Institutional investors and corporate governance: The incentive to increase value

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This paper estimates institutional investors' incentives to actively monitor and engage corporate management. We measure incentives as the increase in an institution's cash flows (management fees) when a firm in its portfolio increases 1% in value, considering both the direct effect on assets under management (AUM) and the indirect effect on subsequent fund flows. By 2015, the average institutional investor gains roughly $118,000 in annual cash flow if a firm in its portfolio rises by 1%. The estimates range from $20,600 for small institutions (who hold relatively concentrated portfolios) to $261,900 for the largest institutions (with greater AUM but more diffuse holdings). Institutional shareholders in one firm often gain substantially when rival firms in the industry do well, by virtue of the institution's holdings in those firms, but the estimates vary greatly with industry concentration and institution size. Our estimates suggest that institutional investors often have strong incentives to be active shareholders.

1 Introduction

This paper studies institutional investors' financial incentives to be engaged shareholders, monitoring and engaging with the companies they own. Institutional ownership of U.S. public firms (as a fraction of firm value) increased from 29% in 1980 to 76% in 2015, according to 13F filings with the SEC, driven in part by the dramatic growth of index funds in recent years. To the extent that institutions have different incentives than other shareholders, the trends have the potential to substantially impact the governance of public firms.

The traditional view of institutional investors is that, with the exception of a small number of activist investors and large blockholders, institutions tend to be passive shareholders. However, recent studies provide evidence that large institutions, including index funds, take an active role in firms they own, exercising 'voice' through proxy voting and behind-the-scenes engagement with management (Appel, Gormley, and Keim 2016; McCahery, Sautner, and Starks 2016). A controversial strand of this literature argues that institutions that invest in multiple firms in the same industry might promote anticompetitive behavior, either by shaping managerial incentives or advocating for less aggressive corporate policies than other investors (Anton et al. 2016; Azar, Schmalz, and Tecu 2017; Azar, Raina, and Schmalz 2017; He and Huang 2017; Panayides and Thomas 2017). Yet it is unclear how widespread such interventions are, and—at a more basic level—what incentives institutions have to undertake them. The answer to the latter question is complicated by the fact that institutional investors themselves compete with each other and tend to be evaluated based on relative performance. An action by one institution to improve a portfolio firm (or set of firms in an industry) benefits other institutional shareholders with whom it competes for funds. This competition may amplify the classic free-rider problem of Grossman and Hart (1980) and Shleifer and Vishny (1986), dampening the incentives to engage with firms in the first place.

Our paper contributes to the literature by providing direct evidence on institutions' financial incentives to increase the value of their portfolio firms. We propose a simple framework to measure these incentives that accounts for externalities among institutions, and use this framework to estimate the magnitude of incentives for different types of institutions and firms. We also analyze institutions' incentives to affect the value of rival firms in the industry to shed light on the potential impact of common ownership, accounting for the fact that rivals are cross-owned not only by the institution itself

(similar to prior literature) but also owned by competing institutions. This latter effect has not been previously examined.

Our framework is simple. We measure incentives as the impact of a 1% increase in firm value on an institution's cash flow (i.e., management fees). Incentives are the sum of a direct component, which captures the fact that an increase in value raises an institution's assets under management (AUM) and hence management fees, and an indirect (flow) component that measures the impact on relative performance and subsequent fund flows. Analogous to Jensen and Murphy (1990) and Hall and Liebmann (1998), we define overall incentives as either the percent or dollar increase in cash flow caused by a 1% increase in the value of a portfolio firm.

Intuitively, direct incentives depend simply on a firm's weight in the institution's portfolio (and AUM, in the case of dollar incentives). Indirect incentives depend on (i) whether the institution underweights or overweights a firm relative to other institutions it competes with for new money (we assume this benchmark group consists of other institutions of the same type, as detailed in Section 3); and (ii) how strongly flows respond to relative performance for institutional investors. Thus, indirect incentives are defined as the overweight of a firm in the institution's portfolio (relative to other institutions) times the flow-to-performance sensitivity of institutions.

Our sample consists of all institutions with 13F filings from 1980–2015 (merged with price and share data on CRSP). The sample grows from 561 institutions in 1980, with an average portfolio of 193 stocks worth $953 million, to 3,105 institutions in 2015, with an average portfolio of 201 stocks worth $4.4 billion. Interestingly, the size distribution becomes more skewed over time, with almost no trend in median institutional size (~$300 million throughout the sample, as measured by their holdings of U.S. stocks). By the end of the sample, five institutions alone—T. Rowe Price, Fidelity, State Street, Blackrock, and Vanguard—account for over 25% of AUM.

As a first step, we estimate the flow-to-performance sensitivity, β, for institutions in our sample. A large literature explores flow-to-performance sensitivities of individual mutual funds (e.g., Chevalier and Ellison, 1997; Sirri and Tufano, 1998), but we are not aware of any study that has done so for fund

families or institutional investors overall. Our estimates indicate that a one percentage point increase in an institution's benchmark-adjusted quarterly return predicts an increase of 1.31 percentage points (standard error of 0.13) in net flow over the subsequent ten quarters. We use this estimate of β for our baseline estimates of flow incentives below.

Turning to our main results, we measure direct and flow incentives for every stock in an institution's portfolio, then average over all institutions holding a stock to get an estimate of incentives for each firm or average over an institution's holdings to get an estimate of incentives for each institution. In both cases, we value-weight incentives, so that larger shareholders and larger holdings receive a greater weight when we aggregate to the firm or institutional level. In some tests, we also consider the incentives of just a firm's largest shareholders.

Both direct and flow incentives can be large, especially at the end of the sample, because institutions hold fairly concentrated portfolios. Focusing on 2015, a typical stock holding represents 1.76% of an institution's portfolio (value-weighting across holdings and institutions).[1] This compares with an average weight of just 0.36% in the benchmark portfolio held by all other institutions. The portfolio weight of 1.76% determines an institution's direct incentives, while the overweight relative to other institutions, 1.40%, determines flow incentives. With a flow-to-performance sensitivity of 1.31, flow incentives are larger than direct incentives, implying that overall incentives (3.59% = 1.76% + 1.31 * (1.76% – 0.36%) more than double when flow incentives are taken into account.[2]

To express these in dollar terms, a 1% increase in firm value translates into a surprisingly large $21.5 million direct increase in AUM on average (value-weighted), a number that varies significantly across stocks and institutions (discussed further below). If we assume, for simplicity, that institutions earn a straight 0.5% management fee, the increase in AUM implies a $81,000 increase in annual cash flow. Adding flow incentives, the overall dollar increase in annual cash flow grows to $118,000. These dollar

[1] This number does *not* mean the average institution holds just 1/.0176 = 56.8 stocks. There are two reasons: First, the average portfolio weight of 1.76% is value-weighted across holdings and drops to 0.52% on an equal-weighted basis. For a given institution, the latter equals 1/N, where N is the number of stocks in the portfolio. Second, the average of 1/N across institutions is not equal to 1/avg(N). In fact, the average institution in our sample holds 1,930 firms in 2015 (value-weighting across institutions).

[2] The percentage incentive estimates have a convenient interpretation as portfolio weights. They also correspond to the percentage increase in an institution's AUM as a result of a 100% increase in a stock's value.

estimates are interesting because they represent the maximum annual cost an institution would be willing to incur to bring about a (permanent) 1% increase in firm value. The average suggests that, even though they receive only a small fraction of the benefits (reflecting the free-rider problem), many institutional shareholders would be willing to spend significant resources monitoring and engaging with at least some of firms in their portfolios.

The estimates vary substantially across stocks and institutions. Small institutions (which collectively hold the bottom 25% of AUM) invest an average of 3.75% of their portfolios in any given firm and strongly overweight these firms relative to other institutions. Thus, on a percentage basis, overall incentives for small institutions are relatively high at 8.28% of AUM. In dollar terms, of course, they are more modest: assuming a 0.5% management fee: a small institution's annual cash flow increases by an $20,600 if a portfolio firm goes up 1%. This compares to $261,900 increase in cash flows for the five largest institutions that make up a quarter of aggregate AUM (the percentage incentives for large institutions are 0.67% of AUM).

We also look at the incentives at the firm level, averaging across institutional investors in a given firm. The goal is to understand how strong the incentives are for institutional shareholders of a given firm to engage with management. For large stocks (in 2015), a typical share is held by an institution that invests 1.8% of its portfolio in the firm, implying that the average institutional shareholder's annual cash flow increases by $319,700 if the value of the firm increase by 1%. For small stocks, the incentives to intervene are much lower with dollar incentives of just $2,900.

Finally, following the recent literature on cross-ownership among firms in the same industry, we quantify how much institutional shareholders in one firm gain if rival firms in the industry increase in value (by virtue of the institutions' holdings of those firms). We focus primary on industries (three-digit SIC codes) with a small number of firms to highlight the potential impact on competition when strategic interactions are more likely to be important. For each institutional shareholder in a given firm, we compute the cash flow effect of a 1% increase in the value of the firm's industry rivals, again taking into account both direct and flow incentives. We calculate overall 'rival' incentives weighting institutions by their investment in the firm.

For relatively concentrated industries, rival incentives are positive but typically smaller than own-firm incentives. For example, in industries with 6–15 firms, we estimate that the average institutional shareholder in one firm gains $86,200 in annual cash flow if the firm goes up 1% in value, but gains $70,700 in annual cash flow if *every* other firm in the industry goes up 1% (institutions often invest in multiple firms in an industry but, when they overweight one firm, they tend not to overweight other firms in the industry). The latter number translates to $7,500 on a per-firm basis. To put the numbers in perspective, consider a corporate action that would increase the value of a firm at the expense of industry rivals, one-for-one (for example, a move that allows the firm to take market share away from its rivals). Our estimates suggest that an institution's ownership of multiple firms in the industry makes this strategy somewhat less valuable to the institution than it otherwise would be, but the net payoff is still positive.

Our paper contributes to the large literature on the governance role of institutional investors. The literature provides evidence that institutions influence corporate policies, including CEO pay, investment, takeovers, board structure, and, more controversially, output prices (Bushee 1998; Gillan and Starks 2000; Hartzell and Starks 2003; Aggarwal et al. 2011; Aghion, Van Reenen, and Zingales 2013; Azar, Schmalz, and Tecu 2017; Azar, Raina, and Schmalz 2017; He and Huang 2017; Panayides and Thomas 2017). However, active involvement requires an institution to spend resources to monitor the firm, engage managers, and vote on shareholder proposals. We contribute to this literature by directly estimating institutions' financial incentives to undertake these actions. Quantifying these effects is important to understand the trade-offs institutions face when considering active engagement with their firms and for understanding the magnitude of free-riders problems in corporate governance. The analysis also helps us gauge the plausibility of costly interventions, for which direct evidence is often difficult to obtain.

Our approach can be further extended in several ways, for example, by estimating costs of institutional engagement, or examining non-financial incentives to be engaged, such as social or political pressures. It is also important to incorporate the extent to which different types of institutions can (and do) affect managerial decisions, and thus, have a potential to affect value. We believe that our general approach provides a useful framework to address these questions.

Our paper also contributes to the literature on flow-to-performance sensitivities in asset management (Chevalier and Ellison 1997; Sirri and Tufano 1998; and others). Prior studies focus on this relation at the level of individual funds. While a few recent studies examine interactions among funds in fund families (Nanda et al. 2004; Brown and Wu 2016), we provide the first— to our knowledge—estimate of the fund-to-performance sensitivity for institutional investors overall. The relation is statistically and economically large, and the implied competition for fund flows between institutions contributes significantly to their financial incentives.

2 Framework

Our main goal in this paper is to understand the incentives that institutional investors have to be active shareholders. We attempt to answer the question: What is an institution's payoff from taking an action—monitoring the firm, engaging with management, proposing or voting on shareholder proposals, etc.—that affects firm value? An oft-stated view in the literature is that many, if not most, institutions have little incentive to be involved in corporate governance, but to our knowledge no one has explicitly estimated the payoffs from being active.

Our framework for measuring incentives is simple. We assume the payoff to being active comes from the additional fees the institution earns if a stock in its portfolio increases in value, recognizing both the direct impact on AUM when the stock goes up and the indirect impact that comes from subsequent performance-related fund flows. To be specific, suppose the institution earns an annual fee equal to a given percentage *p* of AUM, where AUM in period *t* can be written as:

$$AUM_t = AUM_{t-1} * \left(1 + \sum_{i=1}^{N} w_{i,t-1} R_{it}\right) + Flow_t, \quad (1)$$

where R_{it} is the return on stock *i*, $w_{i,t-1}$ is the stock's weight in the institution's portfolio at the start of the period, and $Flow_t$ represents the net inflow of new money in period *t*. In the data, we allow performance to affect flows with a delay but, for expositional simplicity, suppose that $Flow_t$ is driven by an contemporaneous returns relative to a benchmark:

$$\frac{Flow_t}{AUM_{t-1}} = \alpha + \beta * \left(\sum_{i=1}^{N} w_{i,t-1} R_{i,t-1} - \sum_{i=1}^{N} v_{i,t-1} R_{i,t-1}\right) + e, \quad (2)$$

where β measures flow-to-performance sensitivity and v_i is the weight of stock *i* in the benchmark portfolio. From eqs. (1) and (2), the incentives to increase stock *i*'s value in a given year can be broken up into a *direct component*, stemming from the additional fees associated with the direct impact on AUM, and a *flow component* resulting from the incremental fund inflows driven by improved performance. Direct incentives are simply:

$$Direct\ incentives_{i,t} = p * AUM_{t-1} * w_{i,t-1}, \quad (3)$$

while flow incentives are given by:

$$Flow\ incentives_{i,t} = p * AUM_{t-1} * \beta * \left(w_{i,t-1} - v_{i,t-1}\right). \quad (4)$$

To compute flow incentives, we estimate the flow-to-performance sensitivity β for institutions in our sample (Section 4). These flow incentives can be negative if the institution underweights a stock relative to the benchmark portfolio.

Eqs. (3) and (4) express incentives as the dollar impact (on management fees) of a 100% increase in stock *i*'s value. In the empirical section, we divide the values by 100 to calculate the dollar impact of a 1% increase in stock *i*'s value, which seems like a more realistic magnitude to consider. In addition, since $p*AUM_{t-1}$ gives the level of management fees, we can drop the first two terms from the formulas to express incentives on a percentage basis.

Our incentive measures are analogous to Hall and Liebman's (1998) measures of CEO incentives: they represent the institution's gain from a percentage increase in firm value. We consider percentage changes in firm value, rather than dollar changes, to focus on policies that affect value proportional to the firm's size. This is likely the case for decisions that would attract institutional involvement, such as decisions related to a firm's governance or strategy. In the context of institutions, an interesting interpretation of the incentives measures is as the upper bound on the financial cost the institution would be willing to incur to bring about the value increase.

The framework above is easily extended to measure an institution's incentives not just for a single firm

but also for an industry. Recent studies emphasize that institutions often invest in multiple firms in the same industry, providing an incentive to support policies that benefit the industry as a whole (possibly at the expense of consumers). In our framework, we can measure these incentives very simply by calculating how an institution's cash flows are affected by policies that impact both firm *i* and firm *i*'s competitors. Concretely, we define 'rival' incentives for stock *i* by summing our incentive measures over other firms in the industry:

$$Direct\ rival\ incentives_{i,t} = p * AUM_{t-1} * \sum_j\ w_{j,t-1}, \tag{5}$$

and

$$Flow\ rival\ incentives_{i,t} = p * AUM_{t-1} * \beta * \sum_j \left(w_{j,t-1} - v_{j,t-1}\right) \tag{6}$$

where the summation is over all other firms *j* in the industry ($j \neq i$). Intuitively, rival incentives—both the direct and flow components—are higher if the institution has larger cross-holdings within the industry. The flow component also depends on the extent to which competing institutions hold rival firms (as reflected in v_j) and can be negative if such holdings are large. Indeed, overall rival incentives (the sum of eqs. 5 and 6) can be negative even when an institution has modest cross-holdings within the industry, if an action has sufficiently large benefits for institutional shareholders of rival firms. This situation turns out to be observed often in practice, providing a counterweight to the incentives of some institutions to support anticompetitive policies. These rival flow incentives have not been previously incorporated into analyses of the impact of common ownership, and measuring them is a distinguishing contribution of our paper.

3 Data

Our main data come from Thomson-Reuters' database of 13F filings with the SEC. Since 1980, the SEC has required institutional investors that 'exercise investment discretion over $100 million of more' of so-called 13(f) securities to report their holdings of U.S. stocks and other exchange-traded securities (with some exceptions) every quarter. Holdings are identified by CUSIP, allowing an easy merge with price and share data on CRSP.

Thomson-Reuters classifies institutions into five categories: (1) banks, (2) insurance companies, (3) investment companies, (4) investment advisors, and (5) other. The distinction between the last three categories is somewhat arbitrary, and Thomson-Reuters mistakenly misclassified many institutions as 'other' starting in 1998 (see Wharton Research Data Services' (WRDS) *User Guide* for details). To circumvent these issues, we combine the last three categories into a single group that includes mutual fund companies, hedge funds, pensions, endowments, and other asset managers. We sometimes refer to these institutions simply as 'Type 3' institutions.

We make four additional changes to the Thomson-Reuters data. First, to mitigate a potential problem related to split adjustments in the data (see the WRDS *User Guide*), we adjust holdings for stock splits that occur between the 'filing' and 'report' dates using CRSP's adjustment factors. Second, WRDS documents serious problems with Thomson-Reuters' data starting in the second quarter of 2013 caused by stale and omitted 13F filings. As a fix, WRDS provides a supplemental dataset for June 2013–December 2015 based on institutions' original 13F filings with the SEC; we merge these data with the Thomson-Reuters' dataset using the methodology of Ben-David et al. (2016). Third, Thomson-Reuters reports Blackrock's holdings under seven separate entities, which we aggregate into a single institution following Ben-David et al. (2016). Finally, we set institutional ownership to 100% of shares outstanding in the small number of cases that institutions appear to hold more than 100% of the firm (see Lewellen 2011 for details).

Table 1 reports descriptive statistics for the data, breaking the sample into seven 5-year periods from 1980–2015 to show how the sample evolves through time (statistics are computed each quarter and then averaged across quarters).

Panels A and B report statistics for the cross section of institutions. The sample grows from 561 institutions in the period 1980–1985 to 3,105 institutions in the period 2011–2015 (in these panels, 'N' is the number of institutions). In all periods, the average institution holds roughly 200–300 U.S. firms, with a portfolio worth just under $1 billion in the early 1980s and $4.4 billion in recent years.[3]

[3] The unit of observation in the underlying data is an institution–quarter–CUSIP observation. However, we aggregate institutional ownership to the firm level using CRSP's PERMCO variable, converting holdings to institution–quarter–

Interestingly, the median size of institutions is fairly steady over time, between $300 million and $400 million, and the median number of firms held actually declines from 127 firms in the first period to 72 firms in the last period. The different trends for the mean vs. median reflect the fact that institutions' size distribution becomes more skewed over time, with dramatic growth in the top AUM percentiles (AUM here is measured by an institution's holding of U.S. stocks, not its total investment in all securities). For example, the 99th AUM percentile grows from $7.8 billion in the early 1980s to $65 billion in 2011–2015, representing a nearly 10-fold increase. The rise of extremely large institutional investors, with widespread investment in many U.S. stocks, is the motivation for recent work on the competitive effects of common ownership.

Panels C and D report the distribution of institutional ownership across U.S. firms (in these panels, 'N' represents the number of firms in the sample). The average U.S. firm has 20 institutional shareholders who own 13% of shares outstanding at the beginning of the sample, steadily increasing to 152 institutional shareholders who own 55% of shares outstanding in the last five-year period. (On a value-weighted basis, the average firm has nearly 1,000 institutional shareholders at the end of the sample, holding 70% of shares outstanding.) Nearly every firm (>99%) has at least one institutional shareholder in recent years.

4 Institutions' flow-to-performance sensitivity

A key source of incentives for many institutional investors comes from a link between returns and subsequent growth. In this section, we estimate the flow-to-performance sensitivity for institutions (β in our model) after briefly discussing related research.

4.1 Background

A large literature explores how mutual fund flows respond to performance, typically focusing on individual funds. For example, Chevalier and Ellison (1997) estimate the relation between a fund's annual return and its growth in the subsequent year. They find that a young (two-year-old) fund grows

firm observations, and keep only firms with common stock outstanding (CRSP share codes of 10, 11, and 12). The statistics in Panel B therefore represent the number of *firms* held by the institution, not the number of stocks held, and the statistics in Panels C and D are calculated by *firm*, not by stock.

45 percentage points faster (55% vs. 10%) if its excess return in the prior year increases from 0% to 10%, implying a flow-to-performance sensitivity of 4.5. The flow-to-performance sensitivity is smaller for older fund and highly nonlinear, larger for the best-performing funds and close to zero for the worst performers. The findings are consistent with earlier research on fund flows, including Ippolito (1992) and Siri and Tufano (1993).

More recent studies explore the behavior of fund families, though we are not aware of any study that explicitly estimates flow-to-performance sensitivities at the family level. Nanda, Wang, and Zheng (2004) show that the existence of a 'star' fund within a family is positively related to the growth of affiliated funds (see also Khorana and Servaes 1999; Massa 2003; Gaspar, Massa, and Matos 2006).[4] Brown and Wu (2016) argue that investors can learn about the quality of one fund by observing the performance of affiliated funds because of shared skills and resources within the family, including shared managers, analysts, trading desks, etc. They show that fund flows respond positively to the performance of other funds in the family, particularly when the managers of the funds overlap (see also Choi, Kahraman, and Mukherjee 2016).

How strongly the effects show up in institutional data depends on (i) whether results for mutual funds are representative of the wider population of institutional investors and (ii) whether new flows into a fund come from within the family or from competing institutions. Some fund companies make it more costly to move money out of the family than to move money within the family (for example, back-end loads might be waived for within-family transfers), suggesting that a good-performing fund might grow at the expense of affiliated funds, countering the phenomena documented by Nanda, Wang, and Zheng (2004), Brown and Wu (2016), and others.

4.2 Flow-to-performance estimates

We estimate institutions' flow-to-performance sensitivity by regressing net inflows on prior returns, allowing for a delay in the arrival of new money. Specifically, Table 2 reports average slopes from Fama-MacBeth-style cross-sectional regressions of an institution's net inflow in quarters t+1 through

[4] Nanda et al. include the family's past performance as a control variable in their regressions, but the magnitude of their estimate is difficult to interpret given their specification. Sialm and Tham (2016) show that stock returns of the fund management company have a positive effect of fund-level flows.

t+10 on benchmark-adjusted returns in quarter t. Net inflow is measured as the quarterly growth rate of AUM minus the institution's portfolio return:

$$Net\ Inflow_{it} = \frac{AUM_{it} - AUM_{i,t-1}(1+R_{it})}{AUM_{i,t-1}}, \quad (7)$$

where R_{it} is inferred from the institution's holdings at the end of quarter t–1. Benchmark-adjusted returns equal R_{it} minus the value-weighted return earned by all institutions of the same type, capturing the idea that investors might evaluate performance relative to similar institutions (the results only change slightly using raw returns).[5]

The slopes in Table 2 indicate that institutions' net inflows are strongly related to prior performance. The slopes on benchmark-adjusted quarterly returns are significantly positive for horizons of up to three years (all ten quarters reported, plus two additional quarters that are not tabulated), with the strongest effects observed in quarters t+2 and t+3. The quarterly slopes range from 0.111–0.204 for the first eight quarters, implying that an additional 1% return this quarter predicts additional net inflow of 0.11%–0.20% quarterly over the next two years.

For our subsequent analysis, we base our estimate of institutions' flow-to-performance sensitivity β on the cumulative slopes reported in Table 2 (the cumulative slope for horizon t+k is the sum of the quarterly slopes for t+1 through t+k; the t-statistics take into account possible correlation between the slopes at different horizons using the methodology of Jegadeesh and Titman 1993). The cumulative flow-to-performance sensitivity over 10 quarters, 1.314, suggests that a 1% return in quarter t leads to an immediate 1% increase in AUM followed by an additional 1.31% increase in AUM over the subsequent two-and-a-half years as new money is received. The flow-to-performance sensitivity grows to 1.47 if we extend the horizon out to 12 quarters (the last quarter with a significant slope) and peaks at 1.52 if we extend the horizon out to 14 quarters, but we use the cumulative slope of 1.31 from Table 2 to be conservative and to mitigate concerns about data snooping. (Our incentive measures would be

[5] Some background: Institutions' value-weighted returns are almost perfectly correlated (99.7%) with the market index from 1980–2015 (see also Lewellen 2011). On an equal-weighted basis, institutions have an average return of 3.29% quarterly (compared with a market return of 3.11%), and the cross-sectional standard deviation of returns is 3.88%. Institutions grow 3.92% quarterly, reflecting both the returns on their portfolios and net inflows of 0.61% quarterly (with a cross-sectional standard deviation of 14.9%). For the regressions, we trim the data at the 1st and 99th percentiles to eliminate extreme outliers.

slightly higher using the other estimates.) The magnitude of our estimate is comparable to that reported by Chevalier and Ellison (1997) for older mutual funds.

Figure 1 illustrates the shape of the flow-to-performance relation for institutions. We sort institutions into relative-performance quintiles each quarter, and plot the quintiles' net inflow over the subsequent 10 quarters against their relative returns. The graph provides some evidence of convexity in the relation, mirroring results for mutual funds, but the effect is not dramatic. For simplicity, we use the (linear) regression slope from Table 2 as our baseline estimate.

It is also interesting to note that the flow-to-performance sensitivity seems to vary across institutional types (not tabulated). The relation is weakest the small number of insurance companies in the data (58 institutions per quarter with a flow-to-performance sensitivity of just 0.14), and strongest for 'Type 3' institutions that include investment companies, investment advisors, and other asset managers (1,393 institutions per quarter with a flow-to-performance sensitivity of 1.54). This suggests that the flow incentives we document below might overstate incentives for banks and insurance companies but understate incentives for Type 3 institutions (the latter have more than 80% of total AUM in recent years, which is the period we focus on). However, there is no reason to believe that average incentives across all institutions would be biased.

5 Institutions' incentives

As described in Section 2, we measure an institution's incentives to be an active shareholder as the payoff from a 1% increase in the value of the firm. The payoff comes from an increase in management fees when AUM rises, taking into account both the direct increase in AUM if a holding does well (direct incentives) and the indirect impact implied by the flow-to-performance relation documented above (flow incentives). Our estimates of flow incentives are based on the flow-to-performance sensitivity of 1.31 from Table 2.

We estimate how much management fees increase in both percent and dollar terms. Percent incentives depend only on a firm's weight in the institution's portfolio, while dollar incentives also depend on the magnitude of management fees. For simplicity, our baseline measures assume an annual management

fee of 0.5% of AUM, but dollar incentives are easily scaled up or down to reflect other assumptions the reader would like to entertain.

5.1 Institution-level estimates

To begin, Table 3 looks at incentives measured at the institution level: we estimate incentives for each firm in an institution's portfolio, take the value-weighted average across the institution's holdings, and report statistics for the cross-sectional distribution of the institution-level estimates (institutions are weighted equally in Panel A and weighted by AUM in Panel B). Since recent years are probably the most relevant and interesting, given the rise of institutional ownership over time, the table focuses on the period 2011–2015 (we show results for other time periods later).

The table suggests that incentives vary substantially across institutions but can be quite large, in part because institutions often hold fairly concentrated portfolios. Specifically, the weight of a firm in an institution's portfolio determines our measure of percent incentives, and Table 3 shows that the average holding is a remarkable 6.92% of an institution's portfolio when we equal-weight institutions and 1.76% of an institution's portfolio when we value-weight institutions (these averages are reported as '%Incentives_Direct' in the table). These weights are much higher than the same stock's weight in the benchmark portfolio held by other institutions of the same type, 0.32% on an equal-weighted basis and 0.36% on a value-weighted basis (not tabulated). Thus, if a stock held by an institution doubles in value, the equal-weighted average institution realizes a direct 6.92% increase in AUM plus an additional 8.66% increase due to higher subsequent flow (1.31×(.0692–.0032)), for total percent incentives of 15.58%. On a value-weighted basis, a doubling of a portfolio firm leads to a 1.76% direct increase in AUM and an additional 1.83% increase due to subsequent flow (1.31×(.0176–.0036)), for total percent incentives of 3.59%.

To express the numbers in dollar terms, we multiply percent incentives by our baseline estimate of annual management fees (0.5% of AUM) and divide by 100, so that dollar incentives represent the dollar increase in management fees from a 1% increase in firm value.

Measured this way, incentives seem fairly small for the majority of institutions in our data, reflecting the modest size of most institutional investors. A 1% increase in firm leads to an estimated increase of just $7,900 in annual management fees for the equally-weighted average institution (direct incentives of $3,800 plus indirect incentives of $4,000). However, incentives vary substantially across institutions—the cross-sectional standard deviation is $38,700—and tend to be much stronger for large institutions. On a value-weighted basis, a 1% increase in firm value leads to an estimated increase of $118,000 in annual management fees, roughly 15 times larger than the equal-weighted average, and roughly 25% of total AUM is held by institutions with incentives greater than $225,200 (the 75th percentile of value-weighted dollar incentives). Again, these incentives can be interpreted as the maximum annual cost an institutional investor would be willing to incur to bring about a one-time, 1% increase in the value of one of its holdings.

Figure 2 looks more explicitly at the incentives of small, medium, and large institutions. In particular, we sort institutions into value-weighted size quartiles, such that each group contains (roughly) 25% of total AUM. The small group Q1 includes the vast majority of institutions (2,970) with average AUM of $1.1 billion, while the large group Q4 includes just the five largest institutions with average AUM of $754.4 billion.

Not surprisingly, incentives vary substantially across the groups. Small institutions invest an average of 3.75% of their portfolios in any given firm, compared with an average weight of just 0.29% for these stocks in the benchmark portfolio held by other institutions. Thus, on a percentage basis, overall incentives for small institutions are strong, with direct incentives of 3.75% and flow incentives of 4.53% ($1.31\times(3.75\%–0.29\%)$). But, in dollar terms, small institutions' incentives are modest: assuming a 0.5% management fee, average direct incentives equal $9,400 and average flow incentives equal $11,200, implying that a small institution's annual cash flow increases by an $20,600 if a portfolio firm goes up 1%.

On the other side of the spectrum, the largest institutions invest, on average, 0.52% of AUM in a given stock in their portfolios, only slightly higher than the stock's weight (0.40%) in the benchmark portfolio held by other institutions. This implies that, on a percentage basis, incentives for large institutions

(0.67% total = 0.52% direct + 0.15% flow) are an order of magnitude weaker than for small institutions. However, in dollar terms, a 1% increase in firm value leads to an extra $261,900 of annual management fees for the largest institutions. The estimates suggest that large institutions might be willing to spend significant resources to improve the performance of firms they hold, consistent with recent evidence that large institutions take an active role in governance (Appel, Gormley, and Keim 2016; McCahery, Sautner, and Starks 2016).

An interesting pattern in Fig. 2 is that the flow component of incentives is relatively more important for smaller institutions, who tend to invest a large fraction of AUM in a relatively small number of stocks—much higher than the weight of the same stocks in the portfolio held by other institutions. Consequently, smaller institutions benefit directly from an increase in the stocks' values *and* indirectly because of the impact on relative performance (and subsequent inflows). Larger institutions hold better diversified portfolios with weights that deviate much less from the average institution's holdings (or from market-cap weights). They benefit if a holding goes up in value, but the impact on their relative performance is much weaker.

Figure 3 illustrates how average incentives change through time, value-weighting across institutions. Total percent incentives decline during the first 25 years of the sample, from roughly 5.0% to 2.5%, but have since rebounded to about 3.5% in the last 10 years (as reported in Table 3). The decline and subsequent rebound mirror the trend in institutions' average portfolio weight (not shown), which drops from 2.56% in March 1980 to a minimum of 1.32% in March 2004, before rebounding to 1.70–1.80% for the last five years. At the same time, and perhaps not coincidentally, the average institution has become larger over time, especially during the market boom of the late 1990s (adjusted for inflation, average AUM grew 9.4% annually in the 1980s, 26.2% annually in the 1990s, and 5.2% annually from 2000 to 2015). As a consequence, average dollar incentives increase dramatically from $13,200 in March 1980 to $162,800 in June 2000. Dollar incentives have not grown since that point, fluctuating with the level of the stock market (and with average AUM).

5.2 Firm-level estimates

The discussion above focuses on incentives measured at the institutional level. An alternative is to measure incentives at the *firm* level, averaging across each firm's shareholders. The underlying goal is to understand (i) whether institutional shareholders in a given firm have a strong incentive to engage with management and (ii) for what types of firms are institutional incentives the strongest. To get at these issues, we average incentives for either all institutions holding a given firm (Table 4) or for just the five largest institutional shareholders (Table 5), weighting by the value of the holdings in the firm (i.e., voting power). Again, we focus initially on the most recent period, 2011–2015, but show results for the full sample later.

In some ways, the message from Table 4 is similar to our earlier conclusions from the institutional-level estimates: incentives often seem small but vary substantially across firms. For the equal-weighted average firm (Panel A), institutions own a combined 55% of shares outstanding and invest, on average, 1.15% of AUM in the firm (conditional on holding the stock). Average percent incentives equal 2.63%, with a cross-sectional standard deviation of 6.06%, and average dollar incentives equal $11,700, with a cross-sectional standard deviation of $39,700.

Percent and dollar incentives are both stronger for larger firms, as reflected in the value-weighted estimates in Panel B. Institutions hold two-thirds (66%) of the value-weighted average firm and invest, on average, 1.81% of AUM in the firm. As a consequence, percent incentives are somewhat stronger for the value-weighted average firm (3.67%) compared with the equal-weighted average firm (2.63%) and, because the dollar investments are also larger, dollar incentives are more than an order of magnitude higher that the equal-weighted average, $128,000 vs. $11,700. In addition, a 1% increase in firm value leads to more than $174,100 in annual management fees (per institutional shareholder) for firms that represent 25% of total market cap (as indicated by the value-weighted 75th percentile of dollar incentives). The results suggest that institutional investors in many firms would be willing to spend significant resources to improve the firm's performance (assuming no externalities with other firms in their portfolio, an issue we consider shortly).

Flow incentives are a significant component of total incentives in Table 4, roughly on par with direct

incentives. A key feature of flow incentives is that they can be negative, in particular, if an institution invests only a small fraction of AUM in the firm (smaller than the firm's weight in the benchmark portfolio held by other institutions). In those cases, flow incentives reduce the institution's incentive to engage with the firm and, in the extreme, can actually push total incentives negative as well, i.e., some institutional shareholders would benefit if the firm *drops* in value because their losses are smaller than the losses of competing institutions. In fact, for the value-weighted average firm, 20.2% of institutional shares are held by institutions with negative flow incentives and 5.0% of institutional shares are held by institutions with negative total incentives (not tabulated). Thus, a tiny fraction of a firm's shares are held by institutions with apparently perverse incentives.

In Table 5, dollar incentives are roughly twice as strong for a firm's five largest institutional shareholders (institutions with the largest stakes, not institutions with the largest AUM). The five largest shareholders own roughly a quarter of total shares outstanding and gain an estimated $294,500 in annual management fees (per institution) if the value-weighted average firm increases 1% in value. Average dollar incentives for the largest shareholders are greater than $150,000 for firms that make up more than half of total market cap (as indicated by the value-weighted median in Panel B of Table 5) and greater than $401,800 for firms that make up one quarter of total market cap (as indicated by the 75th percentile in Panel B). Not surprisingly, shareholders with the largest stakes have the strongest incentives to engage with management and, presumably, are also the most likely to have an influence on corporate policies.

Figure 4 shows how institutional incentives vary with the size of the firm. We sort firms into value-weighted size quartiles (each group contains roughly 25% of total market value) and report value-weighted average incentives for all institutional shareholders of the firm (not just the biggest five). Group 1 has the smallest 3,752 firms with an average market cap of $1.37 billion, while group 4 has the largest 24 firms with an average market cap of $216.1 billion.

The most striking result in the figure is that percent incentives are only modestly lower for institutional shareholders of small stocks vs. large stocks. Put differently, the average institutional shareholder of a small firm invests nearly as much in the firm (as a percent of the institution's AUM) as the average

institutional shareholder of a large firm invests in that firm, despite the fact that large firms are, on average, more than 100 times bigger. This reflects the fact that, conditional on holding a small stock, the average fractional ownership is greater (4.2% vs. 1.8%) and the fact that smaller institutions are disproportionately likely to hold smaller stocks. In dollar terms, however, institutional shareholders gain substantially more when large stocks do well. For quintile 4, average direct incentives equal $232,300 and average flow incentives equal $87,400, implying that institutional shareholders in the largest firms earn an estimated $319,700 more in annual management fees (per institution) if the firm goes up 1% in value. (The cross-sectional patterns are similar, but the magnitudes roughly double, if we focus on just the five largest shareholders of the firm.)

6 Rival incentives

The estimates above focus on how an institution fares if an individual firm in its portfolio does well. In practice, institutions often invest in several firms in the same industry, and decisions made by one firm can affect other firms in the institution's portfolio. Casual observation suggests this phenomenon has become more widespread in recent years, with the rise of extremely large institutional investors, and has led to growing concerns about its potential effects on competition. In this section, we explore the prevalence of common ownership, measure its impact on institutions' incentives, and study how these incentives vary across firms and industries.

Our approach here is a simple extension of the analysis above. For each firm in an institution's portfolio, we calculate how much the institution invests in other firms in the same industry ('rivals'), as defined by three-digit SIC code. 'Rival incentives' are then measured the same way we did before, estimating how much the institution gains if rival firms increase in value. The goal is to understand how much the institutional shareholders of one firm gain or lose when the firm's competitors do well, via institutions' ownership of those firms. The estimates provide a simple measure of an institution's incentives to consider a firm's competitors when voting on shareholder proposals, engaging with management, etc. As we discuss further below, we estimate aggregate incentives for the industry as well as incentives on a per-firm basis.

A distinguishing feature of our framework is that rival incentives depend not just on an institution's own

holdings of firms in the industry (i.e., direct incentives), but also on the holdings of other institutions through the impact on relative performance and subsequent flows. Even if an institution invests in rival firms, it might not have strong—or, indeed, even positive—rival incentives if other institutions invest more heavily in those firms. In other words, rival incentives depend on whether an institution under- or overweights rivals compared with other institutions, an effect that has not be considered by the prior literature.

A note on interpretation might be useful: Our measures of rival incentives are based on an overall increase in the value of a firm's competitors, an approach that implicitly assumes all rivals in the industry increase by roughly the same (percentage) amount. This measure is most applicable to corporate policies that broadly affect competition in the industry (e.g., pricing or output decisions), not decisions such as a merger or joint venture that might benefit some rivals but hurt others. In the latter case, an institution's holdings in specific rivals would be important to consider, not just the institution's overall investment in the industry.

Part of our goal here is to inform the debate on how common ownership might affect competition among firms. The extent of common ownership, and the possible effects on competition, are likely to depend on the size of the industry. For example, an institution might be more likely to invest in several firms in an industry of 200 firms than an industry of 10 firms, and the impact of any cross-holdings in the two industries could be quite different. To address this issue, we report results separately for industries with (i) 2–5 publicly traded firms, (ii) 6–15 publicly traded firms, (iii) 16–25 publicly traded firms, and (iv) 26 or more publicly traded firms.

6.1 Estimates of rival incentives

Table 6 reports our estimate of rival incentives (Panel A) and, for comparison, the 'own-firm' measure of incentives from Section 5 (Panel B). The estimation approach mirrors the approach in Table 4: we estimate incentives for all institutions holding a given firm, take the value-weighted average based on the number of shares owned to get average incentives at the firm level, and report the value-weighted cross-sectional mean and standard deviation of the resulting firm-level measures. Own-firm incentives represent the average gain to an institution if that firm goes up in value, while rival incentives represent

the gain to the same institution if other firms in the industry go up in value. 'Direct' incentives depend on the weight of a firm (or rivals) in the institution's portfolio, while 'flow' incentives depend on whether the institution under- or overweights the firm (or rivals) relative to other institutions.

As before, we focus initially on the period 2011–2015. During this period, the smallest industries (2–5 firms) include a total of 349 firms per quarter, the next-smallest industries (6–15 firms) include a total of 715 firms, the second-to-largest industries (16–25 firms) include a total of 509 firms, and the remaining industries with the most competitors include 2,456 firms.

The first rows of each panel in Table 6 report percent incentives, with the convenient interpretation that direct percent incentives simply equal portfolio weights. In the most concentrated industries (2–5 firms), an average institutional shareholder in a firm invests 1.40% of AUM in that firm (Panel B) and 0.17% of AUM in all of the firm's industry rivals (Panel A). The first number represents a large overweight relative to how much other institutions invest in the firm (the 'benchmark weight' of 0.13%), while the second number is only slightly higher than other institutions' investment in the same rival firms (0.09%). Thus, an institution that invests in one firm in the most-concentrated industries tends to also invest in the firms' rivals, but the size of the investment is relatively modest. As a consequence, rival incentives for shareholders in these industries are, on average, much smaller than own-firm incentives, 0.28% in percent terms (vs. 3.07% own-firm) and $19,400 in dollar terms (vs. $57,100 own-firm).

A key result in Table 6 is that, if an institution invests in one firm in the most-concentrated industries, it often underweights rival firms (even though the *average* overweight is slightly positive). In particular, the row labeled 'negative flow incentives' shows that 71.54% of institution-held shares are held by institutions that underweight rivals. These institutions may invest something in rival firms, generating positive direct incentives, but an increase in rivals' value reduces the institutions' performance relative to other institutions and, thus, predicts lower subsequent flow. Remarkably, 56.84% of institutional shares are held by institutions for which the negative flow effect is bigger than the positive direct effect, i.e., the institutions gain when the firm's rivals do poorly. These institutions, with negative rival incentives, provide a potentially powerful counterweight to other shareholders that might have an incentive to promote anticompetitive policies.

The qualitative conclusions above extend to the less-concentrated industries of 6–15 or 16–25 firms. In those industries, institutions that invest in one firm substantially overweight that firm but underweight rivals more than 50% of the time (despite the fact that the average overweight of rivals is again slightly positive). The main difference when looking at less-concentrated industries is that, because the set of rival firms is larger, there is more scope for cross-ownership. For example, in industries with 16–25 firms, the average institutional shareholder in a firm invests 1.79% of AUM in that firm and 1.59% of AUM in other firms in the industry (total, not per firm). The first number is much higher the firm's weight in the benchmark portfolio (0.41%), while the second number is again marginally higher than the benchmark weight (1.24%).

Common ownership is, not surprisingly, most pervasive in industries with many firms (26 or more). Conditional on investing in one firm in those industries, the average institution invests an additional 4.56% of AUM in other firms in the same industry. This weight is higher than their weight of 3.58% in the benchmark portfolio held by other institutions, and just over 50% of institutional shareholdings in one firm are held by institutions that overweight rivals.

At one level, the interpretation of Table 6 is simple: common ownership of firms in the same industry is, well, common, especially in industries with many firms. A decision by one firm in an institution's portfolio, if it has repercussions for the firm's competitors, will often affect the value of other firms in the institution's portfolio. Thus, at the most basic level, an institutional shareholder often has at least some incentive to consider the fortunes of rival firms when voting on shareholder proposes or engaging with management.

The magnitudes, however, are perhaps more interesting to consider, in part because their interpretation is likely to depend on the type of policy, decision, or action under consideration. One interpretation, as discussed earlier, is that dollar incentives equal the maximum amount an institution would be willing to spend annually to bring about a one-time, 1% increase in value. For rival firms in the most concentrated industries, this number is relatively modest: the average institution would be willing to spend $19,400 annually in exchange for a 1% increase in the total value of all rival firms, equivalent to just $4,300 per rival (compared with own-firm dollar incentives of $57,100). Dollar incentives tend to be larger for

larger industries, since a 1% increase in the value of a large portfolio of rivals represents a bigger dollar increase, but remain small on a per-rival basis. Dollar rival incentives grow from $70,700 for industries with 6–15 firms to $543,800 for industries with more than 25 firms; the former is equivalent to $7,500 per rival and the latter is equivalent to $4,300 per rival. The per-rival numbers imply that the average institutional shareholder of one firm gains much more if that firm goes up 1% in value (own-firm incentives average around $120,000) than if another firm in the industry goes up 1% in value.

To put the numbers in perspective, suppose a regulator is worried that institutional shareholders have an incentive to promote collusion among firms, given their ownership of multiple firms in the industry. If collusion would increase the value of all firms by 1%, a typical institutional shareholder of one firm would gain about $4,000–$7,000 per rival firm from such a policy (in addition to the own-firm effect). Put differently, the average institution would not find it optimal to promote coordination among many different firms unless the coordination costs per firm (and legal risks) are quite small. (To be clear, we are focusing here on the *incremental* incentive effects of common ownership; the shareholders of any firm, even in the absence of common ownership, would have an incentive to collude with competitors. For example, the own-firm incentive effects average roughly $120,000 from a 1% increase in the firm's value.)

Another way to interpret the magnitudes is to consider a policy that increases the value of a firm at the expense of other firms in the industry, dollar-for-dollar. If the costs are distributed across rivals in proportion to their market caps, a 1% gain for one firm implies a 0.34% loss for the average rival firm.[6] Based on our estimates in Table 6, a 1% increase in firm value leads to an $128,880 increase in annual cash flow for the average institutional shareholder of the firm (own-firm effect), offset by a $62,900 decrease in annual cash flow caused by the institution's losses from the drop in value of rival firms. The latter numbers varies from $11,400 in the smallest (most-concentrated) industries to $71,000 in the largest (least-concentrated) industries. Thus, institutions' cross-holdings in the industry tend to reduce

[6] This value of 0.34% implies that, on a value-weighted basis, the average size of a firm is 34% of the value of all industry rivals. This number is relatively high because (i) some firms have only a small number of competitors and/or come from industries where the competitors are quite small, and (ii) the average is value-weighted based on the size of the firm, so the largest weights are given to firms for which the ratio is large. We trim the ratio at 100% to mitigate the impact of a small number of extreme outliers.

by about 20–50% the average institution's incentive to support a policy that helps the firm at the expense of industry rivals.

Table 7 replicates the analysis for a firm's five largest institutional shareholders (again, the five with the largest stakes, not the first largest AUM). The results are quite similar to those in Table 6 except that dollar incentives here are roughly two-and-a-half times larger. The largest institutional shareholders of one firm tend to invest in rival firms with about the same propensity as other institutions, with an average portfolio weight somewhat higher than the benchmark weight. At the same time, nearly 2/3rds of large shareholders in highly concentrated industries (2–5 firms) and roughly half of large shareholders in less-concentrated industries underweight rivals, implying that a substantial fraction of a firm's largest shareholders have negative rival flow incentives and 8%–44% have negative total rival incentives, depending on the size of the industry. Those institutions have a particularly strong incentive to promote policies that benefit the firm at the expense of industry rivals, again providing a potentially important counterweight to institutions with more widespread ownership in the industry.

Finally, Figure 5 explores how rival incentives (in percent) have changed through time, 1980–2015. Because incentives depend on the size of the industry, we plot separate graphs for more concentrated (2–15 firms) and less concentrated (16 firms and up) industries, and, for comparison, we also plot own-firm incentives in each graph. For the most-concentrated industries, rival incentives are always much lower than own-firm incentives, consistent with the results for 2011–2015 in Table 6. Rival incentives in Panel A increase somewhat through time, from roughly 0.40% in the early 1980s to around 0.70% in recent years, but remain far below average own-firm incentives that remain close to 3.0% throughout the sample. In less-concentrated industries (Panel B), rival incentives also trend up through time and have been consistently higher than own-firm incentives for the last 20 years (these are total incentives if all rival firms go up in value; the numbers are much smaller on a per-firm basis). Rival incentives increase from about 4.0% in the 1980s to 5.0% in recent years, while own-firm incentives drop from about 4.0% in the 1980s to between 3.0 and 4.0% in recent years. Notwithstanding the modest trends, the graphs do not suggest a dramatic change in the importance of common ownership and rival incentives through time.

Figure 6 provides an alternative perspective on trends in common ownership, focusing on the fraction of institution-held shares for which the shareholder has negative rival incentives, i.e., the institution gains if rival firms drop in value. The solid line in each panel shows that most institutional shareholders underweight other firms in the industry, but the fraction has steadily declined through time, from 70% to 60% for more-concentrated industries and from 55% to 50% for less-concentrated industries. The dashed line shows that, even taking into account the positive direct incentives if the institution invests anything in rivals, total incentives are often negative as well, especially in the more-concentrated industries. The fraction of institutional shares held by institution with negative total rival incentives drops from roughly 65% to 40% for more-concentrated industries and from 30% to 15% for less-concentrated industries. These trends provide more evidence that a rise in common ownership has changed the incentives of institutional investors.

7 Conclusions

This paper investigates financial incentives of institutional investors to be engaged shareholders of the firms they own. It develops a simple framework to estimate these incentives as the increase in an institution's annual cash flows caused by a 1% increase in the value of its portfolio firm. The incentive measure includes both the direct effect of the value increase on the institution's AUM and fees, and the indirect effect via the institution's improved performance and, consequently, its increased fund inflows. While direct incentives are determined simply by the size of the institution's holdings in the firm, the indirect (flow) incentives depend on the extent to which these holdings deviate from those of other institutions and on the responsiveness of fund flows to the institutions' relative performance.

We find that the flow component of incentives is as important as the direct component for an average institution. This is because most institutions hold fairly concentrated portfolios, and investors increase flows into institutions with higher relative performance. We estimate the institution-level flow-to-performance sensitivity of 1.31 – a magnitude comparable to that found for older mutual funds.

Based on our estimates, an average institution's AUM increase by 15.6% (equal-weighted) when its portfolio firm doubles in value (this includes both the direct and the flow effects). As a result, a 1%

increase in value of a portfolio firm translates into a $7,900 increase in the annual fees for the institution. This modest estimate suggests that most institutions would be unwilling to spend significant resources to improve their portfolio firms. However, we find that incentives vary considerably across firms and institutions. The five largest institutions that together account of a quarter of the aggregate AUM, earn additional fees of $261,000 when their average portfolio firm goes up by 1%. This is 13 times more than the institutions in the bottom value-weighted quartile. Similarly, incentives are $319,700 for the 31 largest firms that make up a quarter of the total market capitalization. In these settings, institutions gain substantial fees when values go up, suggesting significant financial incentives to influence the firms.

Our framework can be extended to investigate an institution's incentives to consider the effects of its firms' policies on their industry rivals. As prior literature points out, such incentives arise because institutions often cross-own firms in the same industries. We find that though rival incentives (defined as the effect on fees from a 1% increase in the rivals' value) can be significant, they are generally weaker in more concentrated industries, in which scope for strategic interactions is larger. We also find that for many institutions, rival incentives are mitigated by the fact that rival firms are often held by competing institutions, so that an increase in the value of the rival firms often hurts the institution by reducing its fund inflows. This flow effect has a potential to counteract the incentives of larger cross-owners to reduce competition between portfolio firms.

Our approach complements the literature on the effects of instructional ownership on their portfolio firms in that it offers a direct estimate of the institutions' financial incentives to affect value of those firms. The approach can be further extended in several ways. First, while the current analysis focuses on institutions' revenues (fees), examining the costs of institutional engagement would be a useful next step. Second, this paper examines institutions' incentives to affect firm value, but more research is needed to understand how different types of institutions can (and do) affect managerial decisions, and thus, have a potential to affect value. Finally, institutions may become engaged shareholders for non-financial reasons, such as social or political pressures, and the relative importance of the different motives is as yet not well understood. We believe that our general approach provides a useful framework to tackle these question in future research.

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Table 1: Descriptive statistics, 1980–2015

This table reports descriptive statistics for our sample split into 5-year time periods (cross-sectional average, median, standard deviation, and 1st, 25th, 75th, and 99th percentiles). Panels A and B report statistics *by institution* for assets under management and number of firms held (in these panels, N is the number of institutions in the sample). Panels C and D report statistics *by firm* for the number of institutional investors holding the firm and fraction of shares owned by institutions (in these panels, N is the number of firms). Institutional ownership comes from Thomson-Reuters and WRDS, while price and shares outstanding come from CRSP. Institutional ownership by CUSIP is aggregated to the firm level using CRSP's PERMCO variable.

	Avg	Med	Std	p1	p25	p75	p99	N
Panel A: Assets under management ($ millions), by institution								
1980–1985	953	333	1,611	14	155	957	7,759	561
1986–1990	1,420	385	3,174	9	159	1,217	15,949	826
1991–1995	2,042	389	6,093	10	157	1,339	25,449	1,064
1996–2000	4,289	458	19,140	17	188	1,676	75,864	1,446
2001–2005	4,137	335	22,485	11	137	1,296	74,573	1,925
2006–2010	4,054	291	25,341	5	113	1,179	65,179	2,579
2011–2015	4,381	291	34,450	2	112	1,201	65,024	3,105
Panel B: Number of firms held, by institution								
1980–1985	193	127	202	14	74	233	990	561
1986–1990	229	123	348	11	65	256	1,653	826
1991–1995	248	113	423	11	64	252	2,012	1,064
1996–2000	269	110	497	7	61	238	2,619	1,446
2001–2005	253	93	501	5	50	203	2,854	1,925
2006–2010	218	77	455	3	37	175	2,669	2,579
2011–2015	201	72	410	2	31	167	2,395	3,105
Panel C: Number of institutional shareholders, by firm								
1980–1985	20	3	47	0	1	16	251	5,405
1986–1990	30	9	63	0	2	27	335	6,234
1991–1995	41	14	76	0	5	39	397	6,506
1996–2000	53	18	95	0	6	58	498	7,472
2001–2005	89	44	132	0	12	111	691	5,570
2006–2010	117	70	161	1	21	144	842	4,799
2011–2015	152	91	205	2	33	179	1,075	4,197
Panel D: Institutional ownership (% of shares), by firm								
1980–1985	0.13	0.06	0.17	0.00	0.00	0.21	0.63	5,405
1986–1990	0.18	0.12	0.20	0.00	0.01	0.30	0.72	6,234
1991–1995	0.25	0.18	0.23	0.00	0.04	0.40	0.82	6,506
1996–2000	0.29	0.22	0.26	0.00	0.06	0.48	0.91	7,472
2001–2005	0.40	0.36	0.30	0.00	0.12	0.66	0.99	5,570
2006–2010	0.51	0.53	0.32	0.00	0.21	0.80	1.00	4,799
2011–2015	0.55	0.59	0.32	0.00	0.26	0.83	1.00	4,197

Table 2: Flow-to-performance sensitivity, 1980–2015

This table reports the flow-to-performance sensitivity of institutional investors, based on the average slope from cross-sectional regressions of net inflows in quarters t+1, t+2, …, t+10 on benchmark-adjusted returns in quarter t (intercepts are not reported). Net inflow is the quarterly growth rate of assets under management minus the institution's quarterly return. Benchmark-adjusted returns equal an institution's return minus the aggregate return of institutions of the same type. Standard errors are based on the time-series variability of the estimates, incorporating a Newey-West correction with three lags. The cumulative slope for horizon t+k is the sum of the quarterly slopes for t+1 to t+k. N and R^2 are the average number of institutions each quarter and the average regression R^2. Institutional ownership comes from Thomson-Reuters and WRDS, while stock prices and returns come from CRSP.

	Horizon (quarter)									
	t+1	t+2	t+3	t+4	t+5	t+6	t+7	t+8	t+9	t+10
Slope	0.111	0.201	0.204	0.169	0.156	0.113	0.120	0.113	0.059	0.068
t	4.08	8.08	8.19	7.01	8.35	3.72	5.70	5.81	2.57	3.14
Cumulative	0.111	0.312	0.516	0.685	0.842	0.955	1.075	1.187	1.246	1.314
t	4.08	7.73	9.37	10.55	11.64	10.35	10.41	10.67	10.41	10.17
R^2	0.005	0.006	0.006	0.005	0.005	0.004	0.004	0.003	0.003	0.004
N	1,406	1,369	1,334	1,300	1,269	1,240	1,212	1,184	1,159	1,135

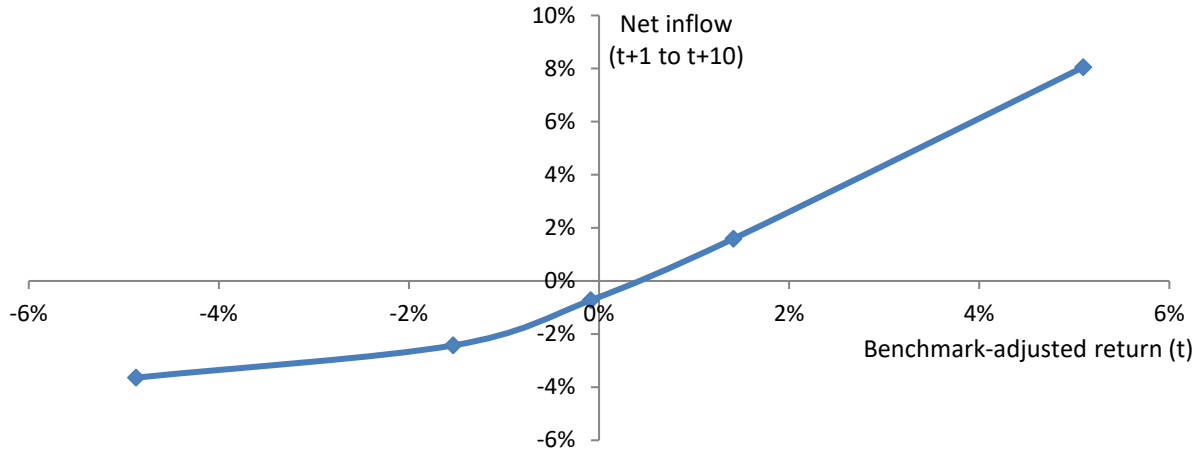

Fig. 1: Flow-to-performance sensitivity, 1980–2015. The figure plots the cumulative net inflow from quarter t+1 to t+10 against the quarterly benchmark-adjusted return in quarter t for institutions sorted into relative-return quintiles. Net inflow is the quarterly growth rate of assets under management minus the institution's quarterly return. Benchmark-adjusted return is an institution's return minus the aggregate return of institutions of the same type. Institutional ownership comes from Thomson-Reuters and WRDS, while stock prices and returns come from CRSP.

Table 3: Institutions' incentives, 2011–2015

This table reports the cross-sectional distribution (across institutions) of institutions' portfolio holdings and incentives. We calculate the variables for each institution (value-weighted averages based on their holdings, except for assets under management and number of firms held) and report the cross-sectional mean, median, standard deviation, and 1st, 25th, 75th, and 99th percentiles of the institution-level estimates. Institutions are weighted equally in Panel A and weighted by value in Panel B. '%Incentives_Direct' = weight of the firm in the institution's portfolio; '%Incentives_Flow' = 1.31 × (Portfolio weight − benchmark weight), where 1.31 is the estimated flow-to-performance sensitivity for institutions and the benchmark weight is the firm's weight in the portfolio held by other institutions of the same type; '%Incentives_Total' = %Incentives_Direct + %Incentives_Flow (this represents the percent increase in annual management fees if the average firm in the institution's portfolio goes up 100% in value). Dollar incentives equal % incentives multiplied by AUM and our baseline management fee (0.5%) and then divided by 100 (this represents the dollar increase in annual management fees if a firm in the institution's portfolio goes up 1% in value). Dollar incentives are reported in $1,000s.

	Mean	Med	Std	p1	p25	p75	p99
Panel A: Institutions are equal weighted							
AUM ($ million)	4,381	291	34,450	2	112	1,201	65,024
Firms	201	72	410	2	31	167	2,395
%Incentives_Direct	0.0692	0.0319	0.1207	0.0038	0.0175	0.0664	0.7076
%Incentives_Flow	0.0866	0.0372	0.1584	0.0013	0.0183	0.0834	0.9233
%Incentives_Total	0.1558	0.0691	0.2791	0.0059	0.0359	0.1497	1.6311
$Incentives_Direct	3.8	0.5	18.5	0.0	0.2	1.9	60.1
$Incentives_Flow	4.0	0.6	20.9	0.0	0.2	2.1	60.0
$Incentives_Total	7.9	1.2	38.7	0.0	0.4	4.0	118.8
Panel B: Institutions are value weighted							
AUM ($ million)	277,211	76,043	367,681	223	15,943	408,114	1,088,964
Firms	1,732	1,732	1,333	15	422	3,084	3,649
%Incentives_Direct	0.0176	0.0061	0.0370	0.0025	0.0050	0.0138	0.1960
%Incentives_Flow	0.0183	0.0030	0.0489	0.0002	0.0013	0.0137	0.2540
%Incentives_Total	0.0359	0.0089	0.0859	0.0028	0.0065	0.0272	0.4502
$Incentives_Direct	81.7	36.9	95.2	0.3	9.0	153.0	295.1
$Incentives_Flow	36.2	19.1	66.6	0.1	4.9	54.3	358.3
$Incentives_Total	118.0	59.4	148.2	0.5	15.1	225.2	635.0

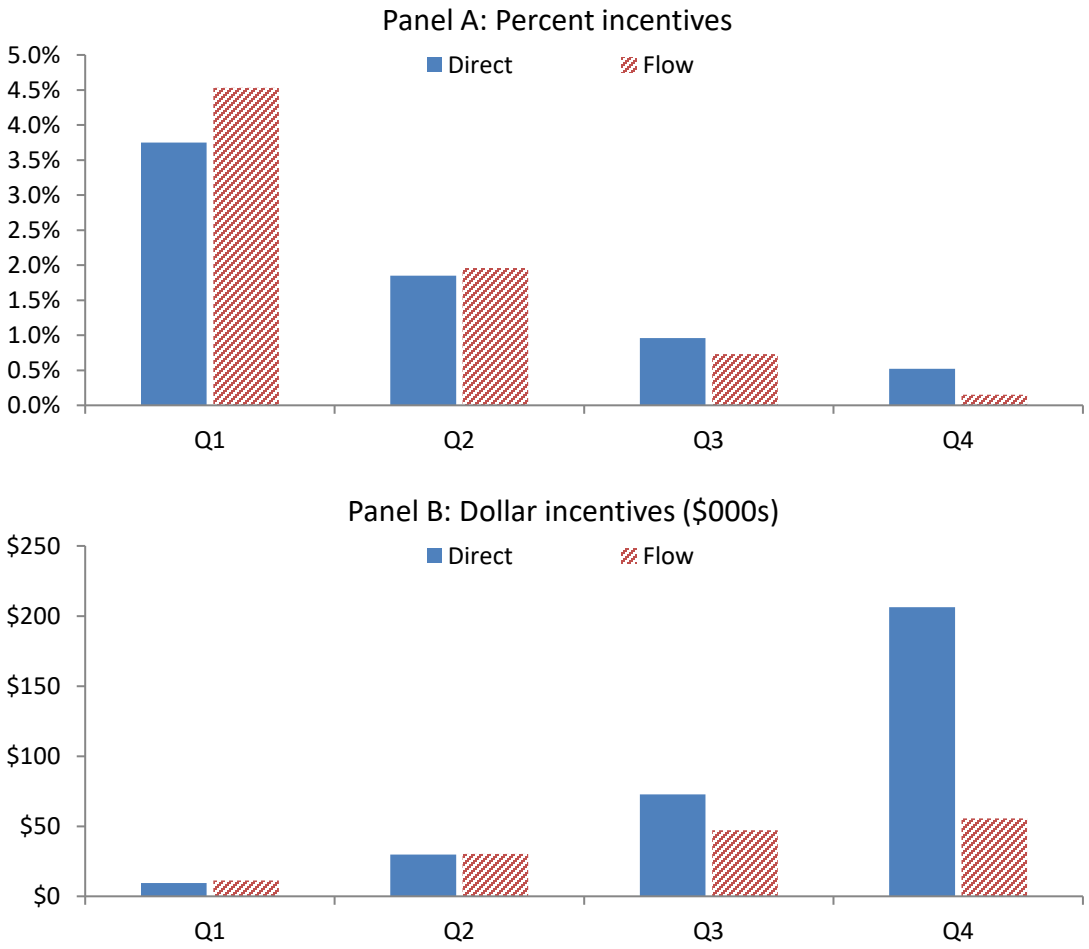

Fig. 2: Institutions' incentives, 2011–2015. The figure plots percent (Panel A) and dollar (Panel B) incentives for insitutional investors sorted into value-weighted size quartiles. Each group has roughly 25% of total AUM. Incentives measure the impact on annual management fees of a 100% (Panel A) or 1% (Panel B) increase in the value of a firm in the institution's portfolio, as described in the text.

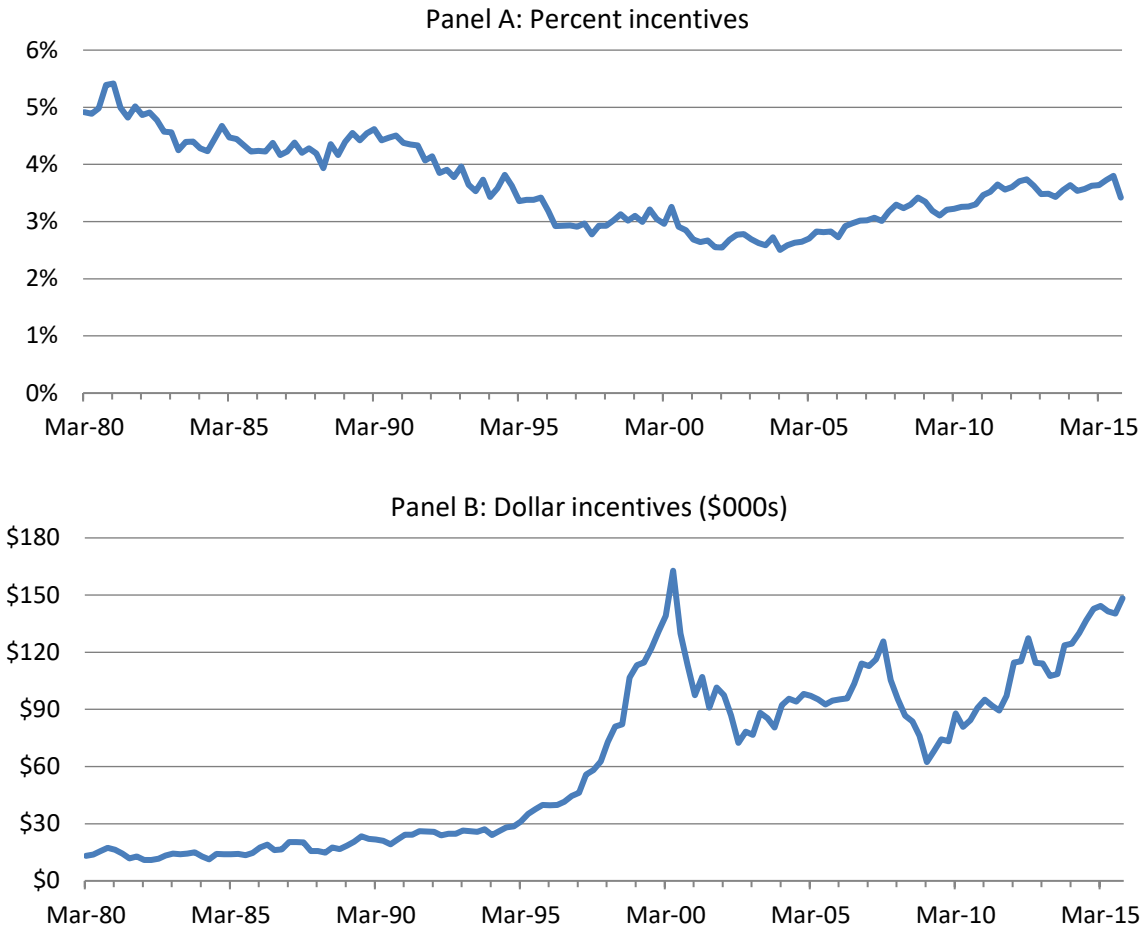

Fig. 3: Institutions' incentives, 1980–2015. The figure plots average percent (Panel A) and dollar (Panel B) incentives for insitutional investors, quarterly, from 1980–2015. Institutions are value-weighted, and dollar incentives are measured in 2015 dollars. Incentives measure the impact on annual management fees of a 100% (Panel A) or 1% (Panel B) increase in the value of a firm in the institution's portfolio, as described in the text.

Table 4: Institutions' incentives by firm, 2011–2015

This table reports the cross-sectional distribution (across firms) of institutional ownership and incentives. We calculate the variables for each firm (value-weighted averages based on institutional ownership, except size and number of institutional investors) and report the cross-sectional mean, median, standard deviation, and 1st, 25th, 75th, and 99th percentiles of the firm-level estimates. Firms are weighted equally in Panel A and weighted by value in Panel B. '%Incentives_Direct' = weight of the firm in the institution's portfolio; '%Incentives_Flow' = 1.31 × (Portfolio weight − benchmark weight), where 1.31 is the estimated flow-to-performance sensitivity for institutions and the benchmark weight is the firm's weight in the portfolio held by all other institutions of the same type; '%Incentives_Total' = %Incentives_Direct + %Incentives_Flow (this represents the percent increase in annual management fees for the mean institutional shareholder if the firm goes up 100% in value). Dollar incentives equal % incentives multiplied by an institution's AUM and our baseline management fee (0.5%) and then divided by 100 (this represents the dollar increase in annual management fees for the mean institutional investor if the firm goes up 1% in value). Dollar incentives are reported in $1,000s.

	Mean	Med	Std	p1	p25	p75	p99
Panel A: Firms are equal weighted							
Size ($ million)	5,013	554	20,536	7	124	2,459	80,134
Institutional investors	155	94	206	4	35	182	1,084
Institutional ownership	0.55	0.59	0.30	0.00	0.28	0.81	1.00
%Incentives_Direct	0.0115	0.0052	0.0262	0.0000	0.0022	0.0110	0.1220
%Incentives_Flow	0.0148	0.0065	0.0343	0.0000	0.0028	0.0138	0.1597
%Incentives_Total	0.0263	0.0117	0.0606	0.0000	0.0049	0.0249	0.2817
$Incentives_Direct	7.0	1.2	23.4	0.0	0.2	4.7	101.2
$Incentives_Flow	4.8	1.1	17.9	0.0	0.3	3.6	56.1
$Incentives_Total	11.7	2.3	39.7	0.0	0.5	8.4	153.7
Panel B: Firms are value weighted							
Size ($ million)	89,307	38,923	116,299	341	11,181	128,246	523,317
Institutional investors	815	704	534	56	353	1,294	1,861
Institutional ownership	0.66	0.67	0.18	0.13	0.56	0.79	1.00
%Incentives_Direct	0.0181	0.0129	0.0239	0.0017	0.0075	0.0202	0.0861
%Incentives_Flow	0.0186	0.0114	0.0305	0.0021	0.0076	0.0185	0.1077
%Incentives_Total	0.0367	0.0249	0.0541	0.0038	0.0154	0.0396	0.1938
$Incentives_Direct	88.7	45.9	106.7	0.6	15.8	120.4	467.9
$Incentives_Flow	39.3	21.5	51.0	0.6	8.8	49.1	185.8
$Incentives_Total	128.0	70.6	151.6	1.2	25.6	174.1	628.0

Table 5: Incentives for the largest institutional shareholders in each firm, 2011–2015

This table reports the cross-sectional distribution (across firms) of institutional ownership and incentives for the five institutions with the largest holdings in each firm. We calculate the variables for each firm (value-weighted averages for the five largest shareholders), and report the cross-sectional mean, median, standard deviation, and 1st, 25th, 75th, and 99th percentiles of the firm-level estimates. Firms are weighted equally in Panel A and weighted by value in Panel B. '%Incentives_Direct' = weight of the firm in the institution's portfolio; '%Incentives_Flow' = 1.31 × (Portfolio weight – benchmark weight), where 1.31 is the estimated flow-to-performance sensitivity for institutions and the benchmark weight is the firm's weight in the portfolio held by all other institutions of the same type; '%Incentives_Total' = %Incentives_Direct + %Incentives_Flow (this represents the average percent increase in annual management fees for the five largest institutional shareholders if the firm goes up 100% in value). Dollar incentives equal % incentives multiplied by an institution's AUM and our baseline management fee (0.5%) and then divided by 100 (this represents the average dollar increase in annual management fees for the five largest institutional shareholders if the firm goes up 1% in value). Dollar incentives are reported in $1,000s.

	Mean	Med	Std	p1	p25	p75	p99
Panel A: Firms are equal weighted							
IO of 5 largest institutions	0.26	0.27	0.14	0.00	0.18	0.34	0.65
%Incentives_Direct	0.0142	0.0040	0.0344	0.0000	0.0011	0.0122	0.1704
%Incentives_Flow	0.0182	0.0048	0.0451	0.0000	0.0012	0.0156	0.2230
%Incentives_Total	0.0324	0.0088	0.0795	0.0000	0.0023	0.0278	0.3934
$Incentives_Direct	14.2	1.9	49.6	0.0	0.3	8.7	225.4
$Incentives_Flow	8.8	1.8	29.2	0.0	0.4	6.3	111.3
$Incentives_Total	23.0	3.8	75.7	0.0	0.7	15.3	329.2
Panel B: Firms are value weighted							
IO of 5 largest institutions	0.25	0.23	0.09	0.06	0.20	0.28	0.52
%Incentives_Direct	0.0193	0.0094	0.0337	0.0004	0.0042	0.0182	0.1372
%Incentives_Flow	0.0202	0.0065	0.0439	0.0003	0.0026	0.0154	0.1767
%Incentives_Total	0.0395	0.0163	0.0774	0.0008	0.0073	0.0337	0.3138
$Incentives_Direct	206.6	98.9	256.2	0.9	32.4	287.3	1149.1
$Incentives_Flow	87.9	43.4	111.5	-0.8	15.1	113.4	450.8
$Incentives_Total	294.5	151.1	355.7	1.9	51.9	401.8	1545.4

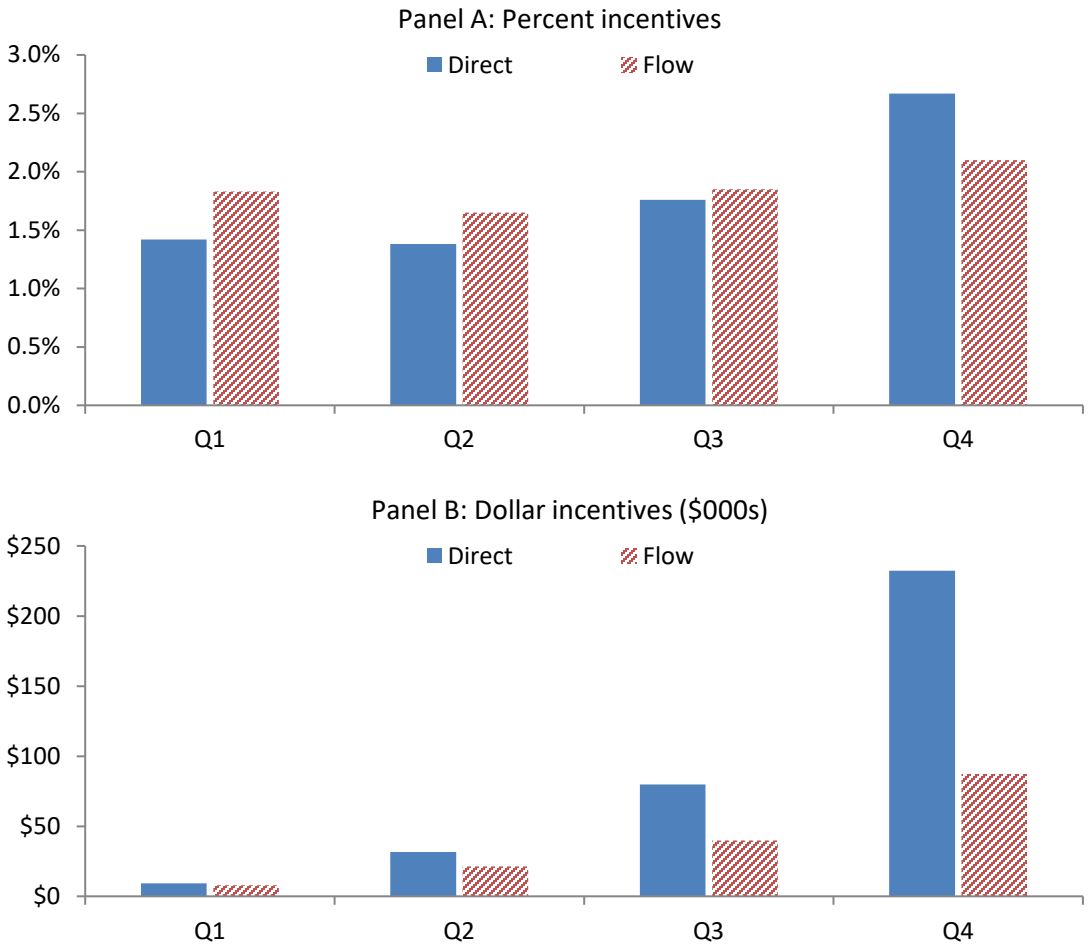

Fig. 4: Incentives vs. firm size, 2011–2015. The figure plots percent (Panel A) and dollar (Panel B) incentives for insitutional shareholders of firms sorted into value-weighted size quartiles. Each group has roughly 25% of total market cap. Incentives measure the impact on annual management fees for the average institutional investor if the firm goes up 100% (Panel A) or 1% (Panel B) in value, as described in the text.

Table 6: Own-firm vs. rival incentives, by industry size, 2011–2015

This table reports the value-weighted cross-sectional mean and standard deviation (across firms) of institutional incentives for industries with (i) 2–5, (ii) 6–15, (iii) 16–25, and (iv) 26 or more publicly traded firms. We calculate the variables for each firm (value-weighted averages based on institutional ownership) and report the cross-sectional mean and standard deviation of the firm-level estimates. Industries are defined by three-digit SIC code. Own-firm incentives represent an institutional shareholder's gain if that firm increases in value (replicating the estimates in Table 4), while rival incentives represent the institutions' gain if other firms in the same industry increase in value. '%Incentives_Direct' = weight of the firm (or rival firms) in the institution's portfolio; '%Incentives_Flow' = 1.31 × (Portfolio weight − benchmark weight), where 1.31 is the estimated flow-to-performance sensitivity for institutions and the benchmark weight is the firm's weight (or rival firms' weight) in the portfolio held by other institutions of the same type; '%Incentives_Total' = %Incentives_Direct + %Incentives_Flow (this represents the percent increase in annual management fees for the mean institutional shareholder if the firm goes up 100% in value (in the case of own-firm incentives) or if rival firms go up 100% in value (in the case of rival-firm incentives)). Dollar incentives equal % incentives multiplied by an institution's AUM and our baseline management fee (0.5%) and then divided by 100 (this represents the dollar increase in annual management fees for the mean institutional investor if the firm goes up 1% in value (own-firm incentives) or rival firms go up 100% in value (rival-firm incentives)). Dollar incentives are reported in $1,000s.

Industry size	2 to 5 firms		6 to 15 firms		16 to 25 firms		>25 firms	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
Panel A: Rival incentives								
%Incentives_Direct	0.0017	0.0033	0.0057	0.0057	0.0159	0.0124	0.0456	0.0365
%Incentives_Flow	0.0010	0.0029	0.0020	0.0044	0.0046	0.0078	0.0129	0.0309
%Incentives_Total	0.0028	0.0061	0.0077	0.0096	0.0205	0.0184	0.0585	0.0631
$Incentives_Direct	15.6	27.3	64.2	63.9	195.2	175.0	521.4	390.6
$Incentives_Flow	3.9	10.5	6.5	19.5	23.9	47.2	22.4	81.6
$Incentives_Total	19.4	36.8	70.7	78.6	219.1	214.5	543.8	425.7
Benchmark weight	0.0009	0.0014	0.0042	0.0037	0.0124	0.0098	0.0358	0.0242
Negative flow incentives	0.7154	0.1733	0.5908	0.1563	0.5334	0.1679	0.4881	0.1746
Negative total incentives	0.5684	0.2071	0.3266	0.1519	0.2276	0.1483	0.1401	0.1115
Panel B: Own-firm incentives								
%Incentives_Direct	0.0140	0.0203	0.0140	0.0168	0.0179	0.0215	0.0200	0.0262
%Incentives_Flow	0.0166	0.0265	0.0148	0.0219	0.0181	0.0273	0.0202	0.0333
%Incentives_Total	0.0307	0.0468	0.0288	0.0385	0.0360	0.0484	0.0402	0.0591
$Incentives_Direct	35.4	40.6	59.9	62.2	102.3	117.0	100.5	114.1
$Incentives_Flow	21.6	28.4	26.3	26.0	50.9	64.9	42.0	51.8
$Incentives_Total	57.1	67.6	86.2	86.2	153.2	177.5	142.4	158.5
Benchmark weight	0.0013	0.0015	0.0027	0.0028	0.0041	0.0046	0.0045	0.0055
Negative flow incentives	0.1812	0.0687	0.2058	0.0710	0.2155	0.0731	0.1983	0.0804
Negative total incentives	0.0499	0.0198	0.0510	0.0202	0.0498	0.0197	0.0490	0.0200

Table 7: Own-firm vs. rival incentives for the largest shareholders, by industry size, 2011–2015

This table reports the value-weighted cross-sectional mean and standard deviation (across firms) of institutional incentives for the five institutions with the largest holdings in each firm, with separate estimates for industries with (i) 2–5, (ii) 6–15, (iii) 16–25, and (iv) 26 or more publicly traded firms. We calculate the variables for each firm (value-weighted averages based on institutional ownership) and report the cross-sectional mean and standard deviation of the firm-level estimates. Industries are defined by three-digit SIC code. Own-firm incentives represent an institutional shareholder's gain if that firm increases in value (replicating the estimates in Table 4), while rival incentives represent the institutions' gain if other firms in the same industry increase in value. '%Incentives_Direct' = weight of the firm (or rival firms) in the institution's portfolio; '%Incentives_Flow' = 1.31 × (Portfolio weight – benchmark weight), where 1.31 is the estimated flow-to-performance sensitivity for institutions and the benchmark weight is the firm's weight (or rival firms' weight) in the portfolio held by other institutions of the same type; '%Incentives_Total' = %Incentives_Direct + %Incentives_Flow (this represents the average percent increase in annual management fees for the five largest institutional shareholder if the firm goes up 100% in value (in the case of own-firm incentives) or if rival firms go up 100% in value (in the case of rival-firm incentives)). Dollar incentives equal % incentives multiplied by an institution's AUM and our baseline management fee (0.5%) and then divided by 100 (this represents the average dollar increase in annual management fees for the five largest institutional shareholders if the firm goes up 1% in value (own-firm incentives) or rival firms go up 100% in value (rival-firm incentives)). Dollar incentives are reported in $1,000s.

Industry size	2 to 5 firms		6 to 15 firms		16 to 25 firms		>25 firms	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
Panel A: Rival incentives								
%Incentives_Direct	0.0015	0.0034	0.0051	0.0062	0.0153	0.0138	0.0454	0.0430
%Incentives_Flow	0.0008	0.0032	0.0013	0.0057	0.0039	0.0112	0.0126	0.0424
%Incentives_Total	0.0023	0.0065	0.0064	0.0113	0.0192	0.0231	0.0580	0.0815
$Incentives_Direct	34.2	59.9	147.3	151.1	448.6	427.4	1162.8	910.8
$Incentives_Flow	9.4	25.7	15.7	53.0	62.7	133.5	32.8	190.2
$Incentives_Total	43.5	82.8	163.0	190.3	511.3	539.9	1195.6	966.8
Benchmark weight	0.0009	0.0014	0.0042	0.0037	0.0124	0.0098	0.0358	0.0242
Negative flow incentives	0.6638	0.2743	0.5543	0.2727	0.5104	0.2961	0.4787	0.3041
Negative total incentives	0.4427	0.2920	0.2038	0.2165	0.1466	0.1952	0.0761	0.1502
Panel B: Own-firm incentives								
%Incentives_Direct	0.0145	0.0297	0.0135	0.0260	0.0203	0.0326	0.0214	0.0360
%Incentives_Flow	0.0173	0.0391	0.0143	0.0343	0.0213	0.0424	0.0222	0.0469
%Incentives_Total	0.0319	0.0688	0.0279	0.0602	0.0416	0.0748	0.0436	0.0826
$Incentives_Direct	76.7	89.0	139.4	150.5	230.7	264.0	237.1	279.0
$Incentives_Flow	44.5	60.4	60.3	63.8	115.6	144.6	93.4	111.5
$Incentives_Total	121.2	145.6	199.7	209.8	346.3	400.4	330.5	376.1
Benchmark weight	0.0013	0.0015	0.0027	0.0028	0.0041	0.0046	0.0045	0.0055
Negative flow incentives	0.1610	0.1548	0.1844	0.1728	0.1961	0.1754	0.1660	0.1839
Negative total incentives	0.0047	0.0221	0.0034	0.0206	0.0043	0.0242	0.0032	0.0205

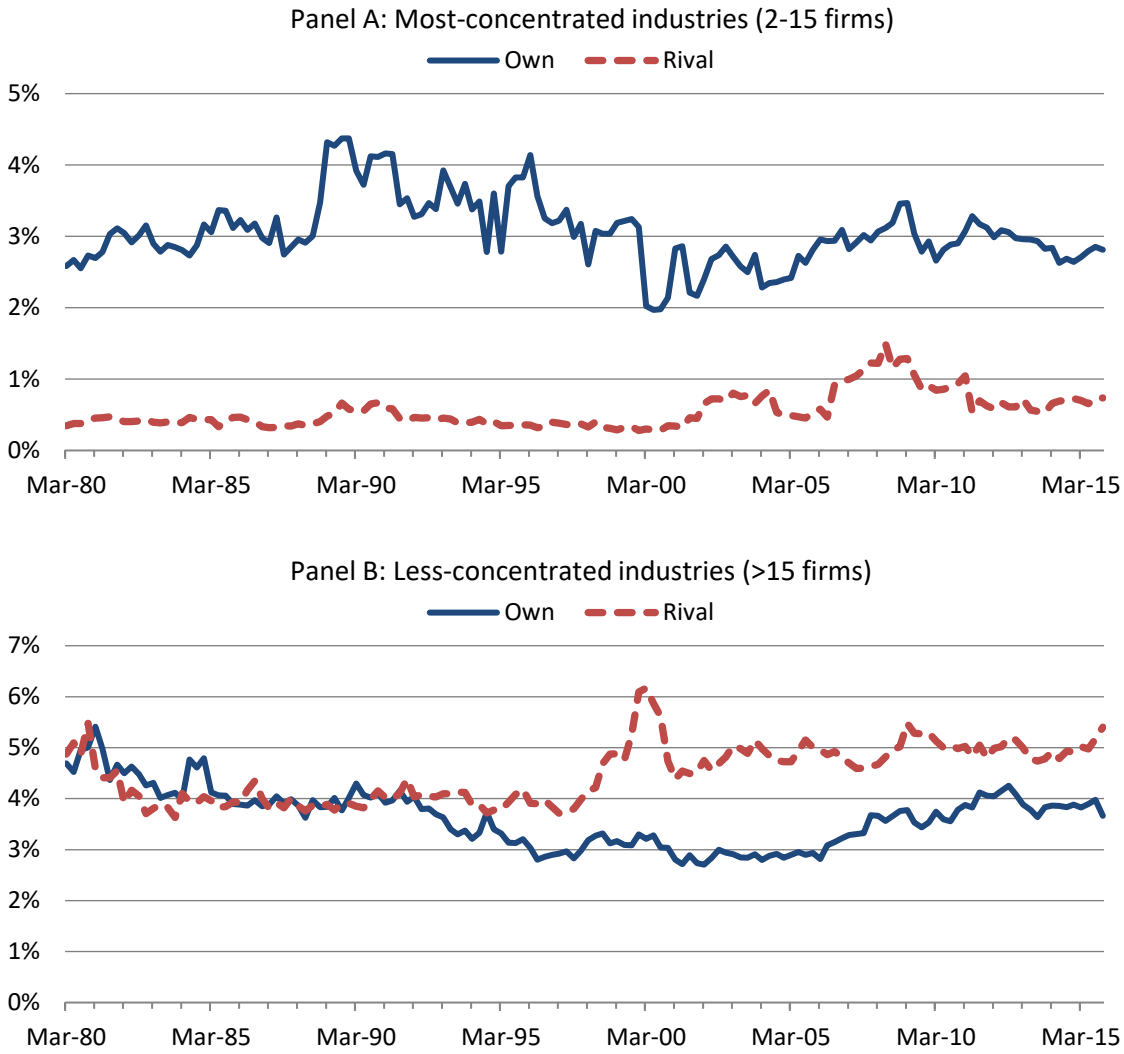

Fig. 5: Own-firm vs. rival incentives, 1980–2015. The figure plots average percent incentives for institutional investors in industries with 2–15 firms (Panel A) and industries with greater than 15 firms (Panel B), quarterly, from 1980–2015. Institutions are value-weighted. Incentives equal the percent increase in annual management fees for the average institutional shareholder if the firm goes up 100% in value (in the case of 'own-firm' incentives) or rival firms go up 100% in value (in the case of 'rival incentives'), as described in the text.

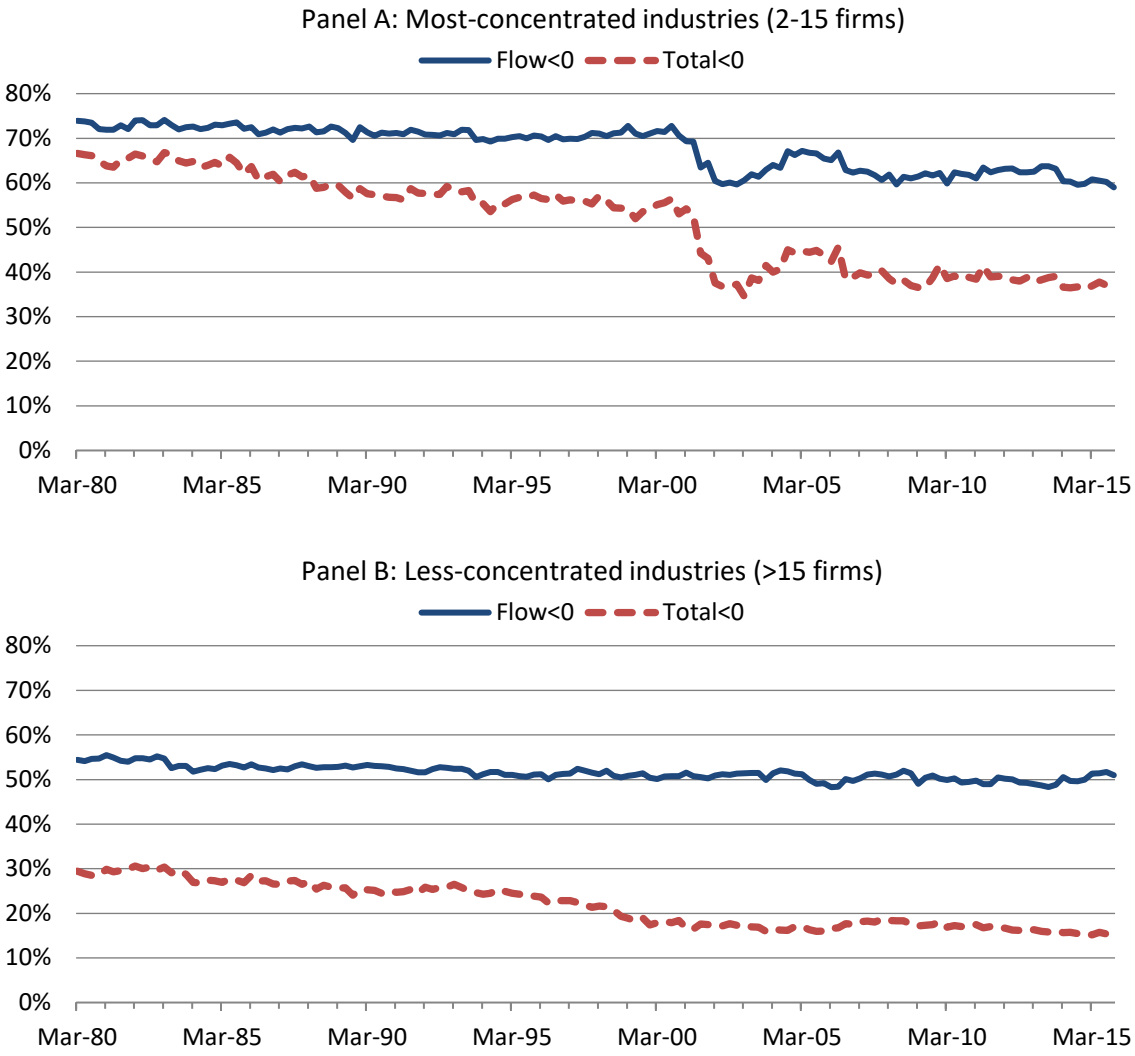

Fig. 6: Frequency of negative rival incentives, 1980–2015. The figure plots the fraction of institution-held shares for which the institution has rival flow incentives that are negative (the institution underweights rivals) or rival total incentives that are negative (the institution gains if rival firms drop in value). Panel A shows results for industries with 2–15 firms and Panel B shows resutls for industries with greater than 15 firms.