# Geographic Concentration of Institutions, Corporate Governance, and Firm Value

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## ABSTRACT

We examine the impact of geographic concentration of institutional investors on corporate governance and firm value. We find that firms whose large institutions, particularly nontransient institutions, are closely located to each other experience higher forced CEO turnover-performance sensitivity, more frequent proxy voting against management, higher returns around CEO turnover announcements and Schedule 13D filings, larger increases in Tobin's *q* (ROA), and greater liquidity. These results are robust to using the introduction of new airline routes as a natural experiment and to using an instrumental variable approach. Our results suggest that geographic concentration of investors increases monitoring effectiveness.



***JEL Classification***: G14, G23, G34

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Previous studies document that the geographic proximity of institutional investors has a significant effect on portfolio selection and invesment returns (Coval and Moskowitz (2001)), earnings forecasts (Malloy (2005)), and corporate governance (Lerner (1995), Gaspar and Massa (2007), Kang and Kim (2008), Uysal, Kedia, and Panchapagesan (2008)). While these studies improve our understanding of the relation between geography and firm outcomes by showing that geographically proximate institutions have an information advantage over other institutions, they focus on institutional investors' physical distance from firms, paying little attention to their physical distance from each other. As a result, little is known about the role of institutions' relative location for corporate governance. In this study we fill this gap in the literature by investigating how the geographic concentration of a firm's large institutions affects corporate governance and firm value.

We argue that the geographic concentration of large institutions holding the same stocks should facilitate monitoring and in turn increase firm value. Institutions that are closely located to each other have more opportunities to network (Hong, Kubick, and Stein (2005)). Efficient information-sharing arising from networking effects decreases information asymmetry vis-à-vis firms (Pagano and Jappelli (1993), Doblas-Madrid and Minetti (2013)), which increases institutions' monitoring capabilities by improving their informational economies of scope. Supporting this view, Doidge et al. (2015) show that private engagements by the Canadian Coalition for Good Governance, a collective action organization comprised of institutional investors in Canada, improve firms' governance through creation and dissemination of value-relevant information. Reduced information asymmetry also increases portfolio firms' liquidity, which reduces the costs of monitoring and thus increases institutions' monitoring

incentives (Maug (1998), Edmans, Fang, and Zur (2013)).[1] The geographic concentration of large institutions also increases institutions' incentives to pursue active monitoring by reducing their communication and transportation costs, and in turn the costs of taking coordinated governance actions. Finally, by reducing coordination costs and increasing the observability of institutions' monitoring efforts, the geographic concentration of large institutions mitigates free-rider problems in corporate governance (Grossman and Hart (1980), Holmstrom (1982), Shleifer and Vishny (1986)) and thus further increases incentives to monitor portfolio firms.[2] Taken together, the above agruments suggest that geographic concentration of large institutions increases their incentives and ability to pursue active corporate governance. To the extent that more active governance translates into better firm performance, firms whose large institutional investors are closely located to each other are expected to have higher firm value than other firms.

To shed light on the role of the geographic concentration of large institutional investors, we first examine whether geographically proximate large institutions pursue more active monitoring, as measured by forced CEO turnover and proxy voting against management, than geographically remote institutions. The arguments above suggest that firms with large institutional investors that

[1] Maug (1998) shows that higher liquidity leads to improved monitoring as more informed trading increases investors' ability to cover monitoring costs. Using decimalization as an exogenous shock to liquidity, Edmans, Fang, and Zur (2013) find that liquidity increases the frequency of hedge funds' voice and exit, and thus improves blockholder governance overall. See also Kyle and Vila (1991), Kahn and Winton (1998), Noe (2002), Edmans (2009), and Edmans and Manso (2011) for studies that show a positive effect of liquidity on corporate governance. Coffee (1991) and Bhide (1993), on the other hand, argue that liquidity hinders shareholder activism because high liquidity allows blockholders to sell their stakes when firms are in trouble.

[2] According to Holmstrom (1982), free-rider problems occur when agents believe that they will bear all of the costs while the benefits are shared with other agents. Holmstrom (1982) argues that the source of such free-rider problems is information asymmetries that arise because individuals' actions cannot be observed. John, Knyazeva, and Knyazeva (2011) argue that geographic proximity makes it easier for monitors to observe agents' decisions and thus reduces the costs of shareholder oversight. Similary, Stiglitz (1990) and Arnott and Stiglitz (1991) argue that peer monitoring in which neighbours monitor each other is an important mechanism for controlling moral hazard in insurance and credit markets. In our context, to the extent that the geographic concentration of large institutions decreases institutions' information asymmetry vis-à-vis each other, increasing the observability of their coordination efforts, it should reduce free-riding on the monitoring efforts of other institutions.

are closely located to each other have higher forced CEO turnover-performance sensitivity and more frequent proxy voting against management. Next, we examine whether the geographic concentration of large institutions increases firm value and performance. We expect firms with geographically proximate institutions to have higher abnormal announcement returns around CEO turnover announcements and Schedule 13D filings, and larger increases in Tobin's *q* and ROA. We also examine the impact of large institutions' geographical concentration on firms' stock liquidity. To the extent that institutions located near each other enjoy lower information asymmetry about portfolio firms, geographic concentration should increase firms' stock liquidity, which helps improve shareholder governance (Kyle and Vila (1991), Kahn and Winton (1998), Maug (1998), Noe (2002), Edmans (2009), Edmans and Manso (2011)). Finally, we examine whether the effects of large institutions' geographic distance on corporate governance and firm value depend on institution type. To the extent that long-term or nontransient institutions (i.e., dedicated/quasi-index institutions) with large ownership have stronger incentives to take an active monitoring role than transient institutions (Chen, Harford, and Li (2007)),[3] we expect the above effects to be more pronounced when nontransient institutions are closely located to each other than when transient institutions are.

We test the above predictions using six measures of the geographic distance between a firm's top 10 institutions.[4] The first set of measures are the equally-weighted physical distance between a firm's top 10 institution pairs (*Ew Distances*) and the ownership-weighted physical distance between a firm's top 10 institution pairs (*Vw Distances*). Next, we employ the standard

[3] We classify an institution as a dedicated/quasi-index investor or a transient investor according to its expected investment horizon following the permanent transient /quasi-indexer/dedicated classifications of Bushee (1998).

[4] The mean (median) equity ownership held by top 10 institutional investors for our sample firms is 29.8% (30.0%), suggesting that they hold a large portion of firm's outstanding shares. In Section V, we use block institutions that own at least 5% of a firm's outstanding shares as large institutions and find qualitatively similar results.

deviation of the top 10 institutions' longitudes (*Ew Std Longitudes*) and the ownership-weighted standard deviation of the top 10 institutions' longitudes (*Vw Std Longitudes*).[5] Our fifth measure is the number of unique states in which the top 10 institutions are located (*Num States*), and our sixth measure is one minus the Herfindahl index of institutional ownership in the states in which the top 10 institutions are located (*1 - Herfindahl State IO*).[6]

Our results using the six concentration measures provide consistent, strong support for the view that geographic concentration of large institutions improves corporate governance and in turn firm value. Specifically, we find that the sensitivity of forced CEO turnover to performance is significantly higher when a firm's top 10 institutions are closely located to each other. For instance, for a firm with zero *Vw Std Longitudes*, a one-standard-deviation decrease in the prior market-adjusted stock return increases the probability of forced CEO turnover by 1.27 percentage points. In contrast, for a firm at the 75$^{th}$ percentile of *Vw Std Longitudes*, a one-standard-deviation decrease in the prior stock return leads to only a 0.1 percentage-point increase in the likelihood of forced CEO turnover. Given that the unconditional probability of forced CEO turnover is only 2.74% for the full sample, the difference in these two probabilities is economically large and significant.

We also find an increase in proxy voting decisions against management by mutual funds located near each other relative to non-voting institutions. For example, using the difference between the longitude of a voting institution and the longitudes of the other top 10 institutions (*Ew Dif Longitudes (voting)*) as the measure of geographic concentration, we find that a

[5] In untabulated tests, we find that using the top 10 institutional shareholders' latitudes, rather than longitudes, does not change our main results.

[6] For the tests of proxy voting decisions by mutual funds, we use the physical distance between a votong top 10 insitution and a firm's other top 10 institutions, the mean absolute difference between its longitude and the longitudes of the firm's other top 10 institutions, and the number of top 10 non-voting institutions located in the same state as the voting institution as our measures of geographic concentration.

one-standard-deviation decrease in *Ew Dif Longitudes (voting)* is associated with a 0.82 percentage-point increase in mutual funds' proxy voting against management. Since the unconditional mean ratio of proxy voting against management by mutual funds for the full sample is approximately 10.3%, this increase accounts for almost 8% of the mean ratio.

We further find that firms with more geographically proximate large institutions realize higher abnormal returns around forced CEO turnover announcements and Schedule 13D filings. These firms also experience higher firm value and better operating performance as measured by annual changes in Tobin's *q* and ROA, respectively. For example, a one-standard-deviation decrease in *Vw Std Longitudes* is associated with a 2.43% higher announcement return (CAR (-20, 20)) for firms targeted by active institutions. Given that the mean CAR (-20, 20) for the full sample is 6.56%, this valuation effect is economically significant. We also find that a one-standard-deviation decline in *Ew Std Longitudes* is associated with a significant 0.038 increase in firm value (Tobin's *q*) - impact comparable to those of a change in firm size by one tenth of a standard deviation, a change in book leverage by two standard deviations, or a change in free cash flow by a one-standard-deviation, all else being equal.

Turning to the prediction for firms' stock liquidity, we find that the geographic concentration of large institutions is significantly positively related to firms' stock liquidity as measured by the square root variant of the Amivest liquidity measure.[7] To the extent that greater liquidity increases shareholder activism (Kyle and Vila (1991), Kahn and Winton (1998), Maug (1998), Noe (2002), Edmans (2009), Edmans and Manso (2011)), this result further implies that geographic concentration of large institutional investors improves governance.

[7] Using the Amihud (2002) illiquidity measure, the Gibbs measures from the market-adjusted and latent common factor models (Hasbrouck (2009), and the percentage of zero returns (Lesmond, Ogden, and Trzcinka (1999)) as alternative measures of firms' stock liquidity does not change the resuts.

Finally, we find that the above results are driven mainly by nontransient institutions. We find no evidence that the geographic concentration of the transient investors among a firm's top 10 institutions affects monitoring and firm value. Previous studies show that nontransient investors have a long-term focus with low portfolio turnover and thus are more likely to engage in active monitoring than transient investors, which have a short investment horizon and high portfolio turnover (Bushee (1998), Chen, Harford, and Li (2007)). Our results extend these studies by showing that the monitoring effectiveness of nontransient institutions increases with their geographic concentration.

To address potential omitted variable or reverse causality concerns, we rely on three approaches. First, in our main regressions, in addition to controlling for an extensive set of institution-level characteristics such as their size, portfolio turnover, and performance, we control for firm fixed effects to mitigate the possibility that time-invariant omitted variables affect both the geographic concentration of investors and corporate governance (or firm value). We also control for internal governance measures such as equity ownership held by blockholders, G-index (Gompers, Ishii, and Metrick (2003)), board size, and the proportion of outside directors on the board. Second, we use the introduction of new airline routes that reduce the travel time between two of the top 10 institutional investors' headquarters as an exogenous shock to their geographic concentration. Third, we use two-stage least squares (2SLS) regressions in which we employ the density of nearby institutions and top 10 institutions' proximity to financial centers as instruments for top 10 institutions' geographic concentration. We capture the density of nearby institutions using the average number of institutions located within 60 miles of a firm's top 10 institutions. We capture top 10 institutions' proximity to financial centers as their average physical distance to the three most influential financial centers in the U.S. according to Global

City Economic Power Index (i.e., Chicago, Los Angeles, and New York).[8] To minimize the concern that institutions may choose to be closely located to their portfolio firms to facilitate corporate governance, when constructing the density of nearby institutions, we use only institutions that have already existed in the areas before firms' establishment. Similarly, when constructing top 10 institutions' proximity to financial centers, we use only top 10 institutions that have already been established before firms' existence. We discuss construction of these instruments, and how they meet the relevance and exclusion requirements of instrumental variables, in more detail in Section V. We find that the geographic concentration effects of institutional shareholders are robust to using these alternative approaches.

Our study contributes to the literature in several ways. First, we extend the literature on geographic proximity by providing new evidence on how the concentration of institutional investors affects corporate governance and firm value. Previous studies show that geographic proximity as measured by investors' physical distance from portfolio firms affects their portfolio selection decisions (Coval and Moskowitz (1999), Ivković and Weisbenner (2005), Baik, Kang, and Kim (2010)), governance activities (Lerner (1995), Gaspar and Massa (2007), Kang and Kim (2008), Uysal, Kedia, and Panchapagesan (2008)), and financial policies (John, Knyazeva, and Knyazeva (2011)), as well as analysts' earnings forecasting ability (Malloy (2005), Bae, Stulz, and Tan (2008)). In contrast to these studies, we show that geographic proximity as measured by institutional investors' physical distance from each other influences their monitoring of portfolio firms and in turn firm value.

[8] http://www.citylab.com/work/2015/03/sorry-london-new-york-is-the-worlds-most-economically-powerful-city/386315/

Second, our study contributes to the literature on the monitoring role of institutions by identifying the geographic concentration of institutions as an important determinant of efficient institutional monitoring. Previous studies on free-rider problems among shareholders (Holmstrom (1982), Grossman and Hart (1980)) show that outside investors' large ownership positions increase their incentives to monitor portfolio firms and thus reduce free-rider problems associated with diffused ownership (Shleifer and Vishny (1986), Huddart (1993)). Our study extends this literature by showing that geographic concentration further increases institutions' incentives to monitor portfolio firms, due to increased observability of institutions' governance efforts (John, Knyazeva, and Knyazeva (2011)), and thus reduces free-rider problems associated with large ownership.

Third, our paper adds to a growing number of studies that examine how shareholder coordination improves corporate governance (e.g., Bradley et al. (2010), Kandel, Massa, and Simonov (2011), Chakraborty and Gantchev (2013), Huang (2014a, 2014b)). Bradley et al. (2010) find strong and frequent attempts by activist arbitrageurs to open-end closed-end funds in the wake of the Securities and Exchange Commission's (SEC) 1992 proxy reform. Chakraborty and Gantchev (2013) show that private investments in public equity (PIPEs) reduce coordination frictions among shareholders and in turn the odds of firm default. Kandel, Massa, and Simonov (2011) find that, using age cohorts among non-controlling shareholders as a proxy for shareholder similarity, shareholder homogeneity acts as an implicit coordination device that disciplines managers. In more closely related work, Huang (2014a, 2014b) finds that geographic proximity among institutional shareholders measured using all institutions is associated with bidder announcement returns, CEO compensation, and the likelihood of CEO turnover. However, our study differs from Huang (2014a, 2014b) in that we focus on a different set of

governance outcomes and investigate other important issues not addressed in his papers. In particular, we examine how institutions' geographic concentration affects firms' stock liquidity, identifying a potential channel through which it facilitates institutional monitoring. Previous literature shows that while ownership concentration increases shareholders' incentives to monitor, it reduces stock liquidity (Brockman, Chung, and Yan (2009)). Our results indicate that large institutional investors' geographic concentration, together with their ownership concentration, increases stock liquidity, which helps improve incentives to monitor portfolio firms (Maug (1998), Edmans, Fang, and Zur (2013)). Moreover, while Huang (2014a, 2014b) uses geographic proximity among institutions and correlations in institutions' portfolio allocation decisions as two different proxies for shareholder coordination, we focus exclusively on institutions' geographic concentration as our key measure of shareholder coordination and construct several geographic concentration variables to provide extensive evidence on institutions' coordination efforts. By focusing exclusively on geography measures, we are able to use the exogenous event that is specific to geographic concentration (i.e., introduction of new airline routes that reduce the travel time between two of the top 10 institutional investors' headquarters) as a natural experiment, and we are able to choose variables that provide plausibly exogenous variation in geographic concentration as instruments in our 2SLS analysis.

The remainder of the paper proceeds as follows. Section I discusses our samples, provides details on our measures of geographic concentration, and presents summary statistics. In Section II we investigate the impact of institutions' geographic concentration on corporate governance as measured by forced CEO turnover-performance sensitivity and the proxy voting decisions of mutual funds. In Section III we study the impact of institutions' geographic concentration on firm value (performance) by examining announcement returns around forced CEO turnovers and

initial Schedule 13D filings and changes in Tobin's *q* (ROA). In Section IV we investigate the impact of institutions' geographic concentration on firms' stock liquidity, Section V presents results of robustness tests, and we present concluding remarks in Section VI.

## I. Samples, Measures of Geographic Concentration, and Summary Statistics

### *A. Samples*

For analyses of the impact of institutions' geographic concentration on firm value (Tobin's *q*), performance (ROA), and liquidity, our sample starts with the universe of firms covered in Thomson Reuters' CDA/Spectrum Institutional (13F) Holdings database over the 1993 to 2009 period. We omit firms with missing stock return data in the Center for Research in Security Prices (CRSP) and firms with missing financial data in Compustat. We also exclude firms in regulated industries (SIC codes between 4900 and 4999 and between 6000 and 6999). The final sample for the above tests comprises 49,293 firm-year observations.

Our sample of forced CEO turnover events comes from Jenter and Kanaan (2014) and Peters and Wagner (2014),[9] who identify CEO turnovers by examining whether the CEO ID in ExecuComp in a given year is different from that in the prior year. Following Denis, Denis, and Sarin (1997) and Parrino (1997), Jenter and Kanaan (2014) and Peters and Wagner (2014) classify turnover events as forced turnovers if 1) the press reports that the CEO has been fired, has been forced to step down from the position, or has departed due to unspecified policy differences, 2) the departing CEO is under the age of 60 and the stated reason for the departure is not death, poor health, or acceptance of another position (outside or within the firm), or 3) the departing CEO is under the age of 60 and the stated reason for the departure is retirement but the

[9] We thank Dirk Jenter and Florian Peters for providing us with forced CEO turnover data from 1993 to 2001 and from 1993 to 2009, respectively.

firm does not announce the departure at least six months in advance. We restrict our sample to those firms that are covered in Thomson Reuters' CDA/Spectrum Institutional (13F) Holdings over the 1993 to 2009 period. Our final sample consists of 2,247 firms (14,748 firm-year observations). Using the date that a CEO turnover first appears on *Factiva* as the announcement date, we identify CEO turnover announcements for 413 of the sample 2,247 firms. To ensure that confounding corporate events (e.g., mergers and acquisitions, dividend payments, earnings announcements, security issuance, company name changes, and delistings) do not affect our results, we search *Factiva* and exclude news associated with such events within one trading day before and after the turnover announcement.

For the analysis of the valuation effects of Schedule 13D filings, we manually retrieve information on initial Schedule 13Ds filed by 13F institutions targeting our sample firms from the SEC's Electronic Data Gathering, Analysis, and Retrieval system (EDGAR). We consider only 13D filings by a firm's top 10 institutions. We exclude observations associated with confounding events by searching *Factiva* over the 20 trading days before and 20 trading days after the initial 13D filing date. Our final sample of Schedule 13Ds comprises 1,213 initial Schedule 13D filings over the 1993 to 2009 period.

We obtain proxy voting records of mutual funds that belong to a firm's top 10 institutions from the Institutional Shareholder Services (ISS) Voting Analytics database. This sample starts in 2003 as this is the first year mutual funds were required to file Form N-PX, which contains their proxy voting records for each year. Our sample consists of 1,561,504 fund voting records of 132 mutual fund families (23,794 fund family-firm-year observations) that have 2,280 individual funds over 2003 the 2009 period.

Information on the state and city of firms' and institutional investors' headquarters comes from Compact Disclosure and the EDGAR database, respectively. Their latitude and longitude data are obtained from the Census 2000 U.S. Gazetteer Files. Information on boards of directors and the G-index (from 1993 to 2006) comes from Investor Responsibility Research Center (IRRC) databases.

*B. Measures of Geographic Concentration*

To capture the geographic concentration of our sample firms' institutional investors, we use the following six measures of geographic proximity among a firm's top 10 institutions: 1) the logarithm of the equally-weighted physical distance between top 10 institutional shareholder pairs (*Ew Distances*),[10] 2) the logarithm of the ownership-weighted physical distance between top 10 institutional shareholder pairs (*Vw Distances*), 3) the standard deviation of top 10 institutional shareholders' longitudes (*Ew Std Longitudes*), 4) the ownership-weighted standard deviation of top 10 institutional shareholders' longitudes, where the weights are the ratio of the equity ownership held by a given institution to the total equity ownership held by all top 10 institutions (*Vw Std Longitudes*), 5) the number of unique states in which the top 10 institutional shareholders are located (*Num States*), and 6) one minus the Herfindahl index of top 10 institutional shareholders' ownership in the states in which the top 10 institutions are located (*1 - Herfindahl State IO*). The Appendix provides a detailed description of the construction of these geographic concentration variables. By examining the geographic concentration of institutions from several different perspectives, the above measures allow us to assess the robustness of our results.

[10] Distance (miles) between top 10 institutional shareholder pairs is measured as: 3,949.99 x arcos (sin ($lon_i$) x sin ($lon_j$) + cos ($lon_i$) x cos ($lon_j$) x cos ($lat_i$ - $lat_j$)), where ($lat_i$, $lon_i$) *and* ($lat_j$, $lon_j$) are the latitudes and longitudes in radians for institutions *i* and *j*, respectively.

In the analysis on the impact of institutions' geographic proximity on firm governance as captured by proxy voting, we measure the geographic proximity of a voting top 10 institution and the firm's other top 10 institutions using the following five variables: 1) the logarithm of the equally-weighted physical distance between a voting top 10 institutional shareholder and the other top 10 institutional shareholders (*Ew Distances (voting)*), 2) the logarithm of the ownership-weighted physical distance between a voting top 10 institutional shareholder and the other top 10 institutional shareholders (*Vw Distances (voting)*), 3) the mean absolute difference between the longitude of a voting top 10 institutional shareholder and the longitudes of the other top 10 institutional shareholders (*Ew Dif Longitudes (voting)*), 4) the ownership-weighted mean absolute difference between the longitude of a voting top 10 institutional shareholder and the longitudes of the other top 10 institutional shareholders (*Vw Dif Longitudes (voting)*), and 5) the number of top 10 non-voting institutional shareholders located in the same state as the voting institution (*Num Same State (voting)*).

*C. Summary Statistics*

Table I provides summary characteristics for our geographic concentration measures as well as for the samples of firms, CEOs, and top 10 institutions. We highlight several of the summary measures here. For sample firms used in the analysis of Tobin's *q*, ROA, and liquidity, the mean market value of equity and mean book leverage ratio (total debt / total assets) are $1.8 billion and 20.6%, respectively. Tangible assets (PPE) and free cash flow account on average for 27.5% and -10.6% of total assets, respectively. About 30.3% of our sample firms pay dividends, and the sample firms have a mean annual change in Tobin's *q* of -0.06 and a mean annual change in ROA of -0.006. The mean square root variant of the Amivest liquidity measure and mean institutional block ownership and are 19.2 and 13.9%, respectively.

Sample firms used in the analysis of forced CEO turnover-performance sensitivity have a mean firm age of 23.5 years, a mean standard deviation of the previous one-year daily stock return of 2.9%, and a mean market-adjusted stock return of 7.4%. CEOs on average hold 2.7% of the outstanding shares in firms, and their mean tenure is about 8 years. About 23.2% of CEOs are above the age of 60 and 58.9% serve as chairman of the board. The mean board size is 9.3, and on average 65.9% of board members are outside directors. The mean G-index is 9.3.

The mean churn rate of top 10 institutions' turnover and their mean quarterly buy-and-hold value-weighted portfolio return are 0.2 and 4.7%, respectively. The mean market value of portfolios managed by top 10 institutions is $67.9 billion. The Appendix provides detailed descriptions of the variables reported in Table I.

## II. Geographic Concentration and Corporate Governance

To examine whether large institutions that are closely located to each other perform an active monitoring role, in this section we examine how the measures of institutions' geographic concentration introduced above are related to institutions' corporate governance activities in portfolio firms. We focus on two types of governance activities. First, we examine forced CEO turnover events, as a forced turnover is considered one of the most influential governance activities that large shareholders can take (Kang and Shivdasani (1995), Denis, Denis, and Sarin (1997), Bethel, Liebeskind, and Opler (1998)). We also examine proxy voting by mutual funds that belong to a firm's top 10 institutions, as proxy voting is one of the few measures of shareholder activism that is directly observable (Morgan et al. (2011)).

### *A. Forced CEO Turnover-Performance Sensitivity*

#### *A.1. Firm Fixed Effects Linear Probability Regression*

In our first test of the impact of institutions' geographic concentration on their corporate governance activities, we estimate regressions in which the dependent variable equals one if a forced CEO turnover event occurs in a given year and zero otherwise. We estimate the regressions using a linear probability model (LPM) as this approach allows us to control for firm fixed effects, which mitigates the concern that omitted firm characteristics simultaneously affect institutions' geographic concentration and monitoring activities.[11] We also include year fixed effects to control for time trends.

Table II presents the LPM regression results. Our independent variable of interest is the interaction term between a given measure of top 10 institutions' geographic concentration and a firm's past stock performance. We control for the average physical distance between the firm and its top 10 institutional shareholders (*IF Distances*) to alleviate the concern that our results are driven by an information advantage due to institutions' proximity to portfolio firms (Coval and Moskowitz (1999), Ivković and Weisbenner (2005), Baik, Kang, and Kim (2010)). The regressions also control for the firm-, CEO-, and top 10 institution-specific characteristics reported in Table I. In particular, we control for top 10 institutions' portfolio turnover since institutions with a longer horizon tend to actively influence firm outcomes through direct involvement rather than voting with their feet, and thus their portfolio turnover may simply proxy for increased monitoring incentives (Gaspar, Massa, and Matos (2005)). We also include top 10 institutions' past portfolio returns to reduce concerns that the geographic concentration of institutions simply proxies for their monitoring ability, and we control for top 10 institutions' fund size, because large funds may have more financial resources available for monitoring, and economies of scale arising from large funds can affect institutions' governance ability (Black

[11] Using probit regressions with industry and year fixed effects does not change the results.

(1990)). The regressions also include several corporate governance variables, including institutional block ownership, board size, the proportion of outside directors on the board, and G-index, to alleviate the concern that our results may be driven by these governance forces. We measure firm and CEO characteristics as of the fiscal year-end that immediately precedes CEO turnover events. All geographic concentration measures and institution characteristics are measured as of the quarter-end that immediately precedes the event year.[12]

In regression (1), we examine the effect of *IF Distances* on the sensitivity of performance to forced CEO turnover. Consistent with previous studies, we find that the coefficient on prior market-adjusted stock returns is negative and significant at the 1% level, suggesting that poor performance increases the likelihood of nonroutine top executive turnover. More importantly, we find that the coefficient on the interaction term between *IF Distances* and past stock returns is positive and significant at the 5% level, indicating that institutions located near a firm are more likely to remove poorly performing top executives than remote institutions. This result is consistent with Kang and Kim (2008), who show that in-state block acquirers play a more active role in nonroutine top management turnover than out-of-state acquirers.

In regressions (2) through (7), we examine the effects of geographic concentration among top 10 institutions on CEO turnover-performance sensitivity. Consistent with our hypothesis, we find that after controlling for *IF Distances,* the coefficients on the interaction terms between past stock performance and the measures of institutions' geographic concentration (*Ew Distances*, *Vw Distances*, *Ew Std Longitudes*, *Vw Std Longitudes*, *Num States,* and *1 - Herfindahl State IO*) are positive and significant at the 5% level or better. These results suggest that forced CEO

[12] Measuring all independent variables including the geographic concentration measures and institution characteristics as of the fiscal year-end that immediately precedes the event year does not change the results.

turnover-performance sensitivity is stronger when firms' top 10 institutions are closely located to each other.

In regression (8), we include both the interaction term between past stock performance and *IF Distances* and the interaction term between past stock performance and *Ew Distances*. The coefficient on the latter interaction term remains significantly positive at the 1% level but the coefficient on the former interaction term loses its significance.[13] In regression (9), we rerun regression (2) controlling for additional internal governance variables including board size, the percentage of outside directors on the board, and the G-index. Because these data are available for only firms covered in the IRRC database, this test is conducted over a smaller sample of 10,321 firm-year observations. We find that our results continue to go through.

The effect of institutions' geographic concentration on CEO turnover-performance sensitivity is also economically large and significant. For example, the interaction term between past stock performance and *Vw Std Longitudes* in regression (5) has a coefficient of 0.001. This number suggests that while a one-standard-deviation decrease in past stock performance (-0.603) increases the probability of forced CEO turnover by 1.27 percentage points (= 0.022 x 0.603) for a firm with zero *Vw Std Longitudes*, the corresponding decrease in past stock returns is associated with only a 0.1 percentage-point increase (= 1.27% - 19.376 x 0.001 x 0.603) in the likelihood of forced CEO turnover for a firm at the 75$^{th}$ percentile of *Vw Std Longitudes* (19.376). Given that the unconditional probability of forced CEO turnover is just 2.74% for the full sample, the difference in these two probabilities is economically large and significant.

[13] In untabulated tests, we replace *Ew Distances* with the other measures of geographic concentration among institutions and reestimate regression (8). We find that the results continue to hold except when we use *Num States*, providing further evidence that large institutions' geographic location relative to each other is a more important factor than their physical distance from the firm in terms of institutional monitoring effects.

Overall, the results in Table II suggest that the geographic concentration of large institutional shareholders increases their incentives to monitor poorly performing corporate managers, and this result is robust to controlling for a range of CEO, firm, institution, and governance characteristics as well as firm fixed effects.

### *A.2. Endogeneity Test: Introduction of New Airline Routes as an Exogenous Shock*

Although inclusion of firm fixed effects in the previous regressions mitigate potential endogeneity bias caused by time-invariant omitted firm characteristics, they do not address potential endogeneity problems arising from the fact that institutional investors do not randomly choose which firms to invest in, or potential endogeneity driven by unobservable institution-level characteristics that affect both the geographic location and monitoring decisions of institutions. For example, institutions that are closely located to each other may have the same preference for stocks with certain characteristics that are highly correlated with governance quality or firm performance. Alternatively, an institution's ability to identify undervalued stocks may be correlated with both its location and monitoring incentives. It is also possible that a firm's governance or performance induces institutions located in the same area to buy its shares, rather than the other way around.

To address these concerns, we use the introduction of new airline routes between the institutional investors' headquarters locations as an exogenous shock to their geographic concentration. As argued by Giroud (2013), new airline routes can lead to a reduction in travel time that is exogenous to firm and institution characteristics, and thus using such an event as a natural experiment enables us to further address omitted variable bias and better identify

causality between the geographic concentration of institutional shareholders and corporate governance (firm performance).

Regression (10) of Table II reports results of a LPM specification in which the dependent variable equals one if a forced CEO turnover event occurs and zero otherwise, and the key independent variable of interest is the interaction term between *Airline Shock* and past stock return performance, where *Airline Shock* takes the value of one if at least one new airline route that reduces the travel time between the headquarters of two of a firm's top 10 institutional shareholders is introduced, and zero otherwise.[14] The introduction of a new airline route is measured during the quarter immediately prior to the event year.[15] We find that the coefficient on the interaction term is negative and significant at the 5% level. In untabulated tests, we also use *Airline Shock* measured during one year prior to the turnover event and find that our results do not change. These results suggest that forced CEO turnover-performance sensitivity is more pronounced when travel time among firms' top 10 institutions is exogenously reduced. Thus, the results in regressions (1) through (9) of Table II are robust to controlling for endogeneity problems that are not addressed by firm fixed effects, and suggest that the geographic concentration of institutional shareholders facilitates active institutional monitoring.

*B. Proxy Voting by Mutual Funds*

To provide further evidence on the role of geographic concentration among institutional shareholders for corporate governance, we examine proxy voting decisions of mutual fund families that belong to a firm's top 10 institutional shareholders. Specifically, we investigate how

[14] The airline time data are obtained from T-100 Domestic Segment dataset. Following Giroud (2013), we compare the driving time between two institutions and the shortest flight time between them to determine whether the introduction of a new airline route reduces the travel time.

[15] In all panel regressions in the paper, we also consider the effect of the introduction of a new airline route on governance outcomes and firm value to be persistent from its introduction to the end of the sample period and find that our results are qualitatively similar (not reported).

the geographic distances between a mutual fund family and a firm's other top 10 institutions influence its proxy votes against management recommendation. Since mutual funds that are closely located to other top 10 institutions can more easily share governance-relevant information and more efficient information-sharing reduces coordination costs in monitoring, these mutual funds are expected to exhibit greater monitoring effort and thus are more likely to vote against management recommendation.

Table III presents results of OLS regressions in which the dependent variable is the percentage of voting where mutual funds are against management recommendations (i.e., number of proposals that mutual funds vote against management recommendations divided by total number of proposals on which mutual funds cast votes (Davis and Kim (2007)). As a fund's proxy votes are usually clustered at the family level, following Davis and Kim (2007) we consider our dependent variable at the level of the mutual fund family firm. Our key independent variables of interest are the measures of proxy voting institutions' geographic concentration discussed in Section I.B. The control variables included in the regressions follow previous studies (e.g., Davis and Kim (2007), Morgan et al. (2011)). We also control for voting institutional shareholders' characteristics such as portfolio turnover, portfolio return, and the logarithm of fund size. To mitigate omitted variables concerns, we include institution fixed effects and firm fixed effects in all regressions. The *t*-statistics are based on standard errors adjusted for heteroskedasticity (White (1980)) and allow for clustering within voting institutions.

In regression (1), we find that the coefficient on the equally-weighted physical distance between the firm and its voting institutional shareholders (*IF Distances (voting)*) is not significant. In contrast, the coefficients on the physical distances between voting institutions and a firm's other top 10 institutions in regressions (2) through (5) (i.e., *Ew Distances (voting)*, *Vw*

*Distances (voting)*, *Ew Dif Longitudes (voting)*, and *Vw Dif Longitudes (voting)*) are all negative and significant at the 1% level, and the coefficient on *Num Same State (voting)* in regression (6) is positive and significant at the 5% level. The results are also economically significant. For example, in regression (4), the coefficient estimate on *EW Dif Longitudes (voting)* is -0.001, which number suggests that a one-standard-deviation decrease in *EW Dif Longitudes (voting)* is associated with an 0.82 (=8.179 x 0.001) increase in the percentage of voting where mutual funds are against management recommendations. Given that the unconditional mean percentage of mutual funds' votes against management is about 10.3, this number accounts for roughly 8% of the unconditional mean. In regression (7), we add governance characteristics to regression (2) and find that the coefficient on *Ew Distances (voting)* is insignificant (*t*-statistic = -0.59), possibly due to the small sample size used in the regression.

In regression (8), we use *Airline Shock (voting)* to capture the exogenous shock to the geographic distances between a firm's voting institutions and other top 10 institutions, where *Airline Shock (voting)* takes the value of one if at least one new airline route that reduces the travel time between the headquarters of a voting institutional shareholder and the headquarters of a firm's other top 10 institutional shareholders is introduced one quarter prior to the event quarter, and zero otherwise. We find that the coefficient on this indicator is 0.021, significant at the 1% level, suggesting that mutual funds experiencing a shock that reduces the travel time between their headquarters and those of a firm's other top 10 institutions vote 2.1% more against management than those that do not experience such a shock. This result accounts for an economically significant 20.3% of the unconditional mean percentage of mutual funds' votes against management.

Overall, the results in Table III suggest that geographic proximity among institutions facilitates active institutional monitoring. In untabulated tests, we estimate the above regressions using a Tobit approach and find that the results are almost identical to those reported in Table III.[16] We also examine how a mutual fund family's geographic location affects its proxy votes for ISS recommendation. Previous studies suggest that ISS is committed to make recommendations on whether to vote for or against each proposal and its recommendations are generally consistent with shareholders' interests (Cai, Garner, and Walking (2009), Morgan et al. (2011)). Therefore, to the extent that geographic concentration among mutual funds increases their incentives to monitor due to lower coordination costs and fewer free-rider problems, we would expect them to vote more in line with ISS recommendations. Consistent with this expectation, we find that all of the geographic concentration measures used in the Table III regressions are significantly related to the ratio of the number of proposals that mutual fund family votes in line with the respective ISS recommendation each year to the total number of proposals on which the mutual fund family casts votes. Thus, mutual funds that are closely located to a firm's other top 10 institutional shareholders are more likely to vote against (for) proposals recommend by management (ISS), lending additional support to our hypothesis that geographic concentration among large institutions facilitates active institutional monitoring.

To further test whether the geographic concentration of institutional shareholders facilitates active institutional monitoring, we use only voting mutual funds in measuring institutions' geographic concentration and reestimate the regressions in Table III. We find that the results are similar (not reported). In terms of economic significance, we find that a one-standard-deviation

[16] In untabulated tests, we also replace the concentration measures used in Table III with those used in Table II (e.g., *Ew Distances*, *Vw Distances*, *Ew Std Longitudes*, *Vw Std Longitudes*, and *Num States*) and find that our results do not change.

decrease in *Ew Distances* (*voting*) is associated with a 0.69 (0.981*0.007) increase in the percentage of mutual funds' votes against management, which accounts for approximately 7% of the unconditional mean. We also examine how the introduction of new airline routes between pairs of voting mutual fund families that reduce their travel time affects the similarity in their proxy voting decisions across all proposals in each firm-year. We find that the propensity of mutual fund families to make the same voting decisions increases significantly after such an introduction: the correlation that two mutual fund families make the same voting decisions is 0.591 before the introduction while the corresponding correlation is 0.675 after the introduction. The difference in these correlations is significant at the 1% level.[17] When we regress the correlation that two mutual fund families make the same voting decisions on *Airline Shock (voting)* and controls used in Table III regression (8), we find that the coefficient on *Airline Shock (voting)* is 0.044, which is significant at the 1% level.

## III. Geographic Concentration and Firm Value

In this section we examine the effect of institutions' geographic concentration on firm value by analyzing the valuation effects of CEO turnover announcements and 13D filings. To the extent that these events are unanticipated by market participants, these analyses should alleviate concerns that firm value influences institutions' geographic concentration, rather than the other way around. We also examine how institutions' geographic concentration affects firm value and performance using annual changes in Tobin's *q* and ROA.

### *A. Valuation Effect of Forced CEO Turnover Announcements*

[17] For each voting mutual fund family, we construct a dummy variable that takes a value of one if the majority of the fammily (i.e., more than 50% of the funds) votes for a proposal and zero otherwise. The propensity that the pairs of mutual fund families experiencing the introduction of new airline routes make the same voting decisions is measured by the correlation between the dummy variables for these pairs across all proposals in each firm-year.

As a first test of the effect of geographic concentration on firm value, we analyze stock market reactions to the announcements of forced CEO turnover. If geographic proximity among institutional investors increases these investors' incentives to monitor portfolio firms and if in turn enhanced monitoring increases firm value, then firms with such institutions as large shareholders should experience higher abnormal returns around forced CEO turnover announcements than firms without these institutions. To examine the announcement effects of forced CEO turnover, we use a market model. We estimate market model parameters using days -210 to -11 relative to the announcement date. We use the CRSP value-weighted index as the proxy for the market portfolio. Three-day cumulative abnormal returns (CARs) are calculated from day -1 before the announcement date to day +1 after the announcement date. In untabulated tests, we find that the mean and median CAR (-1, 1) for our sample firms are -0.89% (*p*-value = 0.08) and -0.12% (*p*-value = 0.64), respectively.

Table IV presents results from OLS regressions in which the dependent variable is the CAR (-1, 1) around the forced CEO turnover announcement date. Similar to the previous tables, our key independent variables of interest are the measures of geographic concentration among top 10 institutional shareholders.[18] We use the same control variables as in Table II and we also control for industry and year fixed effects. Standard errors are clustered by firm.

In regression (1), we find that *IF Distances* does not have a statistically discernible effect on CAR (-1, 1) around forced CEO turnover announcements. However, with the exception of *Num States*, in regressions (2) through (8) the coefficients on all of the measures of top 10 institutions' geographic concentration are highly significant and take the predicted signs. We also find that the valuation effect of institutions' geographic concentration is economically large and

[18] In untabulated tests, we use CAR (-2, 2) as the dependent variable and find that our results do not change.

significant. For example, in regression (4), the coefficient on *Ew Std Longitudes* is -0.005. This coefficient estimate suggests that ceteris paribus, a one-standard-deviation decrease in *Ew Std Longitudes* is associated with an increase in CAR (-1, 1) of almost 2.43% (= 0.005 x 4.871). Given that the mean CAR (-1, 1) is -0.89% for the full sample, this number is quite large and economically significant. In regression (9), we find that the coefficient on *Airline Shock* is 0.021, suggesting that all else being equal, firms whose large institutions experience a reduction in travel time due to the introduction of new airline routes realize a 2.1% higher announcement return than other firms. However, it is not statistically significant (*t*-statistcis = 1.29) possibly due to the small number of airline shock events used in the forced CEO turnover regression.

Overall, these results, together with those in Table II, suggest that close geographic concentration among large institutions facilitates active institutional monitoring and that the stock market incorporates increased monitoring effectiveness into firm value.

*B. Valuation Effect of Initial Schedule 13D Filings*

As a further test of the effect of institutions' geographic concentration on firm value, we investigate whether the concentration measures used in the previous sections are related to abnormal returns around initial Schedule 13D filings by activist institutions. The William Act of 1968 requires investors to file a Schedule 13D with the SEC within 10 days if they acquire more than 5% of the firm's voting equity with an intention to intervene in management (Mikkelson and Ruback (1985)). Anecdotal evidence suggests that activist shareholders form "wolf packs" that work collaborate to exert pressure on target firms when they file Schedule 13Ds.[19] For example, in a recent activist proxy fight initiated by Trian Fund Management LP against DuPont

[19] McCahery, Sautner, and Starks (2015) provide survey evidence that 59% of their sample activists are willing to coordinate with each other, which has become relatively easier since the SEC's 1992 proxy reform that lifted restrictions on shareholder communications (Bradley et al. (2010)).

Co., Trian lined up support from one of DuPont's other large shareholders, California State Teachers' Retirement System.[20] Because use of Schedule 13D filings as a governance mechanism requires shareholder coordination, Schedule 13Ds are expected to convey information to the market about institutions' monitoring capabilities.

Table V presents results from OLS regressions in which the dependent variable is the CAR (-20, 20) around the initial schedule 13D filing (Brav et al. (2008)).[21] The regressions control for several firm (tangibility, firm size, leverage, Tobin's *q*, free cash flow, dividend-payer indicator, ROA, stock return volatility, and past market-adjusted stock return), governance (institutional block ownership, board size, proportion of outside directors on the board, and G-index), institution (portfolio turnover, portfolio return, and portfolio size) characteristics as well as industry and year fixed effects, and cluster standard errors by firm.

We find that although the abnormal returns around the initial schedule 13D filings are not significantly related to *IF Distances* (regression (1)), they increase with the geographic concentration of a firm's top 10 institutional investors (regressions (2) through (8)). For example, in regression (5), the coefficient on *Vw Std Longitudes* is -0.004, and significant at the 5% level. This coefficient indicates that all else being equal, a one-standard-deviation decrease in institutional investors' geographic concentration increases announcement returns by 2.43 percentage points (= 0.004 x 5.771), which represents 35.19% of the sample mean CAR (-20, 20). Thus, the market's positive ex-ante valuation of geographic concentration effects is both statistically and economically significant, supporting the view that geographic proximity among

[20] "Activist's Bid Sets Stage for Brawl for DuPont," *Wall Street Journal*, January 9, 2015.

[21] In untabulated tests, we find that our sample target firms earn statistically significant positive returns around the initial schedule 13D filings: the mean and median CAR (-20, 20) are 6.56% (*p*-value = 0.00) and 5.38% (*p*-value = 0.00), respectively.

institutions facilitates institutional monitoring. Using the introduction of a new airline route as a shock to institutions' geographic concentration leads to the same conclusion (regression (9)).

*C. Impact of Institutions' Geographic Concentration on Firm Value and Performance*

To further illustrate how institutions' geographic concentration affects firm value and performance, in this subsection we examine how annual changes in a firm's Tobin's *q* and ROA are related to the geographic concentration measures used in the previous sections.

Table VI reports the results using annual changes in Tobin's *q* as the dependent variable. The regressions are estimated using OLS with firm and year fixed effects. In regression (1), we find that the physical distance between the firm and institutional shareholders (*IF Distances*) has a negative effect on firm performance, suggesting that firm value is higher when large institutions are located near firms. More importantly, in regressions (2) through (7) we find that, with the exception of *Num state*, the coefficients on all of the measures of geographic concentration among institutions are significant with the predicted signs. The results do not change when we control for additional governance characteristics (regression (8)) or when we use *Airline Shock* to capture an exogenous shock to institutions' geographic concentration (regression (9)). In terms of economic significance, the coefficient estimate of -0.008 on *Ew Std Longitudes* (regression (4)) suggests that all else being equal, a one- standard-deviation decline in *Ew Std Longitudes* is associated with a 0.038 (= -0.008 x 5.367) increase in firm value. In terms of relative economic significance, this impact is comparable to the effects of a change in firm size by one tenth of a standard deviation, a change in book leverage by two standard deviations, or a change in free cash flow by a one-standard-deviation, all else being equal.

In Table VII, we repeat the analysis in Table VI using the annual change in ROA as the dependent variable. The results are qualitatively similar to those reported in Table VI except that the coefficient on *Num state* is now significant at the 1% level with the predicted sign.

Overall, the results in Tables VI and VII confirm that the presence of geographically concentrated large institutional shareholders improves firm value and performance.

## IV. Geographic Concentration and Liquidity

One of the important testable implications of our hypothesis is that close geographic concentration among institutions improves their portfolio firms' stock liquidity as it facilitates efficient information-sharing among institutions, which helps mitigate information asymmetries vis-à-vis the firms. Maug (1998), Kyle and Vila (1991), Kahn and Winton (1998), and Faure-Grimaud and Gromb (2004) show that liquidity can increase shareholder monitoring through intervention. Edmans (2009) further shows that liquidity improves corporate governance by enhancing the threat of blockholder exit. These studies suggest that improved liquidity resulting from the geographic concentration of intuitional investors is an important channel through which geographically proximate intuitional investors perform an active monitoring role. To test whether institutional shareholders' geographic concentration affects firms' stock liquidity, we regress each of the six geographic concentration measures on the square root variant of the Amivest liquidity measure (i.e, annual mean of the square root of the daily ratio of volume to absolute return), which is widely used in academic literature (Cooper, Groth, and Avera (1985), Amihud, Mendelson, and Lauterbach (1997), among others), and the other control variables used in the previous analyses, including firm and year fixed effects.

The regression results are presented in Table VIII. In regression (1), we do not find any evidence that *IF Distances* is significantly associated with a firm's stock liquidity. In contrast, in regressions (2) through (7), we find that institutional shareholders' geographic concentration has a significant effect on stock liquidity: the coefficients on *Ew Distances*, *Vw Distances*, *Ew Std Longitudes*, *Vw Std Longitudes*, *Num States*, *and 1 - Herfindahl State IO* are negative and significant at the 5% level or better. All else being equal, a one-standard-deviation decrease in *Ew Distances*, *Vw Distances*, *Ew Std Longitudes*, *VW Std Longitudes*, *Num States*, and *1 - Herfindahl State IO* account for approximately 5.9 %, 6.0%, 4.1%, 4.0%, 10.0 %, and 11.0%, respectively, of the unconditional sample mean of firms' stock liquidity (19.246). Thus, firms whose large institutions are closely located to each other experience greater improvement in liquidity, in line with our hypothesis.

In regression (8), we add governance characteristics to regression (2) and find that the coefficient on *Ew Distances* is still negative and significant at the 1% level. In regression (9), consistent with the results in regressions (2) through (8), we find that *Airline Shock* is associated with higher stock liquidity.

In untabulated tests, we also experiment with several alternative measures of firms' stock liquidity including the Amihud (2002) illiquidity measure, the Gibbs estimate from the market-adjusted model (C^bma, Hasbrouck (2009)), the Gibbs estimate from the latent common factor model (Gamma 0, Hasbrouck (2009)), and the proportion of days with zero returns (Lesmond, Ogden, and Trzcinka (1999)).[22] We find that all geographic concentration measures except *Num States* and *1 - Herfindahl State IO* are significantly positively related to these four

[22] Data on these alternative measures of firms' stock liquidity for the 1993 to 2006 period are obtained from Joel Hasbrouck's website, http://people.stern.nyu.edu/jhasbrou/Research/GibbsEstimates2006/Liquidity%20estimates%202006.htm.

alternative measures of firms' stock liquidity. The coefficients on *Num States* and *1 - Herfindahl State IO* are positive and significant only in the regressions using the proportion of days with zero returns as the measure of firms' stock liquidity.

In sum, these results support our hypothesis that large institutions' geographical concentration mitigates information asymmetry about portfolio firms through efficient information-sharing, which has a positive effect on stock liquidity.

## V. Robustness Tests

### *A. Further Tests of Endogeneity: Instrumental Variables Approach*

While estimating regressions with firm (and institution) fixed effects and using airline shocks as a natural experiment help mitigate omitted variable bias and reverse causality concerns in the analyses above, to further alleviate these concerns in this subsection we rerun our tests using 2SLS. In paricular, we use *Density of Nearby Institutions* and *Top 10 Institutions' Proximity to Financial Centers* as instruments for the geographic concentration of institutional investors. *Density of Nearby Institutions* is constructed as the average number of institutions located within 60 miles of a firm's top 10 institutional shareholders,[23] and *Top 10 Institutions' Proximity to Financial Centers* is given as the logarithm of the average physical distance between the headquarters of top 10 institutional shareholders and three most influential financial centers in 2012 according to Global City Economic Power Index, namely, New York, Los Angeles, and Chicago. We use the minimum distance between a given institution and these three financial centers in calculating its physical distance to the financial centers. To alleviate the concern that institutions may choose to be closely located to their portfolio firms to facilitate

[23] Using 100 miles does not affect our results except for proxy voting against management.

corporate governance, when constructing the density of nearby institutions, we use only institutions that have already existed in the areas before firms' establishment. Similarly, when constructing top 10 institutions' proximity to financial centers, we use only top 10 institutions that have already been established before firms' existence.[24]

The rationale for using *Density of Nearby Institutions* as an instrument is that if more institutions are located in the same area, these geographically proximate institutions are more likely to become top 10 institutions holding the same stocks, as shown in prior studies on local bias (Coval and Moskowitz (1999), Ivković and Weisbenner (2005), Baik, Kang, and Kim (2010)). This instrument is therefore expected to be negatively correlated with *Ew Distances*, *Vw Distances*, *Ew Std Longitudes*, *Vw Std Longitudes*, *Num States*, and *1 - Herfindahl State IO*, satisfying the relevance requirement of instrumental variables. However, it is unlikely that the average number of other nearby institutions that have already existed in the areas before firms' establishment influences top 10 institutions' governance activities or firm performance except through its effect on top 10 institutions' geographic concentration, and thus it satisfies the exclusion requirement of instrumental variables.

Similarly, since financial centers are a large source of capital, institutional investors are likely to locate near them, resulting in increased geographic concentration among institutions near financial centers. These institutions therefore are likely to be among geographically proximate top 10 institutions for firms in financial centers, satisfying the relevance requirement. However, to the extent that this instrument is based on institutions' proximity to financial centers and constructed using only institutions that have already been established before firms' existence,

[24] These requirements reduce the sample size used in 2SLS tests. The results do not change when we do not impose these restrictions in constructing instrumental variables.

it is unlikely that this measure directly affects institutions' governance activities and firm value, and thus it also satisfies the exclusion requirement.

The regression results using 2SLS are reported in Table IX. Regressions (1), (3), (5), (7), (9), (11), and (13) report estimates from the first-stage regressions in which the dependent variable is *EW Distances* (*EW Distances* (*voting)*)[25] and the instrumental variables are *Density of Nearby Institutions* and *Top 10 Institutions' Proximity to Financial Centers*. Regressions (2), (4), (6), (8), (10), (12), and (14) report estimates from the second-stage regressions in which the dependent variables are an indicator for forced CEO turnover, the percentage of mutual fund family votes against management each year, CAR (-1, 1) around forced CEO turnover announcements, CAR (-20, 20) around initial schedule 13D filings, the annual change in Tobin's *q*, the annual change in ROA, and the square root variant of the Amivest liquidity, respectively, and the key independent variables of interest are predicted *EW Distances* (*EW Distances* (*voting)*) estimated from the first-stage regression. To minimize the concern that our instruments may be proxying for the distance between the firm and its top 10 institutional shareholders, we include this distance variable in both the first- and second-stage regressions. The control variables in the regressions are the same as those used in the previous LPM and OLS regressions.

As expected, we find that the coefficients on both instrumental variables are significant and take the expected signs in all of the first-stage regressions: the coefficients on *Density of Nearby Institutions* are negative and significant at the 1% level and those on *Top 10 Institutions' Proximity to Financial Centers* are positive and significant at the 5% level or better. The *p*-values for the test of the instruments' relevance (i.e., joint test of excluded instruments) are 0.00 or 0.01 in all regressions, thus rejecting the null hypothesis of weak instruments.

[25] In untabulated tests, we reestimate the regressions in Table IX using other measures of institutions' geographic concentration and find that the results are qualitatively similar.

In the second-stage regressions, we find that the coefficient on the interaction term between predicted *Ew Distances* and past stock returns is positive and significant in regression (2) and the coefficients on predicted *Ew Distances* are negative and significant in all other regressions. The *p*-values for the test of underidentification (i.e., Kleibergen-Paap rk LM *p*-values) strongly reject the null hypothesis of underidentification. The *p*-values for the test of overidentifying restrictions are greater than 0.3 in most regressions, indicating that our two instrumental variables pass the Sargan (1958) overidentification test. The Hausman test statistics (*p*-values) for the hypothesis that *EW Distances* is uncorrelated with the error terms of the second-stage regressions are not significant in all regressions except for regressions (4), (8), and (14). Thus, overall, we cannot reject the null hypothesis that *EW Distances* is an exogenous variable.

Overall, these results suggest that our findings in the previous sections are robust to controlling for omitted variable or reverse causality bias.[26]

*B. Institution Heterogeneity*

Previous studies show that nontransient (dedicated/quasi-index) institutions are more likely to monitor management compared to transient institutions (e.g., Chen, Harvard, and Li (2007)), suggesting that our results on the effects of geographic proximity of large institutions on corporate governance and firm value are more pronounced when nontransient institutions are geographically concentrated than when transient institutions are. In this subsection we examine whether our results in previous sections are sensitive to concentration measures estimated using

[26] To check whether our results are sensitive to using an alternative measure of the instrumental variable, we reestimate the regressions in Table IX by replacing *Density of Nearby Institutions* and *Top 10 Institutions' Proximity to Financial Centers* with the average density of high net worth individuals (*HNWI*) in top 10 institutions' states. The density of *HNWI* is computed as the number of high net worth individuals (individuals with net worth between $ 0.6 million and $10 million) in a state standardized by its area (thousand square miles). We expect that higher local density of *HNWI* attracts more financial institutions to serve with and thus they are more likely to invest in the same firm. We obtain information on the number of high net worth individuals in each state from the Statistics of Income program at the Internal Revenue Service. Our results do not change.

these two types of institutional investors. Specifically, following Bushee (1998), we first divide sample firms' top 10 institutions into transient and nontransient investors and then reconstruct our location concentration measures separately for these two types of institutions.

Panels A and B of Table X report the regression results based on the nontransient institution sample and the transient institution sample, respectively. Regressions (1) through (6) use as dependent variables an indicator for forced CEO turnover, CAR (-1, 1) around forced CEO turnover announcements, CAR (-20, 20) around initial schedule 13D filings, the change in Tobin's *q*, the change in ROA, and the square root variant of the Amivest liquidity, respectively. We find that most of our previous results are driven by nontransient institutions: while the coefficients on the geographic concentration measures (*Ew Distances*, *Vw Distances*, *Ew Std Longitudes*, *Vw Std Longitudes*, *Num States*, *1 - Herfindahl State IO*, and *Airline Shock*) are significant with the predicted signs in Panel A (with the exception of the coefficients on *Num States* in regressions (1), (2), and (4)), most of the corresponding coefficients in Panel B are insignificant except for those on the geographic concentration measures in regression (6). Given that transient institutions trade actively to maximize short-term profits, it is not surprising that we obtain significant results in regression (6) for both Panels A and B.

Overall, the findings presented in Table X are consistent with those of Chen, Harvard, and Li (2007) and support the view that geographically concentrated long-term institutions (i.e., nontransient institutions) with large ownership have stronger incentives to perform an active monitoring role than geographically concentrated transient institutions.

*C. Alternative Measure of Large Institutions*

Thus far, we have used a firm's top 10 institutions to examine the importance of geographic concentration among large institutions to corporate governance and firm value. In untabulated tests, we instead define large institutions as block institutions that own at least 5% of a firm's outstanding shares and reestimate the previous regressions. Although using this alternative measure of large institutions reduces our sample size by almost half, we continue to find that our previous results hold, except for the tests of changes in ROA and abnormal returns around Schedule 13D filings. With respect to the latter test, we find that only the coefficients on *Ew Distances* and *Vw Distances* are significant, with the expected signs. For the tests using *Airline Shock* and *Airline Shock (voting)*, we find that with the exception of the tests of abnormal returns around forced CEO turnover announcements and liquidity, the results are similar to those using top 10 institutions as our measure of large institutions.

*D. Controlling for Other Location Measures*

Loughran and Schultz (2005) show that compared to rural firms, urban firms trade more frequently and attract larger institutional ownership, suggesting that an urban location allows firms to enjoy higher liquidity and greater institutional ownership, which facilitates institutional monitoring. To control for this urban location effect, in untabulated tests we include an urban indicator that takes the value of one if a firm's headquarters is located in one of the top 10 urban areas and zero otherwise. Following Loughran and Schultz (2005), the top 10 urban areas are taken to be the 10 largest consolidated metropolitan statistical areas based on population size reported in the 2000 Census: New York City, Los Angeles, Chicago, Washington-Baltimore, San Francisco, Philadelphia, Boston, Detroit, Dallas, and Houston. Our results do not change when we include the urban location indicator in the regressions.

It is also possible that our results are driven by institutions that are disproportionately located in large metropolitan areas where the production and transmission of information are relatively easy. To address this concern, in untabulated tests we first exclude institutional investors located in New York, which is considered one of the largest metropolitan cities in the U.S., and reconstruct our geographic concentration measures using the remaining top 10 institutions. Second, we omit institutional investors located in top five metropolitan cities as in Loughran and Schultz (2005), and reconstruct the geographic concentration measures using the remaining top 10 institutions. Our main results do not change.

An important concern with using the introduction of new airline routes as an exogenous shock to geographic concentration is that local shocks affect both the introduction of new airline routes and firm performance. For example, suppose both the firm and its largest institutional shareholder are located in the same city, Pittsburgh, while its second-largest institutional shareholder is located in New York. If the local economies in both cities are booming, firm performance is likely to increase due to high local demand for its products. At the same time, airlines may have strong incentives to introduce a new flight between these two cities because of an increase in the number of passengers or lobbying by the firm. In this case, our finding that firms with large institutions that are closely located to each other experience higher firm performance may be due to an omitted local shock that simultaneously affects both firm performance and the introduction of new airline routes. To alleviate this concern, in untabulated tests, we include variables that capture the state of the economy, such as the average unemployment rate and the average personal income of the county in which the firm is located, in our main regressions. Our key results are not affected by including these variables.

*E. Governance Quality and Firm-Shareholder Difference*

If the geographic concentration of large institutions increases monitoring effectiveness, we expect our results to be more pronounced for firms with poorer governance and firms that are difficult to monitor such as those whose large shaeholders are located far away from the firms. To address this issue, in untabulated tests, we interactact *EW Distances* with G-index and *IF Distances*, repectively, and reestimate all previous regressions. Consistent with our expectation, we find that the impact of geographic concentration of institutional investors on corporate governance and firm value is stronger for firms with higher G-index (i.e., pooly governed firms) in all tests, except for the test of announcement returns around Schedule 13D filings. We also find that previous results are more evident for firms with larger *IF Distances* in the tests of forced CEO turnover-performance sensitivity, announcement returns aound Schedule 13D filings, Tobins'*q*, ROA, and liquidity.

*F. Alternative Measures of Geographic Concentration*

We next consider alternative measures of institutions' geographic concentration. First, to further normalize the tail effect of distance, we measure *Ew Distances* as the equally-weighted average of the logarithm of the physical distance between a firm's top 10 institutional shareholder pairs, rather than the logarithm of the equally-weighted physical distance between the pairs. Second, in measuring *Vw Distances*, we use the product rather than the sum of two institutions' ownership holdings in the weight, to capture the fact that an institution with larger ownership has stronger incentives to monitor. Specifically, in measuring *Vw Distances*, weight $w_{ij}$ is given by $(i\,(IOi) * j\,(IOj))/(\sum_{i>j}^{10}\sum_{j=1}^{10}(i\,(IOi) * j\,(IOj)))$. Finally, in calculating *Ew Std Longitude*, we use 9 [i.e., N (number of top 10 institutions) – 1] as the sample size in the denominator, to account for a small sampl size used in the calculation of insitutions' geographic concentration. Our results do not change.

*G. Regulation Fair Disclosure and the Information Advantage of Institutions*

Hwang and Qian (2014) and Bernile, Kumar, and Sulaeman (2014) document that the information advantage of institutional investors near corporate headquarters declines sharply following the adoption of Regulation Fair Disclosure (Reg FD), possibly due to the decline in institutions' access to firms' private information. To the extent that all institutions' private information about portfolio firms is affected by the passage of Reg FD, it is possible that information transfer among institutions is also affected by its passage, thus influencing the networking effects of geographic proximity among institutions. This argument suggests that our results above are likely to be weaker after the passage of Reg FD. To test this prediction, we divide the sample into two subperiods—pre-Reg FD (fiscal years ending in calendar years 1999 and before) and post-Reg FD (fiscal years ending in calendar years 2000 and onward) —and reestimate all previous regressions using *EW Distances* as our measure of institutions' geographic concentration.

We find no difference in the results between the two subperiods for the forced CEO turnover-performance sensitivity, Tobin's *q*, ROA, and liquidity regressions. In the regression of CAR (-1, 1) around forced CEO turnover announcements on *EW Distances*, we find that the coefficient on *EW Distances* is significant only in the post-Reg FD period. However, we find the opposite result for the regression of CAR (-20, 20) around initial Schedule 13D filings on *EW Distances*.

In sum, we do not find any systematic evidence that our main findings are affected by the regulatory change limiting institutions' access to firms' private information. These results suggest that although the information advantage of institutions located near portfolio firms may have declined after the adoption of Reg FD, the ability of geographic concentration among

institutions to facilitate information-sharing among them and their incentives to monitor have not been affected by the passage of this law.

## VI. Summary and Conclusion

In this paper we examine the impact of geographic concentration among large institutional investors on corporate governance and firm value. We argue that the geographic concentration of institutional investors increases monitoring effectiveness and firm value by reducing information asymmetry, coordination costs, and free-rider problems in institutional monitoring and increasing firms' stock liquidity and the observability of institutions' coordination efforts. Consistent with this argument, we find that large institutions' geographic concentration improves corporate governance and enhances firm value. Specifically, we find that firms whose top 10 institutions are closely located to each other experience higher forced CEO turnover-performance sensitivity, higher abnormal returns around forced CEO turnover announcements and Schedule 13D filings, a larger increase in Tobin's *q* and ROA, and greater stock liquidity. Firms also experience more frequent proxy voting against management when voting mutual funds are closely located to other top 10 institutions. These results are robust to using alternative measures of geographic concentration among institutions, to various controls for endogeneity bias and other location measures, and to the passage of Reg FD. Finally, we find that these results concentrate among dedicated/quasi-index institutions that are closely located to each other, suggesting that geographically concentrated nontransient institutions have stronger incentives to perform an active monitoring role than geographically concentrated transient institutions.

Overall, our results suggest that large investors' geographic concentration increases their monitoring incentives and in turn firm value.

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## Appendix

The Appendix provides detailed descriptions of all the variables used in the tables.

| Variable | Definition |
|---|---|
| ***Measures of top 10 institutional shareholders' geographic concentration:*** | |
| *Ew Distances* | Logarithm of the equally-weighted physical distance between a firm's top 10 institutional shareholder pairs. Specifically, if the geographic distances between top 10 institutional shareholder pairs are $dist_{12}$, $dist_{13}$, ..., and $dist_{ij}$, then *Ew Distance* is the logarithm of the average of these distances for top 10 institution pairs. |
| *Vw Distances* | Logarithm of the ownership-weighted physical distance between a firm's top 10 institutional shareholder pairs. Specifically, if the geographic distances between top 10 institutional shareholder pairs are $dist_{12}$, $dist_{13}$, ..., and $dist_{ij}$, and top 10 institutional shareholders' percentage equity holdings in a firm are $IO_1$, $IO_2$, ..., and $IO_{10}$, then *Vw Distance* is the logarithm of the average of $w_{12}*dist_{12}$, $w_{13}*dist_{13}$,..., $w_{ij}*dist_{ij}$, ..., where $w_{ij}$ is the sum of ownership held by institution $i$ ($IO_i$) and institution $j$ ($IO_j$) divided by the sum of ownership held by all top 10 institution pairs, $\sum_{i>j}^{10}\sum_{j=1}^{10}(i\ (IOi) + j\ (IOj))$. |
| *Ew Std Longitudes* | Standard deviation of top 10 institutional shareholders' longitudes. Specifically, if the longitudes of a firm's top 10 institutional shareholders are $lon_1$, $lon_2$, ..., and $lon_{10}$, then *EW STD Longitudes* is $\sqrt{\frac{1}{10}\sum_{i=1}^{10}(lon_i - \overline{lon})^2}$, where $\overline{lon}$ is the average of top 10 institutions' longitudes. |
| *Vw Std Longitudes* | Ownership-weighted standard deviation of top 10 institutional shareholders' longitudes, where the weight used is the ratio of the equity ownership held by each institution to the total equity ownership held by the top 10 institutions. Specifically, if the longitudes of a firm's top 10 institutional shareholders are $lon_1$, $lon_2$, ..., and $lon_{10}$, and their percentage equity holdings in the firm are $IO_1$, $IO_2$, ..., and $IO_{10}$, then *VW STD Longitudes* is $\sqrt{\sum_{i=1}^{10} w_i(lon_i - \overline{lon})^2}$, where $w_i$ is the ownership held by institution $i$ ($IO_i$) divided by the total ownership held by the top 10 institutions and $\overline{lon}$ is the average of top 10 institutions' longitudes. |
| *Num States* | The number of unique states in which a firm's top 10 institutional shareholders are located. For example, if a firm's top 10 institutional shareholders are located in seven states (i.e., four institutions are located in the one state and six institutions are located in six different states), then *Num States* equals seven. |
| *1 - Herfindahl State IO* | One minus the Herfindahl index of top 10 institutional shareholders' ownership in a firm in the number of states in which the firm's top 10 institutions are located. For example, if the number of unique states that top 10 institutional shareholders are located in (i.e., *Num States*) is seven and the sum of a firm's ownership held by the top 10 institutional shareholders in each of the seven states is $State\_IO_1$, $State\_IO_2$, …, and $State\_IO_7$, then *1 - Herfindahl State IO* is given by $1 - \sum_{i=1}^{7}(State_{IO\,i} / Top10\_IO)^2$, where *Top10_IO* is the total ownership held by top 10 institutions. |
| *Airline Shock* | An indicator that takes the value of one if at least one new airline route that reduces the travel time between the headquarters of two of a firm's top 10 institutional shareholders is introduced one quarter prior to the event year or event date (or one quarter prior to when firm performance or stock liquidity is measured), and zero otherwise. |
| ***Instrumental variables for top 10 institutional shareholders' geographic concentration:*** | |
| *Density of Nearby Institutions* | Average number of institutions located within 60 miles of a firm's top 10 institutional shareholders. Only nearby institutions that have already existed in the areas before firms' establishment are used in constructing the instrument. |
| *Top 10 Institutions' Proximity to* | Logarithm of the average of the physical distances between the headquarters of top 10 institutional shareholders and three most |

| | |
|---|---|
| *Financial Centers* | influential financial centers according to Global City Economic Power Index: Chicargo, Los Angeles, and New York. We use the minimum distance between an institution and each of these three most influential financial centers in calculating its physical distance to the financial centers. Only top 10 institutions that have already been established before firms' existence are used in constructing the instrument. |

***Measures of voting institutional shareholders' geographic concentration:***

| | |
|---|---|
| *Ew Distances (voting)* | Logarithm of the equally-weighted physical distance between a voting top 10 institutional shareholder *v* and the other top 10 institutional shareholders. Specifically, if the geographic distances between the voting institutional shareholder and the other institutional shareholders are $dist_{1v}$, $dist_{2v}$, …, and $dist_{10v}$, then *Ew Distance (voting)* is the logarithm of the average of these distances. |
| *Vw Distances (voting)* | Logarithm of the ownership-weighted physical distance between a voting top 10 institutional shareholder *v* and the other top 10 institutional shareholders. Specifically, if the geographic distances between the voting institutional shareholder and the other institutional shareholders are $dist_{1v}$, $dist_{2v}$, …, and $dist_{10v}$, and top 10 institutional shareholders' percentage equity holdings in a firm are $IO_1$, $IO_2$, …, $IO_v$, …, and $IO_{10}$, then *Vw Distance (voting)* is the logarithm of the average of $w_{1v}$*$dist_{1v}$, $w_{iv}$*$dist_{iv}$,…, $w_{10v}$*$dist_{10v}$, where $w_{iv}$ is the sum of the ownership held by the voting institution *v* ($IO_v$) and the other institution *i* ($IO_i$) divided by the sum of the ownership held by the voting institution and all other top 10 institution pairs, $\sum_{i=1,i\neq v}^{10}(IO_i + IO_v)$. |
| *Ew Dif Longitudes (voting)* | Mean absolute difference between the longitude of a firm's voting institutional shareholder *v* and those of the other top 10 institutional shareholders. Specifically, if the longitudes of a firm's top 10 institutional shareholders are $lon_1$, $lon_2$, …, $lon_v$, …, and $lon_{10}$, then *Ew Dif Longitudes (voting)* is $\frac{\sum_{i=1,i\neq v}^{10}\lvert lon_i - log_v\rvert}{9}$, where $lon_v$ is the longitude of voting institution *v* and $lon_i$ is the longitude of the other institution *i*. |
| *Vw Dif Longitudes (voting)* | Ownership-weighted mean absolute difference between the longitude of a firm's voting institutional shareholder *v* and those of the other top 10 institutional shareholders. Specifically, if the longitudes of a firm's top 10 institutional shareholders are $lon_1$, $lon_2$, …, $lon_v$, …, and $lon_{10}$, and their percentage equity holdings in the firm are $IO_1$, $IO_2$, …, $IO_v$, …, and $IO_{10}$, then *Vw Dif Longitudes* (*voting*) is $\frac{\sum_{i=1,i\neq v}^{10} w_{iv}\lvert lon_i - log_v\rvert}{9}$, where $w_{iv}$ is the sum of the ownership held by voting institution *v* ($IO_v$) and the other institution *i* ($IO_i$) divided by the total ownership held by the top 10 institutions, $lon_v$ is the longitude of voting institution *v*, and $lon_i$ is the longitude of the other institution *i*. |
| *Num Same State (voting)* | Number of top 10 non-voting institutional shareholders located in the same state as the voting institution. |
| *Airline Shock (voting)* | An indicator that takes the value of one if at least one new airline route that reduces the travel time between the headquarters of a firm's voting institutional shareholder and those of its other top 10 institutional shareholders is introduced one quarter prior to the event quarter, and zero otherwise. |

***Measure of physical distances between the firm and its top 10 institutional shareholders (voting institutional shareholders):***

| | |
|---|---|
| *IF Distances* | Equally-weighted physical distance between the firm and its top 10 institutional shareholders. |
| *IF Distances (voting)* | Equally-weighted physical distance between the firm and the voting institutional shareholders that belong to its top 10 institutional shareholders. |

***Firm, CEO, and, governance characteristics:***

| | |
|---|---|
| Book leverage | Total debt (data9) / book assets (data6). |
| Firm age | Number of years since a firm appears in CRSP. |
| Free cash flow | (Operating income before depreciation (data13) – interest and related expenses (data15) – total income taxes (data16) – total dividends common/ordinary (data21)) / book assets (data6). |

| | |
|---|---|
| Forced CEO turnover (indicator) | An indicator that takes the value of one if a forced CEO turnover occurs in a given year and zero otherwise. We obtain the forced CEO turnover sample from Peters and Wagner (2014), who classify turnover events as forced turnovers if 1) the press reports that the CEO has been fired, has been forced to depart from the position, or has departed due to unspecified policy differences, 2) the departing CEO is under the age of 60 and the stated reason for the departure is not death, poor health, or the acceptance of another position (outside or within the firm), or 3) the departing CEO is under the age of 60 and the stated reason for the departure is retirement but the firm does not announce the departure at least six months in advance. |
| Market-adjusted stock return | One-year buy-and-hold market-adjusted stock return. Equally-weighted CRSP index return is used as the market return. |
| Market capitalization | Stock price (data199) * shares outstanding (data25). |
| Payer (indicator) | An indicator that takes the value of one if a firm pays dividends in the fiscal year and zero otherwise. |
| ROA | Income before extraordinary items (data18) / book assets (data6). |
| Δ ROA | Annual change in ROA. |
| Stock return volatility | Volatility of daily stock return over the year. |
| Tangibility | Net PPE (data8) / book assets (data6). |
| Tobin's *q* | (Book assets + market value of equity – book value of equity) / book assets (data6), where the book value of equity is calculated as (total stockholders' equity (data216) + deferred taxes (data74) + investment tax credit (data208) – preferred stock (combining data216, data 10, and data 130)) and the market value of equity is calculated as price per share (data 24) * common shares outstanding (data25). |
| Δ Tobin's *q* | Annual change in Tobin's *q*. |
| | |
| CEO age>60 (indicator) | An indicator that takes the value of one if the CEO is older than 60 and zero otherwise. |
| CEO as chairman (indicator) | Indicator that takes the value of one if the CEO is the chairman of the board and zero otherwise. |
| CEO ownership | Equity ownership held by the CEO. |
| CEO tenure | CEO's tenure in the firm. |
| | |
| Board size | Number of board members. |
| G-index | Governance index constructed according to Gompers, Ishii, and Metrick (2003). |
| Institutional block ownership | Sum of the ownership held by all block institutional shareholders that own more than 5% of a firm's outstanding shares. |
| % of outside directors | Percentage of outside directors on the board. |
| ***Top 10 institutional shareholders' characteristics:*** | |
| Fund size | Logarithm of top 10 institutional shareholders' average asset holding value. |
| Turnover | Average churn rate for top 10 institutional shareholders, calculated as (aggregate purchase + aggregate sale – absolute value of total net flow) / equity asset holding value. |
| Return | Top 10 institutional shareholders' mean one-quarter buy-and-hold (monthly) value-weighted portfolio return. |
| ***Voting institutional shareholders' characteristics:*** | |
| Fund size (voting) | Logarithm of voting institutions' asset holding value. |
| Turnover (voting) | Churn rate of voting institutions, calculated as (aggregate purchase + aggregate sale – absolute value of total net flow) / equity asset holding value. |
| Return (voting) | Voting institutions' one quarter buy-and-hold (monthly) value-weighted portfolio return. |

## Table I
## Summary Statistics

This table presents summary statistics and data sources for the main regression variables. The Appendix provides detailed variable descriptions.

| | Sample size | Mean | Median | Standard deviation | Minimum | Maximum | Source |
|---|---|---|---|---|---|---|---|
| ***Measures of top 10 institutional shareholders' geographic concentration:*** | | | | | | | |
| *Ew Distances* | 49,293 | 6.781 | 6.917 | 0.590 | 0.000 | 7.901 | 13F, Edgar |
| *Vw Distances* | 49,293 | 6.790 | 6.927 | 0.604 | 0.000 | 7.900 | 13F, Edgar |
| *Ew Std Longitudes* | 49,293 | 15.693 | 16.419 | 5.367 | 0.000 | 36.522 | 13F, Edgar |
| *Vw Std Longitudes* | 49,293 | 14.309 | 14.761 | 6.014 | 0.000 | 26.863 | 13F, Edgar |
| *Num States* | 49,293 | 5.934 | 6.000 | 1.803 | 1.000 | 10.000 | 13F, Edgar |
| *1 - Herfindahl State IO* | 49,293 | 0.650 | 0.717 | 0.200 | 0.000 | 0.893 | 13F, Edgar |
| *Airline Shock* | 49,293 | 0.123 | 0.000 | 0.329 | 0.000 | 1.000 | 13F, Edgar |
| ***Measures of voting institutional shareholders' geographic concentration:*** | | | | | | | |
| *Ew Distances (voting)* | 23,794 | 6.637 | 6.654 | 0.529 | 4.419 | 7.848 | 13F, Edgar |
| *Vw Distances (voting)* | 23,794 | 6.638 | 6.671 | 0.551 | 4.133 | 7.853 | 13F, Edgar |
| *Ew Dif Longitudes (voting)* | 23,794 | 15.340 | 13.734 | 8.179 | 0.047 | 48.614 | 13F, Edgar |
| *Vw Dif Longitudes (voting)* | 23,794 | 15.488 | 13.980 | 8.391 | 0.049 | 48.792 | 13F, Edgar |
| *Num Same State (voting)* | 23,794 | 0.899 | 1.000 | 1.024 | 0.000 | 8.000 | 13F, Edgar |
| *Airline Shock (voting)* | 23,794 | 0.069 | 0.000 | 0.215 | 0.000 | 1.000 | 13F, Edgar |
| ***Measures of physical distance between the firm and its top 10 institutional shareholders (voting institutional shareholders):*** | | | | | | | |
| *IF Distances* | 49,293 | 6.457 | 6.534 | 0.870 | 0.524 | 7.899 | 13F, Compact disclosure |
| *IF Distances (voting)* | 23,794 | 6.467 | 6.784 | 1.305 | 0.573 | 7.906 | 13F, Compact disclosure, Edgar |
| ***Firm, CEO, and, governance characteristics:*** | | | | | | | |
| Tangibility | 49,293 | 0.275 | 0.210 | 0.226 | 0.000 | 0.897 | Compustat |
| Market capitalization (in billion U.S. dollars) | 49,293 | 1.811 | 0.199 | 5.888 | 2.675 | 45.022 | Compustat |
| Book leverage | 49,293 | 0.206 | 0.177 | 0.186 | 0.000 | 0.802 | Compustat |
| Payer (indicator) | 49,293 | 0.303 | 0.000 | 0.459 | 0.000 | 1.000 | Compustat |
| Free cash flow | 49,293 | -0.106 | -0.057 | 0.151 | -0.584 | 0.036 | Compustat |
| Tobin's *q* | 49,293 | 1.812 | 1.274 | 1.613 | 0.577 | 9.321 | Compustat |
| Δ Tobin's *q* | 49,293 | -0.060 | -0.006 | 1.133 | -5.125 | 4.611 | Compustat |
| ROA | 49,293 | -0.025 | 0.036 | 0.226 | -1.341 | 0.275 | Compustat |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Δ ROA | 49,293 | -0.006 | 0.000 | 0.171 | -0.753 | 0.718 | Compustat |
| Square root variant of the Amivest liquidity measure | 56468 | 19.246 | 6.480 | 32.949 | 0.019 | 299.632 | Compustat, CRSP |
| Institutional block ownership | 49,293 | 0.139 | 0.106 | 0.140 | 0.000 | 0.593 | 13F |
| | | | | | | | |
| Firm age (year) | 14,748 | 23.505 | 18.000 | 15.844 | 3.000 | 57.000 | Compustat |
| Stock return volatility | 14,748 | 0.029 | 0.025 | 0.014 | 0.010 | 0.080 | CRSP |
| Market-adjusted stock return | 14,748 | 0.074 | -0.010 | 0.603 | -0.994 | 7.956 | CRSP |
| CEO ownership | 14,748 | 0.027 | 0.004 | 0.060 | 0.000 | 0.339 | ExecuComp |
| CEO tenure (year) | 14,748 | 7.952 | 6.000 | 7.477 | 0.000 | 36.000 | ExecuComp |
| CEO age>60 (indicator) | 14,748 | 0.232 | 0.000 | 0.422 | 0.000 | 1.000 | ExecuComp |
| CEO as chairman (indicator) | 14,748 | 0.589 | 1.000 | 0.492 | 0.000 | 1.000 | ExecuComp |
| | | | | | | | |
| Board size | 10,321 | 9.293 | 9.000 | 2.460 | 5.000 | 17.000 | IRRC |
| % of outside directors | 10,321 | 65.9% | 66.7% | 16.3% | 20.0% | 90.9% | IRRC |
| G-index | 10,321 | 9.299 | 9.000 | 2.617 | 4.000 | 15.000 | IRRC |
| | | | | | | | |
| ***Top 10 institutional shareholder characteristics:*** | | | | | | | |
| Turnover | 49,293 | 0.207 | 0.191 | 0.088 | 0.043 | 0.513 | 13F, CRSP |
| Return | 49,293 | 0.047 | 0.055 | 0.095 | -0.163 | 0.278 | 13F, CRSP |
| Fund size (in billion U.S. dollars) | 49,293 | 67.927 | 51.473 | 53.312 | 1.655 | 252.131 | 13F, CRSP |
| | | | | | | | |
| ***Voting institutional shareholder characteristics:*** | | | | | | | |
| Turnover (voting) | 23,794 | 0.152 | 0.148 | 0.109 | 0.012 | 0.578 | 13F, CRSP, ISS, Edgar |
| Return (voting) | 23,794 | 0.015 | 0.025 | 0.078 | -0.192 | 0.264 | 13F, CRSP, ISS, Edgar |
| Fund size ((voting, in billion U.S. dollars) | 23,794 | 232.512 | 208.117 | 192.436 | 2.229 | 600.103 | 13F, CRSP, ISS, Edgar |

## Table II
## Firm Fixed Effects Regressions of Forced CEO Turnover on Explanatory Variables

The table presents estimates of linear probability regressions in which the dependent variable is an indicator that takes the value of one if a forced turnover event occurs in a given year, and zero otherwise. The sample consists of 14,748 firm-year observations covered in the Compustat, CRSP, Thomson Reuters Institutional (13F) Holdings, and ExecuComp databases from 1993 to 2009. Firms that belong to the financial services or utilities industries are excluded. The main independent variables of interest are the interaction terms between the physical distance between the firm and its top 10 institutional shareholders and past stock performance and the interaction terms between top 10 institutional shareholders' geographic concentration measures and past stock performance. In regression (1), we examine the effect of the equally-weighted physical distance between a firm and its top 10 institutional shareholders on forced CEO turnover-performance sensitivity. In regressions (2) through (7), we examine the effect of geographic concentration among the top 10 institutional shareholders on CEO turnover-performance sensitivity. In regression (8), we examine the effects of the equally-weighted physical distance between the firm and its top 10 institutional shareholders and top 10 institutional shareholders' geographic concentration on CEO turnover-performance sensitivity. In regression (9), we add governance characteristics (board size, percentage of outside directors on the board, and G-index (Gompers, Ishii, and Metrick (2003)) to regression (2) as additional controls. In regression (10), we use the introduction of new airline routes that reduce the travel time between two of the top 10 institutional shareholders' headquarters as an exogenous shock to geographic concentration. Firm fixed effects and year fixed effects are included in all regressions. All geographic concentration measures, the indicator for the introduction of a new airline route, and institution characteristics are measured as of the quarter-end that immediately precedes the event year. The other independent variables are measured as of the fiscal year-end that immediately precedes the event year. The Appendix provides detailed variable descriptions. *t*-statistics in parentheses are based on standard errors adjusted for heteroskedasticity (White (1980)) and allow for clustering within firms. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

| | Geographic concentration measure | | | | | | | | | Exogenous shock |
|---|---|---|---|---|---|---|---|---|---|---|
| | *IF Distances* | *Ew Distances* | *Vw Distances* | *Ew Std Longitudes* | *Vw Std Longitudes* | *Num States* | *1 - Herfindahl State IO* | Interaction of *IF Distances* and *Ew Distances* with past performance | *Ew Distances* and governance variables | Introduction of new airline route |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| ***Physical distance between the firm and its top 10 institutional shareholders:*** | | | | | | | | | | |
| *IF Distances: A* | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.000 | -0.002 | -0.000 |
| | (-0.20) | (-0.38) | (-0.41) | (-0.41) | (-0.40) | (-0.21) | (-0.34) | (-1.18) | (-0.65) | (-0.16) |
| ***Top 10 institutional shareholders' geographic concentration measures:*** | | | | | | | | | | |
| *Ew Distances*: *B* | | 0.007 | | | | | | 0.007* | 0.009* | |
| | | (1.64) | | | | | | (1.69) | (1.83) | |
| *Vw Distances*: *C* | | | 0.007* | | | | | | | |
| | | | (1.66) | | | | | | | |
| *Ew Std Longitudes*: *D* | | | | 0.001** | | | | | | |
| | | | | (2.37) | | | | | | |
| *Vw Std Longitudes*: *E* | | | | | 0.001* | | | | | |
| | | | | | (1.66) | | | | | |
| *Num States*: *F* | | | | | | 0.000 | | | | |
| | | | | | | (0.22) | | | | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| *1 - Herfindahl State IO*: *G* | | | | | | | 0.051** | | | |
| | | | | | | | (2.53) | | | |
| *Airline shock (indicator)*: *H* | | | | | | | | | | -0.007 |
| | | | | | | | | | | (-1.62) |
| Market-adjusted stock return: *I* | -0.020*** | -0.024*** | -0.024*** | -0.021*** | -0.022*** | -0.023*** | -0.023*** | -0.024*** | -0.024*** | -0.008*** |
| | (-3.84) | (-4.27) | (-4.27) | (-5.26) | (-4.04) | (-4.30) | (-4.71) | (-3.82) | (-3.58) | (-2.79) |
| *IF Distances * I* | 0.001** | | | | | | | 0.000 | | |
| | (2.07) | | | | | | | (0.15) | | |
| *Ew Distances * I* | | 0.002*** | | | | | | 0.002*** | 0.001** | |
| | | (2.75) | | | | | | (2.72) | (2.32) | |
| *Vw Distances * I* | | | 0.002*** | | | | | | | |
| | | | (2.74) | | | | | | | |
| *Ew Std Longitudes * I* | | | | 0.000*** | | | | | | |
| | | | | (2.93) | | | | | | |
| *Vw Std Longitudes * I* | | | | | 0.001** | | | | | |
| | | | | | (2.18) | | | | | |
| *Num States * I* | | | | | | 0.001** | | | | |
| | | | | | | (2.21) | | | | |
| *1 - Herfindahl State IO * I* | | | | | | | 0.010*** | | | |
| | | | | | | | (2.62) | | | |
| *Airline shock (indicator) * I* | | | | | | | | | | -0.078** |
| | | | | | | | | | | (-2.15) |
| ***CEO characteristics:*** | | | | | | | | | | |
| CEO ownership | -0.079 | -0.080 | -0.080 | -0.080 | -0.082 | -0.078 | -0.076 | -0.081 | -0.118* | -0.081 |
| | (-1.53) | (-1.54) | (-1.56) | (-1.36) | (-1.60) | (-1.50) | (-1.47) | (-1.56) | (-1.80) | (-1.56) |
| CEO tenure | 0.001*** | 0.001*** | 0.001*** | 0.001** | 0.001*** | 0.001*** | 0.001*** | 0.001*** | 0.001*** | 0.001*** |
| | (3.00) | (3.00) | (3.00) | (2.53) | (2.99) | (3.02) | (3.01) | (3.03) | (2.63) | (3.02) |
| CEO age>60 (indicator) | -0.022*** | -0.022*** | -0.022*** | -0.022*** | -0.022*** | -0.022*** | -0.022*** | -0.022*** | -0.018*** | -0.022*** |
| | (-4.98) | (-4.93) | (-4.93) | (-5.44) | (-4.93) | (-4.99) | (-4.98) | (-4.95) | (-3.70) | (-5.00) |
| CEO as chairman (indicator) | -0.011* | -0.012* | -0.012* | -0.012** | -0.011* | -0.012* | -0.012* | -0.012* | -0.013* | -0.011* |
| | (-1.80) | (-1.87) | (-1.88) | (-2.13) | (-1.82) | (-1.89) | (-1.89) | (-1.85) | (-1.78) | (-1.81) |
| ***Firm characteristics:*** | | | | | | | | | | |
| Tangibility | 0.009 | 0.008 | 0.008 | 0.008 | 0.009 | 0.008 | 0.008 | 0.012 | 0.008 | 0.009 |
| | (0.39) | (0.37) | (0.37) | (0.30) | (0.40) | (0.35) | (0.37) | (0.56) | (0.28) | (0.40) |
| Log (market capitalization) | -0.001 | -0.002 | -0.001 | -0.002 | -0.001 | -0.001 | -0.001 | -0.003 | 0.000 | -0.002 |
| | (-0.33) | (-0.37) | (-0.33) | (-0.27) | (-0.30) | (-0.31) | (-0.30) | (-0.61) | (0.01) | (-0.34) |
| Tobin's *q* | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| | (0.06) | (0.11) | (0.11) | (0.15) | (0.08) | (0.18) | (0.12) | (0.08) | (0.04) | (0.07) |
| Book leverage | 0.025 | 0.024 | 0.024 | 0.023 | 0.024 | 0.025 | 0.024 | 0.025 | 0.044** | 0.025 |
| | (1.43) | (1.38) | (1.38) | (1.29) | (1.38) | (1.44) | (1.41) | (1.47) | (2.01) | (1.45) |
| Payer (indicator) | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.009 | 0.018 | 0.009 |
| | (0.85) | (0.85) | (0.84) | (0.92) | (0.82) | (0.83) | (0.80) | (0.83) | (1.35) | (0.85) |
| Free cash flow | 0.001 | 0.001 | 0.001 | 0.000 | 0.000 | 0.001 | 0.001 | 0.019 | -0.047 | 0.001 |
| | (0.03) | (0.02) | (0.02) | (0.02) | (0.02) | (0.03) | (0.04) | (0.78) | (-1.03) | (0.03) |
| ROA | -0.046* | -0.046* | -0.046* | -0.046** | -0.046* | -0.046* | -0.047* | -0.043* | -0.023 | -0.046* |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | (-1.69) | (-1.70) | (-1.70) | (-2.38) | (-1.68) | (-1.69) | (-1.74) | (-1.65) | (-0.44) | (-1.68) |
| Stock return volatility | 0.102 | 0.100 | 0.098 | 0.095 | 0.091 | 0.096 | 0.111 | 0.151 | 0.241 | 0.104 |
| | (0.43) | (0.42) | (0.41) | (0.45) | (0.38) | (0.40) | (0.47) | (0.63) | (0.67) | (0.44) |
| Firm age | 0.005** | 0.005** | 0.005** | 0.005** | 0.005** | 0.005* | 0.004* | 0.005** | 0.003** | 0.006** |
| | (2.14) | (1.96) | (2.03) | (2.40) | (2.22) | (1.91) | (1.67) | (1.99) | (2.19) | (2.38) |
| ***Governance characteristics:*** | | | | | | | | | | |
| Institutional block ownership | -0.008 | -0.008 | -0.008 | -0.008 | -0.008 | -0.008 | -0.002 | -0.009 | 0.005 | -0.007 |
| | (-0.46) | (-0.50) | (-0.49) | (-0.61) | (-0.47) | (-0.45) | (-0.12) | (-0.56) | (0.21) | (-0.41) |
| Board size | | | | | | | | | -0.000 | |
| | | | | | | | | | (-0.04) | |
| % of independent directors | | | | | | | | | -0.001 | |
| | | | | | | | | | (-0.04) | |
| G-index | | | | | | | | | -0.004 | |
| | | | | | | | | | (-1.48) | |
| ***Top 10 institutional shareholders' characteristics:*** | | | | | | | | | | |
| Turnover | -0.003 | -0.001 | -0.000 | -0.004 | -0.006 | 0.003 | 0.004 | -0.003 | 0.004 | -0.002 |
| | (-0.08) | (-0.03) | (-0.01) | (-0.12) | (-0.20) | (0.09) | (0.13) | (-0.09) | (0.12) | (-0.08) |
| Return | -0.014 | -0.018 | -0.018 | -0.020 | -0.017 | -0.012 | -0.013 | -0.012 | 0.013 | -0.018 |
| | (-0.25) | (-0.32) | (-0.32) | (-0.62) | (-0.31) | (-0.22) | (-0.24) | (-0.23) | (0.17) | (-0.33) |
| Fund size | -0.007 | -0.006 | -0.006 | -0.007 | -0.007 | -0.007 | -0.006 | -0.006 | -0.010* | -0.007* |
| | (-1.64) | (-1.41) | (-1.41) | (-1.57) | (-1.59) | (-1.46) | (-1.36) | (-1.44) | (-1.66) | (-1.65) |
| Year fixed effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effect | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 14,748 | 14,748 | 14,748 | 14,748 | 14,748 | 14,748 | 14,748 | 14,748 | 10,321 | 14,748 |
| *R*-squared | 0.171 | 0.185 | 0.182 | 0.170 | 0.173 | 0.171 | 0.170 | 0.184 | 0.179 | 0.171 |

## Table III
## Firm and Institution Fixed Effects Regressions of Mutual Fund Proxy Voting against Management on Explanatory Variables

The table presents estimates of OLS regressions in which the dependent variable is the percentage of mutual fund families that vote against management each year, calculated as the ratio of the number of proposals that mutual fund families vote against management recommendations divided by total number of proposals on which mutual fund families cast votes each year. The sample consists of 23,794 institution-firm-year observations covered in the Compustat, CRSP, ExecuComp, Thomson Reuters Institutional (13F) Holdings, and ISS Voting Analytics databases from 2003 to 2009. Firms that belong to the financial services or utilities industries are excluded. In regression (1), we examine the effect of the equally-weighted physical distance between a firm and its top 10 institutional shareholders on mutual fund proxy voting against management. In regressions (2) through (6), we examine the effect of mutual funds' geographic concentration on their proxy voting against management. In regression (7), we add governance characteristics (board size, percentage of outside directors on the board, and G-index (Gompers, Ishii, and Metrick (2003)) to regression (2) as additional controls. In regression (8), we use the introduction of new airline routes that reduce the travel time between the headquarters of a voting institution and the firm's other top 10 institutions as an exogenous shock to voting institutions' geographic concentration. Institution fixed effects, firm fixed effects, and year fixed effects are included in all regressions. All geographic concentration measures and institution characteristics are measured as of the quarter-end that immediately precedes the voting quarter. The other independent variables are measured as of the fiscal year-end that immediately precedes the voting quarter. The Appendix provides detailed variable descriptions. *t*-statistics in parentheses are based on standard errors adjusted for heteroskedasticity (White (1980)) and allow for clustering within institutions. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

| | Geographic concentration measure | | | | | | | Exogenous shock |
|---|---|---|---|---|---|---|---|---|
| | *IF Distances* | *Ew Distances (voting)* | *Vw Distances (voting)* | *Ew Dif Longitudes (voting)* | *Vw Dif Longitudes (voting)* | *Num Same State (voting)* | *Ew Distances (voting)* and governance variables | Introduction of new airline route |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| ***Physical distance between the firm and the voting institutional shareholders:*** | | | | | | | | |
| *IF Distances (voting)* | 0.001 | 0.002 | 0.003 | 0.002 | 0.002 | 0.001 | 0.004 | 0.002 |
| | (0.52) | (0.90) | (0.95) | (0.87) | (0.87) | (0.55) | (0.96) | (0.54) |
| ***Voting institutional shareholders' geographic concentration measures:*** | | | | | | | | |
| *Ew Distances (voting)* | | -0.012*** | | | | | -0.003 | |
| | | (-3.40) | | | | | (-0.59) | |
| *Vw Distances (voting)* | | | -0.012*** | | | | | |
| | | | (-3.61) | | | | | |
| *Ew Dif Longitudes (voting)* | | | | -0.001*** | | | | |
| | | | | (-3.67) | | | | |
| *Vw Dif Longitudes (voting)* | | | | | -0.001*** | | | |
| | | | | | (-3.54) | | | |
| *Num Same State (voting)* | | | | | | 0.003** | | |
| | | | | | | (2.17) | | |
| *Airline Shock (voting)* | | | | | | | | 0.021*** |
| | | | | | | | | (2.69) |
| ***Firm characteristics:*** | | | | | | | | |
| Tangibility | -0.005 | -0.004 | -0.005 | -0.005 | -0.005 | -0.005 | -0.124** | -0.004 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | (-0.28) | (-0.27) | (-0.28) | (-0.29) | (-0.29) | (-0.27) | (-2.35) | (-0.27) |
| Log (market capitalization) | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 | -0.004 | -0.022*** | -0.004 |
| | (-1.17) | (-1.22) | (-1.21) | (-1.21) | (-1.19) | (-1.19) | (-2.77) | (-1.18) |
| Tobin's *q* | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.011** | 0.002 |
| | (1.35) | (1.41) | (1.40) | (1.42) | (1.39) | (1.37) | (2.43) | (1.35) |
| Book leverage | 0.041*** | 0.040*** | 0.040*** | 0.040*** | 0.040*** | 0.041*** | 0.045*** | 0.041*** |
| | (3.01) | (2.96) | (2.94) | (2.96) | (2.97) | (3.02) | (2.92) | (3.00) |
| Payer (indicator) | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | 0.003 | -0.008 | 0.003 |
| | (0.41) | (0.42) | (0.40) | (0.44) | (0.42) | (0.40) | (-0.71) | (0.39) |
| Free cash flow | 0.027 | 0.028 | 0.027 | 0.027 | 0.027 | 0.027 | 0.005 | 0.027 |
| | (0.95) | (0.96) | (0.95) | (0.94) | (0.93) | (0.95) | (0.08) | (0.95) |
| ROA | -0.043 | -0.043 | -0.043 | -0.042 | -0.042 | -0.043 | -0.133** | -0.043 |
| | (-1.40) | (-1.39) | (-1.39) | (-1.38) | (-1.37) | (-1.41) | (-2.10) | (-1.40) |
| Market-adjusted stock return | -0.013*** | -0.013*** | -0.013*** | -0.013*** | -0.013*** | -0.013*** | -0.006 | -0.013*** |
| | (-2.80) | (-2.87) | (-2.90) | (-2.85) | (-2.87) | (-2.83) | (-0.76) | (-2.81) |
| ***Governance characteristics:*** | | | | | | | | |
| Institutional block ownership | 0.003 | 0.004 | 0.004 | 0.003 | 0.004 | 0.004 | 0.006 | 0.003 |
| | (0.21) | (0.24) | (0.25) | (0.22) | (0.24) | (0.24) | (0.22) | (0.22) |
| Board size | | | | | | | 0.001 | |
| | | | | | | | (0.53) | |
| % of independent directors | | | | | | | 0.020 | |
| | | | | | | | (0.80) | |
| G-index | | | | | | | -0.003 | |
| | | | | | | | (-0.76) | |
| ***Voting institutional shareholders' characteristics:*** | | | | | | | | |
| Turnover (voting) | 0.030 | 0.029 | 0.028 | 0.027 | 0.027 | 0.030 | -0.014 | 0.030 |
| | (1.01) | (0.96) | (0.96) | (0.91) | (0.91) | (1.00) | (-0.34) | (1.00) |
| Return (voting) | 0.155** | 0.156** | 0.155** | 0.154** | 0.154** | 0.156** | -0.027 | 0.157** |
| | (2.54) | (2.55) | (2.55) | (2.52) | (2.52) | (2.55) | (-0.22) | (2.57) |
| Fund size (voting) | 0.003 | 0.001 | 0.001 | -0.000 | -0.000 | 0.001 | 0.003 | 0.003 |
| | (0.71) | (0.17) | (0.14) | (-0.10) | (-0.05) | (0.30) | (0.57) | (0.71) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Institution fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 23,794 | 23,794 | 23,794 | 23,794 | 23,794 | 23,794 | 9,365 | 23,794 |
| *R*-squared | 0.285 | 0.286 | 0.286 | 0.285 | 0.285 | 0.285 | 0.223 | 0.285 |

# Table IV
# OLS Regressions of CAR (-1, 1) around Forced CEO Turnover on Explanatory Variables

The table presents estimates of OLS regressions in which the dependent variable is the cumulative abnormal return (CAR) from one day before and one day after the forced CEO turnover announcement date. The sample consists of 413 forced CEO turnovers by firms covered in the Compustat, CRSP, Thomson Reuters Institutional Holdings (13F), and ExecuComp databases from 1993 to 2009. Firms that belong to the financial services or utilities industries are excluded. Daily abnormal returns are calculated using a market model with a 189-trading day estimation period beginning 200 days before and ending 11 days before the forced CEO turnover announcement date, using the CRSP value-weighted return as a proxy for the market return. In regression (1), we examine the effect of the equally-weighted physical distance between a firm and its top 10 institutional shareholders on CAR (-1, 1). In regressions (2) through (7), we examine the effect of geographic concentration among the top 10 institutional shareholders on CAR (-1, 1). In regression (8), we add governance characteristics (board size, percentage of outside directors on the board, and G-index (Gompers, Ishii, and Metrick (2003)) to regression (2) as additional controls. In regression (9), we use the introduction of new airline routes that reduce the travel time between two of the top 10 institutional shareholders' headquarters as an exogenous shock to geographic concentration. Industry fixed effects (at the two-digit SIC level) and year fixed effects are included in all regressions. All geographic concentration measures, the indicator for the introduction of a new airline route, and institution characteristics are measured as of the quarter-end that immediately precedes the event day. The other independent variables are measured as of the fiscal year-end that immediately precedes the event day. The Appendix provides detailed variable descriptions. *t*-statistics in parentheses are based on standard errors adjusted for heteroskedasticity (White (1980)) and allow for clustering within firms. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

| | Geographic concentration measure | | | | | | | | Exogenous shock |
|---|---|---|---|---|---|---|---|---|---|
| | *IF Distances* | *Ew Distances* | *Vw Distances* | *Ew Std Longitudes* | *Vw Std Longitudes* | *Num States* | *1 - Herfindahl State IO* | *Ew Distances* and governance variables | Introduction of new airline route |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| ***Physical distance between the firm and its top 10 institutional shareholders:*** | | | | | | | | | |
| *IF Distances* | -0.003 | 0.005 | 0.005 | 0.005 | 0.004 | 0.012 | -0.002 | 0.035 | 0.002 |
| | (-0.09) | (0.72) | (0.71) | (0.73) | (0.52) | (1.10) | (-0.22) | (0.90) | (0.26) |
| ***Top 10 institutional shareholders' geographic concentration measures:*** | | | | | | | | | |
| *Ew Distances* | | -0.058*** | | | | | | -0.037* | |
| | | (-3.25) | | | | | | (-1.71) | |
| *Vw Distances* | | | -0.062*** | | | | | | |
| | | | (-3.19) | | | | | | |
| *Ew Std Longitudes* | | | | -0.005*** | | | | | |
| | | | | (-3.62) | | | | | |
| *Vw Std Longitudes* | | | | | -0.004*** | | | | |
| | | | | | (-3.35) | | | | |
| *Num States* | | | | | | -0.011 | | | |
| | | | | | | (-1.46) | | | |
| *1 - Herfindahl State IO* | | | | | | | -0.208*** | | |
| | | | | | | | (-2.66) | | |
| *Airline Shock* | | | | | | | | | 0.021 |
| | | | | | | | | | (1.29) |
| ***CEO Characteristics:*** | | | | | | | | | |
| CEO ownership | 0.250* | 0.223* | 0.193 | 0.241** | 0.226* | 0.179 | 0.194* | -0.016 | 0.223* |
| | (1.95) | (1.91) | (1.64) | (2.01) | (1.87) | (1.38) | (1.68) | (-0.10) | (1.84) |
| CEO tenure | 0.002** | 0.002** | 0.003** | 0.002** | 0.002** | 0.003** | 0.002** | 0.000 | 0.002** |
| | (2.32) | (2.32) | (2.48) | (2.34) | (2.41) | (2.50) | (2.30) | (0.04) | (2.28) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CEO age>60 (indicator) | -0.014 | -0.020 | -0.029* | -0.022 | -0.020 | -0.015 | -0.013 | 0.014 | -0.008 |
| | (-0.79) | (-1.14) | (-1.70) | (-1.25) | (-1.15) | (-0.77) | (-0.75) | (0.57) | (-0.37) |
| CEO as chairman (indicator) | -0.008 | -0.003 | -0.002 | -0.003 | -0.004 | -0.012 | -0.002 | 0.007 | -0.007 |
| | (-0.55) | (-0.25) | (-0.14) | (-0.21) | (-0.27) | (-0.81) | (-0.16) | (0.31) | (-0.51) |
| ***Firm characteristics:*** | | | | | | | | | |
| Tangibility | -0.053 | -0.059 | -0.050 | -0.068 | -0.059 | -0.076* | -0.055 | -0.020 | -0.049 |
| | (-1.23) | (-1.43) | (-1.21) | (-1.63) | (-1.44) | (-1.67) | (-1.31) | (-0.27) | (-1.08) |
| Log (market capitalization) | 0.006 | 0.006 | 0.006 | 0.007 | 0.007 | -0.002 | 0.006 | 0.009 | -0.005 |
| | (1.25) | (1.14) | (1.23) | (1.43) | (1.46) | (-0.31) | (1.12) | (0.93) | (-1.01) |
| Tobin's *q* | -0.014*** | -0.014*** | -0.014*** | -0.014*** | -0.014*** | -0.003 | -0.014*** | -0.008 | -0.007 |
| | (-3.96) | (-4.02) | (-3.94) | (-4.22) | (-4.23) | (-0.51) | (-4.02) | (-0.84) | (-1.09) |
| Book leverage | 0.067* | 0.074** | 0.085** | 0.081** | 0.076** | 0.112** | 0.075** | 0.055 | 0.079** |
| | (1.84) | (2.03) | (2.29) | (2.22) | (2.07) | (1.97) | (2.01) | (0.81) | (2.18) |
| Payer (indicator) | 0.025 | 0.030* | 0.030** | 0.026* | 0.030** | 0.030** | 0.029* | 0.050** | 0.033** |
| | (1.64) | (1.96) | (2.00) | (1.75) | (1.98) | (2.03) | (1.95) | (2.35) | (2.17) |
| Free cash flow | -0.103 | -0.099 | -0.040 | -0.095 | -0.078 | -0.122 | -0.106 | 0.060 | -0.086 |
| | (-1.17) | (-1.16) | (-0.48) | (-1.12) | (-0.85) | (-1.51) | (-1.18) | (0.33) | (-0.99) |
| ROA | 0.143* | 0.140* | 0.108 | 0.137 | 0.121 | 0.183** | 0.150* | -0.132 | 0.122 |
| | (1.68) | (1.66) | (1.34) | (1.62) | (1.32) | (2.27) | (1.72) | (-0.67) | (1.43) |
| Stock return volatility | 0.980 | 1.111 | 1.086 | 1.130 | 1.152 | 1.398 | 0.934 | 0.571 | 0.983 |
| | (1.14) | (1.38) | (1.35) | (1.41) | (1.43) | (1.63) | (1.11) | (0.36) | (1.24) |
| Firm age | -0.001 | -0.001 | -0.001 | -0.001 | -0.001 | -0.000 | -0.001 | -0.002 | -0.001 |
| | (-0.97) | (-1.09) | (-1.26) | (-1.21) | (-1.37) | (-0.02) | (-1.30) | (-0.83) | (-1.21) |
| ***Governance characteristics:*** | | | | | | | | | |
| Institutional block ownership | -0.049 | -0.034 | -0.031 | -0.030 | -0.030 | -0.033 | -0.071** | 0.058 | -0.039* |
| | (-1.34) | (-0.97) | (-0.90) | (-0.86) | (-0.88) | (-0.95) | (-2.00) | (0.96) | (-0.98) |
| Board size | | | | | | | | -0.002 | |
| | | | | | | | | (-0.33) | |
| % of independent directors | | | | | | | | -0.052 | |
| | | | | | | | | (-0.88) | |
| G-index | | | | | | | | 0.002 | |
| | | | | | | | | (0.48) | |
| ***Top 10 institutional shareholders' characteristics:*** | | | | | | | | | |
| Turnover | -0.110 | -0.166 | -0.153 | -0.145 | -0.136 | -0.203 | -0.122 | -0.175 | -0.066 |
| | (-1.06) | (-1.56) | (-1.45) | (-1.41) | (-1.33) | (-1.58) | (-1.18) | (-0.88) | (-0.58) |
| Return | -0.102 | -0.073 | -0.091 | -0.082 | -0.085 | 0.048 | -0.067 | -0.152 | -0.344 |
| | (-1.28) | (-0.98) | (-1.22) | (-1.11) | (-1.15) | (0.37) | (-0.87) | (-1.17) | (-1.00) |
| Fund size | -0.006 | -0.013 | -0.014 | -0.012 | -0.011 | -0.011 | -0.011 | -0.030 | 0.010 |
| | (-0.39) | (-0.80) | (-0.86) | (-0.77) | (-0.67) | (-0.62) | (-0.65) | (-1.41) | (0.62) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 413 | 413 | 413 | 413 | 413 | 413 | 413 | 227 | 413 |
| *R*-squared | 0.272 | 0.297 | 0.300 | 0.303 | 0.298 | 0.251 | 0.289 | 0.329 | 0.273 |

## Table V
## OLS Regressions of CAR (-20, 20) around Initial Schedule 13D Filings on Explanatory Variables

The table presents estimates of OLS regressions in which the dependent variable is the cumulative abnormal return (CAR) from 20 days before to 20 days after the initial Schedule 13D filing. The sample consists of 1,213 initial Schedule 13D filings by institutional investors targeting the firms covered in the Compustat, CRSP, and Thomson Reuters Institutional Holdings (13F) databases from 1993 to 2009. Only 13D filings by a firm's top 10 institutions are included in the sample. Firms that belong to the financial services or utilities industries are excluded. Daily abnormal returns are calculated using a market model with a 169-trading day estimation period beginning 200 days before and ending 31 days before the Schedule 13D filings, using the CRSP value-weighted return as a proxy for the market return. In regression (1), we examine the effect of the equally-weighted physical distance between a firm and its top 10 institutional shareholders on CAR (-20, 20). In regressions (2) through (7), we examine the effect of geographic concentration among top 10 institutional shareholders on CAR (-20, 20). In regression (8), we add governance characteristics (board size, percentage of outside directors on the board, and G-index (Gompers, Ishii, and Metrick (2003)) to regression (2) as additional controls. In regression (9), we use the introduction of new airline routes that reduce the travel time between the two of the top 10 institutional shareholders' headquarters as an exogenous shock to geographic concentration. Industry fixed effects (at the two-digit SIC level) and year fixed effects are included in all regressions. All geographic concentration measures, the indicator for the introduction of new airline routes, and institution characteristics are measured as of the quarter-end that immediately precedes the event day. The other independent variables are measured at the fiscal year-end that immediately precedes the event day. The Appendix provides detailed variable descriptions. *t*-statistics in parentheses are based on standard errors adjusted for heteroskedasticity (White (1980)) and allow for clustering within firms. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

| | Geographic concentration measure | | | | | | | | Exogenous shock |
|---|---|---|---|---|---|---|---|---|---|
| | *IF Distances* | *Ew Distances* | *Vw Distances* | *Ew Std Longitudes* | *Vw Std Longitudes* | *Num States* | *1 - Herfindahl State IO* | *Ew Distances* and governance variables | Introduction of new airline route |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| ***Physical distance between the firm and its top 10 institutional shareholders:*** | | | | | | | | | |
| *IF Distances* | -0.003 | 0.001 | 0.001 | -0.001 | 0.003 | -0.001 | 0.000 | 0.015 | -0.003 |
| | (-0.43) | (0.13) | (0.13) | (-0.05) | (0.27) | (-0.08) | (0.05) | (1.34) | (-1.00) |
| ***Top 10 institutional shareholders' geographic concentration measures:*** | | | | | | | | | |
| *EW Distances* | | -0.035** | | | | | | -0.047* | |
| | | (-2.00) | | | | | | (-1.76) | |
| *VW Distances* | | | -0.045*** | | | | | | |
| | | | (-2.60) | | | | | | |
| *EW Std Longitudes* | | | | -0.003* | | | | | |
| | | | | (-1.72) | | | | | |
| *VW Std Longitudes* | | | | | -0.004** | | | | |
| | | | | | (-2.17) | | | | |
| *Num States* | | | | | | -0.013** | | | |
| | | | | | | (-2.37) | | | |
| *1 - Herfindahl State IO* | | | | | | | -0.148** | | |
| | | | | | | | (-2.09) | | |
| *Airline Shock* | | | | | | | | | 0.031** |
| | | | | | | | | | (1.97) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Firm characteristics:*** | | | | | | | | | |
| Tangibility | -0.014 | -0.021 | 0.013 | -0.026 | -0.016 | -0.015 | -0.011 | 0.011 | -0.014 |
| | (-0.28) | (-0.48) | (0.28) | (-0.65) | (-0.29) | (-0.30) | (-0.21) | (0.10) | (-0.28) |
| Log (market capitalization) | -0.009 | -0.008 | -0.009 | -0.007 | -0.008 | -0.011 | -0.010 | -0.007 | -0.009 |
| | (-1.21) | (-1.02) | (-1.12) | (-1.01) | (-0.99) | (-1.51) | (-1.34) | (-0.38) | (-1.20) |
| Tobin's *q* | 0.005 | 0.004 | 0.007 | 0.004 | 0.004 | 0.007 | 0.006 | 0.010 | 0.005 |
| | (0.59) | (0.54) | (0.64) | (0.54) | (0.51) | (0.81) | (0.76) | (0.46) | (0.58) |
| Book leverage | -0.071* | -0.081* | -0.070 | -0.081** | -0.080 | -0.070 | -0.064 | 0.040 | -0.071* |
| | (-1.66) | (-1.90) | (-1.49) | (-2.36) | (-1.62) | (-1.35) | (-1.25) | (0.41) | (-1.65) |
| Payer (indicator) | -0.031 | -0.032 | -0.034* | -0.033 | -0.034* | -0.032 | -0.031 | -0.049 | -0.031 |
| | (-1.38) | (-1.42) | (-1.78) | (-1.43) | (-1.71) | (-1.59) | (-1.59) | (-1.21) | (-1.40) |
| Free cash flow | -0.003 | -0.027 | -0.005 | -0.025 | -0.033 | -0.033 | -0.018 | 0.224 | -0.002 |
| | (-0.02) | (-0.19) | (-0.03) | (-0.25) | (-0.22) | (-0.23) | (-0.12) | (1.01) | (-0.02) |
| ROA | -0.044 | -0.016 | -0.043 | -0.021 | -0.005 | 0.003 | 0.002 | -0.109 | -0.045 |
| | (-0.31) | (-0.11) | (-0.29) | (-0.20) | (-0.03) | (0.02) | (0.01) | (-0.43) | (-0.32) |
| Stock return volatility | 0.344 | 0.412 | 0.331 | 0.441 | 0.523 | 0.346 | 0.299 | 0.452 | 0.343 |
| | (0.33) | (0.38) | (0.32) | (0.38) | (0.51) | (0.35) | (0.32) | (0.18) | (0.33) |
| Market-adjusted stock return | -0.019 | -0.020 | -0.018 | -0.020 | -0.019 | -0.021 | -0.020 | -0.078 | -0.019 |
| | (-1.54) | (-1.48) | (-1.21) | (-1.33) | (-1.11) | (-1.21) | (-1.17) | (-1.42) | (-1.53) |
| ***Governance characteristics:*** | | | | | | | | | |
| Institutional block ownership | 0.062** | 0.072** | 0.077*** | 0.072** | 0.080** | 0.098*** | 0.109*** | 0.045 | 0.061* |
| | (2.00) | (2.50) | (3.10) | (2.00) | (2.18) | (3.40) | (2.72) | (0.58) | (1.93) |
| Board size | | | | | | | | 0.000 | |
| | | | | | | | | (0.01) | |
| % of independent directors | | | | | | | | 0.148 | |
| | | | | | | | | (0.37) | |
| G-index | | | | | | | | -0.003 | |
| | | | | | | | | (-0.43) | |
| ***Top 10 institutional shareholders' characteristics:*** | | | | | | | | | |
| Turnover | 0.062** | 0.072** | 0.077*** | 0.072** | 0.080** | 0.098** | -0.155 | 0.045 | -0.210* |
| | (2.00) | (2.50) | (3.10) | (2.00) | (2.00) | (2.45) | (-1.49) | (0.58) | (-1.80) |
| Return | -0.205* | -0.207* | -0.232** | -0.210** | -0.206** | -0.258*** | -0.275*** | 0.449** | -0.204* |
| | (-1.87) | (-1.94) | (-2.24) | (-1.96) | (-2.23) | (-2.82) | (-2.98) | (2.32) | (-1.88) |
| Fund size | -0.003 | -0.002 | 0.001 | -0.001 | -0.003 | -0.004 | -0.005 | -0.007 | -0.003 |
| | (-0.23) | (-0.16) | (0.06) | (-0.13) | (-0.28) | (-0.33) | (-0.41) | (-0.29) | (-0.22) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 1,213 | 1,213 | 1,213 | 1,213 | 1,213 | 1,213 | 1,213 | 273 | 1,213 |
| *R*-squared | 0.146 | 0.151 | 0.203 | 0.150 | 0.153 | 0.157 | 0.151 | 0.412 | 0.146 |

## Table VI
## Firm Fixed Effects Regressions of Changes in Tobin's *q* on Explanatory Variables

The table presents estimates of OLS regressions in which the dependent variable is the annual change in Tobin's *q*. The sample consists of 49,293 firm-year observations covered in the Compustat, CRSP, and Thomson Reuters Institutional (13F) Holdings databases from 1993 to 2009. Firms that belong to the financial services or utilities industries are excluded. In regression (1), we examine the effect of the equally-weighted physical distance between a firm and its top 10 institutional shareholders on the change in Tobin's *q*. In regressions (2) through (7), we examine the effect of geographic concentration among top 10 institutional shareholders on the change in Tobin's *q*. In regression (8), we add governance characteristics (board size, percentage of outside directors on the board, and G-index (Gompers, Ishii, and Metrick (2003)) to regression (2) as additional controls. In regression (9), we use the introduction of new airline routes that reduce the travel time between two of the top 10 institutional shareholders' headquarters as an exogenous shock to geographic concentration. Firm fixed effects and year fixed effects are included in all regressions. All geographic concentration measures, the indicator for the introduction of new airline routes, and institution characteristics are measured as of the quarter-end that immediately precedes the starting quarter in which the annual change in Tobin's *q* is measured. The other independent variables are measured as of the fiscal year-end that immediately precedes the year in which the annual change in Tobin's *q* is measured. The Appendix provides detailed variable descriptions. *t*-statistics in parentheses are based on standard errors adjusted for heteroskedasticity (White (1980)) and allow for clustering within firms. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

| | Geographic concentration measure | | | | | | | | Exogenous shock |
|---|---|---|---|---|---|---|---|---|---|
| | *IF Distances* | *Ew Distances* | *Vw Distances* | *Ew Std Longitudes* | *Vw Std Longitudes* | *Num States* | *1 - Herfindahl State IO* | *Ew Distances* and governance variables | Introduction of new airline route |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| ***Physical distance between the firm and its top 10 institutional shareholders:*** | | | | | | | | | |
| *IF Distances* | -0.021** | -0.013 | -0.015 | -0.015 | -0.014 | -0.023** | -0.026** | -0.003 | -0.021* |
| | (-2.00) | (-1.08) | (-1.32) | (-1.29) | (-1.30) | (-2.14) | (-2.20) | (-0.18) | (-1.94) |
| ***Top 10 institutional shareholders' geographic concentration measures:*** | | | | | | | | | |
| *EW Distances* | | -0.091*** | | | | | | -0.073*** | |
| | | (-5.97) | | | | | | (-2.97) | |
| *VW Distances* | | | -0.080*** | | | | | | |
| | | | (-5.29) | | | | | | |
| *EW Std Longitudes* | | | | -0.008*** | | | | | |
| | | | | (-6.60) | | | | | |
| *VW Std Longitudes* | | | | | -0.008*** | | | | |
| | | | | | (-6.24) | | | | |
| *Num States* | | | | | | -0.003 | | | |
| | | | | | | (-0.19) | | | |
| *1 - Herfindahl State IO* | | | | | | | -0.224*** | | |
| | | | | | | | (4.43) | | |
| *Airline Shock* | | | | | | | | | 0.042*** |
| | | | | | | | | | (2.64) |
| ***Firm characteristics:*** | | | | | | | | | |
| Tangibility | 0.098 | 0.156** | 0.155* | 0.152* | 0.082 | 0.095 | 0.155* | 0.198 | 0.103 |
| | (1.21) | (1.98) | (1.96) | (1.93) | (1.00) | (1.17) | (1.95) | (0.98) | (1.25) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Log (market capitalization) | -0.236*** | -0.233*** | -0.234*** | -0.231*** | -0.231*** | -0.237*** | -0.227*** | -0.269*** | -0.240*** |
| | (-24.60) | (-24.06) | (-24.12) | (-23.83) | (-23.82) | (-24.48) | (-23.11) | (-9.59) | (-24.77) |
| Book leverage | 0.117** | 0.120** | 0.119** | 0.121** | 0.114** | 0.118** | 0.120** | 0.214** | 0.121** |
| | (2.32) | (2.38) | (2.35) | (2.40) | (2.25) | (2.33) | (2.37) | (1.99) | (2.36) |
| Payer (indicator) | 0.018 | 0.013 | 0.013 | 0.013 | 0.014 | 0.016 | 0.016 | 0.066* | 0.019 |
| | (1.06) | (0.80) | (0.81) | (0.79) | (0.85) | (0.96) | (0.97) | (1.76) | (1.11) |
| Free cash flow | 0.272** | 0.316** | 0.316** | 0.317** | 0.272** | 0.267* | 0.306** | 1.734*** | 0.280** |
| | (2.08) | (2.44) | (2.29) | (2.45) | (1.97) | (1.92) | (2.21) | (5.17) | (2.12) |
| ROA | -0.220 | -0.274** | -0.270* | -0.276** | -0.208 | -0.211 | -0.257* | -1.891*** | -0.227* |
| | (-1.62) | (-2.02) | (-1.88) | (-2.04) | (-1.45) | (-1.47) | (-1.78) | (-4.74) | (-1.66) |
| ***Governance characteristics:*** | | | | | | | | | |
| Institutional block ownership | 0.157*** | 0.150*** | 0.146*** | 0.150*** | 0.161*** | 0.153*** | 0.146*** | -0.172* | 0.155*** |
| | (3.04) | (2.89) | (2.81) | (2.89) | (3.12) | (2.95) | (2.79) | (-1.76) | (2.84) |
| Board size | | | | | | | | -0.000 | |
| | | | | | | | | (-0.01) | |
| % of independent directors | | | | | | | | 0.097 | |
| | | | | | | | | (1.06) | |
| G-index | | | | | | | | 0.007 | |
| | | | | | | | | (0.48) | |
| ***Top 10 institutional shareholders' characteristics:*** | | | | | | | | | |
| Turnover | -1.550*** | -1.674*** | -1.697*** | -1.645*** | -1.494*** | -1.570*** | -1.654*** | -0.964*** | -1.569*** |
| | (-15.33) | (-16.28) | (-16.41) | (-15.98) | (-14.66) | (-15.29) | (-15.81) | (-4.90) | (-15.12) |
| Return | -0.094 | -0.041 | -0.031 | -0.051 | -0.084 | -0.086 | -0.052 | -0.118 | -0.104 |
| | (-1.07) | (-0.47) | (-0.36) | (-0.57) | (-0.95) | (-0.98) | (-0.58) | (-0.81) | (-1.14) |
| Fund size | -0.051*** | -0.058*** | -0.059*** | -0.055*** | -0.048*** | -0.053*** | -0.055*** | -0.121*** | -0.052*** |
| | (-4.59) | (-4.70) | (-4.70) | (-4.48) | (-4.16) | (-4.57) | (-4.34) | (-5.79) | (-4.50) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 49,293 | 49,293 | 49,293 | 49,293 | 49,293 | 49,293 | 49,293 | 9,107 | 49,293 |
| *R*-squared | 0.194 | 0.198 | 0.198 | 0.198 | 0.195 | 0.194 | 0.198 | 0.232 | 0.195 |

## Table VII
## Firm Fixed Effects Regressions of Changes in ROA on Explanatory Variables

The table presents estimates of OLS regressions in which the dependent variable is the annual change in ROA. The sample consists of 47,132 firm-year observations covered in the Compustat, CRSP, and Thomson Reuters Institutional (13F) Holdings databases from 1993 to 2009. Firms that belong to the financial services or utilities industries are excluded. In regression (1), we examine the effect of the equally-weighted physical distance between a firm and its top 10 institutional shareholders on the change in ROA. In regressions (2) through (7), we examine the effect of geographic concentration among top 10 institutional shareholders on the change in ROA. In regression (8), we add governance characteristics (board size, percentage of outside directors on the board, and G-index (Gompers, Ishii, and Metrick (2003)) to regression (2) as additional controls. In regression (9), we use the introduction of new airline routes that reduce the travel time between two of the top 10 institutional shareholders' headquarters as an exogenous shock to geographic concentration. Firm fixed effects and year fixed effects are included in all regressions. All geographic concentration measures, the indicator for the introduction of new airline routes, and institution characteristics are measured as of the quarter-end that immediately precedes the starting quarter in which the annual change in ROA is measured. The other independent variables are measured as of the fiscal year-end that immediately precedes the year in which the annual change in ROA is measured. The Appendix provides detailed variable descriptions. *t*-statistics in parentheses are based on standard errors adjusted for heteroskedasticity (White (1980)) and allow for clustering within firms. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

| | Geographic concentration measure | | | | | | | | Exogenous shock |
|---|---|---|---|---|---|---|---|---|---|
| | *IF Distances* | *Ew Distances* | *Vw Distances* | *Ew Std Longitudes* | *Vw Std Longitudes* | *Num States* | *1 - Herfindahl State IO* | *Ew Distances* and governance variables | Introduction of new airline route |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| ***Physical distance between the firm and its top 10 institutional shareholders:*** | | | | | | | | | |
| *IF Distances* | -0.004** | -0.000 | -0.000 | -0.001 | -0.001 | -0.001 | -0.001 | -0.000 | -0.001 |
| | (-1.98) | (-0.18) | (-0.19) | (-0.46) | (-0.45) | (-0.62) | (-0.43) | (-0.03) | (-0.76) |
| ***Top 10 institutional shareholders' geographic concentration measures:*** | | | | | | | | | |
| *EW Distances* | | -0.009*** | | | | | | -0.020*** | |
| | | (-3.26) | | | | | | (-2.90) | |
| *VW Distances* | | | -0.008*** | | | | | | |
| | | | (-2.79) | | | | | | |
| *EW Std Longitudes* | | | | -0.001* | | | | | |
| | | | | (-1.79) | | | | | |
| *VW Std Longitudes* | | | | | -0.000* | | | | |
| | | | | | (-1.73) | | | | |
| *Num States* | | | | | | -0.002*** | | | |
| | | | | | | (-3.06) | | | |
| *1 - Herfindahl State IO* | | | | | | | -0.034*** | | |
| | | | | | | | (-2.90) | | |
| *Airline Shock* | | | | | | | | | 0.009*** |
| | | | | | | | | | (2.60) |
| Control viables in Table VI | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 47,132 | 47,132 | 47,132 | 47,132 | 47,132 | 47,132 | 47,132 | 9,072 | 47,132 |
| *R*-squared | 0.206 | 0.208 | 0.208 | 0.207 | 0.208 | 0.209 | 0.209 | 0.366 | 0.193 |

## Table VIII
## Firm Fixed Effects Regressions of Stock Liquidity on Explanatory Variables

The table presents estimates of OLS regressions in which the dependent variable is the square root variant of the Amivest liquidity measure, which is defined as the annual mean of the square root of the daily ratio of volume to absolute return. The sample consists of 54,626 firm-year observations covered in the Compustat, CRSP, and Thomson Reuters Institutional (13F) Holdings databases from 1993 to 2009. Firms that belong to the financial services or utilities industries are excluded. In regression (1), we examine the effect of the equally-weighted physical distance between a firm and its top 10 institutional shareholders on the square root variant of Amivest liquidity. In regressions (2) through (7), we examine the effect of geographic concentration among the top 10 institutional shareholders on the square root variant of Amivest liquidity. In regression (8), we add governance characteristics (board size, percentage of outside directors on the board, and G-index (Gompers, Ishii, and Metrick (2003)) to regression (2) as additional controls. In regression (9), we use the introduction of new airline routes that reduce the travel time between two of the top 10 institutional shareholders' headquarters as an exogenous shock to geographic concentration. Firm fixed effects and year fixed effects are included in all regressions. All geographic concentration measures, the indicator for the introduction of new airline routes, and institution characteristics are measured as of the quarter-end that immediately precedes the starting quarter in which stock liquidity is measured. The other independent variables are measured as of the fiscal year-end that immediately precedes the year stock liquidity is measured. The Appendix provides detailed variable descriptions. *t*-statistics in parentheses are based on standard errors adjusted for heteroskedasticity (White (1980)) and allow for clustering within firms. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

| | | | | | | Geographic concentration measure | | | Exogenous shock |
|---|---|---|---|---|---|---|---|---|---|
| | *IF Distances* | *Ew Distances* | *Vw Distances* | *Ew Std Longitudes* | *Vw Std Longitudes* | *Num States* | *1 - Herfindahl State IO* | *Ew Distances* and governance variables | Introduction of new airline route |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| ***Physical distance between the firm and its top 10 institutional shareholders:*** | | | | | | | | | |
| *IF Distances* | -0.433 | -0.169 | -0.181 | -0.279 | -0.296 | -0.285 | -0.199 | -0.206 | -0.296 |
| | (-1.18) | (-0.48) | (-0.52) | (-0.79) | (-0.84) | (-0.79) | (-0.56) | (-0.62) | (-1.64) |
| ***Top 10 institutional shareholders' geographic concentration measures:*** | | | | | | | | | |
| *EW Distances* | | -1.812*** | | | | | | -0.877*** | |
| | | (-7.00) | | | | | | (-3.55) | |
| *VW Distances* | | | -1.450*** | | | | | | |
| | | | (-5.32) | | | | | | |
| *EW Std Longitudes* | | | | -0.138*** | | | | | |
| | | | | (-4.18) | | | | | |
| *VW Std Longitudes* | | | | | -0.088** | | | | |
| | | | | | (-2.27) | | | | |
| *Num States* | | | | | | -1.143*** | | | |
| | | | | | | (-11.93) | | | |
| *1 - Herfindahl State IO* | | | | | | | -11.716*** | | |
| | | | | | | | (11.25) | | |
| *Airline Shock* | | | | | | | | | 0.481* |
| | | | | | | | | | (1.74) |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| ***Firm characteristics:*** | | | | | | | | | |
| Tangibility | -7.879*** | -7.756*** | -7.779*** | -7.861*** | -8.140*** | -7.273*** | -7.367*** | -2.141 | -7.559*** |
| | (-3.52) | (-3.48) | (-3.48) | (-3.51) | (-3.59) | (-3.28) | (-3.31) | (-0.65) | (-3.66) |
| Log (market capitalization) | 8.769*** | 8.829*** | 8.793*** | 8.838*** | 8.857*** | 9.020*** | 9.192*** | 11.929*** | 8.459*** |
| | (24.10) | (24.32) | (24.28) | (24.08) | (23.74) | (24.87) | (24.84) | (30.50) | (24.94) |
| Tobin's *q* | 0.122 | 0.142 | 0.138 | 0.138 | 0.155 | 0.059 | 0.052 | 0.712*** | 0.077 |
| | (0.78) | (0.91) | (0.89) | (0.88) | (0.97) | (0.38) | (0.33) | (3.51) | (0.56) |
| Book leverage | -0.952 | -0.922 | -0.932 | -0.901 | -0.906 | -1.034 | -1.071 | 2.842 | -0.535 |
| | (-0.52) | (-0.50) | (-0.51) | (-0.49) | (-0.49) | (-0.57) | (-0.59) | (1.49) | (-0.32) |
| Payer (indicator) | 1.575 | 1.527 | 1.547 | 1.539 | 1.510 | 1.660 | 1.730 | 0.399 | 0.646 |
| | (0.97) | (0.95) | (0.96) | (0.95) | (0.93) | (1.03) | (1.07) | (0.46) | (0.52) |
| Free cash flow | -0.001 | -0.010 | -0.006 | 0.010 | 0.062 | -0.025 | -0.064 | -0.205 | 0.065 |
| | (-0.00) | (-0.02) | (-0.01) | (0.02) | (0.14) | (-0.06) | (-0.15) | (-0.09) | (0.17) |
| ROA | -0.666 | -0.624 | -0.622 | -0.663 | -0.690 | -0.654 | -0.544 | 1.109 | -0.516 |
| | (-1.46) | (-1.38) | (-1.37) | (-1.46) | (-1.48) | (-1.44) | (-1.22) | (0.52) | (-1.21) |
| ***Governance characteristics:*** | | | | | | | | | |
| Institutional block ownership | -9.297*** | -9.068*** | -9.197*** | -9.175*** | -10.174*** | -8.725*** | -9.862*** | -2.365* | -8.668*** |
| | (-6.38) | (-6.28) | (-6.33) | (-6.33) | (-7.93) | (-6.15) | (-6.77) | (-1.90) | (-6.29) |
| Board size | | | | | | | | -0.010 | |
| | | | | | | | | (-0.07) | |
| % of independent directors | | | | | | | | 2.415* | |
| | | | | | | | | (1.66) | |
| G-index | | | | | | | | 0.444** | |
| | | | | | | | | (2.25) | |
| ***Top 10 institutional shareholders' characteristics:*** | | | | | | | | | |
| Turnover | -5.946*** | -5.989*** | -6.001*** | -5.657*** | -5.589*** | -5.596*** | -4.787*** | 10.140*** | -5.781*** |
| | (-6.89) | (-7.13) | (-7.15) | (-6.63) | (-6.55) | (-6.59) | (-5.87) | (4.44) | (-7.03) |
| Return | 15.403*** | 16.430*** | 16.085*** | 16.128*** | 15.354*** | 14.795*** | 14.862*** | 6.808* | 13.853*** |
| | (6.68) | (7.22) | (7.06) | (7.05) | (6.56) | (6.42) | (6.52) | (1.91) | (6.53) |
| Fund size | 2.094*** | 2.077*** | 2.095*** | 2.114*** | 2.165*** | 2.060*** | 2.231*** | 1.092*** | 1.432*** |
| | (11.62) | (11.78) | (11.83) | (11.88) | (12.00) | (11.99) | (13.02) | (4.29) | (9.67) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Firm fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 54,626 | 54,626 | 54,626 | 54,626 | 54,626 | 54,626 | 54,626 | 9,629 | 54,626 |
| *R*-squared | 0.276 | 0.277 | 0.277 | 0.276 | 0.277 | 0.279 | 0.279 | 0.626 | 0.314 |

# Table IX
# 2SLS Regressions of Main Dependent Variables in Previous Tables on Explanatory Variables

The table presents estimates of two-stage least squares (2SLS) regressions. The sample period is from 1993 to 2009. The sample size differs across regressions depending on the variables available in the various data sources. Firms that belong to the financial services or utilities industries are excluded. Regressions (1), (3), (5), (7), (9), (11), and (13) report estimates from the first-stage regressions in which the dependent variable is *EW Distances (Ew Distances* (*voting*) in regression (3)) and instrumental variables are *Density of Nearby Institutions* and *Top 10 Institutions' Proximity to Financial Centers*. *Density of Nearby Institutions* is measured as the average number of institutions located within 60 miles of a firm's top 10 institutional shareholders, and *Top 10 Institutions' Proximity to Financial Centers* is measured as the logarithm of the average of the physical distances between the headquarters of the top 10 institutional shareholders and three most influential financial centers according to Global City Economic Power Index, Chicago, Los Angeles, and New York. We use the minimum of an institution's (a voting institution's) distances to these three influential financial centers in calculating its physical distance to the financial centers. To alleviate the concern that nearby institutions may choose their locations to facilitate corporate governance, when constructing *Density of Nearby Institutions*, we use only institutions that have already existed in the areas before firms' establishment. Similarly, when constructing *Top 10 Institutions' Proximity to Financial Centers*, we use only top 10 institutions that have already been established before firms' existence. Regressions (2), (4), (6), (8), (10), (12), and (14) report estimates from the second-stage regressions. Firm (industry) fixed effects and year fixed effects are included in all regressions. Institution fixed effects are also included in regressions (3) and (4). Industries are classified using the two-digit SIC. Instrumental variables and institution characteristics are measured as of the quarter-end that immediately precedes the event quarter or the starting quarter in which performance or liquidity is measured. The other independent variables are measured as of the fiscal year-end that immediately precedes the event year or the year in which performance or liquidity is measured. The Appendix provides detailed variable descriptions. *t*-statistics in parentheses are based on standard errors adjusted for heteroskedasticity (White (1980)) and allow for clustering within firms. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

| | Forced CEO turnover-performance sensitivity | | Proxy voting against management | | CAR (-1, 1) around forced CEO turnover announcement | | CAR (-20, 20) around schedule 13D filing | | Δ Tobin's *q* | | Δ ROA | | Amivest liquidity | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *EW Distances* | Forced CEO turnover (indicator) | *EW Distances (voting)* | Proxy voting ratio (against) | *EW Distances* | CAR (-1, 1) | *EW Distances* | CAR (-20, 20) | *EW Distances* | Δ Tobin's *q* | *EW Distances* | Δ ROA | *EW Distances* | Square root variant of Amivest liquidity |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) | (14) |
| ***Physical distance between the firm and its top 10 institutional shareholders:*** | | | | | | | | | | | | | | |
| *IF Distances* | 0.049** | 0.000 | | | 0.051 | 0.020*** | 0.111*** | 0.024 | 0.154*** | -0.008 | 0.191*** | -0.001 | 0.121*** | 0.176*** |
| | (2.28) | (0.04) | | | (1.17) | (2.70) | (2.83) | (1.48) | (17.11) | (-0.24) | (11.87) | (-0.40) | (13.84) | (2.76) |
| *IF Distances (voting)* | | | 0.078*** | 0.004 | | | | | | | | | | |
| | | | (5.23) | (1.19) | | | | | | | | | | |
| ***Instrumental variables:*** | | | | | | | | | | | | | | |
| *Density of Nearby Institutions* | -0.004*** | | -0.002*** | | -0.003*** | | -0.002*** | | -0.002*** | | -0.003*** | | 0.121*** | |
| | (-14.70) | | (-3.42) | | (-2.76) | | (-5.01) | | (-23.27) | | (-18.73) | | (13.84) | |
| *Top 10 Institutions' Proximity to Financial Centers* | 0.121*** | | 0.204*** | | 0.226** | | 0.123*** | | 0.339*** | | 0.257*** | | -0.002*** | |
| | (7.91) | | (6.69) | | (2.30) | | (3.62) | | (15.77) | | (21.16) | | (-5.30) | |
| Instrumented variable from the first stage: A | | 0.001 | | -0.043*** | | -0.068** | | -0.155** | | -0.180*** | | -0.030** | | -1.010*** |
| | | (0.03) | | (-3.19) | | (-2.08) | | (-1.98) | | (-3.00) | | (-2.10) | | (-6.54) |
| Market-adjusted stock return: B | 0.013 | -0.018*** | -0.013 | -0.008 | | | -0.038 | -0.029 | | | | | | |
| | (1.58) | (-2.86) | (-0.77) | (-1.56) | | | (-0.88) | (-1.19) | | | | | | |
| A*B | | 0.001** | | | | | | | | | | | | |
| | | (2.08) | | | | | | | | | | | | |
| ***CEO Characteristics:*** | | | | | | | | | | | | | | |
| CEO ownership | 0.198 | -0.047 | | | 0.265 | 0.279*** | | | | | | | | |
| | (1.48) | (-0.82) | | | (0.60) | (2.88) | | | | | | | | |
| CEO tenure | -0.000 | 0.003*** | | | -0.007 | 0.002 | | | | | | | | |
| | (-0.22) | (3.41) | | | (-1.02) | (1.63) | | | | | | | | |
| CEO age>60 (indicator) | -0.004 | -0.031*** | | | -0.090 | -0.050** | | | | | | | | |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (-0.23) | (-4.63) | | | (-0.89) | (-2.49) | | | | | | | | |
| CEO as chairman (indicator) | 0.015 | -0.017** | | | 0.043 | -0.002 | | | | | | | | |
| | (1.01) | (-2.00) | | | (0.57) | (-0.17) | | | | | | | | |
| ***Firm characteristics:*** | | | | | | | | | | | | | | |
| Tangibility | -0.002 | -0.006 | 0.092*** | -0.017 | -0.277 | -0.142*** | 0.117 | 0.119 | 0.048** | 0.010 | 0.037 | 0.000 | 0.068* | -0.500 |
| | (-0.02) | (-0.20) | (2.74) | (-0.90) | (-1.26) | (-2.85) | (0.64) | (1.64) | (2.39) | (0.11) | (0.70) | (0.00) | (1.85) | (-1.41) |
| Log(market capitalization) | 0.016 | 0.001 | 0.013 | -0.004 | 0.049 | -0.001 | 0.044** | -0.027** | 0.063*** | -0.073*** | 0.047*** | -0.001 | 0.036*** | 4.370*** |
| | (1.54) | (0.24) | (1.24) | (-1.17) | (1.59) | (-0.15) | (2.17) | (-2.45) | (19.58) | (-2.72) | (8.78) | (-0.25) | (3.77) | (47.45) |
| Tobin's *q* | 0.000 | -0.001 | 0.002 | 0.002 | -0.041 | -0.000 | -0.003 | 0.009 | 0.001 | -0.124*** | 0.002 | -0.007*** | 0.010*** | 0.160*** |
| | (0.23) | (-0.77) | (0.58) | (1.31) | (-1.63) | (-0.08) | (-0.18) | (0.91) | (0.64) | (-5.93) | (1.55) | (-3.78) | (2.94) | (5.82) |
| Book leverage | 0.114** | 0.012 | 0.019 | 0.048*** | 0.181 | 0.163*** | -0.189* | -0.167*** | -0.031 | -0.250** | -0.033 | -0.005 | -0.025 | 0.979* |
| | (2.36) | (0.55) | (0.36) | (3.04) | (1.09) | (3.74) | (-1.78) | (-2.96) | (-1.45) | (-2.09) | (-1.08) | (-0.47) | (-0.84) | (1.90) |
| Payer (indicator) | 0.003 | 0.017 | -0.008 | 0.007 | -0.007 | 0.023 | -0.073 | -0.060* | -0.019* | -0.016 | -0.016 | 0.003 | -0.024* | -0.704 |
| | (0.11) | (1.34) | (-0.19) | (0.80) | (-0.09) | (1.28) | (-0.98) | (-1.89) | (-1.90) | (-0.29) | (-1.16) | (1.08) | (-1.81) | (-1.38) |
| Free cash flow | 0.035 | 0.021 | 0.132 | 0.010 | -0.051 | -0.165** | -0.086 | 0.013 | 0.054 | 0.550* | 0.064 | -0.166 | 0.031* | 0.115 |
| | (0.86) | (0.57) | (1.57) | (0.30) | (-0.19) | (-2.56) | (-0.24) | (0.07) | (1.32) | (1.82) | (1.33) | (-1.37) | (1.82) | (0.57) |
| ROA | -0.000 | -0.075* | -0.119 | -0.021 | -0.047 | 0.127** | 0.176 | -0.035 | -0.053 | -1.038*** | -0.082 | -0.061 | -0.026** | 0.150 |
| | (-0.01) | (-1.84) | (-1.40) | (-0.58) | (-0.19) | (2.04) | (0.47) | (-0.20) | (-1.23) | (-2.68) | (-1.54) | (-0.54) | (-2.07) | (0.84) |
| Stock return volatility | 0.333 | -0.166 | | | 2.115 | 0.250 | 3.422* | -0.738 | 0.092*** | 0.023 | 0.004 | 0.008 | 0.092** | -1.307*** |
| | (0.65) | (-0.62) | | | (0.65) | (0.29) | (1.84) | (-0.55) | (5.69) | (0.43) | (0.16) | (0.85) | (2.05) | (-4.80) |
| Firm age | -0.005 | -0.001 | | | -0.022** | 0.001 | | | | | | | | |
| | (-1.35) | (-0.10) | | | (-2.35) | (0.99) | | | | | | | | |
| Institutional block ownership | 0.030 | -0.010 | 0.023 | 0.008 | 0.323 | 0.015 | 0.236** | 0.228*** | | | | | | |
| | (0.62) | (-0.45) | (0.37) | (0.41) | (1.62) | (0.35) | (2.19) | (3.48) | | | | | | |
| ***Top 10* (voting) *institutional shareholders' characteristics:*** | | | | | | | | | | | | | | |
| Turnover | 0.068 | (0.19) | -0.046 | 0.057 | -0.547 | -0.024 | -0.102 | -0.185 | 0.361*** | -1.584*** | 0.281*** | -0.105*** | 0.180 | 2.185*** |
| | (0.84) | 0.007 | (-0.69) | (1.42) | (-1.11) | (-0.21) | (-0.34) | (-1.14) | (4.32) | (-7.48) | (5.27) | (-4.68) | (1.22) | (3.55) |
| Return | 0.448*** | (0.12) | -0.090 | 0.041 | 0.094 | 0.066 | 0.068 | -0.333** | -0.030 | -0.138 | -0.012 | 0.004 | 0.555*** | 3.173*** |
| | (3.83) | -0.002 | (-1.17) | (1.51) | (0.24) | (0.82) | (0.30) | (-2.37) | (-0.60) | (-0.60) | (-0.26) | (0.15) | (3.82) | (4.20) |
| Fund size | -0.082*** | (-0.37) | 0.013 | -0.118*** | -0.074 | -0.000 | -0.038 | -0.026 | -0.020 | -0.057** | -0.011 | -0.007 | -0.004 | 0.391*** |
| | (-7.05) | (0.19) | (0.61) | (-11.12) | (-1.06) | (-0.01) | (-1.11) | (-1.51) | (-0.92) | (-2.18) | (-1.14) | (-1.34) | (-0.15) | (6.86) |
| Year fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Industry fixed effects | No | No | No | No | Yes | Yes | Yes | Yes | No | No | No | No | No | No |
| Institution fixed effects | No | No | Yes | Yes | No | No | No | No | No | No | No | No | No | No |
| Firm fixed effects | Yes | Yes | Yes | Yes | No | No | No | No | Yes | Yes | Yes | Yes | Yes | Yes |
| Underidentification (Kleibergen-Paap rk LM *p*-value) | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 |
| Overidentification (Sargan *p*-value) | | 0.769 | | 0.552 | | 0.505 | | 0.162 | | 0.330 | | 0.452 | | 0.143 |
| Joint test of excluded instruments (*p*-value) | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.000 | | 0.011 |
| Endogeneity (Hausman *p*-value) | | 0.919 | | 0.011 | | 0.691 | | 0.079 | | 0.674 | | 0.135 | | 0.000 |
| Observations | 8,426 | 8,426 | 15,851 | 15,851 | 205 | 205 | 647 | 647 | 32,538 | 32,538 | 31,643 | 31,643 | 4,329 | 4,329 |
| *R*-squared | 0.163 | 0.013 | 0.710 | 0.084 | 0.533 | 0.443 | 0.463 | 0.130 | 0.244 | 0.070 | 0.234 | 0.052 | 0.246 | 0.582 |

## Table X
## Subsample Analyses: Effect of Geographical Concentration among Firms' Top 10 Institutional Shareholders on Corporate Governance and Firm Value

This table presents estimates of linear probability and OLS regressions in which the dependent variables are an indicator that takes the value of one if a forced turnover event occurs in a given year, and zero otherwise (column (1)), CAR (-1, 1) around a forced CEO turnover announcement date (column (2)), CAR (-20, 20) around a Schedule 13D filing (column (3)), the annual change in Tobin's *q* (column (4)), the annual change in ROA (column (5)), and the square root variant of the Amivest liquidity measure, which is defined as the annual mean of the square root of the daily ratio of volume to absolute return (column (6)). The sample period is from 1993 to 2009. The sample size differs across regressions depending on the variables available in the various data sources. Firms that belong to the financial services or utilities industries are excluded. In Panel A, we use the subsample of dedicated and quasi-index institutions that belong to a firm's top 10 institutional shareholders in the analysis. In Panel B, we use the subsample of transient institutions that belong to a firm's top 10 institutional shareholders in the analysis. The geographic concentration measures in Panels A and B are calculated using only dedicated/quasi-index and transient institutions, respectively. To preserve the sample size, contols do not include governance characteristics (board size, percentage of outside directors on the board, and G-index (Gompers, Ishii, and Metrick (2003)). Firm (industry) fixed effects and year fixed effects are included in all regressions. Industries are classified using the two-digit SIC. All geographic concentration measures, the indicator for the introduction of new airline routes, and institution characteristics are measured as of the quarter-end that immediately precedes the event quarter or the starting quarter in which performance or liquidity is measured. The other independent variables are measured as of the fiscal year-end that immediately precedes the event year or the year in which performance or liquidity is measured. The Appendix provides detailed variable descriptions. *t*-statistics in parentheses are based on standard errors adjusted for heteroskedasticity (White (1980)) and allow for clustering within firms. ***, **, and * represent significance at the 1%, 5%, and 10% levels, respectively.

| | CEO turnover-performance sensitivity | CAR (-1, 1) around forced CEO turnover | CAR (-20, 20) around Schedule 13D | ΔTobin's *q* | ΔROA | Square root variant of Amivest liquidity |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| **Panel A: Dedicated and Quasi-index Institutional Shareholders** | | | | | | |
| *Ew Distances* | 0.001*** | -0.048*** | -0.041** | -0.009*** | -0.004*** | -1.379*** |
| | (2.66) | (-3.10) | (-2.09) | (-3.75) | (-3.17) | (-6.02) |
| *Vw Distances* | 0.001*** | -0.042*** | -0.056*** | -0.010*** | -0.004*** | -1.264*** |
| | (2.71) | (-3.07) | (-2.79) | (-4.20) | (-3.09) | (-5.23) |
| *Ew Std Longitudes* | 0.000* | -0.003*** | -0.003* | -0.001*** | -0.001*** | -0.104*** |
| | (1.70) | (-2.71) | (-1.68) | (-2.91) | (-3.37) | (-3.73) |
| *Vw Std Longitudes* | 0.000* | -0.003*** | -0.004** | -0.001*** | -0.001*** | -0.078** |
| | (1.67) | (-2.79) | (-2.33) | (-4.28) | (-3.05) | (-2.05) |
| *Num States* | 0.000 | -0.005 | -0.015* | -0.001 | -0.006*** | -0.647*** |
| | (0.13) | (-0.72) | (-1.86) | (-0.42) | (-3.98) | (-4.84) |
| *1 - Herfindahl State IO* | 0.072*** | -0.109** | -0.174* | -0.054*** | -0.022** | -8.399*** |
| | (2.93) | (-2.16) | (-1.80) | (-5.62) | (-2.33) | (-7.14) |
| *Airline Shock* | -0.060* | 0.063* | 0.038** | 0.038*** | 0.006* | 3.186*** |
| | (-1.66) | (1.80) | (2.18) | (2.63) | (1.76) | (6.88) |
| Other control variables | Same as Table II | Same as Table IV | Same as Table V | Same as Table VII | Same as Table VII | Same as Table VIII |
| Observations | 14,685 | 405 | 898 | 47,351 | 46,301 | 53,959 |
| **Panel B: Transient Institutional Shareholders** | | | | | | |
| *Ew Distances* | 0.001 | -0.015 | 0.012 | -0.002 | -0.002 | -0.437*** |
| | (0.76) | (-0.91) | (1.25) | (-0.46) | (-1.06) | (-3.51) |
| *Vw Distances* | 0.001 | -0.017 | 0.011 | -0.002 | -0.001 | -0.445*** |
| | (0.82) | (-0.96) | (1.08) | (-0.44) | (-0.79) | (-3.66) |
| *Ew Std Longitudes* | 0.000 | -0.002* | -0.000 | -0.001 | -0.000 | -0.084*** |
| | (1.26) | (-1.74) | (-0.32) | (-1.31) | (-0.10) | (-4.07) |
| *Vw Std Longitudes* | 0.001 | -0.002* | 0.000 | -0.004 | 0.000 | -0.124*** |
| | (1.64) | (-1.70) | (0.28) | (-1.56) | (0.25) | (-5.17) |
| *Num States* | 0.000 | -0.007 | 0.016 | 0.026 | 0.002** | -1.008*** |
| | (0.90) | (-0.76) | (1.01) | (1.12) | (2.27) | (-6.63) |
| *1 - Herfindahl State IO* | 0.009 | -0.040 | 0.027 | -0.092 | -0.008 | -7.682*** |
| | (0.48) | (-0.86) | (0.41) | (-1.06) | (-0.92) | (-6.84) |
| *Airline Shock* | -0.007 | -0.086 | 0.024 | -0.016 | 0.001 | 0.862*** |
| | (-0.77) | (-0.83) | (1.23) | (-0.74) | (0.19) | (3.27) |
| Other control variables | Same as Table II | Same as Table IV | Same as Table V | Same as Table VI | Same as Table VII | Same as Table VIII |
| Observations | 9,496 | 244 | 261 | 30,885 | 27,878 | 41,626 |