Nonmonetary Benefits, Quality of Life, and Executive Compensation

Xin Deng and Huasheng Gao*

Abstract

We examine the effects of nonmonetary benefits on overall executive compensation from the perspective of the living environment at the firm headquarters. Companies in polluted, high crime rate, or otherwise unpleasant locations pay higher compensation to their chief executive officers (CEOs) than companies located in more livable locations. This premium in pay for quality of life is stronger when firms face tougher competition in the managerial labor market, when the CEO is hired from outside, and when the CEO has short-term career concerns. Overall, the geographic desirability of the corporate headquarters is an effective substitute for CEO monetary pay.

I.   Introduction

Economists have long recognized the importance of nonmonetary rewards for managers, such as living environment, prestige, community standing, and social respect (see, e.g., Jensen and Murphy (1990)). However, the empirical evidence on chief executive officer (CEO) compensation mainly focuses on monetary reward, while the nonmonetary factors are largely overlooked. As pointed out by Mathios (1989), a failure to account for the role of nonmonetary benefit can seriously distort our understanding of compensation policies. From the perspective of geographic attractiveness, this paper is one of the very few studies incorporating important nonmonetary items into the overall CEO compensation package. In particular, we find a strong substitute effect of good living environment for

CEO monetary compensation: Companies in locations with a lower quality of life (e.g., where there is poor infrastructure, high rates of violent crime, heavy pollution, and unpleasant weather, etc.) pay higher monetary compensation to their CEOs than companies located in more livable areas.

A substantial economic literature exists on the need for "disamenity compensation" and the importance of living environment for people's career choices (Power (1980), Myers (1987)). Given that people generally prefer a location with a higher quality of life, companies must pay higher compensation for keeping the same quality employees in an area with poor livability (Roback (1982)). Myers (p. 269) points out, "Firms can reduce the salary levels needed to secure adequate labor (or secure more and better workers at the same price) if they locate in an area whose quality of life is attractive to workers."

Our primary quality-of-life measure is the index provided by Morgan Quitno Press, a leading research and publishing company that ranks cities and states in the United States. Morgan Quitno measures quality of life from various aspects, including crime rates, cost of living, unemployment rates, education systems, household income, weather, and infrastructure. Based on a large compensation data set from 1993 to 2008, we first find a premium in CEO compensation for quality of life at the headquarters locations. The premium is both statistically and economically significant. A CEO working in the least livable state (Mississippi) receives 10% higher compensation than a CEO in the most livable state (Minnesota), after controlling for the conventional firm and CEO characteristics. This pay premium in response to working in an unpleasant location is robust after accounting for different ways of measuring annual compensation, the cost of living, and state income tax.

Furthermore, we find that competitive labor market forces and managerial career concerns are important in explaining the premium for quality of life. Small firms, young firms, and firms with a large number of industry peers, which typically face tougher competition for managerial talents, tend to pay higher premiums in response to unpleasant corporate locations. An externally hired CEO, who usually has better outside opportunities than an internal CEO, is also compensated more for poor geographic livability. Consistent with the view that a retiring CEO emphasizes more short-term compensation than long-term career concerns, a CEO near retirement is found to be associated with a higher compensation premium for quality of life.

To address the possibility that quality of life is subjective depending on individuals, we further break down the overall quality-of-life ranking into a few individual factors where people are likely to have similar preference. We find that individual factors on environmental safety, transportation system, and family-supporting infrastructure are important in influencing CEO monetary rewards. In particular, companies pay higher CEO compensation when the headquarters are located in areas with more hazardous waste sites, higher prisoner incarceration rates, less efficient transportation systems, and poorer facilities for education and public welfare.

Last, we do some additional investigation to further our understanding of the quality-of-life pay premium. First, we use alternative rankings provided by *Bloomberg Businessweek* and *Forbes Magazine* for the quality of life across the

United States. Our results are largely unchanged under these different ranking methods. Second, we extend our investigation to the top 5 executives in companies and find that this premium applies not only for CEOs but also for top management teams.

While studies focusing on agency costs exist, the nature of environmental factors and how they impinge on CEO pay is less examined. Our paper contributes to the literature on executive compensation by providing the first systematic examination (to our knowledge) of the geographic attractiveness of the company headquarters. We demonstrate that, in addition to conventional financial parameters like firm size and performance, the livability at the corporate headquarters is also important in attracting executive talent and eventually influences compensation. Our results suggest that nonmonetary benefits, like a nice living environment, are a substitute for monetary reward to corporate executives.

The plan of the paper is as follows: We describe our sample and variable construction in the next section; we explore the existence and justification of the pay premium for quality of life in Section III; additional investigation is implemented in Section IV; and we conclude in Section V.

II.   Sample Formation and Variable Construction

Our primary proxy for quality of life across the United States is the state ranking published by Morgan Quitno. The ranking is done on an annual basis from 1991 to 2010. Morgan Quitno measures quality of life based on 43 factors, including crime rates, cost of living, unemployment rates, education systems, household income, weather, and infrastructure. As shown in the Appendix, to determine a state's "Livability Rating," Morgan Quitno takes the average of each state's rankings for those 43 factors. Among them, there are 24 factors that are negatively associated with the state's livability (e.g., crime rates, cost of living, and unemployment rates). There are 19 factors that are positively associated with the state's livability (e.g., per capita personal income, percentage of days that are sunny, and home ownership rates). The scale for each factor is 1 to 50, and all factors are given equal weight: The higher the ranking for each factor, the less pleasant the state is to live in. In other words, a higher average for these factors means that the state has fewer positive factors and/or more negative factors. Notably, these 43 factors are broadly consistent with the economics literature on quality of life (see, e.g., Blomquist, Berger, and Hoehn (1988), Gyourko and Tracy (1991), and Viscusi (1993)).

It is worth noting that there are various rankings for livability in U.S. cities and states provided by other institutions, such as *Forbes Magazine* and *Bloomberg Businessweek*. We choose Morgan Quitno mainly because, unlike the rankings that usually cover only a limited number of U.S. cities for the very recent years, it provides the widest time-series and geographic coverage. However, as shown in the later part of the paper, using alternative city-level rankings gives similar results.

As Compustat records only the firm's current headquarters locations, we collect the historical record of firms' headquarters information from Compact Disclosure, following Pirinsky and Wang (2006). Furthermore, we collect CEO

compensation data from ExecuComp, accounting information from Compustat, and stock price information from the Center for Research in Security Prices (CRSP). We use ExecuComp item *TDC1* to measure an executive's total compensation in a given year, which is the sum of the executive's salary, bonuses, long-term incentive plans, grant-date value of restricted stock awards, and Black-Scholes (1973) value of granted options.

Based on the existing literature, we also include a set of control variables that influence compensation policies. We measure firm size (*Firmsize*) as the natural logarithm of the firm sales. To control for firm growth opportunities, we compute market-to-book (*MB*) as the ratio of market value of common equity over the book value of common equity, where the market value is obtained as the fiscal year closing price multiplied by common shares outstanding. Return on assets (*ROA*) is measured as the ratio of net income before extraordinary items and discontinued operations over total assets. We compute *Leverage* as the ratio of long-term debt and current debt over total assets minus book value of equity plus market value of equity, *Cash* as the ratio of the cash item over the firm's total assets, and *Capex* as the ratio of capital expenditure over the firm's total assets. To measure the firm's risk, we use stock return standard deviation based on the firm's monthly returns over a 5-year period (*Volatility*). We also include the firm's annual stock return (*RET*) to control for the stock performance. All of the monetary variables are measured in 2008-constant dollars. To mitigate the effect of outliers, we winsorize all the continuous variables at the 1% level in both tails of the distribution. The final sample consists of 14,295 firm-year observations from 1993 to 2008.

III.   Empirical Results

A.   Summary Statistics

As presented in Table 1, Minnesota, New Hampshire, Iowa, Utah, and Nebraska are the 5 most livable states; Tennessee, Alabama, West Virginia, Louisiana, and Mississippi are the 5 least livable states. Our sample firms locate in each of the 50 states, except Wyoming. The 5 states with the largest median sales are Kentucky, Virginia, Kansas, Rhode Island, and North Dakota. Not surprisingly, California has the most firm-year observations (15% of the sample observations), followed by Texas (9%) and New York (8%).

Table 2 reports the firm and CEO characteristics. The mean (median) CEO total pay is $5.17 million ($2.93 million); the mean (median) salary and bonus is $1.54 million ($1.03 million). The median firm is quite large; its *Sales* are $1,428 million. The sample firms are performing well, with a median *MB* ratio of 2.36, *ROA* of 5.08%, and annual stock return of 12.32%. Moreover, the median firm is moderately leveraged, with *Leverage* of 12%; has sizeable cash holdings of 4% of total assets; and makes considerable investment, with *Capex* of 4%. The median CEO is 56 years old and holds 0.32% of the firm's stock. Panel B presents the correlation matrix of firm and CEO characteristics. The extent of correlation among most pairs of firm and CEO characteristic variables raises little concern for multicollinearity.

TABLE 1

State Ranking and CEO Compensation

Table 1 reports the compensation for executives in states with different livability rankings. The sample consists of 14,295 firm-year observations based on CRSP/Compustat/ExecuComp merged data from 1993 to 2008. The livability ranking is published by Morgan Quitno at the end of every year. The ranking scales from 1 to 50, with 1 meaning "most livable" and 50 "least livable." *Average Rank* is based on the average Morgan Quitno ranking of each state during 1993–2008. *CEO Total Pay* is the variable *TDC1* in ExecuComp, which consists of salary, bonus, value of restricted stock granted, value of options granted (using Black-Scholes (1973)), long-term incentive payouts, and other compensation. *Sales* is from Compustat. The compensation and sales are in 2008 dollars. "—" indicates no observations.

		CEO Total Pay ($M)		Sales ($M)		
Average Rank	State Name	Mean	Median	Mean	Median	No. of Firm-Year Obs.
1	Minnesota	4.65	2.95	5,626	1,616	505
2	New Hampshire	2.80	1.84	945	802	26
3	Iowa	2.61	1.69	1,795	1,120	109
4	Utah	2.23	1.47	949	616	69
5	Nebraska	5.47	3.27	4,135	1,232	63
6	Kansas	7.62	5.10	6,908	3,288	63
7	Wisconsin	3.49	2.80	3,238	1,613	345
8	Virginia	6.86	3.78	8,058	3,908	372
9	Vermont	0.90	0.63	379	381	17
10	South Dakota	0.91	0.65	760	579	20
11	Connecticut	5.47	3.45	5,729	1,429	346
12	Massachusetts	4.78	2.89	2,395	810	584
13	Colorado	5.30	2.92	2,360	997	197
14	Wyoming	—	—	—	—	0
15	New Jersey	5.54	3.45	6,329	1,487	440
16	North Dakota	2.44	2.66	2,818	2,608	8
17	Idaho	2.82	1.60	1,467	725	65
18	Maine	5.60	2.80	1,028	591	19
19	Maryland	5.92	3.86	5,178	1,384	165
20	Oregon	2.99	2.12	1,771	586	180
21	Delaware	5.53	4.64	14,696	1,065	42
22	Washington	3.42	2.13	7,963	1,942	229
23	Indiana	4.25	2.07	3,904	1,261	186
24	Missouri	3.54	2.21	3,107	1,734	321
25	Montana	2.10	1.69	543	346	12
26	Hawaii	2.35	2.20	1,465	1,608	40
27	Nevada	3.29	1.83	1,273	924	102
28	Illinois	4.87	3.40	7,362	2,316	843
29	Ohio	4.17	2.74	5,894	2,032	784
30	Rhode Island	5.52	2.69	8,656	3,226	57
31	Alaska	1.61	1.40	398	420	11
32	Michigan	4.75	2.67	7,387	2,235	382
33	Pennsylvania	5.23	3.09	4,617	1,934	653
34	California	5.80	2.99	3,710	779	2,188
35	Texas	5.51	3.09	6,132	1,513	1,286
36	Arizona	4.48	3.22	2,362	998	153
37	Georgia	4.73	2.57	6,000	1,477	422
38	New York	8.28	4.59	8,889	2,325	1,209
39	North Carolina	4.18	2.56	5,168	2,074	349
40	Oklahoma	3.74	2.20	3,102	1,124	115
41	Florida	5.03	3.73	3,869	1,545	443
42	Arkansas	4.34	1.62	13,438	2,348	122
43	South Carolina	2.67	2.31	1,732	1,280	78
44	Kentucky	7.20	5.58	6,178	4,680	92
45	New Mexico	1.63	1.47	1,647	1,464	13
46	Tennessee	3.96	2.86	4,421	1,433	265
47	Alabama	4.32	2.18	1,465	831	117
48	West Virginia	1.33	1.30	331	314	11
49	Louisiana	3.27	1.84	1,829	934	128
50	Mississippi	1.84	1.17	601	488	49

B.   State Livability Ranking and CEO Compensation

In this section, we implement a multivariate test on the effect of livability on CEO pay. In particular, we estimate the following lead-lag ordinary least squares (OLS) regression:

TABLE 2

Summary Statistics of Sample Firms

The sample consists of 14,295 firm-year observations based on CRSP/Compustat/ExecuComp merged data from 1993 to 2008. *Total Pay* is the variable *TDC1* in ExecuComp, which consists of salary, bonus, value of restricted stock granted, value of options granted (using Black-Scholes (1973)), long-term incentive payouts, and other compensation. *Salary* and *Bonus* are the variables *salary* and *bonus* in ExecuComp, respectively. Here, *Firmsize* is the natural logarithm of total sales from Compustat; *Volatility* is the standard deviation of monthly stock return for the prior 60 months; *RET* is the buy-and-hold return on the firm's stock for the prior 12 months; *ROA* is net income before extraordinary items and discontinued operations divided by the total assets; *MB* equals market value of equity divided by book value of equity, where the market value is obtained as fiscal year closing price multiplied by common shares outstanding; *Cash* is the ratio of cash items over total assets; *Leverage* is defined as the sum of current liabilities and long-term debt divided by total assets minus book value of equity plus market value of equity; *Capex* is the ratio of capital expenditures over total assets; *CEO Age* is the age of the executive from ExecuComp; and *Ownership* is the ratio of shares excluding options owned by the executives over shares outstanding. All the dollar-value variables are measured in 2008-constant dollars. Correlations with an absolute value greater than 0.02 are significant at the 5% level.

Panel A. Descriptive Statistics of Firm Characteristics

Variables	N	Mean	Std	P25	Median	P75
Total Pay ($M)	14,295	5.17	6.44	1.43	2.93	6.04
Salary ($M)	14,295	0.78	0.37	0.52	0.73	1.00
Bonus ($M)	14,295	0.76	1.80	0.00	0.30	0.89
Sales ($M)	14,295	5,240	10,786	555	1,428	4,390
Firmsize	14,295	7.35	1.62	6.32	7.26	8.39
Volatility (%)	14,295	12.14	5.77	8.02	10.70	14.77
RET (%)	14,295	19.34	49.23	−9.41	12.32	36.61
ROA (%)	14,295	4.88	8.71	2.07	5.08	9.00
MB	14,295	3.27	3.21	1.61	2.36	3.83
Cash	14,295	0.09	0.11	0.02	0.04	0.12
Leverage	14,295	0.15	0.14	0.03	0.12	0.24
Capex	14,295	0.06	0.05	0.02	0.04	0.07
CEO Age	14,295	55.65	7.24	51.00	56.00	60.00
Ownership (%)	14,295	2.51	5.81	0.09	0.32	1.47

Panel B. Correlation Matrix of Explanatory Variables

Variables	1	2	3	4	5	6	7	8	9	10	11
1. Rank	1.00										
2. Firmsize	0.00	1.00									
3. Volatility	0.06	−0.44	1.00								
4. RET	0.02	−0.06	0.09	1.00							
5. ROA	−0.02	0.18	−0.31	0.20	1.00						
6. MB	−0.01	−0.02	0.10	0.31	0.26	1.00					
7. Cash	−0.02	−0.35	0.42	0.13	0.00	0.23	1.00				
8. Leverage	0.02	0.18	−0.11	−0.19	−0.30	−0.30	−0.39	1.00			
9. Capex	0.06	−0.04	0.02	0.03	0.13	0.07	−0.08	−0.06	1.00		
10. CEO Age	0.01	0.12	−0.20	−0.04	0.06	−0.09	−0.13	0.05	−0.02	1.00	
11. Ownership	0.02	−0.16	0.10	0.06	0.08	0.07	0.09	−0.11	0.06	0.13	1.00

$$
\begin{aligned}
(1) \quad \ln(CEO\ Pay)_{it} = {} & \alpha + \beta_1 Rank_{it-1} + \beta_2 Firmsize_{it-1} + \beta_3 Volatility_{it-1} \\
& + \beta_4 RET_{it-1} + \beta_5 ROA_{it-1} + \beta_6 MB_{it-1} + \beta_7 Cash_{it-1} \\
& + \beta_8 Leverage_{it-1} + \beta_9 Capex_{it-1} + \beta_{10} CEO\ Age_{it-1} \\
& + \beta_{11} Ownership_{it-1} + Year\ fixed\ effects \\
& + Industry\ fixed\ effects.
\end{aligned}
$$

The dependent variable is the natural logarithm of CEO total pay or other pay measures. *Rank* is the Morgan Quitno ranking for the livability for each state scaled by 50. In Morgan Quitno ranking, the most livable state is ranked as 1, while the least attractive one is ranked as 50. Therefore, *Rank* ranges from 0 to 1, with 0 meaning most livable and 1 least livable. It is worth noting that livability in each state can be largely regarded as exogenous to the company itself, as it is difficult for a firm to influence the geographic desirability of the state.

We also control for a set of firm and CEO characteristics, including firm size, performance, growth potential, risk, availability of cash, investment, CEO age, and CEO ownership. Fama and French's (1997) 48 industry dummy variables and year dummy variables are included to control for industry and time variation in executive pay schemes. Throughout the entire empirical test, *p*-values are computed based on robust standard errors.

Table 3 indicates a significant and positive association between the livability ranking and CEO compensation, indicating that companies located in less livable states pay higher compensation to CEOs than companies in more livable states. In Column 1, we only include *Rank* as the independent variable. The coefficient of *Rank* is 0.127 and is significant at the 1% level. We further control for industry and year fixed effects in Column 2; the coefficient of *Rank* is 0.151, and its significance remains at the 1% level. In Column 3, we include *Firmsize* as an additional independent variable. The coefficient of *Rank* is 0.148 and significant

TABLE 3

The Existence of a Pay Premium for Quality of Life

The sample consists of 14,295 firm-year observations based on CRSP/Compustat/ExecuComp merged data from 1993 to 2008. *Total Pay* is the variable *TDC1* in ExecuComp, which consists of salary, bonus, value of restricted stock granted, value of options granted (using Black-Scholes (1973)), long-term incentive payouts, and other compensation; *Rank* is the state-level livability ranking published by Morgan Quitno at the end of every year scaled by 50 and ranges from 0 to 1, with 0 meaning "most livable" and 1 "least livable." The definitions of all other controls are the same as in Table 2. Industry dummy variables are constructed based on the Fama and French (1997) 48 industries. Corresponding *p*-values from robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	In(*Total Pay*)					
	1	2	3	4	5	6
Rank	0.127***	0.151***	0.148***	0.120***	0.124***	0.152*
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.076)
Firmsize			0.411***	0.431***	0.416***	0.433***
			(0.000)	(0.000)	(0.000)	(0.000)
Volatility				1.365***	1.597***	1.634***
				(0.000)	(0.000)	(0.000)
RET				0.173***	0.176***	0.164***
				(0.000)	(0.000)	(0.000)
ROA				−0.057	0.099	0.802***
				(0.679)	(0.463)	(0.000)
MB				0.033***	0.033***	0.034***
				(0.000)	(0.000)	(0.000)
Cash				0.114	0.143	0.164
				(0.403)	(0.286)	(0.202)
Leverage				−0.070	−0.124*	−0.372***
				(0.323)	(0.080)	(0.000)
Capex				−0.303	−0.188	0.260
				(0.112)	(0.318)	(0.164)
CEO Age					0.003**	0.003**
					(0.013)	(0.033)
Ownership					−2.844***	−2.621***
					(0.000)	(0.000)
Constant	7.925***	8.275***	4.849***	4.364***	4.333***	4.039***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year fixed effect	No	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	No	Yes	Yes	Yes	Yes	Yes
State fixed effect	No	No	No	No	No	Yes
No. of obs.	14,295	14,295	14,295	14,295	14,295	14,295
Adj. R^2	0.1%	6%	34%	36%	38%	42%

at the 1% level. The result is also economically important: Firms in the 10 least livable states pay 12% higher compensation to CEOs than the firms in the 10 most livable states.[1]

In Column 4 of Table 3, we introduce other firm characteristics that are commonly used to explain CEO pay, including firm operating and stock performance, firm risk, investment, and leverage (see, e.g., Core, Holthausen, and Larcker (1999)). The coefficient on livability ranking is 0.120 and is significant at the 1% level, suggesting that a firm in the 10 least livable states pays 10% higher compensation to CEOs relative to the firms in the 10 most livable states, after controlling for firm characteristics.

We further control for CEO age and ownership in Column 5 of Table 3, and the coefficient of *Rank* is 0.124 and significant at the 1% level. An extreme interpretation of this coefficient is that CEOs working in the least pleasant state (Mississippi) are paid 12.4% more than the CEOs in the most pleasant state (Minnesota). In Column 6, we include the state fixed effects to control for the unobserved geographic heterogeneity that may influence CEO compensation. The coefficient of *Rank* is significantly positive. Given the inclusion of state fixed effects, the interpretation of the results is that firms in a state that experiences a downgrade in its ranking tend to increase their CEO compensation.

The coefficients of control variables are generally similar to those in the existing literature (e.g., Core et al. (1999)). A CEO receives higher total compensation in larger firms, in better-performing firms, in riskier firms, and in firms with less leverage. Also, older CEOs get paid more. Consistent with the argument that higher ownership is a substitute for annual compensation, we find that CEOs with higher ownership receive less annual pay.

To further assess the robustness of the pay premium for quality of life, we perform several adjustments in measuring CEO compensation. First, in Column 1 of Table 4, we examine the effect of livability on the CEO's salary and bonus. The coefficient on the livability rank is still positive and significant at the 1% level. In Column 2, we use ExecuComp item *TDC2* to measure the CEOs' compensation. Item *TDC2* is the same as *TDC1* except it replaces the value of options granted with the value of options exercised during the year. Kaplan and Rauh (2010) suggest that *TDC2* measures the ex post pay level and *TDC1* captures the ex ante pay. The coefficient of *Rank* is 0.092 and significant at the 1% level.

A location with a good natural environment tends to have a higher cost of living, which may lead to high levels of executive compensation. This possibility may work against us finding a negative relation between natural environment and executive compensation. As shown in the Appendix, the cost of living has already been incorporated as a factor in the Morgan Quitno ranking. To avoid controlling for cost of living twice, we do not include cost of living in our baseline regressions in Table 3. However, it is still important to examine the extent to which our results are affected by the cost of living. For this purpose, we adjust the CEO total pay to the corresponding cost of living, using the city of Los Angeles as the benchmark.

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[1]Suppose the average livability ranking for the 10 most livable states is 5, and for the 10 least livable states it is 45. Then we obtain $0.148 \times (45 - 5)/50 = 12\%$.

TABLE 4

The Existence of a Pay Premium for Quality of Life: Different Measures of Pay

The sample consists of 14,295 firm-year observations based on CRSP/Compustat/ExecuComp merged data from 1993 to 2008. *Ex Post Pay* is item *TDC2* in ExecuComp; *TDC2* is the same as *TDC1* except it replaces the value of options granted with the value of options exercised during the year; *Cost-of-Living-Adjusted Pay* is *Total Pay* adjusted for the cost of living of the headquarters-located city using the city of Los Angeles as the benchmark, which is equal to [*Total Pay* × (*Los Angeles' Cost of Living / City's Cost of Living*)]; *Tax-Adjusted Pay* is computed as [*Total Pay* × (1 – *State Income Tax*)], where *State Income Tax* is the highest bracket of the state income tax; and *Rank* is the state-level livability ranking published by Morgan Quitno at the end of every year scaled by 50 and ranges from 0 to 1, with 0 meaning "most livable" and 1 "least livable." The definitions of all other controls are the same as in Table 2. Industry dummy variables are constructed based on the Fama and French (1997) 48 industries. Corresponding *p*-values from robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	ln(*Salary + Bonus*) 1	ln(*Ex Post Pay*) 2	ln(*Cost-of-Living-Adjusted Pay*) 3	ln(*Tax-Adjusted Pay*) 4	ln(*Total Pay*) 5
Rank	0.070***	0.092***	0.228***	0.140***	0.169***
	(0.001)	(0.008)	(0.000)	(0.000)	(0.000)
Cost of Living					0.003***
					(0.000)
State Income Tax					0.424
					(0.121)
Firmsize	0.250***	0.382***	0.409***	0.422***	0.412***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Volatility	−0.366**	0.362	1.432***	1.410***	1.540***
	(0.014)	(0.107)	(0.000)	(0.000)	(0.000)
RET	0.101***	0.314***	0.184***	0.184***	0.182***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.044	0.658***	0.220	−0.008	0.143
	(0.693)	(0.000)	(0.106)	(0.944)	(0.292)
MB	0.003	0.039***	0.031***	0.031***	0.033***
	(0.388)	(0.000)	(0.000)	(0.000)	(0.000)
Cash	−0.229*	0.253*	−0.003	0.344***	0.061
	(0.055)	(0.076)	(0.983)	(0.000)	(0.642)
Leverage	0.098	−0.085	−0.106	−0.140**	−0.095
	(0.147)	(0.276)	(0.130)	(0.030)	(0.176)
Capex	−0.519***	−0.206	−0.074	−0.223	−0.088
	(0.003)	(0.346)	(0.697)	(0.195)	(0.641)
CEO Age	0.009***	0.013***	0.002*	0.002*	0.003**
	(0.000)	(0.000)	(0.068)	(0.095)	(0.029)
Ownership	−1.130***	−2.615***	−2.751***	−2.649***	−2.829***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	4.829***	4.203***	4.210***	4.267***	3.757***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year fixed effect	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes
No. of obs.	14,224	14,280	14,251	14,295	14,295
Adj. R^2	28%	34%	41%	46%	39%

In particular, *Cost-of-Living-Adjusted Pay* is computed as [*Total Pay* × (*Los Angeles' Cost of Living / City's Cost of Living*)].[2]

Based on *Cost-of-Living-Adjusted Pay* as the dependent variable in Column 3 of Table 4, the coefficient of *Rank* is 0.228 and is significant at the 1% level. This result implies that firms in the 10 least livable states pay 18% higher cost-of-living-adjusted compensation than the firms in the 10 most livable states. Notably, the magnitude of *Rank* is around 2 times bigger after adjusting for cost of living

[2]The city-level cost of living data is from the Council for Community and Economic Research (http://www.coli.org).

directly, which is consistent with the view that the cost of living may lead to underestimation of the substitute effect of natural environment on monetary CEO pay.

Moreover, state-level income tax is a negative factor in the Morgan Quitno ranking, and income tax may be positively associated with before-tax CEO pay. In other words, our results of pay premium for quality of life can be driven largely by income tax. To examine this possibility, we define *Tax-Adjusted Pay* as [*Total Pay* × (1 − *State Income Tax*)], where we apply the highest bracket of the state income tax rate.[3] Even though we cannot observe the actual income tax paid by CEOs, the tax-adjusted pay variable should be a reasonable estimation for the CEO's compensation net of state-level income tax. Column 4 of Table 4 indicates a significantly positive association between *Rank* and tax-adjusted pay. The coefficient of *Rank* is 0.140, indicating an 11% after-tax pay premium of firms in the 10 least livable states over the firms in the 10 most livable states.

It is worth pointing out that the specifications of cost-of-living-adjusted pay and tax-adjusted pay force a unit slope coefficient on the cost of living and tax rate, respectively. These specifications may be problematic if a CEO saves a large amount of his income in one location and spends it in another location. To address this possibility, we directly include cost of living and income tax rate as 2 additional independent variables in Column 5 of Table 4. The coefficient of *Rank* is 0.169 and still significant at the 1% level. Not surprisingly, cost of living has a significantly positive coefficient (0.003), indicating that companies pay more to the CEO when the local cost of living is higher. Income tax rate also attracts a positive coefficient (0.424), although the coefficient is not statistically significant at the 10% level.[4] Those coefficients indicate that an increase in cost of living (state income tax) by 1 percentage point is associated with an increase in CEO pay by approximately 0.3% (0.4%).[5]

Overall, the pay premium for quality of life is robust after accounting for alternative measures of pay, cost of living, and income tax.

C.   Justifications of Quality-of-Life Premium

Once we identify a significant and robust CEO pay premium for quality of life, it is important to explore what drives this premium. To address these questions, we carry out additional analysis in this section.

If a poorly located firm faces more competition in the labor market, it needs to pay a higher premium to the CEO. Otherwise, the premium can be relatively smaller if the firm has stronger bargaining power in the labor market. We use 3 proxies to measure the firm's competitiveness in the managerial labor market:

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[3]The information on state income tax is from the Federation of Tax Administrators (http://www.taxadmin.org).

[4]As a robustness check, we construct a new state ranking by excluding the factors of cost of living and state & local tax (Factors 4 and 10 in the Appendix) from Morgan Quitno's ranking, and replacing *Rank* with this new state ranking in Column 5 of Table 4; our results are unchanged.

[5]The cost of living index from the Council for Community and Economic Research measures relative price levels among difference areas. The average for all participating areas equals 100, and each participant's index is defined as a percentage of the average for all areas. One percentage point of cost of living is 1.

firm size, firm age, and number of firms in the same industry outside the state. Chidambaran and Prabhala (2003) and Kalpathy (2009) suggest that firm size and firm age are positively associated with the firm's bargaining power in the labor market, as smaller firms and younger firms face tougher competition for managerial talents. Therefore, we expect that those firms will pay a higher premium in response to less attractive locations. Our third proxy is motivated by the literature of industry clusters (see, e.g., Almazan, De Motta, and Titman (2007) and Almazan, De Motta, Titman, and Uysal (2010)). If a large number of a firm's industry peers are located outside the state, it implies a high likelihood that the firm's CEO will be hired by its rivals in different states. In this case, the pay premium in response to a less desirable environment will be more important. In contrast, if a firm faces few industry peers, or if most of the peer firms cluster in the same state, geographic attractiveness will be of less importance because it is less likely for the CEO to move to other states.

The regression specification in Table 5 is similar to that in Table 3: ln(*Total Pay*) is the dependent variable, and *Rank* is the key independent variable. In Column 1 of Table 5, we define the *Small Firm* dummy variable, taking the value of 1 if firm size is below the sample median, and 0 otherwise. The coefficient of the interaction *Rank* × *Small Firm* is 0.199 and is significant at the 1% level.

TABLE 5
The Justification of a Pay Premium for Quality of Life

The sample consists of 14,295 firm-year observations based on CRSP/Compustat/ExecuComp merged data from 1993 to 2008. *Total Pay* is the variable *TDC1* in ExecuComp, which consists of salary, bonus, value of restricted stock granted, value of options granted (using Black-Scholes (1973)), long-term incentive payouts, and other compensation; *Rank* is the state-level livability ranking published by Morgan Quitno at the end of every year, scaled by 50, and ranges from 0 to 1, with 0 meaning "most livable" and 1 "least livable"; *Small Firm* is a dummy variable taking the value of 1 if firm size is below the sample median, and 0 otherwise; *Young Firm* is a dummy variable defined as 1 if firm age is below the sample median, where firm age is the number of years since the firm first appears in CRSP; *Outside Rivals* is a dummy variable, which equals 1 if the number of firms outside this state in the same industry is above the sample median, and 0 otherwise; *Internal CEO* is a dummy variable, taking the value of 1 if the CEO was promoted from inside the firm, and 0 otherwise; *Retirement* dummy variable equals 1 if the CEO reaches age 65 or above, and 0 otherwise. The definitions of all other controls are the same as in Table 2. Industry dummy variables are constructed based on the Fama and French (1997) 48 industries. Corresponding p-values from robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	1	2	3	4	5
			ln(*Total Pay*)		
Rank	0.039 (0.390)	−0.011 (0.769)	0.020 (0.599)	0.186*** (0.000)	0.108*** (0.001)
Small Firm	−1.064*** (0.000)				
Rank × *Small Firm*	0.199*** (0.001)				
Young Firm		−0.071** (0.041)			
Rank × *Young Firm*		0.268*** (0.000)			
Outside Rivals			−0.008 (0.889)		
Rank × *Outside Rivals*			0.095* (0.100)		
Internal CEO				−0.025 (0.486)	
Rank × *Internal CEO*				−0.103* (0.078)	

TABLE 5 (continued)

The Justification of a Pay Premium for Quality of Life

Variables	ln(Total Pay)				
	1	2	3	4	5
Retirement					−0.162**
					(0.020)
Rank × Retirement					0.236**
					(0.028)
Firmsize		0.422***	0.441***	0.416***	0.416***
		(0.000)	(0.000)	(0.000)	(0.000)
Volatility	−0.268	1.437***	1.840***	1.548***	1.522***
	(0.225)	(0.000)	(0.000)	(0.000)	(0.000)
RET	0.157***	0.175***	0.159***	0.177***	0.176***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.970***	0.071	0.828***	0.095	0.097
	(0.000)	(0.599)	(0.000)	(0.481)	(0.474)
MB	0.040***	0.033***	0.035***	0.033***	0.033***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cash	−0.414***	0.177	0.216*	0.141	0.136
	(0.001)	(0.182)	(0.094)	(0.292)	(0.308)
Leverage	0.294***	−0.132*	−0.405***	−0.119*	−0.124*
	(0.000)	(0.061)	(0.000)	(0.092)	(0.079)
Capex	−0.662***	−0.189	0.103	−0.209	−0.203
	(0.001)	(0.317)	(0.571)	(0.269)	(0.282)
CEO Age	0.004***	0.004***	0.003***	0.003***	
	(0.001)	(0.003)	(0.009)	(0.006)	
Ownership	−3.210***	−2.886***	−2.612***	−2.880***	−2.754***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	7.939***	4.281***	4.031***	4.384***	4.519***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year fixed effect	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes
No. of obs.	14,295	14,295	14,295	14,295	14,295
Adj. R^2	30%	38%	41%	38%	38%

This result indicates that small firms tend to pay a higher premium in response to unpleasant living environments. The economic magnitude is also sizable: The partial effect of *Rank* on total pay is about 0.039 for large firms (*Small Firm* = 0) and is about 0.248 (0.039 + 0.199) for small firms. In Column 2, we define a *Young Firm* dummy variable based on the sample median firm age, where firm age is the number of years since the firm first appeared in CRSP. The interaction *Rank × Young Firm* has a coefficient of 0.268, which is significant at the 1% level. This result indicates that young firms are more likely to increase CEO pay in response to a less attractive location. Furthermore, based on the sample median of the number of firms in the same industry outside a given state, we define an *Outside Rivals* dummy variable. When *Outside Rivals* = 1, it indicates that the firm faces a more competitive labor market for managerial talents because there are many potential rivals in other states. Column 3 presents a significantly positive coefficient of *Rank × Outside Rivals*, implying that a poorly located firm is more likely to pay a premium when facing a large number of potential rivals. Overall, the results in Columns 1–3 support the view that the compensation premium for quality of life is more evident for firms that face tougher competition for managerial talents.

The pay premium for quality of life can be different between an internally promoted CEO and a CEO hired from outside. CEOs appointed from outside the firm are usually the ones with a better reputation, stronger managerial talent, and richer outside opportunities, because the hurdle for hiring an outside CEO is higher than for hiring an inside CEO, since insiders have the advantage of possessing firm-specific knowledge (Milbourn (2003), Rajgopal, Shevlin, and Zamora (2006)). To examine this idea, we flag the CEO hired from inside the firm based on the ExecuComp database. In particular, ExecuComp records the date when the CEO takes the CEO position and the date when the CEO first joins the company. We define the *Internal CEO* dummy variable as 1 if the CEO joins the firm more than 1 year prior to taking the CEO position, and 0 otherwise. In Column 4 the coefficient of *Rank* × *Internal CEO* is significantly negative, consistent with the view that the pay premium for quality of life is more important for a firm competing for outside CEOs.

Another factor that may influence the premium for quality of life is the CEO's career concerns. A CEO approaching retirement tends to be more short-term oriented (Gao (2010), Gibbons and Murphy (1992)). A young CEO, who has greater concern about future development in the labor market, may agree to work as CEO in a poorly located company even if the current annual compensation is not high. In contrast, a near-retirement CEO, who is usually more concerned about the short-term monetary recompense, is more likely to demand a high compensation premium for working in a less pleasant location. To examine this prediction, we define the *Retirement* dummy variable, using the age 65 as the cutoff, and include this variable and its interaction with *Rank* in Column 5. The coefficient of *Rank* × *Retirement* is 0.236 and is significant at the 5% level. The economic interpretation of this coefficient is as follows: The partial effect of *Rank* on compensation for nonretiring CEOs is 0.108, while its partial effect for retiring CEOs is 0.344 (0.108 + 0.236). Clearly, managerial career concern plays an important role in explaining the compensation premium for living in a less pleasant location.[6]

In summary, Table 5 suggests that the pay premium for life quality is largely driven by the competition in the labor market for CEOs. In particular, this pay premium is more evident when the firm is small, when the firm is young, when the firm faces a large number of rivals, when the firm tries to hire an external CEO, and when the CEO has a short career horizon.[7]

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[6]It is possible that CEOs in different age cohorts have different concerns about geographic livability and that the *Retirement* dummy variable captures this general age effect rather than career developments. To examine this possibility, we interact *Rank* with *CEO Age*. The interaction *Rank* × *CEO Age* is not significantly different from 0, and its coefficient is almost 0. This result indicates that the compensation premium for quality of life is generally the same for CEOs of different age cohorts.

[7]It may also be interesting to know whether the quality-of-life premium varies across gender. We therefore flag female CEOs, and include the female dummy variable and its interaction with *Rank* in the regression. The coefficient of *Rank* × *Female CEO* is not significantly different from 0, suggesting that the compensation premium for location desirability is not different between female CEOs and male CEOs. This result is understandable if men and women derive the same utility from living in a pleasant location or if the CEO and his/her spouse make the career choice together.

D. Individual Ranking Factors and CEO Compensation

So far, we have used the overall quality-of-life ranking, but quality of life may be subjective depending on individuals. For example, some people like sunny days, while others enjoy rain. Their views of quality of life may not be uniform. Moreover, our overall quality-of-life ranking is based on an equal-weighted index of all 43 factors, but these factors may not be equally important. To address these concerns, in this section we examine some individual factors where people are likely to have similar preferences. To the extent that a typical CEO candidate, aged 45 to 60, may particularly care about environmental safety, efficient transportation, and family-friendly infrastructure, we focus on rankings based on 5 specific factors: hazardous waste sites, prisoner incarceration rates, travel time to work, government expenditure on education, and government spending on public welfare.

In Column 1 of Table 6, the coefficient on *Hazardous Waste Sites* is positive and significant at the 1% level, indicating that companies in a state with more hazardous waste sites pay higher CEO compensation. Given the well-known fact that people desire to avoid this type of facility (see, e.g., Smith and Desvousges (1986)), a CEO will demand higher compensation to work in such a location. In Column 2, we use the prisoner incarceration rates as another indicator of environmental safety and find that CEOs receive more compensation when the prisoner incarceration rate is higher. Our results are broadly consistent with Roback (1982), who argues that the price of pollution and crime may be implicitly reflected in the workers' wages in the labor market.

Transportation may be another aspect of livability for corporate executives. Using the average state-level travel time to work as a proxy for the overall transportation conditions in Column 3 of Table 6, we find that CEO compensation is higher in areas with less efficient transportation (i.e., more travel time to work).[8] This result is consistent with the view that travel time to work reduces the employees' leisure and therefore a higher wage is needed to compensate for that (Becker (1965), Gronau (1977), and Solberg and Wong (1992)).

It is possible that family considerations are also important in CEOs' career choices. To investigate this possibility, in Columns 4 and 5 of Table 6 we include state spending on education and public welfare as independent variables, respectively. These variables are particularly interesting for two reasons. First, they can be proxies for the facilities of children's education and overall neighborhood environment, which are important from a family's perspective and in turn influence CEO compensation. Second, unlike the previous 3 factors, which might imply higher managerial effort needed to run a business in these areas and thereby higher pay for the effort,[9] the government expenditure on education and public welfare is less likely to be correlated with managers' effort, but more likely to be regarded as

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[8]Morgan Quitno starts to provide state ranking of the number of airports in 2005. Based on the subsample over 2005–2008, we find that companies in the states with more airports pay lower CEO compensation. The results are available from the authors.

[9]Specifically, hazardous waste sites, prisoner incarceration rate, and travel time to work could be proxies for environmental regulatory risk, property loss risk, and commuting convenience, respectively. If there are higher risks and less convenience, the CEO has to contribute more effort and

TABLE 6

Individual Livability Factors and CEO Compensation

The sample consists of 14,295 firm-year observations based on CRSP/Compustat/ExecuComp merged data from 1993 to 2008. *Total Pay* is the variable *TDC1* in ExecuComp, which consists of salary, bonus, value of restricted stock granted, value of options granted (using Black-Scholes (1973)), long-term incentive payouts, and other compensation. *Hazardous Waste Sites*, *Prisoner Incarceration Rate*, *Travel Time to Work*, *Expenditures for Education*, and *Spending for Public Welfare* are the state-level rankings based on the corresponding individual factors scaled by 50, which are ranges from 0 to 1. A higher ranking implies more hazardous waste sites, higher prisoner incarceration rate, more time needed to travel to work, greater government expenditure for education, and larger government spending for public welfare, respectively. The definitions of all other controls are the same as in Table 2. Industry dummy variables are constructed based on the Fama and French (1997) 48 industries. Corresponding *p*-values from robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	ln(*Total Pay*)				
Variables	1	2	3	4	5
Hazardous Waste Sites	0.205***				
	(0.000)				
Prisoner Incarceration Rate		0.063**			
		(0.035)			
Travel Time to Work			0.304***		
			(0.000)		
Expenditures for Education				−0.248***	
				(0.000)	
Spending for Public Welfare					−0.070**
					(0.018)
Firmsize	0.413***	0.416***	0.412***	0.416***	0.416***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Volatility	1.663***	1.615***	1.570***	1.630***	1.678***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
RET	0.176***	0.176***	0.177***	0.178***	0.177***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
ROA	0.118	0.092	0.139	0.123	0.104
	(0.382)	(0.498)	(0.374)	(0.363)	(0.440)
MB	0.033***	0.034***	0.033***	0.033***	0.034***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Cash	0.116	0.141	0.081	0.089	0.135
	(0.386)	(0.293)	(0.459)	(0.504)	(0.313)
Leverage	−0.109	−0.124*	−0.111**	−0.116	−0.118*
	(0.125)	(0.081)	(0.043)	(0.101)	(0.096)
Capex	−0.096	−0.200	−0.068	−0.120	−0.177
	(0.611)	(0.288)	(0.112)	(0.527)	(0.348)
CEO Age	0.003**	0.003**	0.002**	0.003**	0.003**
	(0.015)	(0.011)	(0.035)	(0.034)	(0.012)
Ownership	−2.841***	−2.842***	−2.802***	−2.816***	−2.841***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	4.240***	4.348***	4.161***	4.524***	4.420***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year fixed effect	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes	Yes
No. of obs.	14,295	14,295	14,295	14,295	14,295
Adj. R^2	39%	39%	39%	39%	39%

family-supporting facilities. The coefficients on spending on education and public welfare are significantly negative, indicating that a CEO receives lower pay when the firm's location is more family friendly.

In summary, complementing our earlier analysis on overall livability rankings, we find that individual factors of pollution, crime, transportation, and family facilities are also important in influencing CEO compensation.

consequently may require higher compensation. In other words, the effect of such factors might reflect the compensation for managerial efforts.

IV.   Robustness Check and Additional Investigations

A.   Alternative Ranking for Quality of Life

In addition to Morgan Quitno, *Forbes Magazine* and *Bloomberg Business-week* publish livability rankings among U.S. cities. *Forbes* has published a list of "America's Most Miserable Cities" annually from 2008 to 2010 and a list of "America's Most Livable Cities" annually from 2009 to 2010. *Bloomberg Busi-nessweek* also compiled a list of "Unhappiest Cities" for U.S. cities in 2010.[10] Similar to Morgan Quitno's approach, *Forbes* and *Businessweek* construct their rankings based on factors like suicide rates, divorce rates, crime, unemployment, population loss, job loss, weather, and green space. Under these alternative rank-ings, we reexamine the effect of livability on CEO compensation. Given that the rankings for *Forbes* and *Businessweek* only cover recent years, we apply these rankings to our entire sample period from 1993 to 2008, assuming that the city's living environment is persistent over time. We define the dummy variables of *Businessweek America's Unhappiest City*, *Forbes America's Most Miserable City*, and *Forbes America's Most Livable City* as 1 if the firm's headquarters is located within 10 miles of the cities in the respective rankings, and 0 otherwise.[11] In our sample, 354, 1,284, and 812 firm-year observations are *Businessweek America's Unhappiest City*, *Forbes America's Most Miserable City*, and *Forbes America's Most Livable City*, respectively.

Table 7 gives the results with *Forbes* and *Businessweek* rankings. In Col-umn 1, we use *Businessweek America's Unhappiest City* dummy variable as our livable measure, and the coefficient is 0.134 and is significant at the 1% level. The result suggests that firms around the "Unhappiest Cities" pay about 13% higher compensation to CEOs than other companies. Using *Forbes America's Most Mis-erable City* and *Forbes America's Most Livable City* dummy variables, respec-tively, Columns 2 and 3 give consistent results: Firms in the miserable locations pay more, while those located around the desirable areas pay less to their CEOs. Finally, we include both *Forbes America's Most Miserable City* and *Forbes Amer-ica's Most Livable City* in the regression analysis and find that the coefficients for both dummy variables are significant, the first at the 5% significance level and the latter at the 10% level. The coefficients for the 2 dummy variables are 0.055

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[10]*Forbes Magazine*'s most miserable cities for 2008–2010 are Akron, Buffalo, Canton, Chicago, Cleveland, Detroit, Flint, Gary, Kansas City, Memphis, Miami, Modesto, New York, Philadelphia, Rockford, Sacramento, St. Louis, Stockton, Toledo, Youngstown, Los Angeles, Charlotte, and Providence (www.forbes.com/2010/02/11/americas-most-miserable-cities-business-beltway-miserable-cities.html). *Forbes Magazine*'s most livable cities for 2009–2010 are Little Rock, Peabody, Madison, Harrisburg, Denver, Pittsburgh, Worcester, Baltimore, Cambridge, Oklahoma City, Tulsa, Stamford, Des Moines, Bethesda, Portland, Lincoln, Bridgeport, Norwalk, Trenton, Ewing, Manch-ester, Nashua, Omaha, Council Bluffs, Harrisburg, Carlisle, Ann Arbor, Provo, Orem, Clearfield, and Ogden (www.forbes.com/2010/04/29/cities-livable-pittsburgh-lifestyle-real-estate-top-ten-jobs-crime-income_slide.html). *Businessweek* America's unhappiest cities for 2010 are Portland, St. Louis, New Orleans, Detroit, Cleveland, Jacksonville, Las Vegas, Nashville Davidson, Cincinnati, Atlanta, Milwaukee, Sacramento, Kansas City, Pittsburgh, Memphis, Indianapolis City, Louisville, Tucson, Minneapolis, and Seattle (http://images.businessweek.com/ss/09/02/0226_miserable_cities/index.htm).

[11]Instead of using 10 miles, we construct the dummy variables based on the same Metropolitan Statistical Areas; our results are similar.

and –0.057, respectively, indicating that firms located around "Forbes America's Most Miserable Cities" pay 5.5% more than those located in the normal areas, while firms located around "Forbes America's Most Livable Cities" pay 5.7% less than those located in the normal areas.

TABLE 7

Alternative Rankings and CEO Compensation

The sample consists of 14,295 firm-year observations based on CRSP/Compustat/ExecuComp merged data from 1993 to 2008. *Total Pay* is the variable *TDC1* in ExecuComp, which consists of salary, bonus, value of restricted stock granted, value of options granted (using Black-Scholes (1973)), long-term incentive payouts, and other compensation. *Businessweek America's Unhappiest City*, *Forbes America's Most Miserable City* and *Forbes America's Most Livable City* are dummy variables defined as 1 if the firms' headquarters are located within 10 miles from the cities in the 3 rankings, and 0 otherwise. The definitions of all other controls are the same as in Table 2. Industry dummy variables are constructed based on the Fama and French (1997) 48 industries. Corresponding *p*-values from robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	ln(*Total Pay*)			
	1	2	3	4
Businessweek America's Unhappiest City	0.134*** (0.000)			
Forbes America's Most Miserable City		0.059** (0.029)		0.055** (0.044)
Forbes America's Most Livable City			−0.064* (0.070)	−0.057* (0.081)
Firmsize	0.441*** (0.000)	0.440*** (0.000)	0.441*** (0.000)	0.440*** (0.000)
Volatility	1.857*** (0.000)	1.863*** (0.000)	1.834*** (0.000)	1.847*** (0.000)
RET	0.158*** (0.000)	0.159*** (0.000)	0.160*** (0.000)	0.160*** (0.000)
ROA	0.822*** (0.000)	0.830*** (0.000)	0.821*** (0.000)	0.827*** (0.000)
MB	0.035*** (0.000)	0.035*** (0.000)	0.035*** (0.000)	0.035*** (0.000)
Cash	0.207 (0.112)	0.205 (0.116)	0.212 (0.103)	0.208** (0.020)
Leverage	−0.422*** (0.000)	−0.412*** (0.000)	−0.411*** (0.000)	−0.411*** (0.000)
Capex	0.079 (0.663)	0.106 (0.559)	0.091 (0.617)	0.107 (0.551)
Age	0.003** (0.011)	0.003*** (0.010)	0.003*** (0.008)	0.003*** (0.004)
Ownership	−2.590*** (0.000)	−2.603*** (0.000)	−2.599*** (0.000)	−2.601*** (0.000)
Constant	4.051*** (0.000)	4.041*** (0.000)	4.042*** (0.000)	4.040*** (0.000)
Year fixed effect	Yes	Yes	Yes	Yes
Industry fixed effect	Yes	Yes	Yes	Yes
No. of obs.	14,295	14,295	14,295	14,295
Adj. R^2	41%	41%	41%	41%

B.   Quality-of-Life Premium for Management Team

To further our understanding of how the company pays compensation premiums to attract managerial talent in response to unpleasant locations, we examine how widespread the pay premium is within the senior management ranks. The ExecuComp database includes compensation information for up to the

5 highest-paid managers. We reestimate equation (1) by using all the top 5 executive data (excluding the CEO).[12]

Table 8 indicates that the premium for quality of life applies not only for the CEO but also for other senior executives. The coefficients of *Rank* are significantly positive in all 6 regressions. Notably, the magnitude of these coefficients is similar to that reported in Table 3 based on CEO compensation, suggesting that the premium for quality of life is equally important for CEOs and other top executives.

TABLE 8

The Pay Premium for Quality of Life for Management Team (excluding CEO)

The sample consists of 65,732 person-year observations based on the top 5 executives (excluding CEOs) recorded in ExecuComp from 1993 to 2008. *Total Pay* is the variable *TDC1* in ExecuComp, which consists of salary, bonus, value of restricted stock granted, value of options granted (using Black-Scholes (1973)), long-term incentive payouts, and other compensation; *Rank* is the state-level livability ranking published by Morgan Quitno at the end of every year scaled by 50 and ranges from 0 to 1, with 0 meaning "most livable" and 1 "least livable." The definitions of all other controls are the same as in Table 2. Industry dummy variables are constructed based on the Fama and French (1997) 48 industries. Corresponding *p*-values from robust standard errors are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	ln(*Total Pay*)					
Variables	1	2	3	4	5	6
Rank	0.168***	0.198***	0.132***	0.105***	0.104***	0.119***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Firmsize			0.381***	0.438***	0.439***	0.432***
			(0.000)	(0.000)	(0.000)	(0.000)
Volatility				1.665***	1.662***	1.518***
				(0.000)	(0.000)	(0.000)
RET				0.156***	0.155***	0.155***
				(0.000)	(0.000)	(0.000)
ROA				0.304***	0.302***	0.302***
				(0.000)	(0.000)	(0.000)
MB				0.001***	0.001***	0.001***
				(0.002)	(0.002)	(0.001)
Cash				0.701***	0.706***	0.625***
				(0.000)	(0.000)	(0.000)
Leverage				−0.856***	−0.853***	−0.838***
				(0.000)	(0.000)	(0.000)
Capex				0.356***	−0.347***	0.468***
				(0.000)	(0.000)	(0.000)
Ownership					0.001***	0.001***
					(0.003)	(0.002)
Constant	7.013***	6.226***	3.931***	3.252***	3.243***	3.306***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Year fixed effect	No	Yes	Yes	Yes	Yes	Yes
Industry fixed effect	No	Yes	Yes	Yes	Yes	Yes
State fixed effect	No	No	No	No	No	Yes
No. of obs.	65,732	65,732	65,732	65,732	65,732	65,732
Adj. R^2	0.1%	6%	41%	45%	45%	46%

C. Discussion

The purpose of this paper is not to explain the choices of corporate headquarters locations, but rather to examine the real effect of the desirability of corporate

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[12]We do not include executive age in Table 8, because about 50% of executive age data is missing in the ExecuComp database.

locations on CEO pay. But it is still an interesting question why some firms choose to stay in an unpleasant location and pay a premium to their executives. One possible reason is that households and firms differ in their objectives, utility versus profit maximization; many locations least attractive to households are most attractive to firms (Gabriel and Rosenthal (2004)). Moreover, it is theoretically possible that a firm moves its headquarters to a more desirable location in order to attract managerial talent. But moving headquarters is rare in practice. For example, Pirinsky and Wang (2006) find that over the period 1992–1997, only 118 U.S. public firms relocated their headquarters, and the primary concern for the headquarters location decision was to get closer to customers. In our sample, we only find 34 relocation cases. This number is even smaller than that reported in Pirinsky and Wang, probably because the firms covered in the ExecuComp database are the biggest U.S. public firms, and these companies are less likely to relocate headquarters. As a robustness check, we exclude these relocation firms and redo all the analysis; our results are unchanged.

Another possible channel for geographic desirability to influence compensation is that a good working and living environment increases the CEO's productivity, which in turn increases the compensation level. This argument is less likely for the following two reasons: First, we control for stock and operation performance in the regression, which can roughly reflect the CEO's productivity. Second, this argument suggests that CEOs working in more livable locations should receive higher compensation, which is just opposite to our findings.

It is worth mentioning that a state's attractiveness to a CEO may depend on the CEO's origin. Yonker (2010) shows that CEOs have geographic preference toward working in their home states, especially when their home states are desirable for living. Moreover, CEOs working in their home states are paid less. Our paper is consistent with Yonker in terms of showing the important role of geography in CEO compensation policy.

Ang, Nagel, and Yang (2010) show that the level of CEO compensation is positively associated with the number of local CEOs, and they explain this finding as the effect of social pressure on CEO compensation. It is possible that a large number of CEOs live in some unpleasant location, which pushes up the level of CEO pay due to the social pressure effect. To investigate this possibility, we compute the number of firms in the same state as a proxy for the number of local CEOs, and we include it as an additional control to reestimate equation (1). The result of the pay premium for quality of life is the same.

It is likely that firms in the same industry tend to cluster at the same location, and therefore, the geographic difference in CEO pay reflects the industry effect. In the regression analysis, we control for industry fixed effects based on the Fama and French (1997) 48 industry classifications. As a robustness check (unreported), we also control for industry fixed effects based on 1-, 2-, and 3-digit Standard Industrial Classification codes; our results are largely unchanged. Moreover, we pay special attention to California for the following two reasons: First, most of the IT firms are clustered in California; therefore, the industry fixed effect for tech companies may be compounded with the state fixed effect. Second, California is the most populated state as regards the number of company headquarters, and it is in the lower half of states by desirability, which may critically

influence our results. To examine whether our results are mainly driven by California, we exclude the firms in California from our sample and redo all the empirical analyses; the results are similar.

It is worth mentioning that the Morgan Quitno index includes individual income as positive factors (e.g., Per Capita Personal Income and Median Household Income). This fact may work against us finding a positive relation between *Rank* and CEO pay if the CEO compensation in each state were solely a multiple of the state's average income.[13]

Our primary measure of total compensation is ExecuComp item *TDC1*. Starting in 2006, the definition of *TDC1* is slightly changed.[14] To examine the effect of this inconsistency of *TDC1* definition on our results, we follow Walker's (2011) method to reconcile the *TDC1* definition between the 1993–2005 and 2006–2008 periods. Our results are unchanged.

V.   Conclusion

Do nonmonetary benefits matter in overall executive compensation practice? In this paper, we empirically examine this question from the perspective of the living environment around corporate headquarters. We provide the first evidence that CEOs working in unpleasant locations are paid more than those working in more livable locations. This compensation premium for quality of life is both economically and statistically significant after controlling for conventional firm and CEO characteristics.

This quality-of-life pay premium is more evident for firms facing tougher competition for managerial talents, for externally hired CEOs, and for retiring CEOs. These results suggest that the CEO pay premium for livability is part of efficient contracting driven by competitive market forces.

Appendix. Factors Considered in Morgan Quitno's State Ranking

Morgan Quitno considers 43 factors in its state rankings for livability. The scale for each factor is 1 to 50; all factors are given equal weight. For negative factors, a higher number implies poorer livability. Rankings for positive factors are inverted such that a higher number also indicates poorer livability. For example, a 50 for "crime rate," a negative factor, indicates that the state has the highest crime rate in the United States. A 50 for "median household income," a positive factor, means that the state has the lowest median household income. After averaging all 43 factors, the state with the smallest average value is ranked as No. 1, the most livable state.

Negative Factors

1. Percent Change in Number of Crimes
2. Crime Rate
3. State Prisoner Incarceration Rate

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[13]We thank the referee for providing this comment.

[14]For 1993–2005, *TDC1* consists of salary, bonus, other annual compensation, the grant-date value of restricted stock, the grant-date value of option, long-term incentive plan, and other total compensation. For 2006–2008, *TDC1* consists of salary, bonus, nonequity incentive plan, the grant-date value of restricted stock, the grant-date value of option, deferred compensation, and other compensation.

4. State Cost of Living Index
5. Pupil-Teacher Ratio in Public Elementary and Secondary Schools
6. Unemployment Rate
7. Percent of Nonfarm Employees in Government
8. Electricity Prices
9. Hazardous Waste Sites on the National Priority List per 10,000 Square Miles
10. State & Local Taxes as a Percent of Personal Income
11. Per Capita State and Local Government Debt Outstanding
12. Percent of Population Not Covered by Health Insurance
13. Births of Low Birthweight as a Percent of All Births
14. Teenage Birth Rate
15. Infant Mortality Rate
16. Age-Adjusted Death Rate by Suicide
17. Population per Square Mile
18. Divorce Rate
19. Poverty Rate
20. State and Local Government Spending for Welfare Programs as a Percent of All Spending
21. Percent of Households Receiving Food Stamps
22. Deficient Bridges as a Percent of Total Bridges
23. Highway Fatality Rate
24. Fatalities in Alcohol-Related Crashes as a Percent of All Highway Fatalities

Positive Factors

25. Per Capita Gross State Product
26. Percent Change in Per Capita Gross State Product
27. Per Capita Personal Income
28. Change in Per Capita Personal Income
29. Median Household Income
30. Public High School Graduation Rate
31. Percent of Population Graduated from High School
32. Expenditures for Education as a Percent of All State and Local Government Expenditures
33. Percent of Population with a Bachelor's Degree or More
34. Books in Public Libraries Per Capita
35. Per Capita State Art Agencies' Legislative Appropriations
36. Annual Average Weekly Earnings of Production Workers on Manufacturing Payrolls
37. Job Growth
38. Normal Daily Mean Temperature
39. Percent of Days That Are Sunny
40. Homeownership Rate
42. Marriage Rate
43. Percent of Eligible Population Reported Voting

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