

Impact of Classified Board on M&A Target Shareholder Value

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ABSTRACT

It is not certain whether classified board is beneficial or deleterious to shareholders. We examine the implication of classified board on target shareholder value in the mergers and acquisitions context. We also investigate the impact of classified board on firm's innovative activities. We find the existence of a classified board in the M&A target firm is positively related to the target shareholder value, such as the M&A announcement CAR and the target premium, but only for R&D-intensive firms. We also find that classified board increases the quality of innovation for R&D intensive firms. Our findings are consistent with the view that classified board may provide long-term perspectives that promote productive but risky R&D investment, which acquiring firms are willing to pay higher premiums for. We also find that the potential managerial entrenchment effect of classified board is less pronounced than that of CEO-chairman duality, strengthening the proponent view of classified board. We contribute to the corporate governance literature on the relationship between classified board and firm performance. We provide evidence that classified board may enhance target shareholder value in M&A context via better R&D investment, which is distinct from enhancement by virtue of stronger bargaining power as posited in the extant literature. We also contribute to the innovation literature by showing that protection from the market for corporate control by classified board may promote firm's innovative activities. Our findings suggest that classified board, an anti-takeover provision that many practitioners and policy makers suspect to be a managerial entrenchment mechanism that diminishes shareholder value, may not be universally harmful to shareholders. Rather, it may provide appropriate level of protection so that the management can invest in risky but value-enhancing innovative activities.

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INTRODUCTION

It is a long-standing debate whether classified board is beneficial or deleterious to target shareholders in mergers and acquisitions. Opponents of classified board focus on the managerial entrenchment effect. Under the classified board provision, it may take several years for corporate raiders to gain a board majority, making managerial changes and firm acquisition more difficult. Based on the classical agency view, such managerial entrenchment may lead to reduction of managerial accountability on firm performance, weakening of disciplinary role of market for corporate control, and decrease of target shareholder value (Scharfstein, 1988; Mahoney and Mahoney, 1993; Bebchuk, Coates, and Subramanian, 2002; Hartzell, Ofek, and Yermack, 2004; Bebchuk and Cohen, 2005; Faleye, 2007). However, recent research provides contrasting evidences: Bates, Becher, and Lemmon (2008) find that classified board is not negatively related to target shareholder value, and Kadyrzhanova and Rhodes-Kropf (2011) provide theoretical and empirical support for the notion that classified board is beneficial for target shareholders in concentrated industries.¹ The main argument as to how classified board enhances target shareholder value is through stronger bargaining power. Target board and managers protected by such provision may fend off opportunistic bids and obtain higher valuation from the acquirer (Comment and Schwert, 1995).

This study supplements the proponent view of classified board by providing evidence that classified board is associated with higher target valuation in the M&A context, but mainly for firms with intensive R&D investment. R&D involves investments in new technologies that are risky and prone to failure, and hence management under strong performance management may not sufficiently invest in R&D and innovation even though doing so would be value-

¹ Refer to Cremers and Sepe (2016) for a review. They point out methodological limitations of previous literature on classified board and present evidence that empowered board with board classification benefits, rather than hurts, shareholders.

enhancing (Stein, 1988, 1989). Manso (2011) argues that long-term R&D activities require managerial entrenchment, which classified board may provide. Chemmanur and Tian (2016) show that antitakeover provisions nurture innovation by insulating managers from short-term pressures by equity markets and lead to increased firm value, and Cremers, Litov, and Sepe (2016) also find that adoption of classified board leads to increases in firm value by promoting long-term value creation through investment. The above literature suggests that the classified board is positively related to target shareholder value, and this effect is stronger for firms with intensive R&D investment.

Intensive R&D investment does not itself guarantee value creation. R&D tends to yield highly uncertain outcomes, and managers tend to “play it safe” by avoiding risky projects (Bertrand and Mullainathan, 2003; Kim and Lu, 2011; Gormley and Matsa, 2015). As such, the effect of classified board may be ambiguous: on one hand, it encourages value-enhancing R&D investment, but on the other hand it provides slack to managers so that they invest in value-decreasing R&D projects with private benefits. This contradictory effect may be mitigated under strong external governance such as product market competition that controls managerial slack (Giroud and Mueller, 2010).² Collectively, we conjecture that classified board has positive relation to target shareholder value for R&D-intensive firms in competitive industries, herein managerial slack is already mitigated.³ For firms engaging in relatively little R&D investment or in concentrated industries, the effect of classified board may be ambiguous.

² John, Litov, and Yeung (2008) demonstrate that firms exhibiting better governance may pursue more risky but value-enhancing investments, suggesting that the R&D investment channel may work better under strong external governance proxied by product market competition.

³ Gu (2016) show that R&D and product market competition have a strong positive interaction effect on expected stock return. We find a similar complementary effect on target shareholder value but our results are different from Gu’s in two ways: First, Gu (2016) utilizes product market competition as a measure of future cash flow risk, while in our paper it represents strength of external governance. Second, expected stock return in Gu (2016) does not proxy for shareholder value. The higher expected return is compensation for the associated risk and not a result of better R&D investment; this is different from what we argue.

Based on 772 acquisition announcements on U.S. public target firms during the years from 2005 to 2014, we find that the presence of classified board is significantly related to higher target shareholder value measured by the acquisition announcement CAR but only for R&D-intensive firms in competitive industries. For firms without intensive R&D investment or in concentrated industries, the relationship is insignificant. To the best of our knowledge, this is the first study that shows the positive impact of classified board on target shareholder value through R&D investment.

When we use takeover premium as the measure of target shareholder value, we observe similar results with one notable difference: classified board is positively and significantly related to the takeover premium for firms with intensive R&D investment, regardless of industry competitiveness. There could be two potential explanations for the difference. First, in concentrated industries, several firms may compete to acquire the target firm in fear of losing synergy opportunities arising from the acquisition to industry rivals (Kadyrzhanova and Rhodes-Kropf, 2011). Targets with intensive R&D and innovation activities may provide larger synergies (Phillips and Zhdanov, 2013). With classified board, target management gains stronger bargaining power against the acquirer to achieve higher target valuation, especially when the synergy to share is large. However, this argument can neither explain the observed positive and significant impact in competitive industries nor the insignificant impact when CAR is used as the proxy for target shareholder value. Rather, the result can be explained by the difference between the target premium and acquisition announcement CAR. The target premium is the value acquirers are willing to pay upon deal completion, and as such, the probability of deal completion may not be reflected in the target premium. In contrast, the stock market sets the announcement CAR based on both the premium that the target can capture when the deal is completed and the probability of deal completion (Moeller, 2005). When the deal is not completed, the premium will not be paid and the target shareholder value will

decrease to the pre-announcement value. Reflecting potential deal-break, the stock market may set the announcement CAR below the target premium. In concentrated industries, classified board may allow excessive managerial slack so that the management fend off acquisition bids that may benefit target shareholders, leading to smaller CAR. However, in competitive industries where managerial slack is better controlled, such value-decreasing deal breaking may not occur, and the announcement CAR will be set similar to the target premium.

While prior literature mainly investigates the positive impact of classified board on firm value measured by Tobin's Q or innovation output (Chemmanur and Tian, 2016; Cremers et al., 2016),⁴ we focus on M&A target valuation because it may provide advantage in measuring the value of R&D investment. First, due to its risky and long-term nature, the value of R&D investment is difficult to identify. Further, the details of R&D investments are only known to company insiders, making it even harder for outside investors to evaluate R&D.⁵ However, acquisition proposals are formulated after careful examination by potential acquirers, who may have special interest and expert knowledge in the target firm (70% of acquirers are in the same industry as the target in our sample). Moreover, given that targets enjoy significant acquisition premium, acquirers need to identify synergies to create value from the deal, which often come from the utilization of the target's R&D investment (Phillips and Zhdanov, 2013). As such, acquirers may put significant effort into identifying the value of a target's R&D and ensure that this reflects in the target premium. Additionally, the acquisition announcement itself increases the market's attention to the target firm, leading to more active information generation (Kim and Verrecchia, 1994, 1997) and better evaluation of the target shareholder

⁴ Kadyrzhanova and Rhodes-Kropf (2011) illustrate the positive impact of classified board on M&A target premiums, but not on acquisition announcement CAR. Also, their focus is the bargaining power channel of classified board while ours is the R&D investment channel.

⁵ Aboody and Lev (2000) discover that insider gains in R&D-intensive firms are significantly larger than insider gains in firms without R&D, suggesting insiders' superiority (outsiders' inferiority) in evaluating R&D investment.

value.

We posit that classified board contributes to higher target shareholder value through better R&D investment. However, alternatively, classified board may not improve R&D investment but rather only increase bargaining power. Target firm managers with managerial slack due to the classified board may have the impetus to drive hard bargains against the acquirers over the value of the target's R&D and innovations and be able to secure higher valuations. While the alternative view may explain a positive interactive effect of classified board and R&D intensity on target shareholder value, it cannot explain the lack of such an effect on CAR in concentrated industries, where the bargaining power channel may become stronger. As a further inquiry into whether classified board begets better R&D investment, we examine the impact of classified board on the quality of innovation measured by average number of citations on patents granted to the target firm. Supporting the better R&D channel view, we discover that classified board is positively associated with the quality of innovation, especially for R&D intensive firms.

Interestingly, the impact of classified board on better innovation is identified in both competitive and concentrated industries. This suggests that concerns over excessive managerial entrenchment due to classified board may not be warranted. This is in line with Kadyrzhanova and Rhodes-Kropf (2011) who distinguish between delay-provisions (which includes classified board) and non-delay provisions among 24 corporate governance provisions (G-index) delineated by Gompers, Ishii, and Metrick (2003); they show that delay provisions have a positive impact on target shareholder value while non-delay provisions have a negative impact. To investigate the importance of managerial entrenchment induced by classified board, we incorporate another type of managerial entrenchment mechanism, CEO-chairman duality (CEO also chairing the board of directors). While the relationship between CEO-chairman duality and firm performance is still ambiguous (Krause, Semadeni, and Cannella 2014), it is

generally believed that CEO-chairman duality strengthens the CEO's influence over the board, and hence provides more slack for managerial entrenchment. Contrary to CEO-chairman duality, classified board may not function as a managerial entrenchment mechanism: Koppes, Ganske, and Haag (1999) and Wilcox (2002) argue that it may even serve as a monitoring mechanism to the management. To investigate the relative strength of managerial entrenchment, we include CEO-chairman duality together with classified board in all analyses.

We find that, different from classified board, CEO-chairman duality does not increase the quality of innovation, suggesting that it is associated more negatively with entrenchment compared to classified board. When we examine the impact of CEO-chairman duality on target shareholder value, we find it has a negative impact for firms without intensive R&D investment or in concentrated industries, but positive impact on R&D intensive firms in competitive industries. Considering the ineffectiveness of CEO-chairman duality on innovation, this result suggests that the positive impact of CEO-chairman duality on target shareholder value is due to stronger bargaining power stemming from managerial entrenchment, with a condition that excess entrenchment is controlled by product market competition.

Does this result suggest that the positive impact of classified board also stems from strong bargaining power a la Kadyrzhanova and Rhodes-Kropf (2011), not through better R&D investment? A part of the benefit of classified board may work through the bargaining power channel, but better R&D investment should also contribute. If this is not the case, we cannot explain the insignificant impact of classified board for firms in concentrated industries where bargaining power may become stronger, and the positive and significant (insignificant) impact of classified board (CEO-chairman duality) on innovation performance.

We contribute to the current literature in several ways. First, we demonstrate that classified board actually contributes to target shareholder value, casting doubt on the criticisms of classified board levied by both academicians and practitioners. Second, we find that the

increase in target shareholder value works through the better R&D investment channel. While extant research illustrates the positive impact of classified board, it has mainly been concerned with the stronger bargaining power channel (e.g., Comment and Schwert, 1995; Bates et al., 2008; Kadyrzhanova and Rhodes-Kropf, 2011) or focused on firm value in general (measured by Tobin's Q) or innovation (e.g., Cremers et al., 2016; Becker-Blease, 2011). To the best of our knowledge, this is the first study that relates classified board to target shareholder value through better R&D investment channel; Humphery-Jenner (2014) shows that antitakeover mechanisms can increase shareholder value and corporate innovation but the subject of research was acquiring firms, not targets. We also find managerial entrenchment mechanisms (i.e., classified board and CEO-chairman duality) have differential impacts on firm innovation and target shareholder value, which is similar but distinct from what Kadyrzhanova and Rhodes-Kropf (2011) show in that their focus is disentangling G-Index components while we compare classified board and CEO-chairman duality. Different from other managerial entrenchment mechanisms similar to CEO-chairman duality, classified board may enhance shareholder value without the detrimental side effect of excessive entrenchment.

The remainder of this paper is organized as follows. The sample construction and main variables of interest are presented next. Then we examine the effect of classified board on the target shareholder value and innovation. The final section concludes.

DATA AND VARIABLES

The original sample includes the M&A announcements of U.S public targets from the Securities Data Company's Mergers and Acquisitions database (SDC Platinum) during the years from 2005 to 2014. Following Bates et al. (2008), we impose the following restrictions: (a) the acquisition is completed and the transaction value exceeds U.S. \$1 million; (b) the transaction is identified by SDC as a merger, acquisition of majority interest, or tender offer;

(c) the bidder must own less than 50% of the target's share before the transaction and 100% afterward; (d) the target's accounting and daily stock return data (from 245 days before to 1 day after the announcement date, $t-245$ to $t+1$) are available in Compustat and Center for Research in Security Prices (CRSP), respectively; and (e) the target is not a financial institution with an SIC code between 6000 and 6999. We use two variables as proxies for the target shareholder value: the three-day acquisition announcement CAR and 4-week takeover premium. The acquisition announcement CAR is constructed using the market model.⁶ This initial screening results in 906 transactions.

Our major variables of interest are the presence of a classified board in the target firm, *CBoard*, and CEO-chairman duality (target firm's CEO also chairing the board of directors), *Duality*. Both the classified board and CEO-chairman duality are widely used proxies for managerial entrenchment. While CEO-chairman duality provides direct entrenchment to the target firm's CEO, the entrenchment effect of classified board operates on the board of directors and not on the CEO directly. Even though the board captured by the CEO may result in CEO entrenchment (Coles, Daniel, and Naveen, 2014),⁷ the protection on the tenure of the board of directors can also provide bargaining power against the CEO, serving as a monitoring mechanism (Koppes et al., 1999; Wilcox, 2002). We employ both classified board and CEO-chairman duality in all analyses to test whether they have differential effects on managerial entrenchment and target shareholder value. We first refer to the ISS database (formerly known as RiskMetrics) to identify target firms' adoption of classified board and CEO-chairman duality as well as other governance attributes we use as control variables. In the event that target firms

⁶ Market model parameters are estimated over 205 trading days from 245 to 41 days prior to the announcement date.

⁷ Arguably, classified board may reduce the likelihood of board captured by a CEO because when a newly appointed CEO wants to reconfigure the board with co-opted directors (directors hired under the new CEO's supervision), he can only do so by one-third every year.

are not represented by ISS database, we populate the governance variables by manually searching DEF 14A proxy statements filed in SEC Edgar database. We exclude observations where classified board or CEO-chairman duality information are missing, reducing the sample size to 772 observations.

To distinguish high-R&D investment firms from low-R&D investment firms, we construct an indicator variable for high-R&D, *HRD*, which is equal to 1 if R&D intensity defined by R&D expenditures divided by the book value of total assets is above the sample median, and 0 otherwise. To avoid reducing the sample size, we set missing observations of R&D intensity as being equal to 0. To account for the observations with missing R&D, we include *R&D_Missing*, an indicator variable equal to 1 if R&D intensity data is missing, and 0 otherwise, as a control variable.

Following the M&A literature, we include a series of deal- and target firm characteristics as control variables. In the baseline analyses, we control for the following deal characteristics: *SameIndustry*, an indicator variable that is equal to 1 if the target and acquirer have the same Fama-French 10 industry classification⁸, and 0 otherwise; *Private*, an indicator variable that is equal to 1 if the acquirer is a private company, and 0 otherwise; *DealValue*, the natural log of the deal value in U.S. \$million; *CashOnly*, an indicator variable that is equal to 1 if the payment was made in cash, and 0 otherwise; and *TenderOffer*, an indicator variable that is equal to 1 if the acquisition is made with tender offer, and 0 otherwise. We also include the following target firm characteristics: *FirmSize*, the natural log of the target firm's book value of total assets; *Q*, Tobin's Q, defined by the market value of common equity plus the book

⁸ We use Fama-French 10 industry classification for the purposes of industry definition to avoid the small numbers of observations in each industry. The mean/median number of observations in each industry under Fama-French 10 industry classification is 74 and 54, respectively, and the smallest industry (Consumer Durables) has 11 observations. Using more refined industry classifications such as two-digit SIC code leads to some industries with less than 10 observations.

value of total liabilities divided by the book value of total assets; *ROA*, return on assets, defined by EBIT divided by the book value of total assets; *Leverage*, defined by total liabilities divided by the book value of total assets; *BoardSize*, the natural log of the total number of directors on the board; *Independence*, board independence, the number of independent directors divided by the total number of directors on the board; and *CEOAge*, the natural log of the target firm's CEO's age.

Table 1 presents descriptive statistics of the variables used in this paper. About half of the sample firms adopt classified board and CEO-chairman duality, and their correlation is 0.092, suggesting that correlation between these two variables are not of serious concern. The mean announcement CAR and takeover premium are 0.291 and 0.444, respectively. The mean value of total assets in our sample is \$1,973 million with mean ROA of -0.039, suggesting our sample firms are smaller and less profitable than the target firms in prior literature (e.g., Bates et al., 2008; Harford, Humphery-Jenner, and Powell, 2012; Barger et al., 2008). This is reasonable given that our sample includes small target firms that are not covered by the ISS database; ISS database covers only large companies such as S&P 1500 companies. About two out of three cases the sample firms were acquired by firms in the same industry.

EMPIRICAL EXAMINATION

Classified Board, CEO-Chairman Duality, and the Acquisition Announcement CAR

To examine the impact of classified board and CEO-chairman duality on target shareholder value, we use the following baseline specification:

$$Y_{it} = \alpha_0 + \alpha_{Ind} + \alpha_t + \beta_1 \cdot CBoard_{it} + \beta_2 \cdot CBoard_{it} \cdot HRD_{it} + \beta_3 \cdot Duality_{it} + \beta_4 \cdot Duality_{it} \cdot HRD_{it} + \beta_5 \cdot HRD_{it} + \beta_6 \cdot Control_{it} + \mu_{it} \quad (1)$$

where Y_{it} is target firm i 's shareholder value, i indexes firms, t indexes year, and Ind indexes industry. All regressions control for industry and year fixed effects, α_{Ind} and α_t . $Control_{it}$

includes *R&D_Missing*, *SameIndustry*, *Private*, *DealValue*, *CashOnly*, *TenderOffer*, *FirmSize*, *Q*, *ROA*, *Leverage*, *BoardSize*, *Independence*, and *CEOAge*. We include an interaction term between *CBoard* and *HRD* because we conjecture that classified board increases target shareholder value by enabling management to pursue value-enhancing R&D activities. In addition to *CBoard*, we also include *Duality* to determine whether and the extent to which there is a differential effect imposed by these two structures. The variables of main interest are *CBoard*, *Duality*, and their interaction with *HRD*, which measure how managerial entrenchment mechanisms are related to value-enhancing effects of R&D investment. Standard errors are clustered at the industry level.

Table 2 reports the estimation results using the three-day acquisition announcement CAR as the dependent variable. To assess whether any observed impact on CAR is derived from the entrenchment variables alone, we first run regression without the interaction terms and subsequently provide results with the interaction terms. When we focus on the standalone impact of managerial entrenchment in Column (1), we find that *CBoard* is not significantly related to CAR. However, *Duality* is negatively and significantly related (-0.043 at 10% level), suggesting that the value decreasing entrenchment effect of *Duality* may be stronger than that of *CBoard*. When we investigate the interactive effects of *CBoard/Duality* and *HRD* in Column (2), we find a similar pattern: *CBoard* and its interaction with *HRD* have positive but statistically insignificant impacts. However, *Duality* again shows a negative and significant (-0.064 at 1% level) impact, while the interaction of *Duality* and *HRD* is positive but insignificant.

Although both interaction terms are associated with statistically insignificant coefficients, this need not be interpreted as an absence of interactive effects. It may be the case that such an interactive effect becomes unambiguous only under certain conditions, such as strong external governance: Cremers and Nair (2005) show that blockholder ownership (internal governance) increases shareholder value only under strong external governance

mechanisms (e.g., market for corporate control). The effect of classified board or CEO-chairman duality on target shareholder value may also depend on the strength of external governance in a way that the value enhancing effect through R&D becomes significant only when potential value-decreasing managerial entrenchment effects are mitigated by strong external governance. To investigate this possibility, we conduct analyses in subsamples separated by the sample median of product market competition, where high (low) product market competition proxies for strong (weak) external governance.⁹ Results in Columns (3-4) and (5-6) are based on the same specifications as those in Columns (1-2) but in high- and low-competition subsamples.

When interaction terms are not included, *CBoard* is insignificantly related to CAR regardless of the strength of external governance (Columns (3) and (5)), consistent with the Column (1) result. However, *Duality* retains a negative and significant impact (-0.095 at 10% level) on CAR in the low-competition subsample only (Column (5)), and becomes insignificantly related to CAR in the high-competition subsample (Column (3)). This result is consistent with our conjecture that strong external governance reduces the value-decreasing impact of *Duality*, and the shareholder value decrease is observed only under weak external governance. Different from *Duality*, the impact of *CBoard* is positive (albeit insignificant) in both subsamples. This result supports our argument that classified board does not entrench management (as much as CEO-chairman duality does), which is contrary to the accepted wisdom that classified board is detrimental to shareholder value.

⁹ This is similar to the way Gu (2016) constructed indicator for high-, medium-, and low-R&D indicators. Instead of three-digit SIC code, we use Fama-French 10 industry classification to delineate industries to be consistent with the way we define same-industry acquirers. Product market competition is defined as the inverse of Herfindahl-Hirschman index, the squared sum of sales market shares for all Compustat firms in each industry in the year the acquisition announcement is made.

When the interaction terms are included in the analyses, we find that while the coefficient of standalone *CBoard* is statistically insignificant, the interaction of *CBoard* and *HRD* is positive and significant in the high-competition subsample (Column (4)). In the low-competition subsample, both the standalone *CBoard* and its interaction with *HRD* are statistically insignificant (Column (6)). These results support our conjecture that classified board may enhance shareholder value when the firm is engaged in intensive R&D activities; however, this is only when strong external governance ameliorates potential managerial entrenchment. Regarding *Duality*, we find somewhat different results. While standalone *Duality* is negative and significant in both high- and low-competition subsamples, the interaction between *Duality* and *HRD* is positive and significant in high competition subsample, but negative and significant in the low-competition subsample. This result suggests that overall *Duality* exerts a negative influence on target shareholder value, which becomes more pronounced for firms with high R&D investments and under weak external governance. These results accord with the traditional view that CEO-chairman duality is a shareholder value decreasing managerial entrenchment mechanism. However, for firms under strong external governance, interaction between *Duality* and *HRD* shows positive and significant coefficient, suggesting that *Duality* may enhance firm performance only for firms with intensive R&D investment and under strong external governance.

Overall, we find that both *CBoard* and *Duality* enhance target shareholder value for firms with intensive R&D investment and under strong external governance. However, for firms without intensive R&D investment or under weak external governance, their effects are quite different. These results are consistent with our conjecture that unlike CEO-chairman duality, classified board may not be a managerial entrenchment mechanism. Koppes et al. (1999) and Wilcox (2002) argue that classified board may even serve as a monitoring mechanism to the management. Although *CBoard* not a managerial entrenchment mechanism

explains the different results between *CBoard* and *Duality*, it fails to explain the reason about finding an insignificant impact of *CBoard* on CAR under weak external governance. If classified board indeed serves as a monitoring mechanism, the marginal contribution of *CBoard* may become more important under weak external governance. One potential explanation is that classified board belongs to delay provisions (Kadyrzhanova and Rhodes-Kropf, 2011). When the stock market realizes the acquisition announcement, it sets the announcement CAR based on both the premium that the target can capture when the deal is completed and the probability of deal completion. Considering that classified board may hinder deal completion, the stock market may reflect the potential deal-breaking, and thereby assign lower CAR. However, under strong external governance, the board is less likely to fend off value enhancing acquisition, and hence, the value-enhancing channel of classified board is not obfuscated by the probability of deal break. To explore this explanation, we use 4-week takeover premium, *Premium*, as the regression dependent variable and then re-run the analyses. *Premium* is set by the potential acquirer who is willing to pay that amount if the deal is completed, and the probability of deal completion is less likely to play a role in setting the *Premium* (Moeller, 2005).

Classified Board, CEO-Chairman Duality, and the Takeover Premium

We run the same set of analyses as per Table 2, maintaining the same set of independent variables but switching the dependent variable from acquisition announcement CAR to *Premium*, and provide the results in Table 3. The impact of *CBoard* on *Premium* accords with expectation. The interaction term between *CBoard* and *HRD* is now positive and significant with regard to all specifications (in Column (2) full sample, Column (4) under strong external governance, and Column (6) under weak external governance). However, in terms of *Duality*, we obtain very different results. The interaction of *Duality* and *HRD* is positive and significant

(albeit weak at 10% level) only under strong external governance (Column (4)) and insignificant with respect to the full sample and weak external governance subsample. The standalone *CBoard* and *Duality* coefficients are insignificant across all specifications, regardless of the inclusion of interaction terms. These results suggest that unlike CEO-chairman duality, classified board may enhance target shareholder value for firms with intensive R&D investment, regardless of external governance. For *Duality* to increase *Premium*, it requires both strong external governance and intensive R&D investment. This supports our argument that classified board is not a substantive managerial entrenchment mechanism when compared with CEO-chairman duality.

Unlike Table 2 results in which standalone *Duality* is negative and significant in Columns (1, 2, 4, 5, and 6) and *Duality*'s interaction with *HRD* in Column (6) (under weak external governance), all the *Duality*'s coefficients except its interaction with *HRD* in strong external governance now become statistically insignificant. This result suggests that CEO-chairman duality, a widely accepted managerial entrenchment mechanism, does not seem to reduce the target premium. Considering the major difference between the acquisition announcement CAR and *Premium* (the dependent variables in Table 2 and 3 analyses) is the probability of deal break, the observed difference in the coefficients of *Duality* should stem from the probability of a deal break. The increased bargaining power argument may explain the difference: Entrenched target management due to CEO-chairman duality may hold stronger bargaining power to obtain better deal terms from the acquirer (Kadyrzhanova and Rhodes-Kropf, 2011). While such entrenched management may induce deal-break (Comment and Schwert, 1995), this possibility is not reflected in the target premium (Moeller 2005). However, the stock market will reflect such possibilities and set the acquisition announcement CAR accordingly.

If the value-enhancing effect of *Duality* stems from stronger bargaining power, then the same channel may also work for *CBoard*: Considering that R&D investment is difficult to evaluate, target management with stronger bargaining power may drive a hard bargain over the value of R&D and innovation to obtain higher target valuation. Such bargaining may not work well when firms have little R&D and innovation to negotiate over. This explanation competes with our original conjecture that classified board works through better R&D investment. Indeed, it is difficult to discern through which channel classified board works. As such, we directly investigate whether classified board works through the better R&D investment channel by examining its impact on the quality of R&D and innovation outputs next.

Classified Board, CEO-Chairman Duality, and the Quality of Innovation

To examine the impact of classified board and CEO-chairman duality on the quality of innovations the target firm has accomplished, we use the following specification, which is similar to the baseline regression except that we do not include deal-specific control variables and the sample period is from 2005 to 2011:¹⁰

$$\begin{aligned} Scaled_Citation_{it} = & \alpha_0 + \alpha_{ind} + \alpha_t + \beta_1 \cdot CBoard_{it} + \beta_2 \cdot CBoard_{it} \cdot HRD_{it} \\ & + \beta_3 \cdot Duality_{it} + \beta_4 \cdot Duality_{it} \cdot HRD_{it} + \beta_5 \cdot HRD_{it} + \beta_6 \cdot Control_{it} + \mu_{it} \end{aligned} \quad (2)$$

where *Scaled_Citation_{it}* is a measure of innovation performance based on the number of citations a patent has received. Following Bernstein (2015), we scale the number of citations a patent has received because citation rates on patents vary over time and industries. The measure is the total number of citations a patent has received divided by the average number of citations of matched patents (patents granted in the same year and in the same technology class). When

¹⁰ Deal-specific characteristics such as *SameIndustry*, *Private*, or *DealValue* are not likely to influence the quality of innovation in the target firm, which is already determined before the deal announcement. The sample period is reduced by three years due to the availability of the patent citation data.

a firm is granted multiple patents in a year, we use the average of scaled citation counts for all the patents granted in that year. The patent data is from Kogan, , Papanikolaou, Seru, and Stoffman (2016).

Table 4 reports the estimation results. As expected, the interaction of *CBoard* and *HRD* is positive and significant (Columns (2, 4, and 6)), suggesting classified board increases firm's innovative outputs by improving R&D investment. The standalone *CBoard* variable shows statistically insignificant coefficients across all specifications, which can be interpreted in terms of classified board increasing the quality of innovations only when firms engage in intensive R&D investment. Our findings are consistent with Cremers et al. (2016) and Chemmanur and Tian (2016), supporting our conjecture that classified board enhances firm performance through better R&D investment. Contrary to the results on *CBoard*, the impact of *Duality* and its interaction with *HRD* are all statistically insignificant with negative signs, suggesting that CEO-chairman duality is not value-enhancing through R&D and innovation.

Together with the target shareholder value analyses, we find supporting evidence that classified board contributes to higher shareholder value by facilitating more productive R&D investment. We find some evidence that CEO-chairman duality is positively related to the target shareholder value when a firm is engaged in intensive R&D investment and under strong external governance, but this effect seems to work through stronger bargaining power that the target management may leverage, not through better R&D investment.

CONCLUSION

We find that classified board is associated with higher target valuations in M&A context, but mainly for firms with intensive R&D investment. We also find that classified board enhances the quality of innovation when firms engage in intensive R&D investment, suggesting that the target shareholder value-enhancing effect of classified board works via better R&D investment.

These findings hold regardless of the strength of external governance, suggesting that classified board may not be a managerial entrenchment mechanism that is detrimental to shareholder value. CEO-chairman duality, a well-known managerial entrenchment mechanism, is also positively and significantly related to the target shareholder value for firms with high R&D investment but only under strong external governance. The value-enhancing effect of CEO-chairman duality works by enabling stronger bargaining power, rather than better R&D investment as per with classified board. Our findings are consistent with the view that classified board is not a shareholder value decreasing managerial entrenchment mechanism.

Appendix Variable Definitions and Data Sources.

Variable	Definition	Source
<i>Dependent Variables</i>		
CAR	Three-day announcement period cumulative abnormal returns over the interval -1 to +1, where 0 is the announcement date.	CRSP
Premium	Four-week takeover premium defined as the bidder offer price minus the target closing stock price 4 weeks prior to the announcement date divided by the target closing stock price 4 weeks prior to the announcement date.	SDC Platinum
Scaled_Citation	The total number of citations a patent has received divided by the average number of citations of matched patents (patents granted in the same year and in the same technology class). When a firm is granted multiple patents in a year, we use the average of scaled citation counts for all the patents granted in that year.	Kogan, Papanikolaou, Seru, and Stoffman (2016)
<i>Variables of Interest</i>		
CBoard	A binary variable that takes 1 if a board is made up of different classes of directors (classified board) and 0 otherwise.	RiskMetrics; SEC Edgar database
Duality	A binary variable that takes 1 if CEO holds chairman title of the board of target firm, and 0 otherwise.	
HRD	A binary variable that takes 1 if R&D intensity defined as R&D investment divided by total assets is above sample median in each year, and 0 otherwise.	Compustat
<i>Deal Characteristics</i>		
SameIndustry	A binary variable that takes 1 if the target has the same industry membership as its acquirer based on Fama and French 10 industry classifications, and 0 otherwise.	SDC Platinum; Compustat; Kenneth French's website
Private	A binary variable that takes 1 if the target is acquired by a private firm and 0 otherwise.	SDC Platinum
DealValue	The natural log of deal value in U.S. \$million.	
CashOnly	A binary variable that takes 1 if the payment was made 100% in cash and 0 otherwise.	
Tenderoffer	A binary variable that takes 1 if the deal is tender offer and 0 otherwise.	
<i>Firm Characteristics</i>		
FirmSize	The natural log of the total assets of the target firm.	Compustat
Tobin's Q	Total assets minus book equity plus market equity divided by total assets of target firm.	
ROA	The return on assets of target firm, measured by dividing income before extraordinary items by total assets.	
Leverage	The ratio of the total liabilities to total assets of target firm.	
R&D_Missing	If the company has not reported its R&D expense, it is treated as being 0 and the R&D missing dummy is coded as 1, and 0 otherwise	
<i>Board Characteristics</i>		
BoardSize	The natural log of the total number of directors on the board of target firm.	RiskMetrics; SEC Edgar website
Independence	The proportion of outside directors on the board of target firm.	RiskMetrics
CEOAge	The natural log of the target firm's CEO's age.	and DEF 14A

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Table 1
Summary Statistics

VARIABLES	Obs.	Mean	Median	Standard Deviation
	(1)	(2)	(3)	(4)
<i>Dependent Variables</i>				
CAR	752	0.291	0.225	0.329
Premium	741	0.444	0.330	0.514
Scaled_Citation	572	0.644	0.000	1.910
<i>Variables of Interest</i>				
CBoard	756	0.545	1.000	0.498
Duality	772	0.461	0.000	0.499
HRD	772	0.496	0.000	0.500
<i>Deal Characteristics</i>				
SameIndustry	772	0.698	1.000	0.459
Private	770	0.226	0.000	0.418
DealValue	770	6.397	6.387	1.759
CashOnly	770	0.590	1.000	0.492
TenderOffer	770	0.200	0.000	0.400
<i>Target Firm Characteristics</i>				
FirmSize	772	6.043	5.953	1.723
Tobin's Q	772	1.859	1.522	1.170
ROA	772	-0.039	0.026	0.263
Leverage	772	0.205	0.122	0.253
R&D_Missing	772	0.333	0.000	0.472
<i>Board Characteristics</i>				
BoardSize (n)	770	7.825	8.000	1.957
Independence	770	0.750	0.778	0.126
CEOAge (years)	770	54.538	54.000	8.086

This table provides sample descriptive statistics for main independent variable and other control variables. The sample consists of 772 completed M&A deals with the transaction value of at least \$1 million announced by U.S. public targets in 2005-2014, defined as merger, acquisition of majority interest, or tender offer by SDC, and with the bidder having less than 50 percent of the target's share prior to the announcement and 100 percent after the completion, and not in financial industry (SIC code between 6000 and 6999). Variable definitions and data sources are provided in the Appendix.

Table 2
Classified Boards, CEO-Chairman Duality, and Acquisition Announcement CAR

VARIABLES	Full Sample		High-Competition		Low-Competition	
	(1)	(2)	(3)	(4)	(5)	(6)
CBoard	0.016 (0.519)	0.009 (0.728)	0.005 (0.762)	-0.018 (0.289)	0.012 (0.748)	0.049 (0.170)
CBoard × HRD		0.013 (0.787)		0.039* (0.037)		-0.097 (0.138)
Duality	-0.043† (0.069)	-0.064*** (0.000)	0.003 (0.913)	-0.064*** (0.001)	-0.095† (0.055)	-0.061† (0.100)
Duality × HRD		0.038 (0.347)		0.106*** (0.000)		-0.096* (0.028)
HRD	0.035 (0.305)	0.011 (0.874)	-0.016 (0.739)	-0.084 (0.163)	0.086 (0.138)	0.180† (0.052)
SameIndustry	-0.022 (0.583)	-0.021 (0.592)	-0.031*** (0.000)	-0.028** (0.003)	0.013 (0.779)	0.015 (0.745)
Private	-0.067† (0.066)	-0.068† (0.056)	-0.036 (0.379)	-0.040 (0.360)	-0.135* (0.023)	-0.132* (0.025)
Deal Value	0.006 (0.766)	0.006 (0.781)	0.030* (0.021)	0.027* (0.060)	-0.020 (0.528)	-0.023 (0.440)
Cash Only	0.110** (0.009)	0.109* (0.010)	0.071* (0.012)	0.071** (0.009)	0.180** (0.005)	0.189** (0.007)
Tender Offer	0.052† (0.060)	0.054† (0.060)	-0.015 (0.532)	-0.014 (0.590)	0.133† (0.056)	0.127† (0.069)
Firms Size	-0.029 (0.199)	-0.029 (0.208)	-0.063** (0.003)	-0.058* (0.011)	0.023 (0.260)	0.027 (0.158)
Tobin's Q	-0.018 (0.104)	-0.019† (0.090)	-0.028* (0.015)	-0.028* (0.014)	-0.020 (0.163)	-0.016 (0.181)
ROA	-0.171** (0.004)	-0.172** (0.004)	-0.005 (0.885)	0.002 (0.935)	-0.235** (0.001)	-0.229** (0.003)
Leverage	0.120* (0.047)	0.117† (0.051)	0.072 (0.334)	0.076 (0.346)	0.070 (0.377)	0.078 (0.354)
R&D_Missing	0.036 (0.368)	0.036 (0.366)	0.006 (0.918)	0.007 (0.907)	0.049 (0.391)	0.051 (0.378)
BoardSize	-0.009 (0.864)	-0.009 (0.873)	-0.006 (0.731)	-0.009 (0.528)	-0.083 (0.545)	-0.088 (0.548)
Independence	0.149 (0.283)	0.150 (0.275)	0.233† (0.051)	0.231† (0.071)	-0.016 (0.927)	-0.029 (0.870)
CEOAge	-0.025 (0.608)	-0.017 (0.738)	-0.129** (0.002)	-0.103* (0.013)	0.024 (0.847)	0.011 (0.931)
Constant	0.319 (0.201)	0.298 (0.247)	0.803*** (0.000)	0.746*** (0.000)	0.151 (0.811)	0.159 (0.807)
Year/Industry FE	Y	Y	Y	Y	Y	Y
Observations	736	736	426	426	310	310
Adjusted R ²	0.118	0.117	0.049	0.055	0.194	0.194

†p < .10; *p < .05; **p < .01; ***p < .001.

This table estimates the relation between classified board, CEO-chairman duality, and target shareholder value. The dependent variable is three-day acquisition announcement CAR of target company. Variable definitions are provided in the Appendix. The sample period covers years 2005 through 2014. All regressions control for year and industry fixed effects. p-values based on robust standard errors clustered by industry are reported in parentheses.

Table 3
Classified Boards, CEO-Chairman Duality, and Takeover Premium

VARIABLES	Full Sample		High-Competition		Low-Competition	
	(1)	(2)	(3)	(4)	(5)	(6)
CBoard	0.013 (0.766)	-0.045 (0.231)	0.001 (0.989)	-0.048 (0.364)	0.034 (0.328)	-0.011 (0.760)
CBoard × HRD		0.114** (0.008)		0.079** (0.007)		0.120* (0.049)
Duality	-0.035 (0.269)	-0.065 (0.318)	-0.025 (0.433)	-0.135 (0.106)	-0.020 (0.798)	0.010 (0.925)
Duality × HRD		0.053 (0.435)		0.173† (0.051)		-0.080 (0.463)
HRD	-0.051 (0.275)	-0.132* (0.050)	-0.107 (0.480)	-0.222 (0.224)	0.033 (0.653)	0.001 (0.991)
SameIndustry	-0.065 (0.105)	-0.064 (0.129)	-0.096** (0.001)	-0.090** (0.006)	-0.021 (0.493)	-0.019 (0.565)
Private	-0.081 (0.181)	-0.081 (0.171)	-0.091 (0.303)	-0.096 (0.302)	-0.117† (0.073)	-0.112† (0.091)
Deal Value	0.078 (0.122)	0.080 (0.126)	0.025 (0.763)	0.018 (0.828)	0.105† (0.064)	0.109† (0.059)
Cash Only	0.094 (0.214)	0.094 (0.218)	0.046 (0.453)	0.046 (0.454)	0.242* (0.017)	0.243* (0.018)
Tender Offer	0.064 (0.171)	0.067 (0.163)	-0.060 (0.218)	-0.059 (0.251)	0.228** (0.003)	0.227** (0.004)
Firms Size	-0.101* (0.019)	-0.102* (0.017)	-0.095 (0.225)	-0.087 (0.290)	-0.059† (0.089)	-0.063† (0.083)
Tobin's Q	-0.030 (0.234)	-0.033 (0.223)	-0.003 (0.904)	-0.003 (0.891)	-0.057† (0.081)	-0.061† (0.072)
ROA	-0.702*** (0.001)	-0.700** (0.001)	-0.355** (0.001)	-0.336** (0.002)	-0.894*** (0.000)	-0.881*** (0.000)
Leverage	0.426* (0.023)	0.427* (0.022)	0.535 (0.166)	0.537 (0.176)	0.358** (0.001)	0.371*** (0.000)
R&D_Missing	0.020 (0.791)	0.021 (0.773)	-0.052 (0.737)	-0.048 (0.754)	0.115 (0.205)	0.115 (0.209)
BoardSize	0.026 (0.816)	0.028 (0.799)	0.127 (0.117)	0.119 (0.167)	-0.158 (0.303)	-0.170 (0.263)
Independence	-0.052 (0.843)	-0.059 (0.824)	0.207 (0.225)	0.196 (0.307)	-0.329 (0.391)	-0.326 (0.410)
CEOAge	-0.060 (0.457)	-0.033 (0.648)	-0.173 (0.118)	-0.129 (0.209)	-0.124 (0.266)	-0.128 (0.277)
Constant	0.693 (0.177)	0.634 (0.206)	1.121 (0.202)	1.037 (0.243)	0.887 (0.185)	0.932 (0.179)
Year/Industry FE	Y	Y	Y	Y	Y	Y
Observations	723	723	426	426	297	297
Adjusted R ²	0.204	0.206	0.116	0.122	0.361	0.360

†p < .10; *p < .05; **p < .01; ***p < .001.

This table estimates the relation between classified board, CEO-chairman duality, and target shareholder value. The dependent variable is 4-week target premium. Variable definitions are provided in the Appendix. The sample period covers years 2005 through 2014. All regressions control for year and industry fixed effects. p-values based on robust standard errors clustered by industry are reported in parentheses.

Table 4
Classified Boards, CEO-Chairman Duality, and Quality of Innovation

VARIABLES	Full Sample		High Competition		Low Competition	
	(1)	(2)	(3)	(4)	(5)	(6)
CBoard	0.265 (0.299)	0.007 (0.966)	0.359 (0.321)	0.109 (0.749)	0.127 (0.232)	-0.001 (0.992)
CBoard × HRD		0.502*** (0.000)		0.394* (0.031)		0.352† (0.088)
Duality	-0.127 (0.454)	0.033 (0.790)	-0.162 (0.317)	0.142 (0.534)	-0.142 (0.599)	-0.073 (0.517)
Duality × HRD		-0.308 (0.502)		-0.472 (0.344)		-0.190 (0.721)
HRD	0.071 (0.831)	-0.052 (0.809)	-0.292† (0.097)	-0.258† (0.090)	0.931** (0.002)	0.778* (0.041)
Firms Size	0.132† (0.061)	0.130† (0.050)	0.164* (0.012)	0.161* (0.012)	0.118 (0.105)	0.116 (0.115)
Tobin's Q	0.274* (0.020)	0.270* (0.022)	0.506† (0.060)	0.509† (0.053)	0.143** (0.005)	0.141* (0.014)
ROA	-0.138 (0.827)	-0.101 (0.865)	-1.216* (0.024)	-1.198* (0.029)	0.282 (0.456)	0.291 (0.388)
Leverage	-0.801** (0.001)	-0.774** (0.002)	-1.305** (0.002)	-1.357*** (0.000)	-0.295† (0.052)	-0.258 (0.167)
R&D_Missing	-0.426† (0.066)	-0.421† (0.063)	-0.701* (0.011)	-0.686** (0.007)	0.138 (0.570)	0.141 (0.583)
BoardSize	0.078 (0.344)	0.095 (0.208)	0.607* (0.032)	0.629* (0.025)	-0.742 (0.232)	-0.737 (0.268)
Independence	1.241† (0.094)	1.231† (0.077)	1.112 (0.201)	1.045 (0.217)	1.147 (0.167)	1.221 (0.152)
CEOAge	-0.869 (0.123)	-0.832 (0.172)	-1.529 (0.106)	-1.517 (0.135)	0.909 (0.327)	0.938 (0.309)
Constant	1.485 (0.214)	1.385 (0.318)	2.704 (0.286)	2.658 (0.332)	-3.982 (0.247)	-4.110 (0.233)
Year/Industry FE	Y	Y	Y	Y	Y	Y
Observations	560	560	334	334	226	226
Adjusted R ²	0.076	0.078	0.081	0.079	0.100	0.095

†p < .10; *p < .05; **p < .01; ***p < .001.

This table estimates the relation between classified board, CEO-chairman duality, and quality of innovation. The dependent variable is *Scaled_Citation*, the total number of citations a patent has received divided by the average number of citations of matched patents (patents granted in the same year and in the same technology class). When a firm is granted multiple patents in a year, we use the average of scaled citation counts for all the patents granted in that year. Variable definitions are provided in the Appendix. The sample period covers years 2005 through 2011. All regressions control for year and industry fixed effects. p-values based on robust standard errors clustered by industry are reported in parentheses.