

When in Rome: Local Social Norms and Tournament Incentives

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Abstract

We investigate whether social capital influences the use and effectiveness of tournament structure of compensation. We find that pay differentials between the CEO and other executives, or tournament, are lower in U.S. counties with higher social capital. In addition, lower pay differentials are associated with better firm performance in regions with higher social capital. We use a variety of experiments which are shown to change social capital, such as legalization of medical and recreational use of marijuana or moving corporate headquarters. Our results remain robust. These findings suggest that social capital impact firms' compensation setting decisions and firm performance.

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1. Introduction

Empirical research on the structure and efficacy of CEO compensation, particularly tournaments (i.e., pay differentials between the CEO and other highest paid executives) predominately focuses on the agency theory explanations (Hallock and Murphy, 1999; Lazear and Rosen, 1981)). A growing body of literature explores alternative explanations based on social comparison theory (O'Reilly et al, 1988) and power theory (Finkelstein and Hambrick, 1989). This work explores the roles of culture as well as social norms and values on CEO compensation. For instance, in a cross-country setting, Tosi and Greckhamer (2004) and Burns, Minnick, and Starks (2017) show that cultural values affect the structure of executive compensation. Other studies show that in the United States, the CEO compensation setting process can be affected by geographic location and local social environment to which firms are exposed (Grullon, Kanatas, and Weston 2012, Kuhnen and Niessen 2010).¹ Yet, the nature and extent that firms adjust executive pay differentials, or tournaments, under various social environment is still ambiguous *ex ante*.

In this research, we explore whether local social and cultural norms affect the use of tournaments and its effectiveness. The tournament theory of CEO compensation suggests that the potential reward for becoming the CEO fosters competition, which in turn leads to higher performance (Lazear and Rosen, 1981; Green and Stokey, 1983; Rosen, 1986).² We reason that local social norms of the community environment to which executives are exposed likely influence what management consider to be appropriate compensation both for themselves and for others. Because the tournament structure in the U.S. is 30% higher than it is in other countries (Burns, Minnick and Starks, 2017), and because of the regional cultural differences in the U.S., there is room for regional culture differences to affect the tournament incentives in the U.S. Consequently, we explore whether variation of culture and social norms across counties and states in the U.S. affects tournament structure and the effectiveness of the incentives generated by the tournament.

¹ See Grullon, Kanatas, and Weston (2012) provide evidence that religiosity is negatively correlated with the size of managers' compensation packages, and Kuhnen and Niessen (2010) find that societal censure, proxied by news, drives down executive compensation.

² Specifically, non-CEO senior executives compete internally for the CEO position and are evaluated relative to their peers. In theory, the top performer will be promoted and rewarded with higher pay. This increase in compensation creates incentives for senior executives to exert effort which can potentially translate into better firm performance.

Research in sociology and political science operationalize measurement of social norms using the Putnam (1995) Social Capital Index. Studies on social capital generally agree that social capital encourages and constrains individuals' behavior through commonly shared beliefs (i.e., social norms). Putnam defines social capital as the features of a community "that facilitate coordination and cooperation for mutual benefit" (p.2). Hence, social capital is important because it captures cooperation for mutual benefit in a community. The local norms of reciprocity, in turn, permeate social norms in a firm. We predict that social capital will affect tournament incentives if it impacts perceptions of the importance of teamwork and "fair pay" (i.e., if the CEO makes what other executives consider to be a just compensation relative to their own). Specifically, if the tournament incentives are influenced by local social norms, we hypothesize that in areas with higher social capital (i.e., stronger local norms of cooperation), tournament structure will be less steep,³ and "fair" CEO compensation will facilitate more cooperation for value creation. Alternatively, in the framework of optimal contracting theory where the CEO labor market is competitive across states, CEO and executive compensation would be a function of national market forces, not just local. As such, local social norms would not affect the tournament structure and its effectiveness.

Using a comprehensive sample of 20,306 firm-years from 2004 to 2016, we explore whether the social capital in a firm's headquarter county affect the use of the tournaments and its effectiveness. We find that the pay differentials between the CEO and other executives (i.e. tournament) are lower in U.S. counties with higher social capital. This is consistent with our hypothesis that norms of cooperation for mutual benefit are associated with pay differentials. Specifically, stronger norms of cooperation for mutual benefit are associated with lower tournament incentives. Having established that social capital/norm relates to tournament incentives, we then examine the implications of this relationship on firm performance. We investigate whether a correlation between tournament incentives and firm performance varies with social capital. If large pay differentials encourage competition for the CEO position, and competition, in turn, is the catalyst for higher executive effort and greater payoffs for firms, then steeper tournaments should be associated with better firm performance (Lazear and Rosen, 1981;

³ Steepness is the gradient of the difference between the CEO and the other executives . For instance, a CEO may be paid \$2,000, which is not a large final prize, but if the other execs are only paid \$1,000, the CEOs pay is 2x the others (i.e., steep).

Green and Stokey, 1983; and Kale, Reis, and Venkateswaran, 2009). We find evidence that firms with steeper tournament structure (i.e., greater pay differentials between the CEO and senior executives) are associated with better operating performance. However, the effectiveness of the tournament may vary with local perception of the value of pay difference and norms of cooperation. Indeed, we find that the effectiveness of the tournament varies with local social capital. Higher pay differentials are associated with better performance in regions with lower social capital.

We attempt to address endogeneity concerns by using an instrumental-variable, two-stage least squares regressions. In the first stage, we predict whether firms self-select to be in a high or low social capital environment. Instruments used to assist in proper identification of the fitted value of social capital measures are distance of the firm's headquarters from the Canadian border and the adoption of Jim Crow laws in the 1960s⁴ in the state in which sample firms are headquartered. We use a variety of experiments which are associated with changing cultural norms, such as legalization of marijuana and moving corporate headquarters to a new geographic location for tax benefits to account for any effects of self-selection of firms into high or low social capital areas. Our results remain robust.

Our study contributes to the growing literature highlighting the importance of social capital to firm governance in general, and compensation in particular. Prior research on U.S. firms finds that social norms can influence CEO compensation and selection. For example, an early work of Kuhnen and Niessen (2010) show that event associated societal pressure as measured by nationwide press coverage of option compensation is followed by a reduction in option compensation, resulting in a change in executive compensation. Grullon et al. (2012) highlight the importance of religious composition of a firm's headquarter's county in the U.S.. They argue that religion works as a constraint on excessive CEO compensation. A more recent study by Hoi, Wu, and Zhang (2019) find that social capital mitigates agency problems by restraining managerial rent extraction in CEO compensation. We show that regional differences in social norms not only effect CEO compensation, but also the pay differential between CEOs and other top executives. Our

⁴ Alesina, Alberto, and Eliana La Ferrara (2000) show that social capital declines in heterogeneous communities (based on income, ethnicity or race) when a greater percent of the population is averse to associating with others outside of their group.

results indicate that the CEO labor market is a function of both national and regional market forces, and compliment recent work shows that geography plays a significant role in CEO selection (Yonker 2017).

We also contribute to the growing literature highlighting the influence of social capital on firm outcomes. Gupta, Raman, and Shang (2018) and Hasan, Hoi, Wu, and Zhang (2017) link social capital in a firm's headquarter county to the level of trust investors have in a firm's managers, resulting in lower costs of equity and debt, respectively. Social capital is also linked to executive choices and behavior reflected in a reduction in corporate tax avoidance (Hasan et al. 2017), and is related to risk-taking behavior by banks (Adhikari and Agrawal, 2016, using religion). By exploring whether social capital is related to the effectiveness of tournament structure, our paper adds additional insight into the effects of social capital on economic behavior relevant to firm value.

2. Data and Sample Description

We obtain compensation data for individual executives from Capital IQ over the period 2004 to 2016. Compensation is defined as the sum of all compensation components and includes salary, bonus, restricted stock and option grants, LTIPs, and other compensation. Accounting data on firm characteristics are also from Capital IQ. We include firm characteristics such as firm size and risk which are documented by prior literature to affect CEO pay (Kale et al, 2009; Bebchuk, Cremers, and Peyer, 2011). Firm size (measured as total assets) is a characteristic that is robustly related to CEO compensation (Smith and Watts, 1992, Gabaix and Landier, 2008). We use the standard deviation of the monthly stock returns over twelve months as a measure of firm risk. Our capital structure measures include debt and cash relative to assets, each of which affects firm risk (Myers and Majluf, 1984). Prior research shows that governance characteristics such as board size, independence, and ownership affect CEO pay (Yermack, 1996; Core, Holthausen, and Larcker, 1999; Hallock, 1997; and Hermalin and Weisbach, 2003). We therefore control for board size and independence, CEO duality, insider and institutional ownership in all regressions. CEO pay is also affected by the executive's tenure and age, each of which proxies for experience. We measure firm performance as the annual return on the stock and return on assets (measured as EBITDA to assets). We use this measure to capture the effectiveness of the tournament. Our final sample consists of 20,306 firm-year observations during the sample period from 2004 to 2016.

2.1. Social Capital Measures

Putnam (1993) describes social capital as the features of social life—networks, norms, and trust—that facilitate cooperation for mutual benefit, and that social capital “enhances the benefits of investment in physical and human capital”. The main social capital variables that we employ are Putnam’s (1995) social capital index (Putnam Social Capital), the Social Capital of the firm headquarters’ county (SC county) which we obtain from Rupasingha and Goetz (2006, 2008), and Church membership by county from the Association of Statisticians of American Religious Bodies. We also include a measure of church attendance at the county level. The Putnam Social Capital measure is from an updated dataset described in Putnam (1993) and includes zip code and measures of social capital from 1992-2016. It is a combination of 14 indicators in five categories: community organizational life, engagement in public affairs, community volunteerism, informal sociability, and social trust. Putnam’s index was a simple average of the 14 scores (after standardizing on a common scale).⁵ SC County is measured at the county level. Social Capital County includes variables representing membership in organizations at the county level (e.g., golf clubs, civic organizations, bowling centers) and associational activities (percent of the voting eligible population in each county who vote in presidential elections, county-level response rates to Census Bureau’s decennial census, and per capita non-profit organizations). Church Membership measures the percent of a county’s population that is a member of a religious organization, following Jones et al (2002). Economists have studied the association between religion and institutions that support economic progress (Weber, 1905; Putnam, 1993). Putnam (1993) argues that religious associations affect power structure and trust, and he shows that church attendance is positively associated with social connectedness. Similarly, Zingales (2003) shows a significant relationship between religions, the intensity of religiousness (measured by church participation), and economic attitudes that facilitate economic progress. Consistent with Putnam, Guiso, Sapienza and Zingales (2002) show that hierarchical religions like Catholicism are associated with lower trust.

2.2. Executive Compensation and tournament structure

⁵ See Appendix B for details on the Putnam Index.

We use several measures to proxy for a firm's tournament structure: (1) pay slice, which is the percentage of the aggregate compensation of the top executives that is captured by the CEO (Bebchuk et al., 2011); (2) pay ratio, which are the ratios of the CEO's compensation to the mean (median) compensation of the next highest paid executives (Burns et al., 2017), and (3) the firm gini, measured as the standard deviation of pay among top executives. We use the compensation of the CEO and the other four top executives to create our tournament measures. Our main focus is on pay ratios, as opposed to the pay gap measure used in Kale et al. (2015) for the fact that pay ratios take into consideration the effect of firm size on CEO compensation.⁶

2.3. Description of the sample

Table 1 presents the distribution of firms by state and industry. Panel A shows the distribution of firm headquarter locations for the 20,306 firm-year observations in the sample. Firms from 47 of the 50 states are represented in the sample in addition to Washington, D.C. Among the 47 states, California overwhelmingly has the greatest number of firms in the sample with 3,063 (15.08%). Other states with large representations of firms are Texas, New York (state), Massachusetts, Illinois, and Ohio, each covering between 5 and 9 percent of firms in the sample. Panel B displays the industry distribution of firm-years using Fama-French 49 industries classifications. Firms in the restaurant industry have the largest presence with 2,629 (12.95%) out of 20,306 firm-year observations, followed by firms in computers, computer software, and wholesale industries with 1,135 (5.59%), 1,101 (5.42%), and 1,033 (5.09%) firm-year observations, respectively.

—INSERT TABLE 1 HERE—

Table 2 presents univariate statistics of the various social capital measures and correlations among the social capital variables. Higher values of each measure indicate higher levels of social capital. The mean (median) value for the Putnam Index is -0.15 (-0.18). This measure generally range from -1.43 to 1.71 (see Putnam, 2000). North and South Dakota had the highest levels of

⁶ Consider, for example, CEO A and B in two firms X and Y. X is significantly larger than Y in size. CEO A's compensation is \$2,000 and the compensation of the next highest paid executives is \$1,000. CEO B works for a much smaller firm and his compensation is \$200, and the compensation of the next highest paid executives is \$50. In this example, the pay gap in firm X is \$1,000, much higher than in firm Y in which the pay gap is \$150. However, CEO B receives a much bigger pay slice and higher pay ratio compared to CEO A.

social capital, while Mississippi and Nevada has the lowest social capital. The mean (median) value for SC County is -0.23 (-0.27) and generally ranges from -1.57 to 1.07 in our sample. The SC County and Putnam Index have a correlation of 0.54. The county measure, which is calculated across multiple zip codes, has higher variation than the Putnam index which is calculated at the state level.⁷ The average church membership in our sample regions is 63%, and is negatively correlated with the social capital indices. Church membership can reflect both connectedness according to Putnam (1993), but also can reflect hierarchy as described by Zingales (2003). The negative association with social capital suggests the effect of hierarchy is stronger in this measure.

—INSERT TABLE 2 HERE—

Table 3 summarizes compensation, firm, and CEO characteristics for all firms in our sample. We bifurcate sample firms based on median Putnam Social Capital Index (-0.18). A sample firm is classified as a low (high) Putnam SC Index firm if it is headquartered in an area with below (above) median Putnam SC Index. We first examine the difference in total CEO compensation between the two subsamples in Panel A. We find that the average total CEO compensation is greater in low social capital areas (\$3.7 M) than that in high social capital areas (\$3.4M). Among the tournament measures, we first focus on ratio between the CEO's and the mean of other executives' pay (i.e., CEO Pay Ratio with Mean). There is a stark contrast in the first tournament structure variable between the high and low social capital areas. Specifically, the mean (median) CEO pay ratio is 47.08 (19.42) in areas with low social capital compared to 28.42 (19.45) in high social capital areas. Next, we compare the CEO pay to median compensation of other executives (i.e., CEO Pay Ratio with Median). For this measure, the mean (median) CEO pay ratio is 99.45 (39) in areas with low social capital versus 29.85 (19.15) in high social capital areas. Since CEO compensation is constant in the pay differential measures, the variation of pay ratios indicates that at least in some of the firm-years, one (or more) of the top non-CEO executives received particularly low compensation relative to the CEO. In addition to pay ratio, we also examine CEO pay slice (Bebchuk, 2011)⁸. The mean CEO pay slice show a similar pattern in low

⁷ For example, consider Massachusetts. It has a Putnam index of 0.21, which is indicative of high social capital. However, when looking at the county level, the SC County ranges from -0.88 to 0.83. Springfield has the lowest rating while the 02210 zip code in downtown Boston has the highest ratings of social capital.

⁸ CEO Pay Slice (CPS) is the fraction of the total compensation to the group of top-five executives that is received by the Chief executive officer (CEO).

social capital areas is 22.33% versus 7.30% in high social capital areas. Overall, these results indicate that both the compensation level and pay differentials are lower in high social capital areas.

—INSERT TABLE 3 HERE—

Panel B presents the comparison of firm characteristics. The average firm in low SC areas is larger than firms in high SC areas. This may reflect the fact that areas such as NYC, which have relatively low social capital, are home to many large firms. Sample firms in both low and high SC areas have a mean (median) leverage of 21% (16%), and firm risk averages 10% in each subsample. The average board size and independence are also similar between the two samples. CEO duality in our sample firms is approximately 51% and we find no significant difference in duality between the high and low social capital samples. Insider ownership, defined as percent ownership by affiliated persons such as executives, founders, and board members (from Capital IQ), averages 12% in our sample. Our Capital IQ firm sample consists of a greater number of small firms than samples used in Kale et. al. (2009) and Yonkers (2017), which rely on ExecuComp data.

3. Methodology and Empirical Results

3.1. The impact of social norms on tournament incentives

To explore whether social capital is associated with tournament structure, we estimate regressions of tournament and CEO pay slice on the previously described measures of social capital. The primary measures of social capital (SC) include Putnam and county social capital, as well as church membership. We control for firm, corporate governance, and CEO characteristics discussed in the univariate analysis. Because pay differentials can be positively related to the level of income, we also include county GNP to account for the overall level of economy in each county (denoted as County_GNP). In addition, we include firm and year fixed effects, as well as cluster standard errors at the firm level in order to correct for bias in standard errors (Petersen, 2009).

$$\begin{aligned} \text{Tournament} = & \text{SC} + \text{Size} + \text{ROA} + \text{Leverage} + \text{Risk} + \text{Ownership} + \text{Governance} \\ & + \text{County_GNP} \end{aligned} \tag{1}$$

Table 4 shows the results of the regressions of tournaments and social capital. We find that CEO pay differential measures (i.e., tournament variables) are negatively associated with social capital indices of Putnam SC and SC County. In areas with high social capital, the pay differentials between the CEO and other highest paid executives are significantly lower. The coefficients on the social capital variable Putnam SC are negative and significant at the 1% in columns (1) – (4) in which the main dependent variables are the CEO mean and median pay ratios, pay slice, and firm Gini, respectively. Specifically, in column (3) where the dependent variable is CEO pay slice, the coefficient on the Putnam index is -0.097, indicating that each 1% increase in the index, CEO pay slice decreases by approximately 9.7%. These results are consistent with our hypothesis that firms' use of tournament incentives is impacted by the social norm where firms are headquartered. In areas in which norms of reciprocity are higher (i.e., higher social capital), firms are less likely to use tournament to incentivize internal competition. Interestingly, church membership is positively associated with tournament variables. This may reflect the effect of hierarchical faith's effect on hierarch and trust. To further explore this possibility, we control for the percent of the population that belong to a religious institution. Columns (5) through (8) show the results from the same regressions but substitute Social Capital County for Putnam SC. The results are largely similar.

—INSERT TABLE 4 HERE—

Coefficients on our control variables are consistent with those reported in prior literature. Specifically, we find a positive (negative) correlation between tournament and board independence (board size). Independent boards may prefer a higher tournament in order to incentivize performance. CEO duality, possibly indicating greater CEO influence, is also positively associated with tournament. In addition, there exists a positive correlation between institutional ownership and tournament incentives. Prior literature finds that higher institutional ownership is associated more incentive-based compensation (Hartzell and Starks, 2003). In terms of firm characteristics, firm risk and leverage are associated with a less steep tournament, while firm size is linked to a steeper tournament structure. These results mirror those in Kale et al (2009).

3.2. Instrumental variables

Asserting that local social capital is negatively correlated with tournament incentives requires consideration of the potential endogenous correlation between pay differentials and social capital. Putnam (2001) points out the issue of reverse causality stating that the “causal arrows are likely to run in both directions, with citizens in high social capital states likely do more to reduce inequalities, and inequalities themselves likely to be social divisive.” In the case of pay differentials among top executives, this may not be as strong an issue given the skewness of the income distribution. Alternatively, Kuhnen and Nissen (2010) find that CEO option compensation is reduced in response to nationwide public criticism over CEO compensation. Therefore, it is possible that in areas of high social capital, there is increased pressure to ensure that CEO pay is not far out of alignment with the pay of other top executives, which leads to lower pay differentials.

In order to address the reverse causality issue, we employ a two-stage estimation method and use the exogenous instruments of social capital as the key explanatory variable in the first stage. The first equation (1) in the two-stage estimation is the main specification of interest, and the second (2) is the first-stage regression used to estimate the endogenous variable.

$$\begin{aligned} \text{Tournament} = & \text{IV_SC} + \text{Size} + \text{ROA} + \text{Leverage} + \text{Risk} + \text{Ownership} + \text{Governance} \\ & + \text{County_GNP} \end{aligned} \quad (1)$$

The instrumental variable (IV_SC) is estimated using the following equation:

$$\begin{aligned} \text{SC} = & \text{Exogenous_SC} + \text{Size} + \text{ROA} + \text{Leverage} + \text{Risk} + \text{Ownership} + \text{Governance} \\ & + \text{County_GNP} \end{aligned} \quad (2)$$

In equation (2), Exogenous_SC is a vector of instrumental variables to predict social capital (SC) in firms’ headquarter states. The instruments include states that had Jim Crow laws in place and firms’ geographical distance to Canada ($\text{Ln}(\text{Canada})$)⁹. Jim Crow is an indicator that is equal to one if the state had Jim Crow laws in the 1960s and zero otherwise.¹⁰ The use of these instruments is supported by prior research. Hasan et al. (2017) and Gupta et al. (2018) reference Putnam (2001) and argue that distance to the Canadian border is strongly associated with the level

⁹Distance to Canada information is from <https://www.freemaptools.com/measure-distance.htm>.

¹⁰ Jim Crow laws are from the Martin Luther King Society https://www.nps.gov/malu/learn/education/jim_crow_laws.htm

of social capital within the United States, where being closer to the Canadian border means more social capital. Putnam attributes higher social capital in the Northern U.S. (lower social capital in the Southern U.S.) to two factors: 1) Social capital is higher among Scandinavians, and Scandinavians primarily immigrated to the Northern U.S (coupled with the persist nature of culture) and 2) to the devices and systems required to support slavery and post-slavery segregation in the Southern U.S, each social-capital destroying institutions. The geographic distance to Canada may capture social capital but is unlikely to influence the tournament structure of CEO compensation. Additionally, Alesina and La Ferrara (2000) show that social capital (as measured by participation in social activities) is significantly lower in heterogeneous communities whether measured by ethnicity, income inequality, or race. They show that this is due to Whites who are averse to interacting with others outside of their race. We proxy for this aversion using Jim Crow laws which were a legal means to maintain racial segregation and implemented in areas where White citizens were more averse to racial mixing. The Jim Crow indicator variable captures the historical racial segmentation but is unlikely to influence compensation through any channel other than the social capital of a geographic region. In the second stage, we examine the correlation between the predicted value of social capital and CEO compensation measures.

Table 5 reports the results from the Two-Stage-Least-Square Instrumental variables regressions. Columns (1) and (2) report the results from the first stage. Columns (3) through (8) report second stage estimations using the predicted value of social capital as a main control variable to examine the relation between local social capital and tournament incentives. The main dependent variables include CEO to mean other executive compensation, CEO pay slice, and Firm Gini. In addition to providing the economic relevance of the instruments, we also test these instrumental variables for their statistical relevance (correlated with the endogenous variables) and validity (orthogonal to the residuals or exogenous to the dependent variable). We find that these instruments satisfy the necessary relevance and validity criteria. First, all of the instruments are statistically significant with the expected signs in the respective first-stage regressions. Second, the R^2 values provide significant support for the joint relevance of all our instruments in the first stage. Moreover, the p-values from the Hansen-J test of over identification are all above 0.10, indicating that the instruments used to estimate social capital are valid. In addition, the p-values corresponding to the Sargan C statistics are less than 0.01. Collectively, the statistics from the first

stage estimations indicate that the instruments are valid and that their exclusion from the main estimated equation is appropriate.

—INSERT TABLE 5 HERE—

The results show that both CEO to mean top executive pay (i.e., pay ratio) and the percent of top executive compensation going to the CEO (i.e., pay slice) are lower when social capital is higher. Results are stronger with the two-stage instrumented model as compared to the OLS, which suggests that omitted variables may be attenuating the OLS beta coefficients. The two-stage analysis alleviates this negative bias caused by the omitted variables because the instrumental variable contains new information about the endogenous regressor (social capital) that was diminishing the effect of social norm on compensation. The two-stage results show that firms in high social capital states and areas pay their CEOs less and are associated with smaller tournament incentives. Overall, these results indicate that norms of reciprocity result in lower pay differentials even at the top of the income distribution.

3.3. A quasi-experiment: Exogenous shocks to social capital and firms headquarters relocations

In this section, we provide further empirical evidence about the correlation between tournament structure and social capital by exploiting the exogenous shocks to social capital. Specifically, we use the medical and recreational legalization of marijuana, respectively, as shocks to social capital. There are a number of reasons why the legalization of marijuana will result in a change in social capital. First, Crime rates tend to be negatively related to social capital. Legalization of marijuana should reduce a common crime – possession. Gavrilova, Kamada, and Zoutman (2017) shows that crime is reduced in states after the introduction of medical marijuana laws. Furthermore, the change of medical marijuana laws facilitates coordination across ethnic lines as the populations using legalized marijuana increases, which can lead to higher social capital. Finally, there is an economic boom that occurs post legalization. A recent study found that for every “\$1.00 spent in the marijuana industry, between \$2.13 and \$2.40 in economic activity is

generated”.¹¹ Over our sample period, 47 states legalized marijuana for medicinal use and ten states as well as Washington D.C. legalized marijuana for recreational use.

—INSERT TABLE 6 HERE—

Table 6 presents the result of marijuana legalization. We employ a difference-in-difference approach and modify regression (1) by including an indicator variable that equals to one for after the events of marijuana legalization. Regressions include firm and year fixed effects and standard errors are clustered at the firm level. For brevity, Table 6 presents the coefficients on the indicator variable only. The coefficients on each of recreational and medical legalization of marijuana are negative and significant, indicating that firms headquartered in states with higher social capital (as a result of marijuana legalization) are associated with lower pay differentials.

In addition to the legalization of marijuana, we also examine firm headquarter relocations as a shock to a firm’s existing social capital environment. When a firm change headquarters, the social capital environment within the firm may change. We measure firm headquarter relocation as moving headquarters farther than 20 miles away from the prior location. 369 firms in our sample had a headquarter relocation more than 20 miles from their original headquarters over our sample period. As an additional robustness check, we include only firms with headquarter changes where the change is driven by tax incentives as a quasi-experiment. This allows us to focus on firms that are unlikely to have moved to a self-selected environment of social capital without tax incentives. In our sample, 168 firms relocated more than 20 miles due to tax driven reasons (which we verify with news reports).

—INSERT TABLE 7 HERE—

Table 7 presents the results associated with firm headquarter location changes. In these estimations of equation (1), we include two indicator variables, Post, which equals one for after the location change, and Social Capital Increase, for when social capital of the county to which the firm moved is higher relative to the headquarters in the previous location. The interaction between Post and Social Capital Increase is the main term of interest. Panel A presents results for all

¹¹ Quoted from <https://marijuana.procon.org/view.additional-resource.php?resourceID=006871#1>. See Alan Pyke, "Marijuana's \$2.4 Billion Impact in Colorado Is a Lesson for 5 States Considering Legalization," thinkprogress.org, Oct. 28, 2016.

relocations of the 369 firms. We measure the effects of the relocation on pay differentials (i.e. tournament structure variables). Panel B presents result for Tax Based Relocations, focusing only on the 168 firms that moved for tax based reasons. The coefficient on the interaction term is negative and significant in each of the estimations, implying that an increase in social capital resulting from relocation is associated with lower tournament incentives.

3.4. The effectiveness of the tournament based on social capital

So far we have established that as social capital increases, tournaments become less steep (i.e., lower pay differentials between the CEO and other highest paid executives), which begs the question of whether the effectiveness of tournament structure to extract effort and to improve firm value varies with social capital. It is possible that as social capital increases, a steep tournament becomes less important for increasing firm value. With higher social capital, or norms of reciprocity, people share information for mutual benefit and this information sharing can produce synergies to increase firm value. Conversely, as social capital decreases, it can be more important to have a steep tournament to increase firm value. Specifically, a decrease of social capital and less relevance of “fair pay” can foster steeper tournament incentives. And these steeper tournament incentives induce competition among executives that will improve firm value.

To explore these possibilities, we examine the impact of tournament on firm performance based on social capital. The main dependent variables for firm performance are return on assets (ROA) as well as Tobin’s Q. We are aware of the possibility that the correlation among social capital, tournament incentives, and firm performance can suffer from endogeneity. To address these potentially endogenous relations, we employ a two-stage-least-square approach and control for the interaction between tournament incentive and high social capital values. We use the following models:

The instrumental variable (IV_CEO/Mean) is estimated using the following equation:

$$\text{CEO/Mean} = \beta_0 + \beta_1 \text{Size} + \beta_2 \text{Log (GNP)} + \beta_3 \text{Cash Ratio} + \beta_4 \text{Debt Ratio} + \beta_5 \text{SD Return} + \beta_{6-11} \text{Governance Measures} + \beta_{10-14} \text{CEO Characteristics} + \beta_{15-17} \text{Instruments} + \varepsilon \quad (3)$$

We then examine the impact of the estimated pay differential on firm performance by using the following equation:

$$\text{Performance} = \beta_1 \text{Size} + \beta_2 \text{Log (GNP)} + \beta_3 \text{Cash Ratio} + \beta_4 \text{Debt Ratio} + \beta_5 \text{SD Return} + \beta_{6-11} \text{Governance Measures} + \beta_{10-14} \text{CEO Characteristics} + \beta_{15} \text{Predicted CEO/Mean} + \varepsilon \quad (4)$$

Similar to Kale et al. (2009), we include instruments that consist of the Industry average CEO/Mean pay ratio, Industry CEO Alignment, and Industry VP Alignment. CEO (VP) alignment are defined as the median CEO (VP) stock Ownership for each industry and firm size quartile. The underlying economic rationale for these instruments is documented in Murphy (1985). He argues that the level and structure of managerial compensation varies by firm size and industry. Since tournament structure (i.e., pay differentials) is calculated based on compensation, it is logical to assume that it will be influenced by firm size and industry.

We then use propensity scores to match between firms in high and low social capital areas based on industry and tournament incentives (i.e., pay differentials) with the intention of matching firms in the same industry with similar pay differentials. The only difference between treatment and control groups is the county/state the firms are headquartered in. This allows us to ensure that the effects captured from the estimations are related to variations in social capital rather than other omitted variables that effect both performance and tournament. Table 8 shows the results.

—INSERT TABLE 8 HERE—

We first test the instrumental variables' relevance and validity and find that median industry gaps, and median industry CEO and VP alignments satisfy the relevance and validity criteria necessary for appropriate instruments. Our main prediction is that if a steep tournament structure (i.e., greater pay differentials between the CEO and other highest paid executives) is important to incentivize work and to increase firm value in regions with lower social capital, then the coefficient on tournament should be positive and significant for firms in areas with in such regions. We find results consistent with this prediction. Regardless of the firm performance variables, the coefficient on the CEO Mean Pay Ratio Measure in the second stage is positive and significant at the 5% level. Consistent with prior studies, we also find that higher social capital is positively related to performance. The coefficients on *high social capital* is positive and significant at the 1% level in all regressions. However, the interaction between pay disparity (*CEO Mean Measure*) and social capital is negative ($p < 0.05$). This negative coefficient indicates that

tournament incentives are effective in improving firm performance and value, but only in areas with below median social capital.

4. Conclusion

In this paper, we examine whether local culture and social norm impact firm's use of tournament incentives and the effectiveness of tournament structure. We provide evidence that local social norm indeed plays a role in CEO compensation and pay differentials. Addressing issues of endogeneity, we find that firms exposed to local norms that promote cooperation and pay equality (i.e., high social capital) are less likely to use tournament incentives. We then examine the impact of tournament structure on firm performance and find empirical evidence consistent with prior studies. We show that firms with steeper tournament structure (i.e., greater pay differentials) are associated with better operating performance. We use a variety of experiments which are shown to change social norms, such as legalization of gambling, pot, or moving corporate headquarters to a new geographic location for tax benefits and our results remain robust.

- References** Adhikari, Binay K. and Agrawal, A., 2016, Does local religiosity matter for bank risk-taking? *Journal of Corporate Finance*, 2016, vol. 38, issue C, 272-293
- Alesina, Alberto, and Eliana La Ferrara, 2000, Participation in heterogeneous communities, *Quarterly Journal of Economics* 115, 847-904.
- Amiraslani, H., Lins, K.V., Servaes, H., Tamayo, A., (2017). A matter of trust? The bond market benefits of corporate social capital during the financial crisis. Working paper.
- Bebchuk, L. A., Cremers, K. J. M., Peyer, U. C. (2011). The CEO pay slice. *Journal of Financial Economics* 102(1), 199-221.
- Bouwman, C.H.S., (2009). The geography of executive compensation. Working paper.
- Burns, N., Minnick, K., Starks, L. T. (2017). CEO tournaments: a cross-country analysis of causes, cultural influences and consequences. *Cultural Influences and Consequences (Journal of Financial and Quantitative Analysis*, forthcoming.
- Cheng, Q., Farber, D. B. (2008). Earnings restatements, changes in CEO compensation, and firm performance. *The Accounting Review*, 83(5), 1217-1250.
- Coles, J., Li, Z., Wang, A., (2017). Industry tournament incentives, *Review of Financial Studies*, 31(4), 1418-1459.
- Core, J. E., Holthausen, R. W., Larcker, D. F. (1999). Corporate governance, chief executive officer compensation, and firm performance. *Journal of Financial Economics*, 51(3), 371-406.
- Cyert, R. M., Kang, S. H., Kumar, P. (2002). Corporate governance, takeovers, and top-management compensation: Theory and evidence. *Management Science*, 48(4), 453-469.
- Edmans, A., Gabaix, X., Jenter, D., (2017). Executive compensation: a survey of theory and evidence. Working paper.
- Finkelstein, S., Hambrick, D. C. (1988). Chief executive compensation: A synthesis and reconciliation. *Strategic Management Journal*, 9(6), 543-558.
- Fulmer, I. S. (2009). The elephant in the room: Labor market influences on CEO compensation. *Personnel Psychology*, 62(4), 659-695.
- Gavrilova, E., T. Kamada, and F. Zoutman, (2017). Is legal pot crippling Mexican drug trafficking organizations? The effect of medical marijuana laws on US crime. *The Economic Journal*

- Green, J., Stokey, N. (1983). A Comparison of Tournaments and Contracts, *Journal of Political Economy*, 91, 349–64.
- Grullon, G., Kanatas, G., Weston, J., (2012). Religion and corporate (mis)behavior, working paper.
- Guiso, L., Sapienza, P., and L. Zingales, (2011). Civic capital as the missing link, *Handbook of Social Economics*, Vol. 1a, J. Behhabib, A. Bisin, and M.O. Jackson (eds.).
- Gupta, A, Raman, K., (2018). Social capital and the cost of equity, *Journal of Banking and Finance*, 87, 102-117.
- Hallock, K. (1997). Reciprocally Interlocking Boards of Directors and Executive Compensation, *Journal of Financial and Quantitative Analysis*, 32, 331-334.
- Hallock, K, and K. Murphy. (1999) *The Economics of Executive Compensation*, Vol I. Edward Elgar Publishing Ltd. Cheltenham, U.K.
- Hartzell, J. C., Starks, L. T. (2003). Institutional investors and executive compensation. *The Journal of Finance*, 58(6), 2351-2374.
- Hasan, I., Hoi, C.K., Wu, Q. Zhang, H., (2017). Does social capital matter in corporate decisions? Evidence from corporate tax avoidance, *Journal of Accounting Research*, 55(3), 629-668.
- Hass, L.H., Muller, M.A., Vergauwe, S., (2015). Tournament incentives and corporate fraud. *Journal of Corporate Finance*, 34, 251-267.
- Hilary, G., & Hui, K. W. (2009). Does religion matter in corporate decision making in America?. *Journal of financial economics*, 93(3), 455-473.
- Jia, N., Tian, X., Zhang. W., (2017). The real effects of tournament incentives: the case of firm innovation, Kelly School of Business Research Paper No. 16-21.
- Jones, Dale E., Sherry Doty, Clifford Grammich, James E. Horsch, Richard Houseal, Mac Lynn, John P. Marcum, Kenneth M. Sanchagrin and Richard H. Taylor. 2002. *Religious Congregations and Membership in the United States 2000: An Enumeration by Region, State and County Based on Data Reported for 149 Religious Bodies*. Nashville, TN: Glenmary Research Center.
- Kale, J. R., Reis, E., Venkateswaran, A. (2009). Rank-Order Tournaments and Incentive Alignment: The Effect on Firm Performance. *Journal of Finance*, 64(3), 1479-1512.

- Kini, O., Williams, R., (2012). Tournament incentives, firm risk, and corporate policies, *Journal of Financial Economics*, 103 (2), 350-376.
- Kuhnen, C.M., Niessen, A. (2012). Public opinion and executive compensation. *Management Science*, 58 (7), 1249-1272.
- Lazear, E. P., Rosen, S. (1981), Rank-Order Tournaments as Optimum Labor Contracts. *Journal of Political Economy*, 89(5), 841-864.
- Main, B. G., O'Reilly III, C. A., Wade, J. (1993). Top executive pay: Tournament or teamwork? *Journal of Labor Economics*, 606-628.
- Masulis, R. W., Zhang, S. (2014). Compensation gaps among top corporate executives. Working Paper.
- McPhee, Robert D., and Steven R. Corman. (1995). "An activity-based theory of communication networks in organizations, applied to the case of a local church." *Communications Monographs* 62.2 : 132-151.
- Murphy, K. J. (1985). Corporate performance and managerial remuneration: An empirical analysis. *Journal of Accounting and Economics*, 7(1-3), 11-42.
- O'Reilly III, C., B. Main, G. Crystal, (1988) CEO compensation as tournament and social comparison: A tale of two theories. *Administrative Science Quarterly*. 33. 257-274.
- Palia, D. (2001). The endogeneity of managerial compensation in firm valuation: A solution. *Review of Financial Studies*, 14(3), 735-764.
- Mitchell A. Petersen, Estimating Standard Errors in Finance Panel Data Sets: Comparing Approaches, *The Review of Financial Studies*, Volume 22, Issue 1, January 2009, Pages 435–480
- Putnam, R.D., (1993). The prosperous community: social capital and public life, *The American Prospect*, 13, 35-42.
- Prendergast, C. (1999). The provision of incentives in firms. *Journal of Economic Literature*, 7-63.
- Rosen, S. (1986). Prizes and Incentives in Elimination Tournaments, *American Economic Review*, 76, 701–15.
- Rupasingha A, Goetz SJ. U.S. county-level social capital data, 1990-2005. The Northeast Regional Center for Rural Development, Penn State University; University Park, PA: 2008. Retrieved July 31, 2010, from http://nercrd.psu.edu/Social_Capital/Index.html.

- Rupasingha, A., Goetz, S. J., & Freshwater, D. (2006). The production of social capital in US counties. *Journal of Socio-Economics*, 35(1), 83-101.
- Shen, C.H., Zhang, H., (2018), Tournament incentives and firm innovation. *Review of Finance*, 22 (4), 1515-1548.
- Smith Jr, C. W., & Watts, R. L. (1992). The investment opportunity set and corporate financing, dividend, and compensation policies. *Journal of financial Economics*, 32(3), 263-292.
- Thomas, R. S. (2004). Explaining the international CEO pay gap: Board capture or market driven. *Vand. L. Rev.* 57, 1171.
- Tosi, H. L., & Greckhamer, T. (2004). Culture and CEO Compensation. *Organization Science*, 15(6), 657–670.
- Max Weber, (1905), *The Protestant Ethic and the Spirit of Capitalism*
- Wooldridge, J. M. (2002). *Econometric analysis of cross section and panel data*. Cambridge, MA: MIT Press.
- Yermack, D. (1996). Higher market valuation of companies with a small board of directors. *Journal of Financial Economics*, 40(2), 185-211.
- Yermack, D. (2004). Remuneration, retention, and reputation incentives for outside directors. *The Journal of Finance*, 59(5), 2281-2308.
- Yonker, S., (2017). Geography and the market for CEOs, *Management Science*, 63 (3), 609-630.

Table 1 Sample Distribution

Panel A shows the number of observations from 2004-2016 for the firms in our sample by state and by year. Panel B shows the industry distributions of sample firms based on Fama French 49 industry classifications. And Panel C tabulates the state ranking by social capital index scores.

Panel A Sample distribution by state and year

State/Province	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total
AL	8	8	8	8	7	8	8	8	8	8	8	8	8	103
AR	12	12	12	12	11	12	12	12	13	14	14	14	14	164
AZ	22	22	21	21	21	21	21	20	21	20	20	21	21	272
CA	219	227	231	231	223	235	239	240	236	244	248	245	245	3,063
CO	38	37	38	37	36	36	36	36	37	39	40	39	38	487
CT	37	37	40	40	39	39	39	39	38	39	39	39	38	503
DC	6	6	6	6	6	6	7	7	7	7	7	7	7	85
DE	6	6	6	6	6	6	6	6	6	6	6	6	5	77
FL	56	59	58	57	55	56	55	54	55	60	61	59	59	744
GA	51	54	53	52	49	49	51	51	48	52	51	51	51	663
IA	14	14	15	15	15	15	15	15	14	15	15	15	15	192
ID	3	3	3	3	3	3	3	3	3	3	3	3	3	39
IL	85	85	86	85	84	84	84	85	85	86	84	86	85	1,104
IN	34	34	34	32	30	30	30	30	31	33	32	33	32	415
KS	10	10	10	10	10	10	10	10	12	12	12	12	12	140
KY	6	6	6	6	6	6	6	6	6	6	6	6	6	78
LA	11	11	11	11	11	11	11	11	11	12	12	12	12	147
MA	73	74	78	80	78	79	81	83	86	90	91	91	89	1,073
MD	10	10	11	10	10	12	12	12	12	13	14	14	14	154
ME	6	6	7	7	7	6	7	7	7	7	7	7	7	88
MI	42	41	42	40	40	40	40	39	39	41	41	40	40	525
MN	42	43	44	46	45	46	47	46	46	48	49	49	49	600
MO	33	33	35	35	33	34	34	34	35	34	34	33	33	440
MS	6	6	6	6	6	6	6	6	6	6	6	6	6	78
MT	1	1	1	1	1	1	1	1	2	2	2	2	2	18
NC	33	33	33	33	30	32	32	32	32	35	36	38	38	437
ND	2	2	2	2	2	2	2	2	1	2	2	2	2	25
NE	8	8	8	8	7	8	8	8	9	9	9	9	9	108
NH	5	5	5	4	4	4	4	4	4	4	4	4	4	55
NJ	51	53	52	51	50	51	51	51	52	53	57	55	55	682
NM	1	1	1	1	1	1	1	1	1	1	1	1	1	13
NV	9	10	10	10	10	10	10	10	10	11	11	10	10	131
NY	94	96	98	96	99	100	97	100	102	110	110	102	111	1,315
OH	77	78	78	78	72	78	78	78	75	79	80	80	80	1,011
OK	18	18	18	18	17	17	18	18	18	18	18	18	18	232
OR	16	16	17	16	16	16	16	16	14	16	16	16	15	206
PA	64	63	64	64	61	64	64	64	64	66	65	66	66	835
RI	7	7	7	7	7	7	7	7	7	6	7	7	7	90
SC	12	12	12	12	12	12	12	12	13	14	14	14	14	165
SD	4	4	4	4	4	4	4	4	3	4	4	4	4	51
TN	21	20	21	20	17	21	21	20	21	21	21	21	21	266
TX	146	147	149	152	148	152	151	152	155	155	156	158	155	1,976
UT	14	13	14	14	14	14	14	14	14	14	14	14	14	181
VA	34	34	34	33	33	34	34	33	34	36	37	37	36	449
VT	2	2	2	2	2	2	2	2	1	1	2	2	2	24
WA	30	30	31	32	32	32	31	31	32	30	31	31	31	404
WI	25	25	25	25	23	26	26	26	25	27	26	27	27	333
WV	5	5	5	5	5	5	5	5	5	5	5	5	5	65
Total	1,509	1,527	1,552	1,544	1,498	1,543	1,549	1,551	1,556	1,614	1,628	1,619	1,616	20,306

Panel B Sample distribution by industry

FF49	Industry	Obs
1	Agriculture	25
2	Food Products	319
3	Candy & Soda	25
4	Beer & Liquor	91
5	Tobacco Products	117
6	Recreation	233
7	Entertainment	89
8	Printing and Publishing	282
9	Consumer Goods	242
10	Apparel	306
11	Healthcare	665
12	Medical Equipment	982
13	Pharmaceutical Products	423
14	Chemicals	109
15	Rubber and Plastic Products	76
16	Textiles	530
17	Construction Materials	270
18	Construction	285
19	Steel Works	51
20	Fabricated Products	717
21	Machinery	290
22	Electrical Equipment	324
23	Automobiles and Trucks	117
24	Aircraft	87
25	Shipbuilding, Railroad Equipment	26
26	Defense	52
27	Precious Metals	67
28	Non-Metallic and Industrial Metal Mining	52
29	Coal	599
30	Petroleum and Natural Gas	598
31	Utilities	354
32	Communication	168
33	Personal Services	871
34	Business Services	363
35	Computers	1,135
36	Computer Software	1,101
37	Electronic Equipment	533
38	Measuring and Control Equipment	169
39	Business Supplies	100
40	Shipping Containers	468
41	Transportation	577
42	Wholesale	1,033
43	Retail	314
44	Restaurants, Hotels, Motels	2,629
45	Banking	685
46	Insurance	70
47	Real Estate	1,376
48	Trading	311

Panel C Social capital index scores by state

	State	Score
1	North Dakota	1.71
2	South Dakota	1.69
3	Vermont	1.42
4	Minnesota	1.32
5	Montana	1.29
6	Nebraska	1.15
7	Iowa	0.98
8	New Hampshire	0.77
9	Wyoming	0.67
10	Washington	0.65
11	Wisconsin	0.59
12	Oregon	0.57
13	Maine	0.53
14	Utah	0.50
15	Colorado	0.41
16	Kansas	0.38
17	Connecticut	0.27
18	Massachusetts	0.22
19	Missouri	0.10
20	Idaho	0.07
21	Arizona	0.06
22	Michigan	0.00
23	Delaware	-0.01
24	Rhode Island	-0.06
25	Indiana	-0.08
26	Oklahoma	-0.16
27	California	-0.18
28	District of Columbia	-0.18
29	Ohio	-0.18
30	Pennsylvania	-0.19
31	Illinois	-0.22
32	Maryland	-0.26
33	Virginia	-0.32
34	New Mexico	-0.35
35	New York	-0.36
36	New Jersey	-0.40
37	Florida	-0.47
38	Arkansas	-0.50
39	Texas	-0.55
40	Kentucky	-0.79
41	North Carolina	-0.82
42	West Virginia	-0.83
43	South Carolina	-0.88
44	Tennessee	-0.96
45	Louisiana	-0.99
46	Alabama	-1.07
47	Georgia	-1.15
48	Mississippi	-1.17
49	Nevada	-1.43

Table 2 Measures of Social Capital

This table presents univariate statistics on measure of social capital and their correlations. Panel A shows the mean, median, standard deviation and values at the 10th and 90th percentile. Panel B shows the correlations of the social capital variables.

Panel A Univariates of Social Capital

	Mean	Median	SD	P10	P90
Putnam SC Index	-0.15	-0.18	0.52	-0.82	0.53
Social Capital County	-0.23	-0.27	0.95	-1.57	1.07
Church Membership	0.63	0.60	0.20	0.43	0.84
Log(Canada)	5.82	6.35	1.47	4.39	7.13
Voter Turnout (%)	0.14	0.07	0.23	0.51	0.55

Panel B Correlations Between Measures of Social Capital

	Putnam Index	Social Capital County	Church Membership	Voter Turnout
Putnam SC Index	1.00			
Social Capital County	0.54	1.00		
Church Membership	-0.01	0.03	1.00	
Voter Turnout (%)	0.15	0.10	-0.29	1.00

Table 3 Sample Characteristic

This table shows the comparison of CEO compensation, firm and corporate governance characteristics between firms headquartered in low and high social capital states. We report the mean, median, for the 20,306 firm years in our sample segmented by whether the firm has a low Putnam (below median) or high Putnam (above or equal to median) Social Capital Index. We test for significant differences between the two groups. *t*-tests (signed-rank tests) are performed to determine whether the means (medians) for each financial variable significantly differ across the two groups. *, **, and *** denote significance at the 10, 5, and 1% levels, respectively.

Compensation	Low Putnam SC Index		High Putnam SC Index		Significance of Mean	Significance of Median
	Mean	Median	Mean	Median		
CEO total compensation	3,736,752.00	1,902,852.00	3,362,841.00	1,777,388.00	**	**
CEO pay ratio with mean	47.08	19.42	28.92	19.45	***	***
CEO pay ratio with median	99.45	39.64	29.85	19.17	***	***
CEO pay slice (percentage of top pay)	22.33	9.31	7.30	4.89	***	***
Firm Gini	0.25	0.24	0.25	0.25		

Firm and Governance Characteristics	Low Putnam SC Index		High Putnam SC Index		Significance of Mean	Significance of Median
	Mean	Median	Mean	Median		
Assets	10,478.66	1,018.86	8,101.80	1,014.53	*	*
EBITDA/Assets	0.08	0.09	0.08	0.10		
Annual Returns	0.24	0.13	0.20	0.13	*	
SD Returns	0.10	0.09	0.10	0.09		
Cash Ratio	0.15	0.06	0.17	0.07		
Debt Ratio	0.21	0.16	0.21	0.16		
Board Size	18.61	19.00	18.98	20.00		
Board Indep	0.79	0.80	0.80	0.81		
Dual CEO/Chair	0.51	1.00	0.52	1.00		
Insider	0.11	0.00	0.13	0.00		
Inst Own (%)	55.00	59.24	56.11	63.58		
Tenure	6.41	4.40	5.93	4.30		
CEO Age	56.45	56.00	56.14	56.00		
Retiring CEO	0.16	0.00	0.15	0.00		
New CEO	0.10	0.00	0.11	0.00		

Table 4 Social Capital and Pay Differentials

This table presents OLS regression results of the correlation between social capital and pay differentials (i.e., tournament variables) between the CEO and other executives. Firm and year fixed effects are included within the estimations. P-values are shown in parenthesis below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	CEO pay ratio with mean	CEO pay ratio with median	CEO pay slice (percentage of top pay)	Firm Gini	CEO pay ratio with mean	CEO pay ratio with median	CEO pay slice (percentage of top pay)	Firm Gini
Putnam	-0.226*** (0.00)	-0.028** (0.00)	-0.097*** (0.00)	-0.001*** (0.00)				
Social Capital County					-0.100*** (0.00)	-0.097*** (0.00)	-0.014*** (0.00)	-0.001*** (0.00)
Church Membership	1.729*** (0.00)	0.275*** (0.00)	0.392*** (0.01)	0.001 (1.00)	1.783*** (0.00)	1.871*** (0.00)	0.439*** (0.00)	-0.001 (0.85)
Log(Assets)	2.856*** (0.00)	0.332*** (0.00)	0.723*** (0.00)	0.010*** (0.00)	2.916*** (0.00)	2.863*** (0.00)	0.725*** (0.00)	0.010*** (0.00)
Log(GNP)	0.220*** (0.00)	0.078*** (0.00)	0.051*** (0.01)	0.001** (0.02)	0.214*** (0.00)	0.228*** (0.00)	0.053*** (0.00)	0.001** (0.03)
SD Returns	-0.501* (0.06)	-0.112* (0.05)	-0.003* (0.09)	-0.004*** (0.01)	-0.768* (0.05)	-0.577** (0.02)	-0.012* (0.08)	-0.004 (0.60)
Cash Ratio	0.005* (0.06)	0.002*** (0.00)	0.001* (0.08)	0.001** (0.03)	0.005* (0.07)	0.005* (0.06)	0.001* (0.07)	0.001** (0.03)
Debt Ratio	1.905*** (0.00)	0.445*** (0.00)	0.503*** (0.00)	0.037*** (0.00)	1.997*** (0.00)	1.940*** (0.00)	0.516*** (0.00)	0.036*** (0.00)
Board Size	-0.298*** (0.00)	-0.019*** (0.00)	-0.093*** (0.00)	-0.001*** (0.00)	-0.373*** (0.00)	-0.297*** (0.00)	-0.092*** (0.00)	-0.001*** (0.00)
Board Indep	0.879*** (0.00)	0.067 (0.45)	0.248*** (0.00)	0.040*** (0.00)	0.947*** (0.00)	0.711*** (0.00)	0.200*** (0.00)	0.041*** (0.00)
Dual CEO/Chair	1.546*** (0.00)	0.114*** (0.00)	0.315*** (0.00)	0.013*** (0.00)	1.231*** (0.00)	1.551*** (0.00)	0.316*** (0.00)	0.013*** (0.00)
New CEO	-1.203*** (0.00)	-0.077*** (0.00)	-0.262** (0.01)	-0.009*** (0.00)	-1.227*** (0.00)	-1.214*** (0.00)	-0.265*** (0.01)	-0.009*** (0.00)
Insider	-0.695* (0.05)	-0.001 (0.98)	-0.045 (0.63)	-0.008*** (0.00)	-0.167 (0.65)	-0.684* (0.06)	-0.042 (0.65)	-0.008*** (0.00)
Retiring CEO	1.464*** (0.00)	0.012 (0.56)	0.432*** (0.00)	0.001 (0.58)	1.734*** (0.00)	1.455*** (0.00)	0.429*** (0.00)	0.001 (0.55)
Tenure	0.237 (0.12)	-0.053*** (0.00)	-0.004*** (0.00)	-0.054*** (0.00)	0.239 (0.12)	0.092 (0.56)	-0.054*** (0.00)	-0.053*** (0.00)
CEO Age	8.351*** (0.00)	0.264*** (0.00)	2.280*** (0.00)	0.021*** (0.00)	9.620*** (0.00)	8.360*** (0.00)	2.284*** (0.00)	0.021*** (0.00)
Inst Own	0.001*** (0.00)	0.007*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.004*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)
Constant	-56.996*** (0.00)	8.977*** (0.00)	-15.818*** (0.00)	-0.001 (0.97)	-65.800*** (0.00)	-57.042*** (0.00)	-15.834*** (0.00)	-0.001 (0.97)
Observations	20,306	20,306	20,306	20,306	20,306	20,306	20,306	20,306
Adjusted R-squared	0.187	0.494	0.197	0.138	0.198	0.187	0.197	0.138

Table 5 Social Capital and Pay Differentials Controlling for Endogeneity

This table presents 2SLS regression results in which we examine compensation measures as dependent variables with firm-specific independent variables to control for operating differences between firms. Columns (1) and (2) report the coefficients of the first stage regressions, which are used to obtain the fitted social capital variables. The dependent variables in the first stage regressions are *Putnam Index* (1) and *Social Capital County* (2). The instruments are *ln(Canada)* and *Voter Turnout*. These instruments satisfy the exclusion criterion based on the Hansen J-statistic. The p-values corresponding to the Sargan C statistic reject the null hypothesis (in all columns of Table 5) that the measure of social capital is exogenous. Firm and year fixed effects are included within the estimations. p-values are shown in parenthesis below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	First Stage		Second Stage					
	Putnam	Social Capital County	CEO pay ratio with mean	CEO pay slice (percentage of top pay)	Firm Gini			
Log(Canada)	-0.141*** (0.00)	-0.215*** (0.00)						
Jim Crow	-0.367*** (0.00)	-0.179*** (0.00)						
Putnam			-1.771*** (0.00)		-1.923*** (0.00)		-0.002*** (0.00)	
Social Capital County				-1.040*** (0.00)		-1.919*** (0.00)		-0.003*** (0.00)
Log(Assets)	-0.014*** (0.00)	-0.008** (0.02)	5.277** (0.02)	5.103** (0.03)	1.931** (0.02)	1.772** (0.02)	0.010*** (0.00)	0.010*** (0.00)
Log(GNP)	0.007*** (0.00)	0.071*** (0.00)	0.261** (0.03)	0.928** (0.03)	0.612** (0.05)	0.366** (0.05)	0.002*** (0.00)	0.002*** (0.00)
SD Returns	-0.027 (0.52)	-0.606*** (0.00)	-0.784** (0.04)	-0.327** (0.01)	-0.238** (0.01)	-0.575** (0.03)	-0.009 (0.38)	-0.009 (0.41)
Cash Ratio	0.161*** (0.00)	0.083* (0.08)	0.015** (0.04)	0.017** (0.06)	0.030** (0.02)	0.032** (0.02)	0.001*** (0.01)	0.001*** (0.01)
Debt Ratio	-0.083*** (0.00)	-0.032 (0.26)	0.984* (0.06)	0.101* (0.06)	0.570* (0.06)	0.744** (0.01)	0.038*** (0.00)	0.037*** (0.00)
Board Size	0.002** (0.01)	0.006*** (0.00)	-0.058* (0.10)	-0.008* (0.11)	-0.432* (0.06)	-0.392* (0.07)	0.001*** (0.00)	0.001*** (0.00)
Board Indep	0.092** (0.01)	0.545*** (0.00)	0.249*** (0.00)	0.731*** (0.00)	0.635*** (0.00)	0.073*** (0.00)	0.036*** (0.00)	0.037*** (0.00)
Dual CEO Chair	0.003 (0.63)	0.022* (0.08)	1.725*** (0.00)	1.614*** (0.00)	1.401*** (0.00)	1.289*** (0.00)	0.012*** (0.00)	0.012*** (0.00)
New CEO	0.002 (0.88)	0.008 (0.70)	-1.100*** (0.00)	-1.981*** (0.00)	-1.974*** (0.00)	-1.868*** (0.00)	0.012*** (0.00)	0.012*** (0.00)
Insider	0.002 (0.79)	0.062*** (0.00)	-1.442*** (0.00)	-1.912*** (0.00)	-1.916*** (0.00)	-1.485*** (0.00)	-0.009*** (0.00)	-0.009*** (0.00)
Retiring CEO	-0.018** (0.04)	-0.061*** (0.00)	1.903** (0.05)	1.461* (0.05)	1.149** (0.04)	1.782** (0.04)	0.002 (0.45)	0.002 (0.43)
Tenure	-0.009** (0.01)	-0.009 (0.01)	1.412 (0.13)	1.509 (0.12)	1.380 (0.13)	1.466 (0.12)	0.004*** (0.00)	0.004*** (0.00)
CEO Age	-0.033 (0.16)	-0.007 (0.89)	0.929*** (0.00)	0.787*** (0.00)	0.971*** (0.00)	0.806*** (0.00)	0.017*** (0.01)	0.017*** (0.01)
Inst Own	0.001* (0.10)	0.001* (0.07)	0.113* (0.06)	0.110* (0.07)	0.069* (0.09)	0.067* (0.09)	0.001*** (0.00)	0.001*** (0.00)
Constant	1.055*** (0.00)	1.253*** (0.00)	9.610 (0.84)	1.173 (0.84)	0.200 (0.95)	1.931 (0.95)	0.025 (0.37)	0.025 (0.37)
Firm/Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	20,306	20,306	20,306	20,306	20,306	20,306	20,306	20,306
r2			0.223	0.223	0.284	0.280	0.206	0.204
Hansen			0.483	0.486	0.149	0.167	0.637	0.286
Sargan			0.001	0.001	0.001	0.001	0.001	0.001

Table 6 Evidence from a quasi-experiment: Legalization of Marijuana

This table presents OLS regression results in which we examine the impact of a change in social capital (as a result of marijuana legalization) on pay differentials. Firm and year fixed effects are included within the estimations. We use the same control variables as Table 4 but do not report them for brevity. In Panel A, we use a panel estimation where we include an indicator variable that is equal to one if a state has legalized marijuana for recreational use and zero otherwise. In Panel B, we include an indicator variable that is equal to one if the state has legalized marijuana for medical use and zero otherwise. P-values are shown in parenthesis below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	CEO pay ratio with mean	CEO pay ratio with median	CEO pay slice (percentage)	Firm Gini
Panel A Recreational Legalization of Marijuana				
Pot Legalized	-1.686** (0.04)	-1.680** (0.05)	-1.384** (0.05)	-0.008*** (0.00)
Firm/Year Fixed Effects	Yes	Yes	Yes	Yes
N	20,306	20,306	20,306	20,306
r2	0.401	0.441	0.351	0.315
Panel B Medical Legalization of Marijuana				
Medical	-3.598** (0.03)	-2.975** (0.04)	-1.868** (0.04)	-0.003* (0.08)
Firm/Year Fixed Effects	Yes	Yes	Yes	Yes
N	20,306	20,306	20,306	20,306
r2	0.236	0.364	0.325	0.314

Table 7 Evidence from a quasi-experiment: Firm Headquarter Relocation

This Table shows the results of a difference-in-differences test based on the quasi-experiment of headquarter relocation. We include the same dependent and control variables as Table 4. Panel A displays the result using a sample of 369 firms with a headquarter relocation more than 20 miles from their original headquarters over the sample period. Panel B tabulates the result of 168 firms that relocated more than 20 miles due to tax driven reasons (which we verify with news reports). We track CEO pay differentials before and after the move. *Post* is a time indicator variable that equals one if the observation is after the relocation event and zero if the observation is before the relocation event. *Social capital increase* equals one if a firm relocates headquarter to a county with a higher level of social capital; it equals zero if a firm relocates to a county with a lower level of social capital. Firm and year fixed effects are included within the estimations. P-values are shown in parenthesis below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	CEO pay ratio with mean	CEO pay ratio with median	CEO pay slice (percentage of top pay)	Firm Gini
Panel A: All Relocations				
Post	1.850*** (0.00)	1.291** (0.04)	1.740** (0.04)	0.063** (0.01)
Social Capital Increase	-1.539*** (0.01)	-1.449*** (0.01)	-3.057** (0.01)	-0.031** (0.03)
Post*Social Capital Increase	-1.443*** (0.00)	-2.729*** (0.00)	-1.541*** (0.00)	-0.067* (0.00)
Firm Controls	Yes	Yes	Yes	Yes
Year/Firm Fixed Effects	Yes	Yes	Yes	Yes
Obs	3,220	3,220	3,220	3,220
Adjusted R2	0.1333	0.303	0.329	0.347
Panel B: Tax Based Relocations				
Post	21.492*** (0.03)	1.921*** (0.32)	1.953*** (0.10)	0.138*** (0.00)
Social Capital Increase	-1.327*** (0.00)	-1.321*** (0.00)	-2.496*** (0.00)	-0.050*** (0.00)
Post*Social Capital Increase	-1.651*** (0.00)	-0.604*** (0.00)	-1.485*** (0.00)	-0.137*** (0.00)
Firm Controls	Yes	Yes	Yes	Yes
Year/Firm Fixed Effects	Yes	Yes	Yes	Yes
Obs	1,704	1,704	1,704	1,704
Adjusted R2	0.554	0.507	0.552	0.579

Table 8 Effectiveness of Tournaments Incentives based on Social Capital

This table presents 2SLS regression fixed effect regressions of ROA and Tobin's Q, where the first stage is the CEO/Mean Total top other variable of tournament. We use the same specification as Table 5. We first create an indicator variable that is equal to one if the firm is in a high Social Capital County (top 25% of social capital). We then use propensity score matching to match high social capital firms to low social capital firms (below median) in the same year/industry (FF49 classification) based on tournament incentives (CEO/MEAN), firm size, and firm risk. We then run the 2SLS estimation on firms in the top 25% and for firms that are propensity matched benchmarks in low social capital areas. Column (1) reports the coefficients of the first stage regressions, which are used to obtain the fitted CEO/Mean. These instruments satisfy the exclusion criterion based on the Hansen J-statistic. The p-values corresponding to the Sargan C statistic reject the null hypothesis (in all columns of Table 8) that the measure of tournament is exogenous. Firm and year fixed effects are included within the estimations. P-values are shown in parenthesis below the coefficient estimates. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

	<u>CEO/Mean Measure</u>	<u>ROA</u>		<u>Tobin's Q</u>	
	(1)	(2)	(3)	(4)	(5)
CEO/Mean Measure		0.009**	0.007*	0.047***	0.130***
		(0.04)	(0.05)	(0.00)	(0.00)
High Social Cap		0.103***	0.099***	0.449***	0.561***
		(0.00)	(0.00)	(0.00)	(0.00)
High Social Cap*CEO/Mean			-0.003**		-0.005***
			(0.02)		(0.00)
Log(Assets)	4.947*	0.015***	0.015***	-0.169***	-0.169***
	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
Log(GNP)	3.367*	0.004***	0.004***	0.088***	0.088***
	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)
SD Returns	-0.453**	-0.608***	-0.608***	-0.225*	-0.238*
	(0.03)	(0.00)	(0.00)	(0.08)	(0.07)
Cash Ratio	0.019**	0.001***	0.001***	-0.001***	-0.001***
	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
Debt Ratio	4.567*	-0.145***	-0.145***	-0.477***	-0.473***
	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)
Board Size	-1.479*	-0.003***	-0.003***	-0.012***	-0.012***
	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)
Board Indep	2.717**	0.067***	-0.067***	0.364***	0.370***
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
Dual CEO Chair	1.349**	0.014***	0.014***	0.212***	0.212***
	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
Inst Own	0.076*	0.001***	0.001***	0.005***	0.005***
	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)
New CEO	-0.009	-0.009***	-0.009***	-0.028	-0.026
	(0.55)	(0.00)	(0.00)	(0.29)	(0.32)
Insider	-1.873	0.018***	0.018***	-0.013	-0.017
	(0.46)	(0.00)	(0.00)	(0.58)	(0.49)
Retiring CEO	2.462*	0.001	0.001	-0.019	-0.020
	(0.06)	(0.79)	(0.79)	(0.57)	(0.56)
Tenure	0.325*	0.003*	0.003*	-0.013	-0.012
	(0.10)	(0.07)	(0.07)	(0.33)	(0.37)
CEO Age	1.697**	-0.002	-0.002	-0.603***	-0.600***
	(0.01)	(0.72)	(0.74)	(0.00)	(0.00)
Industry Tournament	0.445**				
	(0.04)				
CEO Alignment	1.653**				
	(0.04)				
VP Alignment	-0.177*				
	(0.08)				
Constant	-5.077				
	(0.74)				
Firm/Year FE	Yes	Yes	Yes	Yes	Yes
N	20,306	20,306	20,306	20,306	20,306
r2	0.123	0.166	0.166	0.171	0.172
Hansen		0.4012	0.7331	0.291	0.785
Sargan		0.002	0.006	0.006	0.004

Appendix A
Variable Definitions

log_canada	We measure the distance of the city to the Canadian border and take the log of this value.
pvote	Percent of the voting eligible population in each county who vote in presidential elections
sc_putnam	The Putnam Index
SKIPCM	Social Capital of the firm headquarters' county (Social Capital county) which we obtain from Rupasingha and Goetz (2006, 2008)
Pay Slice	The percentage of the aggregate compensation of the top executives that is captured by the CEO
Pay Ratio	The ratios of the CEO's compensation to the mean (median) compensation of the next highest paid executives
Firm Gini	The measured as the standard deviation of pay among top executives
Church	The percent of the county that is an active member of a church.
Log(Assets)	Log of total assets
Log(GNP)	Log of county level GNP
SD Returns	The standard deviation of returns using monthly returns.
Cash Ratio	Cash over total assets
Debt Ratio	Long Term Debt over total assets
Board Size	Number of directors
Board Indep	Percent of the board that is independent
Dual CEO Chair	An indicator that is equal to one if the board has the CEO as chair and zero otherwise.
New CEO	An indicator that is equal to one if the CEO is new and zero otherwise.
Insider	An indicator is equal to one if the CEO was promoted from within and zero otherwise.
Retiring CEO	An indicator that variable that equals one when CEO Age is greater than 62 years
Tenure	The tenure of the CEO
CEO Age	The age of the CEO
Industry	
CEO/Mean	The median value of tournament across industry and size quartiles
Industry CEO	
Alignment	The median value of CEO ownership % across industry and size quartiles
Industry VP	
Alignment	The median value of VP ownership % across industry and size quartiles
Inst Own	The percent of institutional ownership

Appendix B

The Putnam Social Capital Index is composed of the following fourteen indicators:

1. Agree that “I spend a lot of time visiting friends”
2. Agree that “Most people can be trusted”
3. Agree that “Most people are honest”
4. Attendance at any public meeting on town or school affairs in last year (percent)
5. Number of civic and social organizations per 1000 population
6. Average number of club meetings attended in last year
7. Average number of group memberships
8. Average number of times volunteered in last year
9. Average number of times entertained at home in last year
10. Average number of times worked on community project in last year
11. Number of non-profit (501[c]3) organizations per 1000 population
12. Served as officer of some club or organization in last year (percent)
13. Served on committee of some local organization in last year (percent)
14. Turnout in presidential elections, 1988 and 1992