Some Directors are More Equal than Others:
Board Social Structure as a Moderator of Elite Director Bias in Acquisition Premium
Decisions

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Acquisition premium decisions are an important consideration for value creation and firm performance. In this research tradition, the formal position of CEOs is considered an enabler of outsize influence and treated as a critical factor affecting acquisition premium decisions. In this study, I consider the possibility of board members' external network positions functioning as a basis for influence. Highly central positions enable directors to exert outsize influence on the decision. The salience of external information for acquisition premium decisions and role of directors as conduits to external network resources and information underlie this idea. I theorize that the elite director, i.e. the director with the highest network centrality on the board, exerts an outsize influence on acquisition premium decisions of the board. More specifically, I propose that the elite director's bias on acquisition premiums affect the board's acquisition premium shift. I identify cohesive and hierarchical board structures as critical for sustaining board social dynamics that counteract elite director bias. Positive affect sustained in cohesive boards and weak social integration in hierarchical boards affect the ability of elite director to assert bias. I find empirical support for the relationship between elite director bias and premium shift as well as the moderating effect of cohesive board structure on that relationship. The study contributes to the literature on outsize influence by highlighting social network characteristics as a key alternative to demographic characteristics. The study makes two key contributions to managerial practice: (1) It highlights that social positions that come with no formal title can also function as a basis for outsize influence and affect group decisions. (2) It introduces board cohesion and hierarchy as key structural considerations for director selection and board composition decisions.

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1.0 Introduction

How much of an acquisition premium to pay is a complex strategic board decision. The premium paid by an acquirer over the market value of a target firm has significant consequences on the acquirer's performance. A traditional economics perspective of premium considers it as a price discovered in the market for corporate control and researchers have focused on market related issues (Manne, 1965). These include information asymmetry between acquirers and targets and factors that limit supply and demand in the market such as takeover defenses, structure of CEO incentives, and management hubris (Haleblian, Devers, McNamara, Carpenter, & Davison, 2009; Haunschild, 1994; Sudip, Mai, & Kartik, 2002). Recent research on this topic considers acquisition premium as a group decision and researchers have applied social psychological theories such as group polarization and anchoring bias to further our understanding (Shavin, Pengcheng, & H., 2014; David H Zhu, 2013b). I draw from the extant research on outsize influence in board decisions and board social dynamics to add to this line of research (Chatterjee & Hambrick, 2007; Westphal & Zajac, 1995; Zajac & Westphal, 1996; D. H. Zhu & Chen, 2014). I theorize that elite director bias is positively related to premium shift and the relationship is negatively moderated by social cohesion among directors and hierarchical social structure within the board. I leverage the fact that social network characteristics of directors underlie the eliteness of directors and social dynamics within a board to operationalize key constructs in a novel way to test the hypothesized relationships.

Boards of directors are an important organizational safeguard against challenges to decision quality such as cognitive biases, private interests, and information complexity. Outsize influence by one or a few members of a board undermines group decision process and hurts

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decision quality and organizational performance. CEOs have generally been treated as the prime "suspects" for exercising outsize influence in the strategy and governance literature. Their advantageous formal position within an organization as both the top executives and members of boards responsible for oversight enables outsize influence behavior. Acquisition premium decisions, however, differ in the salience of external information and complexity of decision heuristics by which the information is processed. Independent directors tend to have wider access to external resources and information as well as broader exposure to varying decision heuristics. A director with superior network advantage over others on the board is in a better position to shape the flow of external information and resources and thus to exercise outsize influence on board decisions. I identify such directors as elite directors. Much like formal authority enabling CEOs' outsize influence behavior, the network eliteness of a director can enable outsize influence behavior and impact board premium decisions. Elite director bias signifies a necessary condition under which the outsize influence on premium tends to be evident and premium shift functions as a measure of outsize influence.

The term bias has been used as a key construct widely in management research to signify gender parity, cognitive biases, intergroup perception biases, and behavioral biases among managers and directors (Eisenhardt & Zbaracki, 1992; Schwenk, 1995; D. H. Zhu & Chen, 2014). I apply the word bias narrowly to reflect the magnitude and direction of divergence of elite directors' premium preference from the average preference of the rest of the board. Forecasting bias, the deviation of a firm's forecast from the observed market conditions, is closer to the use of bias in this study (Durand, 2003). All else being equal, when no director exercises any outsize influence, the actual premium paid would be a simple combination, i.e. an average, of premium preferences of all directors on the board. When the premium preference of the elite director

converges with the average preference of the rest of the board, the elite director need not exert any outsize influence to realize his or her premium preference. However, when elite director bias exists, an elite director needs to exercise outsize influence on the board decision to realize his or her preference. The actual premium paid would shift away from the average premium preference of the whole board and towards the preference of the elite director. In other words, the actual premium paid would resemble a weighted average of preference where the weights would be a function of eliteness of each director. The premium shift, i.e. the difference between actual premium paid and average preference of the board, marks the impact of the outsize influence. I hypothesize that elite director bias is positively related to premium shift.

The social structure of corporate boards is often characterized using demographic homogeneity in the corporate board literature (Jensen & Zajac, 2004; Westphal & Stern, 2006; Zajac & Westphal, 1996; David H Zhu, 2013b, 2013a). The demographic categories such as gender, social class, education, and occupation signify bases for directors' relationships with one another beyond the formal board functions (Mäs, Flache, Takács, & Jehn, 2013; Westphal & Bednar, 2005; David H Zhu, 2013b). The emphasis on the social structure can be attributed to its strong relevance for the social dynamics within the group (Burt, 2005; Friedkin, 2004; Lawler & Yoon, 1998). The social dynamics within a group affect how its members relate to one another, how the members perceive and respond to information signals from other members, and their behavior in a group decision making process. More specifically three key implicit mechanisms shaping social dynamics, a presence of positive affect, shared norms and interests, and social monitoring mechanisms, come into play when assessing the impact of structure. I extend this approach by using social network characteristics of directors to describe the social structure of boards.

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I use two different characterizations of board social structures: cohesion and hierarchy. A board has a cohesive social structure when its members are socially proximate to one another in a broader social network. Directors from proximate network neighborhoods are more likely to have positive affect for one another as they are more likely to share similar norms, values, interests, and social monitoring mechanisms. This social dynamic reduces the motivation to assert the bias. A board has a hierarchical social structure when social differentiation separating elite director and the rest of the board is very high. In other words, the board has few or no directors who rank closer to the elite director in terms of centrality in the broader network. Hierarchical boards tend to lack significant positive affect, pose conformity pressures, and leave elite directors less socially integrated. This social dynamic negatively impairs the scope for the elite director to leverage his or her eliteness. To summarize, board cohesion and hierarchy negatively moderate the relationship between elite director bias and premium shift.
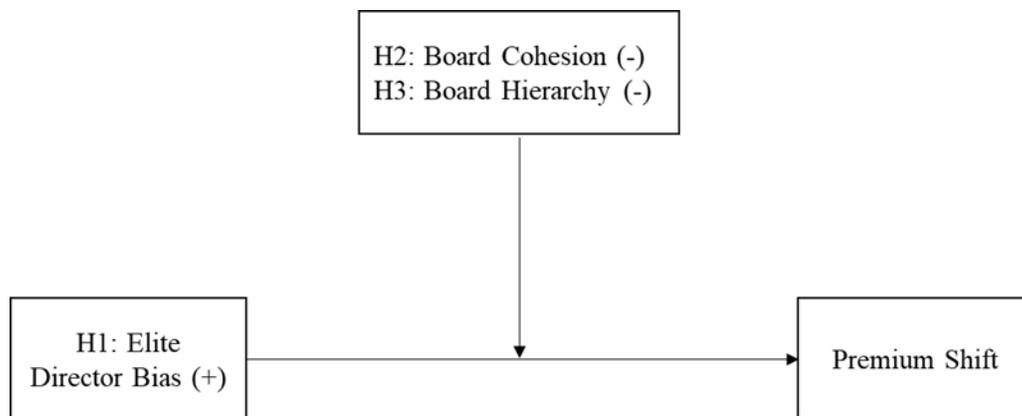
Figure 1 Relationships between elite director bias and acquisition premium decisions

This study makes three key contributions to the strategy literature. First, this study contributes to the literature on acquisition premiums by combining the traditional considerations, salience of elite actor outsize influence behavior and board social structure, to unpack the acquisition premium decision process. This has allowed the study to better account for the embedded nature of board decision making processes underlying acquisition premiums. Second, this study contributes to the research on board decisions and outsize influence by highlighting directors' ability to control the flow of network resources and information to the board as a basis of influence on board decisions. This approach complements the traditional focus on formal roles of board members and board structure as a basis of outsize influence (Dalton, Hitt, Certo, & Dalton, 2007). Third, this study adds to the emerging literature that studies the decision impact of group processes driven by social structure (Westphal & Fredrickson, 2001; Westphal & Zajac, 1995; Zajac & Westphal, 1996). This stream of research uses demographic categories as relational bases to study social structures extensively. The current study contributes to this stream of research by exemplifying a complementary approach to characterize board social structure using network characteristics. The new approach allows investigation of group processes that are more directly connected to social ties and network characteristics.

2.0 Background

Acquisitions are often considered as strategic means to secure growth, efficiency and market dominance (Haleblian et al., 2009). The premium paid by the acquirer for a M&A deal is an important determinant of who captures the value generated. Acquisition premium decisions are highly information-intensive, where information asymmetry is common and highly consequential (Peter, Lin, & H.S., 2016). Identifying the resources, including human and cultural resources, that create value in a target company and pricing their effective transfer to an acquirer requires significant levels of market, technological, and social information relevant to the target. Markets as pricing mechanisms may not be helpful as the control privileges for a specific organization and its resources are often idiosyncratic assets that suffer from market failure. The solution to the problem of pricing the control of a target with few comparable alternatives often comes down to governance safeguards that deter overpricing. Corporate boards and the role of directors in strategic decision-making process are among the most critical safeguards against overpricing and value destruction in acquisitions.

A fundamental objective of a board is to improve the quality of strategic decisions by mitigating shortcomings of individual decisions such as cognitive limitations and personal decision biases of individual decision makers. A failure to discourage the outsize influence of individuals in key strategic decisions allows personal biases to remain unchecked in board decisions. The presence of such biases in strategic governance decisions such as CEO and director selection has the potential to render the governance infrastructure of an organization itself ineffective. A number of studies have looked at the potential for such failure in corporate boards under various decision settings including strategic change, CEO and director selection, and

corporate strategy (Golden & Zajac, 2001; Westphal & Zajac, 1995; Zajac & Westphal, 1996; D. H. Zhu & Chen, 2014). Directors' formal roles and responsibilities on a board, from shaping executive compensation contracts to the approval of the deals, are aimed at ensuring quality of strategic decisions (Gaughan, 2015). A key consideration in this respect is reducing potential for outsize influence by a CEO on strategic board decisions.

CEOs are considered more likely to exercise outsize influence because of the apparent uniqueness of their formal role in the organization. The formal role of a CEO includes not only the ability to determine the strategic decisions but also the accountability for governance and oversight of the strategic decision-making process. On the other hand, the formal role of an independent director is limited to governance and oversight. This superiority of the formal role of the CEOs, in terms of control over the content of strategic decisions as well as governance, is often the rationale for treating CEOs as the default suspect for outsize influence. However, a large body of literature suggest that directors often go beyond their formal role as monitors and shape the contents of board decisions using their superior network position (Dalton, Daily, Ellstrand, & Johnson, 1998; Hillman, Withers, & Collins, 2009; J. L. Johnson, Daily, & Ellstrand, 1996; S. G. Johnson, Schnatterly, & Hill, 2012). A director's role in accessing external information and resources that lie outside the reach of managers is among the most critical functions directors perform. A number of studies have associated the network attributes of directors with wide ranging corporate decisions including acquisition premiums, securing external source of finance, entering product markets in new industries, and adopting organization and governance innovations (Davis, 1991; Haunschild, 1993; Kor & Misangyi, 2008; Krause, Semadeni, & Cannella, 2013; Mizruchi & Stearns, 1994; Pfeffer, 1972; Stearns & Mizruchi, 1993).

The observation that directors participate in board decision-making processes not only through their formal role as monitors but also through a strategic informal role as conduits to external information produces two insights. First, directors' informal role as gatekeepers for network resources may be as important as their formal role in strategic board decisions. This is particularly salient in acquisition premium decisions where access to rare information and resources that lie beyond the reach of managers is critical to avoid value destruction. The emphasis on the informal role of directors is familiar to strategy scholars (Hillman & Dalziel, 2003; Hillman et al., 2009). Recent studies that investigate the relevance of directors' social capital reflect the importance of the informal role of directors for a range of strategic decisions including organizational growth strategies and strategic organizational change (Haynes & Hillman, 2010; S. G. Johnson et al., 2012; Kor & Sundaramurthy, 2008). Second, independent directors with strong network capabilities may exercise outsize influence in acquisition premium decisions where the access to information is critical (Harris & Helfat, 2007). Though it is unconventional in strategy and corporate governance literature to focus explicitly on outsize influence of independent directors, some recent evidence does support this idea. For example, Zhu (2013b, 2013a) in his analyses of group polarization in acquisition premium and CEO compensation decisions found evidence that independent directors with expertise in the specific strategic decisions have enough sway to overcome preferences of the majority directors in boards. These observations motivate an investigation that goes beyond formal role of CEOs and directors and includes the informal role of directors as a source of decision bias.

The informal role of directors as critical conduits for information and resources from the broader social environment is a well-studied phenomenon in the resource dependence, board networks, and board capital literatures. Early resource dependence theory studies suggest that

directors' position in board interlock networks help dampen environmental and resource uncertainty surrounding organizations (Pfeffer, 1972, 1973). Studies on board interlocks support the idea that directors play a critical role in reducing uncertainty and information asymmetry (Beckman, Haunschild, & Phillips, 2004; Schoorman, Bazerman, & Atkin, 1981). The studies on board networks also support the conjecture that the information and resource access provided by the directors not only reduce uncertainty but also shape the content of the decisions (Davis, 1991; Haunschild & Beckman, 1998; Mizruchi, 1996; Westphal, Seidel, & Stewart, 2001). Recent studies on board capital have analyzed the relevance of this role in a range of corporate decisions including CEO selection, strategic change, and growth strategies (Haynes & Hillman, 2010; Hillman & Dalziel, 2003; Hillman et al., 2009; Kor & Sundaramurthy, 2008; Tian, Haleblian, & Rajagopalan, 2011).

The studies analyzing the informal role of directors as conduits of external information and resources suggest an important possibility: The network position of directors and consequent ability of directors to control the flow of external information and resources to the focal board may allow directors to go beyond their formal monitoring role and exercise outsize influence on acquisition premium decisions (Haunschild, 1994; Kor, 2006). The social network literature highlights that the centrality of individuals on a social network is closely tied to their capabilities and potential to exercise outsize influence (Burt, 2005, 2012; Ibarra, 1993; Ibarra & Andrews, 1993). I draw from this literature to claim that the centrality of the directors indicates directors' access to network information and resources and a measure of centrality provides a scale to compare the relative potential of directors to have an outsize influence in premium decisions.
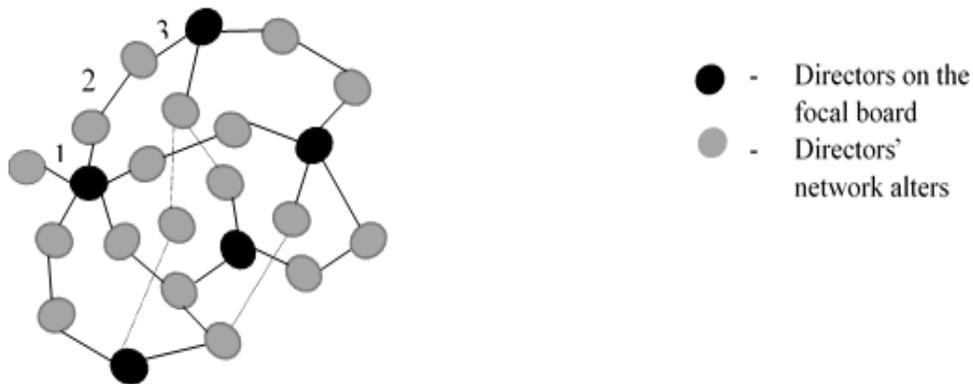
Figure 2 A stylized social network

(geodesic distance between each pair of directors on the board is three degrees)

In this study, I call the director with largest network centrality among those on the board as <u>the elite director</u> to reflect his or her information advantage over other directors on the board (See Figure 2 and Appendix A for illustrations). The elite director, much like a CEO with a superior formal position, is a plausible suspect for a source of outsize influence and potential value destruction in in premium decisions.

The network position of elite directors may enable them to engage in behaviors exhibiting outsize influence such as instrumental control of information flow, strategic manipulation of others' behaviors and strategic endorsement. Much like the superiority in formal position that enables CEO behaviors that affect quality of corporate decision making, superior network positions may enable adverse behaviors in directors. Similar to a CEO's ability to influence the flow of internal information pertaining to the board, elite directors with network advantage have the ability to influence the flow of external information coming into board. Not unlike the formal position that allows a CEO to shape monetary benefits of directors, a superior network position allows elite directors to shape non-monetary benefits such as reputation and resource access. The

key implication is that the usefulness of elite directors' network position comes at the cost of potentially neglecting other sources for outsize influence.

Traditionally, the elite directors are considered to bring better information and expertise to corporate boards and help improve decision quality. However, there are at least two key reasons why this might not be the case in acquisition decisions. First, acquisition decisions are socially complex and the prior acquisition experiences of directors need recontextualization to suit deal-specific characteristics of acquirers and targets. A combination of directors' individual experiences and collective decision making may be more helpful than the elite directors' network advantage alone. A collective decision process with no outsize influence ensures that the individual directors' experiences are appropriately recontextualized and aggregated to improve decision quality. Second, the directors' private interests may differ from the long-term value creation objective of the firms. The directors on a board receive a significant proportion of their compensation in the form of stocks and stock grants. The number of shares they own, i.e. stockholding, vary as a function of their compensation and the length of tenure on the board. The varying compensation, tenure, and stockholding could result in potentially divergent attitude among directors toward an acquisition decision. The short-term impact of the acquisition on stock price may weigh heavily on certain directors' attitude while long term value creation potential of the deal may weigh heavily on certain other directors. The elite directors may choose to use their network advantage to act on their own private interest rather than on the firm's long-term value creation objective.

The HP-Compaq acquisition of 2001 provides a general illustration of the key underlying ideas of outsize influence by elite directors. Management scholars such as Robert Burgelman, with the benefit of hindsight, suggest that the acquisition was supported by sound business logic and

yielded key benefits for HP (LaPlante, 2007) over the long term. However, at the time of the deal, it was broadly perceived as a bad decision, in spite of approval from the board, Institutional Shareholder Services, and shareholders (Tam & McWilliams, 2002). Opposition from Walter Hewlett, a high-status independent director on HP's board, drove the broader negative perception of the deal. Walter Hewlett had no executive experience and taught music at Stanford. Yet, as a scion of the founding family, he enjoyed high status within the board and high visibility among HP's stakeholders. Walter Hewlett opposed the deal after initially voting for it as a board member (Sorkin, 2001), and challenged the deal through various formal and informal means. Although the deal won eventual approval, his objection increased the perception of uncertainty related to deal closing, delayed completion, and intensified scrutiny of the company's performance and future acquisitions. This provides a striking illustration of how elite directors like Walter Hewlett could potentially impact strategic decisions in the direction of their own preference.

3.0 Theory and Hypotheses

3.1 Elite Director Bias

A prime motivator for any member of the board to exercise an outsize influence over collective decision-making process is their personal bias. To be specific, I use the term bias to refer to the divergence of an individual director's preference from that of the rest of the board. The members of a board, including the elite director and CEO, differ in their attitudes, experiences, and familiarity with acquisition transactions and their potential to create value for the firm. The differences in experiences often manifest as a range of individual premium preferences within the board. The diversity in premium experiences tends to contribute to better decision quality in collective board decision-making processes, and function as a check against the personal biases of the board members (Hambrick, Cho, & Chen, 1996). Diversity in premium experiences indicates that the acquisition premium preference of a director may vary significantly from the preferences of the rest of the board. This divergence is a critical source of personal bias and it motivates three key network enabled behaviors of directors. Bias influences what external information the directors are willing to share or withhold from the board. Bias creates scope for directors to engage in active advocacy and nudge the premium preferences of others on the board towards their own preference. Bias motivates directors to selectively endorse other directors' preferences and arguments that conform to their own preferences (Maitlis, 2004).

If directors do not differ from each other in their capacity for tactical control of information flow (Steinel, Utz, & Koning, 2010; Toma & Butera, 2009), strategic manipulation of others' preferences (Burnstein & Vinokur, 1977; Isenberg, 1986; David H Zhu, 2013b), and selective

endorsement (Asch & Guetzkow, 1951; Burnstein & Vinokur, 1977), the final premium decision should match the average premium experience of all directors. A bias-induced move by a director to withhold a specific piece of information from the board would be counteracted by another director's bias-driven introduction of counterbalancing information (Steinel et al., 2010; Toma & Butera, 2009). Attempts by two different directors with dissimilar premium experiences to persuade each other may result in mutual accommodation and a new common ground (Isenberg, 1986; David H Zhu, 2013b). When endorsements of all directors carry equal weight, the selective endorsement would fail to convince those with dissimilar premium experiences to change, and would result simply in a clustering of directors with similar experiences (Asch & Guetzkow, 1951; Burnstein & Vinokur, 1977). This implies that individual biases cancel each other out and the final premium decision would simply match the average of individual premium experiences of all directors on the board. However, when directors differ in their abilities to perform the three network enabled actions, the final premium decision would move away from the average of individual experiences. The premium shift, i.e. the difference between a final premium decision and the average premium experience of the board, would follow the bias of the director with superior capability in the three actions highlighted above (See Appendix A and Appendix B for an illustration and listing of definitions).

The premium shift is more likely to follow elite directors' biases on account of their superior network position. First, tactical control of information flow requires astute ability to anticipate the trajectory of information flow and sophisticated understanding of relationships between different pieces of information. Central positions in a network often cut across a large number of information flows in the network and enable elite directors to have high visibility into the trajectory of diverse information flows. Occupying vantage points in the network, central

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positions allow elite directors to relate information from different flows across time and space (Burt, 2010, 2012). Second, strategic manipulation of premium preferences of dissimilar others involves customized argumentation. Customized argumentation requires a breadth of information about value creation and destruction scenarios in acquisitions as well as a depth of knowledge about market, technological and social factors that affect the acquisition success. Better breadth and depth of information exposure in more central network positions can help formulate custom argumentation. Third, selective endorsement on its own does not have much sway over the final premium decision. Selective endorsement affects final premium decisions only when it functions as a signal of elite directors' preferences and when it encourages other directors with dissimilar premium experiences to change their preferences. Better visibility and status of elite directors in the broader social network confer this signal value to their selective endorsement. Thus:

Hypothesis 1: Elite director bias is positively related to acquisition premium shift in an acquisition transaction.

3.2 Board Cohesion and Hierarchy

The social structure of a board is a key factor that underlie individual behavior within the board. The cohesive and hierarchical structure of boards counteract elite director's ability to influence board decisions. The potential of these structures to counteract rests on the social dynamics they sustain. Social dynamics within a group are better understood by the prevalence of positive affect, shared norms and values, and social monitoring mechanisms. These three factors that are latent in the structure construct collectively shape the nature of relational exchanges within the board and the stability of those exchanges.

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3.2.1 Positive Affect

Any social exchange, including business transactions, involves affective contents (Lawler & Thye, 1999; Uzzi, 1997). Prevalence of positive affect in the board reduces the motivation of the elite director to act on his or her bias, while lack of positive affect among the directors makes the non-elite directors less susceptible to the elite director's instrumental use of his or her information advantage (Friedkin, 2004). Boards with higher levels of positive affect tend to be more accommodating (Høigaard, Säfvenbom, & Tønnessen, 2006). The directors on those boards may be more willing to overlook their personal biases and adopt a consensus-driven collective decision process. The elite directors in such group dynamics would be less motivated to assert their biases to avoid the risk of losing valued relationships with other directors (Lawler, Thye, & Yoon, 2000; Lawler & Yoon, 1996). Boards that lack positive affect provide difficult conditions to support stable positive interactions among directors, a prerequisite for the elite director to be able to sway collective decisions using instrumental control of information flow, custom argumentation, and selective endorsement. Lack of positive affect not only impairs the lines of communication among directors but also aggravates outgroup perceptions (Brewer, 1991, 1999). Such social dynamics may motivate non-elite directors to question the nature of the elite director's information, opinions, and endorsements.

3.2.2 Shared Values and Interests

Shared values, norms, and interests often form the basis for the collaborative relationship among individuals. Boards with a high degree of shared values, norms and interests function as a homogeneous social unit. Elite directors embedded in boards that share their values, norms, and

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interests tend to be less inclined to leverage their social differentiation (Lawler et al., 2000; Lawler & Yoon, 1996). Exercising network capabilities to influence collective decision-making process not only highlights the elite director's information advantage over other directors on the board but also the differences in interests. Elite directors may be considered deviants on boards that have mature norms and interests that are not explicitly shared by the elite directors (Brewer, 1991, 1999). Elite directors on such boards may experience significant conformity pressures that require the elite director to give up on his or her biases (Asch & Guetzkow, 1951; Burt, 2005). The salience of social identity in such contexts also indicates the possibility that the elite director may be treated as an outgroup member. Communications with those considered as outgroup member are often distorted and this limits the scope for instrumental application of elite director's ability to control information flow, engage in custom argumentation, and selectively endorse to sway collective decisions (Brewer & Gardner, 1996).

3.2.3 Social Monitoring Mechanisms

Social monitoring mechanisms are an infrastructure for social control that allows a collective to reward conforming members for good behavior and penalize deviants (Burt, 2005). The accessibility of a member through social monitoring mechanisms is important for social integration of the member with the rest of the collective. Social integration with the collective allows members of the collective to develop stable expectations about other members' behaviors and intentions and engage in useful interactions more readily. The presence of a mature social monitoring mechanism tends to lower the perceived risk in relational exchanges with other members of the collective and render the exchanges with those outside less attractive (Burt, 2005, 2010). When elite directors are embedded in boards with mature social monitoring mechanisms

and are socially integrated with rest of the board, elite directors may be less motivated to assert their personal biases that affect collective decisions (Lawler et al., 2000). The ease with which non-elite directors can sanction or ostracize elite directors using social monitoring mechanisms discourages assertion of personal biases over collective preferences. When elite directors hold onto their social differentiation and are less integrated into boards with mature social monitoring mechanisms, non-elite directors may be less receptive to information, arguments, and endorsements from the elite director (Ou et al., 2014).

3.2.4 Cohesive Boards

Cohesive boards, i.e. boards where the directors are socially closer to one another outside of the focal board, tend to have higher levels of positive affect, shared norms and interests, and social monitoring. Elite directors embedded in cohesive boards may not have the motivation or opportunity to assert his or her own biases about the acquisition premium (even if they have the ability to do so). The proximity of directors outside the focal board indicates a higher probability of contact and social exchange (Blau, 1977). Any attempt by the elite director to assert his or her own premium preferences in the board involves disruption to positive affect even outside the focal board. Proximity outside the board indicates more commonality in identities, values, and interests and more opportunity for social interaction among directors. This allows directors to build on pre-existing commonalities and socially construct more mature norms and consensus about the conduct of directors in cohesive boards (Friedkin, 2001; Rao, 1994). Shared norms and interests might mitigate the motivation to act on personal biases and interests. Social proximity is also indicative of better facility for social monitoring and ease of administering reputational rewards and sanctions that keep directors in line (Westphal & Khanna, 2003). The higher chances of social ostracization

and losing valued relationships in a cohesive board affect the relationship between elite directors' bias and premium decisions. Thus

Hypothesis 2: The effect of elite director bias on acquisition premium shift is weaker in boards where social proximity among directors is higher.

3.2.5 Hierarchical Boards

Hierarchical boards, i.e. boards with few or no directors who rank closer to the elite director in terms of network centrality, tend to lack higher levels of positive affect, pose conformity pressures, and leave elite directors less socially integrated (see Figure 3 for a stylized depiction of a hierarchical board). Non-elite directors' shared social conditions and larger social differential from the elite director strengthen the sense of shared interests among them as well as increase the perceptions of social differentiation from the elite director. The aggravated perceptions of social differentiation leave elite directors lonely at the top with reduced opportunities to develop positive affect (Ou et al., 2014). The heightened sense of shared interests and commonality among non-elite directors poses conformity pressure for the elite director. Yielding to conformity pressure often requires the elite director to give up the personal biases, whereas holding onto the differentiation would affect social integration and potential to control collective decision-making processes (Asch & Guetzkow, 1951; Burt, 2010). Besides, lack of accessibility of the elite director through social monitoring mechanisms, owing to asymmetry in network reach, also tends to aggravate the identity of the elite director as an outgroup member (Brewer, 1991, 1999; Brewer & Gardner, 1996). Insufficient social integration of the elite director with the rest of the board hampers the effect of elite director bias on acquisition premiums. Thus

Hypothesis 3: The effect of elite director bias on acquisition premium shift is weaker in more hierarchical boards.
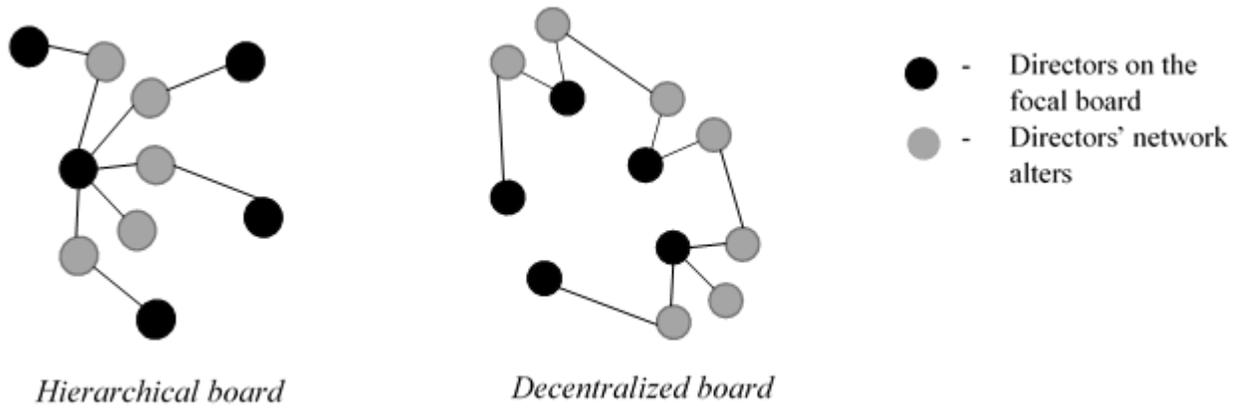

Figure 3 A Stylized depiction of board hierarchy

4.0 Data and Method

4.1 Sample and Data

The sample included acquisition premium shifts experienced by boards of the S&P 1500 firms between years 1996 and 2016. There were about 6490 domestic acquisition transactions for which premium information was available. These transactions include acquisition of public targets by private firms, stock buybacks, strategic and financial investments that involved transfer of partial control, and restructuring that involved acquisition of subsidiaries. About 1757 transactions involved an acquirer who was an S&P 1500 firm in this period, and a target who was listed in either the New York Stock Exchange or NASDAQ. I excluded transactions involving stock buybacks and acquisition of subsidiaries and joint ventures. The data pertaining to these transactions were collected from the Securities Data Corporation (SDC) database. About 874 transactions involved boards that experienced a premium shift and the rest of the transactions involved boards with directors who had no acquisition experience in the 5 years preceding the transaction year. Missing data resulted in a final sample size of about 685 acquisitions.

Data describing directorships of individuals was obtained from Institutional Shareholder Services (ISS) director database. The database lists details of directors of the firms that were part of S&P 1500 index. This includes directors' biographical information and number of shares of the focal firm they own. The social networks for each year in the sample was constructed using employment history of the directors of S&P 1500 companies available from S&P CapitalIQ database. I used a Python-based social network analysis software package called NetworkX to create the two-mode social networks (Hagberg, Schult, & Swart, 2005). The two-mode networks

comprise firms in which directors have worked in key managerial positions prior to the transaction year and other individuals who have also worked in key positions during the same time frame in those organizations. S&P Capital IQ lists about 211 different employment titles and 50 standardized titles as key executives, ranging from functional and divisional vice president to chairman.

I used string-matching software in Python called FuzzyWuzzy to match directors from the ISS database to the records obtained from the CapitalIQ database. The string-matching software provides a score based on the Levenshtein distance metric to indicate similarity of names (Vreda Pieterse and Paul E. Black, 1999). The token set ratio algorithm used in this software allows matching of names that are ordered differently, i.e. the last name first versus the first name first, spelled differently, and addressed differently, e.g. Mr. versus Dr. (SeatGeek, 2016). I wrote a computer program to first create a subset of all professionals associated with a firm and then applied the string-matching procedure to precisely match individuals from two databases. I obtained accounting data that describe firm-level characteristics from the COMPUSTAT database.

4.2 Dependent and Independent Variables

4.2.1 Premium Shift

The dependent variable, *premium shift,* was measured by the computing the difference between percentage premium paid in the focal transaction and average premium experience of the board of directors in the five years prior to the focal transaction. I used the acquisition premiums observed one week prior to the date of acquisition announcement to measure premium paid in the

focal transaction and average premium experience of directors. This window is consistent with the underlying theory that elite directors may play a salient role in price discovery aspects of acquisition decisions. The sample precludes any deals where either no premium information was available or no directors on the board were involved in any acquisition transaction in the five years prior to the transaction year.

4.2.2 Elite Director Bias

The key independent variable, *elite director bias*, was measured by computing the difference between the prior premium experience of the elite director on the focal board and prior premium experience of the rest of the directors on the board. The elite director of a board was identified by comparing the eigenvector centrality of each director on a large social network of key executives (Borgatti, Everett, & Johnson, 2013; Wasserman & Faust, 1994). Consistent with the computation of premium shift, one-day premium information was used to compute prior premium experience of the elite director and the rest of the board members. This social network was constructed by projecting a two-mode network defined by individuals and business organizations as nodes and employment affiliation that started at least one year prior to the transaction year as ties. More specifically, employment affiliations that are flagged as a key executive position by S&P CapitalIQ are considered ties in this network. CapitalIQ identifies 50 standardized titles and 211 employment titles ranging from chairman of the board to head of marketing as key executive positions within an organization. I used a Python social network analysis package, NetworkX, to assemble the two-mode network, convert the network to a single mode professional network, and compute eigenvector centrality scores (Hagberg et al., 2005).

4.2.3 Social Proximity

The first moderating factor, *social proximity*, was operationalized using a network measure called compactness (Borgatti et al., 2013, p. 154). The compactness of a board is calculated by summing the inverse of the geodesic, i.e. shortest distance, between each pair of directors on board and dividing the sum by the number of director dyads on the board. Summation of the inverse of geodesic distances, as against the geodesic distances themselves, ensures that a higher numerical value of the metric would reflect a higher value of compactness. In other words, the longer the network distance between each dyad of directors on the board, the smaller will be the value of compactness. The formal representation of compactness measure is given below; see Appendix A for illustrations.

$$compactness = \frac{\Sigma_{i \neq j}\left(1/d_{ij}\right)}{n(n-1)} \qquad \text{--- } \mathbf{1}$$

Where d_{ij} represents distance between directors i and j and n represent number of directors on the board.

I used a Python implementation for doing cross products to create a list of all possible director dyads for each board and filtered out dyads where both nodes have the same identifier. I used methods available in the NetworkX software to selectively remove the node representing the focal organization from a network object for the transaction, check for the presence of a path between two director nodes, and compute the length of the shortest path between two nodes (Hagberg et al., 2005).

4.2.4 Board Hierarchy

The second moderating factor, *board hierarchy*, was measured using a measure of dispersion in the network centrality score of directors within the focal board. The coefficient of variation, a common measure of dispersion, was used to operationalize hierarchy (Bedeian & Mossholder, 2000). Higher dispersion in the centrality score suggests that one or very few directors have very high centrality score relative to rest of the board members. Lower dispersion suggests that the centrality score of most of the directors fall in a relatively narrow range and directors are mostly comparable in terms of centrality score. The social networks and eigenvector centrality score used to identify elite directors were also used to compute a centrality score for each director on focal board. The coefficient of variation of centrality scores is computed by expressing the standard deviation among the centrality scores as a proportion of mean of scores.

4.3 Control Variables

I controlled for several factors that could account for a premium shift and elite directors' outsize influence.

4.3.1 Transaction Level

At the transaction level, I controlled for advisor effects (acquirer and target financial advisors) and for industry relatedness (whether acquirer and target industries are related). The relationships between acquirer advisors and acquirer, as intermediaries for the transaction,

creditors to acquirer with prior credit risk exposure, and lenders for transaction, provide advisors motivation and capability to move the board decision towards or away from a specific premium (Allen, Jagtiani, Peristiani, & Saunders, 2004; Chahine & Ismail, 2009; David H Zhu, 2013b). Similarly, target financial advisors have their own motivation and capacity to influence premium shift. The monetary and reputational implications of premiums in the form of fee revenues and league table rankings provide a significant motivation for investment bankers on both sides of a transaction to influence premium shift. The position of investment bankers in the deal stream and their involvement in the transaction preparation and negotiation processes provides them the ability to influence premium shift (Eccles & Crane, 1988).

4.3.2 Firm Level Control Variables

At the firm level, I controlled for size of the firm using the logarithm of the total assets, industry in which the target operates using the four-digit primary SIC of the company and relatedness of the target firm's industry to the acquirer's industry. Larger acquirers have been found to pay a relatively higher premium than their smaller counterparts and this may affect premium shift (Bargeron, Schlingemann, Stulz, & Zutter, 2008; Moeller, Schlingemann, & Stulz, 2004). Industries differ in growth and maturity, which may affect acquisition premiums. Targets in related industries may be easier to value. This may affect the salience of an elite director in the decision-making process. I use a relatedness metric that ranges from 0 to 4 based on the similarity between target and acquirer 4-digit SIC (David H Zhu, 2013b). Value 0 indicates no overlap between target and acquirer SIC. A value of 1 indicates that two companies share the first digit of the SIC; a value of 2 indicates that the first two digits are common between acquirer and target; and so on. I also controlled for the acquirer's prior acquisition experience by using the number of

public target acquisitions in the five calendar years prior to the transaction year. Habitual acquirers tend to have mature structures and processes that may limit the agency of directors in premium decisions.

4.3.3 Board Level Control Variables

At the board level, I controlled for board independence, board size, CEO duality and dispersion of stock ownership among directors as an alternate form of power structure. The traditional corporate governance variables such as board independence help account for the distribution of formal power and salience of CEOs in board decisions (Dalton et al., 2007; Hayward & Hambrick, 1997). Board size is related not only to individual power dynamics but also to group social dynamics within a board (David H Zhu, 2013b, 2013a). Boards with high levels of dispersion in stock ownership among directors tend to have one or few directors who have larger economic interests, voting power, knowledge, and influence in board collective decisions.

4.3.4 Director Level Control Variables

At the elite director level, I controlled for non-network sources of influence using dummy variables to reflect whether the elite director was the focal company's CEO. To understand the network basis for achieving influence in board decisions better, it is important to isolate and account for formal sources of influence on a board. This control variable help achieve this objective.

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4.4 Analytical Method

The observations in this study are related by a number of factors, including acquirer and target industries, acquirer and target financial advisors, acquirer firms, and directors on acquirer and target boards. The effects of these factors vary across different deals. For example, salience of deal advisors may be contingent on existence of internal deal teams and processes, while the effect of a director may be dependent on his or her relationship with the rest of the board. In other words, these variables form the random effects component of a model. The linear mixed effects modeling approach allows the specification of random effects components in conjunction with fixed effects components. Successive model comparisons using ANOVA tests are performed on an intercept-only fixed effects model. This helps more precisely specify a linear mixed effect model by reducing the number of random effect variables that do not contribute significant improvement to the explanation. I used the LME4 package in the R software environment to perform these modeling steps (Bates, Mächler, Bolker, & Walker, 2014; R Core Team, 2018).

5.0 Results

5.1 Primary Analysis

Table 1 lists descriptive statistics and correlations for key variables in the model. The bivariate correlations indicated no significant correlations between variables involving focal premium in their computation. The transactions in the sample are related are often cross-classified across a number of cross-cutting qualitative factors. I started the analysis with at least four key classification factors, namely acquirer firm, financial advisors of target firms and acquirer firms, and industry to which target firm belongs. These qualitative factors are essentially random components, and unlike fixed dummy variables, all possible levels for each factor are not represented in the sample. First, I fitted a mixed-effects model using LME4 package in the R software environment with only the intercept as the fixed effects factor and the four classification factors as random components (Bates et al., 2014). Second, I removed the component that contributed the least variance to the premium shift and refitted the model. Then I compared the two models for statistically significant differences in the variance explained using the ANOVA model comparison procedure in the LME4 package in the R language software library. Successive iterations of model fitting and comparison indicated that the inclusion of industry and firm level classification did not explain significantly more variance than the combination of target and acquirer financial advisors alone (change in log likelihood = 0.5, p = 0.770).

Table 1 Descriptive statistics and Pearson correlation coefficients

	1	2	3	4	5	6
1. Premium Shift	1.000					
2. Elite Director Bias	-0.150	1.000				
3. Social Proximity	0.062	0.006	1.000			
4. Hierarchy	-0.016	-0.013	0.034	1.000		
5. Board Independence	-0.104	0.026	-0.095	0.022	1.000	
6. Board Size	-0.020	0.023	0.226	-0.002	0.012	1.000
7. Duality	-0.055	0.030	-0.046	-0.092	0.053	0.093
8. No. of prev. Acqn.	-0.016	0.022	0.117	-0.097	-0.113	0.289
9. Stockholding Disp.	-0.008	-0.003	-0.086	-0.137	0.204	0.160
10. Percent of Stock	-0.026	0.008	0.092	0.048	-0.150	0.199
11. Log Assets	-0.055	0.006	0.084	-0.074	0.126	0.528
12. Relatedness	0.035	-0.034	0.022	0.019	-0.037	-0.087
Mean	0.96	-1.91	1.59	-5.6	0.76	11.13
S.D.	39.75	14.31	0.69	0.59	0.14	3.08

	7	8	9	10	11	12
7. Duality	1.000					
8. No. of prev. Acqn.	0.023	1.000				
9. Stockholding Disp.	0.196	0.075	1.000			
10. Percent of Stock	0.020	0.006	-0.183	1.000		
11. Log Assets	0.131	0.319	0.310	-0.008	1.000	
12. Relatedness	-0.059	0.004	-0.157	0.111	-0.068	1.000
Mean	1.68	1.346	2.049	34.64	9.111	3.35
S.D.	0.47	2.188	0.628	40.1	1.643	1.62

Table 2 presents the results for the mixed-effects model fitted with the combination of acquirer and target advisor as random components using a restricted maximum likelihood estimator (REML). The models differ only in terms of the fixed effects variables. Model 0 represents the base model with only the control variables. Model 1 involves only the main variable, elite director bias. Model 2 relates the first moderating variable, social proximity, and the interaction between elite director bias and social proximity. Model 3 analyses the effect of second moderating variable, board hierarchy, and its interaction with the elite director bias alone. Model

4 introduces the both moderating variables, hierarchy, and their interactions with elite director bias.

Table 2 Results of Primary Analysis

Variable	Model 0	Model 1	Model 2	Model 3	Model 4
Elite director bias		0.038 (0.021) †	0.063 (0.022) **	0.038 (0.021) †	0.062 (0.022) **
Board social proximity			-0.026 (0.012) *		-0.026 (0.012) *
Elite director bias * Social proximity			-0.086 (0.018) **		-0.084 (0.019) **
Hierarchy				0.002 (0.012)	0.002 (0.011)
Elite director bias * Hierarchy				-0.025 (0.028)	-0.012 (0.03)
Board independence	-0.184 (0.105) †	-0.186 (0.105) †	-0.148 (0.101)	-0.189 (0.105) †	-0.149 (0.101)
Board size	-0.005 (0.005)	-0.006 (0.005)	-0.004 (0.005)	-0.006 (0.005)	-0.004 (0.005)
Duality (dummy variable)	-0.002 (0.025)	-0.001 (0.025)	-0.005 (0.024)	-0.002 (0.025)	-0.005 (0.024)
No. of prev. Acqn.	-0.005 (0.008)	-0.005 (0.008)	-0.004 (0.008)	-0.005 (0.008)	-0.003 (0.008)
Stockholding dispersion	0.023 (0.021)	0.023 (0.021)	0.016 (0.02)	0.023 (0.021)	0.016 (0.02)
Percent of stock	-0.0 (0.0)	-0.0 (0.0)	-0.0 (0.0)	-0.0 (0.0)	-0.0 (0.0)
Log assets	0.012 (0.018)	0.012 (0.018)	0.014 (0.017)	0.012 (0.018)	0.014 (0.017)
(Intercept)	-0.084 (0.144)	-0.076 (0.143)	-0.054 (0.149)	-0.067 (0.144)	-0.05 (0.149)
−2 Residual log likelihood	601.057	597.843	578.495	597.106	578.221
Change in log likelihood		3.214†	22.562**	3.951	22.836**
N	685	685	685	685	685

†p < .10, ∗ p < .05, ∗∗ p < .01

Hypothesis 1 predicted that an elite director's bias has a positive effect on premium shift. The results of Model 1 (β = 0.038, p <0.10), Model 2 (β = 0.063, p < 0.01), Model 3 (β = 0.038, p < 0.10), and Model 4 (β = 0.062, p < 0.01) support this hypothesis. Hypothesis 2 predicted that the board social proximity weakens the effect of elite director bias. The results of Model 2 (β = -0.086, p < 0.01) and Model 4 (β = -0.084, p < 0.01) support this hypothesis. In addition, the results of Model 2 (β = -0.026, p < 0.05) and Model 4 (β = -0.026, p < 0.05) also suggest a statistically significant direct negative relationship between board social proximity and premium shift. Hypothesis 3 predicted that the board hierarchy weakens the effect of the elite director bias. The results of Model 4 (β = 0.002, p >0.10) and Model 5 (β = 0.002, p > 0.10) do not support this hypothesis.

5.2 Endogeneity Issue

Some boards, e.g., larger, more independent, and tenure diverse boards, are more likely to have elite directors whose experiences differ from the rest of the board. This represents a risk of self-selection bias in the sample. The number of distinct levels in the random effect factor i.e. number of target and acquirer financial advisors in the sample transactions made it difficult to apply a Heckman correction (Heckman, 1977). I categorized advisors using their Best Linear Unbiased Prediction (BLUP) of the dependent variable into four quartiles (Baayen & Milin, 2010). I used the categories instead of advisor identifications themselves as a qualitative variable in the model. The selection and outcome equations for the procedure are presented in equations 2 and 3. I used SampleSelection, a software library that implements Heckman procedure in R statistical software, to run the analysis (R Core Team, 2018; Toomet & Henningsen, 2008). The null

hypothesis that there is no self-selection bias and the errors are uncorrelated was not rejected (Inverse Mills ratio = -0.6726, p = 0.37). In other words, the test provides no evidence that there is a significant endogeneity concern (see Table 3 for full result).

$$Bias\ exists(dummy)$$
$$= \beta_1\ Board\ size +\ \beta_2\ Board\ Independence$$
$$+ \beta_3\ Social\ prox. + \beta_4 Hierachy + \beta_4\ Stockholding\ dispersion$$
$$+ \beta_5\ No.\ of\ prior\ acqns. + \beta_6\ Elite\ CEO(dummy)$$

--- 2

$$Premium\ shift$$
$$= \beta_1\ Board\ size +\ \beta_2\ Board\ Independence +\ \beta_3\ Elite\ CEO(dummy)$$
$$+ \beta_4\ Stockholding\ dispersion +\ \beta_5\ No.\ of\ prior\ acqns. + \beta_6\ \%\ of\ stock$$
$$+ \beta_7 \log assets +\ \beta_8\ Relatedness +\ \beta_9\ Tar.\ adv.category$$
$$+ \beta_{10}\ Acq.\ adv.category$$

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Table 3 Tobit 2 model (sample selection model) - 2-step Heckman / heckit estimation

Probit selection model:	Estimate (Std. Error)	Outcome model:	Estimate (Std. Error)
Board size	0.037 (0.022) †		
Board independence	-3.486 (0.489)**	Board independence	0.272 (2.079)
Social proximity	0.166 (0.064)*	Board size	0.029 (0.074)
Hierarchy	-0.267 (0.068)**	Elite CEO	-0.418 (0.731)
Stockholding dispersion	-0.030 (0.107)	No. of previous acquisitions	0.016 (0.078)
Elite CEO	-0.304 (0.312)	Stockholding dispersion	-0.030 (0.276)
No. of prior acquisitions	0.048	Percent of stock	-0.004 (0.003)
(Intercept)	-0.893	Log assets	-0.427 (0.275)
		Duality	-1.161 (0.441)
Inverse Mills ratio: -0.616 (p = 0.771)		(Intercept)	0.871 (1.203)
Multiple R-Squared: 0.248			
Adjusted R-Squared: 0.072		Dummies for relatedness, acquiror and target advisor categories	
†p < .10, • p < .05, •• p < .01			

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5.3 Non-independence of Sample

In traditional linear models, it is often assumed that the observations are independent of each other. The observations in this study however are related by number of factors. These include acquirer and target industries, acquirer and target financial advisors, acquirer firms, and directors on acquirer and target boards. The mixed effects model applied in the primary analysis only accounts for the most significant of those factors, namely acquirer and target financial advisors. I use a permutation test for linear models to ensure the stability of results. The permutation test is non-parametric and does not make any assumptions about data distribution. It works by permuting the outcome variable values in the given dataset to create a large number of possible datasets and assesses the probability that they resemble the data specified by the model. The random assignment of each outcome value to a different case allows modeling of data that lacks independence of observations. I used the lmPerm software package available for the R statistical software environment to perform the permutation test (R Core Team, 2018; Wheeler & Torchiano, 2010). Similar to the endogeneity tests, I used the BLUP-based categories of advisors instead of advisor identifications themselves as a qualitative variable in the model. The main effect of the premium bias (H1) was supported (Model 4: $\beta = 1.894$, $p < 0.01$). The moderating effect of the social proximity (H2) was supported (Model 4: $\beta = -0.429$, $p < 0.05$). The moderating effect of the hierarchy (H3) was partially supported (Model 4: $\beta = -0.617$, $p < 0.10$). The complete results are presented in Table 4.

Table 4 Results of permutation test of linear model

	Estimate
Elite director bias	-1.893 **
Board social proximity	-0.022
Elite director bias * Social proximity	-0.429 *
Hierarchy	-0.001
Elite director bias * Hierarchy	0.614†
Board independence	-0.189*
Board size	-0.005
Duality (dummy variable)	-0.008
No. of prev. Acqn.	-0.004
Stockholding dispersion	0.033
Percent of stock	-0.0
Log assets	0.003
Elite CEO	0.021 †
Dummies for year, industry relatedness, advisor categories	included
N	685

Adjusted R-squared: 0.068

F-statistic: 2.221**

†p < .10, ∗ p < .05, ∗∗ p < .01

5.4 Robustness Tests

The primary analysis of this study uses eigenvector centrality as a basis to identify elite director, premium bias, and hierarchy. A number of alternative centrality measures are available to identify position of individual actors in a social network, but each measure is associated with different underlying social mechanisms. To check robustness of the findings, I used degree centrality and two-step reach as alternative centrality measures. These measures of centrality are often associated with both status and information reach, the two key mechanisms that underlie the relationship between network characteristics and eliteness of the directors. The main effect of premium bias (H1) was supported in all four models in both degree centrality based analysis (Model 4: β = 2.06, $p < 0.01$) and two-step reach based analysis (Model4: β = 0.098, $p < 0.01$). The moderating effect of social proximity (H2) was partially supported in Model 2 of the degree centrality based analysis (Model 2: β = -0.527, $p < 0.10$) and not supported in the full model (Model 4: β = -0.424, $p > 0.10$). In the two-step reach based analysis, the relationship (H2) was supported in both models (Model 2: β = -0.045, $p < 0.01$, Model 4: β = -0.046, $p < 0.01$). The moderating effect of Hierarchy (H3) was partially supported in Model 3 of the degree centrality based analysis (Model 3: β = -0.901, $p < 0.10$) and not supported in Model 4 (Model 4: β = -0.745, $p < 0.10$). The relationship was not supported by either Model 3 or Model 4 in the two-step reach based analysis. The difference in the results across different centrality measures could be attributed to network characteristics being captured by the measures. Eigenvector centrality considers connectedness of each successive alter of a node and leverage broader networking data to reflect social position of the node. Degree and two-step reach immediate neighbors and neighbors that are

one step away from the focal node, respectively. The network position as captured by these two measures have less variance and reflect the node's local conditions in the network more.

The variables premium shift and premium bias are based on prior premium experiences in a 5-year window prior to the transaction date. I replicated the analysis with a 3-year window and a 7-year window. In the set of analyses with the 3-year window all three hypotheses were supported (Model 4 H1: $\beta = 0.089$ p < 0.01, H2: $\beta = -0.054$ $p < 0.05$, H3: $\beta = -0.08$ $p < 0.05$). In the set of analyses with the 7-year window, the main effect of the premium bias (H1) was not supported (Model 4: $\beta = 0.01$ p > 0.10) but the interaction effects of social proximity (H2) and the interaction effects of hierarchy (H3) are supported (Model4: $\beta = -0.048$ $p < 0.05$ and $\beta = -0.058$ $p < 0.05$ respectively). The results differ significantly across different time windows. The model using the longest window indicates weaker support for the hypothesized main relationship. This could be attributed to the fact that over a longer duration the prior premium experiences of elite and non-elite directors tend to converge as both groups go through more deals over time.

Table 5 Results of Alternate Analyses

	Two-Step reach	Degree Centrality	7 year	3 year
Elite director bias	-0.098	-2.06	-0.001	0.089
	(0.02)**	(0.395)**	(0.017)	(0.022)**
Board social proximity	-0.014	-0.006	-0.033	-0.017
	(0.012)	(0.015)	(0.014)*	(0.013)
Elite director bias * Social proximity	0.046	0.424	0.048	-0.054
	(0.017)**	(0.315)	(0.02)*	(0.024)*
Hierarchy	-0.002	-0.025	0.007	0.002
	(0.013)	(0.018)	(0.013)	(0.012)
Elite director bias * Hierarchy	0.024	-0.745	-0.058	-0.08
	(0.03)	(0.493)	(0.026)*	(0.035)*
Board independence	-0.169	-0.205	-0.122	-0.159
	(0.099†	(0.098)*	(0.119)	(0.106)
Board size	-0.006	-0.004	-0.007	-0.004
	(0.005)	(0.005)	(0.006)	(0.005)
Duality (dummy variable)	-0.014	-0.015	-0.008	-0.008
	(0.024)	(0.025)	(0.029)	(0.026)
No. of prev. Acqn.	-0.005	-0.005	-0.009	-0.003
	(0.008)	(0.008)	(0.009)	(0.008)
Stockholding dispersion	0.014	0.034	0.013	0.021
	(0.019)	(0.019)†	(0.024)	(0.021)
Percent of stock	-0.0	-0.0	-0.0	-0.0
	(0.0)	(0.0)	(0.0)	(0.0)
Log assets	0.012	0.002	0.021	0.012
	(0.017)	(0.016)	(0.02)	(0.018)
Elite CEO	0.025	-0.036	-0.018	-0.005
	(0.047)	(0.052)	(0.052)	(0.048)
(Intercept)	0.023	-0.203	-0.024	-0.077
	(0.145)	(0.063)**	(0.15)	(0.144)
N	685	685	685	685

6.0   Discussion and Conclusions

The research presented here suggests that directors who are network elites tend to possess outsize influence in acquisition premium decisions. The topic of how some board members exercise outsize influence in making collective board decisions is an important one. However, in this research tradition, analyses of outsize influence have focused on board members' formal roles – e.g., CEO. To complement this focus on formal role, I considered the possibility that directors' network position can serve as another basis for outsize roles in some strategic decisions. In my model, the elite director, i.e. the director with the highest network centrality on the board, exerts outsize influence in acquisition premium decisions of the board on account of the match between the information-intensive nature of a decision and the information advantage of the director. This outsize influence is hypothesized to be moderated by two important aspects of the board's social structure. (1) Cohesion, the extent to which the directors on the board are socially proximate to each other, diminishes the effect of elite direct bias, as hypothesized; and (2) Hierarchy, the extent to which the board is centralized around the most central director, was hypothesized to impair the effect of elite director bias. This hypothesis was supported in part.

Before discussing the contributions of the study, a note on its limitations is in order. First, the board network in this study is based on shared employer affiliation and does not take into account other forms of social ties such as friendship networks. Second, the current analysis is based on the external social network structure to which each director belongs and does not include direct intra-board ties. This limitation prevents us from studying implications of negative affect and negative ties among directors. Third, the study operationalized information advantage in a content neutral fashion. The directors with superior expertise specific to target and acquirer industries,

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technologies, and regulatory concerns may occupy relatively a less advantageous position but still wield information advantage over other directors on the board.

The theory and data presented here make three contributions. First, elite director bias has been addressed from the standpoint of formal and demographic factors; I add a critical social network dimension that has been missing from previous research. The interplay of social role and formal role in strategic decision making is an important consideration that goes beyond the extant literature, which often studies the relationship between the social roles reflected in demographic categories including race, age, gender, education, social class, and industry affiliation and formal roles of CEOs and directors. Second, in the process of unpacking the social bases of outsize influence of directors on acquisition premiums, this study adds to the literature on strategic decision making, thus contributing to the strategy, OT and corporate governance fields. Given the criticality of strategic decision making, with its implications for jobs, investments and competitiveness (corporate and national), it is important to more fully catalog the influences on such decisions. Third, the analysis is based on a large data set that brings into view the directors' extended external networks rather than immediate networks. In an increasingly interconnected world, it is imperative to take advantage of such data sets to throw light on external network influences on board decisions. Overall, this study represents another step in our evolving understanding of how social structure shapes strategy and strategy making.

The ideas presented here suggest two key contributions to managerial practice. First, the idea of elite director and the mechanisms that enable elite director outsize influence underscore a key challenge to decision quality in the strategic decision making process. The challenge is that social positions that come with no visible title can also facilitate outsize influence and affect collective decisions. The evidence from the study suggests that a strategic approach to the social

structure of decision making groups can help counteract this challenge. Second, the ideas of board cohesion and hierarchy highlight structural considerations critical for board composition and director selection. Board composition and director selection have been extensively framed and discussed using the lens of demographic diversity by boards and executive search consultants (Spencer Stuart, 2015). While demographic diversity is helpful in characterizing cognitive breadth of a board, it does not capture the potential social dynamics and influence behavior in a collective decision making situation. The evidence from this study suggests that careful observation of cohesive and hierarchical characteristics of a board would help in director and executive selection decisions.

The theory and pattern of data observed in the course of this study help identify at least three important opportunities for future research. First, future research should study the effects of intra-board ties, including negative ties among directors on boards' strategic decision making processes. This research direction is important to further our understanding of how boards function and how social processes within boards affect strategic organizational decisions and performance. Second, future research should study other strategic board decisions such as director selection and CEO succession where external information is more salient. This line of inquiry will help explain whether the external-network-based elite social positions and board social structures are relevant beyond acquisition premiums and what the pertinent theoretical boundaries are. Third, the statistical models with different centrality measures that use varying depths of network resulted in different results. A similar pattern was seen across models with different time windows. This points to the importance of time and space in networks. Future research should investigate whether distant neighbors, in terms of time and network space, are as important as closer ones for status, social and human capital, and influence of directors and managers.

Appendix A Stylized Illustration

Table 6 Elite Director Bias - An illustration

Board A

	Director 1	Director 2	Director 3	Director 4	Director 5	Degree Centrality	Prior Premium Experience
Director 1 (Elite Director)		3	3	3	3	5	25%
Director 2			3	3	3	1	15%
Director 3				3	3	1	15%
Director 4					3	1	15%
Director 5						1	15%
Board Average					$\frac{10}{10} \times \frac{1}{3} = 0.33$	1.8	17%

Board B

	Director 1	Director 2	Director 3	Director 4	Director 5	Degree Centrality	Prior Premium Experience
Director 1		2	2	2	2	1	25%
Director 2			2	2	2	1	25%
Director 3				2	2	2	25%
Director 4					2	2	25%
Director 5 (Elite Director)						3	15%
Board Average					$\frac{10}{10} \times \frac{1}{2} = 0.5$	1.8	23%

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Table 7 An Illustration of Board Hierarchy

	Board 1	Board2	Board 3	Board 4	Board 5
No. of Directors with high centrality	1	2	3	4	5
Degree Centrality of Director 1	5	5	5	5	1
Degree Centrality of Director 2	1	5	5	5	1
Degree Centrality of Director 3	1	1	5	5	2
Degree Centrality of Director 4	1	1	1	5	2
Degree Centrality of Director 5	1	1	1	1	3
Average Director Centrality	1.8	2.6	3.4	4.2	1.8
Std. Dev. Of Director Centrality	1.789	2.191	2.191	1.789	0.837
Coefficient of Variation (Std. Dev / Average)	0.994	0.843	0.644	0.426	0.465

Appendix B Key Definitions

Table 8 Table of key definitions and illustrations

(See Appendix A for details on illustrative boards A & B).

Key Definitions and Illustrations
Elite director: The director with the highest network centrality on the board. Example: Director 1 and Director 5 are the elite directors on Board A and Board B respectively.
Premium experience: The average prior acquisition premium experience of the focal director. The acquisition preferences and personal bias of directors are assumed to be influenced by the directors' premium experience. Example: The acquisition premium experiences of Director 1 are 25% and 15% on Board A and Board B respectively.
Elite director bias: The difference between the elite director's premium experience and the average premium experience of the rest of the board. Example: The values for elite director bias are 10% and -10% on Board A and Board B respectively.
Premium shift: The difference between actual premium paid and the average premium experience of the board. Example: Assuming 20% as the actual premium paid in both boards, values for the premium shift are 3% and -3% on Board A and Board B respectively.
Board social proximity: The extent to which the directors of the focal board are socially proximate to each other. Boards with lower average network distance among directors are considered more cohesive and likely to form more binding norms. Example: The values for the measure of cohesion are 0.33 and 0.5 in Board A and Board B respectively.
Board Hierarchy: The extent to which the focal board is reliant on one or very few highly central directors. A higher coefficient of variation in director centrality is indicative of reliance on fewer central directors on the board. See table 2 for illustration. Example: The values for hierarchy are 0.994 and 0.465 in Board A and Board B respectively.

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