Executive Market Segmentation: How Local Density Affects Incentive and Performance

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Abstract

This paper documents geographic segmentation in the executive labor market and investigates how local market density affects executive incentives and firm performance. Using executive job changes covered by Execucomp database, I find that firms hire local executives eight times more likely than they would if the executive market were nationally integrated. Based on the finding of geographic segmentation, I then hypothesize and empirically show that firms located in a denser executive market face lower search cost and are, therefore, more likely to replace poor-performing executives, and especially with outside candidates. Such firm behaviors create implicit incentives for executives through two channels: a performance-induced dismissal threat and an outside promotion opportunity. Finally, by interacting implicit incentives with executive career horizon, I find that local executive pool density improves firm performance, and this positive effect is stronger for firms with younger executives.

JEL Classification: G30; G34; J42
Keywords: Executive labor market; geographic segmentation; implicit incentive; firm performance

1 Introduction

The market of executives might not be as national as the conventional wisdom says. Several recent studies document that CEO compensation level and structure are correlated with their local peers, suggesting that the labor market for executives are actually geographically segmented (e.g. Bouwman (2013)). Yonker (2014) further shows that it is five times more likely for a typical U.S. firm to hire a CEO who grew up in the state of the firm's headquarter than a CEO from elsewhere.

The first goal of this paper is to provide more direct evidence on geographic segmentation of the executive labor market. To achieve this goal, I examine all executives who change jobs between firms covered by Execucomp database. Using zip code of firm's headquarter, I calculate the distance between the headquarters of executive's old and new employer. Out of 1926 job changes in my sample, 742 cases have a moving distance of 60 miles or less (i.e. local). Although almost two fifths of hirings being local is more than expected, this by itself is not sufficient evidence on geographic segmentation. In order to conduct formal test on segmentation, I calculate local hiring bias (LHB) similar to Yonker (2014). LHB is measured as the difference between the realized local hiring percentage and the expected local hiring percentage under the null hypothesis that the executive market is nationwide. For each hiring event, the expected local hiring probability is approximated by the number of local firms divided by the number of firms nationwide. I find that the expected local hiring percentage is around 5%, while the realized percentage is 39%. This implies that LHB is 34% and firms hire local executives eight times more often than expected.

One concern with the local hiring bias documented here is that it might actually be driven by geographic clustering of industry and firm's tendency of hiring industry insiders. To disentangle industry effect from the bias, I also measure the expected local hiring probability as the number of local firms within the same industry as the event firm divided by the number of firms in that industry nationwide. With this alternative measure, LHB is still significantly above zero at 25%. I consider further robustness checks using 100-mile and 250-mile as alternative cutoff values, and adjusting each firm counts with its employment size. The pattern of local hiring remains substantial both statistically and economically. Moreover, by

studying different subsamples, I find that *LHB* is prevalent among all industries, all markets with different density, all time periods, and even strongly exists in the largest firms and highest-paid positions.

If the executive market is composed of segmented local markets, then the structure of each local market is important for the firms and executives inside. In this paper, I examine how the density of a local market affects firm's hiring policies and executive's implicit incentives. The main hypothesis is that firms located in denser markets face more high-quality candidates and lower search cost, so they are more likely to replace an executive if his performance turns out to be low and fill the vacancy with an outsider. From an executive's perspective, this implies two things. On one hand, the executive faces a higher performance-based dismissal threat. On the other hand, he also carries more outside promotion opportunities. Interestingly, these two effects both incentivize executives to exert more effort through the channel of implicit contract.

To provide empirical evidence that density of the local market creates implicit incentive for executives, I first examine the relation between market density and CEO performance-to-turnover sensitivity. I measure density as the number of firms within 60 miles of a firm's headquarter. Using CEO turnovers during $1996 - 2013$, I find that the sensitivity of CEO turnover to stock performance rises as density of the local executive pool rises. Such effect is both statistically and economically significant. An interquartile increase in density raises the performance-to-turnover sensitivity by 20%. This result is consistent with my hypothesis that lower searching and replacement costs in denser labor markets make firms dismiss poor-performing CEOs more frequently. Next, I investigate whether denser markets also create more outside promotion opportunities for local executives. On the firm's side, regression results indicate that firms located in thicker executive pools tend to fill vacancies by hiring outsiders rather than promoting insiders. This pattern is statistically significant and exists for both CEO and non-CEO positions. On the executive's side, I find that executives in a denser market do experience more outside promotions. Executives in the market with density at the top quartile have almost doubled outside local promotion opportunities than executives in the bottom-quartile market. The results on firm's choice and executive's realized

outcomes, altogether, imply that market density generates substantial outside tournament incentive for executives.

Although local market density clearly provides executives with implicit incentives, one might reckon that it could also disincentivize executives by offering more backup options in the event of dismissal. Yet, this argument is not necessarily true in theory because potential local employers could have detailed information on those poor-performing executives and are thus reluctant to hire them. Empirically, I construct a sample of executives losing their jobs and examine their subsequent employment outcomes. Applying a similar procedure to Fee and Hadlock (2004), I consider all executives in S&P 500 firms who are under the age of 55 and lost jobs during $2000 - 2010$, and look for their later employment history based on news articles. Regression results indicate that local pool density does not help dismissed executives find a new job more easily, obtain a higher-quality position, or experience shorter unemployment duration.

Since local market density generates strong implicit incentives for executives, the last goal of the paper is to examine whether density enhances firm performance through those incentives. The empirical challenge here is that market density could have an impact on performance through various channels,[1] so a simple positive correlation between these two variables does not suffice. To distinguish the incentive mechanism from other potential mechanisms, I interact market density with executive's career horizon. The idea is that executives with shorter horizon (closer to retirement) should respond less to implicit incentives, so the effect of labor market density on performance should be smaller for firms with older executives. Using executive's current age as a proxy of horizon, I find that an interquartile decrease in average executive age doubles the effect of market density on firm Tobin's Q. As all other potential mechanisms do not interact with executive age, this interacted effect implies that executives in a denser market exert more efforts in response to stronger implicit incentives and thus improve firm value.

This paper relates to three strands of literature. First of all, by examining whether U.S. executive labor market is geographically segmented, it contributes to the burgeoning literature on geographic condition and executive market. Linking geography to social circle,

[1]See Marshall (1920), Duranton and Puga (2004), and Rosenthal and Strange (2004).

Ang et al. (2013) measure CEO's social pressure as the number of local CEOs and social elites and find that CEO's compensation level is positively correlated with social pressure. Bouwman (2013) also find strong geographic patterns in compensation. They show that CEO compensation highly depends on the average level of local peers', and they attribute this phenomenon to CEO envy. The paper most closely related to my study is Yonker (2014), who finds that firms are more likely to hire CEOs who grew up in the same state as firms' headquarters. My examination on firm's geographic preference provides two main improvements to Yonker (2014). First, Yonker compares the CEO's "grew-up" area and firm's headquarter, while I compare the executive's last and current employer's headquarters. Suppose a CEO spent his childhood in California, worked as a senior executive in a New York firm, and then was hired by an Californian firm as CEO. In such case, it is clear that the Californian firm has conducted a nationwide search for CEO, but the hiring would be classified as a local one if CEO's "grew-up" area rather than CEO's last job area is used. Second, by using the zip code of firm's headquarter, I am able to measure the moving distance in miles. This provides me with a more accurate definition of "local" hiring, compared with the state level measure used in Yonker (2014).

My paper also contributes to the literature on implicit incentive mechanisms. Besides explicit incentives from contracts, previous studies show that executives also respond to implicit incentives. Rank-order tournament is one of the most prominent implicit incentives. Lazear and Rosen (1981) and Green and Stokey (1983) build theoretical foundation of how tournament might replace performance-based contracts as an incentive mechanism and why it is even a superior way to lead to efficiency under some circumstances. On the empirical side, Kale et al. (2009) measure non-CEO executive's tournament incentive using pay gap within the firm. They find that such incentive has a positive effect on firm performance. Coles et al. (2012) extend Kale et al. (2009) by examining tournament incentive on CEOs. They argue that although CEOs have no promotion incentive within the firm, they are still in a tournament with other CEOs outside the firm. Apart from tournaments, executives also face other implicit incentives. Gibbons and Murphy (1992) show both theoretically and empirically that career concern is an important source of incentive and firms optimally

adjusts the level of explicit incentive in the compensation contract based on the strength of executive's career concern. Jenter and Lewellen (2010) uncover a much larger effect of firm performance on CEO turnover than previous studies (e.g.Weisbach (1988)) and thus argue that performance-induced dismissal threat is another essential source of incentive. My paper contributes to this literature by demonstrating that both promotion incentive and dismissal threat become stronger when the local executive pool becomes thicker. As a result, market density has a positive effect on firm value through providing executives with stronger incentives.

Finally, by linking local market density with firm's decision on executive employment, this paper also contributes to a growing literature that studies how geographic factors affect firm policies. For instance, existing work finds that geographic clusters encourage surrounding firms to innovate (Glaeser et al. (1992)), to vertically disintegrate (Holmes (1999)), to make acquisitions (Almazan et al. (2010)), and provide firms with easier access to external financing (Deeds and Decarolis (1999)) and business service (Ono (2003)). Similar to my paper, Knyazeva et al. (2013) also study density of local executive market but focus on its impact on board structure. They find that proximity to thicker pools of director talent helps firms build more independent boards and thus leads to better performance. My study focuses on the effect of density on executive employment and shows that firms located in a denser market are more likely to dismiss poor-performing executives and hire outsiders.

The rest of the paper is organized as follows. Section 2 describes the sources of data used in the paper. Section 3 examines geographic segmentation in the U.S. executive labor market. Section 4 applies segmentation results from Section 3 and studies how local labor market density affects firm's policy on executive employment and creates implicit incentives for executives. Section 5 investigates whether market density improves firm value through the channel of executive incentives. Section 6 concludes.

2 Data Sources

This study compiles data from several resources. I use Execucomp database to identify executive job movings, CEO turnovers, and for information on executive characteristics including age, compensation, tenure, etc. All firm-level accounting data come from Com-

pustat. The Center for Research in Security Prices (CRSP) provides data on stock returns. I obtain board and governance characteristics from RiskMetrics database. To calculate the distance between firms and measure local executive labor market, I merge the zip code of firm's headquarter from Compustat with the latitude and longitude of each zip code from the Census 2000 U.S. Gazetteer. The distance in miles between two zip code areas is calculated using the Vincenty formula. I also compare this distance measure with the one calculated by Haversine formula. The correlation between these two distances are almost 1.[2] Finally, I use news articles from Factiva database in two cases. First, for the analysis where CEO turnover is used, I rely on news articles to identify whether a CEO turnover is forced or voluntary, and whether a successor is an insider or an outsider. Second, for a sample consisting of departing executives (including non-CEOs) as discussed in Section 4.5, I use news reports to determine the reason of departure and subsequent employment outcomes. The Appendix provides a detailed descriptions of the variables used in the paper.

3 Local Hiring Bias

I start by documenting the existence of geographic segmentation in the top executive labor market in U.S. The conventional wisdom is that such market is highly integrated and nationwide, because the benefit for firms of finding a perfect leader outweighs the search cost, and the benefit for executives grabbing a high compensation outweighs the moving cost. However, several recent studies provide evidence suggesting that the executive labor market might actually be geographically segmented (see Bouwman (2013), Yonker (2014)). In this paper, I use data on executive job changes to provide direct evidence on market segmentation.

3.1 Sample

I identify executive job changes using Execucomp database from $1992 - 2013$. First, for each executive who ever appeared in the database, I record his employer for each year. If

[2]Vincenty formula calculates the distance between two points on the surface of a spheroid. The distance in miles between two zip code areas with latitude/longitude (φ_i, λ_i) is calculated as

$$3963.19 \times arctan\left(\frac{\sqrt{(cos\varphi_2 sin(\lambda_2 - \lambda_1))^2 + (cos\varphi_1 sin\varphi_2 - sin\varphi_1 cos\varphi_2 cos(\lambda_2 - \lambda_1))^2}}{sin\varphi_1 sin\varphi_2 + cos\varphi_1 cos\varphi_2 cos(\lambda_2 - \lambda_1)}\right)$$

an executive has more than one employer in a single year (about 1.5% of all executive-year observations), the employer that the executive receives most compensation from is considered as the employer. Next, I record an executive job change if the executive's employer in year t is different from his employer in year $t+1$, or the employer in year t is different from year $t+2$ and the executive does not appear in Execucomp in year $t+1$. Following this procedure, I obtain 1926 executive job moves. One limitation of using only Execucomp data is that those job changes identified are mostly among large firms and high-compensation jobs. However, since large firms and executives looking for high compensation should benefit more from a nationwide job search, the local hiring bias documented below could be regarded as a lower-bound.

Table 1 shows the summary statistics of job changes. The sample mean and median total assets of hiring firms are 24.84 and 3.40 billions of 2000 U.S. dollars respectively. Since the mean total assets is about 2.6 billions for Compustat firms and 5.8 billions for Execucomp firms, the numbers in panel A confirms that the hiring firms in my sample mainly consists of the largest U.S. firms. I also compare the size between the new employer and the old employer. As shown in the table, the mean (median) size of the new employer is larger than that of the old one, and more than half the executives move to larger firms. As larger firms are often related with higher compensation level and greater career opportunity, these results suggests that most of the job movings are promotions. When annual sales is used as alternative size measure, similar results are obtained.

Panel B further provides information on the job characteristics.[3] The first three rows show the compensation at old and new positions. The mean (median) level of the compensation at new position is significantly higher than that of the compensation at old position, and the mean (median) ratio of new compensation to old compensation is 1.87 (1.24). I also compare the seniority in the corporate hierarchy between old and new jobs. Among all executives, only 4% of them hold CEO positions in the old job, but 20% executives obtain the CEO position in the new job. More generally, I compare the rank of positions, which is calculated based on the annual total compensation within each firm-year observation. I find

[3]To avoid the potential problem that the executive's data at the last and the first year of an employment only reflects part of the year, I use data one year prior to the last year of the old employment and one year after the new employment to characterize the old and new positions.

that although on average executives do not achieve a rank increase by moving to a new job, they do significantly climb to a higher hierarchy if they move to a smaller firm. Overall, the summary statistics in Table 1 suggest that the hiring firms in my sample are large, and most of the job changes can be regarded as promotions.

3.2 Estimation Strategy

In this subsection, I describe the method to estimate local hiring bias. Following the literature (e.g. Knyazeva et al. (2013), Bouwman (2013)), I mainly define a firm's local area as area within 60-mile radius of the firm's headquarter.[4]100-mile and 250-mile radii are considered as alternative cutoff values. Similar to Yonker (2014), I calculate local hiring bias (LHB) as the difference between the realized local hiring percentage and the expected local hiring percentage under the null hypothesis that the executive market is nationwide. Formally,

$$LHB = \frac{N_L - \sum_{i=1}^{N} p_i}{N}$$

where N is the total number of hiring event in my sample, N_L is the number of actual local hiring, and p_i is the probability of hiring a local executive for each hiring event i under the null hypothesis.

To calculate LHB, I propose several methods to estimate the key element p_i. The first and the most straightforward measure is the number of local firms of event firm i divided by the number of firms nationwide.[5] However, this simple ratio measure does not take into account that large firms might provide more executives to local labor market than small firms, so in the second measure I adjust the ratio with firm size. Specifically, each firm count is adjusted by a size weight, which is calculated as firm's number of employees divided by the average number of employees of all firms in that year. One concern with LHB calculated using either first two measures of p_i is that the bias might actually be driven by firm's tendency to hire industry expertise rather than locals.[6] Consider firms in the silicon valley. Suppose at the extreme that these firms only hire executives within the same industry. Since many of the high-technology firms are located in the silicon valley, one would expect to observe

[4]I implicitly assume that all executives holding top positions at a firm work at the firm's headquarters.
[5]Throughout the paper, I only consider firms that are covered by Compustat except otherwise noticed.
[6]Based on my sample, 48.3% of job changes are within the same 2-digit SIC industry.

a high percentage of local hiring for silicon valley firms. To address this issue and separate industry effect from local effect, in the third measure, I calculate p_i as the number of local firms within the same industry as the event firm divided by number of firms of that industry nationwide. Industry is classified based on 2-digit SIC code. Under this measure, p_i is high for silicon valley firms due to the industry clustering effect and *LHB* should be indifferent from zero if these firms do only tend to hire industry veterans but not locals. Finally, the fourth measure adjusts the third one by firm's size as mentioned above. To the extent that firms hire executive both within and outside the industry, *LHB* estimated using p_i from the first two (cross-industry) and last two measures (within-industry) could be regarded as upper and lower bound of the local hiring bias.

3.3 Results on Local Hiring Bias

Table 2 presents the results on local hiring bias based on the 1926 executive job moves identified in Section 3.1. In Panel A, I conduct the baseline analysis for the full sample. The first and second columns list the total number of hiring events N and the number of realized local hirings N_L. The third and fifth columns show the expected local hiring under null hypothesis $\sum_{i=1}^{N} p_i$ with the first and second measure of p_i respectively. The fourth and the sixth columns calculate local hiring bias *LHB* using the results from the third and fifth columns, respectively. As reported in Panel A, when 60-mile is used as the cutoff, almost 40% (742/1926) of hirings are local. However, if the executive labor market is integrated and nationwide, the expected local hiring percentage should be just around 5% (92.86/1926). Therefore, the local hiring bias, calculated as the difference between the realized and expected local hiring percentage, is 33.7%. In other words, firms hire local executives eight times more often than they would if market were integrated. When I replace the unadjusted p_i with size adjusted p_i in the last two columns, the bias continues to exist and becomes even larger. In the next two rows, I use 100-mile and 250-mile as alternative cutoffs to define local area. The magnitude of local hiring bias remains substantial and is around 35% to 40%. Another thing worth noticing is that although there are 742 hirings within 60 miles, only 52 (165) additional hirings happen between 60 and 100 miles (100 and 250 miles). The number of these additional hirings are actually close to the increase in expected hirings. Hence, it could

be said that the local hiring bias is mostly driven by the hirings within 60 miles of the firm's headquarter.

To address the concern that local hiring bias could actually be driven by firm's tendency to hire industry insider, I use the third and fourth measure of p_i in Panel B. Consistent with the fact that firms within the same industry often cluster together, the expected local hirings become more than doubled compared to the numbers in Panel A. Although the increase in expected local hirings reduces the bias, it is still substantially larger than zero for both unadjusted and size adjusted p_i measures and all three distance cutoffs. As argued in Section 3.2, since the cross-industry and within-industry measures of p_i provide an upper and lower bound of *LHB*, the results in Panels A and B together indicate that the local (60-mile) hiring bias is between 25% to 35%, and firms are three to ten times more likely to hire local executives than expected.

In addition to economic magnitude, I also compute statistical significance using a two-sided binomial test where a local hiring is considered as a success. Formally, for the binomial test, the number of trials is N, the number of success is N_L, and the probability of success is the average of p_i ($\sum_{i=1}^{N} p_i/N$). The test results reject the null hypothesis that the executive labor market is integrated for all distance and p_i measures in Panel A and B at 1% level. The results also reject the null hypothesis for all subsamples in Panels C to G at 1% level, except for year 1993 in Panel G where only 7 hirings are observed (rejection at 5% level).

3.4 Results by Subsamples

In Panels C to G, I provide further evidence on local hiring bias by categorizing all hiring events into different groups. Panel C divides the full sample into subsamples based on hiring firm's industry. For brevity of report and power of statistical test, I use Fama-French 12 industry classification. Results show that the hiring bias is prevalent across all industries and is between 30% to 40% for most of them. Among these 12 industries, the oil, gas, and coal industry has the largest bias at 62%, while wholesale and retail industry has the smallest bias at 16%. One possible explanation is that the benefit from searching a high quality executive is high for retail industry but relatively low for the energy industry. Another reason could be that energy firms are usually geographically clustered while retail firms are more dispersed.

To investigate whether local hiring bias only exists in the densest area (e.g. cities like New York), I create ten subsamples based on the area density of hiring firms in Panel D. Density is measured as the total number of firms within 60 miles of hiring firm's headquarter. As expected, both the number of actual local hirings and expected local hirings increase with the density of the area. Columns (4) and (6) show that the bias is both economically and statistically significant for all density deciles. Even for the sparsest area where there are fewer than 38 firms around, the bias of hiring locals is still about 20%.

In Panels E to G, I examine whether the cost and benefit of conducting a nationwide search has any heterogeneous effect on the magnitude of local hiring bias. Panel E categorizes sample hiring firms based on their S&P code. As the benefit of finding a suitable leader is higher for larger firms, large firms should be more likely to hire an executive from a nationwide executive pool. The results in Panel E offers clear evidence supporting this argument. The local hiring bias is strongest for SmallCap firms at 43.1%, decreases to 37.2% for MidCap, and is lowest for S&P 500 firms at 30.7%. For firms that are not included in S&P 1500 index, both the median size and the local hiring bias are between MidCap and S&P 500.[7]

Panel F sorts the full sample into deciles based on the compensation that executives receive at the new position. To control for the rapid compensation increase in the last two decades, I scale each compensation with the average compensation level in that year.[8] If the level of compensation indicates the importance of the position, high compensation jobs should be associated with fewer local hirings. The empirical results in Panel F are mixed. Although jobs with compensation at the lowest decile have highest tendency to hire locals, the highest-paid jobs do not have the lowest local hiring bias. In fact, the relationship between compensation level and bias is U-shaped. One potential reason for such outcome is that high compensation is often received by senior executives and these executives are less willing to move.

Finally, in Panel G, I study whether the bias changes over time. One might expect that with the increase in information and transportation convenience, firm's searching cost and executive's moving cost would become lower in the latter sample period and thus the

[7]The sample mean (median) total assets is 3.20 (0.93) for SmallCap firms, 7.14 (1.77) for MidCap firms, 36.72 (4.57) for S&P 500 firms, and 28.71 (3.49) for firms not in S&P Index. All amounts are in billions of 2000 dollars.

[8]Similar results are obtained if Consumer Price Index is used to scale compensations.

executive labor market would become more integrated. However, I do not find any time pattern of the bias. The local hiring bias is substantial in all years and fluctuates between 20% to 40%.

4 Executive Market Density and Executive Implicit Incentives

In Section 3, I document the phenomenon that there exists a substantial geographic segmentation in the U.S. executive labor market. If hirings often happen locally, then the density of the local labor market should affect firm's hiring policy. A high density means more high-quality candidates and lower search cost, so firms in a denser market should be more likely to replace an executive if his performance turns out to be low and fill the vacancy with an outsider. For an executive, this implies both a higher performance-based dismissal threat and more outside promotion opportunities. Interestingly, both of these effects work as an implicit contract by creating higher career concern for executives and hence incentivize them to exert more effort. In this section, I first provide empirical evidence on how labor market density affects performance-to-turnover sensitivity. Then, I show that executives in denser area do have higher outside promotion opportunities. Finally, by studying the subsequent employment outcomes for executives who lose their jobs, I address the concern that the market density might disincentivize executives by offering more backup options.

4.1 Summary Statistics for Sample Firms

The main sample consists of firms with available Execucomp, Compustat and CRSP data from 1992 to 2013.[9] The key explanatory variable is the density of executive labor market in the firm's vicinity. Since the bias of local hiring comes mostly within 60 miles of firm's headquarter (as documented in Table 2), I use 60-mile as the cutoff value to define local area. Similar to the strategy discussed in Section 3.2, I consider four measures of market density. *Local executive pool 1* is the total number of firms within 60-mile radius of the sample firm. Knyazeva et al. (2013) use a similar measure to characterize the availability of prospective directors near a firm. The second measure *Local executive pool 2* adjusts each firm count in

[9]For analysis where RiskMetrics data is used, sample starts from 1996. Since governance data are reported biannually before 2006, I follow the literature (e.g. Gompers et al. (2003) and Bebchuk et al. (2009)) and construct annual time series of governance provision by assuming that it remains unchanged from one report until the next.

the local area with its employment size. The third and fourth measures assume that firms only hire industry insiders. *Local executive pool 3* is the number of firms within 60-mile radius of the sample firm and within the same 2-digit SIC industry. *Local executive pool 4* again adjusts for firm size. In all regression analysis, logarithm is used to address the right skewness of the density measures.

The summary statistics of the main variables are presented in Table 3. The sample contains $38,262$ firm-year observations and $3,333$ unique firms. On average, the local executive pool consists of executives from 381 local firms. This number decreases to 265 after size adjustment is used. If firms only consider executives from the same industry as potential candidates, the average market density is about 20 firms. The correlation between *pool 1* (*pool* 3) and *pool 2* (*pool* 4) is 0.912 (0.878), and the correlation between *pool 1* (*pool* 2) and *pool 3* (*pool* 4) is 0.677 (0.564). Panel A also reports other common characteristics of sample firms. Firms on average have total assets of 5.83 and annual sales of 3.16 billions of 2000 dollars. The mean annual stock return, sales growth and return on assets are 20%, 18% and 12% respectively. Executive characteristics are shown in Panel B. A typical CEO is at the age of 56, has been at the helm for 4.5 years, and owns 4% of firm's stock. When the top management team is considered, the average age drops to 51 and stock ownership drops to 1%.

4.2 Performance-to-Turnover Sensitivity

In this subsection, I study how local executive pool density affects firm's decision to replace managers with poor performance. If firms mainly focus on the local executive market rather than the national market, the cost of searching a new manager should be lower for firms located in a denser area. Empirically, I use CEO turnovers and test whether performance-to-turnover sensitivity increases with the density of local executive pool.

Since firms are usually reluctant to announce the true reasons behind CEOs' departure and disguise forced turnovers as voluntary (Weisbach (1988), Jenter and Lewellen (2010)), I include both forced and voluntary turnovers in my analysis. I try two methods to minimize the noise on performance-to-turnover sensitivity due to retirement. First, I include CEO's age in all model specifications as a control variable. Second, as Weisbach (1988) documents

that a nontrivial number of departures happens on CEO's sixty-fifth birthday, I exclude all firm-years with CEOs aged between 64 and 66. The dependent variable is a CEO turnover dummy, which is set to 1 if the CEO is replaced in the subsequent year. Following the literature (e.g. Warner et al. (1988), Weisbach (1988)), I use industry-adjusted stock returns as the performance measure. To capture other causes of CEO departures, I control for CEO duality, CEO tenure, CEO ownership, board size, board independence, E-index, firm size, and firm age. All regressions include year fixed effects and report marginal effects with robust standard errors clustered at firm level.

The first two columns in Table 4 use logit model to document the relation between firm performance and CEO turnover without any interaction with labor market density. Since a firm is more likely to replace its CEO if its performance becomes worse but might still keep the CEO as long as the performance meets some threshold, columns (1) and (2) examine whether the performance-to-turnover sensitivity is symmetric for firms with performance above and below industry median.[10] The result in column (1) shows that for firms with industry adjusted returns below zero, the performance is negatively related with the probability of a CEO turnover. This negative relation is both statistically and economically significant. An interquartile decline in below-zero performance (0.44) raises the likelihood of turnover by about 7.4%.[11] On the other hand, I find in column (2) that there is no clear relation between performance and turnover if the performance meets the industry median. Therefore, in columns (3) to (6) where the interaction effect is investigated, I only use firms with below-zero adjusted returns.

Columns (3) to (6) test whether performance-to-turnover sensitivity increases with local executive market density. In columns (3) and (4), I use *Local executive pool 1* as the measure of density and run logit and probit models, respectively. The coefficient on the interaction term is significantly negative, indicating that as the density of local executive market rises, the sensitivity of CEO turnover to stock performance also rises. For firms facing labor market density at the bottom quartile (4.29), the marginal effect of return on CEO turnover is around 0.15. For firms at the top quartile (6.30), this effect increases by 20% to 0.18.

[10] Jenter and Lewellen (2010) empirically show that the effects of performance on turnover is non-linear. Also see Hermalin and Weisbach (1998) and Adams and Ferreira (2007).

[11] The average CEO turnover ratio for firms with industry adjusted return below zero is 12%.

This is consistent with my hypothesis that firms located in a denser labor market have lower searching and replacement cost and thus dismiss CEOs with poor performance more frequently. In addition to its effect on performance-to-turnover sensitivity, density also affects turnover directly. The positive coefficient on *Local executive pool 1* itself implies that firms in a thicker labor market are more likely to replace CEOs given a level of performance. Columns (5) and (6) use *Local executive pool 2* as an alternative density measure. The statistical and economic significance of the interaction term becomes even stronger.

Overall, I find evidence that an increase in local executive pool density encourages firms to replace poor-performing CEOs. This performance-induced dismissal threat could be an important source of incentives for CEOs and presumably all top executives.

4.3 Outside Promotion Opportunities

In addition to the dismissal threat, local executive market density also provides executives with implicit incentives through outside promotion opportunities. Firms located in a denser market have access to more high-quality external executives and are hence more likely to fill vacancies by bringing in outsiders rather than promoting insiders. From an executive's perspective, a higher tendency of hiring outsiders expands his outside promotion opportunities and generates a tournament-type incentive.[12] Tournament incentives have been widely explored in the literature. Lazear and Rosen (1981) and Green and Stokey (1983) build theoretical foundation for how rank-order tournament works as an incentive mechanism and why it is even preferred to performance-based contracts under some circumstances. Kale et al. (2009) empirically study the internal promotion incentive of non-CEO executives and show that such incentive relates positively to firm performance. Coles et al. (2012) extend Kale et al. (2009) by examining CEOs' industry promotion incentive. They also find a positive effect of tournament incentive on performance. To provide empirical evidence that executives in a denser market do face a stronger tournament incentive, I first document that firms in these areas tend to hire outsiders. Then, I show that executives' realized outside promotion frequency is also strongly related to market density.

[12]The environment here can be easily translated into a simple model where N executives compete for a prize and the prize is higher in a denser market. The number of executives does not necessarily changes with market density because executives in denser area face both more job positions and more competitors. In equilibrium, executive's effort increases with market density.

I start with all CEO turnovers covered in Execucomp database during $1992-2013$. For each turnover case, a new CEO is classified as an outsider if he has been with the firm for less than one year. Since successor choice is strongly related to the reason of turnover (see Parrino (1997)), I search related news articles on Factiva database to determine whether a departure is forced. Following the literature (e.g. Parrino (1997)), I classify a turnover as forced if (i) the report says that the CEO was fired, forced out, or departed due to policy differences; or (ii) the departing CEO is under age of 60, did not announce the retirement at least six months in advance, and did not leave for health reasons or acceptance of another position. Among all $2,887$ departing CEOs, 30% are succeeded by outsiders and 16.8% are ousted. Table 5 column (1) shows the relation between local labor market density and outside succession probability with forced turnover as the only control. Consistent with the hypothesis, the coefficient of *Local executive pool 1* is positive and significant at 1% level. An interquartile increase in executive pool density (2.01) raises the probability of firm hiring a outside successor by about 4.5%, which is a 15% increase compared with average outsider ratio. In line with the findings in previous studies, the coefficient of forced turnover is large in magnitude and statistically significant. In column (2), I extend the result by adding controls including departing CEO characteristics and firm characteristics. The key findings remain unchanged. Column (3) presents the full model specification where board size, board independence and corporate governance are used as further controls. The effect of local market density on outside succession probability is still economically and statistically significant. In column (4), I use *Local executive pool 2* as an alternative measure of market density. The coefficient is now significant at 5% level and an interquartile change in density increases outsider ratio by 2.7%.

In order to provide a more complete picture on how executive pool density affects firm's successor choice, I also study non-CEO successions. I construct the sample using all executive-firm-year observations covered by Execucomp database during $1992-2013$ where an executive is listed on a firm's annual proxy for the first time. Observations in the year when a firm first appears in the database are excluded. For all sample observations, I assume the start date of an executive taking the position as the start date of the fiscal year when he is first reported

in the firm's annual proxy. A hiring is classified as external if the executive has been with the firm for less than one year.[13] For all 14,943 observations in the analysis sample, 23.9% are outside successions. Columns (5) and (6) in Table 5 present the logit regression results. As shown in column (5), the coefficient of *Local executive pool 1* is positive and significant at 1%. Regarding economic magnitude, a firm in an area with labor market density at the top quartile has 3 percentage points higher probability of choosing an outsider when hiring a senior executive than a firm at the bottom quartile, all else equal. Similar to the finding for CEO successions, the effect of market density slightly decreases when *Local executive pool 2* is used as in column (6). Altogether, the results in Table 5 confirm the hypothesis that local labor market density is positively associated with firm's tendency to fill vacant positions with external candidates.

Table 6 gives further evidence on the tournament incentive by examining the counterpart of Table 5. That is, there should be more realized outside promotions for executives in a denser labor market if firms in such a market tend to hire outsiders. The dependent variable in column (1) is the number of executive job changes in each firm-year observation. The construction of the job change sample follows the same procedure as in Section 3.1, except that here I only include top-five executives in each firm year to deal with the concern that the number of changes might be caused by the number of executives reported in the annual proxy. I obtain 1,201 job changes for the analysis sample, which means an average of 0.043 job change in each firm year. As shown in column (1), the coefficient of *Local executive pool 1* is significantly positive, indicating that executives in a denser market do experience more job changes outside their firms. For an interquartile increase in density, the number of job change rises by 0.006, a 15% increase compared to the sample average. Column (2) refines the finding in column (1) by restricting job changes to promotions only. A job change is considered as a promotion if the new job's compensation (deflated by CPI) is higher than the old one's or the new firm is larger than the old one in terms of market values. I find that about 85% of job changes in the sample are promotions. The coefficient of *Local executive pool 1* is still significant at 1% level, and the economic magnitude is also similar to that documented in column (1). Columns (3) and (4) further control for board and governance

[13] For executives with missing data on the date when they join the company, I code them as insiders.

characteristics and consider different density measures. The key finding remains unchanged. Finally, in columns (5) and (6), I consider the number of local promotions in each firm year as the dependent variable. A promotion is considered as local if the distance between old and new employer's headquarters is less than 60 miles. As the sample average local promotion is 0.012, a coefficient of 0.004 implies that executives in the labor market with density at the top quartile have almost doubled outside local promotion opportunities than executives in the bottom-quartile market. Such difference is substantial enough to generate more tournament incentive for executives facing a denser market.

4.4 Alternative Density Measures

Throughout Tables 4 to 6, I use the number of all firms in a local area as the measure of market density. Yet, if firms mainly focus on industry insiders when making a hiring decision, a measure including only firms in the same industry could be more appropriate. Hence, as a robustness check, I consider two additional measures of market density *Local executive pool* 3 and *Local executive pool* 4, which are equal to the unadjusted and size-adjusted number of local firms in the same industry as the target firms, respectively. Table 7 replicates the analysis in Sections 4.2 and 4.3 with the new density measures.

Columns (1) and (2) correspond to Table 4 columns (3) and (5), where the dependent variable is CEO turnover and logit model is used. Consistent with the previous finding, the coefficient of the interaction term is negative in both columns. Yet, the statistical significance of the coefficient decreases to insignificant for *Local executive pool* 3 and significant at 10% level for *Local executive pool* 4. Columns (3) and (4) replicate Table 5 columns (3) and (4), where the dependent variable is outside CEO succession. The marginal effect of market density is significantly positive as expected. The economic magnitude becomes even larger as compared to the previous result, as the marginal effect of the key explanatory variable slightly increases while the interquartile range (standard deviation) of the variable keeps almost the same. In columns (5) and (6), I reexamine the effect of market density on executive outside promotion. I find that both the economic magnitude and statistical significance are similar to the finding in Table 6. Overall, the results from the robustness checks reinforce the key findings that firms located in an area with a denser executive labor pool have a higher

performance-to-turnover ratio and are more likely to hire outsiders.

4.5 Executive Employment Outcomes after Losing Jobs

So far, the results through Table 4 to Table 7 give strong evidence that local executive pool density provides executives with implicit incentive through two channels: a performance-induced dismissal threat and an outside promotion opportunity. However, one might argue that market density could also discourage executives to exert efforts because it offers executives more backup options in the event of dismissal. Yet, this argument does not necessarily hold because potential local employers could have detailed information on executives and are thus reluctant to hire executives who are fired due to poor performance. To empirically test whether labor market density has a negative incentive effect, I examine subsequent employment outcomes of executives losing their jobs.

My data collecting procedure closely follows Fee and Hadlock (2004), who use labor market outcomes to assess how market interprets an executive turnover event. I start constructing the sample with executives who are under the age of 55, listed in an S&P 500 firm's proxy statement in one fiscal year but are not listed in that firm's or any other Execucomp firm's statement in the subsequent year ("leaving" the firm). I restrict the sample to a subset of the Execucomp universe due to the high data collection costs. I focus on S&P 500 firms because the press coverage is more comprehensive on these firms than on others, and I exclude executives "leaving" their firms at the age beyond 55 because these "leavings" are more likely to be driven by retirement. I also restrict the sample period to $2000 - 2010$ for the same practical reason. This procedure yields an initial sample consisting of $1,358$ ""leaving" executives. For each of these executives, I look for their "fate" by searching news reports on Factiva database for a three-year window after the "leaving" year. Following Fee and Hadlock (2004), I search in all publication libraries new articles that contain both the executive's name and his prior employer's name.[14] I obtain my final analysis sample with the following procedure. First, among all $1,358$ cases, I exclude 288 cases where news articles show that executives actually remain in the firm although they are no longer listed in the

[14] As noted in Fee and Hadlock (2004), it is not practical to search new articles just using an executive's name without the employer's name. Also, by comparing the results from news searching and the results from annual Compact Disclosure Compact D database, the authors find that their new searching procedure is sufficient to determine the executive's employment history.

proxy statement. Next, I exclude all cases in which the executive leaves the employer for reasons including health (7 cases), death (5), acceptance of a new position (113), or leaves to go with assets that are spun-off (12). For the remaining sample, I find 336 cases where there is no news found on either executive's departure from old employer or joining new employer. For the cases where some news about the executive's employment history are reported, I define the executive's next employer as any publicly traded firm or any private firm that does not have a consulting or financial focus where the individual is hired as a full-time executive first time after leaving his prior employer. I also record the dates executive departs the old firm and joins the new firm based on new articles.[15] Similar to Fee and Hadlock (2004), I put each executive's departure reason into one of the following four categories. First, a departure is classified as forced if the article reporting the turnover uses words such as "oust", "fired", "terminated" or overtly links the turnover with poor performance or scandal, or the leaving executive is paid with severance. Next, if the reason for a departure is "to pursue other interests", I assign it to the pursue category. For the remaining cases where report says the executive decides to retire from the firm, I call departure retirement.[16] All others are classified as resignation. I find 84 cases of forced departure, 98 cases of pursuing other interests, 176 cases of retirement, and 234 cases of resignation.

For all departures excluding (including) cases where no news report is found, the rate of new employment is 32% (20.5%). This number is close to the findings in Fee and Hadlock (2004), where they find 26.8% (38.9%) of executives under the age of 60 (50) find new employment. This low rate indicates that in general leaving a firm involuntarily is a downturn in an executive's career. To provide further information on the subsequent employment outcome of a departing executive, I also assess the quality of the new position. Since it is difficult to obtain data on executive's compensation, I use firm's size as a proxy for the job's quality.[17] Among all new firms that executives join, around two-thirds (63.3%) are publicly traded firms. Moreover, for new firms with data on total assets available, the median ratio

[15]For a small number of cases where there are news on executive's joining a new firm but no news on leaving the old one, I assume that the executive leaves the firm at the end of the last fiscal year when he appears in the firm's annual proxy.

[16]I do not exclude retiring departures from the analysis because firms often do not report the true reason of an executive's leaving. In fact, the average age of "retiring" executives in my sample is 52.5 and 16.5% of them find a job employment within three years of departure.

[17]Previous studies (e.g. Murphy (1999)) establish a strong relation between compensation and firm size.

of new firm size to old firm size is merely 0.14. Overall, the low new employment rate and the decline in job quality suggest that most of the leavings covered in the sample are career downturns for executives and could be regarded as dismissals, which assists my goal of studying whether market density provides backup options for dismissed executives.

Regression results are displayed in Table 8. To control for factors other than local labor market that could affect subsequent employment outcomes, I include the reason for departure as controls where the omitted group is resignation. I also consider whether the executive holds a CEO position previously and his previous compensation level, as well as some characteristics on his previous employer. Column (1) shows the result for sample including cases where no news report on departure or hiring is found. The dependent variable is a new employment dummy, which equals 1 if an executive obtains an executive position at a new firm within 3 years and 0 otherwise. The coefficient of *Local executive pool 1* is slightly negative but not significant at any conventional level, indicating that labor market density does not help dismissed executives find new jobs more easily. In columns (2) and (3), I exclude cases where no news is found and use *Local executive pool 1* and *Local executive pool 2* as different measures of density. The results resemble the finding in column (1). Columns (4) and (5) address the concern that although market density does not increase the probability of obtaining a new job, it might affect the quality of the position. The dependent variable in column (4) is a public firm dummy which equals 1 only if the new position that an executive finds is in a public firm. The coefficient of market density is still negative and even with a larger magnitude than the results in columns (1) to (3). In column (5), I scale each new position in public firms with its quality, calculated as the ratio of new firm size to old firm size, and estimate the effect of labor market density with a tobit model. It appears that given a new job is found, the quality of the position is slightly negatively correlated with market density. Finally, column (6) examines whether the length of unemployment is different between executives in dense and sparse labor markets. The tobit result suggests that it takes even more time for an executive dense market to find a new job after departing the previous firm. In unreported results, the main findings keep unchanged whether *Local executive pool 3* or *Local executive pool 4* is used as alternative measures. In sum, Table 8 provides empirical

evidence against the concern that local executive pool density disincentivizes executives by offering more backup options.

5 Executive Market Density and Firm Performance

Section 4 empirically shows how local executive market density induces implicit incentive for executives through performance-related dismissal threats as well as outside promotion opportunities. A natural question to examine next is how incentives affect firm performance. Previous studies show that executives respond to implicit incentives and hence improve firm performance. For instance, Kale et al. (2009) and Coles et al. (2012) find that the magnitude of tournament incentive within the firm and within the industry is related to firm performance. By the same logic, firms located in denser areas should achieve better performance.

The key empirical challenge here is that local market density could have an impact on performance through a variety of channels. Marshall (1920) theorized three primary benefits to firms locating in clusters: labor market pooling, input providers pooling, and knowledge spillovers. Although the empirical evidence on the direct impact of clustering on performance is mixed, economists do find that these three channels exist. For example, using patent citation as a "paper trail" of knowledge flow, Jaffe et al. (1993) find that knowledge spillover attenuates with geographic distance since citations are highly spatially concentrated.[18] Besides these economic foundations, market density could also affect firms through reasons well-established in the finance literature. One such example is Knyazeva et al. (2013), who use a density measure similar to the one in this paper and show that thicker markets provide local firms with more outsider directors and thus enhance firm performance.[19]

Due to reasons argued above, a simple finding of a positive correlation between market density and firm performance does not translate into sufficient evidence on the incentive mechanism proposed in this paper. To distinguish the incentive channel from others, I combine the implicit incentive induced by market density with executive's career concern (horizon).

[18]The literature on firm location and clustering have been discussed by economists since Marshall (1920). See Duranton and Puga (2004) and Rosenthal and Strange (2004) for recent reviews of theoretical foundations and empirical results of this literature.

[19]Geographic clustering could also have negative effects on firm. For instance, Shaver and Flyer (2000) argue that the strongest firms gain little from clustering, yet suffer when their technologies and employees spillover to competitors. Also see Glaeser (1998) and Tabuchi (1998) for other reasons of agglomeration diseconomies.

Specifically, in a performance regression analysis, I interact market density with executive's expected years remaining prior to retirement, a proxy of horizon, and examine whether the coefficient of the interaction term is positive. The intuition behind is similar to the argument in Gibbons and Murphy (1992), who point out that "implicit incentives...should be weakest for workers close to retirement". Since an executive cares less about either dismissal threats or promotion opportunities as he approaches retirement, the effect of implicit incentives on performance should decrease with executive's age (opposite of career horizon). A nice feature about this identification strategy is that almost all mechanisms other than incentive work through the channel of firm rather than executive himself and thus do not interact with executive's horizon, leaving incentive to be the only possible explanation for a positive coefficient of the interaction term in the regression analysis.

Table 9 presents the regression results of performance. I use market-to-book ratio (Tobin's Q) as the main performance measure. To control for the effect of other well-documented executive incentives on firm performance, I add CEO stock ownership and logarithm of pay gap within firm in all model specifications. Column (1) reports the preliminary result of how market density affects firm performance. Consistent with the implicit incentive argument, the coefficient on *Local executive pool 1* is positive and statistically significant at 1% level. In terms of economic magnitude, an interquartile increase in local executive pool density raises Tobin's Q by 0.13, which is significant in comparison to the average (median) Tobin's Q of 1.96 (1.44) in the sample. As for other variables, the coefficients on *CEO ownership* and *Pay gap* are both significantly positive, indicating that explicit contract and intra-firm tournament incentive also have positive effects on firm value.

Although column (1) provides evidence that market density improves firm performance, it alone does not prove that executive incentive is the channel. Therefore, in column (2), I apply the interaction strategy as described above. Since most of the executives retire at the age of 60, I measure the average executives' horizon of a firm-year observation as 60 minus average executive's current age. After adding executive horizon and the interaction term, I find that the coefficient on *Local executive pool 1* becomes insignificant from zero while the coefficient of the interaction term is positive and significant at 1% level. Theses two results, combined,

suggest that the effect of market density on performance mainly comes through the channel of executive incentive. As for economic magnitude, a 0.0074 coefficient on the interaction implies that the marginal effect of market density is 0.049 ($0.0043 + 6 \times 0.0074$) for firms with top quartile average executive age (54), and doubles to 0.099 ($0.0043 + 12.5 \times 0.0074$) for firms with bottom quartile executive age (47.25). In column (3), I add board characteristics and governance as additional controls. The coefficient on the interaction term is significant at 5% and slightly increases to 0.0082. Column (4) considers *Local executive pool 2* as an alternative measure. The interacted effect is still positive but loses statistical significance. Columns (5) and (6) replace Tobin's Q with annual stock returns as the dependent variable. The significantly positive coefficients on the interaction term reinforce the finding in column (2) to (4) that executives in a denser market bring higher performance to their firms through responding to stronger implicit incentives. Comparing a firm in a dense market (top quartile 6.3) with young executives (bottom quartile 47.25) with a firm in a sparse market (bottom quartile 4.29) with old executives (bottom quartile 54), I find that the stock return of the former firm is higher than that of the latter one by 0.035. As the mean (median) stock return is 0.20 (0.12), such difference in performance is substantial in economic magnitude.

In Panel B, I conduct a further robustness check using the industry-adjusted market density measures. Similar to the main findings in Panel A, the coefficients on the interaction are positive in all columns and are significant at least at 10% level. The economic magnitude becomes even much larger. For *Local executive pool* 3, firms with strong implicit incentive (in dense area with young executives) have a 0.86 higher Tobin's Q and a 0.064 higher annual stock return than a firm with weak incentive (in sparse area with old executives).

In sum, combining market density with executive horizon, Table 9 provides convincing evidence that firms in areas with higher executive pool density achieve better market performance. Moreover, such effect of market density works through the channel of executive implicit incentive and is stronger when executives have longer career horizon.

6 Conclusion

The primary motivation of this paper is the phenomenon documented by Yonker (2014) that firms hire CEOs from their own headquarter state five times more than they would if

geography plays a role in the search process. Yonker argues that this shakes the conventional wisdom that the market for CEOs is nationally integrated. To provide more direct evidence on the geographic segmentation of the executive labor market, I use executive job changes covered by Execucomp database and calculated the distance between executive's last and current employer's headquarters. I find that firms hire executives within 60-mile radius substantially more frequently than expected. Moreover, this local hiring bias still exists strongly even with the adjustment of industry clustering, and is prevalent across different industries, market densities, firm sizes, job levels, and time periods.

Based on the results of market segmentation, I then study its implications on firm policy and executive incentives. If hirings often happen locally, firms located in a thicker labor markets face lower costs of searching high-quality outside executives. Therefore, they are encouraged to dismiss poor-performing executives and hire outsiders to fill the vacancy. These two policies create implicit incentives through both performance-based dismissal threats and outside promotion opportunities. Empirically, I find strong evidence supporting the above arguments by examining CEO performance-to-turnover sensitivity and executive outside promotions, Furthermore, by studying employment outcomes of executives losing their jobs, I rule out the concern that market density might disincentivize executives through offering more backup options. Finally, I combine the implicit incentive created by labor market geography with executive horizon and find that the density of local executive pools has a positive effect on firm value through the channel of implicit incentives.

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Appendix

Data Sources and Variable Definitions

Notes: The appendix defines the variables used in the paper. The data items taken from Compustat are denoted as data numbers. All returns data come from CRSP. All compensation related data come from Execucomp. Governance data and board data come from RiskMetrics. Data on the reason of executive leaving the firm and data on new employment are hand-collected based on news articles covered by Factiva database. Other data sources include Census 2000 U.S. Gazetteer and Bureau of Labor Statistics.

Variable	Definition
Firm Characteristics	
Local executive pool 1	Logarithm of one plus total number of firms within 60 miles of the firm's headquarter
Local executive pool 2	Logarithm of one plus size scaled total number of firms within 60 miles of the firm's headquarter. Size scale for each firm is calculated as firm's number of employees divided by the average number of employees of Compustat firms in that year
Local executive pool 3	Logarithm of one plus total number of firms within 60 miles of the firm's headquarter and within the same 2-digit SIC industry
Local executive pool 4	Logarithm of one plus size scaled total number of firms within 60 miles of the firm's headquarter and within the same 2-digit SIC industry
Total assets	Total assets; data 6
Firm size	Logarithm of toal assets
Sales	Net annual sales; data 12
Market value	Market capitalization; data 199 $\times$ data 25
Market-to-book ratio	Market value of asset to book value; (data 6 + data 199 $\times$ data 25 $-$ (data 60 + data 74)) / data 6
Sales growth	Ratio of net sale in year t to net sale in year $t-1$ minus one
ROA	Ratio of operating income before depreciation to total asset; data 13 / data 6
Firm age	Current year minus the first year that the firm appeared in Compustat
R&D intensity indicator	Ratio of research and development expenditure to capital; data 46 / data 8; zero if missing
Leverage	Ratio of book value of debt to total assets; (data 9 + data 34) / data 6
Stock return	Cumulative return 12 months before the current fiscal year end
Industry adjusted return	Stock return minus the contemporaneous median industry return (2-digit SIC)
Board size	Number of directors on the board
Board independence	Percent of independent directors on the board
E-Index	Bebchuk, Cohen, and Ferrell (2009) index of corporate governance; similar to existing work, gap years are filled in with adjoining years

Table continued

Variable	Definition
Executive Characteristics	
CEO age	Current age of CEO
CEO is chairman	CEO is chairman of the board
CEO tenure	Current year minus the first year that the executive flaged as CEO in Execucomp
CEO ownership	Percent ownership stake of the CEO in the firm
Average age	Average age of the non-CEO executives in a firm-year observation
Average tenure	Average years that non-CEO executives has been covered by Execucomp under the firm
Average ownership	Average ownership stake of the non-CEO executives
Compensation	Total annual compensation, TDC1 in Execucomp
Pay Gap	Logarithm of one plus the difference between CEO compensation (in thousands) and median compensation of non-CEO executives; zero if the difference is negative
CEO turnover	CEO in year $t+1$ is different from the CEO in year t
Forced turnover	Report says that the CEO was fired, forced out, or departed due to policy differences; or the departing CEO is under age of 60, did not announce the retirement at least six months in advance, and did not leave for health reasons or acceptance of another position
Outsider	New CEO has been with the firm for less than one year before taking the office
Executive Departure and New Employment	
Job change	Executive's employer in year t is different from his employer in year t+1, or the employer in year t is different from year t+2 and the executive does not appear in Execucomp in yeart+1 .
Promotion	Executive moving to another Execucomp firm and new job's compensation (deflated by CPI) is higher than the old one's or the new firm is larger than the old one in terms of market values
Force	The artical reporting the turnover uses words like "oust", "fired", "terminated" or overtly links turnover with poor performance or scandal, or the leaving executive is paid with severance
Pursue	The reason for departure is "to pursue other interests"
Retire	The reason for departure is retirement
Resign	If the turnover is not in any category above
New employment	Executive obtains an executive position at a new firm within 3 years after leaving the old firm
New employment public firm	New firm is covered by Compustat database
New employment quality adjusted	New employment public firm $\times$ log(1 + new firm total assets / old firm total assets) (CPI deflated)
Length of unemployment	(First day in the new position $-$ last day in the old position) / 365
Previous CEO	Executive holding CEO position in the old firm

Table 1: Summary Statistics: Job Changes

Notes: The table reports the summary statistics for a sample of 1926 senior executive job changes between Execucomp firms during 1993 to 2013. Old firm's characteristics are executive previous employer's characteristics at the last year of the employment. New firm's characteristics are executive new employer's characteristics at the first year of the employment. Old position's characteristics are the characteristics of executive's previous position at one year before the last year of the employment. New position's characteristics are the characteristics of executive's new position at one year after the first year of the employment. *CEO* is an indicator variable which equals 1 if the executive holds the CEO position. *Rank* is measured within each firm-year using executive's total compensation, with 1 being the highest. *New rank / Old rank (smaller firms)* only includes job movings where new firm's total assets is smaller than old firm's. All variables stated in dollars are restated in 2000 dollars using Consumer Price Index. All variables are winsorized at the 1^{st} and 99^{th} percentile levels.

	Mean	Median	Std. Dev	P25	P75
Panel A. Firm Characteristics					
Old firm's total assets, $ B 2000	14.44	3.01	34.60	0.99	10.66
New firm's total assets, $ B 2000	24.84	3.40	74.69	0.97	14.19
New firm's total assets / Old firm's	3.32	1.37	7.12	0.43	3.18
Old firm's annual sales, $ B 2000	6.64	2.31	11.84	0.84	7.01
New firm's annual sales, $ B 2000	7.77	2.49	13.25	0.81	8.07
New firm's annual sales / Old firm's	2.54	1.26	4.32	0.42	2.71
Panel B. Job Characteristics					
Old position's compensation, $ M 2000	2.52	1.40	3.19	0.76	2.91
New position's compensation, $ M 2000	3.22	1.70	4.30	0.89	3.65
New position's compensation / Old position's	1.87	1.24	2.05	0.72	2.17
CEO in last position	0.04				
CEO in new position	0.20				
Rank in last position	2.98	3.00	1.57	2.00	4.00
Rank in new position	2.95	3.00	1.66	1.00	4.00
New rank / Old rank	1.24	1.00	1.01	0.57	1.50
New rank / Old rank (smaller firms)	0.91	0.67	0.78	0.43	1.00
Observations	1926				

Table 2: Local Hiring Bias

Notes: The table presents the results on local hiring bias based on a sample of 1926 senior executive job changes between Execucomp firms during 1993 to 2013. Column (1) reports the total number of hiring decisions. Column (2) reports the actual number of local hirings. A hiring is considered as local if the distance between the headquarters of executive's new and old firms is within 60 (100/250) miles. Panel A and panel B consider different distance measures, and panel C to panel G use 60 miles as the cutoff. Column (3) shows the expected number of total local hirings based on the null hypothesis that the executive market is nationwide. Except for panel B, for each hiring, the expected probability of local hiring is calculated as number of local firms divided by number of firms nationwide. Column (5) shows the expected local hirings under the same null hypothesis but uses size-scaled number of local firms in the calculation. Column (4) (column (6)) shows the local hiring bias, which is calculated as column (2) minus column (3) (column (5)) divided by column (1). Panel A shows the results for the full sample. Panel B also uses the full sample but calculates expected probability of local hiring as number of local firms in the same 2-digit SIC industry as the hiring firm divided by number of firms in the same industry nationwide. Panel C shows the results for Fama-French 12 industries. Panel D divides the sample into deciles based on the local market density of the hiring firm, where density is measured as total number of local firms. Panel E shows the subsample results for hiring firms in different S&P categories. Panel F divides the sample into deciles based on the compensation level at the new job. Compensation of each new job is scaled by the average compensation in that year and then categorized into deciles within the full sample. Panel G shows the subsample results in each hiring year. A two-sided binomial test is used to test the null hypothesis that executive market is integrated. The null hypothesis is rejected in each row of the table at 1% level, except for the first row of Panel G (rejection at 5%). For brevity, significance indicators are omitted.

	Hirings	Locals	Expected 1	Bias 1	Expected 2	Bias 2
Panel A: Full Sample						
60 miles	1926	742	92.86	0.337	66.56	0.351
100 miles	1926	794	122.85	0.348	87.73	0.367
250 miles	1926	959	252.72	0.367	188.37	0.400
Panel B: within Industry						
60 miles	1926	742	251.98	0.254	169.42	0.297
100 miles	1926	794	305.95	0.253	196.71	0.310
250 miles	1926	959	617.59	0.177	359.03	0.312
Panel C: By Industries						
Consumer NonDurables	89	35	5.55	0.331	4.13	0.347
Consumer Durables	41	18	0.86	0.418	1.24	0.409
Manufacturing	208	74	8.82	0.313	6.88	0.323
Oil, Gas, and Coal	85	56	3.01	0.623	1.80	0.638
Chemicals	57	18	2.98	0.263	2.11	0.279
Business Equipment	397	175	22.73	0.384	13.94	0.406
Telephone and Television	78	41	4.15	0.472	3.17	0.485
Utilities	158	49	4.84	0.279	3.85	0.286
Wholesale and Retail	261	54	11.14	0.164	8.45	0.175
Healthcare	115	47	6.89	0.349	4.49	0.370
Finance	262	104	13.89	0.344	10.29	0.358
Other	175	67	6.98	0.343	5.47	0.352

Table 1 continued

	Hirings	Locals	Expected 1	Bias 1	Expected 2	Bias 2
Panel D: By Area Density						
Decile 1 (Sparsest)	196	36	0.49	0.181	0.47	0.181
Decile 2	191	38	1.39	0.192	1.70	0.190
Decile 3	192	43	2.05	0.213	2.31	0.212
Decile 4	192	45	4.47	0.211	3.42	0.217
Decile 5	199	71	6.46	0.324	4.61	0.334
Decile 6	190	54	8.00	0.242	6.54	0.250
Decile 7	189	66	10.23	0.295	6.80	0.313
Decile 8	198	83	12.51	0.356	6.81	0.385
Decile 9	187	93	17.92	0.402	11.71	0.435
Decile 10 (Densest)	192	89	26.67	0.325	20.38	0.357
Panel E: By S&P Code						
Not in S&P Index	838	312	40.18	0.324	29.71	0.337
SmallCap	210	99	8.39	0.431	5.40	0.446
MidCap	266	110	11.07	0.372	7.66	0.385
S&P 500	612	221	33.21	0.307	23.79	0.322
Panel F: By Compensation						
Decile 1 (Lowest)	193	80	7.07	0.378	4.26	0.392
Decile 2	192	61	7.24	0.280	5.15	0.291
Decile 3	192	58	7.76	0.262	5.72	0.272
Decile 4	192	51	8.28	0.222	6.22	0.233
Decile 5	192	55	7.81	0.246	5.30	0.259
Decile 6	192	54	8.36	0.238	6.03	0.250
Decile 7	192	62	10.39	0.269	7.47	0.284
Decile 8	192	51	9.43	0.216	6.81	0.230
Decile 9	192	71	10.67	0.314	8.02	0.328
Decile 10 (Highest)	192	73	12.97	0.313	9.67	0.330
Panel G: By Years						
1993	7	2	0.34	0.237	0.26	0.248
1994	53	20	2.26	0.335	1.56	0.348
1995	92	29	4.26	0.269	3.11	0.281
1996	94	36	3.81	0.342	2.84	0.353
1997	141	59	7.80	0.363	5.67	0.378
1998	139	63	6.25	0.408	4.30	0.422
1999	99	37	3.35	0.340	2.58	0.348
2000	130	53	6.50	0.358	4.80	0.371
2001	118	34	5.08	0.245	3.65	0.257
2002	82	37	3.92	0.403	2.64	0.419
2003	93	38	4.91	0.356	3.68	0.369
2004	70	16	3.84	0.174	2.98	0.186
2005	58	21	2.39	0.321	1.85	0.330
2006	97	43	4.51	0.397	3.43	0.408
2007	134	59	6.63	0.391	4.67	0.405
2008	119	55	5.34	0.417	3.84	0.430
2009	97	29	5.30	0.244	3.70	0.261
2010	75	27	4.78	0.296	3.17	0.318
2011	75	31	3.79	0.363	2.69	0.377
2012	82	28	3.85	0.295	2.55	0.310
2013	71	25	3.95	0.296	2.58	0.316

Table 3: Summary Statistics: Sample Firms

Notes: The table reports the summary statistics for a sample of Execucomp/Compustat/CRSP firms with available data from 1992 to 2013. *Local executive pool 1* is the total number of firms within 60 miles of the firm's headquarter. *Local executive pool 2* is the total number of firms, each scaled by its size, within 60 miles of the firm's headquarter. *Local executive pool 3* and *Local executive pool* 4 further restrict local pool to firms within the same industry (2-digit SIC) as the target firm. *Total asset, annual sales and market value* are restated in 2000 dollars using Consumer Price Index. *Market-to-book ratio* is the ratio of market value of assets to book value of assets. *Stock return* is the calculated as the cumulative return 12 months before the current fiscal year end. *ROA* is the ratio of operating income to book value of assets. *Average age, average tenure, average ownership* are the average numbers of non-CEO executives covered by Execucomp for each firm-year observation. *Pay gap* is the logarithm of one plus the difference between CEO compensation and median compensation of non-CEO executive. All variables are winsorized at the 1^{st} and 99^{st} percentile levels.

	Mean	Median	Std. Dev	P25	P75
Panel A. Firm Characteristics					
Local executive pool 1 (number)	380.53	277.00	384.54	72.00	542.00
Local executive pool 1 (logarithm)	5.25	5.63	1.41	4.29	6.30
Local executive pool 2 (number)	265.40	168.76	285.16	60.97	337.70
Local executive pool 2 (logarithm)	4.85	5.13	1.49	4.13	5.83
Local executive pool 3 (number)	19.44	5.00	32.15	1.00	22.00
Local executive pool 3 (logarithm)	2.02	1.79	1.44	0.69	3.14
Local executive pool 4 (number)	20.54	3.47	41.45	0.27	16.31
Local executive pool 4 (logarithm)	1.77	1.50	1.57	0.24	2.85
Total assets, $ B 2000	5.83	1.37	10.90	0.44	4.96
Sales, $ B 2000	3.16	1.01	5.12	0.37	3.15
Market value, $ B 2000	3.78	1.18	6.19	0.45	3.64
Market-to-book ratio	1.96	1.44	2.02	1.10	2.13
Stock return	0.20	0.12	0.69	-0.12	0.37
Sale growth	0.18	0.08	2.79	-0.00	0.20
ROA	0.12	0.12	0.16	0.07	0.18
Firm age	24.18	20.00	16.31	10.00	37.00
R&D intensity indicator	0.41	0.00	0.49	0.00	1.00
Leverage	0.23	0.21	0.22	0.06	0.35
Board size	9.28	9.00	2.75	7.00	11.00
Board independence	0.69	0.71	0.17	0.60	0.83
E-Index	2.28	2.00	1.34	1.00	3.00
Panel B. Executive Characteristics					
CEO age	55.62	56.00	7.52	51.00	60.00
CEO is Chairman	0.40	0.00	0.49	0.00	1.00
CEO tenure	4.52	4.00	3.48	2.00	6.00
CEO ownership	4.07	1.04	8.81	0.30	3.26
Average age	50.63	50.75	5.20	47.25	54.00
Average tenure	4.30	4.00	2.31	2.67	5.50
Average ownership	0.98	0.39	1.57	0.11	1.14
Pay gap	2.52	2.53	2.50	0.00	4.70
CEO turnover	0.10	0.00	0.30	0.00	0.00
Observations	38262				
Unique Firms	3333				

Table 4: Local Executive Pool Density and CEO Performance-to-Turnover Sensitivity

Notes: The table reports the marginal effects from logit or probit model of local executive pool density on CEO performance-to-turnover sensitivity. The sample consists of firms with available data from 1996 to 2013. The dependent variable is a CEO turnover dummy, which equals 1 if CEO is replaced in the next year and 0 otherwise. *Industry adjusted return* is calculated as the stock return 12 months before current fiscal year end minus the contemporaneous median industry return (2-digit SIC). *Local executive pool 1* is the logarithm of one plus total number of firms within 60 miles of the firm's headquarter. *Local executive pool 2* is the logarithm of one plus total number of firms, each scaled by its size, within 60 miles of the firm's headquarter. *CEO tenure* is the number of years that the CEO has been in the office. *CEO ownership* is the percent ownership stake of the CEO in the firm. *E-Index* is from Bebchuk et al. (2009). See Appendix for definition of other variables. Columns (1), (2), (3) and (5) use logit model, and columns (4) and (6) use probit model. Columns (1) and (3) to (6) contain observations with *Industry adjusted return* above zero, while column (2) contains observations with *Industry adjusted return* below zero. Year fixed effects are included in all specifications. Standard errors reported in the parentheses are robust and clustered by firm. *,**,*** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Industry adjusted return	-0.1672***	-0.0020	-0.0808*	-0.0790	-0.0790*	-0.0768
	(0.0157)	(0.0034)	(0.0464)	(0.0508)	(0.0466)	(0.0510)
Local executive pool 1			0.0080	0.0078		
			(0.0056)	(0.0058)		
Industry adjusted return			-0.0164*	-0.0185**		
× Local executive pool 1			(0.0084)	(0.0092)		
Local executive pool 2					0.0089	0.0087
					(0.0061)	(0.0063)
Industry adjusted return					-0.0169**	-0.0191**
× Local executive pool 2					(0.0085)	(0.0093)
CEO age	0.0052***	0.0046***	0.0053***	0.0054***	0.0053***	0.0053***
	(0.0005)	(0.0003)	(0.0005)	(0.0005)	(0.0005)	(0.0005)
CEO is Chairman	-0.0270***	-0.0156***	-0.0269***	-0.0277***	-0.0269***	-0.0277***
	(0.0073)	(0.0049)	(0.0073)	(0.0076)	(0.0073)	(0.0076)
CEO tenure	0.0024**	0.0029***	0.0024**	0.0027***	0.0024**	0.0027***
	(0.0009)	(0.0007)	(0.0009)	(0.0010)	(0.0009)	(0.0010)
CEO ownership	-0.0036***	-0.0018***	-0.0036***	-0.0029***	-0.0036***	-0.0029***
	(0.0010)	(0.0006)	(0.0010)	(0.0011)	(0.0010)	(0.0011)
Board size	-0.0011	0.0002	-0.0010	-0.0012	-0.0010	-0.0012
	(0.0015)	(0.0010)	(0.0015)	(0.0015)	(0.0015)	(0.0015)
Board independence	-0.0004	0.0123	-0.0007	-0.0021	-0.0007	-0.0019
	(0.0212)	(0.0148)	(0.0212)	(0.0226)	(0.0212)	(0.0226)
E-Index	0.0008	-0.0030	0.0008	0.0011	0.0008	0.0011
	(0.0026)	(0.0019)	(0.0026)	(0.0027)	(0.0026)	(0.0027)
Firm size	-0.0037	-0.0010	-0.0035	-0.0036	-0.0035	-0.0036
	(0.0025)	(0.0017)	(0.0025)	(0.0026)	(0.0025)	(0.0026)
Firm age	-0.0001	0.0001	-0.0002	-0.0001	-0.0002	-0.0001
	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Observations	9,545	12,146	9,545	9,545	9,545	9,545
Pseudo R^2	0.050	0.050	0.050	0.049	0.050	0.049

Table 5: Local Executive Pool Density and Outside Successions

Notes: The table reports the marginal effects from logit model of local executive pool density on executive outside succession probability. The sample consists of firms with available data from 1992 to 2013. The dependent variable in columns (1) to (4) is an outside CEO dummy, which equals 1 if an incoming CEO has been with the firm for less than one year before taking the office. The dependent variable in columns (5) and (6) is an outside executive dummy, which equals 1 if a non-CEO executive has been with the firm for less than one year before the first time listed on that firm's annual proxy. *Local executive pool 1* is the logarithm of one plus total number of firms within 60 miles of the firm's headquarter. *Local executive pool 2* is the logarithm of one plus total number of firms, each scaled by its size, within 60 miles of the firm's headquarter. *Forced turnover* is a dummy variable which equals to 1 if (i) the report says that the CEO was fired, forced out, or departed due to policy differences; or (ii) the departing CEO is under age of 60, did not announce the retirement at least six months in advance, and did not leave for health reasons or acceptance of another position. All CEO characteristics refer to the outgoing CEO. See Appendix for definition of other variables. Year fixed effects are included in all specifications. Standard errors reported in the parentheses are robust and clustered by firm. *,**,*** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) CEO	(2) CEO	(3) CEO	(4) CEO	(5) Non-CEO	(6) Non-CEO
Local executive pool 1	0.0218***	0.0193***	0.0207***		0.0147***	
	(0.0068)	(0.0071)	(0.0079)		(0.0035)	
Local executive pool 2				0.0161**		0.0076**
				(0.0071)		(0.0033)
Forced turnover	0.2020***	0.1275***	0.1263***	0.1271***		
	(0.0250)	(0.0301)	(0.0338)	(0.0338)		
CEO age		-0.0039***	-0.0031**	-0.0031**		
		(0.0013)	(0.0014)	(0.0014)		
CEO tenure		-0.0065*	-0.0073*	-0.0073*		
		(0.0037)	(0.0039)	(0.0039)		
CEO ownership		-0.0054**	-0.0028	-0.0029		
		(0.0025)	(0.0027)	(0.0027)		
Industry adjusted return		-0.1072***	-0.0926***	-0.0918***	-0.0101**	-0.0097*
		(0.0268)	(0.0281)	(0.0282)	(0.0051)	(0.0051)
Firm size		-0.0363***	-0.0265***	-0.0262***	-0.0264***	-0.0259***
		(0.0062)	(0.0081)	(0.0081)	(0.0037)	(0.0037)
Firm age		-0.0008	-0.0012	-0.0012	-0.0021***	-0.0022***
		(0.0007)	(0.0008)	(0.0008)	(0.0003)	(0.0003)
Board size			-0.0115**	-0.0119**	-0.0021	-0.0026
			(0.0051)	(0.0051)	(0.0022)	(0.0022)
Board independence			0.3381***	0.3397***	0.0747***	0.0764***
			(0.0814)	(0.0807)	(0.0283)	(0.0286)
E-Index			0.0029	0.0028	0.0005	-0.0002
			(0.0085)	(0.0085)	(0.0037)	(0.0037)
Observations	2,845	2,481	1,970	1,970	14,943	14,943
Pseudo R^2	0.028	0.075	0.082	0.081	0.083	0.082

Table 6: Local Executive Pool Density and Executive Movings

Notes: The table presents the OLS regression of executive movings on local executive pool density. The sample consists of firms with available data from 1992 to 2013. The dependent variable in columns (1) is the number of executive job change, where a job change is identified if an executive's employer in year t is different from his employer in year $t+1$, or the employer in year t is different from year $t+2$ and the executive does not appear in Execucomp in year $t+1$. Promotion is used in columns (2) to (4). A job change is considered as a promotion if the new job's compensation (deflated by CPI) is higher than the old one's or the new firm is larger than the old one in terms of market values. Columns (5) and (6) use local promotion, which is the promotion in a local area. *Local executive pool 1* is the logarithm of one plus total number of firms within 60 miles of the firm's headquarter. *Local executive pool 2* is the logarithm of one plus total number of firms, each scaled by its size, within 60 miles of the firm's headquarter. *Average age* is the average age of the non-CEO executives in a firm-year observation. *Average tenure* is the average years that non-CEO executives has been covered by Execucomp under the firm. *Average ownership* is the average ownership stake of the non-CEO executives. See Appendix for definition of other variables. Year fixed effects are included in all specifications. Standard errors reported in the parentheses are robust and clustered by firm. *,**,*** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) Move	(2) Promote	(3) Promote	(4) Promote	(5) Local	(6) Local
Local executive pool 1	0.0032***	0.0029***	0.0032***		0.0039***	
	(0.0010)	(0.0009)	(0.0010)		(0.0006)	
Local executive pool 2				0.0033***		0.0036***
				(0.0009)		(0.0005)
Average age	-0.0016***	-0.0014***	-0.0014***	-0.0014***	-0.0003**	-0.0003***
	(0.0003)	(0.0002)	(0.0003)	(0.0003)	(0.0001)	(0.0001)
Average tenure	-0.0049***	-0.0041***	-0.0053***	-0.0053***	-0.0011***	-0.0011***
	(0.0006)	(0.0005)	(0.0006)	(0.0006)	(0.0004)	(0.0004)
Average ownership	-0.0005*	-0.0005*	-0.0004	-0.0004	-0.0001	-0.0002
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0001)	(0.0001)
CEO turnover	0.0411***	0.0338***	0.0310***	0.0310***	0.0110***	0.0110***
	(0.0059)	(0.0052)	(0.0057)	(0.0057)	(0.0034)	(0.0034)
Industry adjusted return	-0.0039***	-0.0030**	-0.0030**	-0.0030**	-0.0012	-0.0012
	(0.0014)	(0.0013)	(0.0015)	(0.0015)	(0.0009)	(0.0009)
Firm size	0.0100***	0.0072***	0.0066***	0.0066***	0.0013*	0.0013*
	(0.0010)	(0.0008)	(0.0012)	(0.0012)	(0.0008)	(0.0008)
Firm age	0.0007***	0.0006***	0.0006***	0.0006***	0.0000	0.0000
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Board size			-0.0004	-0.0005	0.0007	0.0006
			(0.0008)	(0.0008)	(0.0006)	(0.0006)
Board independence			0.0088	0.0098	0.0085*	0.0096**
			(0.0086)	(0.0086)	(0.0048)	(0.0048)
E-Index			0.0015	0.0014	0.0008	0.0007
			(0.0010)	(0.0010)	(0.0006)	(0.0006)
Observations	30,720	30,720	23,534	23,534	23,534	23,534
Adjusted R^2	0.015	0.012	0.012	0.012	0.005	0.005

Table 7: Robustness Checks

Notes: The table presents the results for robustness checks on Table 4 to Table 6 with alternative measures on local executive pool density. *Local executive pool 3* is the logarithm of one plus total number of firms within 60 miles of target firm's headquarter and within the same industry (2-digit SIC). *Local executive pool 4* is the logarithm of one plus total number of firms, each scaled by its size, within 60 miles of target firm's headquarter and within the same industry. See Appendix and previous tables for definition of other variables. Columns (1) and (2) replicate Table 4 columns (3) and (5), where the dependent variable is CEO turnover and logit model is used. Columns (3) and (4) replicate Table 5 columns (3) and (4), where the dependent variable is outside CEO succession and logit model is used. Columns (5) and (6) replicate Table 6 columns (3) and (4), where the dependent variable is executive promotions. For brevity, some regressors used in the original model specifications are not reported. Year fixed effects are included in all specifications. Standard errors reported in the parentheses are robust and clustered by firm. *,**,*** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) Turnover	(2) Turnover	(3) Outsider	(4) Outsider	(5) Promotion	(6) Promotion
Local executive pool 3	-0.0005		0.0228***		0.0038***	
	(0.0012)		(0.0072)		(0.0011)	
Local executive pool 4		0.0002		0.0214***		0.0028***
		(0.0002)		(0.0066)		(0.0010)
Industry adjusted return	-0.0083					
× Local executive pool 3	(0.0085)					
Industry adjusted return		-0.0153*				
× Local executive pool 4		(0.0088)				
Industry adjusted return	-0.1129***	-0.0894**	-0.0932***	-0.0926***	-0.0034**	-0.0033*
	(0.0387)	(0.0376)	(0.0280)	(0.0280)	(0.0017)	(0.0017)
Board size	-0.0005	-0.0005	-0.0109**	-0.0111**	-0.0009	-0.0010
	(0.0015)	(0.0014)	(0.0051)	(0.0051)	(0.0008)	(0.0008)
Board independence	-0.0199	-0.0208	0.3365***	0.3421***	0.0267***	0.0272***
	(0.0200)	(0.0200)	(0.0817)	(0.0812)	(0.0100)	(0.0100)
E-Index	-0.0009	-0.0010	0.0046	0.0042	0.0007	0.0006
	(0.0024)	(0.0024)	(0.0085)	(0.0085)	(0.0012)	(0.0012)
Firm size	-0.0046**	-0.0044*	-0.0253***	-0.0256***	0.0075***	0.0076***
	(0.0023)	(0.0023)	(0.0081)	(0.0081)	(0.0013)	(0.0013)
Firm age	-0.0002	-0.0002	-0.0010	-0.0010	0.0006***	0.0006***
	(0.0002)	(0.0002)	(0.0008)	(0.0008)	(0.0001)	(0.0001)
Forced Turnover			0.1275***	0.1279***		
			(0.0337)	(0.0337)		
CEO turnover					0.0312***	0.0313***
					(0.0062)	(0.0062)
Observations	9,545	9,545	1,970	1,970	21,479	21,479
Pseudo R^2	0.039	0.039	0.084	0.085	0.014	0.013

Table 8: Local Executive Pool Density and New Employment Opportunity

Notes: The table presents the effects of local executive pool density on new employment opportunity. The sample consists of executives from S&P 500 firms who lose their jobs during $2000-2013$ for the reason other than death, health, acceptance of a new position, and who are under the age of 55 at the time of departure. The dependent variable in columns (1) to (3) is a new employment dummy, which equals 1 if the executive obtains an executive position at a new firm in 3 years and 0 otherwise. The dependent variable in column (4) is a public firm dummy, which equals 1 if the executive's new employer is a firm covered by Compustat. Column (5) adjusts the public firm dummy in column (4) by quality. For each new employment in a public firm, the quality is measured as the ratio of the new firm's size to the old firm's size. The dependent column (6) is the length of unemployment, which is calculated as the number of days the executive was out of work divided by 365. Column (1) includes observations where no news are found on either departure or new employment. Columns (2) to (6) include only observations where news are found. Columns (1) uses OLS and includes an additional explanatory variable indicating there is no new found. Columns (2) to (4) use logit model. Column (5) uses tobit model with lower bound 0. Column (6) uses tobit model with lower bound 0 and upper bound 3. Marginal effects are reported. For tobit models, column (5) and and column (6) report the marginal effects on the quality of the new employment and the length of unemployment given a new job is found, respectively. See Appendix for definition of departure reasons and other variables. The omitted departure reason is resign. Year fixed effects are included in all specifications. Standard errors reported in the parentheses are robust and clustered by firm. *,**,*** indicate significance at the 10%, 5%, and 1% levels, respectively.

	(1) Including No News	(2) Main Sample	(3) Main Sample	(4) Public Firms	(5) Quality Weighted	(6) Lengh of Unemployment
Local executive pool 1	-0.0095	-0.0159		-0.0156	-0.0164	0.0188*
	(0.0105)	(0.0157)		(0.0124)	(0.0144)	(0.0112)
Local executive pool 2			-0.0062			
			(0.0143)			
Forced	-0.0010	-0.0102	-0.0119	-0.0009	0.0007	0.0270
	(0.0582)	(0.0527)	(0.0525)	(0.0505)	(0.0578)	(0.0382)
Pursue	0.0906	0.0879	0.0899	0.0064	0.0101	-0.0709*
	(0.0602)	(0.0598)	(0.0598)	(0.0459)	(0.0522)	(0.0409)
Retire	-0.2159***	-0.2222***	-0.2200***	-0.1331***	-0.1575***	0.1696***
	(0.0395)	(0.0388)	(0.0389)	(0.0331)	(0.0427)	(0.0399)
Age	-0.0014	-0.0017	-0.0016	-0.0009	-0.0011	0.0025
	(0.0029)	(0.0055)	(0.0055)	(0.0045)	(0.0052)	(0.0040)
Compensation	0.0157	0.0340	0.0302	-0.0032	-0.0036	-0.0320*
	(0.0132)	(0.0242)	(0.0238)	(0.0193)	(0.0217)	(0.0188)
Previous CEO	-0.1248*	-0.1165*	-0.1148*	-0.0526	-0.0570	0.0803
	(0.0679)	(0.0651)	(0.0647)	(0.0565)	(0.0757)	(0.0626)
Firm size	0.0084	0.0099	0.0108	0.0165	0.0191*	-0.0039
	(0.0082)	(0.0123)	(0.0121)	(0.0105)	(0.0113)	(0.0092)
Industry adjusted return	0.0038	0.0003	0.0002	-0.0190	-0.0236	0.0082
	(0.0171)	(0.0183)	(0.0183)	(0.0278)	(0.0309)	(0.0133)
Observations	893	577	577	577	577	577
Adjusted R^2	0.182	0.071	0.070	0.053	0.040	0.042

Table 9: Local Executive Pool Density and Firm Performance

Notes: The table presents the OLS regression of firm performance on local executive pool density. The sample consists of firms with available data from 1992 to 2013. The dependent variable in columns (1) to (4) is the market-to-book approximation of Tobin's Q. The dependent variable in columns (5) and (6) is firm's stock return 12 months before the current fiscal year end. Panel A uses *Local executive pool 1* and *Local executive pool 2* as measures of local executive pool density. Panel B uses *Local executive pool 3* and *Local executive pool* 4. *60−Average executive age* is 60 minus the average age of executives in a firm-year observation. *Pay gap* is the logarithm of one plus the difference between CEO compensation and median compensation of non-CEO executives. *Pay gap* is set to zero if the difference is negative. See Appendix for definition of other variables. Year fixed effects are included in all specifications. Standard errors reported in the parentheses are robust and clustered by firm. *,**,*** indicate significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Local Executive Pool 1 and 2

	(1) Q	(2) Q	(3) Q	(4) Q	(5) Return	(6) Return
Local executive pool 1	0.0666***	0.0043	-0.0127		-0.0115***	
	(0.0137)	(0.0221)	(0.0264)		(0.0043)	
(60−Average executive age)		0.0074***	0.0082**		0.0018***	
× Local executive pool 1		(0.0028)	(0.0036)		(0.0005)	
Local executive pool 2				0.0026		-0.0066*
				(0.0236)		(0.0038)
(60−Average executive age)				0.0051		0.0011**
× Local executive pool 2				(0.0034)		(0.0004)
60−Average executive age		-0.0100	-0.0096	0.0092	-0.0059**	-0.0017
		(0.0135)	(0.0171)	(0.0152)	(0.0027)	(0.0022)
CEO ownership	0.0073***	0.0077***	0.0065*	0.0064*	0.0029***	0.0029***
	(0.0022)	(0.0022)	(0.0037)	(0.0037)	(0.0009)	(0.0009)
Pay gap	0.0333***	0.0331***	0.0381***	0.0385***	0.0073***	0.0073***
	(0.0040)	(0.0040)	(0.0048)	(0.0049)	(0.0015)	(0.0015)
Firm age	-0.0119***	-0.0096***	-0.0078***	-0.0080***	-0.0009***	-0.0009***
	(0.0012)	(0.0012)	(0.0013)	(0.0013)	(0.0002)	(0.0002)
Firm size	-0.1598***	-0.1495***	-0.1090***	-0.1077***	-0.0113***	-0.0112***
	(0.0190)	(0.0192)	(0.0235)	(0.0234)	(0.0030)	(0.0030)
Sale growth	0.0408*	0.0398*	0.2649*	0.2659*	0.0421*	0.0422*
	(0.0224)	(0.0219)	(0.1407)	(0.1410)	(0.0234)	(0.0234)
R&D intensity indicator	0.6629***	0.6687***	0.6266***	0.6353***	0.0186**	0.0192***
	(0.0518)	(0.0515)	(0.0545)	(0.0550)	(0.0074)	(0.0074)
Leverage	-0.0447	-0.0533	-0.5301	-0.5394	-0.1225***	-0.1234***
	(0.4329)	(0.4367)	(0.3904)	(0.3909)	(0.0215)	(0.0215)
Board size			-0.0056	-0.0069	-0.0024	-0.0025
			(0.0079)	(0.0079)	(0.0019)	(0.0019)
Board independence			-0.0465	-0.0424	0.0387	0.0386
			(0.1656)	(0.1661)	(0.0291)	(0.0291)
E-Index			-0.1200***	-0.1211***	-0.0087**	-0.0089***
			(0.0182)	(0.0182)	(0.0034)	(0.0034)
Observations	37,055	37,043	27,125	27,125	26,223	26,223
Adjusted R^2	0.125	0.132	0.147	0.146	0.104	0.103

Table 9 continued

Panel B: Local Executive Pool 3 and 4

	(1) Q	(2) Q	(3) Q	(4) Q	(5) Return	(6) Return
Local executive pool 3	0.1152***	-0.0398	-0.0605		-0.0162***	
	(0.0171)	(0.0343)	(0.0424)		(0.0058)	
(60−Average executive age)		0.0174***	0.0187***		0.0018**	
× Local executive pool 3		(0.0042)	(0.0054)		(0.0007)	
Local executive pool 4				-0.0477		-0.0092**
				(0.0365)		(0.0047)
(60−Average executive age)				0.0138***		0.0011*
× Local executive pool 4				(0.0048)		(0.0006)
60−Average executive age		-0.0079	-0.0057	0.0092	-0.0003	0.0016
		(0.0073)	(0.0089)	(0.0071)	(0.0014)	(0.0012)
CEO ownership	0.0076***	0.0082***	0.0074**	0.0072**	0.0029***	0.0029***
	(0.0022)	(0.0022)	(0.0036)	(0.0036)	(0.0009)	(0.0009)
Pay gap	0.0415***	0.0416***	0.0463***	0.0475***	0.0109***	0.0110***
	(0.0052)	(0.0051)	(0.0059)	(0.0060)	(0.0016)	(0.0016)
Firm age	-0.0105***	-0.0082***	-0.0066***	-0.0071***	-0.0009***	-0.0009***
	(0.0012)	(0.0012)	(0.0013)	(0.0013)	(0.0002)	(0.0002)
Firm size	-0.1628***	-0.1510***	-0.1147***	-0.1116***	-0.0111***	-0.0113***
	(0.0189)	(0.0191)	(0.0235)	(0.0236)	(0.0029)	(0.0029)
Sale growth	0.0401*	0.0385*	0.2587*	0.2611*	0.0419*	0.0420*
	(0.0220)	(0.0213)	(0.1375)	(0.1386)	(0.0232)	(0.0233)
R&D intensity indicator	0.5858***	0.5819***	0.5479***	0.5815***	0.0189**	0.0193**
	(0.0491)	(0.0486)	(0.0532)	(0.0552)	(0.0075)	(0.0077)
Leverage	-0.0222	-0.0254	-0.4969	-0.5347	-0.1227***	-0.1227***
	(0.4287)	(0.4323)	(0.3899)	(0.3902)	(0.0213)	(0.0213)
Board size			-0.0009	-0.0035	-0.0024	-0.0024
			(0.0078)	(0.0079)	(0.0019)	(0.0019)
Board independence			-0.0182	-0.0186	0.0413	0.0405
			(0.1629)	(0.1642)	(0.0290)	(0.0291)
E-Index			-0.1141***	-0.1178***	-0.0087**	-0.0088***
			(0.0180)	(0.0181)	(0.0034)	(0.0034)
Observations	37,055	37,043	27,125	27,125	26,223	26,223
Adjusted R^2	0.130	0.140	0.155	0.151	0.104	0.104