Neighborhood Matters: The Impact of Location on Broad Based Stock Option Plans

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Abstract:

We find that fixed effects related to the location of a firm's headquarters explain variation in broad based option grants after controlling for industry effects and firm characteristics traditionally known to affect option granting. Location matters because of local labor market conditions and social interaction with neighboring firms. Broad based option grants are higher (i) when the firm's stock prices co-move more with stock prices of other firms located in that Metropolitan Statistical Area (MSA); (ii) in states that are less likely to enforce non-compete agreements; and (iii) in MSAs where employees prefer options because firms there have enjoyed abnormally high stock returns. Social influence affects broad based option grants because firms grant more options to rank and file workers when other firms in the MSA grant more broad based options. The neighborhood's option granting practices matter most when the firm is located in a region with a highly educated work force. All results with the exception of the impact of non-compete agreements hold when firms located in California are excluded. However, these results do not hold for top executive option grants.

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> *"We give options to rank and file employees because Microsoft does"*
> A senior executive from a Seattle based retailing firm in an interview with the authors (1/27/05).

1.0 Introduction

Do firms indeed grant options to rank and file employees because other firms in the area do so? Can the location of a firm explain its rank and file option grants? In this paper we examine whether the geographic location of a firm impacts its option grants to rank and file employees. Location could affect broad based option grants via the tightness and the quality of the local labor market that the firm faces. Location also circumscribes the set of neighboring firms whose option granting practices might affect an individual firm's compensation policy via local interaction and social networks.

The prevalence of broad based option plans remains a puzzle for standard economic theory. Any incentive effects arising from rank and file option grants are likely offset by free rider problems. Further, holding stock options in their employer exposes employees to stock price risk, which is highly correlated with the risk in their human capital. In contrast to an incentive based explanation, employee retention provides an important rationale for granting options to rank and file workers.

The location of a firm, through the characteristics of the local labor market and the relevant industrial and legal environment, is likely to impact the need for retention mechanisms of employees as well as the efficacy of such mechanisms in four ways. First, a firm located in a tight labor market, characterized by low unemployment rates, may grant more rank and file options to retain and perhaps even to attract and recruit

employees (Mehran and Tracy 2001). Stock options aid retention as they vest over a long period of time.

Second, a more refined theoretical reason for why broad based stock options aid employee retention is offered by Oyer (2004). Oyer (2004) argues that if an employee's outside opportunities are positively correlated with his current employer's stock price, then options serve to index the employee's deferred compensation to his outside opportunities. If we assume that labor markets are geographically segmented for rank and file employees, the relevant outside opportunities for the employee are more likely to come from other firms located in the same geographical area rather than from those located far away. Hence, stock options will effectively index an employee's compensation to his outside opportunities if the current employer's stock price co-moves more with the stock prices of other firms located in the same region. We examine whether firms, whose stock prices co-move with stock prices of other firms in the local area, are more likely to grant broad based options.

Third, the location of a firm, and the applicable state laws, also impact the effectiveness of alternative mechanisms of worker retention such as the enforceability of non-compete agreements. In states like California, where non-compete agreements are notoriously difficult to enforce, firms are likely to depend more heavily on other mechanisms of retention such as stock options. Finally, in MSAs where firms have experienced abnormally high stock market returns, there may arise an overall optimistic sentiment making the labor pool in the location view stock options favorably. In the presence of such optimism, stock options become an effective sorting mechanism for firms to attract optimistic and hence productive workers (see Oyer and Schaefer 2005).

The impact of location on the rank and file option grants might also stem from firms' tendency to adopt the behavior of other exemplary firms in their neighborhood (see Glaeser, Sacerdote and Scheinkman 1996). Such social interactions would lead to the clustering of option grants in some geographical regions. We posit that the strength of this social interaction effect is likely to depend on the stature of the exemplary firm and whether the region is friendly or hostile to rank and file labor.

To provide empirical evidence on these hypotheses, we obtain rank and file option grants from *Execucomp* over the years 1992-2004 and use the Metropolitan Statistical Area (MSA) as our geographical unit of analysis. In a sample of over 10,000 firm years we find significant MSA fixed effects after controlling for a wide range of firm characteristics and industry fixed effects. We find strong evidence that broad based options are used for employee retention consistent with Oyer's (2004) arguments. In particular, firms with large local betas (that is, firms whose stock prices co-move more with stock prices of other firms in the MSA) grant more rank and file options. Further, we find greater usage of broad based options when firms are located in MSAs where non-compete agreements are harder to enforce although this result seems to be driven by firms located in California. There is some support for sorting theories proposed by Oyer and Schaefer (2005) as firms located in MSAs with high median market adjusted returns grant more rank and file options.

Our evidence also suggests that a firm's social interaction with its neighboring firms affects option grants. In particular, a firm's broad based option grants are positively associated with the option grants of other firms in the MSA. There is, however, little evidence that firms adopt the option granting practices of exemplary

firms.[2] As firms do not appear to respond to a single exemplary firm, we explore whether social pressures in their neighborhood, especially the labor friendly attitudes of their region, affect broad based option grants. However, proxies for labor friendly attitudes such as union membership do not seem to explain the influence of neighboring firms' grants on an individual firm's option grants. There is some evidence that neighboring firms' option granting practices matter most to an individual firm's option grants when the MSA has a highly educated work force.

We also investigate whether the location effect on broad based options that we document is restricted to industrial clusters. Almazan, de Motta and Titman (2006) argue that industry clusters are likely to be associated with greater investment in human capital and greater labor mobility. These arguments suggest that industry clusters may be associated with a much higher incidence of rank and file options. Indeed, after controlling for labor market characteristics and social interactions, we find that (i) industry clusters are associated with higher rank and file options; and (ii) option grants of other firms in the MSA affect option grants at an individual firm if that firm is located in an industrial cluster.

In the final set of analyses, we investigate whether the location effect on option usage generalizes to option grants made to senior executives. Because labor markets for top executives are likely to be nationally segmented rather than geographically segmented, local betas should not and do not explain executive stock option grants. Moreover, executive option grants are not affected by option granting practices of

[2] We use several proxies to capture exemplary firms. All these different proxies, discussed in detail later, suggest no significant impact of exemplary firms on rank and file option granting.

neighboring firms. Thus, location affects option usage mostly for broad based but not for executive option grants.

Our paper contributes to extant literature on employee stock options in several ways. First, our results provide one explanation for the theoretically puzzling occurrence of broad based option plans in corporate America. We are the first to document that the firm's location explains broad based option usage after controlling for a myriad of firm characteristics and industry membership identified by Core and Guay (2001), Ittner, Larcker and Lambert (2001) and Oyer and Schaefer (2005). Location affects rank and file option grants via the characteristics of labor market, as well as through the practices of neighboring firms. Second, we build directly on the work of Oyer (2004) and Murphy and Zabojnik (2004) by proposing that a rank and file employee's outside value may be circumscribed by potential employers in the neighboring geographic region. Existing empirical work in the area is restricted to the CEO's outside opportunities during economic booms (e.g., Himmelberg and Hubbard 2000 and Rajgopal, Shevlin and Zamora 2006). Third, we are among the first to document the existence of peer effects on corporate policy, especially in option compensation. The extant research on the existence of "neighborhood effects" or "peer effects" is limited to various aspects of individual behavior (e.g., Audretsch and Stephan 1996, Hong, Kubik and Stein 2004 and Brown et al. 2004).[3]

The paper proceeds as follows. In section 2, we document the importance of location in explaining variation in broad based option grants. Section 3 explores the

[3] There is a large recent literature that shows the importance of geographic proximity due to associated information advantages. See for e.g., Coval and Moskowitz (1999, 2001), Grinblatt and Keloharju (2001), Peterson and Rajan (2002), Loughran and Schulz (2004), Feng and Seasholes (2005), Malloy (2005), Kedia et al. (2005), and Kedia and Rajgopal (2007).

theory and evidence for why location ought to matter to a firm's broad based option grants. Section 4 considers the role of industry clusters in broad based option grants whereas section 5 investigates senior executive option grants. Section 6 concludes.

2.0 Location Matters

In this section, we document that the location of a firm's headquarters is robustly correlated with its broad based option grants. We begin with a description of the data used for this purpose.

2.1 Data

We examine the usage of broad based option plans in firms covered by the *Execucomp* database over the years 1992-2004. The number of broad based options granted is not explicitly reported in *Execucomp*. Therefore, we obtain that number by subtracting the number of options granted to executives from the total options granted.[4] We normalize the number of broad based options granted in a year by the total shares outstanding (we sometimes refer to this metric as the *Execucomp* measure of rank and file options in the paper). We have data on broad based options for 2,497 unique firms spanning 16,910 firm-years. The untabulated average (median) annual option grant to rank and file employees in our sample is 2.5% (1.24%) of shares outstanding. The first and third quartile cut-offs for the average annual grant is 0.63% and 2.47%. Note that we also considered using the Black-Scholes value of broad based option grants scaled by the

[4] We derive the total options granted by the firm from the number of options granted to the CEO and the CEO's share of total option grants. An estimate of the total options granted can similarly be obtained from the other top four executive's share of total options granted. We discard observations where these estimates of total options granted are not within 1% of each other as such data are likely not reliable. Note that this approach of computing broad based options invariably overestimates the number of options given to rank and file employees.

firm's sales as the dependent variable. It turns out that the correlation between such a variable and our *Execucomp* measure is very high (Spearman $\rho = 0.88$, $p < 0.001$).

We use *Compustat* to obtain the state and county of the firm's headquarters. Our geographical unit of analysis is the Metropolitan Statistical Area (MSA) in which the firm's headquarters is located. As defined by the Office of Management and Budget (OMB), an MSA consists of a core area that contains a substantial population nucleus, together with adjacent communities that have a high degree of social and economic integration with that core. MSAs include one or more entire counties and some MSAs contain counties from several states. For example, the New York MSA includes counties from four states, New York, New Jersey, Connecticut and Pennsylvania. Because we lack data about how broad option grants are distributed inside the firm's various geographical segments, we are forced to attribute all broad based options used by the firm to its headquarters.

The firm's location (county and state) is matched to an MSA based on data gathered from the U.S Census Bureau.[5] All observations with the exception of 38 firms or 242 firm years are matched to an MSA (usually because the unmatched firms are rural or headquartered outside the U.S.) There is wide across-MSA variation in option grants, as expected. Panel A of Table 1 lists the average broad based option grants for MSAs that have at least 150 firm-years listed on *Execucomp* in our sample period 1992-2004. The top three MSAs, sorted on rank and file option grants, are San Jose-Sunnyvale-Santa Clara, CA (6.06%), San-Diego-Carlsbad-San Marcos, CA (4.82%) and San Francisco-Oakland-Fremont, CA (4.2%). The bottom three MSAs include Milwaukee-Waukesha-

[5] The data is obtained from the website http://www.census.gov/population/www/estimates/metrodef.html

West Allis, WI (1.16%), Cincinnati-Middletown, OH-KY-IN (1.53%) and Houston-Baytown-Sugar Land, TX (1.68%).

An immediate concern is whether the patterns just described merely reflect industry-based trends in option granting. There is substantial evidence in the prior literature (Core and Guay 2001, Ittner, Larcker and Lambert 2003 and Oyer and Schaefer 2005) that industry membership is one of the key factors correlated with the intensity of broad based option usage. Moreover, prior literature suggests that industries tend to be geographically concentrated (e.g., Audretsch and Feldman 1996, Audretsch and Stephan 1996, and Ellison and Glaeser 1997). It is therefore, natural to ask whether location patterns in option granting merely reflect industry differences in options usage.

To address this question, we sort option grants by two-digit SIC codes. In particular, we find 65 two-digit SIC codes with non-zero grant observations. Table 1 Panel B reports descriptive statistics of the average fraction of rank and file options granted for two-digit SIC codes that have at least 150 firm-years listed on *Execucomp* during our sample period. The top three SIC codes where rank and file option grants are most pronounced are 73 (Business Services) (5.13%), 87 (Engineering and Management Services) (5.11%) and 36 (Electronic and Other Electrical Equipment And Components, except Computer Equipment) (4.15%) whereas the bottom three SIC codes include 29 (Petroleum and Coal Products) (1.17%), 30 (Rubber and Misc. Plastics Products) (1.18%) and 33 (Primary Metal Industries) (1.21%). Thus, a comparison of panels A and B raises the question of whether the concentration of SIC code 73 firms in California can explain why Californian MSAs dominate the list of largest broad based option grants. We address this question more completely in the following section.

2.2 Firm-level evidence

In this section we investigate whether location is important in explaining broad based option usage over and above firm characteristics and industry membership. It is important for us to control as best as we can for factors associated with the need for incentive compensation across firms and show that location explains variation in broad based options incremental to such factors. Based on a review of the extant literature (e.g., Core and Guay 2001, Ittner, Larcker and Lambert 2001 and Oyer and Schaefer 2005) we identify several firm level characteristics that are known to significantly impact the granting of rank and file options such as firm size, cash constraints, tax status, investment opportunity set, lagged stock return performance, operating losses and stock return volatility. The descriptive statistics for these firm level data, obtained from *Compustat*, are shown in Panel A of Table 2.

Consistent with the prior literature, we find that several of these firm characteristics significantly impact broad based option usage, as seen in column (1) of Table 3. In column (1), we report the results of a regression of broad based option usage for a firm-year on the stated firm characteristics and year dummies which are included to control for time trends in option grants. Note that we correct standard errors for firm level clustering whenever we report regression results in the paper. Column (1) shows that broad based option grants are higher for (i) firms with higher R&D (p-value = 0.09); (ii) firms with a lower book-to-market (p-value = 0.036), a proxy for investment opportunity set, consistent with Smith and Watts (1992); (iii) firms less likely to have long-term debt (p-value = 0.00); (iv) firms with lower marginal tax rate because deferred compensation and hence the associated deferred tax deduction is more attractive for firms

with lower tax rates (p-value = 0.004 on high marginal tax rate indicator); (v) risky firms proxied by volatile stock returns (p-value = 0.000); and (vi) firms with operating losses (p = 0.018) because such firms would rather not award compensation that needs to be expensed through their income statements. Firm-level characteristics account for an adjusted r-squared for 5.8% in explaining the variation of broad based option grants.

As shown in section 2.1, rank and file option grants vary by industry. When we include dummy variables for two-digit SIC codes, the adjusted r-squared increases to 8.4% (see column 2 of Table 3). This suggests that industry membership contributes an incremental 2.6% in explaining cross-sectional variation in rank and file option grants. Lastly, we add MSA fixed effects on top of year and industry fixed effects and as can be seen in column (3) of Table 3, the adjusted r-squared increases to 10.2%. Thus, MSA fixed effects add 1.8% in explanatory power beyond the model with only the firm characteristics and year and industry fixed effects. The explanatory power added by MSA fixed effects (1.8%) is broadly comparable to the explanatory power contributed by industry fixed effects (2.6%). Furthermore, the p-value of an F-test of the hypothesis that the coefficients for all the MSA dummies equal zero is significant at the 1% level.

3.0 Why Does Location Matter?

In this section we explore mechanisms that might potentially explain the empirical importance of location for broad based option usage. A firm's location might impact its option granting practices on account of two sets of factors: (i) labor market influence; and (ii) social interaction theory, which predicts that a firm's option granting is influenced by its neighboring firms' option granting policies. We exploit two sources of

variation in our proposed mechanisms that explain the importance of location to option grants: (i) time-series and cross-sectional variation, across MSAs, in tight labor markets, wage indexation, employee sentiment and social influence; and (ii) predominantly cross-sectional variation across MSAs in non-compete enforcements and labor friendly attitudes.

3.1 Local labor markets

We posit that local labor markets affect a firm's option grants in four ways: (i) tight labor markets; (ii) Oyer's wage indexation theory; (iii) enforceability of non-compete agreements; and (iv) employee sentiment that favors stock options. These mechanisms are detailed below.

3.11 Tight labor markets

The characteristics of the labor market where the firm is located may determine its reliance on broad based options. In particular, the quality of the labor pool and the tightness of the labor markets will vary across locations if labor markets are geographically segmented. Geographic segmentation of labor markets implies that workers are reluctant to move outside a geographical neighborhood but are not averse to moving within the neighborhood thus creating regional labor pools with their distinct characteristics. The preference to stay in a geographic area could be due to family and/ or personal commitments. Prior literature documents evidence of geographic segmentation of labor markets (see Brechling 1973, Hanson and Pratt 1992, and Pan Atlantic Consultants 1999).

Furthermore, clustering of industrial activity in some regions, which could occur due to superior infrastructure or natural advantages, can lead to geographically segmented labor markets. An industry wide shock in the area (e.g., a boom in the demand for software talent in the Bay area) could create tight labor markets in certain geographical regions. As the demand for rank and file workers exceeds supply in these tight labor markets, employees are more likely to receive outside job offers from other firms located in the region.

Firms might use broad based stock option grants in tight labor markets to retain and/or attract workers. Stock options aid employee retention as they vest over several years. Moreover, as the equilibrium wage rate in tight labor markets is high, such a higher equilibrium wage might get reflected in stock options grants given on top of cash compensation (Mehran and Tracy 2001). In a study published by the Department of Labor, Lermann and Schmidt (2004) report that U.S. employers adapted to the tight labor markets, especially in the second half of the 1990s, by offering incentives such as bonuses and stock options to attract workers.

Our proxy for tight labor markets is based on the unemployment rates obtained from the Bureau of Labor Statistics. These statistics are available at the county level and are aggregated to derive MSA level unemployment rates for our analyses.[6] A tight labor market dummy for every MSA every year is coded as one if the annual unemployment rate is less than the average unemployment rate for the MSA over the time period under study, i.e., 1992 – 2004. Tight labor markets, characterized by low unemployment rates,

[6] The MSA level data is the weighted average of the county data with the weights being the population of the counties. Note that when we aggregate counties upto the MSA level, we rely on a population weighted average.

ought to be associated with greater usage of stock options, if options help in attracting and retaining employees. As seen in panel A of Table 2, about 57% of the firm years are characterized as operating in tight labor markets.[7]

3.12 Oyer's wage indexation theory

What is special about stock options, relative to deferred cash or restricted stock compensation, in attracting and retaining employees in tight labor markets? Oyer's (2004) wage indexation theory suggests that stock options are more likely to be effective at employee retention in tight labor markets relative to other modes of compensation. In particular, Oyer (2004) points out that if an employee's outside employment opportunities are positively correlated with a firm's share price, then options serve to index the employee's deferred compensation to his outside opportunities. Consider a firm that is contemplating an offer of $100,000 in deferred cash compensation versus $100,000 in Black-Scholes value of stock options to an employee. If it turns out that labor market conditions are exceptionally tight next year, then the $100,000 in deferred cash may not be sufficient to induce the employee to stay with the firm. However, if the employee holds options, the value of the option package will likely be substantially higher than $100,000 in the event the employee receives an attractive outside offer. If, on the other hand, the labor market turns out to be slack next year, the firm must still pay the employee $100,000 in deferred cash. Note, however, that the realized value of the option package may be considerably smaller than the initial Black-Scholes value in a slack labor

[7] Note that the average wage rate in the MSA could potentially also proxy for tight labor markets. However, as average wage rates are likely determined by both the tightness in the labor market and the quality of the local labor force, we do not report results that rely on wage rates as a proxy for tight labor markets.

market. Such downward indexation of compensation via options is especially important in slack labor markets because it is generally difficult to enforce nominal wage cuts.

In the presence of geographic segmentation, Oyer's (2004) wage indexation theory implies that the relevant outside opportunities for the employee are likely to come from other firms in the same region rather than those that are far away. In other words, stock options will effectively index an employee's compensation to his outside opportunities when the firm's stock price is correlated with the stock price of other firms in the region.

To test whether stock options are more likely to be used for retention as per Oyer (2004), we need to proxy for the correlation of the current employer's stock price with the employee's outside opportunities within the region. Our proxy for such correlation is local betas computed by Pirinsky and Wang (2005) which capture the extent of the co-movement of a firm's stock price with the stock prices of other firms in the MSA. In particular, Pirinsky and Wang (2005) estimate local betas, β^{LOC}, using the following specification:

$$R_{i,t} = \alpha_I + \beta^{LOC} R^{LOC}_t + \beta^{MKT} R^{MKT}_t + \beta^{IND} R^{IND}_t + \varepsilon_{i,t} \qquad (1)$$

where R_t refers to the monthly return of a particular stock, R^{LOC} is the monthly return of the stock's corresponding MSA index, R^{MKT} is the monthly return of the market portfolio and R^{IND} is the monthly return of one of the 46 Fama-French industries corresponding to stock *i*. All returns are in excess of monthly T-bill rates.[8] Pirinsky and Wang (2005) find that only 81 to 95 MSAs, of the total 272 MSAs, have at least five publicly traded firms

[8] To avoid spurious correlations, when calculating the return on the MSA index, the return of the corresponding stock is excluded. Pirinisky and Wang (2005) estimate equation (1) as time-series regressions over three different periods, 1988 to 1992, 1993 to 1997, and 1998 to 2002, such that at least 24 non-missing monthly return observations for a firm enter the regression.

over the sample period 1988 to 2002 to allow estimation of the local beta. The average MSA has around 50 firms operating in the area, while the median number of firms is less than 20. Panel A of Table 2 provides descriptive data on the local MSA betas.

3.13 Non-compete agreements

The location of a firm may also impact the use of stock options as a retention device via the efficacy of alternative retention devices such as non-compete agreements. Non-compete agreements, which are contracts that restrict workers from joining or forming a rival company, limit the employee's outside opportunities and therefore aid his retention. However, the efficacy of non-compete agreements varies as states differ in their enforcement of these contracts (see Garmaise 2006). Garmaise (2006) finds that executive compensation in firms located in states in high enforcement regimes are more likely to be tilted in favor of salary. Non-compete agreements typically have limited geographical jurisdiction (usually the state). As rank and file employees are more likely to look for employers in their immediate geographical neighborhood, the enforcement of non-compete agreements is likely to impact stock option grants of rank and file employees. If stock options to employees help in worker retention, their usage should be high in states where non-compete agreements are relatively difficult to enforce.

We use the non-competition enforceability index compiled by Garmaise (2006) to capture differences in enforcement across states (see Panel B of Table 2).[9] The scale runs from zero to nine where zero represents the lowest degree of enforceability and nine

[9] Firms in the same MSA that span different states will have different values of the non-compete enforceability index. For empirical estimation, we assign the value of the index based on the state of the firm's headquarters.

represents the highest degree of enforceability. It is interesting to note that California gets a score of zero suggesting that non-compete agreements are hard to enforce there.

3.14 Sorting theories

The location of a firm might also impact its broad based option grants through the application of sorting theories. Oyer and Schaefer (2005) consider a model where employees have heterogeneous beliefs regarding the firm's prospects. A firm can then use stock options to attract optimistic employees from the available labor pool. Such a strategy helps the firm to reduce its total compensation costs if the optimistic employee over-values the options relative to its fair value or if optimism is associated with productivity.

Bergman and Jenter (2007) document that large stock returns in the past may result in optimistic sentiment among employees. This optimistic sentiment may arise not only when the firm's returns are high but also when other firms in the neighborhood experience abnormally high stock returns. In short, in MSAs where firms have experienced abnormally high stock market returns, there may arise an overall optimistic sentiment making the labor pool in the location view options favorably. In the presence of such optimism, stock options become an effective sorting mechanism (see Oyer and Schaefer 2005).

To identify potential geographic areas with optimistic employee sentiment, we include the median abnormal stock returns computed for all firms in an MSA over the prior year. A firm's abnormal returns are estimated by subtracting the value weighted market return from the firm's stock returns. MSAs with firms that report a higher (lower) median abnormal return are more (less) likely to be populated by workers favorably

disposed towards stock options relative to other forms of compensation and are hence likely to be characterized by greater (smaller) usage of broad based option plans.

3.15 Control variables

Lastly, we control for the quality of the labor force because such quality is likely to affect broad based option grants in the region. The more educated and qualified the labor pool, the greater is the intensity of option grants. Scientists or skilled computer programmers are likely to receive larger option grants than office administrators or secretaries. We use the percentage of the population with at least a bachelor's degree, obtained from the U.S. Census, to proxy for the quality of the labor pool. These data are available at the county level and have been aggregated to the MSA level for our analyses.[10] To examine if the effect of qualified population is non-linear we also include a highly educated dummy that takes the value one when the fraction of the population with a bachelor's degree is in the top quartile of bachelor degrees across MSAs or greater than 27%.

We also control for the potential influence of higher state taxes. Employees do not pay federal income tax on option grants until the exercise date (if such options are non qualified options). Moreover, they will pay federal income taxes at the lower long-term capital gains tax rate if they sell the stock obtained on exercise of their options a year after the exercise date. In contrast, cash compensation is taxed in the year at the regular federal income tax rate, which is often higher than the long-term capital gains

[10] Note that the quality of workforce argument to explain broad based option grants applies equally at the firm level in that firms with more skilled workers are more likely to grant broad based options. However, data on the quality of a firm's workforce, or even wages or option grants at various grades in the organization, are not readily available.

federal tax rate. Because state income tax is often a function of income computed under the federal income tax rules, we argue that firms located in states with high taxes are likely to grant more stock options. For each state, we obtain the highest state income tax rate and include this in the regression to control for the effect of high state taxes on grant of broad based stock options.

3.16 Results

In Table 4, we report a model in columns (1) and (2) with only the year and industry dummies respectively. Column (3) reports a complete specification with both year and industry dummies. Note that if the results in column (3) are similar to those in these two specifications, then we would be a lot less worried about the importance of perfectly accounting for every control variable. However, if adding industry dummies takes away half of the importance of, for example, the local MSA beta and adding the other controls takes out another significant fraction of the importance of that variable, then we would be worried that the results are just picking up something that has not been controlled for properly. Reassuringly, the coefficients on local MSA beta and the non-compete enforceability index are statistically significant and virtually unchanged in all the specifications reported in Table 4.

There is strong support for a geographically segmented version of Oyer's (2004) hypothesis that broad based options are used for employee retention in the neighborhood. Firms with higher local MSA betas are more likely to grant stock options to rank and file employees (highest p-value across the three specifications = 0.000). In terms of

economic significance, Table 4, column 3 suggests that a one standard deviation increase in the local beta increases the employee stock options grants by 9.2%.[11]

Firms located in states where non-compete agreements are harder to enforce, grant more broad based options as evidenced by the significant negative coefficient on the non-compete enforceability index (highest p-value across the three specifications = 0.000). Note that the tight labor market dummy does not seem to be associated with significantly higher stock options grants in the full specification in column (3). However, the coefficient of tight labor dummy is positive and significant in column (2) which does not include time dummies. This finding suggests that the tight labor dummy is time-varying and such time-based variation is potentially sucked out by the year dummies. There is some support for sorting theories proposed by Oyer and Scahefer (2005) as firms located in MSA with high market adjusted returns grant more rank and file options.

Controlling for the quality of the labor force does appear to be important as firms in MSAs with a highly educated work force are more likely to grant greater broad based options (p-value across the three specifications = 0.00). State income taxes do not appear to affect the grant of broad based options. In sum, the evidence is consistent with the hypothesis that local labor market conditions influence firms' broad based option grants.

3.17 Robustness tests

In this section we perform several tests to determine the robustness of the importance of the local labor conditions in the grant of broad based options.

[11] Note that the standard deviation of local beta is 0.6663. The coefficient in model 3 is 0.004 and this represents a 0.0023 increase in employee grants. As the mean of the employee grants is 0.025, the increment represents a 9.2% increase.

3.17.1 Non-parametric specification of control variables

One potential concern is whether the results are sensitive to parametric assumptions about the relationship between option grants and some of the control variables such as R&D/Sales. That is, R&D/Sales probably has a non-linear relationship with option grants as small levels of R&D do not matter as much to broad based option grants. To capture the incremental impact of R&D at higher levels, we define two R&D dummies: (i) R&D_High_75 dummy that is equal to 1 if R&D/Sales is the top quartile or greater than 0.03 and zero otherwise; and (ii) R&D_High_90 dummy that is equal to 1 if R&D/Sales is in the top decile or greater than 0.10 and zero otherwise. As can be seen in panel A of Table 5, firms with high R&D do grant more rank and file options. However, our main results related to the importance of local labor markets remain unchanged.

3.17.2 Local competition for workers

To probe the robustness of the MSA beta variable, we introduce two new measures of the local competition for workers. These variables capture the extent of industry representation in the MSA and consequently the competition for local workers. In particular, we include (i) the number of other firms in the two-digit SIC that are also located in the MSA; and (ii) the fraction of all firms in the MSA that are in the firm's two digit SIC.

As seen in Table 5 panel B we find that these measures of local competition for labor are not significant in explaining rank and file option grants. The newly introduced measures also do not impact the significance of our prior results. Firms with high local betas continue to grant more stock options. Note that the local beta is not simply a proxy

for industry level competition for local labor because a high local beta captures the co-movement of the firm's stock with all other firms in the MSA, not necessarily, with other firms in the same industry.

3.17.3 Alternate measure of broad based option usage

The estimate of rank and file options obtained by subtracting options granted to top five executives from total options granted is biased upward as it includes options granted to executives that are not the top five executives. To examine whether our results are sensitive to this upward bias, we employ the Oyer and Schaefer (2005) method of correcting for this bias. Similar to Oyer and Schafer (2005), we assume that the highest 10% of employees at the firm receive an average grant that is one-tenth as large as the average executive ranked second through fifth in the list of the top five highly compensated employees of the company.[12] This computation gives us an estimate of the options granted to executives that are not in the list of the top five highly compensated executives for a company. We subtract such grants to the highest 10% of the employees along with the options granted to the top five executives from the total options granted to estimate the number of rank and file options given by a firm in a year. If such difference between total options granted and the sum of options given to the highest 10% of executives and the top five executives is negative, we set the Oyer-Schaefer measure of rank and file options to zero.

[12] Oyer and Schaefer (2005) find that with this adjustment, the broad based option usage obtained from Execucomp can be calibrated to data from the National Center for Eemployee Ownership (NCEO).

The Oyer-Schaefer (2005) correction is likely to produce a conservative estimate of broad based option usage because their method attributes a large fraction of the options granted to executives as opposed to rank and file workers. Indeed, this adjustment results in labeling 70% of firm years as observations with zero broad based stock option grants. Consequently, we rely on tobit estimation to control for this censoring effect in the data. Panel C of Table 5 reports the results of estimating the tobit regression with the Oyer-Schaefer measure as the dependent variable. The results are qualitatively similar with those reported earlier where the dependent variable was the number of broad based option grants scaled by total shares outstanding as per Execucomp (in Table 4) with one exception. States with high state income taxes appear to grant more stock options when the Oyer-Schaefer measure is the dependent variable. In contrast, state income taxes did not influence rank and file option grants with the Execucomp measure.

We continue to find that firms with higher local betas and those located in states where non-compete agreements are harder to enforce are significantly more likely to grant rank and file options (see panel C of Table 5). There is strong support for the sorting theories, as firms located in MSAs with high prior market adjusted returns grant more stock options. Recall that with the *Execucomp* measure the MSA return was significant only at the 10% level in Table 4. Note that we have replicated every regression reported in the paper with the Oyer and Schaefer (2005) measure and find results that are very similar to those obtained with the *Execucomp* measure.

3.17.4 Geographically dispersed industries

An important assumption underlying our analysis is that the local labor conditions prevailing in the MSA of the firm's headquarters are important in determining the grant

of broad based options. This assumption is likely reasonable for most firms because (i) compensation and the size of the option grant is typically decided at headquarters; and (ii) the headquarters is likely to have the largest nucleus of employees working for the firm. However, the importance of the labor market conditions around its headquarters is likely to be potentially smaller for firms that are geographical dispersed and therefore face different local labor markets for their various divisions.

To shed some light on this issue, we employ measures of geographic concentration of industries to determine if firms in dispersed industries are less affected by local labor conditions in the MSA of their headquarters relative to firms in geographically concentrated industries. We use the Ellison and Glaeser (1997) measure of industry concentration and in particular their industry level gammas where industries with high gammas are interpreted as being more concentrated. We classify a high gamma industry as one whose gamma is above the median gamma, i.e. 0.025, for all industries reported in Appendix C of Ellison and Glaeser (1997). We estimate the impact of local beta separately for the high gamma and low gamma industries by interacting local betas with a high and low gamma dummy variable.

As seen in panel D of Table 5, local betas significantly impact broad based option plans only for high gamma or geographically concentrated industries. Local beta does not explain rank and file option grants for geographically dispersed industries. A similar result obtains when we use the Oyer-Schaefer measure as the dependent variable. We did not find any significant effect, in either high or low gamma industries, for the other local

labor market variables. Since industry gamma was available for only about a third our sample, low statistical power may explain this lack of significance. [13]

3.17.5 Results from sub-periods

The results presented thus far are based on data pooled across years. To understand how much of the results arise from within-firm variation in grants over the years we estimate our results for different time periods. The local beta, as calculated by Pirinsky and Wang and used here, is based on three sub-periods: (i) 1988-92; (ii) 1993-1997; and (iii) 1998 to 2002. That is, local betas capture the variation of the firms' stock price with the stock prices of other firms in the MSA over the sub-periods. Therefore, we estimate our results separately for the period 1993-1997 and for 1998-2004.[14]

Results for the first sub-period 1993-1997, displayed in column (1) of Table 5 panel E, are similar to those for the full sample with the exception that local beta is no longer significant. Note that 1993 was a period of high unemployment rates across the country, the tight labor market dummy happens to be set to one for only 3.8% of the MSAs. Hence, we estimate the results after excluding 1993 observations. The local beta is now significant and the other results continue to be in line with the full sample results. The results for the second sample period 1998-2004 are in line with the previously reported results.

[13] As Ellison and Glaeser (1997) examine manufacturing industries (one digit SIC 2 and 3), we are able to obtain an industry gamma for only about one third of our sample.

[14] As the local beta is estimated over a specified sub-period, it cannot be used as the representative local beta for any one year. Moreover, we cannot estimate the local MSA beta for a one-year period due to insufficient data. As we have only one year, i.e., 1992, for the first sub-period we do not estimate our results for the first sub-period. This is especially important because 1990 and 1991 were recession years and the estimation of the local beta over 1988-1992 is unlikely to apply well to 1992. There was no local beta for the years 2003 and 2004 in our sample. We assigned the local beta measured over 1998-2002 for these years. Excluding these years does not change our results.

3.2 Influence of other firms in the neighborhood

Social influence theory suggests that an agent's values or available information, on which their decisions are based, may be influenced by others' values and actions. The common premise in this literature is that interaction among many, possibly dissimilar agents, leads to the emergence of collective behaviors and patterns in social and economic systems at an aggregate level. In particular, in the first stage a few innovators adopt a practice, then people in contact with the innovators adopt, then people in contact with those early adopters adopt, and so forth until the innovation eventually spreads throughout society. This general kind of social influence mechanism has been suggested to explain a variety of social behavior, including criminality, having children out of wedlock, and dropping out of high school (e.g., Crane, 1991, Glaeser, Sacerdote, and Scheinkman, 1996, Akerlof, 1997, and Glaeser and Scheinkman, 2000).

To empirically assess the importance of social influence on option granting, we investigate whether a firm's option grants are increasing with the average broad based option grants of other firms located in the MSA. Table 6 shows this is indeed the case. In particular, column (1) shows that a firm's option grants are strongly increasing in the rank and file options usage of other firms in the MSA (p-value = 0.00). Moreover, this impact of the neighborhood's option practices matters even after accounting for the proxies for local labor market conditions.

Why does the neighborhood's option granting practice affect an individual firm's option grants to rank and file employees? We posit that the presence of exemplary firms in the neighborhood that are associated with large rank and file option grants could

influence similar option granting at the non-exemplary firms in the region. For example, firms in the Seattle area may have granted broad based options because Microsoft, the leading firm that influences other firms in the area, adopted such a practice. However, it is not easy to define the specific attributes that characterize an exemplary firm. We use several proxies to capture attributes of an exemplary firm such as the firm in the MSA with (i) the greatest growth in number of employees; (ii) the highest profitability; (iii), the highest stock returns; (iv) or the highest market capitalization; (v) or the one with the greatest Fortune magazine rank or the highest S&P industry rank.

The results displayed in column (2) of Table 6 rely on a case where the exemplary firm is proxied as the firm with the maximum growth in employees in the MSA during the previous year. We include the average rank and file option grant for the firm with the maximum growth rate in employees during the previous year to capture its broad based option usage. However, we find no evidence that firms are influenced by the rank and file option grants of exemplary firms. In unreported results, we find similar lack of significance for all our above-mentioned proxies of exemplary firms and also for the Oyer-Schaefer measure.

Next, we examine whether the influence of neighboring firms is due to social values that are egalitarian and pro labor. To capture attitudes that are sympathetic to labor we obtain data on the extent of labor union membership in the MSA from www.unionstats.com. In particular, "union coverage" is measured as the union members, both private and public sector, for every year at the state level. If the pro labor argument holds in the data, we expect to observe larger broad based option grants when union coverage is higher. To capture the potential non-linear relationship of union coverage

with stock option grants, we also define a high union dummy which takes the value of one when the union coverage is in the top quartile or greater than 20%. Influence of neighborhood firms due to pro labor attitudes would suggest a greater propensity to imitate neighboring firms in their rank and file options when union membership is high. Consequently, we interact high union membership with the neighboring firm's rank and file option usage.

In column (3), we find that increase in union membership is associated with higher rank and file options however this effect turns negative for high union membership. We find no evidence that influence of neighboring firms is due to pro labor attitudes in the MSA. In short, it does not appear that the influence of neighboring firms is due to attitudes that are sympathetic to labor.

However, in column (4), we observe that the influence of neighboring firms is more pronounced in MSAs with a very educated population. The coefficient on the interaction of neighboring option grants with the high education dummy (which is set to one when the fraction of the population with a bachelors degree is in the top quartile) and neighboring firms broad based option grants is positive and significant. Because the influence of neighboring firms is significant only when the MSA has a high fraction of educated work force, the potential tightness of the labor market for highly educated workers may account for the neighborhood effect. We conjecture that the tightness in the labor market of the educated work force is likely not fully reflected in the tight labor dummy. That is, the tight labor dummy captures years of overall low unemployment in the MSA and is not fine-grained enough to pick up the employment prospects of an educated work force. However, the interaction of highly educated workers and the

neighborhood's option grants is not robust to using the Oyer-Schaefer measure in untabulated work. As the Oyer-Schaefer measure is a more conservative estimate of rank and file options relative to the *Execucomp* based measure of broad based options, the results suggest that potential tightness of labor markets for the mid-level executives (not in the list of the top five highly compensated executives) may account for some of the clustering observed in rank and file option grants. It is also possible that the geographical clustering in rank and file option grants could potentially be due to some unmeasured local characteristics such as risk tolerance or real estate prices tied to the local economy or some other attribute.

3.3 California effect?

Another question arising from our analysis is whether the documented results are primarily due to firms located in California. This is a potential concern because California is unique in the difficulty of enforcing non-compete agreements and has a large fraction of firms that are heavy users of employee stock options. To assess whether California drives the results, we estimate our models by excluding all firms that are located in California.

As suspected, the non-compete variable is no longer significant (see Table 7) in all specifications and for both measures of broad based option plans. Most of the other results do not change when we exclude California. In particular, as can be seen from column (1), we continue to find statistical significance of the local beta and the neighboring firms option granting practices. In untabulated work, we continue to find some support for the sorting theories when we use the Oyer-Schaefer measure. In

summary, Californian observations appear to drive the effect of non-compete agreements on broad based option grants. Most of the other results and, in particular, the importance of local beta, are not confined to California.

3.4 Industrial clusters

Though both location and industry are important in explaining option grants to rank and file employees, it is natural to ask whether geographic areas where industries are clustered (e.g., high-tech industry in the Bay area) drive the results documented thus far. This is likely if industry clusters are characterized by labor shortage or if they are associated with increased investment in human capital and increased labor mobility as modeled in Almazan, de Motta and Titman (2006).

To investigate this question, we designate an MSA as an industry cluster if 10% of the industry's (based on two-digit SIC codes) market value is located in the MSA and 10% of the market value of that MSA is accounted for by that industry. A cluster dummy is a dummy variable that is set to one if the firm is located in an industry cluster. To give the reader a flavor for what these clusters might look like, we reproduce the list of such clusters for a typical year in the sample (1998) in Table 8.

We find that firms located in industry clusters grant more broad based stock options (See Table 9, column 1) even after controlling for firm and local labor market characteristics discussed before. This higher usage of broad based options in clusters is due to a stronger neighborhood effect as can be seen in column 2. The coefficient of the interaction of neighborhood options and cluster dummy is positive and significant. In

summary, our results suggest that the effect of neighboring firms is stronger in industry clusters. However, we acknowledge that our empirical operationalization of industry cluster is subject to several sources of measurement error. In particular, we classify a cluster based on market value of only public companies. Thus, we ignore private companies in our measure although private companies potentially make up the bulk of the market value in many MSAs.

5.0 Top Executive Options

Does a similar location effect exist for grants of options to top executives? As discussed above, a portion of the location effect is attributable to the geographic segmentation of labor markets. Though it is reasonable to assume such segmentation for rank and file employees, it is difficult to argue that top executives are geographically immobile. Hence, the location effect, especially on account of local labor market conditions, ought to be less pronounced for top executives. To illustrate, a potential outside employer for the rank and file employee working for Dell in Austin is more likely to be Whole Foods, also based in Austin, rather than Hewlett Packard located in Palo Alto. On the other hand, for a senior manager working at Dell in Austin, the potential outside employer is more likely to be Hewlett Packard in Palo Alto.

However, one could counter-argue that some executives want to move but most want to stay where they are for reasons similar to those observed in lower level workers. In both cases the labor market can clear if some workers move even if the vast majority cannot. Because we cannot say for sure what that critical fraction will be, we cannot confidently assert that location effects are any less important for executives than for rank

and file workers. Furthermore, the impact of location through differences in the enforceability of non-compete agreements is arguably more important for top executives than rank and file employees as top executives are more likely to be privy to a firm's proprietary information. Therefore, in MSAs with weak non-compete enforceability, firms are more likely to rely on stock options to retain senior executives. Finally, location may impact executive option grants via the influence from option granting practices of neighboring firms. Given these bi-directional arguments, it is worth investigating whether the four location-based factors we examine (local MSA beta, non-compete index, abnormal stock returns in the MSA and the neighborhood's option granting practices) explain variation in executive option grants.

As seen in Table 10, we find no evidence that any of these four factors explains cross-sectional variation in option grants to the top five officers of the firm. Recall, in contrast, that rank and file option grants are significantly associated with each of these local labor market proxies. Thus, location appears to be more significant in explaining cross-sectional variation in option grants to rank and file employees rather than to top executives. This differential role of location in explaining rank and file option grants relative to top executive option grants for the same set of firms also suggests that location is unlikely to merely proxy for some omitted firm or industry characteristics that happen to be associated with option based compensation.

6.0 Conclusions

We are the first to document that the geographical location of a firm's headquarters is associated with the firm's rank and file option grants. This finding holds after controlling for a wide range of firm-level financial and operational characteristics including most importantly, industry membership. We also provide evidence that this geography effect occurs on account of two broad factors: (i) local labor market conditions; and (ii) social interaction with other firms in the geographical neighborhood. In particular, broad based option grants are greater (i) when the firm's stock prices co-move more with stock prices of other firms and hence outside job opportunities in the neighborhood; (ii) in states where non-compete agreements are less likely to be enforced (although this effect is especially strong in California); and (iii) when stock prices in the MSA have experienced abnormally high appreciation. Further, a firm's broad based option grants are higher when other firms in the geographical neighborhood grant more options and such social influence increases if the MSA has a highly educated work force. Interestingly, location does not appear to affect option grants to top executives in a significant manner. Our paper highlights the need to better understand the influence of (i) local conditions; and (ii) neighboring firms' decisions on an individual firm's corporate policy.

References

Akerlof, G. 1997. Social distance and social decisions. *Econometrica* 65: 10005-1027

Almazan, A., A. de Motta, and S. Titman, 2006. Firm location and the creation and utilization of human capital. *Review of Economic Studies* (forthcoming).

Audretsch, D and M Feldman. 1996. R&D spillovers and the geography of innovation and production. *The American Economic Review* 86: 630-640.

Audretsch, D., and P. Stephan. 1996. Company-scientist locational links: The case of biotechnology. *The American Economic Review* 86 (3), pp. 641-652.

Bergman, N.K and D. Jenter. 2007. Employee sentiment and stock option compensation. *Journal of Financial Economics* 84(3): 667-712.

Brechling, F., 1973, Wage inflation and the structure of regional unemployment. *Journal of Money, Credit, and Banking*, Vol. 5, No. 1, 355-379.

Brown, J.R., Z. Ivković, P. Smith and S. Weisbenner. 2004. Neighbors matter: Community effects and stock market participation. Working paper, University of Illinois at Urbana Champaign.

Core, J. and W. Guay. 2001. Stock option plans for non-executive employees. *Journal of Financial Economics* 61(2): 253-87

Coval, J. and T. Moskowitz, 1999. Home bias at home: Local equity preference in domestic portfolios. *Journal of Finance* 54 (6), pp. 2045-2073.

Coval, J. and T. Moskowitz. 2001. Geography of investment: Informed trading and asset prices. *Journal of Political Economy* Vol. 109 (4), pp. 811-841.

Crane, J. 1991. The epidemic theory of ghettos and neighborhood effects on dropping out and teenage childbearing. *American Journal of Sociology* 96: 1226-1259.

Ellison, G. and E. Glaeser. 1997. Geographic concentration in U.S. manufacturing industries: A dartboard approach. *Journal of Political Economy* 105 (5), pp. 889-927.

Feng, L. and M. S. Seasholes, 2004, Correlated trading and location. *Journal of Finance* 59, 2117-2145.

Garmaise, M. 2006. Ties that truly bind: Non-competition agreements, executive compensation and firm investment. Working paper, UCLA.

Glaeser, D., B. Sarcedote and J. Scheinkmen, 1996, Crime and social interactions. *Quarterly Journal of Economics*, Vol. 111 (2), pp. 507-548.

Glaeser, E., and J. Scheinkman. 2000. Non-market interactions. NBER Working Paper No. 8053.

Grinblatt, M., and M. Keloharju, 2001, Distance, language, and culture bias: The role of investor sophistication. *Journal of Finance* 56, 1053-1073.

Hansen, S., and G. Pratt, 1992, Dynamic dependencies: A geographic investigation of local labor markets. *Economic Geography* Vol. 68, No. 4, 373-405.

Himmelberg, C.P., and R. G. Hubbard. 2000. Incentive pay and the market for CEOs: An analysis of pay-for-performance sensitivity. Columbia University Working Paper.

Hong, H., J.D. Kubik and J.C. Stein. 2004. Social interaction and stock market participation. *Journal of Finance* 59 (2004), 137-163.

Ittner, C., D. Larcker and R. Lambert. 2003. The structure and performance of equity grants to employees of new economy firms. *Journal of Accounting and Economics* 34: 89–127.

Kedia, S, V. Panchapagesan and V.Uysal. 2005. Geography and acquirer returns. Rutgers Business School Working Paper.

Kedia, S. and S.Rajgopal. 2007. Geography and the incidence of financial misreporting. Rutgers Business School Working Paper.

Lerman, I. R., and S.R. Schmidt. 2004. An overview of economic, social, and demographic trends affecting the U.S. labor market. www.dol.gov.

Loughran T. and P. Schulz, 2004. Dissemination of information: Urban versus rural stock return patterns, Working Paper, University of Notre Dame.

Malloy, C., 2005. The geography of equity analysis. *Journal of Finance* LX: 719-755.

Mehran, H., and J. Tracy. 2001. The effect of employee stock options on the evolution of compensation in the 1990s. *Economic Policy Review* Vol. 7, No.3, Federal Reserve Bank of New York.

Murphy, K.J., and J. Zabojnik. 2004. CEO pay and appointments: A market-based explanation for recent trends. *American Economic Review* Papers and Proceedings, XCIV (2004): 192-96.

Oyer, P. 2004. Why do firms use incentives that have no incentive effects? *Journal of Finance* 59, 1619-1649.

Oyer, P. and S.Schaefer. 2005. Why do some firms give stock options to all employees?: An empirical examination of alternative theories. *Journal of Financial Economics* 76(1): 99-133

Petersen, M., and R. Rajan, 2002, Does distance still matter? The information revolution in small business lending. *Journal of Finance* 57, 2533-2570.

Pirinsky, C. and Q. Wang. 2005. Does corporate headquarters location matter for stock returns? *Journal of Finance* (forthcoming).

Report by Pan Atlantic Consultants. 1999. Maine Logging Industry and the Bonded Labor Program: An Economic Analysis.

Rajgopal, S., T. Shevlin, and V. Zamora. 2006. CEOs' outside employment opportunities and the lack of relative performance evaluation in compensation contracts. *Journal of Finance* 61, 1813-1844.

Smith, C. and R. Watts. 1992. The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of Financial Economics*, 32, 263-292.

Table 1: Rank and File Option Grant Patterns

Panel A: Rank and file option grant patterns across Metropolitan Statistical Areas (MSAs)

This table reports the number of firm-years and rank and file option grants for MSAs provided an MSA has atleast 150 firm-year observations. The observations are sorted in the descending order of the mean rank and file option grants. Mean rank and file option grants is measured as the number of stock options granted to the non top-five officers of a firm scaled by the number of shares outstanding in a given year, averaged across firms. Number of firm-years refers to the number of Execucomp firm-years over the period 1992 to 2004. The sample covers 2,497 firms across 16,910 firm-years.

MSA	Number of firm years	Mean rank and file option grants
(1)	(2)	(3)
San Jose-Sunnyvale-Santa Clara, CA	806	0.0606
San Diego-Carlsbad-San Marcos, CA	221	0.0482
San Francisco-Oakland-Fremont, CA	634	0.0420
Phoenix-Mesa-Scottsdale, AZ	179	0.0408
Boston-Cambridge-Quincy, MA-NH	731	0.0406
Pittsburgh, PA	174	0.0336
Nashville-Davidson--Murfreesboro, TN	157	0.0313
Atlanta-Sandy Springs-Marietta, GA	418	0.0297
Seattle-Tacoma-Bellevue, WA	217	0.0275
Los Angeles-Long Beach-Santa Ana, CA	846	0.0271
Miami-Fort Lauderdale-Miami Beach, FL	207	0.0265
Portland-Vancouver-Beaverton, OR-WA	178	0.0261
Bridgeport-Stamford-Norwalk, CT	322	0.0248
New York-Northern New Jersey-Long Island, NY	1716	0.0248
Washington-Arlington-Alexandria, DC-VA	325	0.0242
Philadelphia-Camden-Wilmington, PA-NJ	564	0.0229
Dallas-Fort Worth-Arlington, TX	651	0.0222
Minneapolis-St.Paul-Bloomington, MN-WI	524	0.0218
Detroit-Warren-Livonia, MI	240	0.0189
Denver-Aurora, CO	253	0.0188
Chicago-Naperville-Joliet, IL-IN-WI	990	0.0187
St.Louis, MO-IL	270	0.0185
Cleveland-Elyria-Mentor, OH	284	0.0178
Houston-Baytown-Sugar Land, TX	856	0.0168
Cincinnati-Middletown, OH-KY-IN	233	0.0153
Milwaukee-Waukesha-West Allis, WI	223	0.0116

Table 1: Rank and File Option Grant Patterns (Cont'd)

Panel B: Rank and file option grant patterns across industries

This table reports mean number of firm-years and the average fraction of rank and file option grants, scaled by shares outstanding for firm-years classified by two-digit SIC codes over the period 1992 to 2004, averaged across firms provided there are at least 150 firm-year observations in each two digit SIC code. Data are sorted in descending order of the industry average rank and file grants. The sample consists of 2,497 firms across 16,910 firm-years.

Two digit SIC	Industry description	# of firm years	Mean rank and file option grants
(1)	(2)	(3)	(4)
73	Business Services	1415	0.0513
87	Engineering and Management Services	227	0.0511
36	Electronic And Other Electrical Equipment And Components, Except Computer Equipment	1217	0.0415
59	Miscellaneous Retail	362	0.0405
62	Security And Commodity Brokers, Dealers, Exchanges, And Services	200	0.0390
51	Wholesale Trade-non-durable Goods	215	0.0361
35	Industrial And Commercial Machinery And Computer Equipment	1100	0.0354
38	Measuring, Analyzing, And Controlling Instruments; Photographic, Medical And Optical Goods; Watches And Clocks	814	0.0303
67	Holding and Other Investment Offices	195	0.0286
58	Eating And Drinking Places	304	0.0257
45	Transportation by air	179	0.0255
80	Health Services	313	0.0246
50	Wholesale Trade-durable Goods	340	0.0219
48	Communications	402	0.0215
28	Chemicals And Allied Products	1278	0.0212
53	General Merchandise Stores	231	0.0210
56	Apparel And Accessory Stores	283	0.0207
23	Apparel and other textile products	154	0.0206
13	Oil And Gas Extraction	590	0.0200
27	Printing, Publishing, And Allied Industries	349	0.0194
20	Food And Kindred Products	371	0.0179
63	Insurance Carriers	656	0.0172
37	Transportation Equipment	546	0.0147
34	Fabricated Metal Products, Except Machinery And Transportation Equipment	281	0.0140
60	Depository Institutions	955	0.0138
26	Paper And Allied Products	322	0.0128
33	Primary Metal Industries	389	0.0121
30	Rubber and misc. plastics products	154	0.0118
29	Petroleum and coal products	166	0.0117

Table 2: Descriptive Statistics of Select Variables

Panel A: Firm characteristics, local labor market and social interaction proxies

This table presents descriptive statistics from a pooled cross-sectional and time-series analysis of firms' rank and file option grants from 1992 to 2004. Cash flow shortfall is the three-year average of [(common and preferred dividends + cash flow from investing - cash flow from operations)/total assets]. Interest burden is the three-year average of interest expense scaled by operating income before depreciation. Negative values of interest burden and values greater than one are set equal to one. Rnd/Sales is the three-year average of research and development expense scaled by sales. Book-to-market is (book value of assets)/(book value of liabilities + market value of equity). Long-term debt indicator is an indicator variable equal to one if the firm has long-term debt outstanding, and zero otherwise. Low marginal tax is an indicator variable equal to one if the firm has negative taxable income and net operating loss carry-forwards in each of the three years prior to the year the new equity grant is awarded, and zero otherwise. High marginal tax is an indicator variable equal to one if the firm has positive taxable income and no net operating loss carry forward in each of the three years prior to the year the new equity grant is awarded. Log sales is the logarithm of the firm's sales. Log employees is the logarithm of the number of employees. One (two) year lag fiscal yr return is the percentage return on the firm's stock in the prior (prior minus one) fiscal year to the one in which options are awarded. Stock return volatility is the standard deviation of stock returns for the prior fiscal year to the one in which options are awarded. Operating loss dummy is set to one if the firm reported negative earnings in the fiscal year in which options are awarded. Percentage of MSA population with at least a Bachelor's degree is obtained from the U.S. Census Bureau. Tight labor market dummy is set to one if the unemployment rate for a year in the MSA exceeds the average unemployment rate for the MSA during 1992-2004. A firm's local MSA beta is calculated as per equation (1) in the text as per Pirinsky and Wang (2005). Non-compete agreement enforceability index is extracted from Garmaise (2006) and reproduced in panel B of this table. Median abnormal returns is the median abnormal stock returns computed for all firms in an MSA over the prior year. An exemplary firm is defined as the firm with the maximum growth in the number of employees in the MSA.

Variable	Mean	Median	Standard Deviation
Firm characteristics			
Cash Flow shortfall	-0.131	-0.162	0.822
Interest burden	0.299	0.147	0.346
Rnd/sales	0.033	0.000	0.093
Book to market	0.486	0.418	0.539
Long term debt indicator	0.875	1.000	0.329
Low marginal tax indicator	0.015	0.000	0.125
High marginal tax indicator	0.579	1.000	0.494
Log sales	6.91	6.84	1.631
Log employees	1.585	1.566	1.632
One year lag fiscal yr return	0.236	0.116	0.714
Stock return volatility	0.119	0.100	0.076
Operating loss dummy	0.049	0.000	0.218
Local labor market proxies			
Percentage of MSA population with bachelors degree	0.240	0.235	0.053
Tight Labor Market dummy	0.570	1.000	0.494
Local MSA beta	0.368	0.255	0.665
Non compete agreement enforceability index	3.97	5.000	2.088
Median abnormal stock returns for MSA	0.011	0.011	0.064
Social interaction proxies			
Rank & File option grants for other firms in the MSA	0.026	0.022	0.022
Rank & File option grants for exemplary firm in MSA	0.034	0.017	0.071

Table 2: Descriptive Statistics of Select Variables

Panel B: Non-competition enforceability index from Garmaise (2006)

State	Score	State	Score
Alabama	5	Missouri	7
Alaska	3	Montana	2
Arizona	3	Nebraska	4
Arkansas	5	Nevada	5
California	0	New Hampshire	2
Colorado	2	New Jersey	4
Connecticut	3	New Mexico	2
Delaware	6	New York	3
District of Columbia	7	North Carolina	4
Florida 1992-1996	7	North Dakota	0
Florida 1997-2004	9	Ohio	5
Georgia	5	Oklahoma	1
Hawaii	3	Oregon	6
Idaho	6	Pennsylvania	6
Illinois	5	Rhode Island	3
Indiana	5	South Carolina	5
Iowa	6	South Dakota	5
Kansas	6	Tennessee	7
Kentucky	6	Texas 1992-1994	5
Louisiana 1992-2001,2004	4	Texas 1995-2004	3
Louisiana 2002-2003	0	Utah	6
Maine	4	Vermont	5
Maryland	5	Virginia	3
Massachusetts	6	Washington	5
Michigan	5	West Virginia	2
Minnesota	5	Wisconsin	3
Mississippi	4	Wyoming	4

Table 3: Firms' Rank and File Option Grants on Firm Characteristics, Year, Industry, and MSA Fixed Effects

This table displays results from a pooled cross-sectional and time-series analysis of firms' rank and file option grants from 1992 to 2004. The dependent variable is the number of options granted to rank and file employees scaled by the number of shares outstanding. The independent variables are defined in notes to Table 2. Industry fixed effects relate to a dummy variable for every two-digit SIC code and MSA fixed effects refer to dummies for every MSA. We delete firm-year observations where we cannot find at least five firms in each industry or in each MSA. Robust standard errors clustered at the firm level have been used to compute t-statistics. P-values appear in parentheses. ,**,*** represent significance at the 10%, 5%, and 1% level, two-tailed, respectively.

	(1)	(2)	(3)
Firm characteristics	Year Fixed Effects	Year and Industry Fixed Effects	Year, Industry and Location Fixed Effects
Cash Flow shortfall	0.00	0.00	0.00
	(0.38)	(0.42)	(0.21)
Interest burden	0.00	0.002	0.001
	(0.94)	(0.35)	(0.48)
Rnd/sales	0.038*	0.029*	0.016
	(0.09)	(0.095)	(0.20)
Book to market	-0.002**	-0.001	-0.001
	(0.036)	(0.348)	(0.53)
Long term debt indicator	-0.009***	-0.005**	-0.003
	(0.000)	(0.05)	(0.129)
Low marginal tax indicator	-0.011*	-0.009	-0.008
	(0.076)	(0.101)	(0.11)
High marginal tax indicator	-0.003***	-0.003**	-0.002**
	(0.004)	(0.035)	(0.049)
Log sales	0.0001	0.003***	0.002**
	(0.57)	(0.009)	(0.05)
Log employees	-0.001	-0.004***	-0.003**
	(0.28)	(0.005)	(0.038)
One year lag fiscal yr return	-0.002***	-0.002***	-0.002***
	(0.008)	(0.002)	(0.000)
Stock return volatility	0.101***	0.074***	0.064***
	(0.00)	(0.000)	(0.00)
Operating loss dummy	0.01**	0.012**	0.01**
	(0.018)	(0.002)	(0.006)
Fixed effects			
Year dummies	Yes	Yes	Yes
Industry dummies	No	Yes	Yes
MSA dummies	No	No	Yes
R-square (%)	5.8	8.4	10.2
Number of firm-year observations	14419	14419	14419

Table 4: Rank and File Option Grants and Local Labor Markets

This table displays results from a pooled cross-sectional and time-series analysis of firms' rank and file option grants from 1992 to 2004. High education dummy is set to one when the fraction of the population with a bachelors degree is in the top quartile. Highest income tax rate for state is the highest state income tax rate during a year. The other independent variables are defined in notes to Table 2. Industry fixed effects refer to a dummy variable for every two-digit SIC code. Robust standard errors clustered at the firm level have been used to compute t-statistics. P-values appear in parentheses. ,**,*** represent significance at the 10%, 5%, and 1% level, two-tailed, respectively.

	Model 1	Model 2	Model 3
Firm characteristics	Year dummies only	Industry dummies only	Year and Industry dummies
Cash Flow shortfall	0.00	0.00	0.00
	(0.82)	(0.71)	(0.71)
Interest burden	0.000	0.002	0.002
	(0.94)	(0.35)	(0.36)
Rnd/sales	0.022	0.018	0.017
	(0.18)	(0.21)	(0.22)
Book to market	-0.002***	-0.001	-0.001
	(0.006)	(0.10)	(0.13)
Long term debt indicator	-0.008***	-0.004	-0.004
	(0.002)	(0.15)	(0.13)
Low marginal tax indicator	-0.014**	-0.012**	-0.011*
	(0.033)	(0.039)	(0.05)
High marginal tax indicator	-0.003**	-0.002	-0.002
	(0.022)	(0.2)	(0.12)
Log sales	0.00	0.003*	0.003*
	(0.84)	(0.05)	(0.05)
Log employees	0.00	-0.003*	-0.003*
	(0.77)	(0.061)	(0.06)
One year lag fiscal yr return	-0.002***	-0.003***	-0.003***
	(0.002)	(0.001)	(0.001)
Stock return volatility	0.08***	0.065***	0.06***
	(0.000)	(0.000)	(0.000)
Operating loss dummy	0.009*	0.011*	0.011**
	(0.054)	(0.01)	(0.011)
Treatment variables			
Tight labor market dummy	0.002	0.006***	0.001
	(0.29)	(0.00)	(0.35)
Local MSA beta	0.004***	0.004***	0.004***
	(0.001)	(0.005)	(0.005)
Non-compete enforceability index	-0.001***	-0.001***	-0.001***
	(0.003)	(0.00)	(0.000)
Median market adjusted return for MSA	0.016	0.018*	0.018*
	(0.14)	(0.095)	(0.088)
Control variables			
% of MSA population with bachelor's degree	0.02	-0.001	-0.004
	(0.25)	(0.94)	(0.81)
High education dummy	0.008***	0.008***	0.008***
	(0.001)	(0.001)	(0.001)
Highest income tax rate for state	0.0	0.0	0.0
	(0.23)	(0.44)	(0.41)
R-square (%)	7.6	9.6	9.8
Number of firm-year observations	12246	12246	12246

Table 5: Robustness Tests

This table displays partial results for the several tests performed to determine robustness of the results. The variables included but not displayed were cash flow shortfall, interest burden, R&D/ Sales (except in panel A), book to market, long term debt indicator, low and high marginal tax indicator, log of sales, log of employees, lagged fiscal year returns, operating loss dummy, stock return volatility and % of the MSA with a bachelors degree. For panels of this table, the independent variables are defined in notes to Table 2 and 4. The number of observations was 12,246 except when specified. All specifications have year and industry dummies except when specified. Robust standard errors clustered at the firm level have been used to compute t-statistics. P-values appear in parentheses. ,**,*** represent significance at the 10%, 5%, and 1% level, two-tailed, respectively.

Panel A: Non-linear relationship with R&D

This table includes a non-linear specification of R&D/Sales. R&D_High_75 dummy takes the value one when R&D/Sales is the top quartile or greater than 0.03. R&D_High_90 takes the value one when R&D/Sales is in the top decile or greater than 0.10.

	Model 1	Model 2
Rnd/sales	0.006	0.001
	(0.51)	(0.89)
R&D_High_75	0.01***	
	(0.000)	
R&D_High_90		0.013***
		(0.000)
Local labor market conditions		
Tight Labor Market dummy	0.001	0.001
	(0.34)	(0.35)
Local MSA beta	0.003***	0.003**
	(0.008)	(0.012)
Non-compete enforceability index	-0.001***	-0.001***
	(0.000)	(0.000)
Median market adjusted return for MSA	0.018*	0.017*
	(0.076)	(0.09)
R-squared (%)	9.9	10.0

Table 5: Robustness Tests (cont'd)

Panel B: Controlling for MSA industrial characteristics

This table includes number of firms within the industry, captured at the two digit SIC, that are also located in the MSA, as well as the fraction of MSA in the industry.

	Model 1	Model 2	Model 3
Local labor market conditions			
Tight Labor Market Dummy	0.001	0.001	0.001
	(0.29)	(0.34)	(0.30)
Local MSA beta	0.003***	0.003***	0.003***
	(0.006)	(0.007)	(0.008)
Non-compete enforceability index	-0.001***	-0.001***	-0.001***
	(0.001)	(0.001)	(0.002)
Median market adjusted return for MSA	0.018*	0.02*	0.019*
	(0.088)	(0.065)	(0.072)
Number of firms in industry located in the MSA	0.00		0.00
	(0.31)		(0.42)
Fraction of MSA in the industry		0.01	0.008
		(0.16)	(0.24)
R-squared (%)	9.8	9.8	9.8

Panel C: Oyer and Schaefer measure of broad based option grants

The table reports the results of a tobit estimation where the dependent variable is the Oyer and Schaefer (2005) measure of broad based option grants as described in the text.

	Model 1	Model 2	Model 3
High education dummy	0.018***	0.012***	0.012***
	(0.000)	(0.005)	(0.005)
Highest income tax rate for state	0.001***	0.001***	0.001***
	(0.003)	(0.003)	(0.003)
Local labor market conditions			
Tight labor dummy	0.001	0.004*	-0.001
	(0.72)	(0.085)	(0.86)
Local MSA beta	0.007***	0.004**	0.005**
	(0.000)	(0.019)	(0.011)
Non-compete enforceability index	-0.001**	-0.001**	-0.002**
	(0.032)	(0.033)	(0.025)
Median market adjusted return for MSA	0.079***	0.083***	0.083***
	(0.000)	(0.000)	(0.000)
Industry and year dummies	No, Yes	Yes, No	Yes, Yes
Pseudo R-squared	4.99	5.47	5.46

Table 5: Robustness Tests (cont'd)

Panel D: Differences across geographically concentrated and dispersed industries

Industries were classified as high (low) gamma if the gamma was above (below) the median gamma reported by Ellison and Glaeser (1997) in their Appendix C. Note that high (low) gamma corresponds to geographically concentrated (disperse) industries. Number of observations are 3972.

	Broad based Options/Shares outstanding	Oyer-Schaefer Measure
	(1)	(2)
Local labor market conditions		
Tight labor market dummy	-0.002	-0.003
	(0.52)	(0.49)
Local MSA beta * High gamma dummy	0.005**	0.005*
	(0.027)	(0.087)
Local MSA beta * Low gamma dummy	-0.002	-0.003
	(0.38)	(0.29)
Non-compete enforceability index	-0.001	-0.001
	(0.46)	(0.17)
Median market adjusted return for MSA	0.001	0.03
	(0.57)	(0.26)
R-squared (%)	12.6	2.42

Panel E: Different time periods

This table displays the results for different sub periods.

	1993-1997	1994-1997	1998-2004
	Broad Based Options / Shares Outstanding		
	(1)	(2)	(3)
Local labor market conditions			
Tight labor market dummy	-0.001	0.001	0.003
	(0.93)	(0.93)	(0.2)
Local MSA beta	0.002	0.004**	0.004**
	(0.19)	(0.023)	(0.02)
Non-compete enforceability index	-0.001**	-0.002**	-0.001***
	(0.026)	(0.024)	(0.012)
Median market adjusted return for MSA	0.034**	0.037**	0.009
	(0.036)	(0.047)	(0.50)
R-squared (%)	8.4	8.6	11.0
N	4828	3981	7418

Table 6: Rank and File Option Grants and Social Interactions

The variables included but not displayed were cash flow shortfall, interest burden, R&D/ Sales, book to market, long term debt indicator, low and high marginal tax indicator, log of sales, log of employees, lagged fiscal year returns, operating loss dummy, stock return volatility and % of the MSA with a bachelors degree. The independent variables are defined in notes to Table 2 and 4. The number of observations is 11,931 and all specifications include year and industry dummies. Robust standard errors clustered at the firm level have been used to compute t-statistics. P-values appear in parentheses. ,**,*** represent significance at the 10%, 5%, and 1% level, two-tailed, respectively.

	Model 1	Model 2	Model 3	Model 4
	Broad Based Options/ Shares Outstanding			
High education dummy	0.008***	0.008***	0.008***	0.002
	(0.001)	(0.001)	(0.002)	(0.57)
Highest income tax in state	0	0	0	0
	(0.33)	(0.34)	(0.65)	(0.45)
Local labor market conditions				
Tight labor market	0.001	0.001	0.001	0.001
	(0.41)	(0.40)	(0.36)	(0.42)
Local MSA beta	0.004***	0.004***	0.004***	0.004***
	(0.004)	(0.003)	(0.004)	(0.005)
Non-compete enforceability index	-0.001***	-0.001***	-0.001***	-0.001***
	(0.004)	(0.004)	(0.003)	(0.005)
Median market adjusted return for MSA	0.011	0.013	0.011	0.012
	(0.38)	(0.35)	(0.42)	(0.38)
Social interaction effects				
Option grants of other firms in the MSA	0.078***	0.079***	0.064**	0.021
	(0.001)	(0.002)	(0.013)	(0.30)
Firm with the maximum growth in employees in the MSA		0.00		
		(0.95)		
Option grant for firm with maximum employment growth		0.006		
		(0.36)		
Union coverage			0.0002*	
			(0.084)	
High unionization dummy			-0.004*	
			(0.076)	
High union dummy * Option grants of other firms in MSA			0.042	
			(0.58)	
High education dummy * Option grants of other firms in MSA				0.175***
				(0.007)
R-squared (%)	9.7	9.8	9.7	9.9

Table 7: Are the Results Robust to the Exclusion of Californian Observations?

This table displays results from a pooled cross-sectional and time-series analysis of firms' rank and file option grants from 1992 to 2004. All firms located in California have been excluded for this estimation. The independent variables included but not displayed were cash flow shortfall, interest burden, R&D/ Sales, book to market, long term debt indicator, low and high marginal tax indicator, log of sales, log of employees, lagged fiscal year returns, operating loss dummy, stock return volatility and % of the MSA with a bachelors degree. The independent variables are defined in notes to Table 2 and 4. Robust standard errors clustered at the firm level have been used to compute t-statistics. P-values appear in parentheses. *,**,*** represent significance at the 10%, 5%, and 1% level, two-tailed, respectively.

	Broad Based Options/ Shares Outstanding	
Local labor market conditions	(1)	(2)
High education dummy	0.005*	-0.001
	(0.051)	(0.87)
Highest income tax in state	0	0
	(0.98)	(0.89)
Tight labor market dummy	0.00	0.00
	(0.89)	(0.95)
Local MSA beta	0.004***	0.004***
	(0.005)	(0.006)
Non-compete enforceability index	0.00	0.00
	(0.72)	(0.56)
	0.007	0.008
Median market adjusted return for MSA	(0.62)	(0.56)
Social interaction effects		
	0.038*	0.021
Option grants of other firms in the MSA	(0.051)	(0.27)
High education dummy * Option grants of other firms in MSA		0.177**
		(0.032)
Industry and Year dummies	Yes, Yes	Yes, Yes
R-squared (%)	7.4	7.4
Number of firm-year observations	9831	9831

Table 8: List of industry/MSA combinations that qualify as clusters for 1998

An industry cluster is an MSA where 10% of an industry's market value is in the MSA and where 10% of market value of the MSA is in that industry.

MSA	Industry (Two digit SIC code)
Akron, OH	Rubber and miscellaneous plastics products (30)
Allegan, MI	Chemicals and Allied Products (28)
Atlanta-Sandy Springs-Marietta, GA	Food and kindred products (20), Building materials, hardware, garden supply, & mobile (52).
Austin-Round Rock, TX	Industrial Machinery and Equipment (35)
Augusta-Waterville, ME	Electric, gas, and sanitary services (49)
Boston-Cambridge-Quincy, MA-NH	Fabricated metal products (34), Instruments and related products (38)
Charlotte-Gastonia-Concord, NC-SC	Depository institutions (60)
Columbus, OH	Wholesale trade--nondurable goods (51), Apparel and accessory stores (56)
Dallas-Fort Worth-Arlington, TX	Petroleum and Coal Products (29)
Detroit-Warren-Livonia, MI	Transportation Equipment (37)
Greensboro-High Point, NC	Textile mill products (22)
Houston-Baytown-Sugar Land, TX	Oil and Gas Extraction (13)
Lancaster, SC	Chemicals and allied products (28)
Las Vegas-Paradise, NV	Amusement and recreational services (79)
Mankato-North Mankato, MN	Depository institutions (60)
Memphis, TN-MS-AR	Transportation by air (45), Automotive dealers and gasoline service stations (55)
Minneapolis-St. Paul-Bloomington, MN-WI	Instruments and related products (38)
Nashville-Davidson--Murfreesboro, TN	Health services (80)
New York-Northern New Jersey-Long Island, NY-NJ-PA	Chemicals and Allied Products (28), Communications (48) Business services (73)
Pittsburgh, PA	Primary metal industries (33)
Portland-Vancouver-Beaverton, OR-WA	Rubber and miscellaneous plastics products (30)
Providence-New Bedford-Fall River, RI-MA	Miscellaneous manufacturing industries (39)
Reno-Sparks, NV	Miscellaneous manufacturing industries (39)
Richmond, VA	Furniture, home furnishings and equipment stores (57)
Rochester, NY	Engineering and management services (87)
San Jose-Sunnyvale-Santa Clara, CA	Industrial machinery and equipment (35), Electrical and electronic equipment (36)
Seattle-Tacoma-Bellevue, WA	Business services (73)
Toledo, OH	Stone, clay, glass, and concrete products (32)
Tullahoma, TN	Lumber and wood products (24)
Virginia Beach-Norfolk-Newport News, VA-NC	Railroad Transportation (40)
Washington-Arlington-Alexandria, DC-VA-MD-WV	Nondepository credit institutions (61)
Willimantic, CT	Chemicals and allied products (28)

Table 9: Role of Industry Clusters in Rank and File Option Grants

This table displays results that examine the role of industry clusters. The independent variables included but not displayed were cash flow shortfall, interest burden, R&D/ Sales, book to market, long term debt indicator, low and high marginal tax indicator, log of sales, log of employees, lagged fiscal year returns, operating loss dummy, stock return volatility and % of the MSA with a bachelors degree. The independent variables are defined in notes to Table 2 and 4. Cluster dummy takes the value one if the firm is located in an industry cluster. An industry cluster is an MSA where 10% of an industry's market value is in the MSA and where 10% of market value of the MSA is in that industry. Robust standard errors clustered at the firm level have been used to compute t-statistics. P-values appear in parentheses. *,**,*** represent significance at the 10%, 5%, and 1% level, two-tailed, respectively.

	Broad Based Options/ Shares Outstanding	
Local labor market conditions	(1)	(2)
High education dummy	0.052***	0.039***
	(0.000)	(0.009)
Highest income tax in state	0	0
	(0.42)	(0.38)
Tight labor market dummy	-0.001	-0.001
	(0.29)	(0.38)
Local MSA beta	0.003**	0.003**
	(0.016)	(0.010)
Non-compete enforceability index	-0.002***	-0.001***
	(0.000)	(0.000)
Median market adjusted return for MSA	-0.016	-0.026
	(0.80)	(0.30)
Cluster dummy	0.005**	-0.002
	(0.016)	(0.55)
Social interaction effects		
Option grants of other firms in the MSA		0.065**
		(0.015)
		0.237**
Cluster Dummy * Option grants of other firms in MSA		(0.026)
Industry and Year dummies	Yes, Yes	Yes, Yes
R-squared (%)	9.9	9.8
Number of firm-year observations	12245	11931

Table 10: Firms' Top Executives Option Grants on Firm Characteristics, Industry Fixed Effects and Proxies for Local Labor Markets, Social Interaction and Industrial Clusters

This table displays results from a pooled cross-sectional and time-series analysis of firms option grants to top five executives from 1992 to 2004. The dependent variable is the number of options granted to top five executives scaled by the number of shares outstanding. The independent variables included but not displayed were cash flow shortfall, interest burden, R&D/ Sales, book to market, long term debt indicator, low and high marginal tax indicator, log of sales, log of employees, lagged fiscal year returns, operating loss dummy, stock return volatility and % of the MSA with a bachelors degree. The independent variables are defined in notes to Table 2 and 4. Robust standard errors clustered at the firm level have been used to compute t-statistics. P-values appear in parentheses. *,**,*** represent significance at the 10%, 5%, and 1% level, two-tailed, respectively.

	Model 1	Model 2
Local labor market conditions		
High education dummy	0.06	0.061
	(0.33)	(0.33)
Highest income tax in state	0.002	0.002
	(0.44)	(0.45)
Tight labor market dummy	0.115	0.117
	(0.32)	(0.32)
Local MSA beta	-0.088	-0.088
	(0.32)	(0.32)
Non-compete enforceability index	-0.011	-0.011
	(0.31)	(0.31)
Median market adjusted return for MSA	0.132	0.13
	(0.42)	(0.42)
Social interaction effects		
Executive option grants of other firms in the MSA	-0.079	-0.073
	(0.32)	(0.31)
High education dummy x executive option grants of other firms in MSA		-0.014
		(0.37)
Industry and year dummies	Yes, Yes	Yes, Yes
R-squared (%)	0.5	0.5
Number of firm-year observations	12027	12027