

Undervaluation of directors in the board hierarchy: Impact on turnover of directors (and CEOs) in newly public firms

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Research summary: We examine the consequences of the formalization of the board leadership structure at IPO for board-level turnover. We introduce the concept of *director undervaluation*. It indicates the degree to which a director's qualifications based on normatively accepted criteria for board leadership are not duly reflected in his/her appointments to the board chair and committee chair positions. We find that the higher the average undervaluation of directors on the board ("board undervaluation"), the greater the turnover levels of undervalued directors. This effect is stronger when board interaction frequency is higher. We contribute to the behavioral perspective on corporate governance by introducing justice-based legitimacy as a key normative institution, and by providing a novel predictor of aggregate turnover of directors (as well as the firm's CEO).

Managerial summary: Why do outside directors exit the board? We offer a novel answer to this question in the context of newly public firms. We suggest that when directors are passed over for the board chair and committee chair positions despite having higher qualifications than their peers, they have been "undervalued," and a negative board climate is likely to develop. We find that the higher the average undervaluation of directors on the board, the higher the turnover levels of these undervalued directors. More frequent board meetings exacerbate these turnover levels. Further, these turnover effects are not restricted to undervalued directors—even the CEO is more likely to

We are grateful for the excellent guidance of our Editor Jim Westphal and the helpful reviews from our anonymous reviewers. We also thank Phanish Puranam, Kathy Eisenhardt, JT Li, Jinyu He, Wei Shen, Tim Pollock, Steve Boivie, Pavel Zhelyazkov, and Yonghoon Lee for many helpful suggestions on earlier versions of this article. Finally, we acknowledge the helpful comments we received at the Asia Management Research Consortium, Academy of Management Annual Conference, West Coast Research Symposium, and from the seminar participants at HKUST and ESSEC.

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exit. This study demonstrates the critical importance of developing a *legitimate* and *fair* board leadership structure.

KEY WORDS

board leadership structure, board of directors, hierarchy, justice, turnover

1 | INTRODUCTION

When privately owned entrepreneurial firms transition to public-listed companies, formal corporate governance issues come to the fore. A key change during the initial public offering (IPO) process is the formalization of the board leadership structure. By board leadership structure, we mean the chair of the entire board as well as the chairs of the three major committees—that is, audit, compensation, and nomination and governance. Prior to IPO, privately owned entrepreneurial firms usually have informal boards with very limited or even no leadership structures (Garg, 2014; Shen, 2003; Wasserman, 2009). In contrast, public firms are typically required by regulating authorities to have an explicit board structure, including a board chair and specific board committees that are chaired by particular outside directors (Hochberg, 2012). At IPO, then, newly public firms formally identify their board members, including both inside and outside directors and both longstanding board members and those recently recruited for the IPO event (Certo, 2003; Chen, Hambrick, & Pollock, 2008; Pollock, Chen, Jackson, & Hambrick, 2010). Similarly, they also create the board leadership structure (i.e., formal hierarchy on the board): some outside directors are appointed to the board leadership structure and so assume chair positions, while others remain as ordinary directors.¹

Prior literature recognizes that formal hierarchical structures such as board leadership structures are consequences of—and are consequential for—social systems (Fiske, 2010; Magee & Galinsky, 2008). Yet, it is also clear that not all leaders in a formal hierarchical structure are appointed to their positions based on normatively accepted criteria. History is replete with examples of formal hierarchies in corporations, governments, and society more broadly that are based on favoritism, nepotism, politicking, friendship, or simply error. But the governance literature, in general, tends to ignore this legitimacy issue for the board leadership structure. As a result, this literature implicitly assumes that the assignment of chair positions is either normatively appropriate or inconsequential for effective board functioning and board-level outcomes. We question this assumption here.

In this study, we consider the board-level consequences of a newly established board leadership structure that cannot be explained by normatively accepted factors for chair assignment. Thus, we focus on the formalization of the board leadership structure (i.e., the appointment of specific directors to the four chair positions) during the crucial transition from private to public firm that occurs during an IPO. When a director's experience, qualifications, and overall fitness according to normatively accepted criteria are high vis-à-vis fellow directors on the board but not recognized by appointments to the newly public firm's board leadership structure, the director is *undervalued*. By extension, *board undervaluation* refers to the average director undervaluation on the board, and it represents the extent to which the overall board leadership structure cannot be explained by normatively accepted criteria. Because this study considers board-level consequences, we focus on board undervaluation, the board-level aggregation of individual directors' undervaluation.

¹Only outside directors ("directors" henceforth) are eligible for committee positions and are the focus of this study.

We draw on organizational literature that speaks to the intermediate consequences (e.g., disruption, uncertainty, and climate of injustice) and overall outcomes (e.g., turnover) that may arise when organizational structures cannot be explained by factors such as merit, competence, availability, experience, and other characteristics that are normatively assumed to undergird the power, influence, and authority of formal structures. The organizational literature on normatively “explainable structures” (Fredrickson, Davis-Blake, & Sanders, 2010; Shaw, 2015; Trevor, Reilly, & Gerhart, 2012), the broader literature on procedural and distributive justice climates (Simons & Roberson, 2003), and the literature on aggregate turnover levels (e.g., Shaw & Gupta, 2007) all indicate that potentially negative outcomes, such as higher aggregate turnover, occur when organizational structures cannot be explained by normatively accepted factors.

Our focal research question asks whether board undervaluation at IPO leads to subsequent collective turnover of undervalued directors. We address this question in an analysis of 215 newly public technology-based entrepreneurial firms that went public between 2004 and 2007 in the United States. In our primary results, we find that the higher the board undervaluation, the greater the aggregate turnover levels of undervalued directors on the board. This effect is stronger when board meetings are more frequent, but it is unaffected by the presence of a founder-CEO. In our exploratory results, we also find an increase in the aggregate turnover of even accurately valued board members and the CEO when the board undervaluation is higher. More broadly, our work points to undervaluation as a force that seems to create board conflict, a climate of injustice, and overall board-level disruption, including turnover at the board level.

We make several contributions to the corporate governance literature, particularly the behavioral perspective (Westphal & Zajac, 2013). First, our work introduces *justice-based legitimacy* as a core *normative* institution in corporate governance. It explains how boards ought to make major choices, especially those related to the board leadership structure. In so doing, it complements prior behavioral research that focuses on regulatory institutions and behaviors that neutralize them, such as board independence (Westphal, 1998), escaping the scrutiny of market intermediaries (Westphal & Clement, 2008; Westphal & Graebner, 2010), and a variety of behaviors that render board monitoring less effective (e.g., Westphal & Bednar, 2005; Westphal & Khanna, 2003; Zhu, 2013).

Second, we develop a novel mechanism: *director undervaluation*. We find that the average level of director undervaluation on the board (i.e., board undervaluation) predicts the aggregate turnover levels of directors (and even the CEO). Prior research on director turnover has examined turnover of individual directors (Boivie, Graffin, & Pollock, 2012; Marcel & Cowen, 2014; Srinivasan, 2005; Withers, Corley, & Hillman, 2012) as well as aggregate turnover levels on the board (Arthaud-Day, Certo, Dalton, & Dalton, 2006; Zhu & Shen, 2016). We extend insight into the literature on turnover levels on the board by focusing on the social context and dynamics of the group. Board undervaluation influences relations among directors on the focal board by adversely affecting the board climate and engendering board conflicts, which ultimately trigger higher turnover levels for undervalued directors.

Third, our fresh focus on the entire *board leadership structure* extends behavioral research on corporate governance and formal structure beyond simply CEO duality (Finkelstein, Hambrick, & Cannella, 2009; Krause, Semadeni, & Cannella, 2014) to the entire board leadership. Moreover, we highlight the crucial transition of a private firm to public firm with its legally mandated board structures, and we demonstrate potential pitfalls during that transition. Overall, we bring a novel perspective to the corporate governance literature by examining the behavioral consequences of justice-based legitimacy when entrepreneurial firms become public-listed firms.

2 | BACKGROUND AND CONTEXT

2.1 | Board leadership structure in the IPO context

As noted above, entrepreneurial firms typically establish formal board leadership structures as they approach their IPOs in order to comply with the U.S. stock exchange rules. Prior to IPO, formal board structures are usually very limited in entrepreneurial firms and not required by regulators (Garg, 2014; Garg & Furr, 2017). As firms approach IPO, they may add new directors (Chen et al., 2008). Some directors are appointed to the board leadership structure (i.e., board chair and chairs of major committees), while others remain ordinary members of the board. These chairs lead the important process of transitioning private entrepreneurial firms into public firms (Fischer & Pollock, 2004; Jain & Kini, 2000), including navigating and complying with the complex regulatory processes that apply to public firms (Engel, Hayes, & Wang, 2007; Garg, 2013; Linck, Netter, & Yang, 2009). As one interviewee intimately involved as an advisor for numerous IPOs told us, “*Chairs are very important, and the firm takes a careful look at a wide range of factors in determining whom to pick...they affect how the firm adapts to being a public entity.*”

The primary factor associated with chair assignment is competence, which is commonly indicated by experience with public boards (He & Huang, 2011; Neff & Heidrick, 2006), involvement in board- and senior executive-level positions in prominent firms (Chen et al., 2008; Pollock et al., 2010), prior CEO experience (Linck et al., 2009), and prestigious education (Westphal & Khanna, 2003). But since the IPO period is a time of significant transformation, firms may also consider additional factors beyond competence. For example, they may attempt to appear similar to other public firms with respect to the key attributes of their board leaders (e.g., legitimating demographics) (DiMaggio & Powell, 1983; Meyer & Rowan, 1991).

Despite the importance of the board leadership structure, there are two key reasons that significant board undervaluation may exist and that directors’ experience, qualifications, or general appropriateness for chair positions may not be recognized. First, only very general regulations govern chair assignments. For example, although the audit committee must have one loosely defined “financial expert” (e.g., a former CEO who has supervised financial reporting, for example, suffices [Krishnan & Visvanathan, 2008; SEC, 2003]), the audit committee chair is not required to have an accounting or finance background. Loose regulations such as this one can create opportunities for discretion and errors.

Second, amidst the significant preparations for the IPO, many firms may not have the time to consider the finalization of the board leadership structure carefully. Since regulations allow chair declarations very close to the IPO event, firms often delay this important step. Instead, they focus on tasks that must be completed earlier even though they may be less important. A CEO interviewee described this tension: “*We needed to take care of so many things to prepare for the IPO while also running the business well.... It (chair appointments) was just lower down.*” He went on to say, “*It is important, but not urgent*” and to emphasize that it may be useful for firms to delay these decisions because “*You can get input from your experienced IPO advisors.*” Another CEO interviewee explained that their attention at this time is on selecting board members rather than making chair appointments: “*The core focus is to get the right board members together.*” Experienced board recruiters from Heidrick and Struggles (Hanson & Jadick, 2011) further corroborate this time pressure: “*The pre-IPO company lacks the luxury of time. Often, it must fill between five and nine slots with a range of knowledge and experience in just months versus years.*” The uncertainty around the precise IPO launch—the date of stock-market listing—only compounds this delay in board chair appointments. The date is often unclear even after initial listing documents are approved by the

authorities (Chen et al., 2008). Although firms may have preliminary discussions with various outside directors leading up to the IPO, announcing the new board leadership structure is often one of the last steps taken before the IPO.

This lack of specific regulation for chair appointments and the frequent lack of significant time for chair appointment decisions contribute to decisions about board leadership that are not based entirely on normatively accepted criteria for chair appointments. These decisions may also be influenced, explicitly or implicitly, by less legitimate or even illegitimate factors, such as politicking, nepotism, friendship, and other forms of favoritism (Bilimoria & Piderit, 1994; Kesner, 1988; Peterson & Philpot, 2007). As in other settings (Shaw, Gupta, & Delery, 2002; Trevor et al., 2012), there is likely to be variation across newly public firms in terms of the extent to which normatively accepted attributes of directors can explain board leadership structure. And thus, board undervaluation exists.

In this study, we explore board undervaluation and its links to the turnover levels of outside directors. The growing literature on director turnover provides background for our study. Some of this work centers on the turnover of individual directors (Boivie et al., 2012; Cowen & Marcel, 2011; Marcel & Cowen, 2014; Withers et al., 2012). Marcel and Cowen (2014) find, for example, that financial restatement by firms is likely to trigger the exit of individual directors. Similarly, Boivie et al. (2012) observe that firm variables such as status and director variables such as busyness explain the exit of individual directors. More broadly, other work examines collective turnover of directors and so considers how board-level factors may influence churn. This is our focus. For example, Arthaud-Day et al. (2006) explore the board-level disruption that is triggered by the restatement of financial results among public U.S. firms between 1997 and 2002. These firms, they find, are more likely to experience turnover of directors than their counterparts in a set of control firms. Zhu and Shen (2016) examine conflict at the board level. They find that new CEOs who have less experience with diverse boards can trigger board-level conflict that, in turn, drives directors' exit. We build on this growing literature by arguing that board undervaluation, the average mismatch between directors' normatively accepted qualifications and their appointments to board leadership positions, may create board-level disruption and lead to higher turnover levels of undervalued directors. Thus, we emphasize that the social dynamics of the board are likely to play a central role in director turnover levels.

An underlying assumption of our theoretical argument is that most directors prefer chair appointments. Because directors' contracts are typically identical, including compensation (Boivie, Bednar, & Barker, 2015; Chen et al., 2008), chair appointments are the primary means of differentiating power and status on the board. In addition, directors are likely to have few concerns about personal liability from chair responsibilities because they obtain firm-sponsored directors' insurance and are rarely liable for damages even in out-of-court settlements (Klausner, Hegland, & Goforth, 2013). Our field interviews corroborate that directors are generally interested in chair positions. As a prominent board recruiter stated, "*They [outside directors who serve on IPO boards] usually like these chair positions. These guys typically tend to be individuals who like power and influence. So, these chair positions certainly make them feel good. Yes, there is a bit of extra work associated with being a chair of any sort, but it is not that much extra really. There is also support staff and other resources available to make it easier for them.*" Thus, prior research and interview insights support the assumption that outside directors likely prefer to have chair appointments.

3 | THEORY AND HYPOTHESES

Shaw et al.'s (2002) theory of explainable structures suggests that a major factor in the effective functioning of organizations is whether decision makers are able to provide a normatively accepted

defense for the distribution of important outcomes for their employees, customers, and other organizational constituents. This theme is reflected in several literature streams, such as the equity and organizational justice streams in psychology and organizational behavior (e.g., Adams, 1965; Colquitt, Conlon, Wesson, Porter, & Ng, 2001) and in institutional accounts of legitimacy (Meyer & Rowan, 1991; Suchman, 1995). For example, Meyer and Rowan (1991, p. 50) note that decision makers need to provide "*acceptable legitimized accounts of their activities*" to avoid being "*vulnerable to claims that they are negligent, irrational, or unnecessary.*" Likewise, Suchman (1995) echoes this theme in procedural legitimacy whereby organizations employ normatively accepted mechanisms for determining outcomes in order to engender positive value and achieve important ends.

Although Shaw et al.'s (2002) theory concerning legitimacy and justice of organizational structures included aggregate reactions of lower-level employees (truckers and concrete plant employees) to organizational pay structures, the general theory is broadly applicable. It suggests that when outcomes can be explained by legitimate or normatively accepted factors, the organizational entity will experience several collective justice- and productivity-enhancing outcomes. When outcomes cannot be explained by normatively accepted factors, however, other less legitimate factors such as politics, nepotism, and favoritism are seen as the drivers of decisions and outcomes. It is then more difficult for decision makers to provide legitimized accounts of their choices and to justify their outcomes. Shaw et al. (2002, p. 508) highlight the importance of basing organizational structures "*on legitimate grounds,*" indicating that an explainable justification "*may be more acceptable than inconsistency accompanied by no legitimate justification.*"

Our research context is the board leadership structure in firms at IPO. Consistent with the organizational-level studies that bring together justice and legitimacy explanations (Shaw et al., 2002), we argue that board undervaluation relates to the turnover levels of outside directors. As defined earlier, board undervaluation refers to the board-level aggregation (average) of the undervaluation of individual directors on the board. Director undervaluation occurs when a director's chair appointments are not explained by normatively accepted or legitimate factors for determining such positions. These factors include the quality and variety of a director's experience on boards or as CEO, tenure on the focal board, and education. To the extent that directors have normatively accepted attributes but are not appointed to the board leadership structure (i.e., the board chair or a committee chair position), director undervaluation—and, by extension, board undervaluation—occurs.²

Our theoretical model argues that greater board undervaluation increases turnover via several affective and cognitive mechanisms. First, since board undervaluation arises from unexplainable structure (i.e., that which cannot be understood by normatively accepted criteria), it fosters a climate of injustice within boards, a factor that weakens commitment and increases turnover (Roberson, 2006; Simons & Roberson, 2003). When a climate of injustice exists, groups affected by the injustice not only experience dissatisfaction, but also tend to act collectively in terms of effort reduction, sabotage, and skepticism (Colquitt et al., 2001; Skarlicki & Folger, 1997). These reactions, in turn, create unease within the entity and, ultimately, lead to higher turnover rates (Shaw, Dineen, Fang, & Vellella, 2009; also see Hom, Lee, Shaw, & Hausknecht, 2017 for an exhaustive review).

Second, a climate of injustice within the board can also trigger a downward spiral of conflicts and incivility (Andersson & Pearson, 1999). Undervalued directors may express their dissatisfaction by challenging the formal hierarchy, thereby creating conflicts with others (Bendersky & Hays,

²We thank an anonymous reviewer for noting that there can be other sources of undervaluation, such as a lack of appreciation for directors' contributions. We focus on the board leadership structure because it provides a well-grounded and accurate measure of the undervaluation concept.

2012) and further disrupting the board (Zhu & Shen, 2016). Moreover, such breaches of decorum (Lorsch & MacIver, 1989) can lead to the social alienation of undervalued directors (Westphal & Khanna, 2003) and ultimately to their turnover. These directors may choose to leave or may not be reappointed (Zhu & Shen, 2016).

Third, board undervaluation creates uncertainty (Shaw et al., 2009). When chair appointments are not reliably predicted by normatively accepted factors, directors (particularly those who are undervalued) may come to believe that they will be unable to affect positive change, receive recognition for their accomplishments, and eventually move into the board leadership structure. These beliefs create a calculative force for turnover (Maertz & Griffeth, 2004) that may further weaken directors' beliefs in the legitimacy of the board leadership structure and in the financial prospects of the newly public firm. Thus, board undervaluation is likely to generate a clouded line-of-sight between directors' efforts, decisions, and outcomes. To summarize, extending Shaw et al.'s (2002) theoretical arguments regarding reactions to explainable structures and related arguments on justice (Roberson, 2006; Simons & Roberson, 2003) and institutional legitimacy (Suchman, 1995; Sudababy, Bitektine, & Haack, 2017), we propose a positive relationship between board undervaluation and the turnover levels of undervalued directors. Formally:

Hypothesis 1 (H1): The higher the board undervaluation, the greater the turnover levels of undervalued directors.

3.1 | Exacerbating effects—interaction frequency and founder-CEO

Our theoretical model also suggests two potential moderators of the main effect of board undervaluation on turnover levels. The first is the frequency of board interactions. Board meetings are the primary forum in which all board members interact to work on significant strategic issues and operational matters (Forbes & Milliken, 1999; Garg & Eisenhardt, 2017; Tugle, Schnatterly, & Johnson, 2010). A higher frequency of board meetings has two effects. First, board meetings remind directors of the unjustified board leadership structure, triggering rumination. Second, they provide opportunities for social sharing and enacting negative, conflictual, and uncooperative behaviors. Although the social sharing and collective rumination afforded by frequent board meetings may be helpful in the short term (e.g., by enabling board members to release negative emotions), they may also strengthen the attention that directors pay to injustice (e.g., Haggard, Robert, & Rose, 2011). These opportunities, then, are likely to exacerbate the effects of undervaluation on the turnover levels of undervalued directors.

Frequent board meetings also signal greater task interdependence, and the effects of board undervaluation on turnover levels are likely to be accentuated in this context. For example, Shaw et al. (2002) find that when workgroups are highly interdependent (as in public firm boards), the negative effects of variation in pay structures that cannot be explained by normatively accepted criteria are intensified. Consistent with this work, Trevor et al. (2012) also find that the negative effects of unexplainable structure occur in the highly interdependent context of hockey teams.

Finally, more frequent meetings generate more opportunities for undervalued directors to challenge the hierarchy, engage in new conflicts, and intensify existing ones, thus increasing overall conflict and the turnover levels of undervalued directors. Overall, board meetings are a periodic reminder for undervalued directors of their inferior formal position within the board and the inexplicability of that position based on normatively accepted or legitimated factors. Thus:

Hypothesis 2 (H2): The greater the frequency of board meetings, the stronger the positive effect of aggregate director undervaluation on the turnover levels of undervalued directors.

The presence of a founder-CEO is also likely to moderate the relationship between board undervaluation and the turnover of undervalued directors. Given that founder-CEOs are usually the primary source of the initial and now (with an IPO) successful vision of the organizations, founder-CEOs often are perceived to have and do have significant control over their organizations. Since most founders of entrepreneurial firms relinquish their CEO position significantly before the IPO (Baker & Gompers, 2003; Hochberg, 2012), founder-CEOs who remain at the IPO are likely to be particularly powerful. Investors, in particular, are likely to view these founder-CEOs very positively when they are present at the IPO, as they believe that such CEOs have stronger commitments to their firms than non-founder CEOs (Certo, Covin, Daily, & Dalton, 2001; Nelson, 2003). And within the firm, founder-CEOs are often highly respected and storied as the visionaries who led their firms to the rare achievement of IPO. The media reinforces this view by frequently associating the newly public firm with the CEO (e.g., Facebook with Mark Zuckerberg, Tesla with Elon Musk). Overall, it is likely that founder-CEOs at IPO have and are perceived to have a stronger influence than nonfounder CEOs on the board leadership structure.

These arguments suggest that when a founder-CEO is present, directors are likely to believe that the founder-CEO was very influential in deciding the board leadership structure. Thus, board undervaluation is likely to signal to directors (especially undervalued directors) the CEO's strong preferences for certain directors—even when those preferences are more linked to nepotism, biases, and favoritism than to normatively accepted (i.e., legitimate) criteria for chair positions. Under this board climate of injustice, undervalued directors may see little prospect of creating positive change, receiving recognition for their advice, and advancing into the board leadership structure. And given the high regard that founder-CEOs in newly public firms often command from investors, employees, and market intermediaries, these CEOs are especially unlikely to be replaced, potentially further exacerbating the link between undervaluation and turnover levels as undervalued directors see little possibility for change.³ Thus:

Hypothesis 3 (H3): Founder-CEO strengthens the positive effect of board undervaluation on the turnover levels of undervalued directors.

4 | METHOD

4.1 | Sample and data collection

Our sample includes IPOs issued between 2004 and 2007 in the United States in high-technology industries. Following prior studies on high-technology industries (e.g., Katila, Rosenberger, & Eisenhardt, 2008), we focus on biotechnology, computer, semiconductor, medical device, telecommunication, the Internet, and health care. These industries were active in IPO markets in the study period and thus provide sufficient observations for our study. Our arguments, however, are not specific to high technology industries.

We constructed the sample from the Securities Data Corporation (SDC) Global New Issues database, and we collected data from firms' prospectuses (Form 424B), the Boardex, COMPUSTAT and CRSP databases. To remove noise in the potential drivers of turnover levels and improve

³We thank an anonymous reviewer for this helpful observation that founder-CEOs are shielded.

comparability in sample firms, we excluded foreign firms that issued shares in the U.S. market (Chen et al., 2008; Pollock & Rindova, 2003) and firms that were delisted within 3 years after the IPO. In total, we have 215 IPO firms in our analysis. We also conducted 11 interviews with CEOs, board members, board recruiters, and other service providers for firms undergoing IPOs. The key purpose of these interviews was to gain insights to refine our assumptions and our analysis of the board structuring process and the motivations and behaviors of board members at IPO. Representative quotes from these interviews are included throughout the article.

4.2 | Dependent variable: Turnover levels of undervalued directors

Turnover levels of undervalued directors are the count of undervalued directors who were on the board at IPO and exited the focal firm within 3 years post-IPO. A 3-year window has been used frequently in prior corporate governance studies (Boivie et al., 2012; Zhang, 2008; Zhu & Shen, 2016). We determine the exit dates from proxy statements, annual reports, and the Boardex database, and we triangulate across these sources when possible.

As in prior corporate governance research on turnover (Hambrick & Cannella, 1993; Zhu & Shen, 2016), our assessment of turnover levels does not distinguish between voluntary turnover (quits) and involuntary turnover (discharges). Since there is little public information available on the precise reasons for departures, we are unable to code these measures accurately. Distinguishing between quits and discharges is frequently difficult, and employee turnover researchers have grappled with this issue for many years (Park & Shaw, 2013). Recent evidence, however, shows very strong intercorrelations between measures of total turnover and quits, and meta-analytic evidence frequently shows substantively identical patterns of findings with correlates of total turnover and quit rates (Heavey, Holwerda, & Hausknecht, 2013; Park & Shaw, 2013). Furthermore, the theorizing we outlined above—legitimacy-based reactions to a situation of board undervaluation—suggests mechanisms (injustice climate, conflicts, and uncertainty) that would result in a higher likelihood of voluntary *and* involuntary turnover. We return to these issues in the Discussion.

4.3 | Independent variables

4.3.1 | Board undervaluation

To determine board undervaluation (a board-level variable), we first construct the chair appointment equation at the individual outside director-level at IPO [see Equation (1) below]. After calculating undervaluation at the individual director level, we aggregate it to the board level by taking the average of the individual-level undervaluation of undervalued directors. This average value represents board undervaluation. Since only outside directors are qualified for committee chairs, and they are also qualified for board chair, the following equation (and subsequent analysis in the article) focuses only on outside directors.

$$\begin{aligned}
 \text{Chair appointment} = & \beta_0 + \beta_1 * \text{Number of concurrent public boards} + \beta_2 * \text{Number of past public boards} \\
 & + \beta_3 * \text{Past CEO experience} + \beta_4 * \text{Active CEO} + \beta_5 * \text{Prominent board experience} \\
 & + \beta_6 * \text{Prominent executive experience} + \beta_7 * \text{Elite school} + \beta_8 * \text{Director tenure} \\
 & + \beta_9 * \text{Director age} + \beta_{10} * \text{Director education degree} + \beta_{11} * \text{Operation and Engineering background} \\
 & + \beta_{12} * \text{Marketing and sales background} + \beta_{13} * \text{Financial expert dummy} + \text{Firm dummy}_i + \text{Residual}
 \end{aligned} \tag{1}$$

The degree of undervaluation or overvaluation was measured by taking the residuals from Equation (1). Prior studies have frequently used the residual approach to construct independent variables (Carpenter & Sanders, 2002; Harder, 1992; Trevor & Wazeter, 2006; Wade, O'Reilly, & Pollock, 2006). We calculate the residuals as the difference between the true value and the predicted value of the dependent variable from the above Equation (1), and the residual measures the part of the chair appointment that cannot be explained by the characteristics of outside directors. Negative residuals measure the degree to which an outside director's chair appointment is below that predicted by his/her characteristics and thus indicate undervaluation; positive residuals measure the degree to which an outside director's chair appointment is higher than his/her characteristics can explain and thus indicate overvaluation. Within a board, there are both outside directors with negative residuals and those with positive residuals. Following prior studies (Carpenter & Sanders, 2002; Wade et al., 2006), we use spline functions to construct measures of undervaluation and overvaluation. That is, we set undervaluation as the value of the residuals when the residuals are negative and as zero when they are positive; we set overvaluation as the value of the residuals when the residuals are positive and as zero when they are negative.

We now explain the left-hand-side and right-hand-side variables in Equation (1). For the left-hand-side variable *chair appointment*, we focus on four chair positions in a board: board chair, audit committee chair, compensation committee chair, and nomination and corporate governance committee chair. We calculate chair appointment as the fraction of the number of chair positions an individual outside director holds divided by the total number of chair positions on the board and use Tobit estimator.⁴

As we assume that deserving outside directors are first and foremost concerned about receiving chair appointments (the primary differentiator among outside directors), we do not distinguish among the four chairs in our analysis. Academic literature offers limited guidance to assess the hierarchy among various chairs, but we recognize that certain chairs, for example, the overall board chair, may be different from other chairs in importance. To explore this issue, we conducted a robustness check where we exclude each chair at one time and only include the remaining chair positions in our operationalization of chair appointment. We find the same results. This analysis suggests that although there may be hierarchy among various chairs, our results are not driven by the importance attached to any particular chair position.

Right-hand-side variables in Equation (1): since there is no prior work examining the predictors of chair appointments, we try to be comprehensive by including the possible predictors indicated by related research or pointed out by at least two of our interviewees. Our assumption is that the firms and directors both expect the most qualified directors to be appointed as chairs. Advisory firms also suggest this approach to chair appointments. Accordingly, the variables we consider on the right side of Equation (1) largely capture an outside director's key qualifications, including competence, busyness (e.g., active CEO and concurrent boards partially help capture busyness), and demographic characteristics. The value of public board experience has become even more pronounced since the passage of the Sarbanes-Oxley Act of 2002 (He & Huang, 2011; Neff & Heidrick, 2006). Corroborating this, senior executives at Heidrick and Struggles, a major board recruiting firm, stated: "*a premium is put on recruiting directors [at IPO] who have previous board experience and who understand how public companies work*" (Hanson & Jadick, 2011). In order to incorporate this factor, we include the number of public boards an outside director concurrently holds excluding the focal board (He & Huang, 2011), the number of public boards an outside director held before

⁴NYSE requires all three committees but NASDAQ requires only the audit and compensation committees. Nonetheless, 93% of firms in our sample, comprised of firms listed on one of the two exchanges, had all three committees. Empirically, we account for the number of committees present on any given board.

joining the focal board, and dummy variables indicating past and concurrent CEO experience separately. These formative measures capture outside directors' competence, and the concurrent board number and active CEO experience also help capture their busyness (Boivie et al., 2012; He & Huang, 2011).

Because directors' competence may also be reflected in the prominence of their experience (Chen et al., 2008), we include a dummy variable indicating directorship at prominent firms (S&P 500 firms) and another dummy variable indicating employment at prominent firms (vice president or above in S&P 500 firms). Elite education is also typically considered to be an indicator of competence (Westphal & Khanna, 2003), and we include a dummy variable indicating education at elite schools (e.g., Finkelstein, 1992). In addition, as advised by our interviewees, we include tenure measured as the number of years between when an outside director joined the focal firm and the IPO because newer directors are often brought in for their competence and to signal the firm's legitimacy (Certo, 2003; Pollock et al., 2010).

Moreover, to appear more legitimate at IPO, firms may also consider directors' demographic characteristics in these decisions and seek to look similar to other established firms in the sector (DiMaggio & Powell, 1983). Demographic considerations have long been recognized to matter in board committees (Bilimoria & Piderit, 1994; Kesner, 1988; Zhu, Shen, & Hillman, 2014), including those of technology firms (Fenwick and West, 2013). We include outside director's age coded in years at the time of IPO. The education degree is coded as 3 for a PhD, 2 for a master's, 1 for a bachelor's, and 0 if s/he does not have a bachelor's degree. A director's professional background may also be important for chair appointment decisions. Following prior research (Westphal & Zajac, 1995), we include two dummy variables indicating operation and engineering background, and marketing and sales background, respectively. Furthermore, to address the requirement that the audit committee needs a member to be a financial expert, we include a dummy indicating if an outside director is a financial expert, assuming that financial expertise may affect chair appointments. Finally, firm-specific characteristics may also play a role in chair appointment choices. To account for the firm-specific differences, we include firm dummies. Our results are robust to the bootstrapped or robust standard errors.

In a robustness check, for each right-hand-side variable Equation (1), we subtract the average value of the peers in the same board from the focal director's value to obtain the relative value for the focal director on each variable. This approach helps capture the deviations of a director from other directors along each variable and thus gets at peer comparison on the board more directly. We get the same results with this approach.

4.4 | Moderators

4.4.1 | Frequency of board meetings

We measure the frequency of board meetings as the average number of board meetings from the IPO year to the third year post-IPO. Average frequency across 3 years is more appropriate for our study than the frequency of meetings in a particular year. First, a firm may have more frequent board meetings than usual in the IPO year to prepare for the IPO. The average frequency of board meetings over the three-year period, then, mitigates the noise we would see in the frequency for just the IPO year. Second, director turnover is more likely to be a reaction to the board climate over time, so the average frequency of board meetings over 3 years better captures this phenomenon. We collect board meeting data from firm prospectuses and annual reports. (We also tested if frequency of board meetings *mediates* the relationship between board undervaluation and turnover levels of

undervalued directors, but we find no evidence for mediation. See the section below on Alternative Explanations for further discussion.)

4.4.2 | Founder-CEO

Founder-CEO is coded as 1 if the CEO is also the founder of the firm; if not, it is coded as 0. The data were collected from the firm prospectuses.

4.5 | Control variables

4.5.1 | Director characteristics

Directors who join a firm during the focal CEO's tenure are more loyal to the focal CEO (e.g., Wade, O'Reilly, & Chandratat, 1990). When directors join in the CEO's tenure, they need the CEO's support. In addition, CEOs may prefer directors who are similar to them demographically or functionally, which suggests sympathy and also loyalty (e.g., Westphal & Zajac, 1995). Thus, we control for the fraction of outside directors who joined the firm during the focal CEO's tenure. We also include the number of undervalued directors on the board to address the potential concern that it may be the number of undervalued directors that matters rather than the degree of undervaluation. The number of other external board seats that undervalued directors have at the time of exit may also affect their decisions to stay vs. exit, so we control for the average number of such seats at the time of exit for undervalued directors.

4.5.2 | CEO characteristics

CEOs' experience in working with boards may have an impact on the turnover of undervalued directors. We control for the number of boards excluding that of the focal firm on which the CEO has served. We also include a dummy variable indicating if the CEO has been a CEO before. In addition, since CEOs' age can help capture their overall level of experience and has been studied extensively (Cannella & Shen, 2001; Ocasio, 1994; Puffer & Weintrop, 1991), we control for it, as well. CEOs' power can also influence their interaction with the board and possibly director turnover (Finkelstein et al., 2009). We control for proxy sources of CEO power such as CEO duality (1 if the CEO is also the board chair and 0 otherwise; Finkelstein & D'aveni, 1994), CEO tenure (in years; Buchholtz, Ribbens, & Houle, 2003; Wiersema & Zhang, 2011), and CEO ownership (the proportion of a firm's outstanding shares owned by the CEO; Boeker, 1992; Wiersema & Zhang, 2011). We also control for CEO gender (1 for female, 0 otherwise).

4.5.3 | Firm characteristics

It has been suggested that venture capital firms significantly affect post-IPO performance (Acharya & Pollock, 2013; Jain & Kini, 1994) and hence possibly director turnover. We construct a dummy variable - venture-capitalist (VC)-backed - coded as 1 if the firm receives financial backing from a VC prior to the IPO and 0 otherwise. Firm performance may be an important predictor of director turnover. To tease out the performance effect, we controlled for the average return on assets (ROA) from the IPO year to the third year post-IPO. To control for possible IPO size effect, we control for the total proceeds (logged) raised at the IPO (Acharya & Pollock, 2013). We also include firm age and the average number of employees from IPO year to the third year post-IPO to control for firm size effect (Acharya & Pollock, 2013). To control for possible year effects and industry effects, we include IPO year dummies and industry dummies in the regression.

TABLE 1 Descriptive statistics and correlations

Variables	Mean	S.D.	1	2	3	4	5	6	7	8
1 Director turnover levels	0.67	0.87								
2 Board Undervaluation	0.66	0.26	0.15							
3 Frequency of board meeting	8.87	2.65	0.03	0.02						
4 Founder CEO	0.37	0.48	-0.24	0.03	-0.05					
5 Avg ROA	-0.17	0.38	-0.03	0.03	-0.06	0.00				
6 No. undervalued dirs	2.46	1.1	0.44	0.17	0.00	-0.19	0.07			
7 No. boards at exit	0.69	0.76	-0.04	-0.09	0.11	-0.03	-0.04	0.00		
8 Fraction outside dirs join after CEO	0.71	0.3	-0.08	0.06	-0.06	0.47	0.10	-0.03	0.01	
9 CEO board experience	2.15	1.76	0.05	-0.05	0.11	-0.08	-0.17	-0.12	0.07	0.04
10 Repeat CEO	0.31	0.46	0.01	-0.06	0.11	-0.12	-0.25	-0.06	0.09	-0.07
11 CEO age	49.06	7.67	0.04	0.01	0.00	-0.18	-0.08	0.03	-0.02	-0.06
12 Female CEO	0.03	0.17	0.00	-0.03	0.12	-0.01	-0.01	0.01	0.13	0.00
13 CEO tenure	5.85	4.25	-0.08	0.09	-0.12	0.42	0.19	0.07	-0.04	0.47
14 CEO duality	0.43	0.5	-0.15	-0.11	0.04	0.29	0.00	-0.36	-0.02	0.29
15 CEO ownership	0.09	0.14	-0.05	0.07	-0.15	0.20	-0.15	-0.04	-0.02	0.22
16 Avg no. employees	1.07	3.26	-0.05	-0.04	0.06	-0.01	0.13	-0.02	0.05	-0.04
17 Firm age	10.15	8.14	-0.08	0.02	-0.08	-0.17	0.29	-0.01	-0.05	0.05
18 VC-backed	0.71	0.45	-0.01	-0.07	0.10	0.12	-0.07	0.00	0.04	-0.13
19 IPO proceeds	4.31	0.84	-0.06	-0.10	0.10	-0.03	0.35	0.06	0.12	0.03
Variables	9	10	11	12	13	14	15	16	17	18
10 Repeat CEO	0.27									
11 CEO age	0.23	0.18								
12 Female CEO	0.07	0.01	0.08							
13 CEO tenure	-0.09	-0.27	-0.01	0.05						
14 CEO duality	0.24	0.14	0.05	-0.03	0.23					
15 CEO ownership	0.01	-0.03	-0.06	-0.06	0.31	0.25				
16 Avg # employees	0.10	-0.06	0.12	0.02	0.01	0.07	-0.03			
17 Firm age	-0.04	-0.04	0.21	-0.05	0.33	0.01	0.04	0.27		
18 VC-backed	0.10	0.00	-0.08	0.04	-0.13	-0.04	-0.10	-0.19	-0.33	
19 IPO proceeds	0.00	-0.06	0.14	0.05	0.10	0.03	-0.12	0.32	0.30	-0.06

N = 215.

Note. ROA = return on assets; IPO = initial public offering; VC-backed = venture-capitalist-backed

5 | RESULTS

Table 1 provides the descriptive statistics and correlation matrix for all key variables. IPO and industry dummies are included in our analyses but not reported in the descriptive statistics. Table 1 shows that on average 0.67 undervalued directors exit the firm within three years after the IPO. Within three years post-IPO, firms on average have 8.87 board meetings each year. And 37% of the CEOs are founder-CEOs.

Table 2 reports the summary statistics for the variables in Equation (1), and Table 3 reports the analysis predicting the chair appointment. In Model 1 of Table 3, as expected, the coefficients of

TABLE 2 Summary statistics for chair appointment model

Variable		Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Chair appointment	0.15	0.16													
2	No. concurrent boards	1.76	1.41	0.09												
3	No. prior boards	2.31	2.83	0.08	0.30											
4	Past CEO experience	0.32	0.47	0.08	0.11	0.18										
5	Active CEO	0.12	0.33	0.01	0.03	0.02	0.54									
6	Prominent board	0.11	0.31	0.10	0.28	0.32	0.10	-0.01								
7	Prominent employment	0.07	0.26	0.05	0.00	0.03	0.05	0.02	0.15							
8	Education degree	2.04	0.82	-0.06	0.14	0.10	-0.07	-0.04	0.06	-0.04						
9	Elite school	0.49	0.50	-0.01	0.06	0.12	-0.15	-0.09	0.01	-0.04	0.31					
10	Director age	53.36	9.74	0.11	0.18	0.22	0.20	0.07	0.25	0.08	0.03	-0.18				
11	Director tenure	3.42	3.46	-0.01	-0.11	0.04	-0.02	-0.06	-0.03	-0.08	0.04	0.08	0.09			
12	Operation & Engineering	0.28	0.45	-0.09	-0.04	-0.03	0.13	0.09	-0.01	0.03	0.21	-0.03	0.10	0.12		
13	Marketing & Sales	0.06	0.24	-0.03	-0.05	0.00	0.05	0.06	0.01	0.01	-0.08	0.00	-0.03	-0.16		
14	Finance expert	0.39	0.49	0.06	0.01	-0.03	0.05	0.04	0.02	0.08	-0.10	-0.04	0.06	-0.06	-0.06	-0.10

N = 1,269.

TABLE 3 Tobit model predicting chair appointment

Variables	1 Chair appointment
No. concurrent boards	0.479*** (0.098)
No. prior boards	0.039* (0.021)
Past CEO experience	0.290* (0.149)
Active CEO	0.268 (0.211)
Prominent board	0.481** (0.213)
Prominent employment	0.138 (0.190)
Elite school	0.245** (0.120)
Director age	0.037*** (0.007)
Director tenure	0.050** (0.025)
Education degree	-0.199*** (0.072)
Operation & Engineering	-0.575*** (0.128)
Marketing & Sales	-0.415* (0.225)
Finance expert	0.483*** (0.126)
Firm dummies	Yes
Constant	-2.421** (0.940)
Observations	1,269

Note. Standard errors in parentheses.

*** $p < .01$. ** $p < .05$. * $p < .1$.

number of concurrent boards and prior boards are positive and significant or marginally significant ($\beta = 0.479$; $p < .01$ and $\beta = 0.039$; $p < .1$), suggesting that board experience is critical for chair appointment. Past CEO experience is also positive and marginally significant ($\beta = 0.29$; $p < .1$). Prominent board experience is positive and significant ($\beta = 0.481$; $p < .05$). Elite school is positive and significant ($\beta = 0.245$; $p < .05$). Age captures general experience, and is positive and significant ($\beta = 0.037$; $p < .01$). Director tenure is positive and significant ($\beta = 0.05$; $p < .05$). Directors with higher education degrees are less likely to get chair positions ($\beta = -0.199$; $p < .01$). Consistent with prior knowledge, the financial expert dummy is positive and significant ($\beta = 0.483$; $p < .01$), while operation and engineering background and marketing and sales background are negative ($\beta = -0.575$; $p < .01$ and $\beta = -0.415$; $p < .1$).

TABLE 4 Poisson models predicting the turnover levels of undervalued Directors in 3 years post-IPO

Variables	1	2	3	4	5
	Turnover levels of undervalued directors				
Board Undervaluation (BU)		0.734*** (0.272)	0.711*** (0.272)	0.666** (0.284)	0.620** (0.283)
BU*Frequency of board meetings			0.245** (0.101)		0.251** (0.100)
BU*Founder CEO				0.386 (0.700)	0.524 (0.707)
Frequency of board meetings	0.010 (0.029)	0.003 (0.030)	-0.013 (0.033)	0.003 (0.030)	-0.013 (0.033)
Founder CEO	-0.638** (0.289)	-0.615** (0.295)	-0.606** (0.298)	-0.660** (0.296)	-0.666** (0.300)
No. undervalued directors	0.461*** (0.076)	0.485*** (0.082)	0.484*** (0.085)	0.484*** (0.082)	0.481*** (0.085)
Avg no. boards at exit	-0.068 (0.137)	-0.041 (0.132)	-0.033 (0.131)	-0.042 (0.132)	-0.036 (0.131)
Fraction of outside dirs joining after CEO	0.135 (0.280)	0.095 (0.296)	0.096 (0.311)	0.100 (0.296)	0.098 (0.312)
Avg ROA IPO year to 3rd year post-IPO	0.012 (0.263)	0.008 (0.246)	0.070 (0.252)	0.009 (0.249)	0.072 (0.258)
CEO board experience	0.053 (0.043)	0.043 (0.042)	0.040 (0.043)	0.043 (0.042)	0.041 (0.043)
Repeat CEO	-0.060 (0.194)	-0.059 (0.198)	-0.048 (0.196)	-0.064 (0.199)	-0.054 (0.197)
CEO Age	-0.005 (0.011)	-0.006 (0.011)	-0.007 (0.011)	-0.006 (0.011)	-0.007 (0.011)
Female CEO	0.023 (0.397)	0.046 (0.392)	0.137 (0.389)	0.066 (0.387)	0.162 (0.382)
CEO tenure	0.014 (0.030)	0.013 (0.030)	0.013 (0.030)	0.012 (0.030)	0.013 (0.030)
CEO duality	0.194 (0.253)	0.341 (0.262)	0.389 (0.258)	0.343 (0.263)	0.390 (0.258)
CEO ownership	-0.106 (0.635)	-0.183 (0.592)	-0.205 (0.565)	-0.154 (0.604)	-0.175 (0.577)
Avg no. employees IPO year to 3rd year post-IPO	0.127 (0.256)	0.156 (0.263)	0.106 (0.260)	0.168 (0.261)	0.126 (0.257)
Firm age	-0.017 (0.013)	-0.017 (0.012)	-0.015 (0.013)	-0.017 (0.012)	-0.016 (0.013)
VC-backed	-0.072 (0.208)	-0.036 (0.210)	-0.027 (0.204)	-0.039 (0.209)	-0.030 (0.202)
IPO proceeds	-0.119 (0.114)	-0.138 (0.109)	-0.152 (0.108)	-0.136 (0.109)	-0.151 (0.108)
IPO year dummies	Yes	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes	Yes

TABLE 4 (Continued)

Variables	Turnover levels of undervalued directors				
	1	2	3	4	5
Constant	-1.480*	-1.959**	-2.106**	-1.946**	-2.067**
	(0.885)	(0.895)	(0.909)	(0.891)	(0.899)
chi2	115.1	131.2	112.8	129.0	109.5
Log likelihood	-205.4	-203.3	-201.7	-203.2	-201.5

Note. $N = 215$; Robust standard errors in parentheses.

IPO = initial public offering; ROA = return on assets.

*** $p < .01$. ** $p < .05$. * $p < .1$.

Although the variables in Equation (1) capture different characteristics of a director, many of these variables relate to experience or availability, and so multicollinearity may be a concern. Therefore, we conducted the multicollinearity tests for the regressions and find that the mean VIF is 1.2 and the highest value is less than 1.5, far below the threshold of 10. Multicollinearity, then, is not a concern for Equation (1).

In Table 4, we adopt the Poisson estimator to predict the turnover levels of undervalued directors. Model 1 is the baseline model and includes the control variables. We include board undervaluation in Model 2, the interaction with the frequency of board meetings in Model 3, and the interaction with founder CEO in Model 4. We include the full model in Model 5, which we use to test our hypotheses.

In H1, we hypothesize that the higher the board undervaluation, the greater the turnover levels of undervalued directors. To test H1, in Model 5, we can see that the board undervaluation is positive and significant ($\beta = 0.620$; $p < .05$). This result suggests that board undervaluation increases turnover levels of undervalued directors. Specifically, based on Model 5 and Poisson estimator, one unit increase of board undervaluation leads to 0.49 undervalued directors' exit in 3 years post-IPO on average. Thus, H1 is supported.

In H2, we hypothesize that the frequency of board meetings positively moderates the relationship between board undervaluation and the turnover levels of undervalued directors. To test H2, in

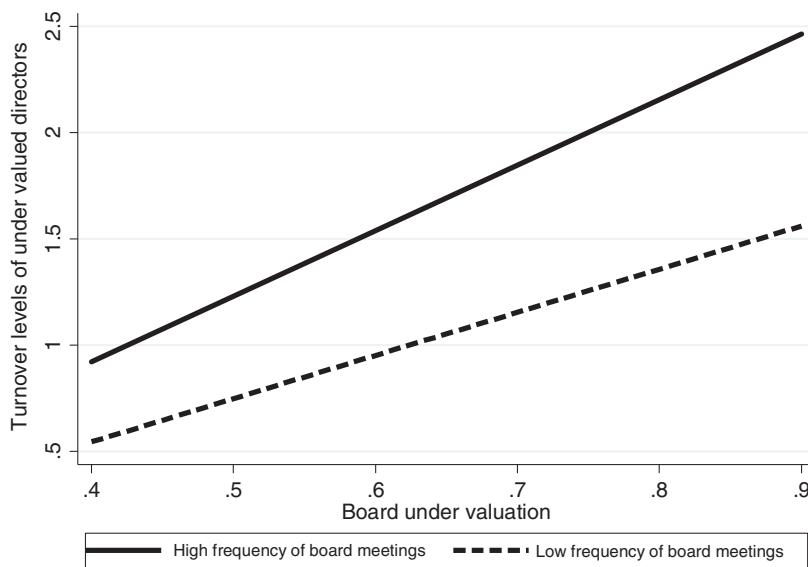


FIGURE 1 Interaction with frequency of board meetings

Model 5, the interaction term of board undervaluation and frequency of board meetings is positive and significant ($\beta = 0.251$; $p < .05$). We plot the interaction term in Figure 1, with the dashed line representing the case in which the frequency of board meetings takes the value of mean minus one standard deviation, and the solid line representing the case in which it takes the value of mean plus one standard deviation. Both lines have positive slopes, suggesting that board undervaluation increases the turnover levels of undervalued directors. The solid line has a steeper slope than the dashed line, indicating that when the frequency of board meetings is higher, the effect of board undervaluation on the turnover levels of undervalued directors is stronger. This finding is consistent with H2 and thus supports the hypothesis.

In H3, we hypothesize that having a founder-CEO positively moderates the relationship between board undervaluation and the turnover levels of undervalued directors. In Model 5, we find that the coefficient of the interaction term of board undervaluation and founder CEO is positive as predicted but not significant ($\beta = 0.524$; $p > .1$). Thus, H3 is not supported. Overall, then, we find support for H1 and H2 but not for H3. That is, board undervaluation increases the turnover levels of undervalued directors, and the frequency of board meetings strengthens the relationship.

5.1 | Supplementary analyses

We further investigate how board undervaluation affects turnover of the CEO and other outside directors on the board, as the disruptive climate induced by board undervaluation may also prompt others to exit. We followed prior researchers (e.g., Gong, Kim, Lee, & Zhu, 2013) and added yet another operationalization of board undervaluation for robustness—the maximum undervaluation among outside directors to capture the potential influence of the most undervalued director on the board. From our legitimacy-based theoretical vantage point and from a composition model perspective (e.g., Chan, 1998), either operationalization is appropriate and can be justified. When our results are evaluated, *in toto*, they are generally consistent, although there is some variation in the level of statistical significance. Our results suggest that board undervaluation affects the turnover of the CEO and accurately valued directors.

5.1.1 | CEO turnover

We coded a dummy variable indicating if a CEO exits the focal firm within 3 years post-IPO, and we report these results in Table 5. In Model 1 with Probit estimator, the coefficient of board undervaluation is positive but statistically insignificant ($\beta = 0.147$; $p > .1$). In Model 2, the coefficient of board undervaluation is positive and significant ($\beta = 0.459$; $p < .01$), suggesting that board undervaluation increases the turnover likelihood of the CEO in 3 years post-IPO. Overall, this result is consistent with the argument that board undervaluation and the consequent negative climate and associated conflicts on the board can more generally lead to CEO turnover. Although we cannot disentangle the mechanisms fully, it is also possible that CEOs become a target for undermining or deviance among the undervalued directors.

5.1.2 | Turnover of accurately valued directors

To identify accurately valued directors on the board, we choose two directors close to perfect valuation per Equation (1)—specifically one director with the least undervaluation and the other with the least overvaluation within a board. In Table 5 Model 3, when we use the likelihood of turnover of two accurately valued directors within 3 years post-IPO as our dependent variable and Probit estimator, the coefficient of board undervaluation is positive and significant ($\beta = 1.016$; $p < .05$). Model 4 shows the same analysis with the second operationalization. We see that the coefficient of

TABLE 5 Supplementary analysis on board undervaluation for other turnover in 3 years post-IPO (Models based on Probit)

Variables	1 CEO turnover	2	3	4 Accurately valued directors
Board undervaluation (Avg)	0.147 (0.200)		1.016** (0.416)	
Board undervaluation (Max)		0.459*** (0.174)		0.771*** (0.284)
Frequency of board meetings	0.316*** (0.056)	0.330*** (0.058)	0.055 (0.038)	0.049 (0.039)
No. directors	-0.175 (0.152)	-0.173 (0.155)	0.868** (0.363)	0.830** (0.367)
Founder CEO	-0.849* (0.440)	-0.758* (0.434)	-0.609** (0.276)	-0.681** (0.280)
Avg no. boards at exit	-0.448** (0.215)	-0.458** (0.220)	0.018 (0.134)	0.012 (0.136)
Fraction of outside dirs joining after CEO	1.427** (0.623)	1.613** (0.666)	0.302 (0.384)	0.375 (0.386)
Avg ROA IPO year to 3rd year post-IPO	-0.271 (0.280)	-0.273 (0.290)	0.169 (0.292)	0.161 (0.303)
CEO board experience	0.170* (0.097)	0.166* (0.099)	0.033 (0.060)	0.027 (0.061)
Repeat CEO	-0.924** (0.380)	-0.964** (0.383)	-0.153 (0.235)	-0.165 (0.236)
CEO Age	0.033* (0.018)	0.040** (0.019)	-0.003 (0.014)	-0.001 (0.014)
Female CEO	0.201 (0.772)	0.126 (0.848)	0.378 (0.615)	0.423 (0.624)
CEO tenure	-0.021 (0.048)	-0.032 (0.052)	0.014 (0.031)	0.013 (0.031)
CEO duality	-0.959** (0.419)	-0.870** (0.405)	-0.302 (0.254)	-0.285 (0.255)
CEO ownership	0.027 (0.985)	0.067 (0.942)	-0.295 (0.786)	-0.394 (0.788)
Avg no. employees IPO year to 3rd year post-IPO	-2.243*** (0.842)	-2.375*** (0.859)	0.302 (0.309)	0.342 (0.310)
Firm age	0.004 (0.019)	0.006 (0.021)	-0.018 (0.016)	-0.020 (0.016)
VC-backed	-0.029 (0.322)	0.088 (0.344)	0.002 (0.242)	-0.006 (0.243)
IPO proceeds	-0.068 (0.197)	-0.099 (0.188)	-0.115 (0.151)	-0.115 (0.151)
IPO year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Constant	-9.115***	-10.742***	-3.505**	-3.728**

TABLE 5 (Continued)

Variables	1 CEO turnover	2	3 Accurately valued directors	4
	(2.046)	(1.787)	(1.435)	(1.457)
Observations	215	215	215	215

Note. Robust standard errors in parentheses. For Model 1 and 2, we control for the number of undervalued directors; for Model 3 and 4, we control for the number of accurately valued directors.

IPO = initial public offering; ROA = return on assets.

*** $p < .01$. ** $p < .05$. * $p < .1$.

board undervaluation is positive and significant ($\beta = 0.771$; $p < .01$), suggesting that board undervaluation indeed affects the turnover likelihood of accurately valued directors. This finding shows that the negative climate induced by board undervaluation not only affects undervalued directors, but also affects even accurately valued directors. For robustness, we also identified the accurately valued directors as the median director(s) in terms of valuation on the focal board. The results of this analysis are consistent (not reported, but available upon request).

We conducted additional analyses to assess if board undervaluation affects turnover levels of overvalued directors, but we found no significant results. Possibly, the overvalued directors feel adequately gratified that they can overlook the negative climate associated with board undervaluation. Finally, we also explored whether board overvaluation, which may create a positive climate, affects turnover of overvalued directors, the CEO, and accurately valued directors. We found no significant effects.

Overall, the above analyses suggest that board undervaluation is a significant force that leads to overall board-level disruption and turnover, beyond undervalued directors.

5.2 | Alternative explanations

Our primary finding that links board undervaluation and turnover levels of undervalued directors could also potentially be explained by preplanned turnover. That is, before the IPO, directors may already plan to exit the focal firm soon upon completion of the IPO. These directors may, for example, only expect to serve for a short time in order to simply “lend” their name and enhance the firm’s legitimacy for its IPO. In these cases, the firm may not care about board dynamics and thus have high levels of board undervaluation as a result. So as per this explanation, the turnover levels would not be driven by board undervaluation but by directors’ premeditated exit plans. To address this concern, we consider the timing of the exit within the 3-year period. If directors have a premeditated exit plan, they are more likely to exit the focal firm soon after the IPO—likely within the first year rather than in the following 2 years. When we examine turnover levels of undervalued directors only in the second and third years, however, we still find the same results. This evidence mitigates this possible endogeneity concern.

Another alternative explanation for our finding is that the frequency of board meetings increases because of disputes induced by board undervaluation, and then the frequency of board meetings ultimately increases turnover levels of undervalued directors. That is, there is a possibility that the frequency of board meetings mediates the relationship between board undervaluation and turnover levels of undervalued directors.⁵ Specifically, the frequency of board meetings may increase in order to resolve the disputes and the turmoil of the board.

⁵We thank an anonymous reviewer for raising this possibility of mediation.

TABLE 6 Tests frequency of board meetings as a mediator between board undervaluation and turnover levels of undervalued directors

Variables	1 Frequency of board meetings	2	3	4
		Turnover levels of undervalued directors		
Board undervaluation	0.824 (0.694)		0.737*** (0.268)	0.734*** (0.272)
Frequency of board meetings		0.010 (0.029)		0.003 (0.030)
Founder CEO	0.015 (0.615)	-0.638** (0.289)	-0.616** (0.295)	-0.615** (0.295)
No. undervalued directors	0.163 (0.163)	0.461*** (0.076)	0.486*** (0.082)	0.485*** (0.082)
Avg no. boards at exit	0.258 (0.340)	-0.068 (0.137)	-0.042 (0.131)	-0.041 (0.132)
Fraction of outside dirs joining after CEO	0.275 (0.829)	0.135 (0.280)	0.098 (0.294)	0.095 (0.296)
Avg ROA IPO year to 3rd year post-IPO	0.063 (0.569)	0.012 (0.263)	0.008 (0.245)	0.008 (0.246)
CEO board experience	0.070 (0.093)	0.053 (0.043)	0.043 (0.042)	0.043 (0.042)
Repeat CEO	0.474 (0.478)	-0.060 (0.194)	-0.057 (0.196)	-0.059 (0.198)
CEO Age	-0.041* (0.023)	-0.005 (0.011)	-0.006 (0.011)	-0.006 (0.011)
Female CEO	1.690 (1.388)	0.023 (0.397)	0.050 (0.395)	0.046 (0.392)
CEO tenure	-0.029 (0.052)	0.014 (0.030)	0.012 (0.030)	0.013 (0.030)
CEO duality	0.881 (0.553)	0.194 (0.253)	0.344 (0.262)	0.341 (0.262)
CEO ownership	-2.414** (1.047)	-0.106 (0.635)	-0.191 (0.586)	-0.183 (0.592)
Avg no. employees IPO year to 3rd year post-IPO	-0.333 (0.460)	0.127 (0.256)	0.157 (0.262)	0.156 (0.263)
Firm age	-0.000 (0.026)	-0.017 (0.013)	-0.017 (0.012)	-0.017 (0.012)
VC-backed	0.227 (0.454)	-0.072 (0.208)	-0.036 (0.209)	-0.036 (0.210)
IPO proceeds	0.409 (0.277)	-0.119 (0.114)	-0.137 (0.107)	-0.138 (0.109)
IPO year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Constant	5.372** (2.181)	-1.565* (0.879)	-2.421*** (0.938)	-1.959** (0.895)

TABLE 6 (Continued)

Variables	1 Frequency of board meetings	2			3	4
		Turnover levels of undervalued directors				
Observations	215	215	215	215	215	
R-squared	0.129					

Note. Robust standard errors in parentheses. Model 1 based on ordinary least squares [OLS], Model 2, 3, and 4 based on Poisson. IPO = initial public offering; ROA = return on assets.

*** $p < .01$. ** $p < .05$. * $p < .1$.

We investigate and test this possible mediation, as well. First, we find that the correlation between the frequency of board meetings and board undervaluation is very low 0.02 (Table 1). Second, we follow Baron and Kenny (1986) to conduct the mediation test and report results in Table 6. In Model 1, we use board undervaluation to predict the frequency of board meetings and find that board undervaluation is not significant ($\beta = 0.824$; $p > .1$). In Model 2, we use the frequency of board meetings to predict turnover levels of undervalued directors in the three years post-IPO, and the frequency of board meetings is not significant ($\beta = 0.01$; $p > .1$). In Model 3, we only include board undervaluation without the frequency of board meetings and find that board undervaluation is positive and significant ($\beta = 0.737$; $p < .01$) in predicting turnover levels of undervalued directors. In Model 4, we include both board undervaluation and the frequency of board meetings and find that board undervaluation remains positive and significant ($\beta = 0.734$; $p < .01$) in predicting turnover levels of undervalued directors, but frequency of board meetings is not ($\beta = 0.003$; $p > .1$). Overall, we do not find evidence for a mediation model.

Yet another alternative explanation is that poorer-performing firms have higher levels of board undervaluation and that these firms then lose directors post-IPO. To investigate this explanation, we check the correlations between board undervaluation in the IPO year and several firm quality-related variables. We find that correlation of board undervaluation is -0.07 with VC-backed dummy, 0.27 with director total qualification, and 0.26 with director average qualification.⁶ Further, the correlation is 0.08 with firm ROA and 0.01 with firm sales growth rate, with both performance variables measured one year prior to the IPO. Overall these correlation coefficients are generally very low and suggest that there is no strong evidence that worse firms or boards have higher board undervaluation.

6 | DISCUSSION

We examine the turnover levels on the boards of newly public firms when the board leadership structure is normatively indefensible. We find that board undervaluation is positively associated with the turnover levels of undervalued directors. This effect is stronger when board meetings are more frequent, but it is not altered even when the CEO is the firm's founder. We also offer exploratory evidence that board undervaluation increases the turnover of the CEO and accurately valued directors.

6.1 | Theoretical contributions

We make several contributions to the corporate governance literature, particularly the behavioral perspective (Westphal & Zajac, 2013). First, we introduce justice-based legitimacy as a key

⁶We calculate qualification index for each director based on our Equation (1) by applying each director's data to the right-hand side of Equation (1).

normative institution in corporate governance. It explains how firms ought to make important decisions pertaining to the board leadership structure. Prior literature typically examines regulatory and quasi-regulatory institutions, with a focus on behavioral approaches to escape the intended effect of these institutions. This includes, for example, behaviors that neutralize the impact of board independence (Westphal, 1998), keep directors from monitoring effectively (Westphal & Bednar, 2005; Westphal & Khanna, 2003; Zhu, 2013), and generate favorable impressions for the firm while deflecting market scrutiny (Bednar, 2012; Westphal & Clement, 2008; Westphal & Graebner, 2010; Westphal & Zajac, 1994).

By contrast, our work highlights normative institutions of corporate governance and examines the critical nature of *justice-based legitimacy* when a firm's significant choices are only loosely bound by regulatory institutions. Specifically, we theorize and find the importance of justice and fairness in selecting the board leadership structure. When these board leadership choices are normatively inappropriate, we find that board turmoil seems to occur. Accounting for an array of factors that may influence turnover levels on the board, we show that board leadership structures that are not based on normatively accepted criteria can make board membership unstable and lead to director exits. Although the central focus of this study is on the consequences of normatively indefensible board leadership structures, our analysis also provides insight into the factors that participants and others *do* expect to drive these leadership structures. Overall, we extend the underrepresented *normative* institutional perspective to the behavioral corporate governance literature.

Second, we develop a novel behavioral mechanism: *director undervaluation*. We find that the average level of director undervaluation on the board (i.e., board undervaluation) predicts turnover levels of directors who are undervalued. Prior literature on director turnover has examined both turnover of individual directors (e.g., Boivie et al., 2012; Marcel & Cowen, 2014; Withers et al., 2012), as well as the collective turnover of the board (e.g., Arthaud-Day et al., 2006; Zhu & Shen, 2016). We offer additional insight into the turnover literature by focusing on the social context and dynamics on the board. Complementing prior research on collective turnover that has examined antecedents such as financial restatements (Arthaud-Day et al., 2006) and new CEOs' experience with diverse boards (Zhu & Shen, 2016), we introduce a novel antecedent that emphasizes social dynamics within the board. Board undervaluation influences relations among directors on the focal board (and also between directors and CEOs, per our supplementary analyses) by adversely affecting the board climate and engendering board conflicts (e.g., Zhu & Shen, 2016), which ultimately triggers turnover of undervalued directors.

Our study also reveals that turnover levels of undervalued directors are exacerbated by a key element of board process: frequency of board meetings. Although more frequent board meetings may appear to indicate "superior governance," these interactions seem to amplify the climate of injustice and conflictual behaviors for undervalued board members, ultimately resulting in their higher turnover levels. In contrast, these turnover levels are unaffected by whether the CEO is a founder. The exacerbating effect of having a founder-CEO that we hypothesized may be mitigated by unobservable factors in our study (e.g., founder-CEO charisma or ingratiation), which may limit the effects of a negative board climate or suppress possible conflict behaviors. Finally, our supplementary analyses point to board undervaluation as a significant force that is also positively associated with other key board-level turnover outcomes: turnover of CEOs and even accurately valued directors on the board, not just turnover levels of undervalued directors. Overall, board undervaluation advances the turnover literature by adding a novel and parsimonious behavioral explanation that centers on the social dynamics of the group.

Third, our fresh focus on the entire board leadership structure extends behavioral research on corporate governance and formal board structure beyond simply CEO duality (Krause et al., 2014;

Westphal, 1998) to the entire board leadership—the board chair and board committee chairs. This extension is important because board committees are recognized as central to public firm boards (Finkelstein et al., 2009) and are key to leading the firm, particularly during the IPO process.

Thus, we complement the sparse literature on board committees that mainly focuses on board committee composition (Finkelstein et al., 2009; Kesner, 1988; Zhu et al., 2014) by fully incorporating these committees into our analysis of board leadership structure and its important consequences for turnover at the board level. Moreover, we highlight the crucial transition from private firm to publicly listed firm, which is when firms often first establish their board leadership structures. While prior work emphasizes the governance advantages of board committees (Brandes, Dharwadkar, & Suh, 2016), we highlight the potential pitfalls associated with them. The assignment legitimacy lens allows us to reveal that the introduction of formal board leadership structure can have unexpected and negative behavioral consequences during this pivotal transition. That is, we identify the new justice-related risk of board undervaluation that can emerge and have a significant impact on turnover at the board level.

6.2 | Limitations and future research opportunities

One limitation of this study is that our design choice does not allow us to directly assess the specific, proximal mechanisms of the influence of board undervaluation on turnover levels. Nonetheless, our findings are consistent with prior theoretical work on the negative consequences of unexplainable structures (Shaw, 2015; Shaw et al., 2002; Trevor et al., 2012). Our findings are also corroborated by our own informational interviews, as well as prior rich observations by scholars and practitioners (Charan, 2012; Sonnenfeld, Kusin, & Walton, 2013; Useem, 2006). Furthermore, a key strength of our design choice (and context) is that it minimizes external validity threat. This would be sacrificed if we had a different design with mechanisms that were more readily measurable. For example, since the regulations for board formalization begin to apply at IPO, there is no left-censoring in our study (Certo, Busenbark, Woo, & Semadeni, 2016). In addition, our study design includes the full set of technology sector IPOs in the United States during the study period. It is also sufficiently longitudinal to allow adequate time for affective and calculative considerations of turnover to emerge. The results also hold even when we exclude first-year turnover that may include planned exits. By contrast, experimental designs could get closer at proximal mechanisms, but limit external validity (Cook & Campbell, 1979). Such an experimental study is perhaps only possible with a different population than actual directors, such as undergraduate students. Board observation data, which remain rare for corporate governance scholars (Finkelstein & Mooney, 2003; Hambrick, Werder, & Zajac, 2008), are also likely to be inaccessible for a 3-year period, especially when assessing negative attitudes and behaviors. Nonetheless, future studies can fruitfully test, refine, and extend our study with experimental designs and better data access. Relatedly, future studies could attempt to gather data behaviors such as ingratiation with undervalued directors that could possibly reduce the effect of board undervaluation.

How and why undervaluation arises is an important potential follow-on research question. Earlier in the article, we referred to two potential drivers. One, the lack of specific regulation for chair appointments can lead to errors, politicking, and nepotism. Second, based on our interviews and publications by board recruiters, we speculated that the tremendous time pressure of an IPO and the need to hire new outside directors before structuring the board often may not allow for adequate time for more careful chair appointments that are based on normatively accepted criteria. There are several other drivers possible, including, biases, and so forth. Future research focused on the antecedents of the director undervaluation on boards could be very insightful.

While our study illustrates the theoretical concept of board undervaluation by examining formal chair assignments, future studies could explore additional sources of undervaluation and factors that mitigate them. Confirming additional sources of undervaluation would not invalidate our model, but rather extend its implications. Our contention is that the effects are unlikely to be erased or reversed given the fundamental importance of chair appointments in IPO boards. Finally, we encourage researchers to take up the empirical question of whether the effect size for board undervaluation based on chair assignments is larger or smaller than other potential sources of undervaluation.

Future research may also examine other key consequences of the undervaluation of directors. While this study is singularly focused on board-level turnover, future studies may, for example, explore individual turnover and how undervalued boards evolve—the characteristics of new directors, whether undervaluation increases or decreases over time, and the overall firm performance consequences of undervaluation. These are important questions that are likely to yield fresh insights to the corporate governance literature.

Like other macro-level turnover studies (Shaw, 2011), we are unable to ascertain precisely whether turnover levels are voluntary or involuntary. Per Hambrick and Cannella (1993), and more recently Zhu and Shen (2016), we suggest that these exits are partly voluntary quits and partly involuntary departures. Our theoretical arguments suggest that a climate of injustice, spiraling conflict, and uncertainty could lead to both quits and force-outs. The broader literature on turnover (see Hom et al., 2017 for a review) indicates that the issue of voluntariness remains unresolved. Although this is a limitation in turnover studies in general, it is mitigated by recent meta-analyses that suggest a strong correlation between voluntary and involuntary turnover rates (Heavey et al., 2013; Park & Shaw, 2013). Nonetheless, future research with richer data may be better able to parse out the voluntary versus involuntary turnover due to undervaluation.

Finally, the generalizability of our results to established public firms is an important question. We examine the IPO context because it presents the relatively clean setting of the first transition to a public firm, and because directors are still heavily involved in young post-IPO firms (Kor & Misangyi, 2008; Kroll, Walters, & Le, 2007). Although we expect our theory may also apply to established public firms, we recognize contextual factors not anticipated in this study may mean that public firms' responses to board undervaluation may be more or less muted. The acid test lies in expanding this study to different organizational forms and geographies. We look forward to taking these next steps.

7 | CONCLUSION

The corporate governance transition from private to public firm is theoretically important and practically significant. While firms often rush to recruit new directors for the IPO, this study reveals the importance of the newly formalized board leadership structure. When that structure produces substantial board undervaluation, it can have disruptive consequences that increase the turnover of undervalued directors and even turnover of the CEO and accurately valued directors. Overall, our study underscores the disruptive potential of the board's formal leadership structure when it is not perceived as just and legitimate.

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How to cite this article: Garg S, Li Qiang (John), Shaw JD. Undervaluation of directors in the board hierarchy: Impact on turnover of directors (and CEOs) in newly public firms. *Strat Mgmt J*. 2018;39:429–457. <https://doi.org/10.1002/smj.2716>