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The Supply of Corporate Directors and Board Independence

Finance Working Paper N° 315/2011
August 2011

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ECGI Working Paper Series in Finance

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We thank Bernard Black, Christa Bouwman, Qianqian Du, Kose John, Jason Kotter, Rafael LaPorta, John Long, Vikram Nanda, Subrata Sarkar, George Serafeim, Cliff Smith, Jerry Warner, Toni Whited, Wanli Zhao, and conference and seminar participants at the 2009 European Financial Management Symposium on Corporate Governance and Control, 2009 Financial Management Association Annual Meetings, 2010 Asian Financial Management Association Meetings, 2010 Australasian Finance and Banking Conference, 2011 SFS Cavalcade, University of Michigan, 2011 Frontiers of Finance Conference at ISB Hyderabad, 2012 American Finance Association Annual Meetings, Dartmouth College, and University of Queensland for valuable comments. The authors gratefully acknowledge the financial support of the William E. Simon Graduate School of Business Administration and the Financial Markets Research Center at Vanderbilt University.

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The Supply of Corporate Directors and Board Independence*

by

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This version: March 7, 2013

Abstract

Empirical evidence on the relations between board independence and board decisions and firm performance is generally confounded by serious endogeneity issues. We circumvent these endogeneity problems by demonstrating the strong impact of the local director labor market on board composition. Specifically, we show that proximity to larger pools of local director talent leads to more independent boards for all but the largest quartile of S&P1500. Using local director pools as an instrument for board independence, we document that board independence has a positive effect on firm value and operating performance and CEO fraction of incentive based pay and turnover.

JEL: G30, G34
Keywords: board of directors, board expertise, director labor market, location, firm value, firm performance, CEO compensation

* We are indebted to the editor (Michael Weisbach), an anonymous referee, Bernard Black, Christa Bouwman, Qianqian Du, Kose John, Jason Kotter, Rafael LaPorta, John Long, Vikram Nanda, Subrata Sarkar, George Serafeim, Cliff Smith, Jerry Warner, Toni Whited, Fei Xie, Wanli Zhao, and conference and seminar participants at the 2009 European Financial Management Symposium on Corporate Governance and Control, 2009 Financial Management Association Annual Meetings, 2010 Asian Financial Management Association Meetings, 2010 Deakin Finance Colloqium, 2nd Finance and Corporate Governance Conference, Melbourne, 2010 Australasian Finance and Banking Conference, 2011 SFS Cavalcade, 2011 Frontiers of Finance Conference at ISB Hyderabad, 2012 American Finance Association Meetings, 2012 Financial Intermediation Research Society Meetings, and seminars at the University of Michigan, Dartmouth College, University of Queensland, and Binghampton University for valuable comments. The authors gratefully acknowledge the financial support of the Simon School of Business and the Financial Markets Research Center at Vanderbilt University.

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Electronic copy available at: http://ssrn.com/abstract=1904730

Prior research has emphasized the role of the board of directors in monitoring and advising the CEO and the importance of board composition (e.g., Adams and Ferreira 2007; Fama and Jensen 1983; Weisbach 1988 etc.). However, in spite of extensive work on the subject of board independence and shareholder value (see, e.g., Coles, Daniel and Naveen (2008) for a survey of prior literature), the empirical evidence on the effects of board independence on major board decisions and firm performance is often contradictory or lacking in significance. This mixed evidence is in large part attributable to endogeneity issues that arise in the choice of corporate governance mechanisms.

Reinforcing concerns about endogeneity, a growing body of research focuses on optimal board design and firm characteristics associated with the demand for independent director representation on boards (Boone, Field, Karpoff, and Raheja 2007; Raheja 2005 etc.) Other research has highlighted the role of private benefits of control and CEO influence over director appointments in explaining the level of board independence (e.g., Hermalin and Weisbach 1998a, 2003; Shivdasani and Yermack 1999).

We circumvent these endogeneity concerns by exploring the role of the local labor market in supplying directors to firms. Specifically, we show that the ability of most firms to recruit qualified independent directors is significantly affected by the local supply of prospective directors, holding demand side characteristics constant. We use this finding to perform a two-stage analysis of the effects of board independence on bottom-line firm outcomes and provide new evidence of the impact of board independence on shareholder wealth and firm performance that is robust to endogeneity.

We argue that local availability of qualified prospective directors has an important bearing on a firm's board appointment process. Prospective directors with full-time jobs - many

of them executives at other firms - have substantial demands on their time. In short, qualified directors are a scarce human resource, and locating willing candidates can be very time consuming. An average senior executive holds less than one outside board seat, suggesting a reluctance by such executives to become overcommitted with outside board responsibilities (Perry and Peyer 2005; Ferris, Jagannathan, and Pritchard 2003). Replacing a director following an unexpected departure takes a considerable amount of effort and time (on average 185 days, according to Nguyen and Nielsen 2010). Since most outside directors come from executive backgrounds (Guner, Malmendier, and Tate 2008; Linck, Netter, and Yang 2008b), we focus on the pool of current executive officers at nearby firms as the primary source of prospective local directors. Further, as qualified prospective directors have opportunity costs of joining company boards, they are more likely to accept appointments at larger firms that offer more visibility and greater director reputation benefits, even if they are more distant. Firms with less visibility are expected to face greater challenges in attracting non-local directors, forcing them to rely more heavily on the local labor market for directors.

Service on a board of a local firm imposes lower costs on an executive: beyond lower transportation costs, there is less time and energy required to travel to board meetings and oversee firm developments outside of formal board meetings. In addition, firms have better access to soft information about the availability of prospective local directors. Overall, we expect firms to face fewer hurdles and to be in a better position to attract local candidates to their boards.[1]

[1] The argument is consistent with the finding in Fahlenbrach, Low, and Stulz (2010) and Bouwman (2011) that CEOs are more likely to hold outside directorships at nearby firms. Although we also argue that geographic proximity can facilitate director appointments, unlike those studies, we identify firms that rely more heavily on local executives for independent board appointments and utilize the documented relation between board independence and the local director pool as a source of exogenous variation in board structure that allows us to reexamine the effects of board structure on a firm's bottom line. Additionally, our analysis allows for a broader range of experts within the potential local director pool.

Empirically, we find that the local supply of director candidates available to a firm has important effects on board structure and independent director representation, even after controlling for determinants of board design uncovered in earlier research. Firms close to larger pools of prospective directors have a higher percentage of locally employed independent directors and greater independent director representation on their boards. As expected, smaller and medium-sized firms are more constrained by the local director supply. Further, firm proximity to local pools of valuable expertise in the legal, financial, and technological fields is associated with greater board representation of such directors.

We also examine the effect of Sarbanes-Oxley and the associated changes in exchange listing requirements, which serve as an exogenous shock to board composition, on the relation between board independence and local director markets. On the one hand, firms required to add independent directors may draw more heavily on the local pool of prospective directors. On the other hand, firms with thin local labor markets may be forced to pursue a nationwide search to comply with the new rules. We find that the relation between local director pools and board independence continues to hold after the imposition of these new regulatory constraints on board composition and specifically on board independence.

Exploiting our finding that local labor markets significantly affect board independence and taking into account the selection of headquarters location predominantly early in a firm's life, we use the variation in the local supply of prospective directors to predict the level of board independence in a two-stage setting. The resulting experimental design enables us to reexamine how board composition affects key firm decisions and outcomes, such as firm value and performance, and managerial compensation and turnover. We focus on small and medium-sized

companies, which comprise the first three quartiles of firms in the S&P 1500, where local labor market conditions act as a constraint on a firm's ability to attract independent directors.

Supporting theoretical predictions that independent boards serve a valuable monitoring role, we find board independence positively affects firm profitability and operating performance. Consistent with this evidence, markets recognize the benefit of independent boards in the form of higher market valuations. We also find that more independent boards lead to a higher proportion of incentive based pay for CEOs, and all else equal, greater CEO turnover-performance sensitivity. However, total CEO pay is not significantly affected by board independence. Intuitively, independent boards contribute to improved profitability and higher valuation, in part through a better alignment of manager incentives with shareholder interests. We find the effects of board independence change signs, magnitudes and significance levels when we replace ordinary least squares estimates with two-stage least squares estimates. Endogeneity appears to confound the relationship of board independence with firm performance and value resulting in insignificant statistical effects. Further supporting the importance of correcting for endogeneity, the Hausman test of the differences in ordinary least squares and two-stage least squares coefficients confirms the endogeneity of board independence.

Our findings contribute to the growing literature on corporate boards (see, e.g., Rosenstein and Wyatt 1990; Yermack 1996; Yermack 2004; Guner et al. 2008; Fich 2005; Linck, Netter, and Yang 2008a; Boone et al. 2007; Masulis and Mobbs 2011; Brickley, Coles, and Terry 1994). Our study also relates to a handful of board studies that attempt to tackle endogeneity using a variety of approaches. Guo and Masulis (2013), Chhaochharia and Grinstein (2007), and Duchin, Matsusaka and Ozbas (2010) focus on changes in board independence and composition around the enactment of SOX and the related changes in exchange listing

requirements. Nguyen and Nielsen (2010) examine sudden director deaths. Coles, Daniel, and Naveen (2008) implement a two-stage approach, using firm level characteristics, rather than geographic characteristics, as instruments.

Our paper also relates to studies of geographic factors in other financial settings related to the effects of distance on information collection and monitoring by investors (Loughran and Schulz 2005, 2006; Coval and Moskowitz 1999, 2001; Brennan and Cao 1997; Kang and Stulz 1997; Ivkovic and Weisbenner 2005), analysts (Malloy 2005; Bae, Stulz, and Tan 2008), and VCs (Lerner 1995; Bengtsson and Ravid 2011), and on corporate finance outcomes such as shareholder payouts (John, Knyazeva, and Knyazeva 2011; Becker, Ivkovic, and Weisbenner 2011), acquisitions (Kedia, Panchapagesan, and Uysal 2008; Kang and Kim 2008), employee relations (Landier, Nair, and Wulf 2009), and bank lending terms (Knyazeva and Knyazeva 2012). Focusing on the effects of director distance, Bouwman (2011) finds that individuals are more likely to be appointed to boards if they previously held a seat in the same locality or at a firm with a common director. John and Kadyrzhanova (2009) find that firms are less likely to adopt takeover defenses in areas where firms on average exhibit good governance, which leads to better corporate performance if local peer firms have strong governance practices. Masulis, Wang, and Xie (2012) find that foreign independent directors are less likely to attend board meetings; and firms with foreign directors are more apt to offer excess CEO compensation, restate earnings and exhibit significantly poorer performance. Wan (2008) shows that local independent directors are better informed, but less effective as monitors, possibly due to greater social dependence, while Alam, Chen, Ciccotello, and Ryan (forthcoming) report that local independent directors reduce CEO pay, but weaken turnover performance sensitivity. In contrast

to Alam et al., we do not find a separate effect of local directors after controlling for the representation of independent directors.

Distinct from this prior literature, we document the effects of the local supply of potential directors on board composition in all but the largest firms and use this variable as an instrument to address endogeneity concerns about the estimated relation between independent boards and firm value or performance. Other recent studies examine changes in board composition after SOX and either analyze time-series changes affecting all firms or condition the effects of the compliance shock on firm-level variables, such as pre-SOX board composition or information asymmetry proxies, both of which could be endogenous. In contrast, we are able to incorporate significantly more exogenous variation in board independence across a large sample of firms, adding to the power of our tests.

1. Data

The sample includes Compustat / CRSP firms with available RiskMetrics data on board characteristics and takeover provisions, 13f data on institutional holdings, and Execucomp data on CEO characteristics and share ownership. We exclude financial firms (6000–6999), regulated utilities (4900–4999), small firms (assets under $20 million), foreign firms, and firms headquartered outside the continental US. The sample period is 1996–2006. Where director titles are required to identify executive experts, the sample starts in 1998 due to data availability in RiskMetrics. For robustness we use BoardEx data on director titles for the 2002–2008 period.

1.1 Board characteristics

Following prior work, the main measure of board composition is *board independence*, defined as the proportion of the board represented by independent (non-gray outside) directors. By contrast, gray directors are outside board members with familial or business ties to the firm or

its senior management, which create conflicts of interests that can compromise a board's major functions.[2] Robustness tests also consider inside directors, defined as the proportion of firm officers on the board. For a representative sample firm, the board is comprised of 9 directors, of whom 65% are independent, 14% are gray, and 21% are officers (including the CEO).

Local independent directors are independent directors employed at companies located within a sixty-mile radius of the sample firm, as a fraction of independent directors holding corporate jobs. For the average firm in our sample, about a third of independent directors are identified as holding executive positions, of which a third are employed at local firms. *Executive experience* contributes to a director's ability to effectively monitor and advise the CEO (Fich 2005; Adams and Ferreira 2007; Raheja 2005). It is defined as the proportion of executive experts among independent board members (or outside directors, where specified). Executive experience includes current service as a chief executive officer, chief financial officer, chief operating officer, or inside director on another firm's board.[3] Appendix Table A1 presents detailed variable definitions. Table 1 shows summary statistics for the main variables.

[Table 1]

1.2 Local director labor markets

According to Guner et al. (2008), the most common outside director occupation is an active executive at another nonfinancial firm, followed by an active executive at a financial firm

[2] RiskMetrics identifies gray directors based on proxy statements and disclosures of related transactions. Examples include executives of professional service providers; customers; suppliers; former employees of the firm or subsidiaries; directors designated by a significant shareholder or group (such as a union); majority holders; family members of executives; recipients of the firm's gifts; and interlocking directors (a director and executive of the sample firm sits on another board that has an executive and director who also sits on the sample firm's board). Following NYSE listing standards, former employees can be reclassified as independent directors after three years. Excluding the few such cases from the independent director definition does not affect our results (the average proportion of independent directors declines by a tenth of a percent).

[3] Identification of directors with executive expertise is based on current executives within the RiskMetrics S&P 1500 universe of companies, which does not cover very small or privately held firms. Compared to their peers at large firms, executives of small firms are less likely to sit on corporate boards, so excluding them should have little effect on our empirical results. As a way of evaluating the effect of excluding this group of executives, we also use a more comprehensive executive expertise measure based on BoardEx data in robustness analysis.

and non-corporate backgrounds. Similarly, in Linck et al. (2008b) corporate directors with nonfinancial executive backgrounds are significantly more prevalent than financial, nonprofit, consultant or academic backgrounds. Therefore, our main measure of availability of prospective directors in the firm's vicinity is the density of nonfinancial firms within a sixty-mile radius of the sample firm (*local director pool*).[4] Logs are used to address the right skewness of the densities. Since executives of direct competitors are unlikely to join the board due to competitive concerns about the release of proprietary information and anti-trust liability (price fixing), we exclude firms in the same four-digit SIC industry. In robustness tests, we expand the local pool definition to use a hundred-mile radius, add Canadian firms and exclude small firms from the local director pool in case small firms are an infrequent source of directors.

We use firm headquarters locations reported in Compustat. Geographic coordinates are obtained from the US Census (2000) Gazetteer. Headquarters locations are generally chosen in the early life of a firm, many years prior to going public or making the board composition choices we examine, and typically for reasons unrelated to demand for a particular board structure. Thus, we treat firm location as predetermined and use the concentration of organizations' headquarters in the firm's vicinity as a source of exogenous variation. We perform robustness tests to examine the influence of infrequent headquarters relocations.

1.3 Control variables

We include a number of controls to capture other determinants of board independence suggested in prior work. Firm size has been linked to the presence of more outside directors

[4] This measure implicitly assumes that prospective directors holding top positions at other firms are generally concentrated at a firm's headquarters (which seems plausible as headquarters locations are likely to be most relevant for determining a director's cost of board participation) and the number of top executives available to serve on outside boards is comparable across firms. To address the possibility that firms of different size supply varying numbers of prospective directors, we redefine local director pools to contain only large companies in a robustness test in Table 4, Panel A, and find our results are invariant to this alternative measure of local pool size.

(Boone et al. 2007; Coles et al. 2008; Linck et al. 2008a). Some tests include the degree of a firm's business and geographic diversification, measured by the number of industry segments and a foreign segment indicator, respectively, as additional measures of the firm's operational complexity and the ensuing need for more outside experts on the board (Linck et al. 2008a).

Although independent directors have fewer conflicts of interest than insiders, they typically have less firm-specific knowledge (Fama and Jensen 1983). Growth firms rely more on firm-specific knowledge, which results in fewer outside directors on the board (Coles et al. 2008; Linck et al. 2008a). We use sales growth, R&D intensity, and intangible asset intensity (and to an extent, return volatility) to proxy for firm growth options.

Some of our tests use controls for other governance and alignment mechanisms suggested in prior studies to be substitutes for or complements to board monitoring: the Gompers, Ishii, and Metrick (2003) G Index; institutional ownership, which captures institutional investor monitoring and governance preferences; and CEO ownership, which captures the degree of alignment of managerial and shareholder interests (Raheja 2005). CEO characteristics may also affect board composition. More influential CEOs with longer tenure may require more board monitoring (Raheja 2005). Alternatively, if tenure reflects ability, CEOs with longer tenure should require fewer outside experts on the board. Additionally, firms with older CEOs nearing retirement may add insiders to the board to facilitate internal succession (Linck et al. 2008a; Hermalin and Weisbach 1998b). Robustness tests add classified board and dual class shares indicators and an index of the strength of anti-takeover laws in the firm's state of incorporation from RiskMetrics. While firm-level governance and alignment indicators are used in prior work on boards as controls, they suffer from being determined simultaneously with board composition choices. Therefore, the coefficients associated with these controls cannot reliably be interpreted

as causal effects, so we omit these controls to verify our main results. Finally, all specifications include three-digit SIC industry and year fixed effects to capture industry and temporal variation.

1.4 Two-stage analysis

The crux of our analysis is based on a two-stage least squares examination of the relation between board independence and important firm decisions and outcomes (total CEO pay, the proportion of incentive pay in total pay, CEO turnover, firm value, and operating performance) to deal with major endogeneity concerns common in prior work. In the first stage, we predict the level of board independence by the size of the local director pool, our measure of interest, as well as industry median board independence (in the spirit of John and Kadyrzhanova 2009) and large and medium-sized city indicators. These variables affect board independence, but do not directly influence firm outcomes. We demonstrate the relevance of geographic predictors of board structure in the main board independence regressions.

In the second stage, firm performance and other variables are regressed on predicted board independence and a set of controls. The analysis excludes the top quartile of S&P 1500 firms based on total asset size, for which local director markets are less likely to be a binding constraint, to focus on the smaller 3/4ths of S&P 1500 firms. Since observations of a given firm can be autocorrelated, we use robust standard errors clustered at the firm level.

2. Local Director Labor Markets and Board Independence

Figure 1 provides descriptive statistics supporting the premise that firms with access to larger local director markets draw a larger proportion of independent directors locally: in the full sample of S&P 1500 companies the proportion of locally employed directors among independent directors with identifiable corporate positions is three times higher for companies drawn from the top quartile of local director pool size compared to companies from the bottom quartile.

2.1 Multivariate evidence

Table 2 presents the main multivariate test of the relation between local director pools and a firm's percentage of independent directors on the board (in the full sample). We find the local supply of prospective directors has a strong effect on board independence. Firms near larger pools of prospective directors have a higher percentage of independent directors, after controlling for industry and year fixed effects (column 1). In columns 2 and 3, the result continues to hold after the inclusion of controls for other firm and CEO characteristics that have been linked to board independence in past work (size, growth, ROA, age, risk, asset tangibility, R&D intensity, institutional ownership, the G index, and CEO ownership, age, and tenure).

[Table 2]

Figure 2 summarizes the economic magnitudes of these effects on board independence by taking one standard deviation changes in each variable, holding the other variables at their mean values. The local director pool effect is larger in magnitude than the individual effects of sales growth, risk, ROA, tangible asset intensity, and CEO tenure; comparable to the effects of firm size and CEO age; and is roughly half the size of CEO ownership, G index and R&D intensity effects. Consistent with Coles et al. (2008), Denis and Sarin (1999), and Linck et al. (2008a), large firms have more independent directors. Young, growth firms have fewer independent directors, consistent with such firms having a greater need for firm-specific inside knowledge. Consistent with Coles et al. (2008), R&D intensive firms have more independent directors on the board. Monitoring by institutional investors appears to complement board oversight, whereas higher managerial ownership and greater exposure to corporate control markets appear to serve as substitutes for strong board governance, although we are careful to interpret the relation as indicative of association rather than causally determined. Though instrument relevance only

requires statistical significance, the fact that the documented effect has an economic magnitude on par with other well established determinants of board composition serves to reinforce our economic intuition about the importance of local director markets.

The relation between local director labor markets and board independence could vary by firm visibility. Directors internalize the costs of service on nonlocal boards, including transportation costs and opportunity costs of their time spent traveling to board meetings and keeping abreast of developments in these distant firms outside of board meetings (especially high if the firm encounters legal or financial difficulties). Prospective directors are more likely to overlook the costs of a nonlocal appointment if the firm is large and highly visible, since it offers greater reputational benefits, career building opportunities and networking benefits.[5] Small firms typically hold the same number of board meetings (approximately seven per year), so a director's time commitments would appear to be roughly similar (Vafeas 1999). Small firms are also more likely to face financial difficulties and financing constraints in the event of cash shortfalls. Although smaller firms could compensate directors for their lesser reputation benefits with higher pay, existing evidence indicates that director pay at smaller firms is significantly lower (Linck et al. 2008b; Brick, Pamon, and Wald 2006; Linn and Park 2005).[6] To the extent that potential independent directors are more willing to join boards of distant large firms, large firms are less constrained by the depth of the local director pool. By contrast, small and medium-sized firms appear to be significantly constrained by the local pool of prospective directors.

[5] For example, Masulis and Mobbs (2013) show that independent directors with multiple directorships value directorships in larger firms more. As a result, they are willing to invest more time and effort at large firms, which is consistent with them being willing to spend more time and energy travelling to the more distant board meetings of these larger firms.

[6] In unreported tests, adding a control for director pay does not eliminate the local director pool effect, and there is no significant relation between local director pools and director pay.

Univariate tests in Table 1, Panel B show that smaller firms have a larger portion of independent directors who are locally based, consistent with the intuition that while high visibility firms have the luxury of tapping a wider, national director pool, less visible firms are constrained by the local supply of prospective directors. Multivariate evidence on this question is presented in Table 3. The local director pool has an economically strong and statistically significant effect on board independence for smaller firms, characterized by less overall visibility, but the local director pool is insignificant for large, well established firms. In summary, local director pools affect board independence at firms with low to moderate visibility (roughly three-quarters of the sample). High visibility firms do not appear constrained by the local supply of director talent. Intuitively, firm visibility is a plausible source of variation in the willingness of prospective directors to bear the costs of distant board meetings and thus, it captures the extent to which a firm is constrained to search locally for prospective directors.

[Table 3]

In the last set of tests reported in Table 3, we examine the relation between local director pools and board independence in the aftermath of recent governance reforms (the Sarbanes-Oxley Act (SOX) and revised governance rules in the listing requirements of the NYSE and Nasdaq). More stringent board governance standards, including a majority of independent directors and independent director representation on key committees, could force non-compliant firms to expand their director search beyond their local director pools in the post-SOX period to accommodate this regulatory shock. We also note that this later period benefits from more advanced information and communications technology, which could make it easier for more distant directors to electronically attend board meetings and to acquire firm-specific information from longer distances. However, we find that local director pools remain a significant factor in

the appointment of independent directors, even as noncompliant firms increase board independence in the post-SOX period.

2.2 Robustness analysis and instrument validation

To ensure the robustness of our findings, we examine the sensitivity of our finding to alternative variable definitions and sample selection criteria, and to additional controls. Our main local director pool measure includes executives at all nonfinancial US firms (outside the firm's own industry[7]) located within sixty miles of the firm in question. In Panel A of Table 4, we modify the local director pool definition for robustness. We start by varying the geographic boundaries of the local director pool, limiting it to the same county in column 1, expanding it to a hundred-mile radius in column 2, and augmenting it with Canadian firms in column 3. Since firms may only want to hire independent directors with executive experience at larger or comparable size firms, we limit the local director pools to firms of similar or larger size in column 4 and exclude small firms in column 5.[8] We include financial as well as non-financial firms in column 6. The local director pool coefficient remains positive and significant and retains its economic magnitude throughout these robustness tests. In an unreported test, inclusion of separate indicators for local director pools below and above sample median does not reveal significant nonlinearities.

[Table 4]

Panel B of Table 4 uses alternative variable definitions and sample selection criteria. Since the proportion of independent directors is a fraction bounded between zero and one, in

[7] Of independent directors with executive positions, a small minority are executives in another firm in the same industry (only 2% and 3.5% work for a firm in the same four and three digit SIC industry respectively). This is likely to reflect potential concerns over the disclosure of proprietary information to competitors and anti-trust issues.
[8] We exclude firms with assets below hundred million, which approximately corresponds to the first and second quintiles of assets in the full sample of nonfinancial firms (including firms with missing governance data) for our sample period.

column 1 we report a logit regression of board independence (see, e.g., Maddala 1983). While the estimates differ in magnitude, the local director pool coefficient retains its sign and significance. Firms headquartered in large cities are excluded in tests reported in column 2 to verify that the local director pool is not merely capturing a big city effect. In unreported tests, we use local director pool lagged by one and two years, redefine board independence to exclude directors with 5% or greater stakes, include firms headquartered in Alaska and Hawaii (a handful of observations), add a quadratic firm size term, replace book value of assets with its market value as a measure of firm size, and cluster errors both by firm and by year. The main effect remains statistically and economically significant.

With any proposed instrument, it is important to assess whether it satisfies the two criteria for an instrument's validity, namely (i) relevance and (ii) exogeneity and excludability. The relevance of local director pools for board composition is supported by the evidence of significant local director labor market effects on board composition shown in Tables 2–4. (First-stage statistics from the two-stage least squares analysis shown in Tables 6–9 and Appendix Table A2 similarly confirm the instrument's strength and relevance.)

Turning to the IV's exogeneity, a firm's location is for a vast majority of firms a predetermined characteristic that pre-dates independent director selection (see, e.g., Becker, Cronqvist, and Fahlenbrach 2011; Pirinsky and Wang 2010). More specifically, firms in our sample are far removed from their startup stage when the firm's initial location is chosen (firms in the sample on average go public 24 years earlier and their initial incorporation generally occurs much earlier).[9] However, the results remain qualitatively the same if firms going public

[9] Prior research finds that the initial location decision is typically motivated by proximity to raw materials and other production inputs, minimization of transportation costs, and access to skilled workers (e.g., Malecki 1985; Almazan, DeMotta, and Titman 2007; Matouschek and Robert-Nicoud 2005). The results continue to hold after we control for population density, college education per capita, and unemployment rate (column 2 of Panel C). Since certain

during our sample period are excluded from the analysis to alleviate concerns about the joint choice of location and governance (column 5 of Panel B). Subsequent relocations are rare. Based on our analysis of historical location data from Compact Disclosure, the overwhelming majority of firms do not relocate, and most firms that relocate remain within sixty miles of their former location. Nevertheless, if we exclude the few headquarters relocations beyond sixty miles, our findings are qualitatively unchanged as shown in columns 7–8, and in an unreported test, the same holds for relocations beyond twenty miles. As a sensitivity check, we also eliminate possible merger related relocations by excluding firm-years with acquisition spending in excess of five percent of book value of assets (column 6 of Panel B).

In addition to being exogenous, a valid instrument must meet the exclusion requirement, in other words, it cannot capture economic factors that are likely to directly affect firm value or performance or CEO pay or turnover respectively. For example, local director pools in the vicinity of a firm should not be directly related to individual firm valuations. Of course "proving a negative" is always a challenge. The main approach used in existing studies is to check whether the IV captures omitted variation in other economic factors known or expected to affect the bottom line (e.g., Saunders and Steffen 2011; Becker, Cronqvist, and Fahlenbrach 2011; Fahlenbrach, Low, and Stulz 2010; Rauh 2006). If factors known to affect firm performance (or major board decisions regarding the CEO) can explain the local director effect on boards, then our instrument fails the exclusion test. To test this condition, we include economically plausible determinants of firm performance (or major board decisions regarding the CEO) that vary by geographic location, but have no connection with the local director pool measure, to assess

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sectors and locations are more prone to regional industry clustering, we exclude firms located in large cities, the large industrialized states of California, Illinois, Massachusetts, and New York, and firms in technology intensive and automotive industries (the sample already excludes financials). The key results on local director pools remain qualitatively unaffected (columns 2–4 of Panel B).

whether their inclusion causes the local director pool effect to become statistically insignificant.[10]

Our findings continue to hold after controlling for a host of local economic and demographic characteristics of a firm's region that can have first-order effects on firm performance, such as local population density, density of upper-income households, households drawing retirement income, and college educated population, and the unemployment rate (column 2 of Panel C). Further, if the local director pool merely captures regional variation in governance practices, which can affect investor perceptions and valuation of the firm, the IV would not be excludable. Examining this condition empirically, we find the local director pool remains highly significant after controlling for local governance practices, proxied by average statewide independent director representation on the board (column 3 of Panel C). We add a number of controls for other firm governance, information and investment characteristics, which might affect firm value and performance and CEO pay and turnover and could incidentally be captured by local director markets, namely NYSE listing, classified boards, dual class shares, and business and foreign segments (columns 4–6 of Panel C), and in unreported tests, average profitability and market-to-book in the state. We find that inclusion of these variables does not diminish the effect of the local director pool. Overall, the tests in Panel C of Table 4 fail to uncover any evidence to undercut the validity of our instrument.

As a final test, similar to Guner et al. (2008), we examine a "placebo" instrument candidate. We choose as our placebo instrument local industry clusters, defined as the local density of same-industry firms. By construction, the local director pool (which captures local

[10] Some studies use the Hansen (1982) J-statistic to test for instrument validity (e.g., Armstrong and Vashishtha 2012; Demirguc-Kunt and Huizinga 2010, etc.). Based on this test the local director pool meets the exclusion requirement. However, this test is known to have low power and to rely on strong distributional assumptions, so it should be interpreted with caution.

availability of general business experts, excluding same-industry firms) is unrelated to local industry clusters. However, local industry clusters can affect investment opportunities and hence, firm performance and valuation. For example, local industry clusters can facilitate acquisitions and provide other investment and technology synergies and information spillovers (see, e.g., Almazan, DeMotta, Titman, and Uysal 2010). If location in a dense industry cluster is also associated with greater board independence and explains away our main result, then this provides a direct channel unrelated to the local director market that can drive both board composition and firm performance, casting doubt on our identification strategy. As seen from column 1 of Panel C, local industry clusters have *no* effect on board composition or the local director pool coefficient. Later, we also control for local industry clusters in second-stage tests, with no change in our main findings. In unreported tests, we control for a firm's headquarters state in our firm value regressions and find similar results. We conclude with a caveat. While our prior analysis and tests consistently support our instrument's validity, as with all IV based studies, conclusive proof of excludability is virtually impossible to obtain.

2.3 Other board characteristics

To supplement our previous findings on the proportion of independent directors, we examine the proportion of gray and inside directors on the board in Panel A of Table 5. Firms with weak local director markets are likely to rely more heavily on gray directors to offset a lack of suitable independent director candidates. Although less effective as monitors, gray directors may be easier to recruit and they may offer valuable advice. As expected, we find that the proportion of gray directors is decreasing in the local director pool (column 1). The fraction of inside directors is similarly decreasing in local director pool (column 2).

[Table 5]

If proximity to a larger local pool of prospective directors leads firms to substitute independent directors for inside or gray directors, then board size should not be affected. If firms located near deeper local director pools add more independent directors while leaving other non-independent directors on the board, then we should observe larger boards. Interestingly, we find that board size is not significantly related to local director pool (column 3), consistent with firms substituting non-independent directors when independent directors are difficult to recruit.

The prior analysis of board characteristics focuses on the proportion of outside directors on a firm's board. While it indicates the degree of board oversight, it is not a sufficient metric of the quality of such oversight or a board's ability to provide expert advice to management. Outside directors with executive expertise may be better able to challenge a CEO and thus, be crucial to improving shareholder wealth. Moreover, executives from other local firms comprise a significant proportion of independent directors and of the local pool of prospective directors. In Panel B of Table 5, the proportion of independent directors with executive experience is positively associated with the size of the local pool of executives (column 1). This finding helps verify the hypothesized channel through which local pools of executives affect independent director recruitment. It also suggests that local director markets have implications for the level of board expertise – and arguably, the quality of board oversight – in addition to their effect on independent director representation. The results remains qualitatively the same when we focus on the pool of potential executives from similar-size or larger local firms (column 2); include all outside directors (columns 3–4); or use BoardEx to construct a more comprehensive measure that includes executive experience at small publicly listed firms and private firms (column 5).[11]

[11] BoardEx data yields a higher estimate of the proportion of executive experts among outside directors (over sixty percent) due to the inclusion of executive affiliations at smaller firms and unlisted companies.

To further analyze the channels through which local director pools affect board composition, we examine the representation of local executive experts on the board. Consistent with our hypothesis and univariate evidence in Figure 1, the proportion of local executives among independent and outside directors with executive experience is increasing in the local pool of executives (columns 6–7). We obtain similar results for the proportion of local gray directors in column 8. Further, average distance to an independent director's primary employer falls as the local director pool grows (column 9). We further note that representation of locally drawn independent and outside directors is highest on the boards of small firms, which are more constrained in their ability to recruit distant directors.

We also examine which types of firms supply local directors. We conjecture that large firms supply more prospective directors with executive expertise. We find that the proportion of executives with outside board seats at other local firms is higher for larger firms (column 1 of Appendix Table A3). An executive of a large firm is more likely to sit on another local board and to hold more local board seats (columns 2–3). Overall, large firms appear to act as suppliers of outside directors with executive expertise to smaller local firms (beyond the effect of large firms having more officers).

Corporate boards can benefit not only from general managerial experience, but also from independent directors with *specialized expertise* (see, e.g., Linck et al. 2008b). However, firms could be forced to forego certain types of valuable director expertise, such as technical, legal, or financial, when the local supply of such experts is limited. Of course, when specialized expertise is considered essential for a corporate board, representation of such experts could be less sensitive to local labor market conditions, as firms would search more intensively and potentially

more widely for such expertise. This leaves us with an empirical question as to the importance of the local pool of director candidates with a particular expertise for a board's composition.

Tests of the effects of local pools of expertise are presented in Panel C of Table 5. Consistent with a local labor supply effect, the proportion of outside directors with technology expertise increases in the size of the local pool of such prospective directors. Further, a board's overall legal expertise is positively related to the local density of main offices of major law firms, a proxy for the local supply of prospective directors with legal experience. At the margin, the board's level of financial expertise is positively related to the density of financial institution headquarters in a firm's vicinity, which is a proxy for the local availability of potential directors with financial knowledge. We conclude that composition of a firm's board in terms of independent director expertise is significantly related to the local pool of such expertise.

3. The Effects of Board Independence on CEO Incentives and Firm Performance

A number of prior studies report evidence that greater representation of outside directors on boards is associated with shareholder wealth gains (e.g., Masulis and Mobbs 2011; Rosenstein and Wyatt 1990; Brickley et al. 1994). Other prior empirical studies find mixed or insignificant evidence on the effect of independent director representation on performance or shareholder wealth (e.g., Bhagat and Black 2002; Hermalin and Weisbach 1991; Klein 1998; Agrawal and Knoeber 1996; Yermack 1996; see, e.g., Adams, Hermalin, and Weisbach (2010) and Hermalin and Weisbach (2003) for a detailed survey).[12] Moreover, several studies emphasize the endogeneity of board composition and the challenges to attributing causation to any observed associations of board independence with firm decisions and outcomes (e.g., Hermalin and

[12] Bar-Hava and Segal (2010) find poor performance after independent director resignations. However, as Adams et al. (2010) and Hermalin and Weisbach (1998a,b) argue, independent director presence on the board is endogenous to performance. Also, as Aggrawal and Chen (2011) and Dewally and Peck (2010) indicate, director resignations may be related to boardroom conflicts between directors and management over board performance and agency problems. In this light, interpretation of the effects of independent director resignations on performance faces serious hurdles.

Weisbach 1998a, 2003; Adams et al. 2010; Boone et al. 2007; Coles et al. 2008). First, omitted variable bias is present when certain characteristics not captured by the model are correlated with both firm value and board independence. For example, growth firms, which tend to have higher valuations, may appoint more insiders due to the high costs of conveying proprietary information to outsiders, whereas mature firms, which tend to have lower valuations, may appoint outsiders to overcome their greater agency conflicts. Second, reverse causality concerns may arise if well performing firms, with fewer agency problems, and hence, less need for external monitoring, choose to appoint fewer outside directors to the board (see, e.g., Hermalin and Weisbach 1988b; Coles et al. 2008). Unless proper identification is used, these confounding effects can dominate the positive effect of independence on firm value and performance and bias the relations toward insignificance.[13]

Given the controversies surrounding the causal relation between board independence and shareholder wealth, we offer new evidence much less susceptible to endogeneity concerns. Specifically, we exploit the exogenous variation in the density of local labor markets for director talent, documented in the previous tables, to instrument for board independence. We then estimate the effects of board independence on CEO compensation and turnover, and firm value and operating performance. All our regressions include industry and year fixed effects to filter out industry variation and general time trends. We also incorporate a number of controls to account for differences in firm characteristics that could be related to bottom line outcomes.

[13] Endogeneity concerns cast serious doubts on the ability of OLS estimation to establish causation. A recent study by Nguyen and Nielsen (2010) seeks to address this endogeneity concern by looking at market reactions to sudden director deaths, a type of unexpected exogenous shock to board composition. Although the approach yields interesting insights consistent with our findings that independent directors add to firm value, it is limited to a small sample of 229 sudden deaths of directors, including 108 independent directors; moreover, a large majority of the deceased independent directors are replaced with new independent directors within a year and there can be some offsetting effects associated with market expectations about their expected replacements.

3.1 Evidence from two-stage least squares analysis

A limited pool of local director talent imposes more binding external constraints on board selection in small and medium-sized firms, as shown earlier in this study. Thus, we concentrate our attention on this large subsample (75% of the full sample of S&P 1500 firms) and employ a two-stage instrumental variables model. In the first stage, we use variation in local director pools and other controls to predict board independence. Then in the second stage regressions, we re-examine the effects of board independence on the quality of important board decisions, such as CEO pay and turnover, and firm performance outcomes, measured by operating performance and Tobin's Q. This evidence is presented in Tables 6–9.

[Table 6]

Existing studies report that firms with more independent boards use higher proportions of incentive pay, presumably to better motivate managers (e.g., Mehran 1995). We reexamine the association between board composition and CEO pay using local availability of prospective directors as a source of external variation in board structure. In Table 6, column 1, we find clear evidence that more independent boards use a larger proportion of equity based compensation in total CEO compensation. All else the same, a one standard deviation increase in board independence results in a 5.7% increase in the percent of stock option pay in total CEO pay. The result holds with a broader definition of performance pay that combines stock options and restricted stock grants (column 2). Interestingly, the increase in CEO risk-bearing caused by more performance based pay is not compensated by higher executive pay. There are no significant effects of board independence on total CEO pay (column 3). Inclusion or omission of controls for CEO-chairman duality, industry clusters, a sunshine index, industry median pay level, capital expenditure and R&D levels as a percent of assets, number of industry segments,

presence of a foreign sales segment, or a technology intensive sector indicator does not qualitatively change these results. Thus, while independent boards strengthen CEO incentives through a greater weight on equity compensation, we do not find evidence of a board independence effect on the overall level of CEO pay.

We also examine the relation between board independence and CEO turnover, including both voluntary and forced. Since firms commonly disguise forced turnover when reporting CEO changes (Weisbach 1988; Jenter and Lewellen 2010), the distinction between forced and voluntary departures is difficult to decipher in practice. Nevertheless, some instances of CEO turnover are clearly unrelated to performance, namely CEO deaths. Since they do not offer evidence of boards disciplining CEOs, we exclude these relatively infrequent CEO turnover cases. We find that the proportion of independent directors is positively associated with CEO turnover. Independent director representation is also associated with marginally higher sensitivity of turnover to poor performance (a negative stock return interaction term, significant at ten percent). All else the same, a twenty-percent increase in board independence raises the likelihood of turnover by 4%. Thus, we find new evidence free of endogeneity concerns that more independent directors lead to significantly stronger CEO performance incentives, both in terms of compensation and turnover.

In Table 7 we examine the effect of board independence on the firm's profitability and operating performance, measured by ROA and operating cash flow scaled by total assets. The proportion of independent directors has a significant positive effect on operating performance. The documented effects are economically important. Holding other factors constant, a one standard deviation (17.5%) increase in board independence predicts a 1.2–1.7% increase in ROA. As a point of comparison, median ROA is 14% and a one standard deviation of ROA is

11%, so the effect of board independence is economically significant in absolute terms. In relative terms, the magnitude of the board independence effect on ROA exceeds or is comparable to that of other determinants, except for firm risk and R&D intensity. Operating cash flow yields similar effects (a 1.4–1.8% increase in response to a one standard deviation increase in board independence, all else equal).

[Table 7]

In Table 8, we evaluate whether predicted board independence has significant effects on firm value (measured by market-to-book ratios at fiscal year-end).[14] We find that the proportion of independent directors on the board has significant positive effects on firm value. The effect is also economically meaningful. All else the same, a one standard deviation increase in the proportion of independent directors on a firm's board results in a 0.16–0.17 rise in a firm's market-to-book ratio (as a point of comparison, the median market-to-book ratio is 1.66 and the standard deviation is 1.44). In terms of magnitude, the board composition effect is larger than or comparable to the effects of other determinants except sales growth and R&D intensity.

[Table 8]

In Table 9 we examine the effects of board size in addition to the effects of independence. After controlling for board independence, board size is not statistically significant. Next, it is also possible that the proportion of local directors has a value effect above and beyond the impact of independent director representation. Local directors could be better informed as monitors, or they could be less effective due to being more socially dependent on the CEO. However, we find that local directors per se do not have a significant effect, while independent director representation remains significant. Thus, the key benefit of deeper local director pools is

[14] Market-to-book is defined as fiscal year end market value divided by book value, similar to prior work. In untabulated results, the effects of director independence are similar if we divide by lagged book value.

facilitating the recruitment of more independent directors, which enhances firm performance and shareholder value.

[Table 9]

Following prior work, we include standard controls for firm size, age, growth opportunities, risk, G index, institutional ownership, and CEO characteristics. The G Index enters with a negative sign in firm value regressions, consistent with Gompers et al. (2003). Institutional ownership is associated with better operating performance and firm value. CEO tenure, a proxy for managerial quality, is positively associated with firm performance. In some specifications we added other controls suggested in prior studies of firm value (dual class firm indicator and dividend payout), which were not significant but did not affect the relation of board independence and firm value.

3.2 Quantifying the effects of endogeneity on board independence estimates

One of our main contributions is providing evidence of the impact of board independence on various firm outcomes from a large firm panel after correcting for endogeneity. Below we take a two-prong approach to quantify the effects of endogeneity on board independence estimates. Though our analysis and contexts differ, a similar discussion of endogeneity concerns and the effects of endogeneity adjustments on coefficient estimates is found in the Edmans, Goldstein and Jiang (2012) study of market discounts and takeovers.

First, for the purposes of comparison with two-stage estimates, at the bottom of each table we report ordinary least squares estimates of board independence effects, which do not adjust for endogeneity. Consistent with prior evidence based on OLS regressions, independent boards do not significantly improve firm value or performance (see, e.g., Adams et al. (2010) and Hermalin and Weisbach (2003) for a detailed survey). Moreover, in most cases, two-stage

estimates differ substantially in terms of magnitudes, signs and significance from OLS estimates. Estimates of board independence effects on firm valuation change from a near zero statistically insignificant coefficient in the OLS regression to a statistically significant positive 0.009–0.010 coefficient in two-stage regressions (a one standard deviation increase in board independence predicts a 0.16–0.17 increase in market-to-book). In the performance regressions, OLS estimates of board independence coefficients are insignificant and close to zero (or negative, in one ROA specification), whereas two-stage estimates are highly significant and positive, 0.067–0.097 (a one standard deviation increase in board independence predicts a 1.2–1.7% increase in ROA). In the turnover regressions, OLS estimates of board independence effects are insignificant, while two-stage regressions reveal significantly greater frequency of CEO turnover in the presence of independent boards. In the CEO incentive pay regressions, both OLS and two-stage estimates of board independence are positive, but two-stage estimates are significantly larger in size (rising from 0.06–0.08 to around 0.3). Finally, there is no significant board independence effect on total pay, in either the OLS or 2SLS specifications.

Second, we perform a formal Hausman test of the differences between ordinary least squares and two-stage estimates of board independence. A significant test statistic indicates that the null hypothesis that the two sets of coefficient estimates are statistically indistinguishable is rejected, which would support the concern about the endogeneity of board independence. The tests reveal endogeneity in the board independence estimates (significant at the ten percent or better level), which is corrected in two-stage estimation.

Both preliminary comparisons and formal tests reveal significant differences in OLS and 2SLS board independence estimates. Endogeneity present in OLS results weakens the estimated economic and statistical impacts of board independence on firm performance. Thus, adequately

adjusting for endogeneity is a necessary and important step to obtaining a clearer understanding of how board independence affects shareholder wealth.

Our findings are consistent with the empirical prediction of Hermalin and Weisbach (1998b) that firms increase board independence in response to poor performance. They argue that periods of strong performance strengthen the belief about the CEO's ability, resulting in greater CEO bargaining power, which is associated with decreases in board independence. By contrast, poor performance reduces the CEO's bargaining power and forces the CEO to accept the addition of independent directors to the board. When this reverse causality effect of poor performance on increased independence is combined with the direct effect of board structure on performance, OLS estimates become uninformative. Endogeneity of board composition has led many studies to find insignificant or mixed evidence of board independence effects on various firm bottom-line variables. When we isolate the direct effect of board independence on performance in a two-stage setting, we obtain significant positive coefficients.

3.3 Discussion

In Section 2, we present a number of sensitivity tests and arguments in support of the validity of the IV. However, one might be concerned that some other variable correlated with local director pool size could create a direct channel for firm value or performance effects, undermining the identification assumption. While we have controlled for many possible candidates in our robustness analysis, one particularly credible candidate is local industry clusters, which might lead to possible competitive or knowledge spillover effects or better access to needed technical expertise from local industry peers which could lead to improved firm performance. To address this concern, we control for the local density of firms in the same

industry. In all these specifications, we use industry fixed effects to account for time-invariant heterogeneity in firm performance.

The use of an extensive set of controls mitigates omitted variable bias, however, some variables, such as CEO ownership and managerial characteristics, as well as firm risk and R&D, may be determined jointly with firm performance. Therefore, in Tables 7–8 we also report parsimonious specifications that omit those controls and replace the firm-level G index with the index of anti-takeover laws in the firm's state of incorporation, which can be more strictly viewed as exogenous. The main results continue to hold.

Our location-based instrument can be widely used to address endogeneity of board composition when examining a variety of other corporate finance and governance research questions. The instrument is applicable to a broad cross-section of firms. Using the data available to us, we have demonstrated the instrument's relevance for the lower 75% of the S&P 1500 universe, based on firm size. Given our intuition about director labor markets, we expect that it can also be applied to smaller listed and unlisted firms and to smaller firms in the top quartile of the S&P 1500. It may also be useful for smaller firms in the top quartile of the S&P 1500. Our analysis has focused on firm performance and valuation outcomes as well as CEO compensation and retention. In future work, this instrument could be used to examine the effects of board composition on a broad range of corporate decisions, financial policies, governance mechanism choices beyond board monitoring, earnings management, firm information disclosure choices, shareholder wealth effects of corporate news, etc.

4. Conclusions

We examine how local director labor markets affect board composition choices. We find that small and medium-sized firms, which have low visibility, are most dependent on local

director labor markets. By contrast, the largest firms (top quartile) are able to recruit directors nationally. Intuitively, prospective directors appear willing to trade off the costs of distance and the benefits of affiliation with a large, established firm.

We find that the supply of potential directors in the local labor market strongly affects board composition for all but the largest S&P 1500 firms. Access to larger local pools of prospective directors increases the fraction of independent directors and reduces the fraction of gray and inside directors on a board. This suggests that firms struggling to recruit independent directors fall back on appointing gray and inside directors. At firms located near larger local pools of prospective directors, a significantly larger fraction of independent directors are drawn locally. In terms of economic importance, this effect exceeds or is comparable to the individual effects of several other well-established determinants of board composition, including sales growth, firm risk, size, tangible asset intensity, and CEO traits. To corroborate the channel through which the local director pool influences board composition, we examine the proportion of independent directors who hold executive roles at local firms and find that it similarly increases in the size of the local pool of executive directors.

Prior studies of board independence effects on firm value report mixed or weak results, in part due to the endogeneity of board composition choice, as firms tend to increase board independence in response to performance declines. Using our finding that local pools of prospective directors are a powerful predictor of board independence, we reexamine the important question of how board independence is related to a firm's bottom line outcomes. We focus on the firms that are most constrained by the local pool of prospective directors due to their lack of visibility and prestige. Using this supply constraint on director hiring for identification, we find that board independence has significant positive effects on firm value, operating

performance, CEO turnover, and the proportion of equity based pay, but no effect on total CEO compensation. We find a one standard deviation increase in board independence results in a 1.2–1.7% increase in ROA and a 0.16–17 increase in the market-to-book ratio, all else equal.

Overall, local labor markets for prospective director talent are an important determinant of board composition, in spite of the availability of long distance travel and information technology. Geographic distance negatively affects the willingness of prospective directors, especially those employed in full-time executive and professional positions that place heavy demands on their time, to serve on boards. Thus, the supply effect of local director pool has strong influence on board composition, and future research on boards should take this into account.

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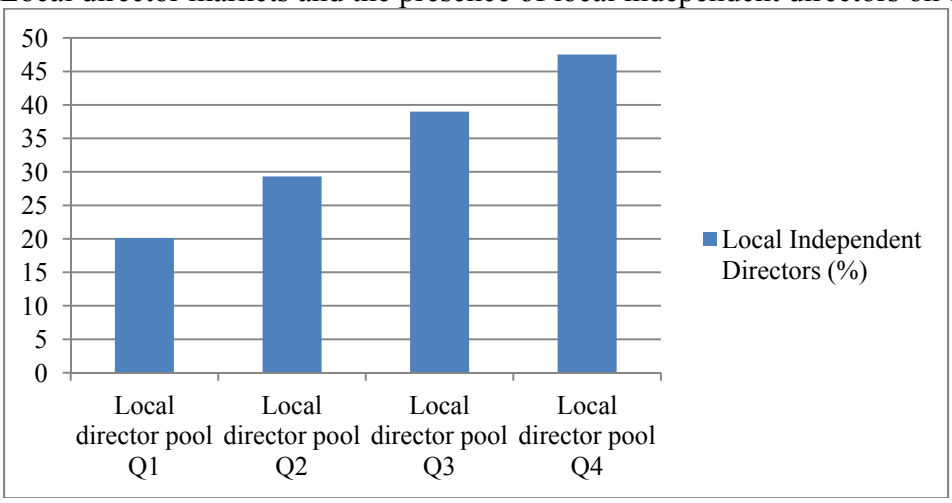
Figure 1

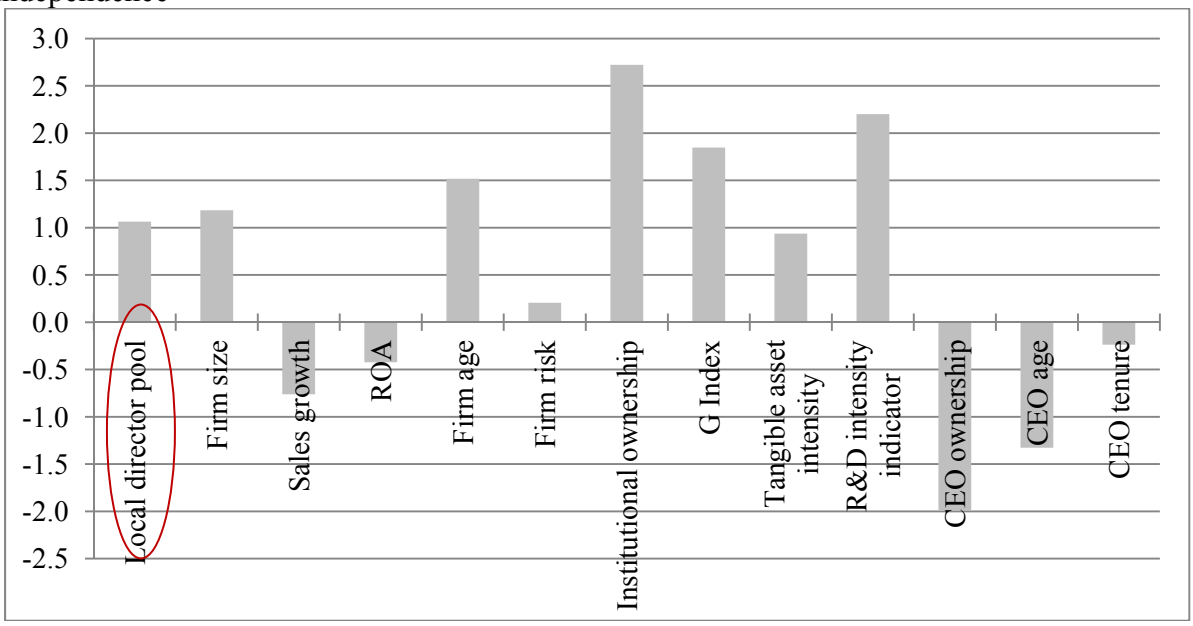
Local director markets and the presence of local independent directors on boards



Mean local independent directors (%) (on the Y-axis) by Local director pool quartile. Local independent directors (%) is the percent of independent directors holding corporate executive positions who are locally employed (within a sixty-mile radius of the firm's headquarters). For consistency, only observations where name and headquarters location of the company of outside employment is known were used. Variable definitions and sample selection criteria are presented in Table A1.

Figure 2

The economic significance of local director markets relative to other determinants of board independence



The economic effects of a one standard deviation increase in the X variable on Independent directors (%) are shown above. Each effect represents the predicted change in independent director representation on the board in response to a one standard deviation increase in the X variable, holding other determinants constant. The effects are computed from the coefficient estimates in Table 2, column 3 and standard deviations of right-hand-side variables reported in Table 1.

Table 1
Summary statistics of the main variables

Panel A: Summary Statistics		Obs	Mean	Median	Standard Deviation
Board Characteristics:	Independent directors (%)	9693	65.14	66.67	17.49
	Inside directors (%)	9693	20.88	16.67	11.39
	Gray directors (%)	9693	13.98	11.11	13.83
	Board size	9693	2.17	2.20	0.27
	Board size [num]	9693	9.11	9.00	2.48
	Local independent directors (%)	3365	34.03	0.00	43.34
	Local gray directors (%)	785	49.64	50.00	48.85
	Local outside directors (%)	3842	36.76	0.00	43.92
	Insiders with local directorships (%)	9628	13.54	0.00	30.20
	Executive expertise (%)	8217	33.35	33.33	23.42
Local Director Pool:	Local director pool	9693	3.75	4.04	1.65
	Local director pool [num]	9693	105	56	116
	Local director pool (similar or larger size)	9693	2.65	2.83	1.46
	Local director pool (similar or larger size) [num]	9693	32	16	44
Firm Characteristics:	Firm size	9693	7.32	7.18	1.41
	Firm size [mln]	9693	5571	1312	18219
	Sales growth	9693	0.12	0.08	0.28
	ROA	9693	0.14	0.14	0.11
	Market-to-book ratio	9693	2.12	1.66	1.44
	Dividend yield	9693	0.96	0.33	1.35
	G Index	9693	9.22	9.00	2.60
	Institutional ownership	9693	67.83	69.72	17.93
	Firm age	9693	2.93	2.94	0.79
	Firm age [years]	9693	24.12	18.00	19.33
	Firm risk	9693	2.57	2.26	1.28
	Tangible asset intensity	9693	0.30	0.24	0.21
	R&D intensity indicator	9693	0.53	1.00	0.50
CEO Characteristics:	CEO ownership	9693	2.34	0.31	5.62
	CEO age	9693	0.09	0.00	0.29
	CEO tenure	9693	1.74	1.79	0.90
	CEO tenure [years]	9693	7.33	5.00	7.61
	Incentive/total CEO pay	9640	36.18	35.25	28.96
	Incentive/total CEO pay (II)	9640	43.99	47.20	29.09
	Total CEO pay	9499	3.27	1.80	4.66
	CEO turnover	9481	0.12	0.00	0.32

Panel B: The presence of local directors on boards (by subsample)

Firm size	Small (bottom 75%)	Large (top 25%)	Δ		Small (bottom 50%)	Large (top 50%)	Δ	
Local independent directors (%)	39.44	26.32	13.12	***	42.09	30.2	11.85	***
Local gray directors (%)	57.74	38.64	19.10	***	65.13	41.9	23.21	***
Local outside directors (%)	42.77	27.78	14.99	***	46.59	31.9	14.71	***
Indep. dir. distance to exec. job (Mean)	4.70	5.48	-0.78	***	4.51	5.26	-0.75	***
Outside dir. distance to exec. job (Mean)	4.52	5.45	-0.94	***	4.28	5.2	-0.91	***

We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. Variable definitions are presented in Table A1. Panel A presents summary statistics for the main sample. Panel B presents two-sided t-tests of differences in means across subsamples based on total assets. Local independent/gray/outside directors (%) is the percent of directors employed within a sixty-mile radius of the firm's headquarters among independent/gray/outside directors respectively with identified corporate positions (where name and headquarters location of the company of outside employment is known). Statistical significance at 1%, 5%, and 10% levels is denoted with ***, **, and *, respectively.

Table 2
Local director labor markets and board composition.

	(1)		(2)		(3)	
Local director pool	0.740	***	0.600	**	0.646	***
	2.84		2.47		2.78	
Firm size			1.189	***	0.840	***
			3.99		2.90	
Sales growth			-3.189	***	-2.707	***
			-3.49		-3.12	
ROA			-4.426		-3.938	
			-1.25		-1.15	
Firm age			2.085	***	1.919	***
			4.10		3.88	
Firm risk			0.409		0.160	
			1.31		0.54	
Institutional ownership			0.190	***	0.152	***
			8.49		6.96	
G Index			0.833	***	0.710	***
			5.77		5.06	
Tangible asset intensity					4.378	
					1.60	
R&D intensity indicator					4.412	***
					3.99	
CEO ownership					-0.354	***
					-5.59	
CEO age					-4.576	***
					-5.27	
CEO tenure					-0.264	
					-0.85	
Number of observations	9693		9693		9693	
R-squared	0.24		0.30		0.33	
Adjusted *R*-squared	0.22		0.29		0.31	

We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. The dependent variable is independent director representation on the board, Independent directors (%). Variable definitions are presented in Table A1. Ordinary least squares regressions with three-digit SIC industry and year fixed effects. Robust t-statistics adjusted for clustering by firm are reported. The symbols ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 3

Local director labor markets and board independence: Subsample analysis.

Panel A: Firm visibility

	Small (bottom 75%)	Large (top 25%)	Small (bottom 50%)	Large (top 50%)
Local director pool	0.590 **	0.374	0.686 **	0.431
	2.36	0.70	2.30	1.24

Panel B: Governance reforms

	Before reforms All firms	After reforms All firms
Local director pool	0.808 ***	0.673 *
	2.73	1.87

We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. The dependent variable is independent director representation on the board, Independent directors (%). Variable definitions are presented in Table A1. Ordinary least squares regressions by subsample. Control variables from Table 2, column 3 are included but not shown for brevity. Subsamples in Panel A are identified based on Firm size (total assets). In Panel B, observations before governance reforms include firm-years 1999–2002, whereas observations after governance reforms include firm-years 2003–2006, for firms that failed to meet one of the following governance requirements by 2001 – majority of independent directors on the board, independent directors on nominating/governance and compensation committees and three independent directors on the audit committee. Three-digit SIC industry and year fixed effects are included. Robust t-statistics adjusted for clustering by firm are reported. The symbols ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 4
Local director labor markets and board composition: robustness checks
Panel A: Alternative local director pool definitions

	(1)		(2)		(3)		(4)		(5)		(6)	
Local director pool (same county)	0.528	**										
	2.17											
Local director pool (100mi)			0.571	**								
			2.43									
Local director pool (incl. Canada)					0.648	***						
					2.79							
Local director pool (similar or larger)							0.740	***				
							2.85					
Local director pool (excl. small)									0.654	***		
									2.67			
Local director pool (incl. financials)											0.561	**
											2.03	
Firm size	0.875	***	0.861	***	0.839	***	1.024	***	0.841	***	0.862	***
	3.04		2.98		2.90		3.53		2.91		2.99	
Sales growth	-2.775	***	-2.711	***	-2.705	***	-2.686	***	-2.701	***	-2.707	***
	-3.20		-3.12		-3.12		-3.10		-3.11		-3.11	
ROA	-3.856		-3.961		-3.939		-3.898		-3.935		-3.848	
	-1.12		-1.15		-1.15		-1.14		-1.15		-1.11	
Firm age	1.935	***	1.916	***	1.919	***	1.903	***	1.921	***	1.905	***
	3.91		3.86		3.88		3.85		3.88		3.84	
Firm risk	0.183		0.169		0.160		0.153		0.170		0.190	
	0.61		0.57		0.53		0.51		0.57		0.63	
Institutional ownership	0.153	***	0.152	***	0.152	***	0.153	***	0.152	***	0.152	***
	6.99		6.98		6.96		7.02		6.97		6.95	
Tangible asset intensity	4.340		4.247		4.381		4.389		4.344		0.702	***
	1.58		1.55		1.60		1.60		1.58		5.01	
R&D intensity indicator	4.490	***	4.377	***	4.414	***	4.371	***	4.394	***	4.097	
	4.04		3.96		3.99		3.96		3.98		1.49	
G Index	0.694	***	0.701	***	0.710	***	0.710	***	0.706	***	4.393	***
	4.94		5.01		5.06		5.05		5.03		3.96	
CEO ownership	-0.351	***	-0.354	***	-0.354	***	-0.354	***	-0.355	***	-0.357	***
	-5.55		-5.58		-5.59		-5.58		-5.59		-5.63	
CEO age	-4.560	***	-4.573	***	-4.574	***	-4.569	***	-4.557	***	-4.553	***
	-5.25		-5.25		-5.26		-5.26		-5.24		-5.23	
CEO tenure	-0.274		-0.266		-0.264		-0.263		-0.267		-0.264	
	-0.88		-0.86		-0.85		-0.85		-0.86		-0.85	
Number of observations	9693		9693		9693		9693		9693		9693	
R-squared	0.33		0.33		0.33		0.33		0.33		0.33	
Adjusted R-squared	0.31		0.31		0.31		0.31		0.31		0.31	

Panel B: Alternative sample selection criteria and variable definitions

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
Local director pool	0.029	***	1.499	***	1.138	***	0.582	**	0.726	***	0.610	***	0.723	***	0.522	*
	2.59		3.87		3.80		2.14		2.89		2.58		2.82		1.69	
Firm size	0.047	***	0.478		0.833	**	0.770	**	0.570	*	0.903	***	0.868	***	0.240	
	3.31		1.14		2.39		2.15		1.78		3.00		2.66		0.58	
Sales growth	-0.130	***	-2.975	**	-4.167	***	-4.510	***	-2.510	***	-2.083	**	-2.103	**	-1.700	
	-3.12		-2.01		-3.37		-3.88		-2.89		-2.13		-2.12		-1.63	
ROA	-0.193		-3.869		-5.237		0.562		-4.676		-3.515		-3.819		-5.867	
	-1.18		-0.68		-1.17		0.14		-1.29		-0.99		-0.98		-1.28	
Firm age	0.095	***	1.797	**	1.749	***	2.189	***	3.526	***	1.654	***	2.144	***	1.737	**
	3.82		2.43		3.00		3.96		5.07		3.24		3.97		2.56	
Firm risk	0.010		-0.339		0.142		0.193		0.249		0.072		0.340		0.521	
	0.66		-0.75		0.38		0.53		0.75		0.24		1.02		1.35	
Institutional ownership	0.007	***	0.180	***	0.176	***	0.164	***	0.162	***	0.146	***	0.150	***	0.148	***
	6.83		6.25		6.81		6.51		6.92		6.56		6.19		5.06	
Tangible asset intensity	0.203		2.318		2.895		0.736	***	0.592	***	3.533		6.460	**	5.902	*
	1.52		0.61		0.92		4.62		3.90		1.26		2.12		1.65	
R&D intensity indicator	0.214	***	4.463	***	4.622	***	2.162		5.705	*	4.441	***	4.074	***	6.443	***
	4.00		2.80		3.57		0.71		1.95		3.93		3.21		4.72	
G Index	0.035	***	0.968	***	0.997	***	3.960	***	3.716	***	0.694	***	0.845	***	0.727	***
	5.07		4.63		5.93		3.29		3.20		4.74		5.47		3.67	
CEO ownership	-0.017	***	-0.320	***	-0.278	***	-0.342	***	-0.385	***	-0.361	***	-0.379	***	-0.448	***
	-5.70		-3.19		-3.60		-4.71		-5.99		-5.50		-5.64		-5.54	
CEO age	-0.222	***	-3.875	***	-3.245	***	-4.527	***	-4.673	***	-4.260	***	-5.248	***	-4.037	***
	-5.36		-3.21		-3.09		-4.76		-5.13		-4.65		-5.56		-3.35	
CEO tenure	-0.010		-0.275		-0.308		-0.136		-0.259		-0.350		-0.341		0.255	
	-0.70		-0.64		-0.82		-0.38		-0.80		-1.07		-0.98		0.58	
Number of observations	9693		4672		6437		7424		8642		8002		7673		4717	
R-squared	0.33		0.43		0.39		0.36		0.35		0.33		0.34		0.37	
Adjusted *R*-squared	0.31		0.41		0.37		0.34		0.33		0.31		0.32		0.34	

Panel C: Alternative explanations and additional control variables

	(1)		(2)		(3)		(4)		(5)		(6)	
Local director pool	0.626	**	1.125	***	0.449	**	0.620	***	0.554	**	1.127	***
	2.30		3.09		2.02		2.60		2.39		3.44	
Firm size	0.837	***	0.894		0.953	***	0.625	**	0.915	***	0.780	***
	2.88		3.14		3.35		2.02		3.20		2.60	
Sales growth	-2.706	***	-2.790	***	-2.635	***	-2.190	***	-3.184	***	-2.687	***
	-3.12		-3.20		-3.04		-2.60		-3.66		-3.13	
ROA	-3.941		-4.461		-3.602		-3.417		-4.648		-4.757	
	-1.15		-1.29		-1.05		-0.98		-1.35		-1.37	
Firm age	1.923	***	2.044	***	1.865	***	1.891	***	2.185	***	1.852	***
	3.88		4.14		3.78		3.63		4.50		3.74	
Firm risk	0.157		0.103		0.105		0.251		0.021		0.308	
	0.52		0.35		0.36		0.82		0.07		1.03	
Institutional ownership	0.152	***	0.152	***	0.149	***	0.155	***	0.165	***	0.156	***
	6.95		7.03		6.96		6.87		7.73		7.20	
Tangible asset intensity	4.379		4.493	*	3.151		5.422	*	4.366		4.044	
	1.60		1.65		1.18		1.91		1.61		1.47	
R&D intensity indicator	4.394	***	4.222	***	4.356	***	4.096	***	4.632	***	4.478	***
	3.98		3.94		4.12		3.56		4.22		4.07	
G Index	0.712	***	0.687	***	0.608	***	0.761	***			0.676	***
	5.06		4.88		4.33		5.16				4.81	
CEO ownership	-0.354	***	-0.343	***	-0.345	***	-0.329	***	-0.367	***	-0.345	***
	-5.59		-5.45		-5.43		-5.31		-5.91		-5.46	
CEO age	-4.576	***	-4.324	***	-4.309	***	-4.763	***	-4.423	***	-4.628	***
	-5.26		-5.05		-5.02		-5.40		-5.19		-5.34	
CEO tenure	-0.265		-0.303		-0.308		-0.184		-0.155		-0.189	
	-0.85		-0.98		-1.01		-0.57		-0.50		-0.62	
Industry cluster	0.079											
	0.14											
Population density			1.902									
			0.38									
Upper-income density			-4.615									
			-1.08									
Retirement income density			3.103									
			1.30									
College graduates (%)			0.102									
			0.49									
Unemployment (%)			-0.650	***								
			-2.93									
Mean (state)					0.710	***						

			8.76			
Business segments				0.577		
				1.04		
Foreign segment				0.993		
				1.28		
Classified board					1.040	
					1.47	
Dual class firm					-8.341 ***	
					-6.48	
NYSE listing						1.570 *
						1.66
Big city						-2.450 *
						-1.65
Medium-sized city						0.141
						0.11
Number of observations	9693	9693	9693	8650	9693	9693
R-squared	0.33	0.34	0.35	0.34	0.34	0.33
Adjusted *R*-squared	0.31	0.32	0.33	0.32	0.32	0.32

We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. The dependent variable is independent director representation on the board, Independent directors (%). Variable definitions are presented in Table A1. Ordinary least squares regressions with three-digit SIC industry and year fixed effects. Robust t-statistics adjusted for clustering by firm are reported. Panel A uses other Local director pool definitions: same county (column 1); hundred-mile radius (column 2); including Canadian firms (column 3); excluding firms smaller than our firm (column 4); excluding small firms (column 5); including financial firms (column 6). Panel B uses alternative definitions and sample criteria: logit transformation of board independence, ln[y/(1-y)] (column 1); excluding firms headquartered in the ten largest metropolitan areas (column 2); excluding firms headquartered in CA, IL, MA, and NY (column 3); excluding high-tech and automotive firms (column 4); excluding firms that entered the sample during our sample period (column 5); excluding observations with acquisition spending in excess of five percent percent of total assets (column 6). Next we retrieve Compact Disclosure (CD) data on historical headquarters locations (2004 is the latest reliable CD data year). The 1996–2004 sample contains 8,004 obs., of which 5,048 observations have matching CD data. In columns 7–8, we exclude 331 observations whose CD headquarters locations are more than sixty miles away from the Compustat designated headquarters location. Column 8 also excludes observations that could not be matched to CD data. Panel C adds controls for industry clusters (column 1); population density, upper-income household density, retirement income household density, college graduates, Census region dummies, and unemployment (%) (column 2); mean of board independence in the state (column 3); business and regional diversification (column 4); classified board and dual class shares dummies (column 5); NYSE listing and big- and medium-sized city dummies (column 6). The symbols ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 5
Local director labor markets and other board characteristics.
Panel A: Local director labor markets and other board characteristics

	Gray directors (%)		Inside directors (%)		Board size	
	(1)		(2)		(3)	
Local director pool	-0.689	**	-0.426	*	-0.002	
	-2.50		-1.75		-0.47	
Firm size	-0.053		-0.726	***	0.076	***
	-0.20		-3.79		17.58	
Sales growth	0.915		1.788	***	-0.022	**
	1.40		4.04		-2.45	
ROA	0.105		4.857	**	-0.006	
	0.04		2.47		-0.14	
Firm age	-1.124	***	-0.714	**	0.047	***
	-2.65		-2.46		6.89	
Firm risk	-0.075		-0.228		-0.024	***
	-0.30		-1.21		-5.98	
Institutional ownership	-0.106	***	-0.047	***	-0.002	***
	-5.60		-3.33		-7.20	
G Index	-0.147		-0.527	***	0.009	***
	-1.22		-5.98		5.01	
Tangible asset intensity	-1.279		-2.913		0.049	
	-0.58		-1.54		1.22	
R&D intensity indicator	-3.506	***	-0.986		0.017	
	-3.75		-1.25		1.03	
CEO ownership	0.029		0.325	***	-0.004	***
	0.54		6.47		-4.21	
CEO age	0.777		3.647	***	0.028	**
	1.01		5.12		1.97	
CEO tenure	-0.356		0.512	**	-0.006	
	-1.39		2.36		-1.32	
NYSE listing	0.276		-1.941	***	0.030	**
	0.35		-3.19		2.20	
Big city	2.273	*	0.069		-0.009	
	1.87		0.06		-0.43	
Medium-sized city	1.340		-1.505	*	0.014	
	1.31		-1.71		0.84	
Number of observations	9693		9693		9693	
R-squared	0.18		0.33		0.49	
Adjusted *R*-squared	0.16		0.31		0.48	

Panel B: Local director labor markets, executive expertise and appointments of local directors

	Executive expertise (%)		Executive expertise (%)		Executive expertise (%)	Local independent directors (%)	Local outside directors (%)	Local gray directors (%)	Independent director distance to exec. job
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Local director pool	0.651 **		0.512 *		0.743 *	7.987 ***	7.277 ***	7.007 ***	-0.259 ***
	2.23		1.93		1.89	7.95	7.74	2.67	-4.91
Local director pool (similar or larger)		0.774 **		0.635 **					
		2.34		2.14					
Firm size	0.225	0.422	0.598 *	0.756 **	1.736 ***	-4.352 ***	-5.022 ***	-9.643 ***	0.255 ***
	0.64	1.20	1.84	2.33	4.70	-3.46	-4.21	-3.02	4.07
Sales growth	1.326	1.347	1.614 *	1.633 *	-1.346	0.006	-1.869	-6.211	-0.032
	1.33	1.35	1.75	1.77	-1.13	0.00	-0.56	-0.93	-0.14
ROA	6.347	6.379	3.296	3.325	-0.354	13.575	16.938	28.906	-1.097
	1.42	1.42	0.81	0.81	-0.08	0.80	1.09	0.69	-1.28
Firm age	1.182 *	1.163 *	0.136	0.119	-1.416 **	-1.913	-2.273	5.066	0.064
	1.93	1.90	0.25	0.22	-2.13	-1.02	-1.21	1.12	0.68
Firm risk	0.443	0.429	0.677 *	0.662 *	0.676 **	1.741	1.311	-3.038	-0.124
	1.11	1.07	1.90	1.85	2.21	1.34	1.02	-0.81	-1.64
Institutional ownership	0.030	0.031	0.019	0.020		-0.135	-0.228 **	-0.446 *	0.006
	1.09	1.13	0.78	0.81		-1.48	-2.40	-1.86	1.40
G Index	0.120	0.121	0.233	0.234		1.335 **	1.173 **	-0.946	-0.054 *
	0.65	0.65	1.41	1.42		2.36	2.11	-0.73	-1.85
Tangible asset intensity	0.373	0.415	2.613	2.675	-6.173	0.352	1.517	-4.799	0.180
	0.11	0.12	0.83	0.85	-1.54	0.03	0.13	-0.18	0.29
R&D intensity indicator	1.477	1.442	1.988 *	1.959	3.342 **	7.802 *	10.936 ***	22.976 **	-0.273
	1.08	1.05	1.67	1.64	2.17	1.69	2.59	2.19	-1.19
CEO ownership	-0.135	-0.134	-0.099	-0.099	-0.344 ***	0.296	0.351	0.940	-0.020
	-1.51	-1.51	-1.26	-1.26	-3.43	0.83	1.04	1.08	-0.93
CEO age	-3.471 **	-3.466 **	-2.784 **	-2.781 **	-3.939 **	-1.833	-0.492	0.300	0.165
	-2.54	-2.54	-2.38	-2.38	-2.57	-0.39	-0.11	0.04	0.66
CEO tenure	0.678 *	0.680 *	0.813 **	0.815 **	-0.990 **	0.380	0.383	2.132	0.038
	1.72	1.73	2.30	2.30	-2.15	0.27	0.28	0.69	0.49
Number of observations	8181	8181	8201	8201	7945	3365	3842	785	3365
R-squared	0.35	0.3545	0.41	0.4112	0.21	0.31	0.31	0.52	0.27
Adjusted *R*-squared	0.34	0.3357	0.39	0.3941	0.19	0.27	0.27	0.41	0.23

Panel C: Local director labor markets and specialized board expertise

	R&D expertise (%)		R&D expertise (%)		Tech expertise (%)		Tech expertise (%)		Financial expertise (%)		Legal expertise (%)	
	(1)		(2)		(3)		(4)		(5)		(6)	
Local director pool (R&D)	0.037	***	0.037	***								
	2.83		3.19									
Local director pool (tech)					0.042	***	0.042	***				
					4.82		5.16					
Financial institutions									0.391	*		
									1.95			
Law firms											0.618	**
											2.21	
Firm size	0.016		0.018		0.006		0.002		-0.528	**	0.502	**
	1.21		1.42		0.51		0.23		-2.21		2.20	
Sales growth	0.061		0.039		0.048		0.041		0.328		0.585	
	1.48		1.04		1.38		1.36		0.47		0.98	
Firm age	-0.028		-0.039	**	-0.015		-0.016		-1.347	***	0.145	
	-1.37		-2.08		-0.94		-1.12		-2.99		0.35	
Firm risk	0.008		0.001		0.014		0.008		0.445	**	0.086	
	0.62		0.05		1.21		0.74		2.33		0.52	
Institutional ownership	0.001		0.001		-0.001		-0.001					
	1.12		0.58		-1.38		-1.00					
G Index	0.007		0.007		-0.002		-0.002					
	1.11		1.33		-0.49		-0.57					
Tangible asset intensity	0.217	*	0.257	**	-0.185	**	-0.119		-2.374		-2.177	
	1.87		2.39		-2.04		-1.42		-0.92		-0.94	
Regulated firms									11.008	***	6.744	
									4.14		1.18	
R&D intensity	0.007	**	0.009	***	0.010	***	0.007	**	-15.628	**	-12.215	*
	2.09		2.86		3.26		2.06		-2.22		-1.79	
CEO age	-0.005		-0.001		-0.005	**	-0.003		-2.060	**	1.047	
	-1.47		-0.40		-2.11		-1.05		-2.30		1.21	
CEO tenure	0.006		-0.014		-0.053		-0.062	**	-0.775	***	0.481	*
	0.11		-0.30		-1.37		-2.12		-2.84		1.75	
CEO ownership	-0.014		-0.020	*	0.004		0.001		-0.006		0.059	
	-1.03		-1.66		0.37		0.08		-0.11		1.02	
Number of observations	3339		3813		3339		3813		9667		9667	
R-squared	0.28		0.31		0.29		0.28		0.18		0.18	
Adjusted *R*-squared	0.24		0.27		0.25		0.24		0.15		0.16	

We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. Ordinary least squares regressions with three-digit SIC industry and year fixed effects. Robust t-statistics adjusted for clustering by firm are reported. Panel A examines other board characteristics. Panel B examines the proportion of executive experts among independent directors (columns 1–2) and outside directors (columns 3–5); column 5 uses BoardEx data on director characteristics; columns 6–9 examine representation of local executives among independent, outside, and gray directors with executive positions and average independent director distance to their executive jobs. Panel C examines specialized board expertise (technology, legal and financial); columns 1–4 use the main sample; columns 5–6 use BoardEx data for all firms, including regulated firms (SIC 6000–6999 and 4900–4999); columns 1 and 3 use independent directors; columns 2 and 4–6 use outside directors. The symbols ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 6
The effect of board independence on CEO pay and turnover

	Incentive/ Total CEO pay		Incentive/ Total CEO pay (II)		Total CEO pay		CEO turnover		CEO turnover	
	(1)		(2)		(3)		(4)		(5)	
Independent directors (%)	0.324	***	0.286	***	-0.009		0.002	**	0.002	**
	3.02		2.76		-0.51		1.97		2.15	
Independent directors (%)*Return									-0.048	*
									-1.65	
Firm size	3.929	***	5.261	***	-1.960	***	0.003		0.003	
	6.36		8.57		-13.96		0.62		0.61	
Sales growth	0.668		2.051		0.905	***	-0.060	***	-0.045	***
	0.47		1.54		2.74		-4.37		-3.14	
Firm age	-2.492	***	-1.999	**	-0.025		0.010		0.010	
	-3.17		-2.49		-0.15		1.47		1.48	
Firm risk	1.781	***	1.704	***	0.349	***	0.001		0.003	
	3.88		3.78		3.40		0.32		0.59	
Institutional ownership	0.195	***	0.215	***	0.018	**	-0.001	***	-0.001	**
	5.33		5.93		2.26		-2.59		-2.25	
G Index	-0.335		-0.126		0.005		0.002		0.002	
	-1.45		-0.56		0.12		0.99		0.91	
Tangible asset intensity	-7.549	*	-6.529		-1.188		-0.067	*	-0.075	**
	-1.88		-1.63		-1.58		-1.82		-2.03	
R&D intensity indicator	56.622	***	54.761	***	13.606	***	-0.015		0.008	
	5.23		5.69		4.13		-0.17		0.08	
CEO ownership	-0.356	***	-0.440	***	-0.082	***			0.003	
	-3.54		-4.20		-4.57				0.63	
CEO age	-2.677		-4.784	***	-0.539	**			0.002	**
	-1.62		-2.97		-2.20				2.15	
CEO tenure	-1.996	***	-2.932	***	-0.313	***			-0.048	*
	-3.86		-5.68		-3.06				-1.65	
Industry cluster					0.506	***				
					3.12					
CEO-Chair					0.805	***				
					3.66					
Dividend yield					-0.110	**	0.004		0.003	
					-2.00		0.92		0.61	
Return									2.929	
									1.64	
Past return					0.122	***			-0.378	***
					5.42				-3.29	
Capex					0.034					
					1.64					
High tech					0.207					
					0.23					
Foreign segment					0.444	**				
					2.13					
Business segments					-0.445	***				
					-3.24					
High sunshine					0.362					

Industry median					1.54 0.643 8.95	***				
Number of observations	6566		6566		5241		6902		6900	
First-stage Cragg-Donald statistic	81.15		81.15		65.22		104.88		41.18	
Hausman test (endogeneity of independent directors (%))	4.340	**	3.108	*	0.879		4.320	**	4.434	**
OLS: Independent directors (%)	0.055	*	0.079	***	0.005		-2.E-04		-2.E-04	
	1.94		2.84		0.82		-0.69		-0.93	
Independent directors (%)*Return									0.008	
									1.57	

We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. For this test, observations in the top quartile of total assets are excluded from the sample. The dependent variables are: incentive/total CEO pay (column 1); incentive/total CEO pay (II) (column 2); total CEO pay (column 3); an indicator for CEO turnover (excluding CEO deaths) in a given year (columns 4–5). Instrumental variables regressions are used. Independent directors (%) is predicted from the local director pool, big and medium-sized city indicators, industry median independent directors (%), and second-stage controls. Also, turnover-performance sensitivity regressions use industry median stock return and the product of industry medians of stock return and independent directors (%) to predict a Independent directors (%)*Return. Three-digit SIC industry and year fixed effects are included. Robust t-statistics adjusted for clustering by firm are reported. In all regressions, the null hypothesis of weak instruments is rejected. For purposes of comparison, coefficients of key variables estimated using ordinary least squares using the same model specifications are reported at the bottom of the table. The symbols ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 7
The effect of board independence on firm profitability and operating performance

	ROA		ROA		OCF		OCF	
	(1)		(2)		(3)		(4)	
Independent directors (%)	0.097	***	0.067	**	0.104	***	0.080	**
	2.96		2.23		3.03		2.43	
Firm size	1.466		0.453		0.983		0.196	
	3.48		1.20		2.53		0.55	
Sales growth	4.232	***	4.342	***	2.327		2.359	
	2.66		2.90		1.31		1.38	
Firm age	-0.349		-1.067	***	-0.725	**	-1.206	***
	-0.98		-3.39		-2.03		-3.60	
Institutional ownership	0.118	***	0.090	***	0.091	***	0.072	***
	6.12		5.12		4.73		3.99	
Tangible asset intensity	8.374	***	6.854	***	8.825	***	7.536	***
	3.86		3.44		4.40		4.01	
Industry cluster	-1.112	***	-0.557	*	-0.428		-0.017	
	-3.14		-1.71		-1.21		-0.05	
G Index (state laws)	0.094				0.061			
	0.44				0.30			
G Index			-0.080				-0.149	
			-0.85				-1.60	
Firm risk			-3.574	***			-2.918	***
			-14.98				-13.33	
R&D intensity indicator			-0.119				0.454	
			-0.19				0.71	
CEO age			0.417				0.028	
			0.79				0.05	
CEO ownership			0.046				0.083	**
			1.20				2.21	
CEO tenure			0.444	**			0.301	
			2.17				1.42	
Number of observations	7271		7271		7271		7271	
First-stage Cragg-Donald statistic	112.57		105.31		112.57		105.31	
Hausman test	9.25	***	3.68	*	11.42	***	5.88	**
(endogeneity of independent directors (%))								
OLS: Independent directors (%)	-0.034	**	-0.022		-0.020		-0.010	
	-2.29		-1.62		-1.47		-0.72	

We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. For this test, observations in the top quartile of total assets are excluded from the sample. Variable definitions are presented in Table A1. The dependent variables are ROA (columns 1–2) and operating cash flow (columns 3–4). Instrumental variables regressions are used. Independent directors (%) is predicted from the local director pool, big and medium-sized city indicators, industry median independent directors (%) and second-stage controls. Three-digit SIC industry and year fixed effects are included. Robust t-statistics adjusted for clustering by firm are reported. In all regressions, the null hypothesis of weak instruments is rejected. For purposes of comparison, coefficients of key variables estimated using ordinary least squares are reported at the bottom of the table. The symbols ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 8
The effect of board independence on firm value

	M/B		M/B		M/B	
	(1)		(2)		(3)	
Independent directors (%)	0.010	**	0.009	**	0.009	**
	2.56		2.37		2.26	
Firm size	-0.080		-0.095		-0.095	
	-2.04		-2.36		-2.36	
Sales growth	1.104	***	1.086	***	1.069	***
	8.93		9.01		8.89	
Firm age	-0.119	**	-0.109	**	-0.095	**
	-2.53		-2.38		-2.03	
Institutional ownership	0.007	***	0.007	***	0.007	***
	3.57		3.72		3.56	
Tangible asset intensity	-0.349		-0.388	*	-0.387	*
	-1.53		-1.71		-1.70	
Industry cluster	0.240	***	0.236	***	0.235	***
	4.58		4.39		4.37	
G Index (state laws)	0.002					
	0.08					
G Index			-0.027	*	-0.027	*
			-1.89		-1.91	
Firm risk			-0.094	***	-0.102	***
			-3.88		-4.21	
R&D intensity indicator			0.231	**	0.227	**
			2.55		2.50	
CEO age			-0.104		-0.104	
			-1.39		-1.40	
CEO ownership			0.006		0.006	
			1.11		1.07	
CEO tenure			0.047		0.048	
			1.62		1.63	
Dividend yield					-0.040	**
					-2.22	
Dual class firm					-0.104	
					-0.91	
Number of observations	7271		7271		7271	
First-stage Cragg-Donald statistic	112.57		105.31		104.65	
Hausman test (endogeneity of independent directors (%))	4.56	**	3.36	*	3.26	*
OLS: Independent directors (%)	0.001		0.001		0.001	
	0.52		0.69		0.59	

We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. For this test, observations in the top quartile of total assets are excluded from the sample. Variable definitions are presented in Table A1. The dependent variable is market-to-book ratio. Instrumental variables regressions are used. Independent directors (%) is predicted from the local director pool, big and medium-sized city indicators, industry median independent directors (%) and second-stage controls. Three-digit SIC industry and year fixed effects are included. Robust t-statistics adjusted for clustering by firm are reported. In all regressions, the null hypothesis of weak instruments is rejected. For purposes of comparison, coefficients of key variables estimated using ordinary least squares using the same model specifications are reported at the bottom of the table. The symbols ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table 9
Additional tests: the effects of board independence, board size and local directors on firm value and performance

	M/B		M/B		ROA		ROA		OCF		OCF	
	(1)		(2)		(3)		(4)		(5)		(6)	
Independent directors (%)	0.009	**	0.015	*	0.066	**	0.148	**	0.079	**	0.250	***
	2.33		1.92		2.19		2.34		2.41		3.57	
Firm size	-0.096		-0.019		0.556		0.702		0.330		0.235	
	-1.90		-0.27		1.28		0.99		0.77		0.38	
Sales growth	1.074	***	1.275	***	4.305	***	4.850	**	2.312		6.154	***
	8.89		4.74		2.87		2.04		1.35		2.63	
Firm age	-0.093	*	-0.093		-0.997	***	-0.975	**	-1.117	***	-0.706	
	-1.86		-1.13		-2.97		-2.17		-3.10		-1.40	
Firm risk	-0.101	***	-0.037		-3.606	***	-3.188	***	-2.959	***	-2.647	***
	-4.00		-0.87		-14.62		-9.01		-13.01		-7.27	
Institutional ownership	0.007	***	0.007	**	0.087	***	0.073	***	0.069	***	0.051	*
	3.34		2.02		4.91		2.63		3.70		1.88	
G Index	-0.026	*	-0.034		-0.069		-0.114		-0.135		-0.212	
	-1.77		-1.25		-0.72		-0.73		-1.43		-1.22	
Tangible asset intensity	-0.385	*	-0.729	*	6.937	***	5.910	*	7.641	***	5.069	
	-1.67		-1.79		3.47		1.72		4.05		1.47	
R&D intensity indicator	0.223	**	0.224	*	-0.084		1.225		0.497		0.982	
	2.46		1.70		-0.13		1.25		0.77		0.86	
CEO age	-0.105		-0.128		0.452		-0.994		0.077		-1.022	
	-1.38		-1.20		0.85		-1.23		0.15		-1.09	
CEO ownership	0.006		0.026	**	0.040		-0.013		0.076	**	0.112	
	1.04		2.42		1.04		-0.17		1.99		1.07	
CEO tenure	0.045		-0.026		0.427	**	0.991	***	0.280		0.708	*
	1.55		-0.52		2.07		2.79		1.31		1.79	
Industry cluster	0.236	***	0.213	**	-0.588	*	-0.488		-0.059		0.205	
	4.34		2.48		-1.78		-0.91		-0.17		0.37	
Dividend yield	-0.041	**	-0.035									
	-2.19		-1.26									
Board size	-0.004				-1.318				-1.703			
	-0.01				-0.60				-0.70			
Local independent directors (%)			0.000				-0.005				-0.003	
			0.14				-0.41				-0.21	
Number of observations	7271		1975		7271		1975		7271		1975	
First-stage Cragg-Donald statistic	71.95		17.68		72.55		17.69		72.55		17.69	
Hausman test (endogeneity of independent directors (%))	3.15	*	3.81	*	3.54	*	4.85	**	5.68	**	11.25	***
OLS: Independent directors (%)	0.001		-0.001		-0.022		-0.007		-0.010		-0.004	
	0.73		-0.19		-1.62		-0.33		-0.73		-0.16	
Board size	-0.097				-0.003				-0.890			
	-0.77				0.00				-0.93			
Local independent directors (%)			2.E-04				0.011				0.011	
			0.18				1.56				1.42	

We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. For this test, observations in the top quartile of total assets are excluded from the sample. Variable definitions are presented in Table A1. The dependent variables are market-to-book (columns 1–2), ROA (columns 3–4), and operating cash flow (columns 5–6). Instrumental variables regressions are used. Independent directors (%) (as well as board size or local independent directors (%)) is predicted from the local director pool, big and medium-sized city indicators, industry median independent directors (%) and second-stage controls (as well as industry median board size or local independent directors (%) for the latter two dependent variables respectively). Three-digit SIC industry and year fixed effects are included. Robust t-statistics adjusted for clustering by firm are reported. In all regressions, the null hypothesis of weak instruments is rejected. For purposes of comparison, coefficients of key variables estimated using ordinary least squares using the same model specifications are reported at the bottom of the table. The symbols ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Appendix

Table A1

Variable definitions

Variable	Definition
Board characteristics	
Independent directors (%)	Percent of independent directors on the board. RiskMetrics.
Gray directors (%)	Percent of gray directors on the board. Gray directors are professional service providers, customers, suppliers, former employees, directors designated under an agreement with a group or by a significant shareholder, majority holders, relatives of executives, recipients of gifts, certain interlocking directors (a director and executive of our firm sits on another board that has an executive and director who also sit on our board), and others, as identified in proxies and disclosures. RiskMetrics.
Inside directors (%)	Percent of inside directors on the board. RiskMetrics.
Board size	Log of the number of directors on the board. RiskMetrics.
Local independent directors (%)	Percent of local independent directors (employed within sixty miles of the firm) among independent directors with corporate positions (officer of another firm, as reported in RiskMetrics, where location is known). *Local Gray Directors* (%) and *Local Outside Directors* (%) are defined similarly.
Independent dir. distance to executive job (mean)	Log of one plus average distance in miles to the main executive job held by an independent director on the firm's board, based on independent directors holding executive jobs. *Outside* Dir. Distance to Exec. Job (Mean) is defined similarly, except both independent and gray directors are considered.
Executives with local directorships (%)	Percent of insiders with seats on other local boards (within sixty miles of the firm), as reported in RiskMetrics; defined for firms with at least one insider. *Local Directorships per Insider* is average number of seats on other local boards held by the firm's insiders, defined for firms with at least one insider. RiskMetrics.
Executive expertise (%)	Percent of independent (outside, as specified) directors with executive expertise on the board. Executive expertise is defined as holding the title of CEO, CFO, CIO, COO, president, VP, executive VP, senior VP, partner, managing director, treasurer title, or having insider status on another board. RiskMetrics/BoardEx.
Legal expertise (%) and Financial expertise (%)	Percent of directors with specialized expertise on the board. *Legal Expertise* is defined as having an attorney, counsel, or similar law-related title or holding a law degree. *Financial Expertise* is defined as holding the CFO, treasurer, banking, finance, investment or accounting position. Data on outside director expertise for the present and past years reported in BoardEx is used.
R&D expertise (%) and Tech expertise (%)	Percent of outside directors with corporate experience at firms with positive R&D and high-tech firms (SIC codes 2833–2836, 3570–3577, 3600–3674, 7371–7379 or 8731–8734, following Baginski et al. 2004), respectively, among outside directors with identifiable corporate jobs (officer on another board, where RiskMetrics identifies the firm).
Local director labor markets	
Local director pool	Log of one plus the number of US nonfinancial firms headquartered within sixty miles of the firm's headquarters, excluding firms in the same four-digit SIC (SIC4) industry. Alternative local pool definitions differ based on (i) geography - hundred-mile radius [*Local director pool* (*100 mi*)], the firm's county [*Local director pool* (*county*)], US and Canadian firms in the sixty-mile radius [*Local director pool* (*incl. Canada*)]; (ii) firm size - firms in the same or higher quartile of assets [*Local director pool* (*similar or larger size*)] or firms with total assets of at least one hundred million [*Local director pool* (*excl. small*)]; and (iii) sample composition – financial firms and nonfinancial firms [*Local director pool* (*incl. financials*)].
Law firms	Log of one plus the number of law firms (250 largest law firms in the 2008 Internet Legal Research Group ranking) within a sixty-mile radius of the firm's headquarters.
Financial institutions	Log of one plus the number of financial institutions (SIC codes 6000–6999) headquartered within sixty miles of the firm.

Local director pool (R&D)	Log of one plus the number of US nonfinancial firms with positive R&D headquartered within sixty miles of the firm, excluding firms in the same SIC4 industry.
Local director pool (tech)	Log of one plus the number of US high-tech firms (identified by SIC codes 2833–2836, 3570–3577, 3600–3674, 7371–7379 or 8731–8734, following Baginski et al. 2004) headquartered within sixty miles of the sample firm, excluding firms in the same four-digit SIC industry.
Control variables	
Firm size	Log of total assets. Compustat.
Sales growth	Annual change in net sales divided by the previous year's net sales. Compustat.
ROA	Ratio of operating income before depreciation to total assets. ROA (%) is ROA expressed as a percent of total assets. Compustat.
Firm age	Log of one plus the number of years since the first listing of the firm's shares in CRSP. CRSP monthly.
Firm risk	Standard deviation of daily excess returns expressed in percent in a given year. CRSP daily.
Institutional ownership	Total percentage institutional ownership. *Institutional block* equals 1 if the firm has a 5% institutional blockholder. Thomson Reuters.
G Index	The Gompers et al. (2003) index of 24 takeover defenses. Similar to existing work, gap years are filled in with adjoining years. RiskMetrics.
CEO age	Equals 1 for CEO aged sixty-five and over; 0 otherwise. Execucomp.
CEO ownership	Percent ownership stake of the CEO in the firm. Execucomp.
CEO tenure	Log of CEO tenure. Execucomp.
R&D intensity	Ratio of research and development expenditure to assets; 0 if missing. *R&D intensity indicator* equals 1 if *R&D Intensity* is positive and 0 otherwise. Compustat.
Tangible asset intensity	Ratio of property, plants, and equipment to total assets. Compustat.
Classified board	Indicator variable equal to 1 if the firm has a classified board provision and 0 otherwise. RiskMetrics.
Business segments	Log of the number of business segments. Compustat Segments.
Foreign segment	Indicator variable equal to 1 if the firm has a foreign geographic segment and 0 otherwise. Compustat Segments.
NYSE listing	Indicator variable equal to 1 if the firm's shares are listed on NYSE.
Big and medium-sized city indicators	Big city indicator equals 1 if the firm is headquartered in one a top 10 metropolitan statistical area based on the 2000 Census and 0 otherwise. Medium-sized city indicator equals 1 if the firm is headquartered in one of top 11-50 metropolitan statistical areas by population size and 0 otherwise. Compustat; Census (2000).
Industry cluster	Log of number of US nonfinancial firms in the same four-digit SIC industry as the sample firm headquartered within sixty miles of the sample firm.
Population density	Log of population density in the counties located within sixty miles of the sample firm's headquarters. US Census (2000).
Upper-income density	Log of the density of households with income above $100,000 in the counties located within sixty miles of the sample firm's headquarters. US Census (2000).
Retirement income density	Log of the density of households with retirement income in the counties located within sixty miles of the sample firm's headquarters. US Census (2000).
College graduates (%)	Percent of college graduates and advanced degree holders in population ages 25+ within sixty miles of the sample firm's headquarters. US Census (2000).
Unemployment (%)	Percent of unemployed in total civilian labor force in the county of the firm's headquarters. US Census (2000).
Dividend yield	Cash dividends per share divided by price at year-end, times hundred. Compustat.
Return	Annual average of monthly excess stock return, lagged where specified. CRSP monthly.
Dual class firm	Indicator that equals 1 if the firm has dual classes of shares. RiskMetrics.

High sunshine	Indicator that equals 1 if the average percent possible sunshine exceeds 60. National Climatic Data Center.
CEO-Chair	Indicator that equals 1 if the CEO is also the chairman of the board. RiskMetrics.
Capex	The ratio of capital expenditure to total assets, times 100. Compustat.
Firm value, performance and compensation	
Market-to-book ratio	Ratio of market value (book value of assets minus book value of equity plus year-end price times common shares outstanding) to book value of assets. Compustat.
Incentive/Total CEO pay	Percent of value of CEO option grants in total CEO compensation. *Incentive/Total CEO pay* (*II*) uses the sum of option and restricted stock grants. Execucomp.
Total CEO pay	Total CEO compensation (including value of option grants), in million, divided by total assets. Execucomp, Compustat
CEO turnover	Indicator variable equal to 1 if a change in the CEO has occurred compared to the previous year, according to Execucomp. CEO deaths and retirements are excluded.

We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. Tests of legal, financial and executive (where indicated) expertise use BoardEx data on outside directors for the 2002–2008 period, excluding firms with missing CRSP/Compustat or Execucomp data, firms with total assets below twenty million, firms headquartered outside continental US, and boards reporting fewer than three directors but including financials and regulated utilities.

Table A2
First stage estimates

	Independent directors (%)		Independent directors (%)	
	(1)		(2)	
Local director pool	1.004	**	0.982	***
	2.50		2.57	
Big city	-3.693		-2.841	
	-2.18		-1.77	
Medium-sized city	0.029		0.015	
	0.02		0.01	
Independent directors (%) (industry median)	0.621	***	0.595	***
	17.98		17.21	
Firm size	-0.072		-0.267	
	-0.16		-0.59	
Sales growth	-2.584	***	-1.894	**
	-2.65		-2.09	
Firm age	1.694	***	1.135	**
	2.80		1.97	
Institutional ownership	0.209	***	0.169	***
	8.89		7.39	
Tangible asset intensity	1.434		3.397	
	0.44		1.09	
Industry cluster	0.739		0.596	
	1.07		0.89	
G Index (state laws)	-0.035			
	-0.10			
G Index			0.690	***
			4.27	
Firm risk			0.591	*
			1.90	
R&D intensity indicator			3.377	***
			2.65	
CEO age			-4.449	***
			-5.21	
CEO ownership			-0.303	***
			-4.38	
CEO tenure			-0.355	
			-1.03	
Number of observations	7271		7271	
First-stage F-statistic	86.08		78.55	

This table presents first stage estimates of instrumental variables regressions (the specific estimates are from Table 7). We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. For this test, observations in the top quartile of total assets are excluded from the sample. Variable definitions are presented in Table A1. Independent directors (%) is predicted from the local director pool, big and medium-sized city indicators, industry median independent directors (%) and second-stage controls. Three-digit SIC industry and year fixed effects are included. Robust t-statistics adjusted for clustering by firm are reported. The symbols ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.

Table A3
Determinants of a firm's propensity to supply local directors

	Executives with local directorships (%)		D(Executives with local directorships >0)		Local directorships per executive	
	(1)		(2)		(3)	
Local director pool	2.107	***	0.025	***	0.030	***
	5.27		4.71		5.23	
Firm size	3.676	***	0.054	***	0.043	***
	6.17		7.30		5.09	
Sales growth	-4.531	***	-0.039	***	-0.058	***
	-4.47		-2.79		-4.32	
ROA	7.719		0.092		0.118	*
	1.49		1.33		1.71	
Firm age	2.441	***	0.029	**	0.033	***
	2.67		2.42		2.82	
Firm risk	-0.398		-0.013	*	-0.010	
	-0.81		-1.81		-1.52	
Institutional ownership	-0.035		-0.001		-0.001	
	-0.92		-1.29		-0.98	
G Index	0.588	**	0.010	***	0.008	**
	2.32		2.78		2.29	
Tangible asset intensity	-7.928	*	-0.120	*	-0.101	
	-1.66		-1.81		-1.63	
R&D intensity indicator	0.574		-0.009		0.013	
	0.30		-0.34		0.52	
CEO ownership	-0.088		-0.001		-0.002	*
	-0.97		-0.88		-1.66	
CEO age	-1.619		-0.024		-0.022	
	-0.92		-1.06		-1.03	
CEO tenure	1.522	**	0.022	***	0.024	***
	2.55		2.67		2.74	
Number of observations	9628		9628		9628	
R-squared	0.17		0.18		0.17	
Adjusted *R*-squared	0.15		0.16		0.15	

This table examines firm size and other characteristics in relation to firms' propensity to supply local directors and the service of executives on other local firms' boards. We use the 1996–2006 sample of Compustat/CRSP firms with available RiskMetrics corporate governance, 13f institutional holdings, and Execucomp data, excluding firms with total assets below twenty million, regulated financial and utility firms (SIC codes 6000–6999 and 4900–4999), and firms headquartered outside the continental US. Variable definitions are presented in Table A1. Ordinary least squares regressions with three-digit SIC industry and year fixed effects. Robust t-statistics adjusted for clustering by firm are reported. The symbols ***, ** and * denote significance at the 1%, 5% and 10% levels, respectively.