The Geography of Executive Compensation

Christa H.S. Bouwman

Case Western Reserve University and

Wharton Financial Institutions Center

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Various papers have recently documented that distance matters in economic transactions. There are several reasons to believe it could matter in executive compensation as well, in the sense that CEO compensation may depend on how much geographically-close CEOs earn. These include: (i) the force of local labor market competition for CEOs; (ii) the effect of "leading firms" in the vicinity as suggested by the literature on social interaction; and (iii) envy among geographically-close CEOs endowed with relative-consumption preferences. In this paper, I first examine whether geography does matter for CEO compensation, and then explore the possible reasons for this relationship.

I find strong evidence that geography matters for executive compensation: CEO compensation (salary and cash compensation) is positively and significantly related to the level of compensation of CEOs of firms headquartered within a 100-kilometer or 250-kilometer radius. The results suggest that if CEOs within a 100-kilometer radius enjoyed a $1 salary increase in the previous year, the CEO will experience a $0.29 increase in salary this year *ceteris paribus*.

These results are obtained while controlling for previously-documented factors that affect CEO compensation, including CEO age, CEO tenure, firm size, growth options, and firm performance. Since CEO pay is typically benchmarked against that earned at industry peers of similar size, the regressions include the average compensation at similar-sized firms in the same industry. The ACCRA Cost of Living Index is used to control for differences in the cost of living. Year and industry fixed effects are included in all regressions; results are similar when state fixed effects are added or when firm fixed effects are used instead of industry fixed effects. All results are based on each firm's actual location in each year – since Compustat only reports the most recent headquarter location, this data is hand-collected for each sample firm.

An examination of what drives this relationship between geography and executive compensation reveals that the results are most consistent with envy. Robustness checks are conducted to deal with issues related to potentially omitted variables and endogeneity, and the results survive these checks.

Contact details: Weatherhead School of Management, Case Western Reserve University, 10900 Euclid Avenue, 362 Peter B. Lewis Building, Cleveland, OH 44106. Tel.: 216-368-3688. Fax: 216-368-6249. E-mail: christa.bouwman@case.edu.

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THE GEOGRAPHY OF EXECUTIVE COMPENSATION

"In its wisdom, the SEC wants to make even more components of CEO pay public. Have we learned nothing on this issue? More than a decade ago, when SEC-mandated disclosure of pay in proxy statements expanded to include not just salaries and bonuses but also stock options grants, it sparked an arms race among compensation consultants happy to exploit another bargaining chip for their clients. And I've seen no evidence that disclosing the grants and their costs caused the size of those grants to go down.

Nor is disclosure likely to curb indulgent retirement benefits and other perks--like the $84,000 that former Tyson Foods chairman Donald Tyson received last year to cover "lawn maintenance" at his five estates or the $1 million the company paid to cover his income tax bill.

On the contrary. The minute other CEOs see how poorly they're faring against counterparts like Tyson, you can bet they'll be pushing to get their lawn-mowing bills covered too. Why? In part because every company that wants to stay competitive needs to be able to advertise that it pays its execs as well as the next company."

"How to end CEO pay envy", CNN.com, June 1, 2006

1. INTRODUCTION

In recent years, a variety of papers have documented that distance matters in economic transactions. Coval and Moskowitz (1999, 2001), Huberman (2001), and Grinblatt and Keloharju (2001) document that investors prefer to invest in the stock of geographically-close firms. Hong, Kubik and Stein (2005) show that mutual fund managers in the same city hold similar portfolios. Butler (2008) finds that "local" investment banks have a competitive advantage over nonlocal banks in municipal bond underwriting, especially for high-risk and non-rated bonds. Malloy (2005) finds that analysts provide more accurate forecasts when they are geographically located closer to the firms they analyze. Uysal, Kedia and Panchapagesan (2008) find that acquirer returns are significantly higher in geographically-proximate deals. John and Kadyrzhanova (2008) document a geographic clustering of firms with anti-takeover provisions. Kedia and Rajgopal (forthcoming) find that more stock options are granted to rank-and-file workers when a higher percentage of geographically-close firms grant more options. Petersen and Rajan (2002) show that, while small firms have to be located near their lenders due to the high cost of information acquisition, greater usage of information technology at banks has enabled small firms to borrow over greater distances.

With the evidence of the seemingly pervasive economic effects of geography as the background, this paper asks: does geography affect CEO compensation, and if so, what are the factors that generate this relationship? While there is no room for geography in the optimal compensation contract emerging from the standard principal-agent model (see, for example, Prendergast, 1999), there are identifiable factors that could conceivably inject geography into CEO compensation.

One factor could be differences in local labor market competition for CEOs. A second possible factor is that physical proximity facilitates both awareness and social interaction, and could thus create "neighborhood effects" that cause firms to follow the lead of "stellar" firms in the vicinity in setting CEO compensation (Glaeser, Sacerdote and Scheinkman, 1996).[1] A third possible reason is that neighborhood effects could be manifested as envy – there is plenty of evidence that people care about their *relative* status (e.g., Frank, 1985; and Solnick and Hemenway, 1998). Relative status effects or envy are strongest within "reference groups" because people tend to compare themselves more with those who they feel are more similar to them (e.g., Elster, 1991). For CEOs, one natural reference group is other CEOs at similar-sized firms in the same industry. Since compensation consultants and executive compensation committees tend to benchmark CEO compensation against that earned at similar-sized industry peers (Bizjak, Lemmon and Naveen, forthcoming), one would expect a link between CEO compensation and that of its peers even absent relative status concerns. A second natural reference group for a CEO, one that has not been previously examined, is comprised of the CEOs of companies that are headquartered near the CEO's own company. CEOs in the same geographic neighborhood are likely to engage in greater social interaction with each other than with CEOs elsewhere. Since information on CEO pay is publicly available, compensation comparisons and envy may occur among CEOs who interact socially with each other.[2] The philosopher Thomas Aquinas (1265-1274), for example, argues: "Thus a commoner does not envy the king, nor does the king envy a

[1] Hong, Kubik and Stein (2004) show that social interaction, such as that which occurs among neighbors or in churches, affects the stock-market participation of individuals.

[2] Even if CEOs themselves do not overtly push for higher compensation based on relative status concerns, their board may perceive some pressure to adjust their wages to be comparable to those of local CEOs as the following quote suggests: "A few CEOs actually feel uncomfortable with the high pay their boards urge them to accept. But given their directors' fear that lower pay might send the wrong message to the company or investors, they feel they can't afford the luxury of such modesty." ("CEO pay: The prestige, the peril." BusinessWeek, November 20, 2006.)

commoner […]. Wherefore a man envies not those who are far removed from him, whether in *place*, time, or station, but those who are near him […]."[3] Thus, physical proximity can determine who is included in a reference group for comparison, making envy a channel through which geography affects executive compensation.

I find empirical evidence that strongly supports the hypothesis that CEO compensation is affected by geography. CEO compensation (salary and cash compensation) is positively and significantly related to the level of compensation of CEOs employed at firms headquartered within a 100-kilometer or 250-kilometer radius.[4]

These results are obtained while controlling for other factors that have been found to affect CEO compensation, including CEO age, CEO tenure, firm size, growth options, firm performance, and year and industry fixed effects. Several additional control variables are added to all regressions. Since CEO pay is typically benchmarked against that earned at industry peers of similar size (Bizjak, Lemmon, and Naveen, forthcoming), the regressions include the average compensation at similar-sized firms in the same industry.[5] To ensure that the results are not driven by differences in the cost of living, I use the ACCRA Cost of Living Index (from the Council for Community and Economic Research) for every locality in the sample. All t-statistics are based on robust standard errors clustered by firm. The results are robust to using a variety of alternative specifications, including the addition of corporate governance proxies, the use of log-transformed variables, and the use of state and firm fixed effects.

It is important to note that Compustat only reports the most recent headquarter location of each firm and assigns this location to every year in the dataset. Although headquarter relocations should only make it harder for me to find significance, I hand-collect the actual location of each firm in the sample (using 10Ks, IPO prospectuses, annual reports, and articles found using Factiva) to ensure that the regression results are based on the correct location in every year.

[3] See Salovey and Rodin (1984) for empirical evidence on the importance of physical proximity for envy reference groups.
[4] The CEO's own compensation in the previous year is *not* included in the average compensation of geographically-close CEOs to exclude the effect of intertemporal wage correlations.
[5] The CEO's own compensation in the previous year is *excluded* from the average compensation of CEOs at industry peers.

The coefficients on the average salary and cash compensation of geographically-close CEOs are positive and significant in all specifications, generally at the 1% level. The results are also economically significant: for example, the main regression results suggest that a $1 increase in salary enjoyed by geographically-close CEOs in the previous year results in a $0.29 increase in CEO salary in the current year. The effect of geography on CEO salary and cash compensation is sizeable and tends to equal roughly 35% to 50% of the effect of industry peer compensation.

The three potential explanations for these results mentioned earlier are then examined. First, I examine whether the results arise from the effect of local labor market competition, which would tend to raise the compensation of all CEOs in tight local labor markets and lower it in others. To test this, the sample is limited to companies that were part of the S&P 500 in the previous year. These are the largest and most prominent firms that compete in national or even global labor markets for their CEOs, so the compensation contracts for their CEOs should *not* be affected by the locations of the headquarters of these firms. But even for these firms, I find that geography affects CEO compensation. Since the effect of geography on compensation cannot be a local labor market effect for these firms, there is more going on here than can be explained solely by local competition for talent.

Second, the literature on social interaction suggests that CEO compensation at firms in a geographic area is influenced by the compensation policies of "leading firms" (rather than all firms) in the area, but the compensation policies of the leading firms themselves are *not* affected by those of other firms (e.g., Glaeser, Sacerdote and Scheinkman, 1996; and Kedia and Rajgopal, forthcoming). To investigate this, I classify the top three firms based on sales or market value of equity in any locality as the "leading firms" in that locality. When the sample is restricted to these leading firms, the results turn out to be even stronger than the ones based on the entire sample. That is, the compensation of CEOs at leading firms is strongly influenced by the average compensation of the CEOs of other firms in the vicinity. Furthermore, when the average compensation of geographically-close CEOs is replaced by the average compensation of the CEOs at these leading firms and these leading firms are subsequently excluded from the sample, the coefficients are substantially smaller rather than larger. That is, it does not appear that the leading firms in an area are exerting a stronger influence on the compensation of a CEO than the influence

being exerted by the average compensation of CEOs in the vicinity. Both results are inconsistent with the "leading-firm effect."

The third possible explanation that I explore is relative status concerns or envy. The literature suggests that agents may care about what they earn relative to other agents due to fairness/equity considerations (e.g., Bolton and Ockenfels, 2000) or envy (e.g., Foster, 1972) that is embedded in preferences (e.g., Robson, 2001).[6] As noted before, these effects are strongest within reference groups, which include CEOs at similar-sized firms in the same industry and CEOs at geographically-close firms. Thus, a CEO's concern with the compensation levels of other CEOs in the vicinity could induce him to negotiate with his board of directors for adjustments in his compensation, and this could cause geography to affect CEO compensation.[7] The maintained hypothesis throughout is that CEOs possess some bargaining power in the determination of their compensation.[8]

The effect of relative status concerns should be strongest the further the CEO's pay lies below that of geographically-proximate CEOs *ceteris paribus*. As an initial test of this hypothesis, I therefore regress the change in CEO compensation on the CEO's "compensation gap", the difference between the compensation of geographically-close CEOs and the CEO's own compensation, plus control variables. I find that the coefficient on the compensation gap is positive and significant, which supports the hypothesis that relative status concerns drive the effect of geography on CEO pay. Note that this result cannot be explained away as a mere "economic mean reversion" effect. The results indeed suggest that the CEO is catching up with the mean, but it is the pursuit of a mean that should be irrelevant.

It is important to check the robustness of the conclusion that a concern for relative consumption is the driving force behind the results. Even though the OLS regressions control for a variety of known factors that affect CEO compensation, one can never be completely sure that

[6] The intuition that envy may play a role in compensation also comes from survey evidence. Solnick and Hemenway (1998) surveyed Harvard University graduate students in public health. The majority of those surveyed indicated that they would prefer a world in which they earned $50,000 and others $25,000 to a world in which they earned $100,000 and others $250,000.

[7] Since the CEO's reference group also includes CEOs at firms of similar size and other firms in the same industry, I introduce compensation variables based on similar-sized industry peers as controls in the analyses.

[8] For empirical evidence and discussions on this, see, for example, Lorsch and Maciver (1989); Hermalin and Weisbach (1998); Baker and Gompers (2003); and Fahlenbrach (forthcoming).

an omitted variable unrelated to envy is causing the compensation of all CEOs in a given geographic area to be similar. A related issue is endogeneity. Although I posit that the compensation of CEO i (dependent variable) is driven by the average compensation of all CEOs in the area (independent variable), the causality may also run the other way. To the extent that this is because the other CEOs in the area are envious of CEO i rather than routine compensation benchmarking, this does not affect what I conclude from the analysis. Moreover, this endogeneity issue is dealt with by lagging the independent variable. However, to be further reassured about the reverse causality and the omitted variable issues, I use instrumental variable regressions in which the average cash compensation of geographically-close CEOs is instrumented by the average cash compensation of professional North American sports players (MLB, NBA, NFL, and NHL) within a 100-kilometer radius. Compensation earned by professional sports players can be used as an instrument because it does *not* directly affect CEO compensation; neither executive compensation consultants nor boards of directors could justifiably benchmark the compensation of professional athletes to justify CEO pay. Moreover, it is highly unlikely that a particular CEO's compensation affects the wages of professional sports players in the area since these wages are determined through league-related supply and demand forces and collective bargaining agreements. But there is reason to suspect that status concerns could cause the average compensation of CEOs in an area to be correlated with the compensation of professional athletes in that area as the following quote exemplifies:

> "*In part, greed may account for these huge salaries and perks. But for some CEOs, high pay is also a status symbol, the currency of competition with other CEOs. Other chiefs expect big packages because they've internalized our culture's view of CEOs as celebrities or potential heroes. If Alex Rodriguez can make about $20 million a year with the Yankees (and not come through in the clutch), the thinking goes, don't CEOs deserve an extra zero or two?*" ("CEO pay: The prestige, the peril." BusinessWeek, November 20, 2006.)

First-stage regression results confirm that sports pay is positively and significantly correlated with the average compensation of geographically-proximate CEOs. Second-stage regression results are similar to the main regression results. Thus, the results from OLS and IV regressions suggest that CEO envy likely drives the finding that the average compensation of geographically-close CEOs significantly affects CEO compensation.

The rest of the paper is organized as follows. Section 2 discusses the related literature. Section 3 describes the data and discusses the methodology. Section 4 presents the main empirical results. Section 5 includes robustness checks. Section 6 examines the alternative explanations for the effect of geography on CEO compensation. Section 7 summarizes and concludes.

2. THE RELATED LITERATURE

This paper is related to three strands of the literature. The first strand is the literature on the various economic ramifications of distance. In most of the papers in this strand, distance matters because of informational advantages: information is more efficiently procured when distances are smaller (Coval and Moskowitz, 1999, 2001; Huberman, 2001; Grinblatt and Keloharju, 2001; Petersen and Rajan, 2002; Hong, Kubik and Stein, 2004, 2005; Malloy, 2005; Butler, 2008; and Uysal, Kedia and Panchapagesan, 2008). This paper is part of a small group of papers in which distance matters for a *different* reason.[9] The average compensation of geographically-close CEOs affects CEO compensation because CEOs care about their wages *relative* to those of geographically-proximate CEOs in their reference group.

The second strand of the literature to which this paper is related contains papers on executive compensation. While part of this literature has focused on estimating and explaining the pay-for-performance sensitivity of executive compensation (Jensen and Murphy, 1990; Hall and Liebman, 1998; Murphy, 1999; and Bebchuk and Fried, 2004), a variety of papers have examined the *level* of executive compensation. For example, Bebchuk and Grinstein (2005) find that from 1993-2003, executive pay has grown beyond what can be explained by changes in firm performance, size, and industry mix. Gabaix and Landier (forthcoming) argue that the substantial increase in CEO pay between 1980 and 2003 can be attributed to increases in market capitalization. Bizjak, Lemmon and Naveen (forthcoming) show that competitive benchmarking using peer groups affects the level of CEO pay. Yermack (1997), Bertrand and Mullainathan (2001), Bebchuk and Fried (2004), and Kuhnen and Zwiebel (2007) explain the rise in executive

[9] Another paper in this group is Kedia and Rajgopal (forthcoming), which attempts to explain why broad-based option plans are so prevalent. They argue that labor markets for rank-and-file employees are geographically segmented. To attract and retain such employees, firms examine the use of options at other firms in the local community with whom they compete for labor. Firms will thus be more inclined, for competitive reasons, to offer options if geographically-close firms offer options.

pay on the basis of an increase in managerial entrenchment. By contrast, this paper focuses on the effect of relative consumption preferences on executive pay.[10]

The third strand of the literature to which this paper is related consists of papers that examine how characteristics of managers – such as relative-consumption preferences that lead to envy – affect corporate policies and outcomes.[11] Envy has been studied extensively (see, e.g. Smith and Kim, 2007 for an overview).[12] Early contributions on the importance of relative position and social concerns in economics include Smith (1759), Marx (1849), Veblen (1899) and Keynes (1930). More recent theoretical contributions have used relative-consumption preferences to explain compressed wages (Frank, 1984; Lazear, 1989; and Levine, 1991), involuntary unemployment (Akerlof and Yellen, 1990), corporate socialism in investment (Goel and Thakor, 2005), the effectiveness of tournaments (Grund and Sliwka, 2005), and optimal worker contracts (Dur and Glazer, 2007). However, empirical research on the subject is scarce, possibly because empirical proxies for envy or equity-seeking behavior are hard to find. Existing empirical evidence suggests that: workers are not paid their marginal products due to positional concerns (Frank, 1984); wage dispersion reduces (increases) turnover of administrators with relatively high (low) salaries (Pfeffer and Davis-Black, 1992); individuals care about their compensation relative to that of others (Solnick and Hemenway, 1998); self-reported happiness is lower when neighbors earn more (Luttmer, 2005); and envy can lead to merger waves (Goel and Thakor, forthcoming b).

[10] This does not preclude the possibility that relative-consumption-related increases in compensation may be facilitated by managerial entrenchment.

[11] Other contributions have focused on overconfidence and optimism. Recent theories that highlight how biases like overconfidence and optimism can affect various corporate decisions include Manove and Padilla (1999), Bernardo and Welch (2001), Heaton (2002), Van den Steen (2004), Coval and Thakor (2005), and Goel and Thakor (forthcoming a). Empirical evidence on overconfidence and optimism suggests that overconfident CEOs invest more aggressively and are more likely to engage in value-destroying mergers (Malmendier and Tate, 2005 and forthcoming); firms with overconfident CFOs maintain higher debt ratios and are less likely to pay dividends or repurchase shares (Ben-David, Graham and Harvey, 2007); optimistic individuals exhibit systematically different choices compared to others, such as holding less diversified portfolios (Puri and Robinson, 2007); and optimistic CEOs expect better future performance (Graham, Harvey and Puri, 2007).

[12] Kant (1785) defines envy as follows: "Envy (livor) is a tendency to perceive with displeasure the good of others, although it in no way detracts from one's own […]; it is however only an indirect, malevolent frame of mind, namely a disinclination to see our own good overshadowed by the good of others, because we take its measure not from its intrinsic worth, but by comparison with the good of others and then go on to symbolize that evaluation." Envy is common and experienced by most people regardless of their cultural background (e.g, Schoeck, 1969; Foster, 1972). Even monkeys experience envy. Brosnan and De Waal (2003) report that in experiments, if one monkey received a grape, considered a superior food, the other often refused the cucumber or threw food out of the cage. If one received a reward for doing nothing, then 80% of the time the other declined to participate further.

Important for this paper is the general view in this literature that people do not envy everyone, but only those in their own reference groups (e.g., Thomas Acquinas, 1265-1274; and Elster, 1991). This paper is the first to link relative-consumption preferences to the geography of CEO compensation.

3. METHODOLOGY, VARIABLE DESCRIPTIONS, AND SAMPLE

This section first explains the methodology. It then explains how distances are calculated and defines "geographic closeness". Finally, the variables and the sample are described.

3.1. Methodology

To test whether the compensation of geographically-close CEOs affects CEO compensation, the following model is estimated:

$$CEOcomp_{i,t} = \beta_0 + \beta_1 aveCEOgeoclose_{i,t-1} + B'X_{i,t-1} + \eta_i + \lambda_t \quad (1)$$

where $\text{CEOcomp}_{\text{i,t}}$ is CEO i's compensation in period t; $\text{aveCEOgeoclose}_{i,t-1}$ is the average compensation of CEOs geographically-close to CEO i in period t-1; X is a matrix of control variables including the average compensation of CEOs at similar-sized industry peers, CEO age, CEO tenure, firm size, growth options, firm performance, and proxies for local market conditions; η is an industry fixed effect (based on 17 Fama-French groupings); and λ is a year fixed effect.[13] All of these variables are defined in Section 3.3. Note that aveCEOgeoclose is lagged relative to CEOcomp in part to deal with the endogeneity concerns discussed earlier. Robust standard errors clustered by firm are reported.

3.2. Geographic Proximity

I obtain the location (city) of the headquarters of every firm in the sample from Compustat. Unfortunately, Compustat does not report a firm's actual location in each year, but backfills the data, i.e. it assigns the firm's most recent headquarter location to every year in the dataset. One could argue that headquarter relocations will only make it harder to find significance. Since it is

[13] Similar results are obtained if state fixed effects are added or if firm fixed effects are used instead of industry fixed effects (see Section 5.4).

better to use the actual location in every year, however, this data was hand-collected from 10Ks, IPO prospectuses, firms' websites, and Factiva.[14]

Each firm's actual headquarter location is then matched with latitude and longitude data from the Census 2000 U.S. Gazetteer. Compustat city names are checked to ensure that they correspond with the names found in the Gazetteer "places" files and are corrected when needed.[15] In case a Compustat city name could not be found on the Gazetteer file (90 instances), I check the actual location of the city on maps.google.com and assign the observation to the nearest place that is on the Gazetteer file within a 15 kilometer radius of the original location.

The distance between cities is estimated using the Haversine formula.[16] Firms that are headquartered within a 100-kilometer or a 250-kilometer radius of the firm are defined as being "geographically close" (e.g., Coval and Moskowitz, 2001; Malloy 2005; Kedia and Rajgopal, forthcoming; and Uysal, Kedia and Panchapagesan, forthcoming).

3.3. Variable Descriptions

The dependent variable in all regressions is CEOcomp, the dollar amount of CEO compensation. Results are qualitatively similar if a log specification is used instead (see Section 5.5). Three alternative definitions of compensation are used in the tests: salary, cash compensation, and total compensation. These variables are taken from ExecuComp (items: salary, total_curr, and tdc1, respectively). Salary is defined as the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation includes salary, bonus, long-term incentive payouts, other compensation, restricted stock grants, and the Black-Scholes value of stock option grants.

The key independent variable in most regressions is $aveCEOgeoclose_{i,t-1}$, the average dollar amount of CEO compensation received in the previous year by CEOs that work at firms that

[14] I gratefully acknowledge the help of Burch Keeley and Rimas Biliunas in collecting this data.

[15] The Gazetteer "places" files contain "cityfips", five-digit Federal Information Processing Standard (FIPS) codes that uniquely identify "populated places," including cities, towns, boroughs, villages and census districts.

[16] The haversine formula gives great-circle distances between two points on a sphere. The distance between cities 1 and 2 is calculated as $d_{12} = R \times 2 \times \arcsin(\min(1, \sqrt{a}))$, where R is the earth's radius (approximately 6371 kilometers), $a = (\sin(dlat / 2))^2 + \cos(lat_1) \times \cos(lat_2) \times (\sin(dlon / 2))^2$. In this expression, $dlat = lat_2 - lat_1$ and $dlon = lon_2 - lon_1$. Lat_1 and lon_1 (lat_2 and lon_2) are the latitudes and longitudes of $City_1$ and $City_2$, respectively.

are "geographically close."[17] Geographic closeness is defined using the 100-kilometer and 250-kilometer cutoffs described in Section 3.2. Compensation is again measured as salary, cash compensation, and total compensation.

Executive compensation committees often use data on executive compensation at companies of similar size in the same industry to assess the competitiveness of the compensation packages awarded to top management at their firms (e.g., Bizjak, Lemmon and Naveen, forthcoming). To ensure that the results are not merely driven by the compensation at similar-sized industry peers, I create industry-size terciles (based on total assets) in each year and assign each firm to the appropriate peer group in that year. The average compensation in the appropriate industry-size group in the previous year is included in the regressions as a control variable.[18]

Age is a well-recognized determinant of compensation and has been shown to be significantly related with CEO pay (e.g., Gibbons and Murphy, 1992; and Bognanno, 2001). I therefore control for the CEO's age in the regressions.

CEOs who have been in office longer may receive higher compensation because they are more reputable (e.g., Milbourn, 2003) or because longer tenure strengthens the CEO's ability to influence the board and hence, his compensation (Lorsch and Maciver, 1989; Hermalin and Weisbach, 1998; Baker and Gompers, 2003; and Fahlenbrach, forthcoming). To capture this dimension of governance, CEO tenure, defined as the number of years the executive has been the firm's CEO, is included in the regressions.

The CEO pay literature finds that compensation tends to be highly correlated with organization size and growth opportunities, presumably because it requires greater skill to manage a larger, more complex company with higher growth prospects (e.g., Rosen, 1982; and Smith and Watts, 1992). Firm size and growth opportunities are therefore added as control variables. Firm size is measured as total assets as of the prior fiscal year end. Growth opportunities are measured by the firm's market-to-book (M/B) ratio, calculated as the market value of equity divided by the book value of equity as of the prior fiscal year end.

[17] As indicated before, the average compensation of geographically-close CEOs does *not* include the CEO's own compensation in the prior year.
[18] The average compensation at similar-sized industry peers *excludes* the CEO's own compensation in the prior year.

Agency theory suggests a positive relationship between firm performance and CEO compensation (e.g., Holmstrom, 1979). Two measures of firm performance are included: stock returns and profitability. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end.

CEO compensation may be higher in areas in which the average income of *all* geographically-proximate people is higher. To ensure that this does not drive the results, I obtain the average per capita income for every locality in my study from the 2000 decennial Census. For consistency, the *average* per capita income is calculated using the same 100-kilometer distance cutoff as before.

Since CEO pay may be greater in areas with a higher cost of living, it is important to control for differences in the cost of living. I obtain cost of living data from C2ER, the Council for Community and Economic Research.[19] Every quarter, C2ER publishes the well-known ACCRA Cost of Living Index. This index is constructed as follows. Every quarter, C2ER obtains pricing data on six major consumer expenditure categories (grocery items, housing, utilities, transportation, health care, and miscellaneous goods and services) from chambers of commerce, economic development agencies and universities in over 300 U.S. cities. C2ER then applies weights to these categories based on data from the U.S. Bureau of Labor Statistics' 2004 Consumer Expenditure Survey to obtain the actual cost of living in each participating place. These cost of living numbers are then used to construct the ACCRA Cost of Living Index: the average price level of all participating places in a quarter is set to 100, and each place's score is expressed as a percentage of this average. For example, in 2006, cost of living in the most expensive place (New York City) was 214.7 percent of the average while that in the least expensive place (Joplin, MO) was 82.0 percent of the average. The ACCRA Cost of Living Index is available for virtually every place in my sample for most years. I calculate the *average* cost of living using the same 100-kilometer distance cutoff as before

[19] I am grateful to C2ER for providing me with their ACCRA cost of living index for the geographic areas in my sample in the fourth quarter of every year.

Although not reported, industry fixed effects (based on the 17 Fama-French groupings) and time fixed effects are included in most regressions to help control for potential omitted industry- and time-invariant variables.[20]

3.4. Sample

Data on CEO compensation (described in Section 3.3) are retrieved for all firms included in the ExecuComp database from 1992 to 2006. Following Milbourn (2003), three ExecuComp variables are used to classify whether an executive was the firm's CEO during the fiscal year: "Became CEO", "Left Office", and "Month of fiscal year-end". In particular, if a CEO left office during the fiscal year, the executive is classified as the firm's CEO in that fiscal year only if the person remained in office for at least six months; a similar six-month rule is applied for newly-appointed CEOs.

CEO compensation data are complemented with data from Compustat and CRSP to calculate the variables described in Section 3.3. Latitude and longitude data, needed to calculate the distance between firms' headquarters, are obtained from the 2000 Census Gazetteer files.

The final sample includes 16,243 CEO-year observations.[21] Table 1 Panel A contains key summary statistics on the regression variables. Panels B and C show the top and bottom 25 cities, respectively, in average compensation of CEOs at firms headquartered within a 100-kilometer radius in 2005.

Place Table 1 here

4. REGRESSION RESULTS

This section establishes that the remuneration of geographically-close CEOs has a significant impact on CEO compensation. The results are obtained from regressions of CEO compensation (CEOcomp) on the average compensation of CEOs that work at firms that are headquartered within a 100-kilometer or 250-kilometer radius (aveCOMPgeoclose) plus control variables. Three compensation measures are used: salary, cash compensation, and total compensation. All

[20] As noted before, similar results are obtained when firm fixed effects are used instead of industry fixed effects or when state fixed effects are added (see Section 5.4).
[21] I impose the restriction that all variables included in the base regressions are available.

regressions include year and industry fixed effects. Industries correspond to the 17 Fama-French industry groupings. t-statistics are based on robust standard errors clustered by firm.

Table 2 reports the main regression results. In Panels A and B, geographic proximity is measured as firms headquartered within a 100-kilometer and a 250-kilometer radius, respectively. Each panel contains three columns showing the results based on the three compensation measures: salary, cash compensation, and total compensation.

The results in Panel A show that the coefficients on the average compensation of CEOs in a 100-kilometer radius are positive and statistically significant at the 1% level in the salary and cash compensation regressions (t-statistics of 6.25 and 6.14, respectively), and at the 10% level in the total compensation regression (t-statistic of 1.88). Results based on a 250-kilometer radius are similar (see Panel B). Note that the coefficients on the average compensation of CEOs in the same industry-size tercile are also highly significant, consistent with the view that compensation consultants and executive compensation committees do take the compensation at similarly-sized firms in the same industry into account when setting CEO pay.

The results are economically significant as well. For example, in Panel A, the coefficient on the average salary of geographically-proximate CEOs is 0.292, suggesting that if other CEOs within a 100-kilometer radius enjoyed a $1 salary increase in the previous year, the CEO will experience a $0.292 increase in salary this year *ceteris paribus*. The magnitude of this effect is 35% of the magnitude of the effect of industry-peer compensation. The effect of geography on cash compensation is similar in size, but its effect on total compensation is somewhat smaller. A $1 increase in cash compensation (total compensation) experienced by geographically-close CEOs in the previous year results in a $0.291 ($0.120) increase in CEO cash compensation (total compensation) this year. Results are similar if a 250-kilometer radius is used instead of a 100-kilometer radius.

The results permit a simple, albeit qualified, thought experiment: how would moving a firm's headquarter from a bottom-25 city (in terms of average compensation of geographically-close CEOs) to a top-25 city affect CEO compensation, *ceteris paribus*? The data suggest that if we were to move a company from say San Diego, CA (a bottom-25 city) to New York City (a top-25 city) in 2006, the CEO's salary would improve by 19%, the CEO's cash compensation would

increase by 60%, and total compensation would go up by 40%, *ceteris paribus*.[22] However, such a calibration exercise must be interpreted with caution, since it extrapolates results based on local linearity assumptions that may not be valid globally.

The results in this section suggest that the compensation of geographically-proximate CEOs is an important determinant of CEO pay.

Place Table 2 here

5. ROBUSTNESS CHECKS

The effect of geography on compensation is puzzling from the standpoint of optimal contracting theory. This theory suggests that the CEO's compensation should depend on his reservation utility, his disutility for effort, his risk aversion, the risk in the payoff (e.g., Holmstrom, 1979), and possibly his perceived ability (e.g., Holmstrom and Ricart i Costa, 1986). Geography has no role to play. In this section, I perform a variety of robustness checks to see if the surprising effect of geography on CEO compensation goes away when additional variables are introduced as controls or when alternative specifications are used.

5.1. Effect of firm age

The first robustness check is to see if the results documented thus far may be driven by firm age. Younger firms are likely to have more recent relationships with venture capital (VC) firms and are more likely to be run by their founders. Thus, their compensation practices may differ from those of more established firms run by non-founder professional managers who are also distant from VCs. If coincidentally younger firms tend to cluster geographically (e.g., Silicon Valley), then the effect of geography on executive compensation would be illusory. To check this, I introduce firm age as a control variable. I calculate firm age as the number of years since the firm first appeared on CRSP.

Table 3 shows the results. As before, in Panels A and B, geographic closeness is measured as firms headquartered within a 100-kilometer and a 250-kilometer radius, respectively. Each

[22] For example, the average salaries of geographically-close CEOs were $576K in San Diego and $955K in New York, resulting in a percentage increase in salary of 0.292 * ($955K - $576K) / $576K = 19%.

panel contains three columns showing the results based on the three compensation measures: salary, cash compensation, and total compensation.

The coefficient on firm age is positive and significant in all specifications, suggesting that compensation is significantly higher at older firms. The coefficients on the average salary and cash compensation of geographically-close CEOs remain positive and significant at the 1% level in all cases, while the coefficients on total compensation are positive and significant at the 5% – 10% level. This evidence suggests that differences in firm age cannot explain the persistent effect of geography on CEO compensation.

Place Table 3 here

5.2. Governance: Monitoring by Directors

In the main specification, I only use CEO tenure to control for differences in corporate governance across firms. The existing literature, however, has found that a variety of governance proxies may affect CEO compensation, which raises the possibility of omitted corporate governance variables driving the results. One aspect of governance that may be particularly relevant is monitoring by directors. Such monitoring may be more effective when the board is composed of more outside directors, i.e. board members who are not current executives, retired executives, or the family of present or past management. Although the evidence is inconclusive, the papers in this literature tend to find a positive relation between CEO compensation and the fraction of outside directors (e.g., Lambert, Larcker and Weigelt, 1993; and Core, Holthausen and Larcker, 1999). The effect of director monitoring may also be related to board size (e.g., Yermack, 1996). Board size has been found to be positively related with CEO pay (e.g., Core, Holthausen and Larcker, 1999).

To examine the possibility of the results being driven by differences in board composition and board size across firms, these two variables are added as control variables to the regressions. The number of outside directors and board size are obtained from The Corporate Library's directorships database.[23] The fraction of outside directors is calculated as the number of outsiders divided by the total number of directors.

[23] Since this data is only available from 2001 onward, the analyses in this section focus on 2001 – 2006.

Table 4 presents the results. As before, in Panels A and B, geographic closeness is measured as firms headquartered within a 100-kilometer and a 250-kilometer radius, respectively. Each panel contains three columns showing the results based on the three compensation measures: salary, cash compensation, and total compensation.

Consistent with the existing literature, the fraction of outside directors and board size have a positive (albeit not always significant) effect on CEO pay. Importantly, however, the coefficients on the average compensation of geographically-close CEOs remain positive and highly significant based on salary and cash compensation.[24]

Place Table 4 here

5.3. Governance: Shareholder Rights and Leverage

Besides board monitoring, other aspects of governance could also potentially drive my results. Gabaix and Landier (forthcoming) examine the effect of shareholder rights on CEO pay. They use the Gompers, Ishii and Metrick ("GIM") (2003) governance index, which focuses on provisions and firm-level rules that restrict shareholder rights or increase managerial power, for this purpose. They find that poor governance (higher GIM) significantly increases CEO compensation.

Leverage may matter as well. First, debtholders provide monitoring services that differ from those provided by shareholders. Their mere presence may affect CEO compensation. Second, debt is a "hard claim" that disciplines management (Hart, 1993; and Hart and Moore, 1995). This effect too may influence CEO compensation. Third, when leverage increases, the agency costs of debt go up *ceteris paribus*. John and John (1993) predict that optimal CEO compensation has pay-for-performance sensitivity that is decreasing in leverage because this diminishes the CEO's incentive to act solely in the shareholders' interest and expropriate wealth from the bondholders. Pay-for-performance sensitivity affects the CEO's compensation risk and thus leverage may also affect the *level* of compensation. To examine the possibility that shareholder rights or leverage explain my results, the GIM index and leverage, defined as the debt-to-asset ratio as of the previous fiscal year-end, are added to the regressions.

[24] The coefficients on total compensation lose significance. This is consistent with Chhaochharia and Grinstein (forthcoming), who find that the equity/option-based component of CEO compensation is lower at firms with boards that are more independent.

Table 5 contains the results. In Panels A and B, geographic closeness is again measured as firms headquartered within a 100-kilometer and a 250-kilometer radius, respectively. Consistent with existing evidence, the coefficients on the GIM index tend to be positive and significant, suggesting that CEO compensation is higher when shareholder rights are poorer (higher GIM). The coefficients on leverage are positive and significant in four out of six cases.[25] However, the coefficients on the compensation of geographically-close CEOs continue to be positive and significant in all but one case.

Place Table 5 here

5.4. Adding State Fixed Effects and Using Firm Fixed Effects

The regressions so far included year and industry fixed effects to deal with unobserved time and industry heterogeneity. It is possible, however, that there are regional differences in compensation as well. That is, social norms may affect CEO compensation and these may differ across regions. For example, CEOs in the Midwest may be paid systematically differently compared to CEOs in the South. To address this, I rerun the regressions and add state fixed effects.

Table 6 Panel I contains the regression results. In subpanels I-A and I-B, geographic proximity is measured as firms headquartered within a 100-kilometer and a 250-kilometer radius, respectively. The coefficients on the average compensation of geographically-close CEOs remain highly significant using a 100-kilometer radius, and are also significant based on salary and cash compensation using a 250-kilometer radius.

Consistent with the literature on the level of CEO compensation (e.g., Core, Holthausen and Larcker, 1999; Milbourn, 2003; and Gabaix and Landier, forthcoming), I have included year and industry fixed effects. However, my sample includes multiple observations per firm, which suggests that the t-statistics may be somewhat overstated. To mitigate this issue, I rerun the regressions including firm fixed effects.[26]

[25] Because there is no existing theory that directly links leverage to the level of CEO compensation, it is difficult to say whether the sign of the coefficient on leverage is what we should expect. One possible way to understand what I find is that leverage increases the risk of bankruptcy and hence the probability that the CEO's tenure with the firm will be terminated, so the CEO is compensated for that risk through higher compensation (e.g., Jaggia and Thakor,1994).

[26] The use of firm fixed effects led me to drop the industry fixed effects from the regressions.

Table 6 Panel II contains the results. In subpanels II-A and II-B, geographic closeness is measured using the usual distance cutoffs (100-kilometer and 250-kilometer radius). Using firm fixed effects rather than industry fixed effects, the coefficients on the average compensation of geographically-close CEOs are smaller than before, but the t-statistics indicate that the results remain statistically significant at the 5% level based on salary and cash compensation (in all cases) and at the 10% level based on total compensation (in one out of two cases).

Place Table 6 here

5.5. Specification in Logs

Consistent with the approach in Core, Holthausen and Larcker (1999), Faulkender and Yang (2007) and Kuhnen and Zwiebel (2007), the regression results presented so far were obtained using untransformed data. The dollar amount of CEO compensation was regressed on the average dollar amount of compensation earned by geographically-close CEOs plus control variables that – where appropriate – were also expressed in levels (industry-peer compensation, firm size, per capita income and cost of living). An alternative would be to estimate the regressions using log transformations. Amacon (1975), for example, shows that guide charts used by human-resource specialists to set compensation levels are obtained by regressing the logarithm of compensation on the logarithm of firm size. To examine whether using a log-transformed specification alters my findings, I rerun the regressions using log(compensation), log(average compensation of geographically-close CEOs), log(average compensation at similar-sized industry peers), log(firm size), log(per capita income) and log(cost of living).

Table 7 contains the results of this log-transformed specification. As before, in Panels A and B, geographic closeness is measured as firms headquartered within a 100-kilometer and a 250-kilometer radius, respectively. Each panel contains three columns showing the results based on the three compensation measures: salary, cash compensation, and total compensation.

All the coefficients on the logarithm of the average compensation of geographically-close CEOs are positive and significant at the 1% or 5% level. The coefficient on the average salary of geographically-proximate CEOs of 0.115 presented in the first column of Panel A suggests that, ceteris paribus, when the salaries of geographically-close CEOs increase by 10%, CEO salary goes

up by over 1%. This effect of geography equals roughly half of the effect the average compensation of CEOs at similar-sized industry peers has on CEO compensation, a sizeable effect.

Importantly, the effect of geography on CEO compensation persists even when log-transformed variables are used.

Place Table 7 here

5.6. Evidence from One Industry: Electric Utilities

Consistent with the existing literature, the results presented so far include industry fixed effects (with the exception of a robustness check in Section 5.4). However, the validity of using industry fixed effects hinges on two critical assumptions: where a firm locates its headquarters is not an endogenous choice, and within each industry different technologies adopted by firms do not imply different optimal locations (see Hong, Kubik and Stein, forthcoming). These two assumptions may not be met in the preceding analysis. For example, a firm that relies heavily on the human capital of computer experts may be more likely to locate in Silicon Valley, and a firm that uses land-intensive technologies may choose a location with cheap real estate. To ensure that these factors do not drive the results, I rerun the main regressions using a subsample of electric utilities (SIC codes 4911 and 4931), as suggested by Hong, Kubik and Stein (forthcoming). Production technologies employed by utilities are relatively homogeneous in different parts of the U.S. and high transportation costs in this industry tend to minimize the endogenous location-selection effect. All of the previously-used control variables are included in the regressions, except that the average compensation at similar-sized industry peers is now based on electric utilities only. As before, the CEO's own compensation is excluded from the industry average.

Table 8 contains the results. In Panels A and B, geographic closeness is again measured as firms headquartered within a 100-kilometer and a 250-kilometer radius, respectively. When compensation is defined as salary or cash compensation, the coefficients on compensation are positive and significant in all cases. It is not surprising that the coefficients based on total compensation are positive but only significant in one out of two cases, since CEO stock and option plans are less prevalent in this industry.

It is actually remarkable to detect signs of a geographic component in CEO pay at electric utilities. These firms operate in a highly-regulated industry and CEO compensation is (partially) regulated as well. Thus, finding generally consistent results based on restricting the sample to electric utilities reinforces the main findings.

Place Table 8 here

5.7. Exclude New York and California

To ameliorate concerns that New York and California, whose compensation practices may differ from those in other states, are exercising a disproportionate influence on the results, the regressions are rerun using a sample that excludes these two states.

Table 9 contains the results. The coefficients on the compensation variables tend to be somewhat smaller than those shown in Table 2. However, the coefficients on salary and cash compensation continue to be positive and significant at the 1% level. Coefficients are not significant based on total compensation. Thus, the inclusion of New York and California does not seem to drive the main results.[27]

Place Table 9 here

5.8. Summary of Findings

In this section, various robustness checks were performed to examine whether the surprising effect of geography on CEO compensation goes away after introducing additional control variables or using alternative specifications. While the results based on total compensation continued to be significant in roughly half the cases, the results based on salary and cash compensation were shown to remain significant in *all* cases, generally at the 1% level.

In the remainder of this paper, results based on total compensation are therefore merely shown for completeness. The discussion will focus on salary and cash compensation.

6. POTENTIAL EXPLANATIONS

[27] Results are qualitatively and quantitatively similar when New Jersey is also excluded.

In this section, I attempt to empirically distinguish between three potential drivers of the result that the average salary and cash compensation of geographically-close CEOs has a significant impact on CEO compensation: local competition for talent, a leading firm effect, and relative-consumption preferences.

6.1. Local Competition for CEOs Effect?

One possibility is that the results are driven by the effect of local labor market competition for CEOs. Such competition would tend to raise the compensation of all CEOs in an area in which the labor market is tight and lower it in an area in which the labor supply is ample, which would lead to geographic clustering of compensation (e.g., Vietorisz and Harrison, 1973; and Kennan and Walker, 2008).[28] Given that the ExecuComp database includes only relatively large, listed companies, it seems unlikely that local labor market competition for CEOs is driving the results, since one may expect the force of such competition at these firms to be relevant only for the compensation of lower-level employees. Nonetheless, this issue is now examined.

For this examination, I limit the sample to the largest and most prominent companies in the U.S., those that were part of the S&P 500 in the previous year. The labor market for the CEOs at these firms should be global or national rather than local, and their compensation should therefore *not* exhibit geographic clustering due to local labor market competition. That is, if the results are driven by this local competition for talent effect, the coefficients on the average compensation of geographically-close CEOs should be smaller than those presented in Table 2 and not significant using this restricted sample.

Table 10 contains the results. As before, in Panels A and B, geographic closeness is measured as firms headquartered within a 100-kilometer and a 250-kilometer radius, respectively. Contrary to what the local-competition-for-CEOs effect predicts, the coefficients on the average salary and cash compensation of geographically-close CEOs tend to be bigger than before and continue to be positive and statistically significant at the 1% level. This means that even at the largest and most prominent firms, for which CEO labor markets should be global or national and

[28] Kedia and Rajgopal (forthcoming) show that geographic clustering exists in the offering of stock options to rank-and-file employees.

compensation should be unaffected by local labor market conditions, geography affects CEO compensation. Thus, the link between geography and CEO compensation does *not* seem to be driven entirely by local labor market competition for CEOs.

Place Table 10 here

6.2. Leading Firm Effect?

The leading firm effect is suggested by the literature on social interaction which proposes that agents may be influenced by others (e.g., Murphy, Shleifer and Vishny, 1993). Initially, a few leading agents adopt a practice, and subsequent social interaction with these leaders causes others to adopt the practice as well. Glaeser, Sacerdote and Scheinkman (1996) argue that not all agents are equal: some agents influence their neighbors but cannot themselves be influenced. Kedia and Rajgopal (forthcoming) use this insight to examine whether the existence of leading firms can explain observed geographic differences in option grants.[29] In the context of this paper, the social interaction effect suggests that leading firms determine the compensation levels for their CEOs and geographically-proximate firms follow suit, generating the link between geography and executive compensation that I find. This possibility is now examined.

As a first test, the base regressions are rerun while limiting the sample to leading firms. That is, I ask: is the compensation of CEO i in a leading firm influenced by the average compensation of CEOs at other firms in the geographic vicinity? If my results are driven by leading firms, the coefficients on the compensation of geographically-close CEOs should now be insignificant since leading firms – by assumption – cannot be influenced. Leading firms are defined here as the top three firms within a 100-kilometer radius based on sales or market value of equity in the previous year (e.g., Kedia and Rajgopal, forthcoming). Firms that act as leading firms to any firm in the main sample are kept in the leading firm sample.

Table 11 contains the results. In Panels A1 and A2, firms are identified as leading firms based on sales and market value of equity, respectively. As before, each panel contains three columns, one for each of the three compensation measures. Contrary to what the leading-firm

[29] They hypothesize that, for example in the Seattle area, some firms may have adopted option plans because the leading firm – Microsoft – had adopted such a plan.

effect predicts, the coefficients on the average salary and cash compensation of geographically-proximate CEOs are larger in size than those presented in Table 2 and significant at the 1% level.

As a second test, the base regressions from Table 2 are rerun, but in computing the average compensation of CEOs within a 100-kilometer radius, attention is limited to just the CEO compensation at the leading (top three) firms. These leading firms are subsequently excluded from the regressions. If the compensation at geographically-close leading firms (rather than all geographically-close firms) is driving the results, the coefficients on these alternative average CEO compensation measures should be larger than those presented in Table 2 and more significant.

Table 11 Panels B1 and B2 present the results, identifying firms as leading firms based on sales and market value of equity, respectively. The coefficients on the average salary and cash compensation of geographically-close CEOs employed at top three firms are positive and significant at the 1% level. However, contrary to what the leading-firm effect predicts, the coefficients are tiny compared to those presented in Table 2 and the t-statistics are smaller.

The evidence presented in this section suggests that my findings are not driven by a leading-firm effect.

Place Table 11 here

6.3 Explanation Based on Relative Consumption Preferences

In this section, I examine whether relative status concerns or envy can explain why geography affects CEO compensation. Since reference groups for CEO envy are composed of CEOs at similar-sized firms, firms in the same industry, and those in the vicinity, I use controls for CEO compensation at similar-sized industry peers in order to delineate the effect of geography.

A strong implication of the envy hypothesis is that the effect of relative status concerns will be bigger the further the CEO's pay lies below the average compensation of geographically-close CEOs and smaller the further his pay lies above the average.[30] That is, the effect of envy

[30] The effect of envy is not limited to those who earn less than the average. The following quote from The New York Times ("In web world, rich now envy the superrich", Nov. 21, 2006) supports this view: "Almost anywhere else, Reid Hoffman would be considered a major success. As an early executive of PayPal, he was in the money when the company was sold to eBay in 2002 for $1.5 billion. These days, he runs a new start-up company of his own while

will be increasing in the difference between the average compensation of geographically-proximate CEOs and the CEO's own compensation. As an initial test of the envy hypothesis, I therefore regress the percentage change in CEO compensation on the CEO's "percentage compensation gap", the difference between the compensation of geographically-close CEOs and the CEO's own compensation expressed as a percentage of the CEO's own compensation, plus control variables. The control variables are similar to those included in the previously-reported regressions, except that the compensation at similar-sized industry peers has been replaced with the percentage compensation gap between similar-sized industry peers and the CEO. In addition, firm size and profitability have been replaced with the change in firm size, and the change in profitability.[31] The compensation wage gap and these new control variables are all measured as of the previous fiscal year-end. If envy drives the result that geography affects CEO compensation, the coefficient on the compensation gap between geographically-close CEOs and the CEO should be positive and significant.[32]

Table 12 contains the results. As before, in Panels A and B, geographic closeness is measured as firms headquartered within a 100-kilometer and a 250-kilometer radius, respectively. Consistent with the envy hypothesis, for all three compensation measures, the coefficients on the percentage compensation gap between geographically-close CEOs and the CEO are positive and significant.

Note that this result cannot be explained away as a mere "economic reversion to the mean" effect. The results do suggest that the CEO is catching up with the mean wage of CEOs in the

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investing in others. But when greater fortunes are made — as happened recently to three former PayPal colleagues when YouTube was sold to Google for $1.65 billion — Mr. Hoffman said he could not avoid a twinge of envy.

"It's kind of embarrassing," said Mr. Hoffman, 39, whose start-up, a business-oriented social-networking site called LinkedIn, is almost four years old. "You started a year or two earlier, and they start after you and then this thing zips right past you and gets the golden results. Envy may be a sin in some books, but it is a powerful driving force in Silicon Valley, where technical achievements are admired but financial payoffs are the ultimate form of recognition." [..]

Reference points only make matters worse, Mr. de Botton said. He pointed to research that has been done on attractive women who feel ugly when surrounded by images of more beautiful women. "Very often the problem isn't so much what an individual happens to look like, but the extraordinary comparisons being made," he said."

[31] Results are qualitatively similar if only firm size and profitability are replaced.

[32] Since envy reference groups also include CEOs of similar-sized firms in the same industry, the coefficient on the compensation gap between similar-sized industry peers and the CEO is also predicted to be positive. However, this effect is difficult to disentangle from a mere "catching up with the mean" story, since compensation specialists focus explicitly on CEO pay at similar-sized firms in the same industry when setting CEO compensation (e.g., Bizjak, Lemmon and Naveen, forthcoming).

neighborhood, but it is a mean that should be irrelevant according to standard optimal contracting theory. Thus, the evidence presented in this section suggests that envy may drive my finding that geography affects CEO compensation.

Place Table 12 here

6.4. Explanation Based on Relative-Consumption Preferences – Instrumental Variable Regressions

This section examines the robustness of the conclusion that relative status concerns or envy drive the documented geographic clustering of CEO compensation. Two potential concerns are addressed. The first is a possible omitted variable bias. Even though the OLS regressions control for a variety of previously-documented factors that affect CEO compensation, such as CEO age, CEO tenure, firm size, industry, and corporate governance, one cannot entirely dismiss the possibility that an omitted variable unrelated to either geography or relative-consumption concerns is causing the compensation of all CEOs in a given geography to be similar. The second concern is endogeneity. Although I hypothesize that the compensation of CEO i (dependent variable) is driven by the average compensation of all CEOs in the area (independent variable), the causality may be reversed. After all, CEO compensation is based on the benchmarking data of other CEOs. Of course, compensation benchmarking is normally based on firm size and industry (factors controlled for in the regressions), not geography, so the strong effect of envy working through geography that is documented here cannot be waved away based on just compensation benchmarking. Moreover, in all the regressions presented in this paper, the independent variable is lagged to deal with potential endogeneity concerns. And at a more fundamental level, to the extent that relative consumption concerns of geographically-close CEOs cause them to receive higher levels of compensation because CEO i had a high compensation (reverse causality), the main argument is unaffected.

Nonetheless, I deal with both of the concerns above and check the robustness of my results that CEO i's salary in period t was affected by the salaries of other CEOs in the area in period t-1 by performing an instrumental variable analysis. I use the compensation of top professional sports stars in the area as an instrument for the compensation of geographically-close CEOs. What

professional athletes make is not used in bechmarking for setting CEO compensation, so this variable cannot have a direct impact on CEO i's compensation through routine benchmarking. Moreover, sports stars function in their own league labor markets and their salaries are unlikely to be affected by what the CEOs in their geographies make. However, the wages of sport stars are very public and represent salient information that could cause an individual CEO as well as the collection of geographically-close CEOs to be envious, which could positively affect their wage demands. This makes the wages of sports stars a good instrument for verifying the effect of envy.

Data on the salaries of all professional sports players is obtained from *USA Today's* salaries database. This database contains data on individual salaries (typically including signing bonus) of: Major League Baseball (MLB) players from 1988-2008; National Basketball Association (NBA) players from 2001-2006; National Football League (NFL) players from 2000-2007; and National Hockey League (NHL) players from 2000-2007 (except 2004). Thus, I have sufficient data for all the years in my sample period based on MLB players, and for roughly half the years based on NBA, NFL, and NHL players. The average compensation of geographically-close sports players is calculated based on the salary (including bonus) data of, respectively, all MLB, NBA, NFL, and NHL players within a 100-kilometer radius. Since I only have "cash compensation" (salary plus bonus data combined) for sports players, I use this as an instrument for CEO cash compensation.[33]

In the first-stage regressions, the average cash compensation of geographically-close CEOs is regressed on all the exogenous variables plus the instrument, the average cash compensation of geographically-close professional sports players. I find that the coefficient on the instrument is positive and significant at the 1% level based on all four sports. In the second-stage regression, CEO compensation is regressed on the fitted or predicted values of the average cash compensation of geographically-close sports players plus all other exogenous variables.

Table 13 shows the second-stage instrumental variable regressions. The results are similar to my main findings – the coefficient on the average compensation of geographically-close CEOs (instrumented) is positive and significant based on MLB data, the only sports league for which

[33] Similar results are obtained if the compensation of sports players is used as an instrument for CEO salary (rather than cash compensation).

data are available for all years. The coefficient on the average compensation is also positive and significant in two out of the three remaining specifications. Thus, the instrumental variable analysis confirms the main result that envy appears to be the channel through with the compensation of geographically-proximate CEOs affects the compensation of individual CEOs.

Place Table 13 here

7. SUMMARY AND CONCLUSION

This paper has examined whether CEO compensation depends on how much geographically-close CEOs earn. The documented results show that CEO compensation exhibits a strong geographical bias: CEO compensation (salary and cash compensation) is positively and significantly related to the level of compensation of CEOs employed at firms headquartered within a 100-kilometer or 250-kilometer radius. These results were obtained while controlling for other factors that have been found to affect CEO compensation, including CEO age, CEO tenure, firm size, growth options, firm performance, year and industry fixed effects. All regressions also included the average compensation of similar-sized firms in the same industry. Proxies for local market conditions were included to ensure that the results are not driven by differences in per capita income or the cost of living. The results are robust to using a variety of alternative specifications, including: the addition of corporate governance proxies; excluding New York and California from the sample; limiting the sample to electric utilities; the use of log-transformed variables; and the use of state or firm fixed effects. All t-statistics are based on robust standard errors clustered by firm.

Three potential explanations for this effect were examined. First, it may be that the results are driven by the effect of local labor market competition for CEOs, which would tend to raise the compensation of all CEOs in the area when the local labor market is tight and lower it when the labor supply is ample. I find that this effect cannot explain the results. Second, it is possible that CEO compensation reflects the social-interaction effect proposed by Murphy, Shleifer and Vishny (1993) and Glaeser, Sacerdote and Scheinkman (1996), which would predict that CEO compensation is influenced by compensation policies at leading firms (rather than all firms) in the vicinity. Specific empirical tests to check this as a possible cause of the effect of geography

indicate that this "leading-firm effect" cannot explain my findings. Third, it is possible that CEOs exhibit envy, and their concern with the compensation of geographically-proximate CEOs in their reference group could lead to geographical clustering of CEO pay. The empirical evidence strongly supports this hypothesis. The robustness of this conclusion to omitted variable and endogeneity concerns is verified using instrumental variable (IV) regressions in which the average cash compensation of geographically-close CEOs is instrumented by the average cash compensation of professional sports players (MLB, NBA, NFL, and NHL) within a 100-kilometer radius. Results from the IV regressions confirm the results of the OLS regressions.

The results from this paper add to a growing literature that finds that CEO characteristics affect corporate policies. While the focus in the literature has largely been on CEO overconfidence and CEO optimism, this paper is part of a small but growing literature which shows empirically that relative-consumption preferences may also influence corporate policies.

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Table 1: Summary Statistics

This table provides summary statistics on the regression variables (Panel A), and the top and bottom 25 cities in average compensation of CEOs at firms headquartered within a 100-kilimeter radius in 2005 (Panels B and C, respectively).

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research.

Panel A: Summary Statistics on the Regression Variables

	N	mean	median	std dev
CEO compensation:				
Salary ($K)	16243	638	590	340
Cash compensation ($K)	16243	1,352	948	1,549
Total compensation ($K)	16243	4,805	2,231	21,114
Average compensation of geographically-close CEOs:				
100-kilometer radius:				
Salary ($K)	16243	592	584	126
Cash compensation ($K)	16243	1,288	1,149	561
Total compensation ($K)	16243	4,073	3,654	2,494
250-kilometer radius:				
Salary ($K)	16243	601	597	108
Cash compensation ($K)	16243	1,332	1,211	485
Total compensation ($K)	16243	4,268	3,928	2,197
Control variables:				
Avg. industry compensation				
Salary ($K)	16243	603	563	224
Cash compensation ($K)	16243	1,282	1,031	827
Total compensation ($K)	16243	4,316	2,984	3,732
CEO age (years)	16243	55.55	56.00	7.47
CEO tenure (years)	16243	8.04	5.75	7.50
Firm size ($M)	16243	10,742	1,240	52,385
M/B ratio	16243	2.73	2.07	2.00
Stock returns (%)	16243	1.79	1.48	4.22
Profitability (%)	16243	3.48	4.45	10.13
100-kilometer radius:				
Per capita income ($K)	16243	23.29	22.22	6.31
Cost of living	16243	119.17	106.20	29.71
250-kilometer radius:				
Per capita income ($K)	16243	22.60	22.26	5.21
Cost of living	16243	113.41	105.05	20.12

Panel B: Top 25 Cities in Average Compensation of CEOs at Firms Headquartered within a 100-Kilometer Radius in 2005

	Salary		Cash Compensation		Total Compensation	
Rank	City	State	City	State	City	State
1	Columbus	GA	Fresno	CA	Mosinee	WI
2	Evansville	IN	Montgomery	AL	Montgomery	AL
3	Montgomery	AL	Spring Lake	NJ	Spring Lake	NJ
4	Las Vegas	NV	Budd Lake	NJ	Budd Lake	NJ
5	Mosinee	WI	Princeton	NJ	Princeton	NJ
6	Spring Lake	NJ	Carpinteria	CA	White House Station	NJ
7	Budd Lake	NJ	Coral Gables	FL	Red Bank	NJ
8	Princeton	NJ	White House Station	NJ	East Brunswick	NJ
9	White House Station	NJ	Red Bank	NJ	Hauppauge	NY
10	Red Bank	NJ	East Brunswick	NJ	Kenilworth	NJ
11	East Brunswick	NJ	Hauppauge	NY	Plainview	NY
12	Hauppauge	NY	Kenilworth	NJ	Watchung	NJ
13	Kenilworth	NJ	Plainview	NY	New York	NY
14	Mountain Lakes	NJ	New York	NY	Morristown	NJ
15	Plainview	NY	Mountain Lakes	NJ	Mountain Lakes	NJ
16	Morristown	NJ	Morristown	NJ	Society Hill	NJ
17	New York	NY	Watchung	NJ	Madison	NJ
18	Watchung	NJ	Madison	NJ	Chatham	NJ
19	Madison	NJ	Society Hill	NJ	Menomonee Falls	WI
20	Chatham	NJ	Chatham	NJ	Bridgeport	CT
21	Society Hill	NJ	Menomonee Falls	WI	Danbury	CT
22	Menomonee Falls	WI	Bridgeport	CT	Westport	CT
23	Bridgeport	CT	Pembroke Pines	FL	Norwalk	CT
24	Danbury	CT	Danbury	CT	Milwaukee	WI
25	Westport	CT	Westport	CT	Butler	WI

Panel C: Bottom 25 Cities in Average Compensation of CEOs at Firms Headquartered within a 100-Kilometer Radius in 2005

	Salary		Cash Compensation		Total Compensation	
Rank	City	State	City	State	City	State
1	Elkhart	IN	Elkhart	IN	Elkhart	IN
2	Fort Smith	AR	Battle Creek	MI	Battle Creek	MI
3	Battle Creek	MI	Little Rock	AR	Benton Harbor	MI
4	Benton Harbor	MI	Benton Harbor	MI	Fort Smith	AR
5	Monroe	LA	Monroe	LA	Little Rock	AR
6	Zeeland	MI	Carthage	MO	Monroe	LA
7	Quincy	IL	State College	PA	Zeeland	MI
8	Broomfield	CO	Fort Smith	AR	San Diego	CA
9	Fort Collins	CO	Zeeland	MI	Exton	PA
10	Exton	PA	Exton	PA	Carthage	MO
11	State College	PA	Buffalo	NY	Poway	CA
12	Jackson	MS	Camp Hill	PA	Tulsa	OK
13	Ankeny	IA	Quincy	IL	Santa Barbara	CA
14	Buffalo	NY	Portland	OR	Quincy	IL
15	Camp Hill	PA	McConnellsburg	PA	Honolulu	HI
16	Watsonville	CA	Lafayette	LA	Columbus	GA
17	Lafayette	LA	Watsonville	CA	Palm Beach Gardens	FL
18	McConnellsburg	PA	San Diego	CA	Lafayette	LA
19	San Diego	CA	Boise City	ID	Duluth	MN
20	Tucson	AZ	Poway	CA	Charlotte	MI
21	Palm Beach Gardens	FL	Roanoke	VA	Reno	NV
22	Fresno	CA	Monterey	CA	Franklin	TN
23	Tulsa	OK	Honolulu	HI	Portland	OR
24	Poway	CA	Tucson	AZ	State College	PA
25	Portland	OR	Franklin	TN	Carlsbad	CA

Table 2: Regressions to Determine the Relationship of CEO Compensation to the Average Compensation of Geographically-Close CEOs

This table reports the results of regressing CEO compensation on the average compensation of geographically-close CEOs and control variables. The results show that the average compensation of geographically-proximate CEOs has a positive and significant effect on CEO compensation.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Time and industry fixed effects are included but not reported. Industries correspond to the 17 Fama-French industry groupings.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Panel A: "Geographically close" = within 100 kilometers			**Panel B: "Geographically close" = within 250 kilometers**		
Dependent variable:	**CEO salary**	**CEO cash compensation**	**CEO total compensation**	**CEO salary**	**CEO cash compensation**	**CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of geographically-close CEOs	0.292	0.291	0.120	0.427	0.290	0.200
	*(6.25)***	*(6.14)***	*(1.88)**	*(6.77)***	*(5.03)***	*(2.07)**
Avg. industry compensation	0.843	0.611	0.682	0.845	0.614	0.683
	*(26.53)***	*(14.26)***	*(11.93)***	*(26.67)***	*(14.14)***	*(12.45)***
CEO age	4.747	11.649	-4.560	4.687	11.806	-4.512
	*(5.85)***	*(3.84)***	*(-0.22)*	*(5.80)***	*(3.87)***	*(-0.22)*
CEO tenure	0.413	-0.505	-24.470	0.531	0.113	-21.920
	(0.50)	*(-0.14)*	*(-0.97)*	*(0.63)*	*(0.03)*	*(-0.86)*
Firm size	0.001	0.008	0.031	0.001	0.009	0.031
	*(2.10)**	*(7.73)***	*(8.91)***	*(2.08)**	*(7.79)***	*(8.90)***
M/B ratio	2.733	22.352	741.133	2.408	21.916	745.188
	(1.01)	*(2.30)**	*(5.56)***	*(0.89)*	*(2.23)**	*(5.53)***
Stock returns	-0.868	8.295	48.925	-0.792	8.383	49.511
	(-1.59)	*(3.20)***	*(1.19)*	*(-1.45)*	*(3.21)***	*(1.22)*
Profitability	1.711	7.973	22.205	1.712	8.343	22.745
	*(5.87)***	*(7.98)***	*(2.34)**	*(5.93)***	*(8.23)***	*(2.44)**
Per capita income	1.108	12.437	105.230	2.178	17.473	114.447
	(1.23)	*(3.51)***	*(4.33)***	*(2.01)**	*(4.16)***	*(3.03)***
Cost of living	-0.024	0.084	-0.411	-0.008	0.184	-1.089
	(-0.49)	*(0.41)*	*(-0.41)*	*(-0.13)*	*(0.66)*	*(-0.84)*
Constant	-332.841	-891.164	-3529.069	-421.290	-1023.197	-3781.245
	*(-6.07)***	*(-4.50)***	*(-3.25)***	*(-6.72)***	*(-4.95)***	*(-3.61)***
Nr obs	16243	16243	16243	16243	16243	16243
Adj R2	0.42	0.31	0.04	0.42	0.31	0.03

Table 3: The Effect of Firm Age

This table reports the results of regressing CEO compensation on the average compensation of geographically-close CEOs and control variables. Firm age has been added as a control variable to allow for the possibility that compensation levels are set differently at younger firms. The results show that the average compensation of geographically-proximate CEOs has a positive and significant effect on CEO compensation even after controlling for firm age.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Firm age is the number of years since the firm first appeared on CRSP. Time and industry fixed effects are included but not reported. Industries correspond to the 17 Fama-French industry groupings.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Panel A: "Geographically close" = within 100 kilometers			**Panel B: "Geographically close" = within 250 kilometers**		
Dependent variable:	**CEO salary**	**CEO cash compensation**	**CEO total compensation**	**CEO salary**	**CEO cash compensation**	**CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of geographically-close CEOs	0.253	0.274	0.116	0.341	0.252	0.184
	*(5.57)***	*(5.77)***	*(1.78)**	*(5.37)***	*(4.24)***	*(2.00)**
Avg. industry compensation	0.724	0.550	0.647	0.730	0.556	0.651
	*(19.71)***	*(11.88)***	*(12.23)***	*(19.83)***	*(11.84)***	*(12.52)***
CEO age	3.574	8.687	-13.859	3.566	8.986	-13.207
	*(4.38)***	*(2.83)***	*(-0.71)*	*(4.38)***	*(2.91)***	*(-0.68)*
CEO tenure	1.323	1.804	-17.329	1.419	2.342	-15.175
	(1.59)	*(0.50)*	*(-0.72)*	*(1.68)**	*(0.64)*	*(-0.62)*
Firm size	0.001	0.008	0.031	0.001	0.009	0.031
	*(2.13)**	*(7.70)***	*(8.81)***	*(2.13)**	*(7.74)***	*(8.79)***
M/B ratio	3.405	24.434	749.981	3.103	23.826	753.449
	(1.30)	*(2.54)**	*(5.55)***	*(1.19)*	*(2.44)**	*(5.52)***
Stock returns	-0.316	9.917	53.302	-0.281	9.866	53.445
	(-0.61)	*(3.95)***	*(1.32)*	*(-0.54)*	*(3.90)***	*(1.33)*
Profitability	1.409	7.157	19.399	1.426	7.581	20.130
	*(4.98)***	*(7.20)***	*(2.09)**	*(5.10)***	*(7.54)***	*(2.18)**
Per capita income	1.155	12.665	104.830	1.693	17.106	112.790
	(1.30)	*(3.58)***	*(4.29)***	*(1.60)*	*(4.09)***	*(2.94)***
Cost of living	0.010	0.159	-0.166	0.033	0.280	-0.725
	(0.21)	*(0.77)*	*(-0.18)*	*(0.51)*	*(1.00)*	*(-0.58)*
Firm age	3.703	8.014	23.721	3.602	7.727	22.212
	*(8.34)***	*(5.64)***	*(2.00)**	*(8.00)***	*(5.27)***	*(1.93)**
Constant	-289.061	-889.550	-3610.050	-345.380	991.620	-3818.927
	*(-5.29)***	*(-4.50)***	*(-3.29)***	*(-5.44)***	*(4.78)***	*(-3.63)***
Nr obs	16243	16243	16243	16243	16243	16243
Adj R2	0.45	0.32	0.04	0.45	0.32	0.04

Table 4: The Effect of Monitoring by Directors

This table reports the results of regressing CEO compensation on the average compensation of geographically-close CEOs and control variables. Two director monitoring proxies have been added as control variables to allow for the possibility that compensation levels are affected by the level of director monitoring. The results show that the average salary and cash compensation of geographically-proximate CEOs has a positive and significant effect on CEO compensation even after controlling for director monitoring.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Fraction of outside directors is the number of outside directors divided by the total number of directors. Board size is the total number of directors. Time and industry fixed effects are included but not reported. Industries correspond to the 17 Fama-French industry groupings.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Panel A: "Geographically close" = within 100 kilometers			**Panel B: "Geographically close" = within 250 kilometers**		
Dependent variable:	**CEO salary**	**CEO cash compensation**	**CEO total compensation**	**CEO salary**	**CEO cash compensation**	**CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of geographically-close CEOs	0.276	0.195	0.011	0.415	0.197	0.221
	*(4.88)***	*(3.75)***	*(0.12)*	*(5.39)***	*(2.97)***	*(1.55)*
Avg. industry compensation	0.708	0.471	0.540	0.714	0.473	0.538
	*(19.41)***	*(8.00)***	*(5.29)***	*(19.66)***	*(8.01)***	*(5.08)***
CEO age	4.304	10.162	11.842	4.205	10.068	10.926
	*(3.72)***	*(1.92)**	*(0.44)*	*(3.64)***	*(1.89)**	*(0.41)*
CEO tenure	0.508	1.081	-31.417	0.588	1.276	-30.703
	(0.51)	*(0.21)*	*(-1.21)*	*(0.58)*	*(0.24)*	*(-1.18)*
Firm size	0.000	0.007	0.017	0.000	0.008	0.017
	*(1.65)**	*(7.23)***	*(3.23)***	*(1.63)*	*(7.32)***	*(3.16)***
M/B ratio	6.410	31.584	971.731	6.515	30.525	974.664
	*(1.78)**	*(2.02)**	*(3.39)***	*(1.82)**	*(1.92)**	*(3.36)***
Stock returns	-0.483	8.127	-37.122	-0.396	8.416	-35.398
	(-0.48)	*(1.86)**	*(-0.62)*	*(-0.39)*	*(1.91)**	*(-0.60)*
Profitability	1.946	10.599	14.988	1.910	10.900	15.665
	*(4.48)***	*(5.50)***	*(1.47)*	*(4.40)***	*(5.56)***	*(1.50)*
Per capita income	0.629	12.626	108.479	1.734	20.872	104.542
	(0.55)	*(2.56)**	*(3.84)***	*(1.24)*	*(3.23)***	*(1.80)**
Cost of living	0.024	0.260	0.105	0.062	0.532	0.652
	(0.41)	*(0.89)*	*(0.08)*	*(0.65)*	*(1.10)*	*(0.34)*
Fraction of outside directors	161.150	79.516	566.138	156.538	62.239	481.112
	*(4.04)***	*(0.36)*	*(0.48)*	*(3.94)***	*(0.28)*	*(0.41)*
Board size	18.679	37.738	663.723	18.408	38.711	658.613
	*(7.42)***	*(2.94)***	*(1.19)*	*(7.37)***	*(2.97)***	*(1.20)*
Constant	-623.161	-1779.698	-11464.181	-749.511	-1995.826	-12400.906
	*(-8.16)***	*(-5.09)***	*(-1.86)**	*(-8.37)***	*(-5.85)***	*(-2.01)**
Nr obs	6509	6509	6509	6509	6509	6509
Adj R2	0.42	0.29	0.02	0.43	0.29	0.02

Table 5: The Effect of Shareholder Rights and Leverage

This table reports the results of regressing CEO compensation on the average compensation of geographically-close CEOs and control variables. A shareholder rights proxy and leverage have been added as control variables to allow for the possibility that compensation levels are affected by these two variables. The results show that the average compensation of geographically-proximate CEOs has a positive and significant effect on CEO compensation even after controlling for shareholder rights and leverage.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. GIM index is the Gompers Ishii Metric shareholder rights index. Leverage ratio is debt divided by total assets. Time and industry fixed effects are included but not reported. Industries correspond to the 17 Fama-French industry groupings.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Panel A: "Geographically close" = within 100 kilometers			**Panel B: "Geographically close" = within 250 kilometers**		
Dependent variable:	**CEO salary**	**CEO cash compensation**	**CEO total compensation**	**CEO salary**	**CEO cash compensation**	**CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of geographically-close CEOs	0.270	0.274	0.111	0.399	0.257	0.187
	*(5.27)***	*(5.21)***	*(1.52)*	*(5.69)***	*(3.94)***	*(1.73)**
Avg. industry compensation	0.756	0.524	0.651	0.759	0.526	0.653
	*(19.60)***	*(11.58)***	*(12.42)***	*(19.71)***	*(11.52)***	*(12.74)***
CEO age	4.649	10.480	0.168	4.600	10.785	0.431
	*(4.59)***	*(2.78)***	*(0.01)*	*(4.57)***	*(2.85)***	*(0.02)*
CEO tenure	0.871	1.378	-11.637	0.989	1.993	-9.271
	(0.93)	*(0.33)*	*(-0.42)*	*(1.04)*	*(0.48)*	*(-0.33)*
Firm size	0.001	0.008	0.032	0.001	0.009	0.032
	*(2.03)**	*(7.68)***	*(9.24)***	*(2.02)**	*(7.74)***	*(9.27)***
M/B ratio	6.251	38.927	840.352	6.000	39.009	844.574
	*(1.92)**	*(3.18)***	*(4.92)***	*(1.85)**	*(3.14)***	*(4.93)***
Stock returns	0.368	19.359	37.781	0.463	19.272	37.759
	(0.50)	*(5.35)***	*(0.76)*	*(0.63)*	*(5.29)***	*(0.77)*
Profitability	2.105	10.308	19.677	2.084	10.848	20.469
	*(6.02)***	*(7.42)***	*(2.13)**	*(5.90)***	*(7.47)***	*(2.24)**
Per capita income	1.806	17.441	106.943	2.855	23.298	114.057
	*(1.70)**	*(4.09)***	*(4.40)***	*(2.20)**	*(4.58)***	*(2.88)***
Cost of living	-0.031	0.108	-0.353	-0.018	0.273	-0.638
	(-0.58)	*(0.46)*	*(-0.29)*	*(-0.25)*	*(0.80)*	*(-0.38)*
GIM index	8.269	27.185	103.936	7.817	26.427	97.780
	*(3.59)***	*(2.94)***	*(1.16)*	*(3.35)***	*(2.81)***	*(1.15)*
Leverage ratio	70.742	432.629	-222.225	69.545	449.798	-209.435
	*(2.33)**	*(3.73)***	*(-0.30)*	*(2.28)**	*(3.82)***	*(-0.29)*
Constant	-393.659	-1328.573	-4995.853	-475.813	-1473.727	-5173.903
	*(-6.06)***	*(-5.06)***	*(-2.70)***	*(-6.51)***	*(-5.45)***	*(-3.20)***
Nr obs	13366	13366	13366	13366	13366	13366
Adj R2	0.37	0.31	0.03	0.38	0.30	0.03

Table 6: The Effect of State Fixed Effects and Firm Fixed Effects

This table reports the results of regressing CEO compensation on the average compensation of geographically-close CEOs and control variables. While regression results shown in prior tables use year and industry fixed effects, state fixed effects have been added in Panel A and firm fixed effects are used instead of industry fixed effects in Panel B. The results show that the average compensation of geographically-proximate CEOs has a positive and significant effect on CEO compensation even after controlling for state and firm fixed effects.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Time, industry and state fixed effects are included in Panel A (not reported); time and firm fixed effects are included in Panel B (not reported). Industries correspond to the 17 Fama-French industry groupings.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel I: Adding State Fixed Effects

	Panel I-A: "Geographically close" = within 100 kilometers			**Panel I-B: "Geographically close" = within 250 kilometers**		
Dependent variable:	**CEO salary**	**CEO cash compensation**	**CEO total compensation**	**CEO salary**	**CEO cash compensation**	**CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of geographically-close CEOs	0.191	0.245	0.132	0.239	0.129	0.120
	*(3.36)***	*(4.76)***	*(2.59)***	*(2.31)**	*(1.88)**	*(1.52)*
Avg. industry compensation	0.842	0.620	0.687	0.845	0.623	0.692
	*(26.76)***	*(14.51)***	*(12.76)***	*(27.04)***	*(14.61)***	*(12.92)***
CEO age	4.618	10.723	-7.238	4.500	10.316	-7.711
	*(5.99)***	*(3.68)***	*(-0.34)*	*(5.85)***	*(3.55)***	*(-0.36)*
CEO tenure	0.566	-0.528	-25.925	0.661	-0.122	-22.778
	(0.72)	*(-0.15)*	*(-1.06)*	*(0.84)*	*(-0.03)*	*(-0.92)*
Firm size	0.001	0.008	0.031	0.001	0.008	0.031
	*(2.10)**	*(8.41)***	*(9.34)***	*(2.10)**	*(8.44)***	*(9.27)***
M/B ratio	2.163	20.988	724.951	2.154	22.032	722.055
	(0.85)	*(2.20)**	*(5.26)***	*(0.85)*	*(2.31)**	*(5.26)***
Stock returns	-0.722	7.814	46.480	-0.736	7.769	46.803
	(-1.37)	*(3.10)***	*(1.15)*	*(-1.39)*	*(3.07)***	*(1.16)*
Profitability	1.782	8.763	27.136	1.803	8.828	27.322
	*(6.01)***	*(8.38)***	*(2.75)***	*(6.17)***	*(8.40)***	*(2.77)***
Per capita income	2.138	9.591	97.345	2.679	17.989	77.611
	(1.21)	*(1.36)*	*(2.76)***	*(0.95)*	*(1.44)*	*(1.59)*
Cost of living	0.193	0.720	1.793	0.488	1.991	-4.858
	*(2.49)**	*(1.93)**	*(0.95)*	*(2.91)***	*(2.59)***	*(-0.93)*
Constant	-320.833	-715.483	-3742.877	-370.969	-877.067	-2774.666
	*(-4.15)***	*(-2.99)***	*(-2.05)**	*(-3.27)***	*(-2.50)**	*(-1.32)*
Nr obs	16243	16243	16243	16243	16243	16243
Adj R2	0.43	0.33	0.04	0.43	0.33	0.04

Panel II: Using Firm Fixed Effects instead of Industry Fixed Effects

	Panel II-A: "Geographically close" = within 100 kilometers			Panel II-B: "Geographically close" = within 250 kilometers		
Dependent variable:	**CEO salary**	**CEO cash compensation**	**CEO total compensation**	**CEO salary**	**CEO cash compensation**	**CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of geographically-close CEOs	0.103	0.164	0.085	0.207	0.201	0.163
	*(2.55)***	*(2.54)***	*(1.52)*	*(2.26)***	*(2.12)***	*(1.65)**
Avg. industry compensation	0.287	0.217	0.240	0.286	0.216	0.238
	*(11.39)****	*(4.40)****	*(3.69)****	*(11.39)****	*(4.42)****	*(3.59)****
CEO age	3.090	6.122	38.728	3.093	6.023	38.484
	*(3.62)****	*(1.65)**	*(0.77)*	*(3.62)****	*(1.63)*	*(0.77)*
CEO tenure	2.805	5.981	-35.100	2.777	5.943	-36.053
	*(2.97)****	*(1.28)*	*(-0.47)*	*(2.94)****	*(1.27)*	*(-0.48)*
Firm size	0.000	0.004	0.004	0.000	0.004	0.004
	(1.09)	*(2.83)****	*(0.31)*	*(1.12)*	*(2.89)****	*(0.32)*
M/B ratio	0.571	19.625	703.027	0.558	19.833	701.540
	(0.27)	*(1.70)**	*(4.74)****	*(0.27)*	*(1.72)**	*(4.74)****
Stock returns	0.362	8.731	4.035	0.342	8.770	4.618
	(0.93)	*(3.75)****	*(0.09)*	*(0.88)*	*(3.73)****	*(0.11)*
Profitability	0.862	4.130	28.684	0.871	4.188	29.010
	*(4.29)****	*(3.82)****	*(1.89)**	*(4.32)****	*(3.84)****	*(1.90)**
Per capita income	-4.075	-16.049	-22.900	-2.048	-9.000	84.620
	*(-1.98)***	*(-1.30)*	*(-0.24)*	*(-0.64)*	*(-0.53)*	*(0.81)*
Cost of living	-0.043	-0.989	-6.104	0.492	0.802	-1.449
	(-0.17)	*(-1.11)*	*(-1.15)*	*(1.43)*	*(0.52)*	*(-0.18)*
Constant	155.736	360.029	-2456.864	22.653	42.255	-5352.914
	*(2.35)***	*(0.93)*	*(-0.98)*	*(0.24)*	*(0.08)*	*(-1.61)*
Nr obs	16243	16243	16243	16243	16243	16243
Adj R2	0.85	0.63	0.15	0.85	0.63	0.15

Table 7: Robustness With Respect to a Specification in Logs

This table reports the results of regressing the logarithm of CEO compensation on the logarithm of average compensation of geographically-close CEOs and control variables. The results show that using this log-transformed specification, the average compensation of geographically-proximate CEOs again has a positive and significant effect on CEO compensation.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Time and industry fixed effects are included but not reported. Industries correspond to the 17 Fama-French industry groupings.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Panel A: "Geographically close" = within 100 kilometers			**Panel B: "Geographically close" = within 250 kilometers**		
Dependent variable:	**log(CEO salary)**	**log(CEO cash compens.)**	**log(CEO total compens.)**	**log(CEO salary)**	**log(CEO cash compens.)**	**log(CEO total compens.)**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
log(Avg. compensation of geographically-close CEOs)	0.115	0.160	0.119	0.292	0.225	0.099
	*(2.24)***	*(3.79)****	*(4.54)****	*(2.33)***	*(4.00)****	*(2.73)****
log(Avg. industry compensation)	0.210	0.099	0.114	0.214	0.097	0.112
	*(3.02)****	*(2.50)***	*(4.80)****	*(3.06)****	*(2.45)***	*(4.69)****
CEO age	0.008	0.007	-0.002	0.008	0.007	-0.002
	*(3.29)****	*(2.89)****	*(-0.88)*	*(3.24)****	*(2.82)****	*(-0.89)*
CEO tenure	0.001	0.000	-0.007	0.001	0.000	-0.006
	(0.41)	*(0.11)*	*(-2.45)***	*(0.46)*	*(0.00)*	*(-2.34)***
log(Firm size)	0.145	0.248	0.353	0.143	0.249	0.356
	*(8.06)****	*(15.01)****	*(25.31)****	*(7.77)****	*(14.88)****	*(25.31)****
M/B ratio	-0.010	0.011	0.092	-0.010	0.011	0.092
	(-1.38)	*(1.59)*	*(12.32)****	*(-1.40)*	*(1.59)*	*(12.13)****
Stock returns	0.001	0.008	0.011	0.001	0.009	0.012
	(0.28)	*(3.52)****	*(3.89)****	*(0.39)*	*(3.68)****	*(3.92)****
Profitability	0.004	0.007	0.004	0.003	0.007	0.004
	*(4.04)****	*(6.38)****	*(3.27)****	*(3.95)****	*(6.43)****	*(3.34)****
log(Per capita income)	0.005	0.102	0.240	0.026	0.134	0.339
	(0.10)	*(1.72)**	*(3.74)****	*(0.41)*	*(1.92)**	*(4.64)****
log(Cost of living)	-0.005	-0.003	0.002	-0.007	-0.002	-0.002
	(-0.54)	*(-0.29)*	*(0.14)*	*(-0.58)*	*(-0.15)*	*(-0.16)*
Constant	2.705	2.359	2.170	1.547	1.833	2.018
	*(6.24)****	*(7.90)****	*(7.94)****	*(1.91)**	*(4.96)****	*(6.04)****
Nr obs	16127	16127	16127	16127	16127	16127
Adj R2	0.17	0.29	0.39	0.17	0.28	0.39

Table 8: Evidence from One Industry: Electric Utilities

The use of industry fixed effects assumes that where a firm locates its headquarters is not an endogenous choice and within each industry different technologies adopted by firms do not imply different optimal locations. This Table addresses concerns that these conditions may not have been met. It shows results of regressing CEO compensation on the average compensation of geographically-close CEOs and control variables using data from an industry where such concerns are likely less important: electric utilities (SIC 4911 and 4931). The average compensation of geographically-proximate CEOs is shown to have a positive and significant effect on CEO compensation even using this restricted sample.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Time fixed effects are included but not reported.

t-statistics based on robust standard errors are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Panel A: "Geographically close" = within 100 kilometers			**Panel B: "Geographically close" = within 250 kilometers**		
Dependent variable:	**CEO salary**	**CEO cash compensation**	**CEO total compensation**	**CEO salary**	**CEO cash compensation**	**CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of geographically-close CEOs	0.282	0.333	0.127	0.189	0.345	0.085
	*(2.97)***	*(3.01)***	*(1.89)**	*(1.73)**	*(2.65)***	*(0.93)*
Avg. industry compensation	0.577	0.400	0.568	0.583	0.396	0.551
	*(5.99)***	*(3.28)***	*(4.43)***	*(5.99)***	*(3.15)***	*(4.37)***
CEO age	1.596	-21.356	-58.544	1.608	-20.690	-56.992
	(1.08)	*(-1.15)*	*(-0.85)*	*(1.11)*	*(-1.15)*	*(-0.84)*
CEO tenure	15.182	20.010	75.650	15.340	19.336	75.433
	*(9.44)***	*(2.30)**	*(1.76)**	*(9.14)***	*(2.15)**	*(1.71)**
Firm size	0.001	0.003	0.039	0.001	0.005	0.041
	(0.36)	*(0.32)*	*(1.01)*	*(0.50)*	*(0.59)*	*(1.07)*
M/B ratio	77.117	102.809	397.713	70.864	104.714	374.334
	*(3.89)***	*(0.56)*	*(0.53)*	*(3.66)***	*(0.58)*	*(0.51)*
Stock returns	-2.720	-15.009	93.085	-1.989	-15.202	92.486
	(-0.53)	*(-0.41)*	*(0.64)*	*(-0.39)*	*(-0.41)*	*(0.63)*
Profitability	-4.105	-7.892	14.060	-4.413	-9.527	9.988
	(-1.03)	*(-0.50)*	*(0.18)*	*(-1.15)*	*(-0.63)*	*(0.13)*
Per capita income	4.374	13.211	8.008	12.706	26.401	64.478
	*(1.87)**	*(1.63)*	*(0.16)*	*(2.94)***	*(1.13)*	*(0.58)*
Cost of living	0.172	0.363	4.371	0.196	1.780	4.989
	(0.94)	*(0.43)*	*(0.84)*	*(0.88)*	*(1.39)*	*(0.56)*
Constant	-268.430	817.367	1843.960	-401.295	389.688	598.746
	*(-2.18)***	*(0.82)*	*(0.47)*	*(-3.15)***	*(0.58)*	*(0.16)*
Nr obs	629	629	629	629	629	629
Adj R2	0.71	0.34	0.30	0.71	0.34	0.30

Table 9: The Effect of Excluding New York and California

To ameliorate concerns that New York and California, whose compensation practices may differ from those of other states, are exercising a disproportionate influence on the results, the main regressions are rerun using a sample that excludes these two states. The results reported in this Table suggest that the inclusion of New York and California does not drive the results.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Time fixed effects are included but not reported.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Panel A: "Geographically close" = within 100 kilometers			**Panel B: "Geographically close" = within 250 kilometers**		
Dependent variable:	**CEO salary**	**CEO cash compensation**	**CEO total compensation**	**CEO salary**	**CEO cash compensation**	**CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of geographically-close CEOs	0.261	0.204	0.022	0.433	0.173	0.151
	*(5.13)***	*(3.83)***	*(0.28)*	*(6.21)***	*(3.06)***	*(1.25)*
Avg. industry compensation	0.818	0.580	0.591	0.818	0.580	0.590
	*(21.20)***	*(12.25)***	*(10.35)***	*(21.25)***	*(12.21)***	*(10.78)***
CEO age	5.057	10.785	26.584	4.973	10.762	25.429
	*(5.60)***	*(3.41)***	*(1.58)*	*(5.53)***	*(3.38)***	*(1.59)*
CEO tenure	1.131	4.067	-22.843	1.244	4.317	-22.178
	(1.09)	*(1.07)*	*(-0.91)*	*(1.17)*	*(1.13)*	*(-0.88)*
Firm size	0.002	0.006	0.029	0.002	0.006	0.029
	*(2.66)***	*(3.53)***	*(4.98)***	*(2.65)***	*(3.54)***	*(4.98)***
M/B ratio	5.780	34.574	592.927	5.252	34.385	594.176
	*(1.91)**	*(3.31)***	*(4.11)***	*(1.73)**	*(3.26)***	*(4.13)***
Stock returns	-1.052	6.661	14.470	-0.960	6.797	15.093
	*(-1.79)**	*(2.55)**	*(0.52)*	*(-1.63)*	*(2.56)**	*(0.56)*
Profitability	1.640	6.595	6.748	1.642	6.852	6.486
	*(4.38)***	*(5.71)***	*(0.58)*	*(4.45)***	*(5.88)***	*(0.57)*
Per capita income	1.592	5.215	44.074	2.237	10.501	28.860
	(1.32)	*(1.17)*	*(2.06)**	*(1.70)**	*(1.94)**	*(0.86)*
Cost of living	-0.065	-0.077	-1.020	-0.108	-0.236	-2.075
	(-1.22)	*(-0.41)*	*(-1.10)*	*(-1.61)*	*(-1.18)*	*(-1.63)*
Constant	-348.848	-639.325	-2942.301	-441.775	-726.373	-2713.582
	*(-5.52)***	*(-3.15)***	*(-2.73)***	*(-6.30)***	*(-3.50)***	*(-3.07)***
Nr obs	12347	12347	12347	12347	12347	12347
Adj R2	0.45	0.26	0.02	0.46	0.26	0.02

Table 10: Is Local Labor Market Competition for CEOs Driving the Results?

This table examines whether local labor market competition for CEOs can explain the main results. The sample is restricted to companies that were part of the S&P500 in the previous year since the market for the CEOs at these firms should be global or national rather than local. The results are similar to those reported before, suggesting that local labor market competition for CEOs does not drive the results.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Time and industry fixed effects are included but not reported. Industries correspond to the 17 Fama-French industry groupings.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Panel A: "Geographically close" = within 100 kilometers			**Panel B: "Geographically close" = within 250 kilometers**		
Dependent variable:	**CEO salary**	**CEO cash compensation**	**CEO total compensation**	**CEO salary**	**CEO cash compensation**	**CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of geographically-close CEOs	0.490	0.412	0.072	0.639	0.449	0.490
	*(4.12)***	*(3.79)***	*(-0.33)*	*(4.14)***	*(3.09)***	*(4.12)***
Avg. industry compensation	0.568	0.296	0.366	0.565	0.287	0.568
	*(7.21)***	*(3.74)***	*(3.98)***	*(7.14)***	*(3.61)***	*(7.21)***
CEO age	7.442	15.216	5.542	7.257	16.119	7.442
	*(3.23)***	*(-1.49)*	*(-0.06)*	*(3.17)***	*(1.58)*	*(3.23)***
CEO tenure	-0.052	10.445	5.579	0.053	10.253	-0.052
	(-0.03)	*(-1.17)*	*(-0.06)*	*(0.03)*	*(1.14)*	*(-0.03)*
Firm size	0.001	0.008	0.029	0.001	0.008	0.001
	*(2.17)***	*(7.43)***	*(8.51)***	*(2.14)***	*(7.60)***	*(2.17)***
M/B ratio	-8.568	-45.221	822.612	-9.628	-46.547	-8.568
	(-1.31)	*(-1.60)*	*(2.17)***	*(-1.48)*	*(-1.60)*	*(-1.31)*
Stock returns	-2.546	24.359	-37.985	-2.415	24.408	-2.546
	*(1.72)**	*(2.30)***	*(-0.29)*	*(-1.64)*	*(2.31)***	*(-1.72)**
Profitability	2.138	14.330	34.064	2.134	15.135	2.138
	*(1.65)**	*(2.63)***	*(-0.75)*	*(1.66)**	*(2.74)***	*(1.65)**
Per capita income	-1.442	19.693	185.973	-0.820	32.112	-1.442
	(-0.72)	*(2.13)***	*(2.74)***	*(-0.33)*	*(2.70)***	*(-0.72)*
Cost of living	0.032	0.085	0.880	0.177	0.721	0.032
	(-0.23)	*(-0.12)*	*(-0.21)*	*(0.73)*	*(0.57)*	*(0.23)*
Constant	-289.706	-926.034	-5827.701	-373.059	-1301.227	-289.706
	*(2.17)***	*(-1.56)*	*(-1.44)*	*(-2.51)***	*(-2.12)***	*(-2.17)***
Nr obs	4741	4741	4741	4741	4741	4741
Adj R2	0.29	0.27	0.02	0.29	0.27	0.29

Table 11: Is the Leading-Firm Effect Driving the Results?

This table examines whether the results found so far may be driven by a "leading firm" effect. Leading firms are defined as top three firms based on sales or market value of equity within a 100-kilometer radius. Panel A restricts the sample to leading firms and reports the results of regressing leading firm CEO compensation on the average compensation of geographically-close CEOs and control variables. Panel B uses the entire sample and reports the results of regressing CEO compensation on the average compensation of CEOs who work at leading firms within a 100-kilometer radius and control variables. The results show that my findings are not likely driven by a leading firm effect.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Time and industry fixed effects are included but not reported. Industries correspond to the 17 Fama-French industry groupings.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A: Restrict the Sample to Leading Firms (i.e. Top 3 Firm Based on Sales or MVE)

	Panel A1: "Leading firm" = top 3 firm based on sales			**Panel A2: "Leading firm" = top 3 firm based on MVE**		
Dependent variable:	**Leading firm CEO salary**	**Leading firm CEO cash compensation**	**Leading firm CEO total compensation**	**Leading firm CEO salary**	**Leading firm CEO cash compensation**	**Leading firm CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of geographically-close CEOs	0.378	0.604	0.218	0.351	0.558	0.383
	*(3.61)***	*(4.33)***	*(1.88)**	*(3.28)***	*(4.20)***	*(1.66)**
Avg. industry compensation	0.861	0.520	0.495	0.856	0.515	0.648
	*(7.51)***	*(4.93)***	*(6.97)***	*(7.72)***	*(5.36)***	*(7.46)***
CEO age	6.344	17.139	67.198	6.987	19.031	96.643
	*(2.11)***	*(1.53)*	*(1.68)**	*(2.37)***	*(1.77)**	*(1.09)*
CEO tenure	1.185	2.972	-24.599	-0.561	1.768	-38.842
	(0.39)	*(0.37)*	*(-0.73)*	*(-0.20)*	*(0.24)*	*(-0.33)*
Firm size	0.001	0.007	0.026	0.001	0.007	0.023
	(1.60)	*(4.92)***	*(7.48)***	*(1.61)*	*(4.81)***	*(5.78)***
M/B ratio	13.650	65.692	572.233	3.582	13.348	1203.455
	(1.44)	*(1.89)**	*(3.32)***	*(0.42)*	*(0.42)*	*(2.47)***
Stock returns	-0.104	36.244	172.349	-2.644	26.071	-97.735
	(-0.04)	*(2.84)***	*(2.48)***	*(-1.08)*	*(2.17)***	*(-0.57)*
Profitability	0.558	10.458	11.169	0.478	13.425	-29.521
	(0.35)	*(1.82)**	*(0.35)*	*(0.33)*	*(2.66)***	*(-0.56)*
Per capita income	4.745	40.777	215.735	3.871	41.333	322.965
	(1.44)	*(3.22)***	*(3.87)***	*(1.25)*	*(3.51)***	*(3.63)***
Cost of living	-0.177	-0.488	-0.533	-0.187	-0.353	-3.949
	(-1.48)	*(-1.20)*	*(0.30)*	*(-1.74)**	*(0.91)*	*(-1.32)*
Constant	-532.355	-1941.653	-8975.464	-503.793	-1950.943	-14013.067
	*(-3.32)***	*(-3.00)***	*(-3.27)***	*(-3.22)***	*(-3.09)***	*(-3.26)***
Nr obs	3124	3124	3124	3340	3340	3340
Adj R2	0.34	0.35	0.24	0.34	0.35	0.02

Panel B: Use the Average Compensation of CEOs at Leading Firms (i.e. Top 3 Firm Based on Sales or MVE) Within a 100-Kilometer Radius Rather than the Average Compensation of CEO of All Geographically-Close Firms

	Panel B1: "Leading firm" = top 3 firm based on sales			Panel B2: "Leading firm" = top 3 firm based on MVE		
Dependent variable:	**CEO salary**	**CEO cash compensation**	**CEO total compensation**	**CEO salary**	**CEO cash compensation**	**CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
Avg. compensation of CEOs at leading firms within 100-kilometer radius	0.074	0.034	0.005	0.074	0.034	0.009
	*(5.33)***	*(4.07)***	*(0.38)*	*(5.43)***	*(3.99)***	*(0.82)*
Avg. industry compensation	0.787	0.553	0.701	0.797	0.559	0.564
	*(28.31)***	*(11.63)***	*(8.55)***	*(30.81)***	*(11.67)***	*(11.21)***
CEO age	4.341	9.628	-23.512	4.175	9.022	-29.932
	*(5.84)***	*(3.64)***	*(-1.02)*	*(5.94)***	*(3.52)***	*(-1.69)**
CEO tenure	0.368	-0.513	-17.382	0.665	-0.180	-16.404
	(0.55)	*(-0.13)*	*(-0.59)*	*(1.02)*	*(-0.05)*	*(-1.05)*
Firm size	0.000	0.011	0.037	0.000	0.011	0.035
	(0.59)	*(6.03)***	*(5.19)***	*(0.86)*	*(6.39)***	*(5.10)***
M/B ratio	0.885	15.796	789.101	-0.671	7.266	570.854
	(0.35)	*(1.79)**	*(5.14)***	*(-0.28)*	*(0.89)*	*(5.09)***
Stock returns	-0.833	6.459	32.946	-0.482	7.828	75.976
	(-1.64)	*(2.64)***	*(0.74)*	*(-0.98)*	*(3.25)***	*(1.94)**
Profitability	1.857	8.108	24.248	1.787	7.317	16.961
	*(6.33)***	*(8.04)***	*(2.36)**	*(6.17)***	*(7.42)***	*(1.80)**
Per capita income	1.396	14.825	105.143	1.271	14.817	116.794
	(1.57)	*(4.31)***	*(3.06)***	*(1.42)*	*(4.38)***	*(4.50)***
Cost of living	-0.005	0.083	-1.380	0.010	-0.021	-1.040
	(-0.11)	*(0.47)*	*(-1.40)*	*(0.21)*	*(-0.13)*	*(-1.50)*
Constant	-208.804	-591.472	-2584.751	-201.259	-539.276	-1808.915
	*(-4.21)***	*(-3.48)***	*(-2.35)**	*(-4.17)***	*(-3.21)***	*(-1.75)**
Nr obs	13027	13027	13027	12812	12812	12812
Adj R2	0.42	0.29	0.03	0.42	0.29	0.10

Table 12: Are Relative-Consumption Preferences Driving the Results?

This table examines whether relative consumption preferences among CEOs can explain the main results. The percentage change in CEO compensation is regressed on the CEO's "percentage compensation gap," the difference between the compensation of geographically-close CEOs and the CEO's own compensation expressed as a percentage of the CEO's own compensation, plus control variables. The effect of relative status concerns will tend to be bigger the further the CEO's pay lies below the average compensation of geographically-close CEOs and smaller the further his pay lies above the average. The results are consistent with the hypothesis that relative status concerns drive the effect of geography on CEO pay.

Compensation measures: Salary measures the compensation part that is fixed (non-contingent) at the beginning of the year. Cash compensation is the sum of salary and bonus. Total compensation is the sum of salary, bonus, stock and option grants.

% compensation gap is the difference between the average compensation of geographically-close CEOs and the CEO's compensation, both as of the previous year. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer or a 250-kilometer radius. % compensation gap between industry and the CEO is the difference between the average industry compensation and the CEO's compensation, both as of the previous year. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year. The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Time and industry fixed effects are included but not reported. Industries correspond to the 17 Fama-French industry groupings.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

	Panel A: "Geographically close" = within 100 kilometers			**Panel B: "Geographically close" = within 250 kilometers**		
Dependent variable:	**Δ CEO salary**	**Δ CEO cash compensation**	**Δ CEO total compensation**	**Δ CEO salary**	**Δ CEO cash compensation**	**Δ CEO total compensation**
Compensation variables based on salary, cash compensation or total compensation depending on the table column:						
% compensation gap between geographically-close CEOs and CEO	0.006	0.010	0.032	0.007	0.012	0.006
	*(1.86)**	*(1.99)***	*(3.63)****	*(2.02)***	*(2.37)***	*(1.86)**
% compensation gap between industry and CEO	0.027	0.096	0.133	0.026	0.093	0.027
	*(4.62)****	*(10.17)****	*(8.52)****	*(4.37)****	*(9.67)****	*(4.62)****
CEO age	-0.083	-0.078	-0.450	-0.081	-0.073	-0.083
	*(-3.66)****	*(-1.21)*	*(-2.03)***	*(-3.59)****	*(-1.13)*	*(-3.66)****
CEO tenure	-0.203	-0.152	-0.608	-0.204	-0.149	-0.203
	*(-10.21)****	*(-2.45)***	*(-2.80)****	*(-10.24)****	*(-2.40)***	*(-10.21)****
Δ Firm size	0.033	-0.033	0.163	0.033	-0.033	0.033
	*(7.38)****	*(-2.76)****	*(3.39)****	*(7.35)****	*(-2.77)****	*(7.38)****
M/B ratio	-0.060	-0.669	3.960	-0.064	-0.683	-0.060
	(-0.77)	*(-3.38)****	*(4.21)****	*(-0.82)*	*(-3.44)****	*(-0.77)*
Stock returns	0.210	-0.102	1.500	0.209	-0.104	0.210
	*(5.45)****	*(-0.90)*	*(3.48)****	*(5.45)****	*(-0.93)*	*(5.45)****
Δ Profitability	0.000	-0.004	0.010	0.000	-0.004	0.000
	(0.14)	*(-2.63)****	*(2.16)***	*(0.12)*	*(-2.62)****	*(0.14)*
Per capita income	-0.043	0.112	0.857	-0.063	0.090	-0.043
	*(-2.12)***	*(1.91)**	*(4.08)****	*(-2.53)***	*(1.26)*	*(-2.12)***
Cost of living	0.000	0.000	0.000	0.000	0.000	0.000
	(1.03)	*(1.62)*	*(0.01)*	*(1.97)***	*(1.81)**	*(1.03)*
Constant	14.858	14.107	12.995	15.074	14.212	14.858
	*(11.07)****	*(3.69)****	*(1.00)*	*(10.93)****	*(3.65)****	*(11.07)****
Nr obs	13871	13893	13933	13871	13893	13871
Adj R2	0.08	0.12	0.10	0.08	0.12	0.08

Table 13: Instrumental Variable Regression Results to Check the Robustness of the Relative-Consumption Preferences Finding

This table shows second-stage instrumental variable regression results. The effect of the average compensation of geographically-close CEOs (within a 100-kilometer radius) on CEO compensation is examined using the average cash compensation of major sports players (MLB, NBA, NFL, and NHL) within a 100-kilometer radius as an instrument.

Compensation measures: Cash compensation is the sum of salary and bonus, where salary measures the compensation part that is fixed (non-contingent) at the beginning of the year.

The CEO's own compensation is *not* included in the average compensation of geographically-close CEOs and the average industry compensation. The average compensation of geographically-close CEOs is calculated using the previous year's CEO compensation at firms headquartered within a 100-kilometer radius. Average industry compensation is the average compensation of CEOs at similar-sized firms (i.e. in the same total assets tercile) in the same industry in the previous year.

CEO age is the CEO's age. CEO tenure is the number of years the executive has been the firm's CEO. Firm size is measured as total assets as of the prior fiscal year end. M/B ratio is the market value of equity divided by the book value of equity as of the prior fiscal year end. Stock returns are the average monthly stock returns over the prior fiscal year. Profitability is return on assets, measured as net income divided by total assets as of the prior fiscal year end. Per capita income is from the 2000 decennial census. Cost of living (the ACCRA Cost of Living Index) is from the Council for Community and Economic Research. Time and industry fixed effects are included but not reported. Industries correspond to the 17 Fama-French industry groupings.

t-statistics based on robust standard errors clustered by firm are in parentheses. Superscripts ***, **, and * denote statistical significance at the 1%, 5%, and 10% level, respectively.

Instrument based on the average compensation of:	**MLB sports players**	**NBA sports players**	**NFL sports players**	**NHL sports players**
Dependent variable:	**CEO cash comp.**	**CEO cash comp.**	**CEO cash comp.**	**CEO cash comp.**
Avg. compensation of geographically-close CEOs (instrumented)	0.413	0.496	0.435	0.089
	*(2.83)***	*(3.35)***	*(2.28)**	*(0.42)*
Avg. industry compensation	0.697	0.756	0.637	0.730
	*(20.26)***	*(14.11)***	*(13.29)***	*(11.45)***
CEO age	14.388	15.937	14.454	14.380
	*(7.88)***	*(3.57)***	*(3.81)***	*(3.14)***
CEO tenure	-4.963	-6.687	-8.946	-10.407
	*(-2.72)***	*(-1.58)*	*(-2.44)**	*(-2.90)***
Firm size	0.009	0.008	0.008	0.008
	*(7.82)***	*(5.43)***	*(6.64)***	*(5.90)***
M/B ratio	26.633	31.982	40.925	4.463
	*(3.73)***	*(2.38)**	*(3.06)***	*(0.30)*
Stock returns	6.625	12.168	0.591	0.219
	*(2.51)**	*(2.11)**	*(0.14)*	*(0.05)*
Profitability	7.936	9.657	8.030	11.830
	*(8.01)***	*(5.85)***	*(3.90)***	*(5.68)***
Per capita income	7.372	-0.274	-1.295	6.899
	(1.36)	*(-0.05)*	*(-0.14)*	*(0.49)*
Cost of living	0.911	1.425	0.398	1.320
	*(2.64)***	*(3.38)***	*(1.02)*	*(1.42)*
Nr obs	10760	3787	4175	3529
Adj R2	0.32	0.27	0.27	0.27