (see Figure 4), we find that the number of resignations of such academics skyrockets after the issuance of the Regulation 11 and that is represents a large number of academics resignations in the aftermath of the Regulation 11 (74%). These observations alleviate the concern that our inferences on the value of academics based on the academic resignation following the issuance of the Regulation 11 could be primarily driven by official-like academic resignations. Yet, in our analysis, we will take advantage of this source of heterogeneity in the pool of academic director resignations (*official-like* versus *pure academics*) to investigate the different contributions of academics that the market could value (i.e., networking versus advising/monitoring).

[Insert Figure 4 about here]

Finally, another potential concern is that some of the academic directors resigning over the 2015/11-2017/12 period may resign for reasons not related to the Regulation 11. To alleviate this concern, we restrict our sample of academic resignations to the ones plausibly caused by the Regulation 11. To that extent, we concentrate on the academic resignations occurring in the six months following the issuance of the Regulation 11[7] and for which the explicit reason of the resignation mentioned on the stock exchange's website is not a health or family issue[8]. We

[7] As we show, this six-month period corresponds to the abnormal surge in the number of academic director resignations post Regulation 11.

[8] Within the 324 academics resignations in the six months following the issuance of Regulation 11 not due to health of family issues, for 234 of them the reason of the resignation mentioned on the stock exchange's website explicitly refers to the Regulation 11 (or to the Rule 18). However, for the 90 remaining academic director resignations, the reason mentioned is "personal reason" or "personal job reason", which are to be interpreted as resignations also caused by the issuance of the Regulation 11 according to Chinese insiders (see for instance http://www.xinhuanet.com/fortune/2015-11/28/c_128476697.htm). In our empirical analysis, we show that our

can identify, over the period 2015/11-2017/11, a sample of 324 academic resignations most likely caused by the Regulation 11. In our core analysis, we use this sample of resignations to draw inferences on the value of academic directors and on their contributions to the boardroom. For robustness, we also use an even narrower set of 234 academic resignations for which the official reasons stated on the stock exchange's website is explicitly the Regulation 11 (Rule 18).

4. Empirical Analysis

4.1. Descriptive statistics

Throughout our empirical analysis, we use a full sample of 2,617 resignations of independent directors over the period 2013-2017 and concentrate more specifically on the academic resignations following the issuance of the Regulation 11 over the period 2015/11 – 2016/04.

Panel A of Table 2 reports descriptive statistics on director, board, and firm characteristics for our sample of independent director resignations. Appendix A provides the variable definitions. Over the sample period, 40% of the resigning directors are academics. Academics, who have as unique profession academic and, as unique employer, a university, represent a much smaller cohort, i.e., 10% of the resigning directors. The average director in our sample is a male (90%), who is 55 years old and have been sitting on a board for more than three years. Half of the resigning academic directors have an administrative position. 40% of the resigning academic directors hold a PhD degree, which largely overlaps with the proportion of academics. 60% of the resigning independent directors majored in business, 10% in law, and 10% in engineering. The median board of firms with resigning directors consist of 10 members and has a proportion of independent directors of 40%. For less than one-third of the boards, the firm CEO is also the

conclusions remain qualitatively unchanged if we narrow down the list of academic resignations to the ones for which the official reason explicitly refers to the Regulation 11 (Rule 18).

chairman of the board. The median firm directors has a total asset of 3.20 billion Yuan, a leverage of 20%, a cash to total asset ratio of 15%, a return on asset of 3%, an equity market-to-book of 1.80, a CAPM beta of 1 and a volatility of the monthly returns of 10%. Finally, the average market reaction to an independent director resignation in our sample is -0.10%. These reported values are in line with prior studies on directors and boards in China (e.g., Lo et al. 2010; Liu et al. 2014; Liu et al. 2015; Giannetti et al. 2015; McGuinness et al. 2017).

[Insert Table 2 about here]

Panel B of Table 2 reports descriptive statistics on director attributes for the group of resigning academic directors and the group of resigning non-academic directors. We observe a series of significant differences between academic and non-academic resigning independent directors. We further notice that academic directors are significantly younger (about one year) and much more likely to hold a PhD degree (10% vs 74%). They are also more likely to have majored in business and less likely to have majored in engineering. Moreover, academic directors are more likely to hold an administrative position, and within the pool of directors with administrative positions, they tend to hold administrative positions of relatively higher ranks. This finding points to a potential concern, as already discussed, that some academics can be considered as official-like directors.

Panel C of Table 2 shows the distribution of the administrative position ranks among the group of academic director resignations. Appendix C provides the Wind definitions of each rank.12% of these academics hold a national leadership position and 24% hold a provincial position. For the rank 5 to 10, university administrative positons are matched to equivalent official positions in terms of benefits (salary and other treatment). 20% of them have an administrative position

equivalent to a Bureau-level leadership position (university president), 20% have an administrative position equivalent to a county-level leadership positions (faculty dean), and 20% have an administrative position equivalent to a deputy county-level leadership position (faculty deputy dean). Later in our analysis, we will take advantage of the variation in the university administrative positions of the resigning academics to examine whether the market value the access to university resources that some academics may facilitate.

In the next subsection, we examine the market reaction to the academic independent director resignations.

4.2. Market reaction to academic director resignations

To study the market reaction to director resignations, we follow previous and consider the cumulated abnormal returns in the three days surrounding the resignation event, whereby we define abnormal returns as daily returns in excess of a Carhart four-factor model. To build the market factor, we use CSI 300 (Chinese Securities Index 300) to proxy for the market return of China A-share stocks and calculate the market factor as the CSI 300 return over the risk-free rate, measured by Chinese 3-month deposit rate. We follow Fama and French (1993) to compute the SMB and HML factors and Carhart (1997) to compute the MOM factor. For each resignation, we estimate the parameters of the four-factor model over an estimation window of [-255, -46] days, then we use the coefficient estimates to compute the expected daily returns from day -1 to day 1, using the daily factor values. The cumulated abnormal returns are the sum of the returns in excess of the prediction of the four-factor model over the [-1, 1] window surrounding the resignation event and constituted our measure of market reaction. For robustness purposes, we also compute the market reaction over alternative event windows.

Panel A of Table 3 reports the market reaction for the whole sample of independent director resignations, academic versus non-academic director resignations, and the group of plausibly exogenous academic resignations. It shows the average market reaction, as measured by the mean cumulated abnormal return over the resignation event is not significantly negative for the whole sample of resignations and for the sample of non-academic resignations. However, academic resignations elicit on average a significantly negative market reaction (-0.34%) over the period 2013-2017. These resignations cannot be considered as exogenous to the performance and valuation of the firms whose directors are quitting (e.g., Hermalin and Weisbach 2003; Raheja 2005; Harris and Raviv 2006; Wintoki et al. 2012). Thus, it limits the inferences we can draw for the value of academics. We document a significantly negative market reactions to plausibly exogenous academic resignation induced by the Regulation 11 (-0.77%). This market reaction is twice the size of the one we document for the whole sample of academic resignations and can be used to draw inference on the market valuation of academic directors.

This first finding is consistent with a positive valuation by the market of the role of academic directors in the boardroom. For robustness purposes, we also compute the average market reaction to academic resignations induced by the Regulation 11 for which the reason mentioned for the resignation is explicitly the Regulation 11(Rule18). We document a market reaction of a similar magnitude (-0.81%). In both cases, the market reaction is very sizeable compared to the unconditional average market reaction of -0.11% to independent director resignations (non-academic director resignations).

[Insert Table 3 about here]

In Panel B of Table 3, we show that our finding is robust to the use of alternative resignation event window to compute the market reaction to academic director resignations induced by the Regulation 11. In particular, in Panel C of Table 3, we report the average market reaction to academic director resignations induced by the Regulation 11 for a subsample of unique directors. That is we only consider the first resignation per director in the six months following the issuance of the Regulation 11. We do so to ensure that the market reaction we document is overly driven by specific directors. We document an average market reaction of a slightly lower magnitude that is however still significantly negative and sizeable (-0.59%), which alleviates the concern of director-specific market reactions. In Panel D of Table 3, we report the average market reaction to academic director resignations induced by the Regulation 11 for a subsample of unique firms. That is, we only consider the first resignation per firm in the six months following the issuance of the Regulation 11. We do so to control for the influence of firm-specific market responses. We document an average market reaction that is slightly stronger than in our core specification (-0.96%). Based on these series of robustness checks, we feel confident in asserting that director resignations induced by the Regulation 11 is associated with important negative market reactions.

We next compare the market reaction to academic director resignations induced by the Regulation 11 to the market reaction to contemporaneous resignations of non-academic directors with comparable years of experience, gender, and age, and belonging to firms operating in the same industry. Our examination of the descriptive statistics indicate that academics are significantly younger than non-academics. Moreover, prior literature documents variations in board member contribution to firm performance based on gender and tenure (e.g., Vafeas 2003; Adams and Ferreira 2009; Ahern and Dittmar 2012; Huang and Hilary 2013; Liu et al. 2014). We want to ensure that our findings cannot be explained way by these specific

observable director attributes. Following Rosenbaum and Rubin (1983), we use a probit model to calculate propensity scores, and to find optimal matches, we use the nearest neighborhood matching technic. All matchings are conducted with replacement. As suggested by Smith and Todd (2005), in order to ensure the quality of the matching, we drop 2% of observations for which the propensity score density of the matched observations is the lowest. As reported in Appendix B, the sample of academic director resignations and the matched sample of non-academic director resignations are comparable in terms of director gender, age, and tenure. We find a match for 78 of the plausibly exogenous academic director resignations induced by the Regulation 11. Panel E of Table 3 reports the difference in the market reaction between both samples of resignations. Results indicate that market reaction is much more negative for the academic director resignations with respect to a matched sample of directors sharing comparable director characteristic. The difference is statistically significant and sizeable (-0.68%). These difference is specific to the sample of academic resignation plausibly exogenous to firms because we do not document any difference in the market reaction to academic and non-academic director resignation over the full 2013-2017 period. This diverging results between the full sample of academic-resignations and the ones consisting of the plausibly exogenous ones yield different inferences regarding the value of academics, which highlights the importance of using an identification strategy that minimizes endogeneity issues. The strongest market reaction we document supports the idea that academic independent directors bring a specific set of contributions to the boardroom that is relatively more valuable than otherwise comparable non-academic independent directors.

While we control for director characteristics when we use the above matching approach, we do not explicitly control for other board and firm characteristics that could influence the market reaction. We therefore use a multivariate regression setting, where we further control for the

influence of board and firm characteristics. We explain the market reaction by firm (profitability, size, and returns volatility), board (board size, CEO duality, percentage of independent board members), director attributes (age, gender, tenure), and industry and year fixed effects. The two variables of interest are *Academic*, a dummy variable that indicates whether the resigning director is an academic, and *Academic Post R11*, a dummy variable that the resigning director is an academic and that her resignation is induced by the Regulation 11. We run two series of regression using either *Academic* or *Academic Post R11* as our main independent variable. Panel F of Table3 reports the results of the regressions. They show that, in normal times, the academic nature of a director is not associated with a market reaction to resignations that is significantly different from the one for non-academic directors. The results also show that academic resignations induced by the Regulation 11 are associated with a significant and negative market reaction relative to the one for resignations of other directors, after controlling for the influence of firm, board, and directors attributes.

Overall, the findings documented in this section support a negative market reaction of investors to the resignations of academics induced by the issuance of the Regulation 11, which is consistent with a positive valuation of the role of academic directors in the boardroom. Because we document a negative market reaction at the time of the resignation, it implies that the market do not fully anticipate those resignations at the time of the issuance of the Regulation, otherwise it would react at the time of the issuance. To shed more light on the market anticipation, we next investigate how the market reacts to the issuance of the Regulation 11.

4.3. Market reaction to the issuance of the Regulation 11

The Regulation 11 has been issued on the 3rd of November 2015, we examine the market reaction during the three trading days surrounding this event. Panel A of Table 4 reports the

results. It shows a significant and sizeable negative market reaction (-1.70%) that is robust to the use of alternative event windows. This finding is consistent with a positive valuation of academic directors. We also notice that the market does not react significantly to the issuance of the Rule 18 that targets all government officials, which suggests that the market does react more to the academic nature of a resigning director than to its official nature.

We further examine whether the market is reacting more negatively to the issuance of the Regulation 11 for firms that will lose at least one academic director after the issuance Regulation 11 (823 firms) and firms that will lose at least one non-academic directors (727 firms). We do not document any significant difference in the market reaction between the two samples, suggesting that the market reacts negatively to the regulatory change at an aggregate level but cannot foresee which firms will specifically suffer more than others from these resignations. A likely explanation for this finding is that the text of the Regulation 11 is not very precise regarding the scope of the academics which have to resign, giving some room for firms to interpret the text, which has resulted in the resignations of official-like academics but also the resignations of non-official-like academics. While the Regulation 11 aimed to ensure that officials above a certain rank (8), who are working in institutions monitored by the Ministry of Education, cannot hold a directorship in a Chinese public company, as we show in this paper, it triggered a sizeable number of resignations of academic directors, who are not holding any meaningful administrative position (rank<8) or no administrative position at all.

In line with the series of results of the previous section, these results indicate a negative market response to exogenous academic independent director resignations, which is consistent with a positive contribution of academics directors to firm value. To further examine what the market

values in academic directors, next we consider the heterogeneity in the market response to academic director resignations due to differences in director, board, and firm characteristics.

4.4. Heterogeneity in the market reaction to academic director resignations

We study variations in the market response to academic director resignations induced by the Regulation 11 based on differences in director, board, and firm characteristics to identify settings where the monitoring, advising, or networking contributions of academic directors should be particularly valuable to investors. We use prior literature to guide our choice of potential heterogeneity sources (e.g., Dewally and Peck 2010; Adams and Ferreira 2009; Anderson et al. 2011; White et al. 2014; e.g., Francis et al. 2015). Table 5 reports descriptive statistics on the market reaction to academic resignations for different partitioning of our sample according to director, board, or firm attributes, as well as the results of two-sample t-tests of mean equality.

[Insert Table 5 about here]

We first investigate the potential monitoring contribution of academic directors. Among the pool of outside directors, academics may stand out for several reasons. Academics are trained to be independent and critical thinkers with their own opinions and judgements (Jiang and Murphy 2007). Because they are less likely to be influenced by others, they could be better monitors of management decisions. In our sample of resigning academics directors, we expect academics to be less likely to be exposed to conflict of interests, and hence to be better monitors (White et al. 2014). Arguably, within the group of academics, *pure academics*, in the sense that their only profession is academic and their only employer is a university, should be even less likely to be exposed to conflict of interests. As reported in Table 5, the average market reaction

to *pure academic* resignations is significantly stronger than for the rest of the academics (-1.38% versus -0.46%), which is consistent with the market valuing a monitoring contribution of some academic directors.

In addition, we expect the market to value more the monitoring role of academics in settings where it is much needed, that is when CEO power is stronger, boardroom coordination is harder, or the monitoring of the remaining directors is weaker (e.g., Jensen 1993; Cotter et al. 1997; Eisenberg et al. 1998; Cheng 2008; Nguyen and Nielsen 2010; Baldenius et al. 2014). In line with our expectation, we document a significantly stronger market reaction to academic resignations for firms with above-median board size (-1.19% vs. -0.26%), below-median proportion of intendent director (-1.03% vs -0.21%), and for firms where the CEO is also the chairman of the board (-1.18% vs -0.37%).

We also document a stronger market reaction for firms with high growth opportunities and above-median free cash flow, which can be interpreted as the market discounting more heavily the loss of academic directors for firms undertaking new projects or investments and for firms where the CEO has relatively more cash to use at her discretion, which in both cases call for a more efficient monitoring and for firms (Jensen 1986).

The body of evidence we document indicates that the negative market reaction to academic resignations is stronger in settings where their monitoring contribution should be more valuable, which supports a positive market valuation of the monitoring contribution of academic directors.

Second, we examine the potential advising role of academic directors. As independent experts in their area of expertise, academic directors may facilitate board access to external knowledge and bring new perspectives in the boardroom (Forbes and Milliken 1999; Audretsch and Lehmann 2006). As a result, they could be valuable advisors. If this is the case, we expect to

find a stronger market reaction to academic resignations from larger and more complex firms or for firms intensive in R&D, because for these firms outside expertise should be more valuable (e.g., Boone et al. 2007; Coles et al. 2008; Linck et al. 2008; White et al. 2014). As reported in Table 5, however, we do not find supportive evidence. The market reaction from above and below median firms in terms of intangible investment or market capitalization is not significantly different. Furthermore, contrary to prior literature (White et al. 2014), we do not find a stronger market reaction to academic resignations for academics holding business, law, or engineering degrees, neither do we for academics holding PhD degrees[9].

While these findings can be interpreted as the market not valuing the advising contribution of academics to the boardroom, they may allow point to a source of valuable expertise in the Chinese context that differ from the US context. In that direction, we find a markedly stronger market reaction for the resignations of academics, who graduated from foreign universities, which is consistent with an advising contribution of academics based on their knowledge acquired through a foreign academic experience. Prior literature shows that directors with foreign experience transmit knowledge about overseas management practices and corporate governance to firms, which in turn influences their performance and investments (e.g., Masulis et al. 2012; Giannetti et al. 2015).

The evidence we provide on the market reaction to academic resignations in settings where their advising contribution should be more valuable is thus mixed. It does support a positive market valuation of the advising contribution of academic directors who graduated from foreign universities.

[9] We also do not find significant differences in the market reaction to academic director resignation when we look at the intersection of firms with a greater need for outside expertise and resignations of academic directors more likely to bring such an expertise. Due to sample constraints, in our empirical analysis, we concentrate on one-dimensional partitions of academic independent director resignations.

Third, we study the potential networking contribution of academic directors. Academics, as other independent directors, bring their network and social connections to the boardroom, which may facilitate the recruitment of qualified directors as well as talented graduates, and give access to university resources (e.g., Lynall et al. 2003; Trautman 2012; Chahine and Goergen 2013). In particular, official-like academics are likely to contribute more to firm value through their political connections attached to high administrative positions and which can grant firms some advantages such as preferential lending, government bailout, legal protection, or government contract (e.g., Faccio 2006; Li et al. 2008; Goldman et al. 2009; Wu et al. 2012; Goldman et al. 2013; Cull et al. 2015; Wang 2015; Fan 2016). As reported in Table 5, we do not document a significant difference in the mean market reaction to resignations of academics with or without an administrative position. In both cases the market reaction is around -0.75%, which alleviates the concern that official-like academic resignations may drive our results. Yet, within the group of academics with administrative positions, we find a much stronger market reaction to the resignations of academics occupying top administrative positions such as national and provincial leadership ones. This is consistent with a contribution to firm value through the political connections attached to high administrative positions. When we look at the group of academics directors occupying top administrative university positions (university president to faculty deputy-dean), we do not find a stronger market reaction relative to the other academic directors. This finding suggests that the market does not value the loss of the academic network that could facilitate hiring of talented graduates or accessing university resources (e.g., Lynall et al. 2003).

On the whole, the market reaction to academic resignations we document in settings where their networking contribution should be more valuable is mixed. It does support a positive market valuation of the networking contribution of official-like academic directors who are holding high administrative positions.

4.5. Long-term effect of academic director resignations on firm performance

So far, we have documented a negative market reaction to the issuance of the Regulation 11 and to the induced academics resignations. We have also shown that the market reaction is even more negative in settings where the monitoring, advising, and networking contributions of academics should be more valuable. This series of results is consistent with a positive market perception of the influence of academic directors on firm value. Consistently, we expect to observe tangible effects of the academic resignation of firm performance in the years following the resignations. To investigate this issue empirically, we use a difference-in-differences regression setting, where we use return on asset (ROA) as our proxy for firm performance (e.g., Frijns et al. 2016). We examine whether firms losing at least on academic director because of the Regulation 11 experience a decrease in performance in the years following the resignations with respect to firms loosing other types of independent directors. We use this setting to control away for the average impact the resignation of an independent director may have on firm performance.

[Insert Table 6 about here]

Our key variable of interest is *Post * Academic Lost R11*, which takes the value one if a firm experiences the loss of at least one academic director in the six months following the issuance of the Regulation 11 and 0 otherwise. The coefficient on this variable captures the change in firm performance of firms losing at least one academic director as a result of the Regulation 11. The variable *Post* takes the value 1 in the two years following the issuance of the Regulation 11 (2016-2017) and 0 in the two years before the issuance of Regulation 11 (2013-2014). The coefficient on this variable captures the average performance difference between the post and pre Regulation 11 periods. The variable *Academic Lost R11* takes the value 1 if a firm experiences the resignation of at least one academic director in the six months following the

issuance of the Regulation 11 (provided that the resignation is not due to health or family issues), and 0 if the firm experiences the resignation of at least one non-academic independent director over the same period. The coefficient on this variable captures the average performance difference between firms experiencing the resignation of academic directors and firms that experience the resignation of other types of independent directors in the 6 months following the issuance of the Regulation 11. We also add standard firm and board control variables of firm performance (e.g., size, market-to-book, cash-to-asset ratio, leverage, return volatility, board size, proportion of independent board members, CEO duality).

Panel A of Table 6 reports the results of the difference-in-difference regression. It shows that the coefficient on *Post * Academic Lost R11* is significant and negative (-0.869%). It indicates that, in the two years following the issuance of the Regulation 11, the profitability of firms experiencing the resignation of at least one academic director induced by Regulation 11 decreases relative to firms experiencing the resignation of other types of independent directors. The magnitude of the relative decrease is about of about 1%, controlling for standard determinants of firm performance.

4.6. Long-term effect of academic director resignations on firm value

We next examine the long-term returns of a portfolio consisting of firms which experience the resignation of one or more academic directors induced by the issuance of the Regulation 11. As argued by Edmans (2011), long-term returns suffer fewer reverse causality issues than profits and are more directly linked to shareholder value, capturing all the channels through which losing an academic directors may harm shareholders value.

Although we document a negative market response to academic director resignations at the time of the issuance of the Regulation 11 and to the actual resignations, this does not preclude that the market, in the short-term, fail to fully incorporate the impact of these resignations on

firm value. As for other intangibles, we suspect that a decrease in board monitoring, advising or networking ability takes time to materialize in tangible outcomes that push the market to revise its expectations. Thus, it is possible that a portfolio consisting of firms which experience the resignation of one or more academic directors induced by the issuance of the Regulation 11 yield negative returns on average over the long-term.

We built our portfolio as follows. We include all the firms which experience the resignation of at least one academic director in the six months following the issuance of the Regulation 11, provided that the resignation is not due to health or family issues. We give the market ample opportunity to react to the resignations by starting to accrue the portfolio returns at the end of the six-month period following the issuance of the Regulation 11. We do so to ensure that the potential long-term return of the portfolio is not contaminated by the short-term market reaction we document. We then compute the value weighted returns of the portfolio for each month over the [+6 months, + 24 months] period relative to the issuance of the Regulation 11, that is from May 2016 to December 2017, over 18 months.

Panel B of Table 6 reports the mean monthly returns of the portfolio over the period window [+6 months, + 24 months] relative to the issuance of the Regulation 11 over different market models. The mean return adjusted by the market return is -1.45%, which extrapolated over the full period amounts to a negative buy and hold return of -26%. We then assess the portfolio performance in excess of the one predicted by standard market models. To compute the portfolio *alpha* on the CAPM (Carhart four-factor) model, we use run OLS regressions of the portfolio monthly returns on the market factor (market factor plus the SMB, HML and MOM factors). Standard errors are calculated using Newey and West (1987), which allows for the residuals to be heteroskedastic and serially correlated. We document a significant portfolio alpha of 1.10% (0.48%) in excess of the CAPM model (Carhart four-factor model). As

discussed by (Edmans 2011), these results can be interpreted both as an evidence of the contribution of academic directors to firm value and as an evidence of the market mispricing their contribution in the short-term.

5. Conclusion

It is an open question whether academics add value to the boardroom. A key empirical challenge to address this question is to find a setting in which academic resignations (appointments) are plausibly exogenous to the firms under scrutiny. Otherwise, the market reaction to resignations (appointments) is unlikely to be informative about the market perception of the value of academic directors. In this paper, we utilize academic independent director resignations induced by the introduction of the Regulation 11, which prohibits academics from holding positions in Chinese public companies, to examine their contribution to firm value.

Consistent with a positive contribution to firm value, we document a negative market reaction to the issuance of the Regulation 11 and to the academic director resignations. We next use the heterogeneity in the market response to academic director resignations to study what the market values in academic directors. We find supportive evidence of monitoring, advising, and networking value contributions of academics depending on the firm or academic director attributes. Finally, we document some evidence supportive of material long-term consequences of academic resignations on firm profitability, which supports the positive contribution of academic directors. We also show that although the market reacts negatively to academic resignations in the short-term, it does not seem to fully price the negative impact it may have on firm value at the time of the resignation. We document strong negative abnormal long-term returns for a portfolio that is long on firms experiencing at least one academic resignation induced by the Regulation 11. Our paper adds to the literature on board heterogeneity by

showing that academics represent a valuable pool of independent directors. It complements a growing body of research on corporate governance in China and shows a negative side-effect of the structuration of boards of public companies in China mostly through regulation.

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Figure 1. Number of independent director resignations per month over the 2013-2017 period

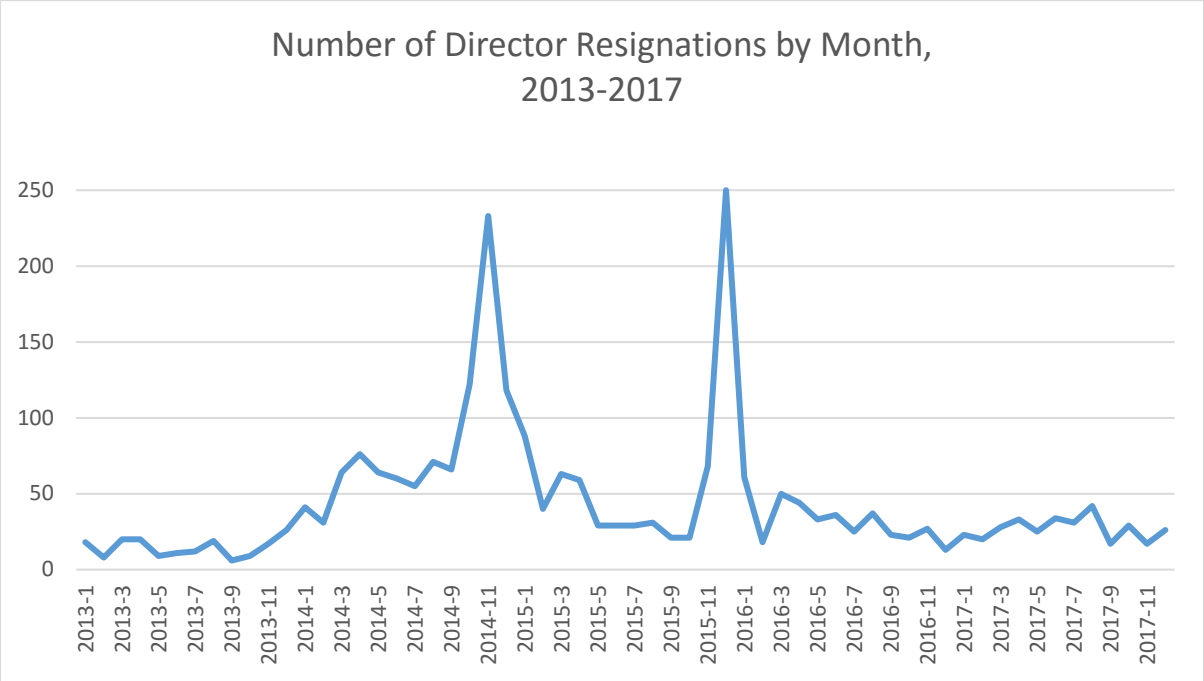

Figure 2. Number of academic independent director resignations per month over the 2013-2017 period

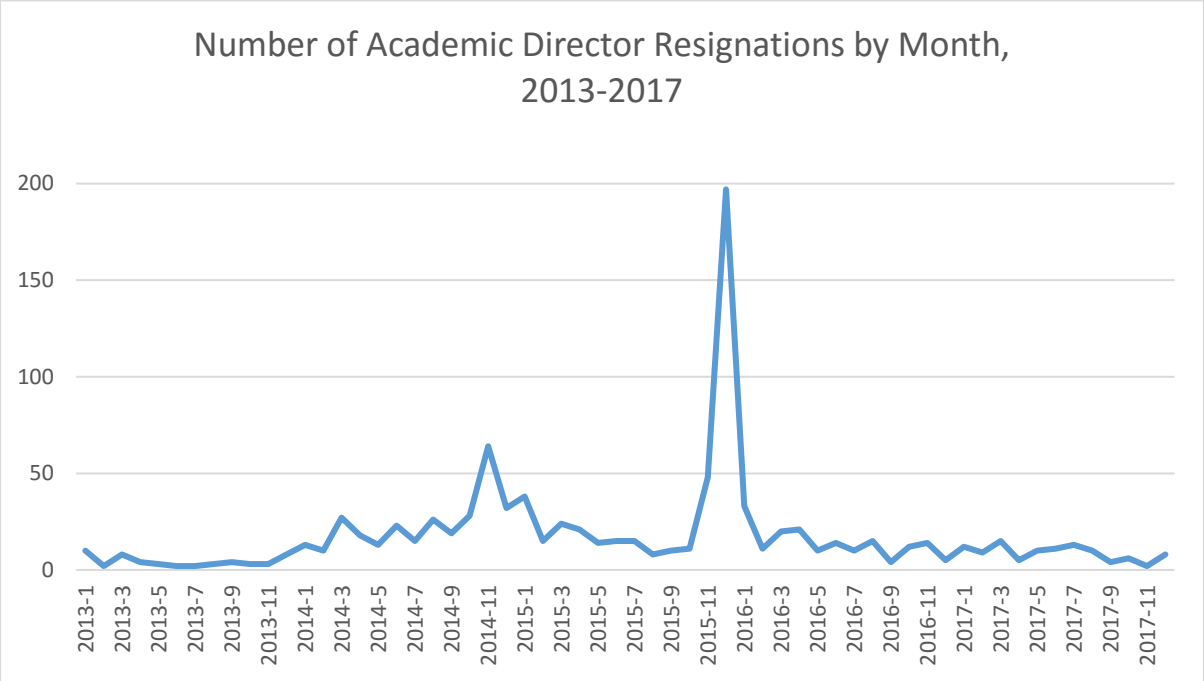

Figure 3. Number of non-academic independent director resignations per month over the 2013-2017 period

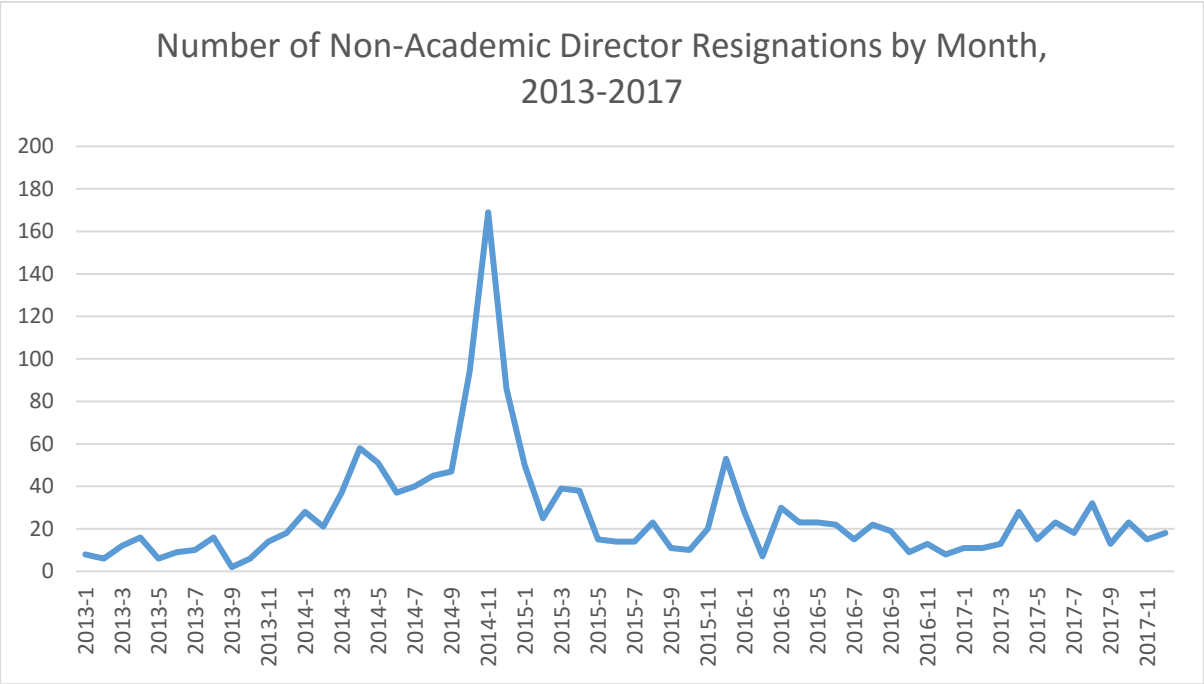

Figure 4. Number of academic independent director resignations per month over the 2013-2017 period, for academic directors without administrative positions

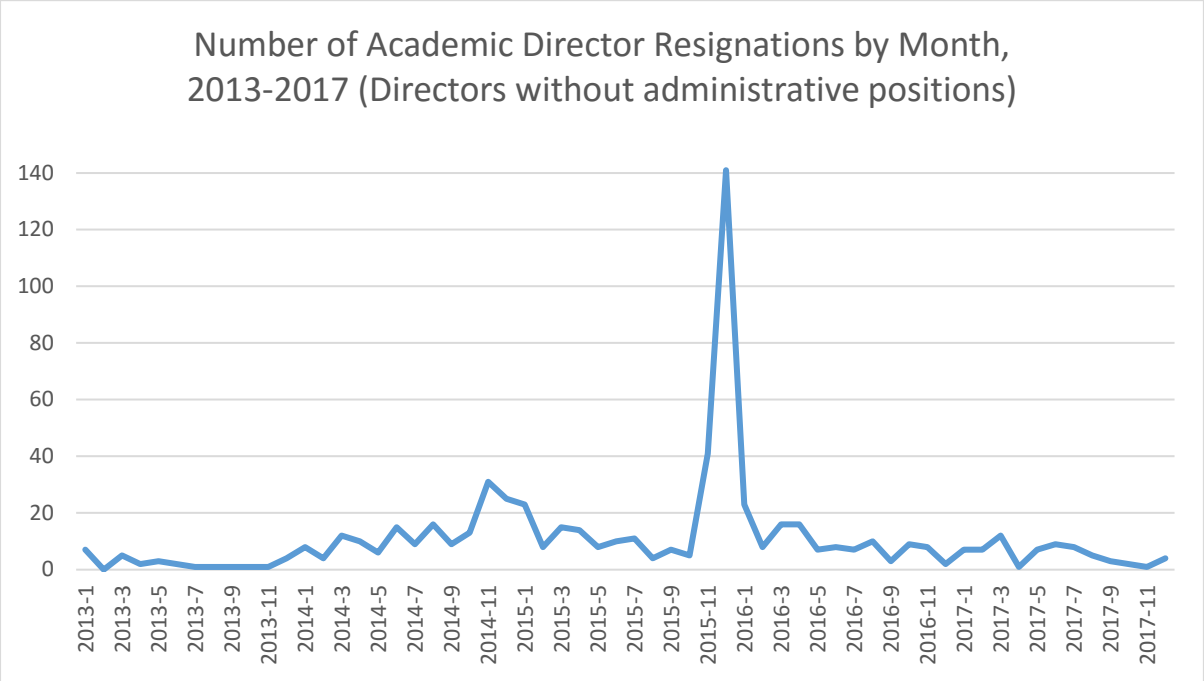

Table 1. Number of independent director resignations per month over the 2013-2017 period

Year-month	Total	Academics	Pct. Academics	Non-Academics	Pct. Non-Academics
2013-1	18	10	56%	8	44%
2013-2	8	2	25%	6	75%
2013-3	20	8	40%	12	60%
2013-4	20	4	20%	16	80%
2013-5	9	3	33%	6	67%
2013-6	11	2	18%	9	82%
2013-7	12	2	17%	10	83%
2013-8	19	3	16%	16	84%
2013-9	6	4	67%	2	33%
2013-10	9	3	33%	6	67%
2013-11	17	3	18%	14	82%
2013-12	26	8	31%	18	69%
2014-1	41	13	32%	28	68%
2014-2	31	10	32%	21	68%
2014-3	64	27	42%	37	58%
2014-4	76	18	24%	58	76%
2014-5	64	13	20%	51	80%
2014-6	60	23	38%	37	62%
2014-7	55	15	27%	40	73%
2014-8	71	26	37%	45	63%
2014-9	66	19	29%	47	71%
2014-10	122	28	23%	94	77%
2014-11	233	64	27%	169	73%
2014-12	118	32	27%	86	73%
2015-1	88	38	43%	50	57%
2015-2	40	15	38%	25	63%
2015-3	63	24	38%	39	62%
2015-4	59	21	36%	38	64%
2015-5	29	14	48%	15	52%
2015-6	29	15	52%	14	48%
2015-7	29	15	52%	14	48%
2015-8	31	8	26%	23	74%
2015-9	21	10	48%	11	52%
2015-10	21	11	52%	10	48%
2015-11	**68**	**48**	**71%**	**20**	**29%**
2015-12	**250**	**197**	**79%**	**53**	**21%**
2016-1	**61**	**33**	**54%**	**28**	**46%**
2016-2	**18**	**11**	**61%**	**7**	**39%**
2016-3	**50**	**20**	**40%**	**30**	**60%**
2016-4	**44**	**21**	**48%**	**23**	**52%**
2016-5	33	10	30%	23	70%
2016-6	36	14	39%	22	61%
2016-7	25	10	40%	15	60%
2016-8	37	15	41%	22	59%
2016-9	23	4	17%	19	83%
2016-10	21	12	57%	9	43%
2016-11	27	14	52%	13	48%
2016-12	13	5	38%	8	62%
2017-1	23	12	52%	11	48%
2017-2	20	9	45%	11	55%
2017-3	28	15	54%	13	46%
2017-4	33	5	15%	28	85%
2017-5	25	10	40%	15	60%
2017-6	34	11	32%	23	68%
2017-7	31	13	42%	18	58%
2017-8	42	10	24%	32	76%
2017-9	17	4	24%	13	76%
2017-10	29	6	21%	23	79%
2017-11	17	2	12%	15	88%
2017-12	26	8	31%	18	69%
Total	2,617	1,030	-	1,587	-

Table 2. Descriptive Statistics

Panel A: Descriptive statistics for the full sample of independent director resignations

Panel A reports descriptive statistics for our main variables of interest. Appendix A provides the variable definitions.

Variables	Obs.	Mean	S.D.	P25	Mdn	P75
Cumulated Raw Returns [-1,1]	2,617	0.20	5.30	-2.30	0.00	2.60
Cumulated Abnormal Returns [-1,1]	2,617	-0.10	4.60	-2.50	-0.30	1.80
Academics	2,617	0.40	0.50	0.00	0.00	1.00
Academics Post R11	2,617	0.12	0.00	0.00	0.00	0.00
Academics Post R11 - Explicit	2,617	0.09	0.00	0.00	0.00	0.00
Pure Academics	2,617	0.10	0.30	0.00	0.00	0.00
Director Age	2,615	55	10	48	53	62
Director Male Dummy	2,617	0.90	0.30	1.00	1.00	1.00
Director Tenure (in days)	2,167	1,259	961	555	1,009	1,829
Administrative Position Dummy	2,616	0.50	0.50	0.00	0.00	1.00
Administrative Position Rank	1,279	6.99	4.09	5.00	6.00	8.00
Degree	2,163	4.04	0.93	3.00	4.00	5.00
PhD Degree	2,167	0.40	0.49	0.00	0.00	1.00
Business Degree	1,136	0.60	0.50	0.00	1.00	1.00
Law Degree	1,136	0.10	0.40	0.00	0.00	0.00
Engineer Degree	1,136	0.10	0.30	0.00	0.00	0.00
Total Assets (in billion Yuan)	2,571	29.00	0.21	1.50	3.20	7.80
Size	2,571	15.20	1.50	14.30	15.00	15.90
Leverage	2,560	0.23	0.19	0.06	0.20	0.36
Cash	2,551	0.19	0.15	0.09	0.15	0.25
Free Cash Flow	2,445	0.00	0.07	-0.03	0.01	0.04
Profitability (%)	2,571	3.01	6.28	0.92	2.91	5.86
Market-to-Book	2,442	3.60	5.00	1.00	1.80	3.90
Stock Beta	2,543	1.00	0.40	0.80	1.00	1.30
Stock Volatility	2,537	0.10	0.10	0.10	0.10	0.20
Board Size	2,423	11.2	3.30	9.00	10.00	13.00
Pct. Independent Directors	2,423	0.40	0.10	0.30	0.40	0.40
CEO Duality	2,423	0.30	0.50	0.00	0.00	1.00

Panel B: Descriptive statistics on director attributes for the group of academic director resignations and non-academic director resignations

Panel B reports descriptive statistics for our main director attribute variables for the group of resigning directors who are academics and for the group of resigning directors who are not academics. It also reports the difference in mean across different variables for both groups. Appendix A provides the variable definitions. . *, **, and *** denote statistical significance of the two-sample t-test of mean equality at the 10%, 5% and 1% level, respectively (one-sided t-test).

Variables	Academic = 0	Obs.	Academic = 1	Obs.	Difference	P-value
Director Age	55.32	1,585	54.37	1,030	-0.95***	0.01
Director Male Dummy	0.86	1,587	0.87	1,030	0.02	0.18
Director Tenure (in days)	1,249	1,182	1,272	985	23.04	0.58
Administrative Position Dummy	0.41	1,586	0.64	1,030	0.23***	0.00
Administrative Position Rank	6.73	628	7.24	651	0.50**	0.03
Degree	3.55	1,201	4.65	962	1.10***	0.00
PhD Degree	0.12	1,201	0.74	962	0.62***	0.00
Business Degree	0.53	496	0.70	640	0.17***	0.00
Law Degree	0.16	496	0.13	640	-0.03	0.21
Engineer Degree	0.16	496	0.07	640	-0.09***	0.00

Panel C: Distribution of the administrative position rank of academic directors

Rank of the administrative position	Freq.	Percent	Cum.
1	16	2.46	2.46
3	62	9.52	11.98
4	38	5.84	17.82
5	115	17.67	35.48
6	68	10.45	45.93
7	121	18.59	64.52
8	133	20.43	84.95
9	26	3.99	88.94
10	5	0.77	89.71
15	2	0.31	90.02
16	7	1.08	91.09
17	7	1.08	92.17
18	51	7.83	100

Table 3. Market reaction to academic director resignations

Panel A: Market reaction to director resignations

Panel A reports the market reaction to the resignations of independent directors over the period 2013-2017 for public Chinese companies. The market reaction to a director resignation is defined as the cumulated abnormal return in the three days surrounding the resignation event, whereby an abnormal daily return is a daily return in excess of the prediction of a Carhart's four-factor model. *, **, and *** denote statistical significance of the market reaction at the 10%, 5% and 1% level, respectively (one-sided t-test).

Independent directors resignations	No. Resignations	Mean Cumulated Raw Returns [-1,1]	Mean Cumulated Abnormal Returns [-1,1]
All Directors	2,617	0.22**	-0.11
Non-Academics	1,587	0.43***	0.04
Academics	1,030	-0.10	-0.34***
Academics Post R11	324	-0.64**	-0.77***
Academics Post R11 - Explicit	234	-0.87***	-0.81***

Panel B: Alternative event windows

Panel B reports the market reaction to the resignations of academic independent directors over the period 2013-2017 for Chinese public companies for alternative event windows. *, **, and *** denote statistical significance of the market reaction at the 10%, 5% and 1% level, respectively (one-sided t-test).

Resignation Event Window	Mean CAR to Academic Director Resignations Induced by the Regulation 11
[-2,2]	-1.11***
[-1,1]	-0.77***
[2,1]	-0.42**
[2,0]	-0.67***
[-1,0]	-0.45**
[-1,2]	-0.41**
[0,1]	-0.53***
[0,2]	-0.64**

Panel C: Unique directors

Panel C reports the market reaction to the resignations of academic independent directors induced by the Regulation 11. We consider only the first resignation of each of our sample director. *, **, and *** denote statistical significance of the market reaction at the 10%, 5% and 1% level, respectively (one-sided t-test).

Academic Resignations	No. Resignations	Mean Cumulated Raw Returns [-1,1]	Mean Cumulated Abnormal Returns [-1,1]
Academics Post R11	221	-0.78**	-0.59**
Academics Post R11 - Explicit	154	-1.03***	-0.68**

Panel D: Unique firms

Panel D reports the market reaction to the resignations of academic independent directors induced by the Regulation 11. We consider only the first resignation experienced by each of our sample firms. *, **, and *** denote statistical significance of the market reaction at the 10%, 5% and 1% level, respectively (one-sided t-test).

Independent directors resignations	No. Resignations	Mean Cumulated Raw Returns [-1,1]	Mean Cumulated Abnormal Returns [-1,1]
Academics Post R11	257	-0.71**	-0.96***
Academics Post R11 - Explicit	183	-0.94***	-108***

Panel E: Market reaction to academic director resignations relative to matched control non-academic director resignations

This panel reports the difference in the average market reaction to the resignations of academic directors and matched control non-academic directors. Control and academic directors resign in the same month, are comparable in terms of tenure, age, gender, and belong to firms operating in the same industry in the year before their resignations. Appendix B reports descriptive statistics on director characteristics for academic and control directors before and after the matching. Detailed definitions of the variables are provided in Appendix A. *, **, and *** denote statistical significance of the mean equality test at the 10%, 5% and 1% level, respectively (one-sided).

	Control Directors		Academic Directors		Difference
Market reaction to director resignations	Mean	Obs.	Mean	Obs.	
All - Cumulated Raw Returns [-1,1]	0.68	638	0.03	638	-0.65**
All - Cumulated Abnormal Returns [-1,1]	0.09	638	-0.08	638	-0.17
Post R11- Cumulated Raw Returns [-1,1]	1.03	78	-1.88	78	-2.91***
Post R11- Cumulated Abnormal Returns [-1,1]	-0.34	78	-1.02	78	-0.68**

Panel F: Multivariate regression analysis

This panel reports the results of regressions of the market reaction to an independent director resignation (CAR over the [-1, 1] event window) on director, firm, and board characteristics. *Academic* is a dummy variable that codes for whether the resigning director is an academic. *Academic Post R11* is a dummy variable that codes for whether the resigning director is an academic and resign because of Regulation 11. Detailed definitions of the variables are provided in Appendix A. We do not report constant terms. Standard errors are reported in parentheses. *, **, and *** denote statistical significance of the coefficients at the 10%, 5% and 1% level, respectively.

Cumulated Abnormal Returns [-1,1]	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Academic	-0.234	-0.247	-0.264	-0.278				
	(0.203)	(0.202)	(0.209)	(0.224)				
Academic Post R11					**-0.689****	**-0.600****	**-0.596****	**-0.564***
					(0.292)	**(0.298)**	**(0.301)**	**(0.312)**
Director Age	0.020*	0.021*	0.019*	0.022*	0.019*	0.020*	0.018*	0.023**
	(0.011)	(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.012)
Director Male Dummy	0.399	0.297	0.347	0.182	0.400	0.293	0.339	0.178
	(0.313)	(0.308)	(0.320)	(0.325)	(0.313)	(0.308)	(0.320)	(0.326)
Director Tenure	0.000	-0.000	-0.000	-0.000	0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA		-0.007	-0.007	-0.007		-0.006	-0.007	-0.007
		(0.018)	(0.018)	(0.019)		(0.018)	(0.018)	(0.019)
Size		-0.090	-0.124*	-0.200**		-0.086	-0.121*	-0.202**
		(0.064)	(0.069)	(0.088)		(0.065)	(0.069)	(0.088)
Return Volatility		-2.998	-2.812	-6.577**		-3.066	-2.842	-6.657**
		(2.405)	(2.512)	(3.061)		(2.403)	(2.511)	(3.058)
Board Size			-0.014	0.002			-0.011	0.004
			(0.033)	(0.033)			(0.033)	(0.034)
CEO Duality Dummy			-0.340	-0.351			-0.340	-0.352
			(0.251)	(0.264)			(0.251)	(0.264)
Pct. Independent Director			0.778	0.715			0.871	0.763
			(1.350)	(1.395)			(1.350)	(1.395)
Observations	2,166	2,093	2,001	2,001	2,166	2,093	2,001	2,001
R-squared	0.01	0.01	0.01	0.04	0.01	0.01	0.01	0.04
Year Fixed Effects	No	No	No	Yes	No	No	No	Yes
Industry Fixed Effects	No	No	No	Yes	No	No	No	Yes

Table 4. Market reaction to the issuance of the Rule 18 and to the issuance of the Regulation 11

Panel A: Market reaction to the issuance of the Rule 18 and the Regulation 11 for Chinese listed companies for which at least one independent director resigns over the 2013-2017 period

Panel A reports the mean cumulated abnormal returns to the promulgation of the Rule 18 and Rule Regulation 11 for firms for which at least one independent director is resigning over our sample period, using alternative resignation event windows. *, **, and *** denote statistical significance of the market reaction at the 10%, 5% and 1% level, respectively (two-sided t-test).

	No. Firms	CAR [-1,1] (%)	CAR [-2,2] (%)	CAR [0,1] (%)
Rule 15 21th of October, 2013	1,439	0.02	-0.38	0.16
Regulation 11 3rd of November, 2015	1,550	-1.70***	-3.21***	-1.09***

Panel B: Market reaction to issuance of the Regulation 11 for Chinese listed firms

Panel A reports the mean cumulated abnormal returns to the promulgation of the Rule Regulation 11 using an [-1,1], event window, for firms for which at least one academic director will resign in the two years following the issuance of the Regulation 11 and for firms which will experience non-academic director resignation. *, **, and *** denote statistical significance of the market reaction at the 10%, 5% and 1% level, respectively (two-sided t-test).

	Academic directors will resign =0		Academic directors will resign =1		
	No. Firms	CAR[-1,1] (%)	No. Firms	CAR[-1,1] (%)	Difference
Regulation 11 3rd of November, 2015	727	-1.67	823	-1.74	0.064

Table 5. Cross-sectional heterogeneity in the market response to academic director resignations

This table reports the mean difference between subsamples of academic director resignations induced by the Regulation 11. Each row corresponds to a different partitioning. *, **, and *** denote statistical significance of the two-sample t-test of mean equality at the 10%, 5% and 1% level, respectively (one-sided t-test).

Within the universe of academic independent director resignations induced by the issuance of the Regulation 11:	No		Yes		
	Mean CAR [-1,1]	Obs.	Mean CAR [-1,1]	Obs.	Difference
Director Characteristics					
Pure Academic	-0.45	210	-1.38	114	-0.93*
Director Age > Median	-0.84	188	-0.69	140	0.15
Director Male Dummy	-0.67	40	-0.79	284	-0.12
Director Tenure > Median	-0.99	161	-0.60	158	0.39
Hold Administrative Position	-0.70	85	-0.80	239	-0.10
Hold High Administrative Position	-0.66	217	-2.21	22	-1.55*
Hold High University Administrative Position	-0.83	144	-0.73	180	0.11
Business Degree	-1.05	64	-0.86	154	0.18
Law Degree	-0.89	184	-1.09	34	-0.20
Engineering Degree	-0.90	204	-1.16	14	-0.26
PhD Degree	-0.91	47	-0.87	259	0.05
Foreign University	-0.26	164	-2.46	16	-2.20**
Chinese Ranking (XDF)	-0.09	79	-0.50	79	-0.41
Ranked on ARWU	-0.97	201	-0.26	123	0.51
Board Characteristics					
Board Size	-0.26	189	-1.17	125	-0.91*
Pct. Independent Directors > Median	-1.04	161	-0.21	154	0.83*
CEO Duality Dummy	-0.30	226	-1.18	85	-0.88*
Firm Characteristics					
Market Value > Median	-0.45	148	-0.51	147	-0.06
Growth Opportunities > Median	-0.26	162	-1.21	161	-0.96*
Free Cash Flow > Median	0.35	146	-1.22	145	-0.87*
Intangible Investment > Median	-0.84	162	-0.70	162	0.14

Table 6. Long-term effect of academic director resignations on firm value

Panel A: Difference-in-differences regression of firm profitability on academic director resignation shocks

This table reports the results of a difference-in-differences regression of return on asset on the interaction term between a dummy variable (*At least one Academic Director Resignation)* coding for the loss of at least one academic independent director induced by the Regulation 11 in the six month following the issuance of the Regulation 11 and a dummy variable (*Post Regulation 11*) that takes the value 1 for years 2016 and 2017 and 0 for years 2014 and 2013. Detailed definitions of the variables are provided in Appendix A. We do not report constant terms. Standard errors are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5% and 1% level, respectively.

	(1) Return on Asset (%)
Post Regulation 11	-0.534
	(0.427)
At least one Academic Director Resignation	-0.144
	(0.335)
At least one Academic Director Resignation * Post Regulation 11	**-0.869****
	(0.395)
Size	0.841***
	(0.169)
Market-to-book	-0.0159
	(0.0471)
Cash	3.194**
	(1.468)
Leverage	-10.95***
	(1.180)
Volatility	-2.318
	(4.887)
Board Size	0.0680
	(0.651)
Pct. Independent Directors	4.450***
	(1.685)
CEO Duality Dummy	0.0305
	(0.357)
Observations	1,376
Industry Fixed Effects	Yes
Year Fixed Effects	Yes
R-squared	0.26

Panel B: Long-term returns on a portfolio consisting of firms experiencing at least one academic director resignation induced by Regulation 11

This panel reports the average long-term monthly returns of a portfolio consisting of firms experiencing the loss of at least one academic director induced by Regulation 11 in the six-month period following the issuance of the Regulation 11. Returns are weighted by the market value of the stocks at the time of the portfolio formation. We examine the portfolio performance over the [+6 months, +24 months] window. Column 1 reports the average raw monthly return. Column 2 reports the average monthly return in excess of the market return. Column 3 reports the average monthly return that is not explained away by the CAPM model (alpha). Column 4 reports the average monthly return that is not explained away by Cahart's four-factor model (alpha). *, **, and *** denote statistical significance of the mean long-term return at the 10%, 5% and 1% level, respectively (one-sided t-test).

Portfolio long-term returns [+6 months, +24 months] (%)	Mean raw monthly return	Mean monthly return in excess of the market return	Portfolio alpha CAPM Model	Portfolio alpha Carhart Four-Factor Model
	-0.32	-1.45***	-1.10***	-0.48**

Appendix A. Variable Definitions

Variable	Definition	Source
Market Reaction		
Cumulated Raw Returns [-1,1]	Cumulated returns minus risk-free rate over the three days surrounding the resignation event.	DataStream
CAR[-1,1]	Cumulated returns minus risk-free rate in excess of the Carhart's four-factor model prediction.	
Firm Variables		
Size	Natural logarithm of the market capitalization.	DataStream
Cash	Cash and equivalent divided by total assets.	
Leverage	Short-term and long-term liabilities divided by total assets.	
Market-to-book	Market value of equity divided by book value of equity.	
Profitability	Net income divided by total assets.	
Growth Opportunities	Capital expenditures divided by sales.	
Intangible Investment	R&D plus SG&A spending scaled by total assets.	
Free Cash Flow	Net operating profit after taxes minus net investment in operating capital, scaled by total assets.	
Stock Volatility	Standard deviation of stock returns over last 36 months.	
Stock Beta	CAPM Beta estimated by regressing the excess stock returns on excess market returns over the last 36 months, whereby we use the CSI 300 (Chinese Securities Index 300) to proxy for the market return of China A-share stocks and we use China 3-month deposit rate as risk-free rate.	
Board Variables		
Board Size	Number of directors of the board.	Annual reports/ Company's website
CEO Duality	Dummy variable that takes the value one if the CEO and the Chair are the same person and zero otherwise.	
Pct. Independent Directors	Percentage of independent directors sitting on the board.	
Director Variables		
Academic	Dummy variable that takes the value one if the director has an academic profession. Academic professions include lecturer, senior lecturer, associate professor, and professor.	Wind Database
Pure Academic	Dummy variable that takes the value one if the director has an academic profession which is his/her only known profession and if his/her only known employer is a university.	
Administrative Position Rank	Rank of the highest administrative position held by the director. Refer to Appendix C for further information.	
Administrative Position Dummy	Whether the director hold an administrative position. Refer to Appendix C for further information.	
Director Age	The director's age at the time he/she resigned, in years.	
Director Male	Dummy variable equal to 1 if the director is a male, and 0 otherwise.	
Director Tenure	Number of days since the nomination of director.	
Degree	Highest academic degree held by the director. 5 stands for a Doctoral degree, 4 stands for a Master degree, 3 stands for a Bachelor degree, 2 stands for a Junior college diploma, 1 stands for a technical secondary school diploma.	
PhD Degree	Dummy variable that equals 1 if the director holds a PhD degree, and 0 otherwise.	
Business Degree	Dummy variable that equals 1 if the director majored in business, and 0 otherwise.	
Law Degree	Dummy variable that equals 1 if the director majored in law, and 0 otherwise.	
Engineering Degree	Dummy variable that equals 1 if the director majored in engineering, and 0 otherwise.	
Foreign University	Dummy variable that equals 1 if the director graduated from a foreign university.	
Chinese Ranking (XDF)	Ranking of the Chinese University employing the director according to XDF.cn. XDF is the leading provider of private education in China and publishes one of the most influential local ranking of the Chinese Universities.	XDF's Website
Ranked on ARWU	Whether the University employing the director is ranked on the Academic Ranking of World Universities (Shanghai Ranking).	ARWU's Website

Appendix B. Differences in director characteristics for academic director resignations induced by the Regulation 11 and control non-academic director resignations before and after matching

Please refer to Table 3, Panel E, for further information.

Director Resignations Post Regulation 11	Obs.	Male	Age	Tenure (days)
Before Matching				
Non-Academics	167	0.84	50.95	1,180
Academics	324	0.88	52.85	1,103
After Matching				
Non-Academics	78	0.83	52.55	1,254
Academics	78	0.81	53.55	1,282

Appendix C. Administrative positions

This appendix reports the different administrative positions and associated rank of our sample directors, as provided by the Wind database.

Rank	Administrative Position
1	National leadership position
2	National deputy leadership position
3	Provincial leadership position
4	Deputy provincial leadership position
5	Bureau level leadership position/University President
6	Deputy bureau level leadership position/University vice-President
7	County level leadership positions/Faculty dean
8	Deputy county level leadership positions/Faculty deputy-dean
9	Township section-level leadership position/Head of Department
10	Deputy township section-level leadership positions/Deputy head of department
11	Bureau level position without leadership
12	Deputy bureau level position without leadership
13	County level positions without leadership
14	Deputy county level positions without leadership
15	Township section-level position without leadership
16	Deputy township section-level position without leadership
17	Senior clerk
18	Junior clerk