Estimating the Effects of Large Shareholders Using a Geographic Instrument

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Abstract

Large shareholders may play an important role for firm performance and policies, but identifying an effect empirically presents a challenge due to the endogeneity of ownership structures. We develop and test an empirical framework which allows us to separate selection from treatment effects of large shareholders. Unlike other blockholders, individuals tend to hold blocks in public firms located close to where they reside. Using this empirical observation, we develop an instrument – the density of wealthy individuals near a firm's headquarters – for the presence of a large, non-managerial individual shareholder in a firm. These shareholders have a large impact on firms, controlling for selection effects. Consistent with theories of large shareholders as monitors, we find that they increase firm profitability, increase dividends, reduce corporate cash holdings, and reduce executive compensation. Consistent with the view that there exist conflicts between large and small owners in public firms, we uncover evidence of substitution toward less tax-efficient forms of distribution in firms with blocks. In addition, large shareholders reduce the liquidity of the firm's stock.

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1. Introduction

A corporation's shareholders legally control the firm, but they often delegate this control to managers. In large public companies, which have small, dispersed shareholders, owners may find it costly to coordinate and exercise control, leaving managers considerable discretion. The resulting agency problems between owners and managers may be severe. Large shareholders, by concentrating a block of votes and cash flow rights in the hands of a single decision maker, may play a beneficial role in remedying these agency problems and facilitate effective owner control.[1] Having a large shareholder can, for example, restrain managers from extracting rents, reduce the free-riding problem in takeovers, and if the large owners have long horizons, mitigate myopic investment behavior. In contrast, other theories predict that blocks may be detrimental to firms. Large shareholders can, for example, reduce managerial initiative and the liquidity of the firm's shares.[2]

In this paper, we empirically analyze the effects of large non-managerial individual shareholders on corporate policies and performance, using instrumental variable techniques to overcome the econometric challenge posed by the endogeneity of ownership structures: large shareholders are not randomly allocated to firms, but choose in which firms to invest. Correlations between firm performance or corporate policies and ownership structures will thus naturally capture both large shareholders' selection of certain firms and their impact on firm outcomes (conditional on selection effects). Suppose for example that blockholders tend to select firms with relatively poor performance, but conditional on selecting such firms, their monitoring improves firm performance. The correlation between firm performance and block presence will then confound selection and treatment effects. We develop an

[1] We use the terms "large shareholder" and "blockholder" interchangeably.

[2] An incomplete list of papers concerning the theory of large shareholders include Berle and Means (1932), Grossman and Hart (1980), Fama and Jensen (1983), Demsetz and Lehn (1985), Jensen (1986), Shleifer and Vishny (1986), Stein (1988), Roe (1990), Holmstrom and Tirole (1993), Bhide (1993), Burkart, Gromb and Panunzi (1997), Bolton and von Thadden (1998), and Friedman, Johnson and Mitton (2003). We review some of the existing literature on large shareholders in Section 2.

instrumental variable that allows us to separate selection from treatment effects and therefore to assess the impact of blockholders on a broad set of important firm outcomes.

Our instrument for the presence of a large non-managerial individual shareholder in a firm is the number of high net worth individuals in a state divided by the number of listed firms in the state. The instrument can isolate the causal effect of large shareholders on corporate policies if two conditions are fulfilled – the instrument is correlated with the endogenous variable (the relevancy condition) and it is affecting the dependent variables only through its effect on the endogenous variable (the exclusion condition).

The instrument is likely to fulfill the relevancy condition, because it reflects economic forces important for the formation of blocks. First, personal wealth is likely the key determinant of an individual's ability to accumulate a large position of equity in a public firm. Second, individual blockholders may exhibit a preference for investments in firms that are headquartered close by. For example, monitoring costs may be lower, making blocks in such firms more desirable (see Lerner (1995) for evidence in the context of venture capitalists), or individuals may have an information advantage in selecting local companies (see, e.g., Coval and Moskowitz (1999), Coval and Moskowitz (2001)). We collect data on the location of large shareholders relative to the firms in which they have invested, and show that blockholders who are non-managerial individuals, but not institutions such as mutual funds and money managers, indeed tend to invest locally.[3] Finally, it is necessary that there be significant cross-state variation in the density of wealthy individuals. Glaeser (1998) provides several theoretical reasons for why wealthy individuals may want to live close to each other, and thus why there could be variation in the density of wealthy individuals across states. This may reflect exogenously attractive areas, but also similarities in consumption tastes or the pursuit of social status. We show that U.S. states exhibit considerable variation in the density of high net worth individuals. The density varies from 228 high net worth individuals per firm headquarter in Colorado to 2,500 in Alaska. The wealth density generates

[3] Throughout the paper, when we use the terms "individual shareholders" or "individual blocks" we exclude those held by current or former managers of the firm.

predictable spatial variation in the incidence of individually owned large blocks of shares. The magnitude of the estimated effect is large: moving from the 25th percentile state, Arizona, to the 75th percentile state, Idaho, while holding everything else constant, changes the predicted probability of a local firm having at least one block from 8.7 percent to 12.8 percent, i.e., increases the probability by almost 50 percent.

While there is no formal test of the validity of the exclusion condition in the absence of multiple instruments, we provide several empirical observations to support that the exclusion restriction is maintained. First, our instrument reflects inheritance data, i.e. deceased wealthy people, so it is skewed toward "old money". Hence, the instrument is not likely to reflect recent local wealth-creating events such as initial public offerings, which could directly impact corporate policies and performance. Second, while the density of high net worth individuals correlates with individual non-managerial blocks, it does not predict the presence of large shareholdings by either managers or institutional investors. It therefore seems unlikely that our instrument is correlated with firm characteristics that proxy for the "demand for blocks" (e.g., poor performance or excessive CEO compensation). If it did, we would expect a correlation of wealth density with several different types of blocks, and not only non-managerial individual blocks. We discuss the validity of our instrument in more detail in Section 4.

Our main empirical results examine the average effect of large shareholders on the firms in which they hold stakes. Controlling for selection effects, we find that blockholders have a positive impact on firm operating profitability and reduce investment. These results are consistent with theories of monitoring by large shareholders. Also, we find that large shareholders alter payout policy in two significant ways. First, total payout increases in the presence of a block, consistent with monitoring theories and managerial reluctance to part with firm resources. Second, dividends replace repurchases, consistent with a blockholder preference for a form of payout that maintains blockholder control. In addition, large shareholders also cause lower cash holdings. Examining CEO pay, we find that firms with large shareholders have a significantly lower average pay, especially in the form of options and stock. Board representation appears to be one channel through which large shareholders exert their influence because we find that firms with large shareholders have a larger number of outside directors. Finally, we

find a strong negative effect of blockholders on share liquidity, consistent with theories of trading in the presence of informed parties.

Our evidence is consistent with the view that managers behave differently when a firm has a "principal" in the form of a large non-managerial individual shareholder. One interpretation of this evidence is that agency problems between owners and managers of public firms are important and that these large shareholders increase monitoring and owner-influence over firms. This idea was first suggested by Berle and Means (1932) and has been instrumental in many theories. Why are these blockholders so important? One possibility is that non-managerial individuals are particularly suited to monitor firms. Individuals are free from many of the legal restrictions on activism in corporate governance faced by many institutions (e.g., Black (1990)). Individuals also avoid the agency problems from which many institutional investors inevitably suffer (Diamond (1984)).

The existing empirical literature on the effects of concentrated ownership is extensive.[4] Our approach differs from earlier studies of large shareholders in two important ways. First, we explicitly model the supply of blockholders to which a particular firm is exposed. The economics of the supply side of blocks is relatively unexplored in the corporate governance literature, perhaps because the focus has been on partial equilibrium results (see Gorton and Kahl (2008) for an exception). Because we focus on the supply of a particular kind of block, those held by individuals, this also affects the conclusions we draw (i.e. we cannot say anything about the effects of other types of blockholders). Second, compared to most previous work, our empirical approach is more supportive of a causal interpretation of blockholder impact on firms than studies relying on correlations. The use of instruments to address endogeneity problems in the study of ownership and firm performance was originally suggested by Demsetz and Lehn (1985), but few viable instruments have been proposed. Our paper attempts to fill this gap in the governance literature.

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[4] See, e.g., Holderness (2003) for an overview of U.S. evidence, Shleifer and Vishny (1997) for on overview of international evidence, and McConnell and Servaes (1990) and Mehran (1995) for evidence on blockholders and firm performance. For an overview of the literature on corporate governance and control, see Becht, Bolton, and Röell (2003).

Finally, our study adds to a growing literature that attempts to address endogeneity in corporate governance. Other papers include Bertrand and Mullainathan (2003) (changes in antitakeover laws) and Pérez-González (2005) (the abolishment of foreign majority ownership regulations in Mexico). Several papers use the passage of the Sarbanes-Oxley Act as a plausibly exogenous change (e.g., Chhaochharia and Grinstein (2007) and Hochberg, Sapienza and Vissing-Jorgensen (2007)). In contrast to these papers which all use changes in laws (i.e., quasi-natural experiments) to reduce endogeneity problems, we develop an instrumental variable for an important governance mechanism.

The paper is organized as follows. Section 2 reviews the role of large shareholders in the governance of public corporations. Section 3 describes our data in detail. Section 4 defines the instrument, describes the econometric model that we use to identify and quantify the impact of blocks on firms, and examines the validity of the instrument. Section 5 analyzes the impact of large shareholders on firm performance and corporate policies using our two-stage selection model. Section 6 concludes.

2. Corporate governance and large shareholders

2.1. Why large shareholders matter

The shareholders of a firm have extensive legal rights to oversee its management and make decisions, but as Berle and Means (1932) point out, public corporations tend to be owned by a large number of small shareholders and this ownership dispersion makes it difficult for owners to exert control (see also Jensen (1986)). Small, dispersed owners must overcome coordination problems in order to exercise effective control of the firm, and their incentives to take any action aiming to increase firm value are weakened by free-riding problems (Grossman and Hart (1980)). Under these circumstances, effective

control in firms with dispersed ownership will tend to revert to managers – a state Berle and Means refer to as "separation of ownership and control."[5]

Large shareholders have long been considered a potential remedy to this problem. By concentrating votes and cash flow rights in the hand of a single decision maker, a block of shares may eliminate the coordination problem. A large block may provide sufficient financial incentive for an owner to incur monitoring costs and costs of intervention, thus partially overcoming the free-riding problem. The benefits from such large shareholders can be manifold. Demsetz and Lehn (1985) suggest that large owners restrain managers from consuming firm resources. In the model of Shleifer and Vishny (1986), large shareholders reduce free-riding problems in takeovers. Stein (1988) and Stein (1989) suggest that large owners with long investment horizons can mitigate myopic investment behavior. Managers may disagree with owners on payout policy, wanting to reduce dividends (Easterbrook (1984) and Jensen (1986)). This effect may be alleviated by the presence of a large shareholder.

The benefits of large shareholders may come at a cost, however. The possibility of intervention by owners can reduce managerial initiative (Burkart, Gromb and Panunzi (1997)). Even when the presence of a block is *ex post* efficient, the possibility of future interference may reduce a manager's *ex ante* incentive to undertake value-increasing effort, such as searching for good investment opportunities. Moreover, by keeping some shares off the public market, blockholders reduce share liquidity, thereby potentially reducing information production in the stock market (Holmstrom and Tirole (1993)),[6] and possibly limiting the threat of takeovers (Bolton and von Thadden (1998)).

Another cost of large shareholders, from the perspective of small shareholders, is that they may have preferences that diverge from value maximization. Fama and Jensen (1983) show that large shareholders, because they are undiversified, may favor investment choices that differ from the value-maximizing choices. Similar arguments can be made regarding the choice of capital structure. More

[5] There is a large literature on owner-manager agency conflicts. Demsetz (1983) argues that a manager may extract non-pecuniary benefits to the detriment of shareholders. Jensen (1986) and Jensen (1989) argue that managers expropriate small, dispersed shareholders by diverting corporate resources for empire building or perk consumption.
[6] Maug (1998) points out that liquidity may affect the cost of forming blocks, so causality plausibly runs both ways.

pernicious still is the possibility of transfers from other owners to blockholders (e.g., Johnson, La Porta, Lopez-de-Silanes and Shleifer (2000)). Berle and Means (1932) state that large shareholders "can serve their own pockets better by profiting at the expense of the company than by making profits for it" (p. 114), although Shleifer and Vishny (1997) argue that this problem is likely to be more severe outside the U.S.

The theories cited above tend to make little distinction between types of large shareholders. In practice, different shareholders are likely to differ substantially in the extent to which they participate actively in the governance of firms. For example, many mutual funds refrain from active participation, either because of regulatory constraints (e.g., Black (1990)) or because they are afraid of losing future money management business (e.g., Brickley, Lease and Smith (1988) and Davis and Kim (2007)). Individual shareholders are less constrained from being active.[7] Also, individuals are likely to come with relatively few agency problems of their own, unlike other investor types (e.g., Diamond (1984)). For these reasons, it is useful to study *individual* blockholders when evaluating theories of large shareholders. Finally, we note that the above theories refer to the potential impact on firms of large *non-managerial* shareholders. As a result, we exclude all blocks held by either current or former managers from our empirical analysis.

2.2. Predicted effects of large shareholders

We group the effects that theory has proposed for large shareholders into three categories: Effects that benefit all shareholders, effects that benefit only the large shareholder, and indirect effects of large shareholders. We will now discuss the empirical predictions for each category in more detail.

[7] Some institutional investors are more active than others. A recent paper by Brav, Jiang, Partnoy and Thomas (2008) compares firms before and after an activist hedge fund accumulates a stake. Their findings agree with our results for individual investors in several ways. For example, the arrival of an activist hedge fund tends to increase profitability and payout.

2.2.1. Monitoring

Several of the theories suggest that large shareholders can increase the operational performance of a firm by monitoring management, thereby improving project selection, investment levels, and reducing costs. For example, the existence of a block can mitigate the potential overinvestment problem by reducing corporate investment in declining industries where there is relative scarcity of investment opportunities and positive NPV projects. We examine the impact of large shareholders on several measures of profitability (e.g., ROA), investment levels, and costs.

Some theories suggest that large shareholders affect firms' financial policies, such as capital structure, cash, and payout policy. Consider for example payout policy. Managers may prefer less payout to shareholders because such payments reduce the resources under the managers' control and subject the managers to the scrutiny of capital markets if the firm needs to use external finance to fund new projects (e.g., Easterbrook (1984) and Jensen (1986)). The monitoring of a large shareholder may restrict managers from reducing payouts to shareholders or from holding too much cash. To examine these predictions, we test whether individual blocks affect corporate payout policy and cash holdings.

Whether CEOs in the U.S. are "overpaid" and in part able to set their own pay is a question that has been subject to a lot of recent discussion and academic research (see Bebchuk and Fried (2004) for a review). As a result, it is interesting to study the extent to which the existence of a block in a firm reduces CEO pay. Large shareholders are predicted to mitigate rent extraction by a firm's management.

2.2.2. Private benefits

Large shareholders may pursue activities that deviate from the interests of minority shareholders.[8] The most extreme of such activities, the transfer of assets and profits out of firms or 'tunneling', may not be relevant in our study because we focus on large, public U.S. firms and on large shareholders that are not managers of the firm. However, even large non-managerial shareholders may have interests that

[8] See La Porta, Lopez-de-Silanes, Shleifer and Vishny (1997) for the importance of conflicts between small and large owners.

diverge from those of minority shareholders. Large shareholders may influence investment policy. For example, they may want to reduce the risk of the firm's operations because of their lack of diversification. Large shareholders may curtail new investment if it requires accessing external capital markets, as the issue of new equity dilutes their stake. For a similar reason, large shareholders may have a preference for dividends over more tax efficient repurchases (our sample period is 1996-2001) if they require payouts to finance their consumption.

2.2.3. Liquidity

Some of the above theories predict that large shareholders may reduce the liquidity of a firm's shares by keeping shares off the public market. Furthermore, Kyle (1985) and Glosten and Milgrom (1985) argue that one cause of stock market illiquidity is the presence of privately informed traders. One such group of potentially privately informed traders is the group of blockholders. Bhide (1993) argues that large active shareholders, who may reduce agency costs by providing internal monitoring, may also reduce stock liquidity by increasing informational asymmetries. We test whether blocks impact the liquidity of a firm's shares using the percentage bid-ask spread and the measure of illiquidity of Amihud (2002).

3. Data

We exploit a number of existing data sources and also use several sources of original data. This section describes in detail the nature of our data.

3.1. Data on large shareholders

We use the database of large publicly traded corporations in the U.S. and all their 5% blockholders compiled by Dlugosz, Fahlenbrach, Gompers and Metrick (2006) (DFGM).[9] The database

[9] Available from Wharton Research Data Services, http://wrds.wharton.upenn.edu/. The use of annual data, as opposed to more frequent observations, may underestimate the true number of large shareholders because some blockholders can enter and exit our panel within a year, thus not showing up in firms' proxy statements. If some

is an unbalanced panel of the S&P 1,500 universe, excluding dual-class firms, from 1996-2001. It contains 1,919 different firms and 18,818 blockholder-firm-year observations.[10]

We use this database to identify the set of all non-managerial individual blockholders. A block belongs to the category of non-managerial, individual blockholders if it meets two requirements. First, an individual has sole voting power of the block. We therefore include blocks held by individuals such as Kirk Kerkorian or Edward S. Lampert. Second, the individual is neither a current nor a former officer of the firm in which the block is held. We therefore exclude from the non-managerial individual block category any block by an individual who is, or at any point was, an officer of the firm (e.g., a founder who retired but retained a 5% block), but we include blocks held by directors who never were officers. We identify current and former officers through firms' proxy statements and a Dow Jones Interactive news search. We also exclude holdings by current and former officers' spouses or trusts (e.g., the Bill and Melinda Gates Trust). We exclude blocks held by second generation family members if the family has management representation, but include blocks held by second generation family members if they only have board representation. For example, the block held by the Hewlett and Packard families is included, although the family has four non-executive directors in 1998. Our raw dataset contains 1,079 non-managerial individual blockholder-firm-years.[11]

A natural question to ask is who these non-managerial individual large shareholders are. In the Appendix, we provide some background and details about the owners of six blocks from our sample. Such a detailed analysis cannot be exhaustive and will naturally be very descriptive, but provides a sense of the characteristics of the large shareholders we study and shed some light on the motives behind their

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large shareholders choose to own a stake below the 5% reporting threshold, they also do not show up in the proxy statements and in the DFGM database.

[10] The database has 20,975 blockholder entries. However, not all of these entries are 5% blockholders. For example, "Karen Smith" and "Peter Smith" are recorded in the raw data, but they jointly hold shares through the "Smith Family Trust." Conditioning on the final blockholder flag in the DFGM database will eliminate Karen Smith and Peter Smith, and retain only the Smith Family Trust.

[11] Some readers may question our classification of activist investors or second generation family members as belonging to the group of non-managerial, individual shareholders. However, all results we present in section 5 are robust to the exclusion of these two types of investors from the group of non-managerial, individual shareholders.

block investments. Also, some of the examples in the Appendix show the channels through which large shareholders influence the firms in which their hold a large stake.

3.2. The location of large shareholders

We obtain data on the geographic location (zip code) of each block in our sample from firms' proxy statements. We exclude blocks located abroad. For some individuals who are officers or directors, the proxy statements do not give an address, but state "Same address as company". We may thus underestimate the actual distance between the location of some individuals and firm headquarters. Also, some individuals have multiple residences; we use the one reported in the proxy.[12] We obtain zip codes of firm headquarters from the *Execucomp* database, the *Compact Disclosure* discs, or hand-collect them from proxy statements. Finally, we identify the latitude and longitude of each blockholder and firm by matching the zip codes to data from the *U.S. Census Bureau's Gazetteer Place and Zip Code Database*.

We compute the distance (in miles) from a blockholder to each of its firms' headquarters using the methodology of Coval and Moskowitz (1999). Table 1 reports a small median distance of 42.5 miles for the group of non-managerial individual blocks. More than half of the non-managerial individual shareholders are located in the same state as the firm. Perhaps not surprisingly, the median distance between blockholder residence and firm headquarters for managerial blocks is zero and more than 90% of all managerial large shareholders are located in the same state as the corporate headquarters. The results are significantly different for institutional investors. The median distance between mutual fund (money manager) headquarters and the headquarters of the firms in which they own large stakes is 1,017 miles (858 miles). Less than 10% of all mutual fund and money manager headquarters are located in the same state as the corporate headquarters of their block investments.[13]

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[12] Blockholders' and potential blockholders' choose residences. However, as long as they do not relocate based on expectations about future corporate policy changes in local firms, which we consider unlikely in practice, this will not bias our analysis or affect the validity of our instrument.

[13] Gaspar and Massa (2007) analyze the local ownership of mutual funds and find a local bias. Their analysis is not inconsistent with ours. They aggregate the local ownership of many different mutual fund managers working for different firms to calculate a measure of total ownership in the geographic proximity of a firm's headquarters. We

3.3. Geographic data

Our data for the geographic distribution of high net worth individuals are from the *Statistics of Income* (SOI) program at the *Internal Revenue Service* (IRS).[14] It reports the number of high net worth individuals in each state, estimated from estate tax return filings.[15] An alternative data source for the distribution of wealth in the U.S. is the *Survey of Consumer Finance*. Johnson and Moore (2002) compare the methodology and wealth distributions from the SOI and SCF data, and find that they are similar. Most importantly given our objective, SOI provides geographic information, whereas the SCF does not.[16]

The SOI reports estimates of the number of high net-worth individuals by state in 1995, 1998 and 2001 as well as their estimated average wealth. The definition of high net worth varies somewhat from year to year. In 1995, it is net wealth from $0.6 to $10 million (in terms of counting the total number of high net worth individuals, the upper cutoff makes a minor difference). In 1998 and 2001, the lower limit is $1 million of net wealth and there is no upper limit. The three cross-sections are similar. We use the 1995 data since it predates all the ownership observations in our sample.

We also collect several control variables that vary at the state level. We get education, population and income data from the Census Bureau. We collect corporate income tax rates for 2000 (we have used other years as well) from various sources. When there are multiple brackets we use the rates applying for highest income levels. We also collect anti-takeover laws (see e.g. Bertrand and Mullainathan 2003). We

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aggregate shares across different fund managers within the same mutual fund family and attribute the total ownership to the location of the headquarters of the mutual fund family.

[14] For details, see IRS, Statistics of Income Bulletin, Winter 2002-2003, Publication 1136 (Rev. 4-2003).

[15] A limitation of the SOI is that it provides data at the state-level. We may thus have a noisier measure of local wealth density for firms headquartered close to neighboring states. This would make it more difficult to identify the first stage in our regressions. To the best of our knowledge, there is no database available that reliably captures U.S. *wealth* distribution on a finer scale (such as Metropolitan Statistical Areas).

[16] There are other subtle differences. The SOI data are for individuals, whereas the SCF is household-based. One advantage of the SOI dataset is that the sample size is significantly larger since the number of estate tax filings is on the order of 15,000 per year, which all correspond to a high net worth individual. For comparison, high net worth individuals are only about a tenth of those surveyed in the SCF (the 1994 SCF covers 4,522 families). Also, the precision of the SOI may be somewhat better since tax authorities require detailed documentation to support the filings, whereas SCF is survey-based. On the other hand, there may be financial incentives to misreport when filing with the IRS.

construct a count variable for the existence of six anti-takeover laws in the state of incorporation using the "state" subindex of the G-index of Gompers, Ishii, and Metrick (2003).

3.4. Firm variables

The theories of large shareholders discussed in Section 2 predict that large shareholders can impact a broad set of corporate decisions. We focus on five different sets of firm outcome variables:

(i) Operating performance. We analyze return on assets (ROA) and return on sales (ROS). We also analyze investment levels (measured by capital expenditures) and cost cutting policy (measured by S, G & A expenditures).

(ii) Capital structure. We analyze measures of both book and market leverage.

(iii) Resources and payout policy. We analyze measures of payout policy and cash holdings.

(iv) Managerial compensation and board structure. We analyze the log of base CEO salary and the fraction of pay that is paid in equity. We also analyze the number of outside directors on the board.

(v) Liquidity. We analyze trading volume, the percentage bid-ask spread, and the illiquidity measure of Amihud (2002).

Our data source for annual accounting variables is Compustat. We exclude observations with independent variables in both the top and bottom 1%.[17] Our data sources for CEO compensation and board structure are the Execucomp database and the IRRC director database, respectively. The data used to calculate the liquidity measures come from the Center for Research in Security Prices (CRSP). All variables are defined in the Data Appendix.

Table 3 reports summary statistics. Panel A shows that there exists at least one non-managerial individual block in 11.8% of all firm-year observations. A manager (either current or former) holds a block in 21.9% of all firm-year observations. More than two-thirds of all sample observations have at

[17] We also used winsorizing at the 1% level with qualitatively and quantitatively similar results.

least one large mutual fund shareholder. Panel B reports means, medians, and standard deviations for the dependent and independent variables we use in Section 5.[18]

4. Instrument and empirical methodology

In this section, we define the instrument, describe the econometric model that we use to identify and quantify the impact of blocks on firms, and examine the validity of the instrument.

4.1. The instrumental variable

We define our instrument, the density of high net worth individuals, as the number of high net worth individuals in 1995 divided by the total number of firms headquartered in a state using the 1995 SOI data and information on all firm headquarters from the Compustat database.

The significant geographic variation in the density of high net worth individuals is illustrated in Figure 1. It is worth pointing out that states with a large number of high net worth individuals, e.g., California, will not necessarily have the highest density measure if a large number of firms are also headquartered in the state. Across states, the median wealth density is 565 (Oklahoma). The mean is 664 (between Mississippi and West Virginia). The 25th and 75th percentiles are 419 (Arizona) and 733 (Idaho), respectively. The lowest two densities are 228 (Colorado) and 247 (Utah) and the highest two are 1,857 (North Dakota) and 2,500 (Alaska).[19] Of the top five states in terms of number of headquarters, California has a density of 442, Texas 299, New York 473, Florida 603 and Massachusetts 270. Throughout the analysis, we normalize the measure so that it is measured in units of thousands of individuals per firm headquarter (i.e., the median is 0.565).

[18] The number of blockholders in Table 3 does not correspond to those in Table 1, because Table 1 is the raw database and allows for more than one large shareholder per firm year.

[19] These statistics are computed across the 50 states. Our sample, which is restricted to large firms, contains no firms headquartered in Alaska, for example. Across sample firms, the mean density is 460 individuals per firm and the standard deviation is 151.

4.2. Estimated wealth distributions

Are the high net-worth individuals on which we base our instrument wealthy enough to own large stakes in the largest U.S. firms? Substantial wealth is required to buy a 5% or larger stake in one of the firms in our sample. To assess whether the number and wealth of high net worth individuals are large enough to be consistent with the value of blocks in our sample, we have to extrapolate from high net worth to very high net worth individuals. We use the fact that wealth distributions follow a power law for the top 5-10% of individuals (see Levy and Solomon (1997), Klass, Biham, Levy, Malcai and Solomon (2006), and Chatterjee, Sinha and Chakrabarti (2007)). Such a power law implies a particular relationship between the wealth rank of an individual and her wealth. Using this, we can infer the number of people of any particular wealth level (as long as that wealth level is in the top 5-10% of individuals) using the number of people above the cut-off for inclusion in the SOI wealth data.

We use the power law parameter of 1.36, as estimated by Levy and Solomon (1997), to infer the top of the wealth distribution.[20] We infer the number and wealth of the richest individuals in each state in 1998.[21] Table 2 shows our estimates of the wealth distributions for Oregon (with the median number of millionaires: 27,000), Georgia (75th percentile: 64,000), New York (2nd highest: 243,000), and California (highest: 412,000). In these four states, the estimated wealth of the hundred richest individuals was $17.4 billion, $32.8 billion, $87.4 billion, and $128.8 billion, respectively. The estimated number of ultra-wealthy individuals – with more than $100 million in personal wealth – is 51 in Oregon, 122 in Georgia, 463 in New York and 785 in California. The table also reports the number of sample firms in each state, the total market value of equity of these firms, and the median, average, and largest firm market values in 1999. Five percent of the median firm's market value across the four states is $43 million, $70 million,

[20] Levy and Solomon (1997) use data from the 1996 Forbes 400 list of the richest people in the U.S. to back out the parameter of 1.36. Klass et al. (2006) calculate an average parameter of 1.49 using the Forbes 400 lists during 1988–2003. We use the 1996 parameter as it predates our sample.

[21] To be consistent with the rest of the paper, we would have preferred to use 1995 data for these calculations. However, we have to use the SOI (1998) later on, as we match it to the Forbes 400 list. The 1998 Forbes list of the wealthiest Americans does, but the 1995 list does not, contain data on individuals' principal residence, which we require. Since the various SOI cross-sections are so similar, and since wealth distributions are stable over time, we expect that we would get very similar results using 1995 or 2001 data.

$171 million, and $58 million, respectively, and there are 162, 198, 223, and 1,659 individuals with enough estimated wealth to buy such a stake if they invested all their wealth. The conclusion that emerges from our estimates in Table 2 is that there is enough in the hands of the wealthiest individuals for them to potentially play a significant role as owners of large blocks of shares.

The estimates in Table 2 depend on the accuracy of the power law distribution. The following exercise shows that the extrapolation using the power law distribution works remarkably well. Forbes publishes an annual list of the wealthiest Americans and their principal residences. The minimum wealth required to make the 1998 list was $430 million. We count the number of high net worth individuals in each state. We then use the power law and the SOI data to predict, for each state, the number of individuals with wealth greater than $430 million. Finally, we compare our estimates to the actual number of ultra-wealthy individuals. Figure 2 plots the actual against the predicted number of individuals with more than $430 million in each state. The aggregate number of estimated individuals in the right range of wealth is 221, i.e. off by about a factor two. The correlation coefficient is 0.89 (highly statistically significant). Thus, the power law distribution can be used to accurately predict the geographic distribution of ultra-wealthy individuals using the distribution of only moderately wealthy individuals. This supports our use of the SOI data for measuring the supply of potential block holders.

4.3. Two-stage selection model

Most of the existing empirical literature in corporate finance on the economic effects of large shareholders has estimated an equation of the following form:

$$y_{it} = \gamma d_{it} + \delta_i + \lambda_t + \boldsymbol{\beta}\mathbf{X}_{it} + \varepsilon_{it} \qquad (1)$$

where *i* indexes firms and *t* indexes years. y_{it} is a firm performance or corporate policy variable, δ_i are industry fixed effects, λ_t are year fixed effects, and $\mathbf{X}_{it}$ is a vector of time-varying firm-level controls, e.g., the size or age of the firm. d_{it} is an indicator variable that is equal to 1 if a large shareholder is present in firm *i* in year *t*, and 0 otherwise.

It is not possible to draw any causal inferences about the impact of blockholders on firm behavior from estimates of γ in equation (1), because there are economic reasons to expect that blocks are not randomly distributed across firms. For example, growth options, managerial quality or firm size are potential determinants of corporate policy choices and firm performance, but the same variables may also be correlated with the presence of a large shareholder. If the vector $\mathbf{X}_{it}$ does not include all relevant variables, the large shareholder indicator variable d_{it} will be correlated with the error term in equation (1), and OLS estimates of γ will be biased. For example, if the selection and treatment effects go in opposite directions, then γ will be biased towards zero. In this case, the correct inference is not that blocks have no (treatment) effect.

To explicitly address this endogeneity problem, we use a two-stage selection model, following Heckman and Robb (1985). The model we estimate differs from standard two-stage least squares (TSLS) models because of the binary nature of the endogenous variable of interest (the presence of a non-managerial individual block). As in standard TSLS, the estimation involves two equations. The first stage equation is:

$$d_{it}^{*} = g w_{it} + a_i + c_t + \mathbf{b}\mathbf{X}_{it} + e_{it}$$
$$d_{it} = \begin{cases} 1 & d_{it}^{*} > 0 \\ 0 & d_{it}^{*} \le 0 \end{cases} \qquad (2)$$

where d_{it}^{*} is a latent variable and w_{it} is our instrument, a measure of local wealth density, i.e., the number of high net worth individuals per firm headquarter in a state. We report estimates of the first stage using both linear probability models and probit models.

In the second stage, firm performance or corporate policies are modeled and it is assessed how they are affected by the predicted probability of block presence in a firm. The second stage equation is:

$$y_{it} = \gamma_{Block} \times \hat{d}_{it} + \delta_i + \lambda_t + \boldsymbol{\beta}\mathbf{X}_{it} + \varepsilon_{it} \qquad (3)$$

Since the only endogenous variable in equation (3) is an indicator variable, this model is sometimes referred to as a "dummy endogenous variable model" (Heckman (1978)). We assume that e_{it} and ε_{it} follow a joint normal distribution with a correlation coefficient of ρ. The model is estimated by maximizing the joint likelihood function (see also Maddala (1983)). The estimated coefficient γ_{Block} captures the effect of a large shareholder on y_{it}.

If the error terms e_{it} and ε_{it} are uncorrelated ($\rho = 0$), then the effect of large shareholders on firm performance or corporate policies can be consistently estimated with ordinary least squares (OLS). If ρ is positive, then the coefficient γ estimated through OLS is overstated; if ρ is negative, then it will be understated. We test whether ρ is zero with a Chi-square test which is reported in all tables.

With our approach, we exploit the fact that in a state with high wealth density, some firms will have blocks which otherwise identical firm in a low wealth density state will not. These marginal firms will help us tell part the effect of having a block shareholder from the selection criteria of blockholders. In other words, the treatment effect (of blockholders on firms) can be separated from the selection effect.

4.4. Validity of the instrument

Two conditions have to be fulfilled for the instrument to be valid. First, the instrument and the endogenous variable must be correlated (once all other exogenous variables have been controlled for). Another condition for the validity of our instrument is the exclusion restriction, i.e., the requirement that the instrument not be correlated with the error term of the second stage equation. Since we have only one instrument, it is not possible to construct a test using overidentifying restrictions. As Wooldridge (2002) puts it, "this condition has to be maintained" (p. 86). In this subsection, we will discuss both conditions.

4.4.1. Relevancy condition

The first condition for wealth density to be a valid instrument is that it must predict the presence of large non-managerial individual shareholders in local firms. As discussed above in Section 4.1, there

is significant variation in the density of wealthy individuals across U.S. states. This is important because personal wealth is likely the key determinant of an individual's ability to accumulate a large position of equity in a public firm. We have also documented in Section 3.2 that large non-managerial, individual shareholders exhibit a significant local investment bias: they prefer investments in firms that are headquartered close by. Based on these two results, there are economic reasons to expect a strong and robust relation between the wealth density instrument and the presence of blocks in local firms. Whether the correlation between blocks and wealth density is sufficient for our purposes is an empirical matter.

We find a strong positive relation between the local density of high net worth individuals and the frequency of large, individual shareholders in local firms. While our tests will address this in a panel data setting, the easiest way to appreciate the strength of this relationship is to collapse data by state. Figure 3 plots the frequency with which firms in a state have a large individual shareholder against our instrument, the density of high net worth individuals. Each state is represented by a circle whose area is determined by the number of firm observations used to calculate the state block frequency.[22] Hence, states that are large in terms of firms, such as California and Texas, appear large (918 and 649 observations, respectively). On the other hand, South Dakota (the low outlier just below 1.5 on the x-axis) or Iowa (the high outlier with block frequency around 55%) are small (six and 40 observations, respectively). The graph shows an estimated regression line where observations have been weighted by the number of firms used in calculating the frequency (i.e. the circle sizes). The estimated slope is 0.190 (heteroskedasticity-robust standard error 0.05, t-stat 3.77).

It is clearly important to run regressions at the firm level with proper firm and state controls to rule out the possibility that our instrument is correlated with some firm-level determinant of blocks such as firm size or state level variables such as income inequality. However, the simple state-by-state plot in Figure 3 shows that the relation we exploit for identification is strong and easily identifiable.

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[22] The block frequency is an average across our sample years to maximize the number of observations used to calculate the average. Using only the 1996 cross-section of blocks and firms increases the significance and estimated slope somewhat, so the exact procedure is not critical.

4.4.2. Exclusion restriction

The second condition for the validity of our instrument is that a state's wealth density does not affect any of the dependent variables apart from the indirect effect through blocks, i.e. the wealth density must not affect dependent variables directly, and not through any other channels.[23] The validity of this condition cannot be tested statistically without another instrument, but we can consider its plausibility and compare it with alternative explanations. For several reasons, we argue that the exclusion restriction is likely to be fulfilled, and that several alternative explanations can be ruled out.

One concern may be that areas with wealthy individuals experienced considerable recent wealth creation (e.g., Microsoft and the State of Washington) so that there is a direct effect of wealth density on firm performance (if it persists), or potentially reverse causality. Two observations alleviate this particular concern. Our instrument is reflecting "old money" because it is based on inheritance data, i.e. deceased wealthy people. Therefore, the instrument is not related to contemporaneous firm performance and recent IPO activity. This reduces any concern of reverse causality with firm performance. Also, our block measure does not include individuals who are current or former executives, the individuals most likely to have wealth created in IPOs and through superior firm performance.

Second, while the density of high net worth individuals correlates with individual non-managerial blocks, it does not predict the presence of large shareholdings by either managers or institutional investors. It therefore seems unlikely that our instrument is correlated with variables such as poor performance or excessive CEO compensation that proxy for the "demand for blocks". If it did, we would expect a correlation of wealth density with several different types of blocks, and not only with non-managerial individual blocks.

Third, it is important to emphasize that we do not require the absence of geographic patterns in the dependent variables we analyze. Suppose we found, e.g., that CEOs get paid less in states with low

[23] Technically, this condition states that the correlation between the instrument and the second stage error term must be zero.

income per capita. Such a relationship could operate apart from the wealth density, blocks, and CEO compensation relationship and would not invalidate our results, unless income inequality was also the driver of both blocks and our wealth measure. We provide evidence that wealth density remains a strong and robust predictor of block presence even after the inclusion of a host of state-level economic variables such as per capita income, income inequality, state population, state-level takeover laws, and population density.[24]

Fourth, we measure our wealth density instrument prior to our sample period (i.e., we measure density in 1995 but our sample period is 1996-2001), and while our instrument is measured at the state-level, we examine corporate performance and policies at the firm-level. The lag reduces the likelihood of reverse causality, especially when considering dependent variables with low persistence.

Fifth, because we study a very broad set of corporate policies, any potential economic model of a direct relation between wealth density and a particular policy also has to explain a large number of relationships, i.e., both the relation between wealth density and block presence and the one with all the dependent variables. We are aware of no economic model which predicts a direct relation between wealth density and the full set of dependent variables we study.

A final concern is that firms' location choices are endogenous. If being located in states with a high wealth density indeed increases the probability of having a large shareholder and being subject to monitoring, weaker firms may decide to relocate away from those states. We do not believe that such a bias could be large. For large, public firms, headquarter changes are extremely rare events. For example, Pirinsky and Wang (2006) identify only 115 headquarter relocations among more than 5,000 firms between 1992 and 1997. The initial location of these large firms, at inception, seems a priori unlikely to

[24] Furthermore, the geographic pattern would have to be at the state-level to violate our exogeneity condition. For example, Almazan, De Motta, Titman, and Uysal (2007) find that manufacturing firms located in a Metropolitan Statistical Area with more similar firms make different corporate decisions. Loughran and Schultz (2005) find that rural firms trade less than urban firms. It is not obvious how these geographic patterns could be measured at the state level, and why they would correlate with wealth density and non-managerial, individual block creation.

reflect the future supply of blockholders, and hence can probably be treated as exogenous to ownership structure.

4.5. Weak instrument problem

Recent econometrics research has dealt with the "weak instrument problem" (e.g., Bound, Jaeger and Baker (1995), Nelson and Startz (1990), and Staiger and Stock (1997)), a situation where instruments are only weakly correlated with the endogenous variable(s). In cases with a large number of instruments, each weakly correlated with the endogenous variable, standard estimators can be biased and confidence intervals understated. This critique does not apply to our tests, as we only have a single instrument. In a TSLS setting, Imbens and Wooldridge (2007) suggest that second stage confidence intervals will be large if there is only one instrument that is weak or irrelevant, i.e., standard methods of inference are reliable. With the caveat that we use a probit selection equation in the first stage, this suggests that our test statistics are accurate.[25] Moreover, with weak instruments, TSLS estimations are biased toward OLS estimates (see Bound, Jaeger and Baker (1995)). Because we find significant differences between IV and OLS estimates (see Section 5), this again suggests that our results are unlikely to suffer from a weak instrument problem.

4.6. Interpretation of IV estimates

Some caution needs to be exercised when interpreting the second-stage results. If, conditional on the control variables, the effect of each large shareholder on firm performance and corporate policies is identical or homogeneous, the second stage large shareholder coefficient can be interpreted as the effect for any firm that has a large shareholder. If this homogeneity assumption does not hold, we estimate the average impact of blocks across firms (average treatment effect). Furthermore, since our instrument only results in an actual block in a subset of firms, our estimates reflect the mean effect for those firms that

[25] Staiger and Stock (1997) develop a rule of thumb for sufficient significance of the incremental power of instruments (in the case of one instrument, the squared t-test should be approximately 10). Several issues prevent us from using their rule of thumb. First, we estimate a probit first stage equation. Second, we cluster our standard errors by state such that we violate the iid assumption upon which their test is based.

have a large shareholder because they are located in states with a high wealth density measure (*local* average treatment effect).[26] It seems highly likely that such a homogeneity assumption is unwarranted, and that our estimated effects are local, i.e. they would not generally represent the average effect of blocks across the whole universe of firms. Two forms of heterogeneity may be important. First, the potential impact of a blockholders likely varies across firms, for example because other governance mechanisms are in place in some firms but not others. Our estimated effects therefore have to be thought of as average effects for those firms which are marginal targets, i.e. not the most obvious targets (because those firms have blocks in all states), nor the firms with the lowest potential impact of a block (because those firms do not have blockholders even in states with very high wealth density). Second, different blocks are probably formed for different reasons, e.g., to force management to raise leverage or to solidify a commercial relationship. We estimate average effects across many variables, so there may in fact be larger effects in a subset of firms with blocks.[27]

5. Results

5.1. Block presence and high net worth individuals

We begin our formal empirical analysis by reporting results from the first stage regression, in which we predict the presence of a non-managerial individual block in a firm. Table 4 shows that the density of wealthy individuals in a particular geographic region significantly predicts the presence of a large shareholder in a firm located in the same region. We report significant *t*-statistics (cluster- and heteroscedasticity-consistent) for our instrument in all first-stage regressions.[28] In the first column (1), we

[26] For further discussion, see Imbens and Angrist (1994) and Imbens, Angrist, and Rubin (1996).

[27] We may even miss potential effects of blockholders if heterogeneity involved effects of opposite signs (e.g., Cronqvist and Fahlenbrach (2008). For example, if blockholders increase leverage in some firms but reduce it in others, the estimated net effect might be indistinguishable from zero. While perhaps possible for leverage, this possibility seems less likely for e.g. profits or liquidity. In any case, this suggests that there may be more effects of large shareholders than we identify, but does not suggest ever finding any effects spuriously.

[28] Reported standard errors are clustered by state. Clustering by firm is less conservative and not appropriate because our instrument only varies by state. Not surprisingly, we find that if we cluster by firm, *t*-statistics are more significant (untabulated).

estimate a linear probability model by OLS. The coefficient (0.190) implies that a one standard deviation increase in the density of high net worth individuals (0.420) increases the block probability by nearly eight percentage points. The economic magnitude of the estimated effect is large compared to the mean probability of having a non-managerial individual block in our sample: 11.8%.[29]

The linear probability model is possibly a poor fit, since probabilities are close to zero. In columns (2) through (4), we estimate probit regressions with and without year-fixed effects, industry-fixed effects,[30] and time-varying firm controls. Our conclusion that block presence in a firm is significantly predicted by the density of local wealth is robust and does not change across specifications.[31] The coefficients on the control variables appear to be economically plausible. Non-managerial individual blockholders seem to be present in smaller firms with significant sales growth. Firm age is positively correlated with the existence of a non-managerial individual blockholder, which suggests that non-managerial individuals do not invest in the youngest sample firms.

The magnitude of the estimated effects is large. In column (4), we find that around the sample mean probability of having an individual block, the effect of increasing the density of high net worth individuals by one standard deviation is to increase the block probability by about 7.1 percentage points. For a firm that is one standard deviation smaller (log assets is 1.5 lower) and ten years younger, but that is otherwise at the average block probability, the effect of an increase in the density of high net worth individuals by one standard deviation is to increase the block probability from 26% to 37%. We will use the specification in column (4) of Table 4 as the first-stage equation when we study corporate performance and policies.

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[29] This standard deviation is across states, i.e., 50 observations. Taking a standard deviation across firms yields a lower number because few firms are located in the states with extreme densities. A firm-based standard deviation is density is 0.151. An increase in the density of 0.151 increases the probability of a block by approximately 2% starting from the sample mean probability of 11.8%.

[30] Industries are based on Fama and French (1997). We have checked that our results are similar when using 2-digit North American Industry Classification System (NAICS) industries.

[31] It can be argued that individual and institutional blocks are substitutes. In untabulated regressions, we have included an indicator variable for the existence of a large mutual fund, money manager, or other institutional owner in a firm. These control variables do not change any of the reported results.

In the remaining columns of the table, we report several robustness checks. In column (5), we replace the numerator of the wealth density measure (number of wealthy individuals) with the total wealth held by these individuals, thus incorporating information on the high net worth individuals' average wealth from the 1995 SOI. At the sample mean, a one standard deviation increase of wealth per listed firm increases the predicted probability of an individual block by 6.6 percentage points. Hence, the economic and statistical significance is very similar across columns (4) and (5). In column (6), we report a linear specification with the log of one plus the ownership by non-managerial individual blockholders as the dependent variable. Again, there is a significant positive coefficient for wealth density. Finally, in column (7), we show that the predictive power of the density of wealthy individuals is restricted to non-managerial blocks. Our instrument does not significantly predict the existence of a managerial block in a firm.

The first conclusion that can be drawn from the results of the various first stage regressions is that blocks are not randomly distributed across firms. Small firms with high sales growth but low lagged returns have a significantly higher probability of having a large shareholder, all else being equal. Furthermore, both observable and unobservable variables that determine the presence of a blockholder such as firm size or quality of management are likely to be important in the second stage regressions as well. This is important as it implies that causal inference regarding the impact of blocks on firms is not possible from standard econometric models such as equation (1) and OLS, because the treatment effects of blocks are confounded with selection effects. For all of the remaining regressions in the paper, we therefore use instrumental variable regressions.

Because the variation in our instrument is driven by state-level differences, a concern is that we are capturing differences across states that are correlated with blockholder presence but have nothing to do with the economic explanation that we provide. If some state level variable is both a driver of blocks and correlated with our wealth density measure, our identification is not valid. Therefore, we re-estimate

the first stage including state-level control variables which might be correlated with blocks.[32] The controls variables are: population density, per capita income, state anti-takeover provisions, educational attainment and state-level corporate taxes. Table 5 shows that these state-level variables are not related to the presence of an individual block in local firms. Importantly, the coefficient on our instrument remains positive and statistically significant and is hardly affected by these controls.

To conserve on space, we do not tabulate regressions that include year and industry fixed effects (similar results) as well as additional state-level controls, all of which have no effect on the significance of our instrument in the first stage and all of which are themselves insignificant when included in a regression of firm controls and industry and year fixed effects (as in Table 5). For example, we have included a state of Delaware incorporation indicator variable, and measures of state level income inequality. We also use the overall G-index of Gompers, Ishii, and Metrick (2003) as a broad measure of anti-takeover provisions. The G-index has very little effect on both first and second stage results. We have also included fixed effects for the four Census regions (West, Midwest, South and Northeast) and the nine Census divisions. This also has very little effect on the results.

In conclusion, our instrument, the density of very wealthy individuals, is an unusual variable in that it predicts the presence of non-managerial individual blocks across states with surprising power. This relationship is robust to the inclusion of many variables that vary geographically, reducing concerns about the validity of the instrument.

5.2. Operating performance

Table 6 reports evidence on the effect of large shareholders on operating performance. We find that blockholders have a significant and positive effect on return on assets (ROA). In column (1), we find that the coefficient on the block indicator variable is 0.029 and statistically significant at the 5% level. This corresponds to 2.9 percentage points higher operating profitability, all else equal, in firms with a

[32] As pointed out above, any variable which drives second stage dependent variables but is uncorrelated with blocks and our instrument will not bias our results. It therefore makes sense to focus on the first stage.

large individual shareholder.[33] This is large in economic terms given the mean ROA in our sample is 4.7% (the standard deviation is 10.4%). For robustness purposes, we replace ROA with ROS (profits scaled by sales) in column (2). The impact of large shareholders remains positive and significant. The positive estimated effect of large shareholders on profitability supports theories of large shareholders as monitors.

The estimated correlation of the error terms in the first and second stage is negative and significant, meaning that large shareholders tend to invest in firms with relatively low profitability (holding other firm level variables constant). Thus, endogeneity will tend to bias downward OLS estimates of the impact of blocks on operating performance.

There are several potential sources of the positive block impact on profitability, such as improving project selection, changing investment levels, and cutting costs. Our dataset allows us to analyze some of these sources. In column (3), we find that S, G & A expenditures do not seem to be significantly impacted by the presence of a large shareholder in a firm. If cost cutting is not responsible for the effect on operating profitability, another potential source of the efficiency increase is that large shareholders improve investment levels by, e.g., reducing overinvestment. In column (4), we find that investment levels of firms are about 5.5% lower in the presence of a block in the firm, although this effect is only significant at the 10% level. We also find that blockholders tend to select firms that invest more, all else equal (ρ is positive). This is consistent with blockholders mitigating overinvestment problems, but also with other theories suggesting that large shareholders restrain investment (e.g., Stulz (2005)). For example, large shareholders may be reluctant to provide more funds for new projects themselves, but also do not want other investors to increase their equity stakes for fear of losing voting power.

[33] Since we are reporting results from the second stage, the precise and accurate statement is that there is a 2.9 percentage point higher operating profitability in firms that are predicted to have a large non-managerial individual shareholder. For expositional simplicity, we will be less precise in this section and refer the reader to Section 4.6 about the correct interpretation of our results.

5.3. Capital structure

We next examine the impact of large shareholders on leverage and capital structure. The evidence on capital structure is reported in Table 7. We study three measures in columns (1)-(3): book leverage, long term book leverage, and market leverage. Across all measures, we find that the coefficient on the block indicator variable is negative, but the coefficient is only significant, at the 10% level, for one of the three specifications (long-term book leverage in column (2)). The coefficient in column (2) implies 3.9 percentage points lower long-term book leverage for firms with a large blockholder, which can be compared to the average ratio of 21% in our sample.

One interpretation of this evidence is that large shareholders have little impact on firms' capital structure decisions, but an important caveat that applies to this finding is that heterogeneity across blocks can also explain the lack of significant blockholder impact on leverage. Cronqvist and Fahlenbrach (2008) show that different blockholders are associated with significant leverage effects, but that some have a positive and others have a negative association. If some non-managerial large shareholders have a positive effect on leverage ratios while others have a negative effect, then we could estimate a zero average effect.

5.4. Resources and payout policy

Table 8 reports evidence on payout policy and cash holdings. We analyze three measures of payout policy in columns (1)-(3): book dividend yield, market dividend yield, and dividend payout ratio (dividends scaled by EBITDA instead of equity). Controlling for selection effects, we find that blockholders significantly increase dividends. The magnitudes of the effects implied by our estimates are large: a block in a firm is estimated to approximately double the book and market dividend yields compared to the means. Moreover, we find that blockholders tend to select firms with low dividends relative to otherwise similar firms. For the dividend payout ratio, we find that large shareholders increase the ratio. The estimated effect is 0.226, or approximately half a standard deviation. This effect is significant at the 10% level.

A caveat applies to this finding, related to recent evidence on dividend catering. Becker, Ivković and Weisbenner (2007) find that firms have higher dividend yields at locations where seniors constitute a large fraction of the population. It is possible that managers also cater to high net-worth individuals in the geographic area of a firm's headquarters. Yet, we consider catering of the payout policy to wealthy individuals an unlikely explanation for our result, because the U.S. tax code during the period we study did not favor dividends as a means of distributing resources to shareholders in the highest tax brackets.[34]

We also document that large shareholders significantly reduce firms' cash holdings. In column (4), we find that the coefficient on the instrumented block indicator variable is -0.057 and statistically significant at the 5% level. This effect is economically large: cash holdings (as a fraction of total assets) of firms with blocks are smaller by 5.7 percentage points, compared to a sample mean of about 18%. Thus, cash is reduced by about a third in firms with large shareholders.

A main area of conflicts of interest between owners and managers is managers' preference for retaining assets and resources within the firm (Easterbrook (1984) and Jensen (1986)). The evidence presented in Table 8 suggests that large shareholders increase dividends and reduce cash holdings. Our findings are supportive of theories about managerial resource grab and are consistent with the hypothesis that monitoring by large shareholders can restrain managers from retaining too many resources inside the firm. However, large shareholders may value dividends and repurchases differently than other owners. For example, their tax situation might be different. Furthermore, large blockholders may have a desire to obtain cash (e.g., to finance consumption) while maintaining voting power. If this motivates payouts, we would expect to see some substitution from repurchases to dividends. In order to examine this, we replace the dividend payout ratio with the repurchase payout ratio (calculated the same way as the dividend payout ratio). Results are reported in column (5). It turns out that large individual shareholders

[34] Chetty and Saez (2005) find that for firms with low institutional ownership and directors who have large shareholdings, the increase in dividends after the 2003 Jobs and Growth Tax Relief Reconciliation Act of 2003 is larger which is consistent with our finding. However, Chetty and Saez (2005) acknowledge that while the tax cut provides an exogenous shock to payout policies, it does not generate exogenous variation along the executive and institutional ownership dimensions. Such exogenous variation is needed for a causal interpretation of the results and is provided by our instrumental variable analysis.

have a negative effect on repurchases, consistent with the substitution hypothesis. The coefficient is approximately half of the coefficient on dividend payout, suggesting that while substitution is an important part of the increased dividends, there is also a positive net impact on payout.[35] Overall, the payout results suggest that while large shareholders mitigate agency problems between owners and managers, they also create new agency conflicts between different owners.

5.5. Managerial compensation and governance

In this section we examine blockholders' influence on CEO compensation and board composition. The evidence is reported in Table 9. In columns (1) and (2), results are reported for two measures of CEO pay: the log of total CEO pay and the fraction of CEO pay that is paid in the form of stock or options. Our results point to significantly lower CEO pay and lower incentive pay for CEOs running firms in which blockholders have a stake. The coefficient estimate in column (1) implies a reduction in CEO pay of 0.8 of a standard deviation in the presence of a blockholder. Moreover, incentive pay is a smaller fraction of total compensation by about 0.4 (the mean is 0.5; a standard deviation is 0.3).[36] In both regressions, there is a positive and significant correlation between first and second stage error terms which implies that firms with unusually high CEO pay packages seem to attract blocks.[37]

The evidence of lower CEO pay is consistent with several theories. First, this finding is consistent with the joint hypotheses that CEOs use pay to try to extract rents (Bebchuk and Fried (2004)) and that blockholders mitigate such managerial agency problems by monitoring CEO compensation. Second, the lower incentive pay is consistent with substitution of different governance mechanisms: firms with a non-managerial individual blockholder as a monitor do not need as much pay-for-performance

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[35] We have verified this using the aggregate payout ratio as well as the aggregate payout yield.

[36] Our estimates correspond to an average reduction in CEO pay by about $1.5M, almost all in terms of incentive pay. Note also that many CEOs receive $1M in cash pay for tax reasons, which may explain why incentive are a lower part of total pay for CEOs with lower total compensation.

[37] Bertrand and Mullainathan (2001) study "pay-for-luck" and find that CEOs are rewarded for changes in firm performance that are beyond their control. They also find that better governed firms pay less for luck, and these effects are strongest for the presence of large shareholders on the board (23-33% less pay for luck). Our two stage regression approach prevents us from analyzing the impact of blockholders on pay-for-luck.

sensitivity to align the interests of owners and management. Another possibility is that firms with blockholders hire different CEOs. For example, it may be less enjoyable to run a firm with strong owners and the possibility of intervention by large owners can reduce managerial initiative (Burkart, Gromb and Panunzi (1997)), or the need for a skilled CEO is lower for firms with large active blockholders, so those firms hire a less expensive CEO.

It seems large shareholders often work through the firm's board. In Table 9, we find that there are 1.6 more outside directors in firms with a blockholder. The effect is economically large, because the average firm in our sample has a total of about seven outside directors. This suggests that large blockholders exert influence on corporate policies, and thus ultimately affect operating performance, through the board.

5.6. Liquidity

The theoretical prediction for stock market liquidity is particularly problematic to evaluate empirically using a standard OLS estimation procedure, because as argued by Maug (1998), blocks are more easily and inexpensively formed in firms with more liquid shares. This prediction has some support in the data because we document that blockholders tend to select firms with relatively high trading volume. Using our two-stage selection model, we can isolate the causal effect of blocks on liquidity without selection effects impacting the estimates.

Table 10 reports our evidence on liquidity and large shareholders. We analyze three measures of liquidity: trading volume, bid-ask spread, and Amihud's (2002) illiquidity measure. Our estimates show economically large negative effects of blocks on liquidity. In column (1), we find that trading volume is reduced by about half a standard deviation in the presence of a block. Because this may simply be the result of a smaller free float of shares among firms with blocks, we also analyze alternative measures. In column (2), the estimated coefficient on the large shareholder indicator variable implies that a block increases the bid-ask spread by about one standard deviation. In column (3), we find that Amihud's (2002) illiquidity measure increases by a quarter of a standard deviation when a block is present in a firm.

The evidence in the table that blocks significantly reduce the liquidity of a firm's shares supports the predictions by Holmström and Tirole (1993) and Bhide (1993), and implies that one side effect of large shareholders in public firms is lower stock liquidity and less information production about the firm.

5.7. Robustness of results

One potential concern is that the first-stage significance of our instrument is driven by a few states with the most extreme wealth density measures. In untabulated regressions, we find that dropping the ten states with the highest and lowest wealth density has little effect on the economic and statistical significance of the coefficient of the instrument. The same is true if we drop the ten states with the lowest number of headquarters. Dropping states with few firms tends to make our coefficient estimate in the first stage more precisely estimated, i.e., the t-statistic increases.

In addition, we conduct several other tests to check the robustness of our results. When examining a local bias in institutional holdings, Coval and Moskowitz (1999) estimate regressions in which they exclude the New York metropolitan area, because so many mutual funds and firm headquarters are located in New York City. The inclusion of New York City could lead to an overestimate of the local bias. In our case, a concern is that many rich individuals could deem New York City an attractive city to live in, and at the same time, hold blocks in one of the many firms in New York. When we exclude the New York City area to see whether it drives our results, we find that the economic and statistical significance of the estimated first stage coefficient of the instrument increases.

One concern is that the block indicator may be proxying for non-linear size effects. We have therefore also included $[\text{Log (market value)}]^2$ and $[\text{Log (market value)}]^3$ in the regressions but the estimated coefficients on these variables are statistically insignificant and including them does not change any of the other results.

Another concern is that the denominator of our density measure uses the number of firm headquarters in an area, which may be correlated with many factors unrelated to the supply of wealthy individuals who are potential blockholders. For example, information about a firm may be more easily

obtained where there are only a few firms in the geographic region. We have included the two components of our instrument separately in the first stage regression (i.e., the number of individuals with high net worth and one divided by the number of corporate headquarters of public firms located in a state). We find that both measures have independent and significant power in explaining the large shareholder dummy. The effect of wealth is larger and more significant. This cannot be explained by the informational advantage argument or other factors correlated with the number of local firm headquarters.

Some non-managerial individual large shareholders that are also directors do not provide their address in the proxy statement, but state "same address as company". To make sure that these observations do not drive our results, we re-estimate all regressions excluding blocks with zero distance between the location of the blockholder and the firm's headquarters. The results of these regressions are qualitatively and quantitatively similar to those reported in Tables 6 through 10.

The group of non-managerial individual large shareholders includes activist investors and second-generation family members without management representation. We repeat our first-stage regressions excluding blocks held by second-generation family firms and blocks held by activist investors to make sure that these are not driving our results. Our results remain qualitatively and quantitatively similar.

Our instrument is based on the high net worth distribution for 1995, because it predates our full sample. We have also used 1995 SOI data for 1996-1998 and 1998 data for 1999-2001 (the last year in our sample), as well as 1998 data for all years, with very small differences in the results.

6. Discussion and conclusions

While there exist many theoretical models of large shareholders which imply that blocks can impact firm behavior and outcomes, it has been challenging to isolate these effects empirically. Empirical studies face the problem that blocks are not randomly distributed across firms and that the performance and corporate policy measures that a large shareholder can impact may also motivate his purchase decision. Although this has been long recognized and instrumental variable solutions have been

suggested (at least since Demsetz and Lehn (1985)), it has been difficult to find an instrument that fulfills the exclusion restriction.

We develop and test an instrumental variable framework which allows us to separate selection from treatment effects of a large group of shareholders (non-managerial individual blockholders) and to assess the impact of these blockholders on a broad set of firm outcomes. Because of significant selection effects, we find that the estimated coefficients of the instrumented large shareholder indicator variable in our second stage regressions are statistically and economically different from those obtained from OLS models. That is, OLS estimates of large shareholders are often biased. Table 11 summarizes this key result from our paper by comparing our instrumental variable estimates with OLS estimates. It can clearly be seen that the OLS results often mask a finding of significant blockholder influence on firms when selection is not controlled for because OLS confounds selection and treatment effects.

An important conclusion from our paper is that once block selection effects are controlled for, empirical effects emerge that are consistent with several theoretical predictions about the governance role of large shareholders. Specifically, we find that large shareholders have a significant impact on operating performance, corporate policies, and the liquidity of a firm's stock. Consistent with theories of large shareholders as monitors, we show that profitability and payout ratios are higher, and cash holdings and CEO pay are lower with a large shareholder present in a firm. We also find that large shareholders take actions that are not necessarily in the interest of smaller shareholders, for example substituting dividends for (tax efficient) repurchases. Consistent with theoretical predictions, we also find that another effect of having large shareholders is reduced stock liquidity. That is, blocks are associated with economic benefits as well as costs.

Finally, we want to recognize some limitations of our study. We have sidestepped the issue of how large shareholders apart from individuals (e.g., institutions) impact corporate policies and performance, because our instrument does not identify the presence of other owners. Also, we have not analyzed interactions of individual blocks with various other governance mechanisms because clear, testable predictions have not been worked out theoretically (with the exception of Zwiebel (1995)). In

addition, our empirical framework does not separate the effect of the threat of block presence from the immediate impact of existing large shareholders in a firm. As suggested by Manne (1965), the mere threat of actions by blockholders or raiders can influence managerial behavior, and if firms in high wealth density states face a higher threat of block formation, this may partly explain our results. To the extent that we are interested in the aggregate impact of large shareholders on firms and on the economy, the indirect effect of a threat is important, but ideally, it should be separately identified.

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Appendix: Examples of large non-managerial shareholders

The data for this Appendix are from Factiva / Dow Jones News searches and the forms SC 13D that are mandatory SEC filings for any person obtaining a stake in excess of 5% in a public firm.

For some blocks in our dataset, it is evident how excess returns may be generated and through which channels influence can be exerted. George Lucas owns, through Lucasfilm Ltd., a 7.4% stake in toymaker HasBro Inc. This stake was obtained in exchange for licenses to certain intellectual property rights (e.g., StarWars figure toys) and the right of first refusal to others. Clearly, the threat of cancellation of licensing agreements or the threat not to license future film figures and to cooperate with different toy makers appears credible.

Ty Warner, the inventor of the Beanie Babies, bought in February 1998 a 7.3% stake in Cyrk, Inc., a corporate promotion company, after he agreed that Cyrk launches and maintains the "Beanie Baby Official Club." At the time of the investment, Cyrk Inc. was in difficulties, having lost about a quarter of its work force. Ty Warner bought the stock at $13, and the stock declined significantly in the following year, down to $6.50 in February 1999. For the twelve months ending December 31st, 1999, Cyrk reported an increase in net earnings of almost 30%, part of which was attributed to the licensing agreement with Ty Warner, which boosted the stock price to almost $12.

Denver billionaire and private investor Donald Sturm owns a 5.1% stake in Level 3 Communications, Inc., headquartered in Broomfield, Colorado. Sturm spent a considerable part of his career at Peter Kiewit Sons', Inc., a construction, coal mining, and telecommunications company that spun off Level 3 Communications in 1998. Although he had retired from Peter Kiewit in 1991, he decided to hold a 5.1% stake in the newly created company. In May 1998 his stake was worth $31 per share. In August of 2000, he sold 0.4% of his holdings for approximately $87 per share.

Robert Coates, founder, chairman, and CEO of Management Insights, Inc., a management consulting firm, doubled his stake in Inprise Corporation to 6.3% in April 1999. Inprise is the owner of the Borland family of embedded database tools. Robert Coates' block purchase is a good example of the power that a non-managerial shareholder, although the owner of only a 6.3% stake, can have. In his

initial form SC 13D filed on April 9th, 1999, he notes under purpose of transaction the following: "*The market value of the common stock of Inprise Corporation has been steadily decreasing. Recently, the Chief Executive Officer and Chief Financial Officer have resigned from Inprise Corporation. As an interested and significant shareholder, Robert Coates and Management Insights, Inc. will take all actions necessary as may be deemed appropriate to protect their investment in Inprise.*"

In fact, Robert Coates put up a shareholder proposal critical of management for the 1999 annual meeting. This triggered a response from the corporation, and in an amended form SC 13D filed May 17th, 1999, it is reported that Robert Coates entered into an agreement with Inprise Corp. The agreement specifies that Coates is put up as a nominee for the board of directors. In exchange, he withdraws the earlier stockholder proposal and contractually agrees to the following: "*The members of the Coates Group and their respective Affiliates and Associates and the Company shall publicly support and recommend that the Company's stockholders vote for the election of each of the 1999 Nominees at the 1999 Annual Meeting and for each of the other matters being presented by the Board for a vote of stockholders at the 1999 Annual Meeting.*"

Finally, in early 2000, Robert Coates stepped down as a board member to protest the proposed acquisition of Inprise by Corel Corporation. Coates felt that the terms of the merger were not advantageous to Inprise shareholders, and actively fought the merger. Three months later, the merger fell through.

For some blocks, it is not obvious why it was bought or is maintained. For example, Microsoft-founder Bill Gates owns a 5.3% stake in Avista Corporation (formerly Washington Water and Power). Minnesota-based entrepreneur Richard Born, founder and CEO of Born Information Services, Inc., bought in 2000 a 5.8% stake in cross-town firm Analysts International group, which could be deemed a competitor. Born's initial statement of ownership indicates that he bought the block for investment purposes. He has neither sought nor obtained a board seat, nor did the two firms ever enter into merger talks.

Appendix: Variable definitions

Variable	Definition
Assets (log)	Log of total assets (Compustat item 6)
Average share price	Mean daily closing share price previous year
Bid-ask spread	Yearly average of the end-of-day relative bid-ask spread, derived from the closing bid and ask from CRSP
Cash holdings	Cash and short-term investments (item 1) divided by lagged net property, plant, and equipment (item 8)
CEO incentive pay	Fraction of toal CEO pay (Execucomp item TDC1) that is paid in either stock or options
CEO pay (log)	Log of the sum of cash salary, cash bonus, and the Black-Scholes value of options granted during a fiscal year to the CEO (Execucomp item TDC1)
Dividend yield	Ratio of the sum of common dividends (item 21) and preferred dividends (item 19) over book value of common equity (item 60) or over market value of common equity
Dividend payer	Indicator variable that is equal to 1 if the sum of common dividends (item 21) and preferred dividends (item 19) > 0, and 0 otherwise
Dividend payout ratio	Common dividends (item 21) divided by EBITDA (item 18)
Firm age	Log of months since first listing on stock exchange
Illiquidity	Yearly average of absolute daily return divided by daily dollar volume, as calculated by Amihud (2002). Data come from CRSP
Industry fixed effects	The 10 Fama-French industries, FF10
Institutional block ownership	Aggregate ownership by institutions, counting only blocks of 5% or more of common equity
Investment	Capital expenditures (item 128) divided by lagged net property, plant, and equipment (item 8)
Lagged return	Stock market return over the previous fiscal year
Leverage	Long-term debt (item 9) plus current liabilities (item 34) divided by long-term debt plus current liabilities plus book value of common equity (item 60) (book leverage) or divided by long-term debt plus current liabilities plus market value of common equity (market leverage)
Market capitalization	Number of shares outstanding times calendar year closing price (item 25 x item 199)
Nasdaq membership	Dummy variable equal to one for firms listed on NASDAQ, and zero otherwise
Number of outsiders on board	Number of non-affiliated directors on firm's board, from the IRRC director database
Return on assets	Ratio of EBITDA (item 18) divided by lagged total assets (item 6)
Return on sales	Ratio of EBITDA (item 18) divided by lagged total sales (item 12)
Sales growth	Net sales (item 12) divided by lagged net sales, minus 1
S, G & A	Selling, general, and administrative expenses (item 189) divided by sales (item 12)
Trading volume	Yearly average of number of shares traded per months divided by total shares outstanding
Volatility	Standard deviation of monthly share price, calculated over previous 24 months

Figure 1: The geographic distribution of high net worth individuals

The figure shows estimates of the number of high net worth individuals per Compustat firm headquarter for each U.S. state. The wealth data are from the Internal Revenue Service's Statistics of Income (SOI) data which report the estimated number of individuals with a high net worth in 1995. The data for firms' headquarters are from Compustat in 1995.

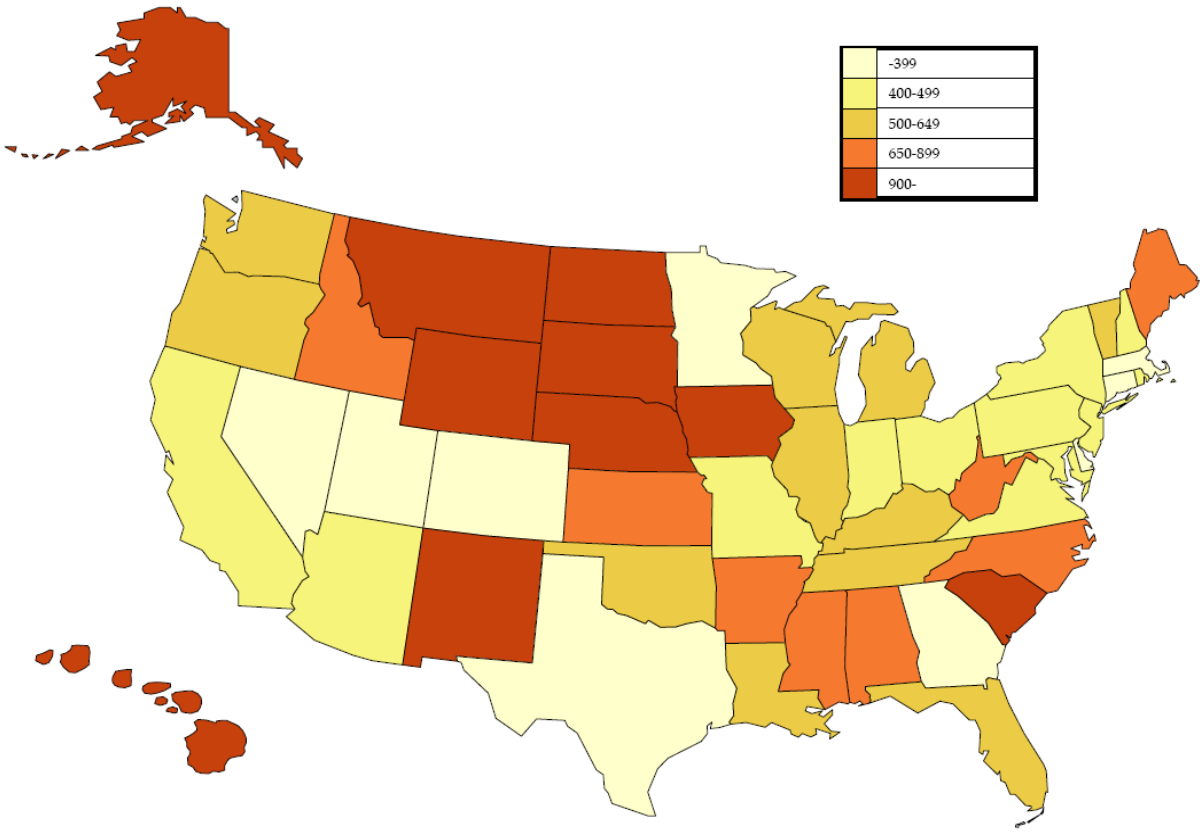

Figure 2: Actual versus predicted number of individuals on the Forbes 400 list

The figure plots state by state, the actual number of individuals on the *Forbes* list of the wealthiest Americans (in 1998) against the predicted number of individuals. We use the wealth data from the Internal Revenue Service's Statistics of Income (SOI) database (1998) and the power law distribution with a parameter of 1.36 estimated by Levy and Solomon (1997) to predict the number of individuals on the list (minimum wealth required to be on the Forbes 1998 list was $430 million). The correlation coefficient between actual and predicted number of ultra-wealthy individuals is 0.89.

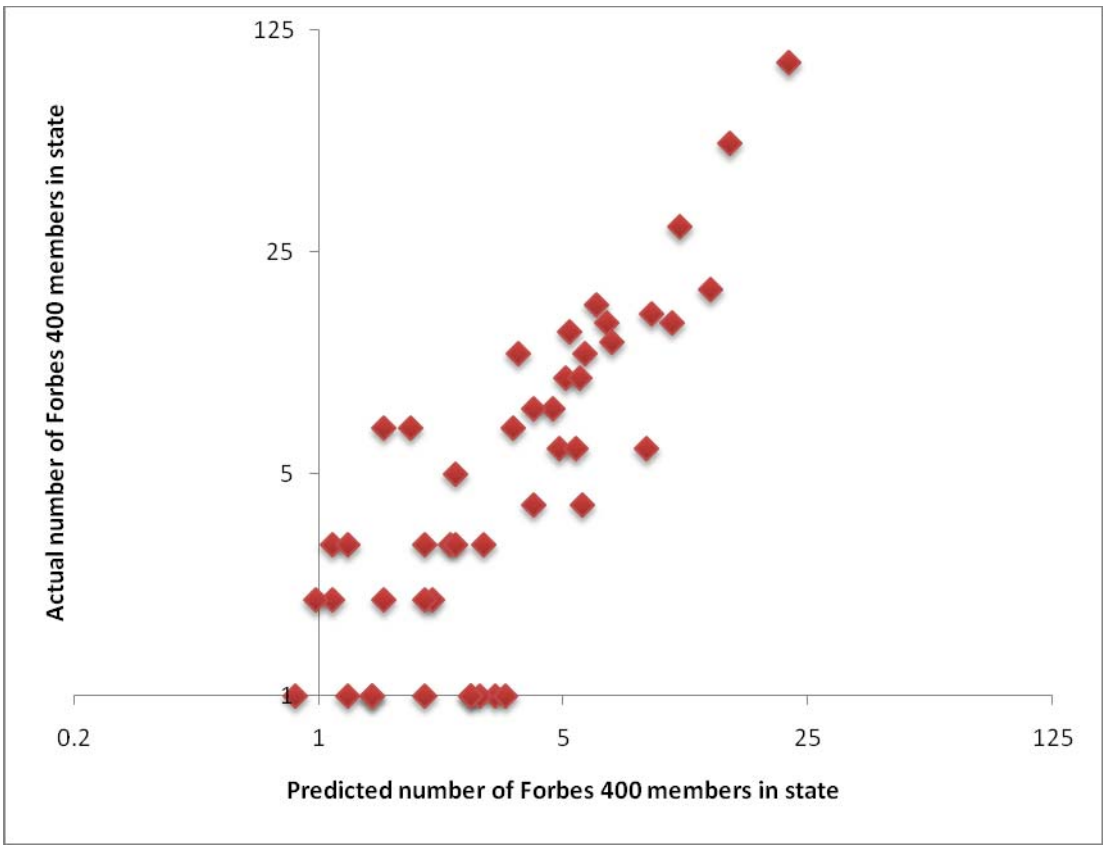

Figure 3: Frequency of individual blocks by US state

The figure plots the frequency of large, individually held, non-managerial blocks in each state (across all sample years) against the density of high net worth individuals in 1995. Each circle represents one state. The area of a circle is proportional to the number of firms in the state. The dashed line represents the regression line from a weighted least squares regression (weights are the number of firms). This regression has an estimated intercept of 0.031 (standard error 0.026), an estimated slope of 0.190 (standard error 0.051). The slope is significantly different from zero at the 0.1% level. The adjusted R–squared is 0.236.

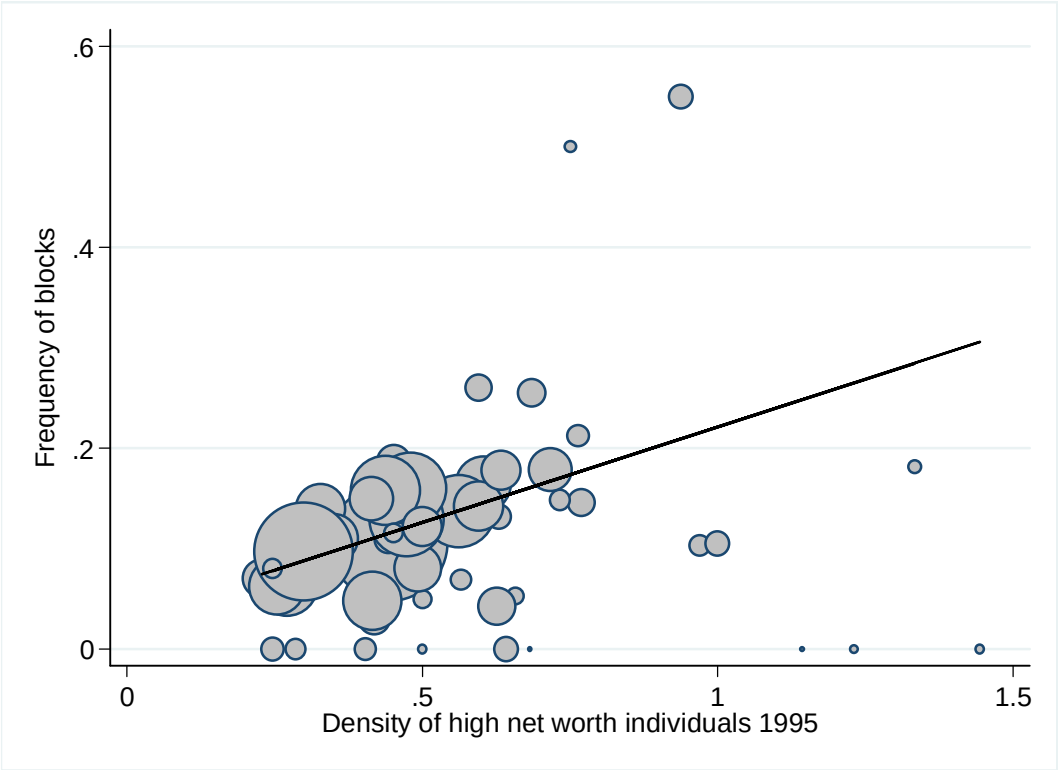

Table 1: Distance between large shareholders and firms' headquarters

The table shows summary statistics for the distance in miles between the location of a blockholder and the headquarters of the firm in which the block is held for four different types of large shareholders. The four types of blockholders are non-managerial individuals, managers (both current and former), mutual funds, and money managers. The summary statistics are based on blockholder-firm-year observations. The sample is non-dual class S&P 1500 firms during the period 1996-2001. Blockholders are entities that own at least 5% of the outstanding shares. The blockholder zip codes are hand-collected from proxy statements. The firms' zip codes come from the *Execucomp* database, the *Compact Disclosure* discs, or are hand-collected from proxy statements. The distances are calculated for U.S. based blockholders (excluding Alaska and Hawaii) only, using latitude and longitude data from the *U.S. Census Bureau's Gazetteer Place and Zip Code Database*. The indicator variable "Same State" is equal to one if the blockholder and firm headquarters are located in the same state, and zero otherwise.

		Distance in miles		
Type of blockholder	N	Mean	Median	Same State
Non-managerial individual	1,079	464.2	42.5	53.1%
Managers	2,022	57.3	0	91.3%
Mutual funds	7,929	1,173.5	1,017.2	9.7%
Money managers	2,652	1,081.1	857.5	8.7%

Table 2: Estimated wealth distributions

The table shows estimates of the number and wealth of high net worth individuals for four U.S. states (Oregon, Georgia, New York, California). The wealth estimates are based on data from the Internal Revenue Service's Statistics of Income (SOI) data which reports the estimated number of individuals with a high net worth ($1M and up) in 1998. The wealth of subsamples of these individuals (100 richest, number with $100 million or more in net wealth) is estimated assuming individual net wealth follows a power law distribution with $W_n = A \times n^{-1/1.36}$ for wealth W, and individual rank n. A is a constant. The parameter of 1.36 is estimated by Levy and Solomon (1997) (LS (1997) below). The 1999 end-of-year market value and number of listed firms are constructed from Compustat data. The sample is non-dual class S&P 1500 firms.

	Oregon	Georgia	New York	California	Data source
Number of individuals with a high net worth	27,000	64,000	243,000	412,000	SOI (1995)
Wealth of 100 richest individuals ($M)	17,367	32,759	87,373	128,817	Estimate using
their wealth as fraction of state market value 1999	140%	8%	5%	9%	LS (1997)
Number of individuals with $100M in wealth	51	122	463	785	Estimate using
their wealth as fraction of state market value 1999	110%	9%	8%	18%	LS (1997)
Number of sample firms in state (1999)	7	26	70	153	Compustat
Total market value of equity in 1999 ($M)	12,420	392,538	1,827,770	1,420,483	Compustat
Median market value in 1999 × 5% ($M)	43	70	171	58	Compustat
Average market value in 1999 × 5% ($M)	89	755	1,015	597	Compustat
Largest market value in 1999 × 5% ($M)	259	7,200	17,500	9,700	Compustat
No. of individuals with enough wealth to buy 5% of:					Estimates using LS (1997)
median firm in state	162	198	223	1,659	
average firm in state	61	8	20	69	
2nd largest firm in state	27	0.6	0.6	1.9	
largest firm in state	14.1	0.4	0.4	1.6	

Table 3: Summary statistics

The table shows sample summary statistics. Panel A shows the number of observations and frequency for four types of blockholders: Non-managerial individuals, managers (both current and former), mutual funds, and money managers. Panel B shows mean, median and standard deviation for all other variables. The sample size (N) varies across variables because of data availability and because outliers are excluded from regressions. All variables are defined in the Data Appendix. The sample is non-dual class S&P 1500 firms during the period 1996-2001.

Panel A: Blockholders		
Type of blockholder	N	Frequency
Non-managerial individuals	5984	0.118
Management	5984	0.219
Mutual funds	5984	0.677
Money managers	5984	0.305

Panel B: Regression variables				
Variables	N	Mean	Median	Standard deviation
Firm age	5979	24.0	20.1	19.13
ROA	5787	0.047	0.055	0.104
ROS	5784	0.035	0.047	0.166
S,G&A	5318	0.251	0.213	0.179
Investment	5632	0.282	0.221	0.221
Leverage, BV	5751	0.252	0.246	0.182
Leverage, long-term only, BV	5755	0.210	0.195	0.169
Leverage, MV	5744	0.278	0.220	0.277
Dividend yield, BV	5765	0.020	0.013	0.025
Dividend yield, MV	5760	0.013	0.006	0.017
Dividend payout	5765	0.182	0.014	0.491
Cash holdings	5771	0.146	0.043	0.270
Number of outsiders on board	5584	7.440	7.000	2.812
CEO pay (log)	5092	7.820	7.775	1.188
CEO incentive pay	5092	0.512	0.553	0.285
Trading volume	5966	0.006	0.004	0.007
Volatility	5893	0.450	0.392	0.248
Annualized stock return	5951	0.054	0.089	0.475
Bid-ask spread	5954	0.017	0.013	0.016
Illiquidity	5890	0.031	0.004	0.088

Table 4: First stage results

The table shows results from linear probability models and probit regressions of three large shareholder variables on measures of the density of high net worth individuals in a state in 1995 and controls. The large shareholder dummy variable is equal to one if an individual non-managerial large shareholder is present in the firm, and zero otherwise (columns 1 through 5). Log (block ownership) is the log of one plus the ownership by individual non-managerial blockholders (column 6). The managerial block dummy variable is equal to one if a large individual managerial shareholder is present in the firm, and zero otherwise (column 7). The sample is non-dual class S&P 1500 firms during the period 1996-2001. Blockholders are entities that own at least 5% of outstanding shares. All other variables are defined in the Data Appendix. Robust standard errors (shown in parentheses) are clustered by state. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Table 4 – cont'd

Dependent variable	Large shareholder dummy					Log (block ownership)	Managerial block dummy
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Regression type	OLS	Probit	Probit	Probit	Probit	OLS	Probit
Density of high net worth individuals, 1995	0.190***	0.892***	0.691***	0.724***		0.183**	0.266
	(0.060)	(0.250)	(0.265)	(0.276)		(0.084)	(0.224)
Wealth per listed firm, 1995					0.508***		
					(0.171)		
Lagged return				-0.112*	-0.110	-0.026	
				(0.063)	(0.063)	(0.016)	
Log (market value)				-0.035	-0.035	-0.005	
				(0.064)	(0.064)	(0.018)	
Log (assets, book value)				-0.127**	-0.125**	-0.025	
				(0.058)	(0.059)	(0.016)	
Age				0.018**	0.018**	0.0045*	
				(0.009)	(0.009)	(0.0024)	
Age squared				-0.00022	-0.00021	-0.00006**	
				(0.00016)	(0.00014)	(0.00003)	
Sales growth				0.163**	0.138*	0.031**	
				(0.067)	(0.070)	(0.015)	
Return on assets (ROA)				-0.050	-0.023	-0.028	
				(0.030)	(0.306)	(0.075)	
Year fixed effects			Yes	Yes	Yes	Yes	Yes
Industry fixed effects			Yes	Yes	Yes	Yes	Yes
R-squared	0.008	N/A	N/A	N/A	N/A	0.035	N/A
N	5,972	5,972	5,848	5,752	5,752	5,752	5,821

Table 5: First stage results with state-level controls

The table shows probit regressions of a blockholder indicator variable on the density of high net worth individuals in 1995 and other variables that vary at a state level. The sample is non-dual class S&P 1500 firms during the period 1996-2001. The large shareholder dummy variable is equal to one if a large individual non-managerial shareholder is present in the firm, and zero otherwise. Each specification includes the firm-level controls in Table 4. Robust standard errors (shown in parentheses) are clustered by state. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Regression type	Probit	Probit	Probit	Probit	Probit	Probit	Probit
Density of high net worth	0.882***	0.867***	0.871***	0.836***	0.872***	0.890***	0.766***
individuals	(0.272)	(0.268)	(0.273)	(0.267)	(0.280)	(0.271)	(0.264)
Population density		-0.005					-0.003
		(0.004)					(0.003)
Corporate tax rate (state)			0.012				0.013
			(0.013)				(0.014)
Per capita income				-0.001			-0.002
				(0.002)			(0.002)
State anti-takeover provisions					0.022		0.008
					(0.029)		(0.031)
Educational attainment - % high						0.005	0.005
school graduates						(0.005)	(0.005)
Firm control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	5,752	5,752	5,752	5,752	5,648	5,752	5,648

Table 6: Operating performance and large shareholders

The table shows results from the second stage regression of operating performance measures on a large shareholder dummy and control variables. The large shareholder dummy is equal to one if a large individual non-managerial shareholder is present in the firm, and zero otherwise. It is instrumented in the first stage regression with the density of high net worth individuals in 1995. The last two rows of the table show the coefficient and standard error for the density of high net worth individuals from the first stage probit regression of the large shareholder dummy on the density measure and controls. $\hat{\rho}$ is the estimated correlation between first and second stage error terms. The sample is non-dual class S&P 1500 firms during the period 1996-2001. All other variables are defined in the Data Appendix. Robust standard errors (shown in parentheses) are clustered by state. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Dependent variable	ROA	ROS	S, G & A	Investment
	(1)	(2)	(3)	(4)
Second stage results				
Large shareholder dummy	0.0287**	0.0556***	-0.0540	-0.055*
[instrumented]	(0.0125)	(0.0186)	(0.0349)	(0.029)
Controls	Age, age squared, log (market value), log (assets), sales growth, lagged return, dividend payer dummy, dividend yield		Age, age squared, log (market value), log (assets), sales growth, lagged return	
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Estimated $\hat{\rho}$	-0.193	-0.344	0.263	0.157
Chi-square test ($\hat{\rho} = 0$)	4.72**	9.26***	3.96**	5.05**
N	5,503	5,488	5,172	5,483
First stage results				
Density of high net worth individuals	0.742***	0.769***	0.983***	0.855***
	(0.289)	(0.272)	(0.358)	(0.315)

Table 7: Capital structure and large shareholders

The table shows results from the second stage regression of three measures of leverage on a large shareholder dummy and control variables. The large shareholder dummy is equal to one if a large individual non-managerial shareholder is present in the firm, and zero otherwise. It is instrumented in the first stage regression with the density of high net worth individuals in 1995. The last two rows of the table show the coefficient and standard error for the density of high net worth individuals from the first stage probit regression of the large shareholder dummy on the density measure and controls. $\hat{\rho}$ is the estimated correlation between first and second stage error terms. The sample is non-dual class S&P 1500 firms during the period 1996-2001. All other variables are defined in the Data Appendix. Robust standard errors (shown in parentheses) are clustered by state. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Dependent variable	Leverage, BV	Long term leverage, BV	Leverage, MV
	(1)	(2)	(3)
Second stage results			
Large shareholder dummy	-0.034	-0.0386*	-0.0523
[instrumented]	(0.028)	(0.0206)	(0.0428)
Controls	Age, age squared, log (market value), log (assets), sales growth, ROA, dummy for dividend payers, lagged return		
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Estimated $\hat{\rho}$	0.142	0.137	0.039
Chi-square test ($\hat{\rho} = 0$)	6.40**	6.20**	2.48
N	5,652	5,655	5,553
First stage results			
Density of high net worth individuals	0.695**	0.685**	0.745**
	(0.289)	(0.287)	(0.295)

Table 8: Payout policy, cash holdings, and large shareholders

The table shows results from the second stage regression of five measures of payout policy on a large shareholder dummy and control variables. The large shareholder dummy is equal to one if a large individual non-managerial shareholder is present in the firm, and zero otherwise. It is instrumented in the first stage regression with the density of high net worth individuals in 1995. The last two rows of the table show the coefficient and standard error for the density of high net worth individuals from the first stage probit regression of the large shareholder dummy on the density measure and controls. $\hat{\rho}$ is the estimated correlation between first and second stage error terms. The sample is non-dual class S&P 1500 firms during the period 1996-2001. All other variables are defined in the Data Appendix. Robust standard errors (shown in parentheses) are clustered by state. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Dependent variable	Dividend yield (book value)	Dividend yield (market value)	Dividend payout ratio	Cash holdings	Repurchase payout
	(1)	(2)	(3)	(4)	(5)
Second stage results					
Large shareholder dummy	0.0576***	0.0197***	0.226*	-0.0567**	-0.134**
[instrumented]	(0.00374)	(0.0022)	(0.121)	(0.0278)	(0.0633)
Controls	Age, age squared, log (market value), log (assets), sales growth, ROA, lagged return				
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Estimated $\hat{\rho}$	-0.832	-0.693	-0.251	0.077	0.079
Chi-square test ($\hat{\rho} = 0$)	172.0***	18.79***	2.00	1.85	7.08***
N	5,592	5,605	5,693	5,606	5,245
First stage results					
Density of high net worth individuals	0.490***	0.566***	0.747***	0.730***	0.737***
	(0.172)	(0.206)	(0.258)	(0.284)	(0.274)

Table 9: Managerial compensation, governance mechanisms, and large shareholders

The table shows results from the second stage regression of CEO pay and board structure on a large shareholder dummy and control variables. The large shareholder dummy is equal to one if a large individual non-managerial shareholder is present in the firm, and zero otherwise. It is instrumented in the first stage regression with the density of high net worth individuals in 1995. The last two rows of the table show the coefficient and standard error for the density of high net worth individuals from the first stage probit regression of the large shareholder dummy on the density measure and controls. $\hat{\rho}$ is the estimated correlation between first and second stage error terms. The sample is non-dual class S&P 1500 firms during the period 1996-2001. All other variables are defined in the Data Appendix. Robust standard errors (shown in parentheses) are clustered by state. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Dependent variable	CEO pay (log)	CEO incentive pay	No. of outsiders on board
	(1)	(2)	(3)
Second stage results			
Large shareholder dummy	-0.938***	-0.447***	1.598*
[instrumented]	(0.200)	(0.046)	(0.952)
Controls	Age, age squared, log (market value), log (assets), sales growth, ROA, dummy for dividend payers, lagged return)		
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Estimated $\hat{\rho}$	0.496	0.749	-0.368
Chi-square test ($\hat{\rho} = 0$)	14.38***	63.45***	1.83
N	4,279	5,004	5,368
First stage results			
Density of high net worth	0.907***	0.600***	0.716***
individuals	(0.310)	(0.269)	(0.278)

Table 10: Liquidity and large shareholders

The table shows results from the second stage regression of measures of liquidity on a large shareholder dummy and control variables. The large shareholder dummy is equal to one if a large individual non-managerial shareholder is present in the firm, and zero otherwise. It is instrumented in the first stage regression with the density of high net worth individuals in 1995. The last two rows of the table show the coefficient and standard error for the density of high net worth individuals from the first stage probit regression of the large shareholder dummy on the density measure and controls. $\hat{\rho}$ is the estimated correlation between first and second stage error terms. The sample is non-dual class S&P 1500 firms during the period 1996-2001. All other variables are defined in the Data Appendix. Robust standard errors (shown in parentheses) are clustered by state. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Dependent variable	Trading volume	Bid-ask spread	Illiquidity
	(1)	(2)	(3)
Second stage results			
Large shareholder dummy	-0.00381***	0.0153***	0.120**
[instrumented]	(0.00086)	(0.0009)	(0.182)
Controls	Age, age squared, log (market value), log (assets), sales growth, lagged return, ROA, dummy for dividend payers, institutional block ownership, dummy of Nasdaq membership, average share price, volatility		
Other controls		Trading volume	Trading volume
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Estimated $\hat{\rho}$	0.355	-0.771	-0.684
Chi-square test ($\hat{\rho} = 0$)	14.64***	128.56***	26.69***
N	5,704	3,909	5,702
First stage results			
Density of high net worth individuals	0.821***	0.376*	0.400*
	(0.273)	(0.222)	(0.208)

Table 11: Comparison of instrumental variable and OLS estimates

The table compares instrumental variable (IV) and OLS estimates of non-managerial individual blockholder effects on firms. Each reported number corresponds to a separately estimated coefficient on the large shareholder dummy variable for the different dependent variables. We use the same control variables in each regression as those in Tables 6-10. The IV column shows the estimated second stage coefficients on the instrumented large non-managerial individual shareholder dummy variable. It is instrumented with the density of high net worth individuals in 1995. The OLS column shows the corresponding OLS estimate of the large non-managerial individual shareholder dummy variable. All variables are defined in the Data Appendix. Robust standard errors (shown in parentheses) are clustered by state. Statistical significance at the 1%, 5%, and 10% level is indicated by ***, **, and *, respectively.

Dependent variables	IV	OLS
ROA	0.0287**	-0.0019
ROS	0.0556***	-0.0009
S, G & A	-0.054	0.0127
Investment	-0.055*	-0.0028
Leverage, BV	-0.034	0.0057
Long term leverage, BV	-0.0386*	-0.0091
Leverage, MV	-0.0523	0.0090
Dividend yield, BV	0.0576***	0.0069**
Dividend yield, MV	0.0197***	0.0025**
Dividend payout ratio	0.226*	0.029
Cash holdings	-0.0567**	-0.0134
CEO pay (log)	-0.938***	-0.189***
CEO incentive pay (log)	-0.447***	-0.048***
Number of outside directors	1.598*	0.310**
Trading volume	-0.00381***	-0.00175***
Bid-ask spread	0.0153***	0.0010
Illiquidity	0.120**	0.002