Institutional investors and corporate governance: The incentive to be engaged

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Abstract

This paper studies institutional investors' incentives to be engaged shareholders. We measure incentives as the increase in an institution's management fees when a stockholding increases 1% in value, considering both the direct effect on assets under management and the indirect effect on subsequent fund flows. In 2017, the average institution gains an extra $129,000 in annual cash flow if a stock in its portfolio rises 1%. The estimates range from $19,600 for institutions' investments in small firms to $307,600 for their investments in large firms. Institutional shareholders in one firm often gain when the firm's competitors in the industry do well, by virtue of institutions' holdings in those firms, but the impact of common ownership is modest in the most concentrated industries.

1 Introduction

This paper studies institutional investors' financial incentives to be engaged shareholders. Institutional ownership of publicly traded U.S. firms rose from 32% to 73% of the overall market from 1980–2017, according to 13F filings with the SEC, and the 100 largest institutions now own more than 50% of all equity. This shift in ownership has the potential to substantially affect the governance of public firms if institutional investors have different incentives than other shareholders.

Institutions have traditionally been viewed as passive owners, raising concerns that their growth will weaken governance and exacerbate agency problems (Bebchuk, Cohen, and Hirst 2017). However, recent studies provide evidence that larger institutions often exercise 'voice' through proxy voting and behind-the-scenes engagement with management (Carleton, Nelson, and Weisbach 1998; McCahery, Sautner, and Starks 2016; Appel, Gormley, and Keim 2016). A controversial strand of the literature argues that institutions who invest in several firms in the same industry may discourage product-market competition, either by shaping managerial incentives or advocating less aggressive corporate policies (Anton et al. 2020; Azar, Schmalz, and Tecu 2018; Azar, Raina, and Schmalz 2019). Yet it remains unclear how extensive institutional intervention is or, at a more basic level, whether institutions have strong incentives to be engaged. The answer to the latter question is complicated by the fact that institutions compete with each other and tend to be evaluated based on relative performance. Engagement by one institution will benefit other shareholders with whom it competes for funds, likely exacerbating the classic free-rider problem in corporate governance discussed by Grossman and Hart (1980) and Shleifer and Vishny (1986).

Our paper contributes to the literature by providing direct evidence on institutions' financial incentives to be engaged shareholders. We propose a simple framework to measure incentives that accounts for externalities among institutions and use this framework to estimate incentives for different types of institutions and firms. We also analyze how the payoffs of institutional shareholders of one firm are linked to the value of other 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. The latter effect has not been previously examined.

Our analysis is based on a simple framework: we measure incentives as the impact of a 1% increase in firm value on an institution's management fees. Incentives are the sum of a direct component that captures how a change in firm value affects assets under management (AUM) and management fees, and an indirect (flow) component that captures the impact on an institution's relative performance and subsequent fund flows. Analogous to Jensen and Murphy (1990) and Hall and Liebman (1998), we define overall incentives as either the percent or dollar increase in cash flow caused by a 1% increase in firm value.[1]

Intuitively, direct incentives depend simply on the size of an institution's investment in the firm. Indirect incentives depend on whether the institution under- or overweights a firm relative to competing institutions and how strongly flows respond to institutions' relative performance.

Our sample consists of all institutions with 13F filings. The sample grows from just under 500 institutions in 1980, with an average portfolio of 180 stocks worth $2.5 billion (in 2017 dollars), to 3,800 institutions in 2017, with an average portfolio of 210 stocks worth $5.5 billion. The size distribution becomes more skewed over time and, by the end of the sample, five institutions alone—Fidelity, Capital Group, State Street, Blackrock, and Vanguard—account for over 25% of total AUM.

Our first step is to estimate the flow-to-performance sensitivity for institutional investors. We find that a one percentage point increase in an institution's quarterly return predicts a highly significant 1.39 percentage point increase in net inflow over the subsequent 12 quarters. This estimate implies that flows contribute significantly to institutions' incentives and extends the literature on flow-to-performance sensitivities for mutual funds (e.g., Chevalier and Ellison 1997; Sirri and Tufano 1998).

For 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 a given firm or average over an institution's holdings to get an estimate of incentives for a given institution. In both cases, we value-weight

[1] Chung et al. (2012) and Lim, Sensoy, and Weisbach (2016) use a similar approach to study the pay-for-performance sensitivities of private equity and hedge funds.

incentives, so that larger shareholdings receive a greater weight. In some tests, we also consider the incentives of just a firm's largest shareholders.

Direct and flow incentives are both important and have increased in recent years. In 2017, a typical stock-holding represents 1.56% of an institution's portfolio, compared with a weight of 0.44% in the portfolio held by other institutions.[2] The weight of 1.56% determines an institution's direct incentives, while the overweight relative to other institutions, 1.12%, determines flow incentives. With a flow-to-performance sensitivity of 1.39, total incentives can be expressed as 3.12% (1.56% + 1.39×1.12%), equal to the percentage increase in an institution's AUM and management fees if a typical stockholding doubles in value.

To measure incentives in dollar terms, we need to estimate the dollar level of management fees. If we assume that fees equal 0.5% of AUM, a 1% increase in a typical stockholding leads to an extra $236,300 in an annual cash flow (direct incentives of $174,800 plus flow incentives of $61,600). Alternatively, if we use mutual fund data to proxy for how fees vary with an institution's size and investment approach, we estimate that a 1% increase in firm value leads to $129,000 in additional fees (direct incentives of $84,400 plus flow incentives of $44,600).[3] These numbers can be interpreted as the annual cost that an institution would be willing to incur to bring about a certain one-time, 1% increase in firm value. (The total amount an institution would be willing to spend, equal to the present value of the stream of additional management fees, would be roughly an order of magnitude larger.) The estimates suggest that, despite the free-rider problems in corporate governance, many institutions would be willing to spend significant resources monitoring and engaging with firms if they expect engagement to have at least a modest impact on value.

To put the numbers in perspective, we also estimate the incentives of activist investors who, through 13D filings, explicitly indicate an intention to influence the firm. These estimates provide a benchmark for

[2] The average weight of 1.56% is higher than 1/average(N), where N is the number of stocks held, for two reasons. First, the weight is based on a value-weighted average for each institution, not an equal-weighted average (the latter equals 1/N). Second, average 1/N across institutions is not equal to 1/average(N). In fact, the value-weighted average institution in our sample holds 1,977 firms in 2017.

[3] The management fee estimates are described later. Average fees are close to 0.5% during our sample but decline through time. In 2017, small fund companies have a fee of 0.70%, large fund companies have a fee of 0.36%, and large index fund companies have a management fee of 0.11%.

evaluating how strong incentives need to be to make engagement worthwhile. Activists take large positions in firms and have stronger incentives on average (in part because of their higher fees), but their incentives are often comparable to those of other institutions. For example, we estimate that a 1% increase in firm value leads to an average annualized gain of $520,400 for activist investors, with an interquartile spread of $119,700–$732,600, based on a sample of 13D filings from 2015–2017.

Incentives vary substantially across stocks and institutions. Small institutions invest an average of 4.11% of AUM in a given firm, leading to incentives that are strong on a percentage basis (9.32%) even though they are modest in dollar terms ($31,300). In contrast, large institutions tend to be more diversified, investing just 0.73% of AUM in an average stockholding. Their incentives are lower in percentage terms, but, given their size, a 1% increase in firm value leads to an extra $219,500 in annual cash flow (using an estimated management fee of 0.36% for large institutions).

The growth of index funds and ETFs has an interesting effect on institutional incentives. Institutions with large indexed portfolios—Schwab, Dimensional, State Street, Blackrock, and Vanguard—make large dollar investments, which, all else equal, provide stronger incentives to be engaged. On the other hand, these institutions charge lower management fees and, therefore, receive a smaller portion of any increase in firm value compared with other institutions. The net effect is that, for the five institutions above, a 1% increase in the value of a typical stockholding leads to an extra $133,000 in annual management fees (based on an estimated management fee of 0.11% in 2017).

We also study incentives at the firm level, averaging across a firm's institutional shareholders, to understand how strong the incentives are for a given firm's shareholders to engage with management. For large stocks, a typical share (in 2017) is held by an institution that invests 2.47% of its portfolio in the firm. Direct and flow incentives together imply that the average institutional shareholder gains $307,600 in annual cash flow if firm value increases 1%. For small stocks, a 1% increase in firm value leads to dollar gains of just $19,600; the incentives to intervene are lower, though the costs of engagement could be lower as well.

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 (taking into account both direct and flow incentives). We focus primarily on industries with a small number of firms or high sales concentration to highlight the potential impact on competition when strategic interactions are more likely to be important. For these industries, rival incentives are positive but typically smaller than own-firm incentives. For example, in industries with 2–6 firms, the average institutional shareholder in one firm gains $78,100 in additional fees if that firm goes up 1% in value but $31,400 in annual cash flow if *every* competitor 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 equals $8,100 per rival firm. 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 institutions' ownership of multiple firms in an industry makes this strategy about 30% less valuable for most institutional shareholders than it otherwise would be and 73% less valuable for the five large indexers, for which common ownership is more important. We find similar results using other concentration measures and either SIC-based or Hoberg-Phillips (2010, 2016) industries.

Our findings contribute to the large literature on the governance role of institutional investors. The literature suggests that institutions influence various 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; Fich, Harford, and Tran 2015; He and Huang 2017; Azar, Schmalz, and Tecu 2018; Azar, Raina, and Schmalz 2019; Koch, Panayides, and Thomas 2020; Lewellen and Lowry 2020). However, active involvement requires an institution to spend resources to monitor the firm, engage managers, and vote on shareholder proposals, all of which have an uncertain payoff and success rate. Our results estimate institutions' potential benefits from taking these actions, but more work is needed to understand the costs of engagement, the probability that engagement is successful, and the value consequences of successful engagement.

Our paper also contributes to the literature on flow-to-performance effects in asset management, which typically focuses on individual mutual funds (e.g., Chevalier and Ellison 1997; Sirri and Tufano 1998). While a few papers explore interactions among funds within a family (Nanda, Wang, and Zhang 2004; Brown and Wu 2016), we provide the first estimate of the fund-to-performance sensitivity for institutional investors overall. The relation is statistically and economically large, and the implied competition for funds contributes significantly to institutions' financial incentives.

2 Framework

The goal of the paper is to study the incentives that institutional investors have to be active shareholders: What is an institution's payoff from taking an action—monitoring the firm, engaging with management, 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 approach focuses on the additional fees an institution earns if a stockholding increases in value, recognizing both the direct impact on AUM when the stock goes up and the indirect impact from performance-related fund flows. To be specific, suppose the institution earns an annual fee equal to a given percentage *p* of AUM, where AUM at the end of period *t+1* equals:

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

$R_{i,t+1}$ is stock *i*'s return in period *t+1*, $w_{i,t}$ is the stock's weight in the institution's portfolio at the start of *t*+1, and $Flow_{t+1}$ represents the net inflow of new money in period *t+1*. Our empirical analysis allows *Flow* to react with a delay to performance but, for expositional simplicity, suppose that it is linked to contemporaneous returns relative to a benchmark:

$$Flow_{t+1} = AUM_t * \left[\alpha + \beta * \left(\sum_{i=1}^{N} w_{i,t} R_{i,t+1} - \sum_{i=1}^{N} v_{i,t} R_{i,t+1}\right) + e_{t+1}\right], \quad (2)$$

where β is the 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 come from a *direct component*,

stemming from the additional fees associated an increase in AUM:

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

and a *flow component* coming from the incremental fund inflows driven by improved performance:

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

An implicit assumption here is that *Flow* reacts the same to all sources of relative performance, whether from luck, stock-picking skill, engagement activities, etc. This would be true, for example, if investors observe the institution's return but not underlying cause. In addition, eqs. (3) and (4) consider the impact on fees if a single stock changes in value, holding constant the value of other stocks. Our measure of 'rival' incentives, described below, considers how incentives change if engagement affects a firm's competitors, but the analysis does not encompass any potential impact on a firm's customers or suppliers. Those effects could be important if institutions invest in multiple firms in the supply chain.

Eqs. (3) and (4) express incentives as the dollar increase in management fees of a 100% increase in stock *i*'s value. Empirically, we divide by 100 to calculate the dollar impact of a 1% increase in stock *i*'s value, which strikes us as a more appropriate magnitude to consider. In addition, since *p*AUM* is the level of management fees, we can drop that term 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, representing an institution's gain from a *percentage* increase in firm value. We consider percentage changes in firm value, rather than dollar changes, because policies that affect value roughly in proportion to a firm's size (such as governance or strategic issues) seem the most likely to attract institutional attention.

One interpretation of dollar incentives is that they give an upper bound on the annualized cost the institution would be willing to incur to bring about a certain 1% increase in value. (The total amount the institution would be willing to spend is given by the present value of the stream of additional fees, but we leave the numbers as annual cash flows for simplicity.) These costs might stem from the extra time, effort, and legal expenses needed to monitor the firm and engage with management. An important point is that we focus on the

incentives of the money manager itself—how much the manager would be willing to spend out-of-pocket—not the incentives of the institution's clients, who would benefit from the entire increase in AUM rather than just the increase in p*AUM. This distinction is important because it is not always clear who actually bears the costs of engagement. In mutual funds, for example, some costs are paid directly by the management company while other costs are charged to the fund as an operating expense. The latter arrangement would seem to better align the money manager's and clients' interests, since the manager would have an incentive to spend until the net benefit to investors is zero, but, anecdotally at least, engagement costs often seem to be borne directly by the mutual fund company (see, e.g., Pozen 1994). In a similar vein, it is important to note that we focus on the incentives of the management company, not of individual funds. Individual funds could have conflicting interests in some circumstances, but we abstract from those issues to highlight the potential gains to the management company itself.[4]

The framework is easily extended to consider issues related to common ownership. Recent studies emphasize that institutions often invest in many firms in an industry, providing an incentive to support policies that benefit the industry as a whole (possibly at the expense of consumers). We measure these incentives very simply by calculating how institutional shareholders in firm i are affected by changes in the value of firm i's competitors. Concretely, we calculate 'rival incentives' for stock i by summing our incentive measures over other firms in the same industry:

$$Direct\ rival\ incentives_{i,t} = p * AUM_t * \sum_j w_{j,t}, \quad (5)$$

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

where j indexes other firms in the industry ($j \neq i$). Rival incentives are higher if the institution invests more within the industry and depend, in part, on the holdings of competing institutions (v_j). Total rival incentives (the sum of eqs. 5 and 6) can be negative if an institution has modest cross-holdings within the industry if an action benefits other institutional shareholders of rival firms more. This situation is observed often in our data,

[4] For large mutual fund companies, engagement policies are often set by a central 'stewardship' or 'governance' group, though specific voting and engagement decisions may be made in consultation with individual fund managers. See, e.g., about.vanguard.com/investment-stewardship/, www.blackrock.com/us/individual/about-us/investment-stewardship, and www.capitalgroup.com/intermediaries/dk/en/about/esg.html.

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 common ownership.[5]

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 or more' of so-called 13(f) securities to report, with some exceptions, their holdings of U.S. stocks and other exchange-traded securities every quarter. Holdings are identified by CUSIP, allowing an easy merge with price and share data from the Center for Research in Security Prices (CRSP).

Thomson Reuters classifies institutions as (i) banks, (ii) insurance companies, (iii) investment companies, (iv) investment advisors, or (v) 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—'Type 3' institutions—that includes mutual fund companies, hedge funds, pensions, endowments, and other asset managers.

We make four additional changes to Thomson Reuters' data. First, to mitigate a potential problem related to split adjustments in the data (see 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 the 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 2017 based on institutions' original 13F filings with the SEC. We clean these data and merge them by hand with Thomson Reuters (see the Appendix for details). Third, we aggregate (separately) the holdings of Blackrock and Capital Group, which Thomson Reuters reports under multiple entities (see also Ben-David et al. 2018). We also download from EDGAR two quarters of 13F data for Blackrock (March and June 2010) that are missing from Thomson Reuters. Finally, we set institu-

[5] Alternative ways of measuring cross-ownership are proposed, for example, by Bresnahan and Salop (1986), O'Brien and Salop (2000), Harford, Jenter, and Li (2011), and Gilje, Gormley, and Levit (2019).

tional 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 various subperiods from 1980–2017 to show how the sample evolves through time.[6]

Panels A and B describe the cross section of institutions. The sample grows from 540 institutions in the early 1980s to 3,648 institutions in the period 2015–2017 (in these panels, 'N' is the number of institutions in the sample). The average institution in all periods holds roughly 200–250 U.S. firms, with a portfolio worth $2.4 billion in the early 1980s and $5.3 billion in recent years (in 2017 dollars). Interestingly, the median institution actually shrinks by about half from 1980 to 2017, ending with a portfolio of 76 stocks worth $302 million in the final subperiod. 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). For example, the 99th AUM percentile grows four-fold over the sample, from $18.5 billion in the early 1980s to $76.0 billion in 2015–2017. This rise in large institutional investors with widespread stockholdings has led to concerns about the competitive effects of common ownership.

Panels C and D summarize the distribution of institutional ownership across U.S. firms (here, 'N' represents the number of firms in the sample). The average firm at the beginning of the sample has 19 institutional shareholders who own 12% of shares outstanding, steadily increasing to 186 institutional shareholders who own 58% of shares in the period 2015–2017. (On a value-weighted basis, the average firm has more than 1,000 institutional shareholders at the end of the sample, holding 73% of the firm's shares.) Nearly every firm has at least one institutional shareholder in recent years.

[6] The unit of observation in the underlying data is an institution–quarter–CUSIP observation. We aggregate ownership to the firm level using CRSP's PERMCO variable 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, and the statistics in Panels C and D are calculated by *firm* not by stock.

4 Flow-to-performance sensitivity

An increase in the value of an institution's stockholdings has both a direct impact on AUM and an indirect effect via relative performance and subsequent flows. We estimate the latter effect—the flow-to-performance sensitivity of institutions—in this section.

4.1 Background

A large literature studies how mutual fund flows respond to past performance. For example, Chevalier and Ellison (1997) estimate that a two-year-old fund grows 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. Flow-to-performance sensitivities are smaller for older funds, close to zero for poorly-performing funds, and strong for the best-performing funds (implying nonlinearities in the relation).

A few recent studies explore growth within fund families, though we are not aware of any study that directly estimates flow-to-performance sensitivities at the family level. Nanda, Wang, and Zheng (2004) show that the existence of a 'star' fund is positively related to the growth of affiliated funds (see also Khorana and Servaes 1999; Massa 2003; Gaspar, Massa, and Matos 2006; Sialm and Tham 2016). Brown and Wu (2016) argue that flows respond to the performance of other funds in the family because their returns provide information about the quality of shared resources (see also Choi, Kahraman, and Mukherjee 2016). How strongly these effects show up at the family level depends on whether new flows into a fund come from within the family or from competing institutions.

4.2 Flow-to-performance estimates

We estimate institutions' flow-to-performance sensitivity by regressing net inflow on past benchmark-adjusted returns, allowing for a delay in the arrival of new money. Quarterly net inflow equals the growth rate of AUM minus the institution's quarterly portfolio return:

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

where R_{it} is inferred from the institution's holdings at the end of quarter t–1. The predictor variable, an

institution's benchmark-adjusted return, equals R_{it} minus the value-weighted return of all institutions of the same type, capturing the idea that investors are more likely to evaluate an institution's performance relative to similar institutions (the results only change slightly using raw returns).[7]

Table 2 shows that flow is strongly related to prior performance. In Panel A, we regress flow in quarters *t*+1 through *t*+12 on benchmark-adjusted returns in quarter *t*. The slopes are significantly positive for all 12 quarters, with the strongest effects observed in quarters *t*+2 through *t*+4 (slopes of 0.18–0.21). The cumulative flow-to-performance sensitivity over 12 quarters, 1.37, implies that a 1% return in quarter *t* leads to an immediate 1% increase in AUM followed by an additional 1.37% increase in AUM in the subsequent three years as new money is received (the t-statistics in the table take into account possible correlation between the slopes at different horizons using an approach similar to Jegadeesh and Titman 1993). The quarterly slopes become insignificant after three years and the cumulative flow-to-performance sensitivity grows only slightly, to 1.41, if we extend the horizon out to 16 quarters. The results are comparable to those reported by Chevalier and Ellison (1997) for older mutual funds.

A potential concern with the estimates in Panel A is that the cumulative flow at horizon *t*+k reflects not only the impact of returns in quarter *t* but also the impact of returns in *t*+1, …, *t*+k–1, which might be correlated with the return in quarter *t* if performance is persistent. That effect is subtly different than the effect we are trying to measure, which is how flow responds to a *one-time* increase in value. As a robustness check, in Panel B, we regress flow on all 12 lags of quarterly returns simultaneously, to isolate the impact of each quarter's return controlling for performance in other quarters (the slope on the *k*th lag is reported under horizon '*t*+k', in a slight abuse of notation). The slopes are very similar to the simple-regression estimates, with a cumulative flow-to-performance sensitivity of 1.39.

[7] Some background: Institutions' value-weighted returns from 1980–2017 are almost perfectly correlated (99.9%) with the overall market (see also Lewellen 2011). Equally weighted, institutions have an average return of 3.33% quarterly (compared with a market return of 3.15%), and the cross-sectional standard deviation of their returns is 4.88%. Institutions grow 4.00% quarterly, reflecting both the returns on their portfolios and net inflows of 0.68% quarterly (the latter has a cross-sectional standard deviation of 15.6%). For the regressions, we trim the data at the 1st and 99th percentiles to eliminate extreme observations.

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 12 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.

It is interesting to note that flow-to-performance sensitivities vary across institutional types (not tabulated). The relation is weakest for the small number of insurance companies in the data (38 institutions per quarter with a flow-to-performance sensitivity of just 0.47), and strongest for 'Type 3' institutions that include investment companies, investment advisors, and other asset managers (1,396 institutions per quarter with a flow-to-performance sensitivity of 1.59). This suggests that the flow incentives we document below might overstate incentives for banks and insurance companies but understate incentives for Type 3 institutions (which have more than 80% of total AUM in recent years). However, there is no reason to believe that average incentives across all institutions would be biased.

Perhaps surprisingly, flow-to-performance sensitivities do *not* seem to depend on an institution's size. In particular, our estimates are similar if the regressions include only institutions that make up the top 75% of total AUM (cumulative slope of 1.50) or just the 100 largest (cumulative slope of 1.61) or 50 largest (cumulative slope of 1.45) institutions each quarter. In all three cases, the flow-to-performance sensitivity is not significantly different for institutions above and below the cutoff, with t-statistics of 0.30–1.65 on interaction terms added to full-sample regression.

5 Institutions' incentives

As described in Section 2, we measure an institution's incentive to be an active shareholder as its payoff from a 1% increase in the firm's value. The payoff comes from an increase in management fees when AUM rises, considering both the direct increase in AUM if a holding does well (direct incentives) and the indirect impact on relative performance and subsequent flow (flow incentives). Our estimates of flow incentives are based on the flow-to-performance sensitivity of 1.39 in Panel B of Table 2.

Percent incentives depend on a firm's portfolio weight, while dollar incentives also depend on the level of management fees, which are not observable. For simplicity, our baseline measure assumes an annual management fee equal to 0.5% of AUM for all institutions, close to the average advisory fee of U.S. equity mutual funds during the sample (e.g., Rawson and Johnson 2015).

The baseline can be scaled up or down to reflect alternative assumptions about average fees, but a limitation is that it does not account for variation across institutions. A second approach is to use data on mutual fund fees, available on CRSP since 1999, to approximate how fees vary with an institution's size and investment approach (we cannot merge the datasets directly because CRSP only has mutual funds). To be specific, we estimate percentage management fees for five groups of institutions: a group of institutions with large index funds—Schwab, Dimensional, State Street, Blackrock, and Vanguard—and four non-indexer size quartiles, each with 25% of (remaining) AUM. We match institutions in the index group and top size quartile directly to fund companies on CRSP to estimate their management fees (if we cannot match, we use the average fee for other institutions in the group as a proxy). For smaller institutions, we use the average management fee for fund-company size quartiles as a proxy for the management fees of institution size quartiles (the group's average fee in 1999–2002 is used for earlier years). Average management fees using this approach trend downward from 0.60% in the early 2000s to 0.45% in 2017 and are lower for large institutions and indexers. The estimates vary over time from 0.70–0.78% for small institutions, 0.61–0.69% for quartile 2, 0.47–64% for quartile 3, 0.36–0.49% for quartile 4, and 0.11–0.24% for indexers.

5.1 Institution-level incentives

To begin, Table 3 looks at incentives measured at the institution level: we estimate incentives for each firm in an institution's portfolio and calculate the value-weighted average across holdings.[8] The table summarizes the cross-sectional distribution of these institution-level estimates, with institutions weighted equally in Panel A and weighted by AUM in Panel B. The table focuses on 2015–2017 since recent years are probably the most interesting, but results for other time periods are reported later.

[8] Results for the equal-weighted average are available on request. They are similar to incentives for small stocks, which are explored in detail below.

Consider, first, percentage incentives. Many institutions hold fairly concentrated portfolios, with the average stockholding equal to 5.71% of AUM when we equal-weight institutions and 1.59% of AUM when we value-weight institutions (these numbers equal '%Incentives_Direct' in the table). The weights are much higher than the same stock's weight in the benchmark portfolio held by other institutions of the same type, 0.35% on an equal-weighted basis and 0.39% 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 5.71% increase in AUM plus an additional 7.45% increase due to higher subsequent flow (1.39×(5.71%–0.35%)), implying total percentage incentives of 13.16%. For the value-weighted average institution, a doubling in firm value leads to a 1.59% direct increase in AUM and an additional 1.68% increase due to subsequent flow (1.39×(1.59%–0.39%)), implying total percentage incentives of 3.27%.

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

Measured this way, incentives seem fairly small for the majority of institutions, reflecting their modest size. Focusing on our second approach for estimating fees, a 1% increase in firm value leads to an additional $11,000 in annual management fees for the equal-weighted average institution (direct incentives of $5,200 plus flow incentives of $5,900). However, incentives vary substantially across institutions—the cross-sectional standard deviation is $47,700—and tend to be much stronger for larger institutions. On a value-weighted basis, a 1% increase in firm value leads to an average increase of $112,600 in annual management fees, 10 times larger than the equal-weighted average, and a quarter of total AUM is held by institutions with incentives greater than $150,200 (the value-weighted 75th percentile of dollar incentives). Again, these incentives can be interpreted as the maximum an institutional investor would be willing to spend *annually* to bring about a one-time, 1% increase in the value of a stockholding.

Figure 2 looks more explicitly at the incentives of small, medium, and large institutions. We sort institutions into the five groups described earlier, representing a group of large 'indexers' plus four value-weighted size

quartiles. The small quartile (Q1) includes the majority of institutions (3,469) with average AUM of $1.1 billion, while the large quartile (Q4) includes just the 10 largest, non-index institutions with average AUM of $398.1 billion. (The indexers—Schwab, Dimensional, State Street, Blackrock, and Vanguard—have average AUM of $880.8 billion.) For brevity, we report dollar incentives using only the approach that allows management fees to vary across groups. Percentage fees equal 0.73%, 0.64%, 0.54%, and 0.38% for quartiles 1–4 and 0.15% for indexers during this period.

Not surprisingly, incentives vary substantially across groups. Small institutions invest an average of 4.05% of their portfolios in a given firm, compared with a weight of just 0.32% in the benchmark portfolio. Thus, on a percentage basis, overall incentives for small institutions are strong, with direct incentives of 4.05% and flow incentives of 5.18% (1.39×(4.05%–0.32%)). In dollar terms, average direct incentives equal $12,900 and average flow incentives equal $16,300, implying that a small institution's annual cash flow increases by an $29,200 if a stockholding goes up 1%. Small institutions benefit directly from an increase in a stock's value but even more from its impact on relative performance and subsequent flow.

On the other side of the spectrum, the largest non-index institutions invest, on average, 0.67% of AUM in a given stock in their portfolios, modestly higher than the stock's weight (0.43%) in the benchmark portfolio held by other institutions. Percentage incentives for large institutions, 0.67% direct and 0.33% flow, are about an order of magnitude weaker than for small institutions. In dollar terms, however, a 1% increase in firm value leads to an extra $184,400 of annual management fees for large institutions. The estimates suggest that large institutions should be willing to invest 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).

The final group, indexers, have the largest dollar holdings. All else equal, this provides stronger incentives to be active shareholders. But these institutions also have the lowest management fees and the most diversified portfolios, which push incentives in the opposite direction. The group's average stockholding is just 0.48% of the institution's portfolio, and total percentage incentives are just 0.56% (0.48% direct + 0.08% flow). In

dollar terms, indexers' total incentives equal $114,000, only a small amount of which comes from flow incentives since their holdings closely mirror the aggregate holdings of other institutions. These dollar incentives seem modest given indexers' size but, in absolute terms, still suggest that indexers should be willing to spend significant resources to improve firms in their portfolios.

Our estimates here provide an interesting perspective on the growing role of institutional investors and the rise of very large institutions. There seems to be a fairly common view that large institutions such as Blackrock and Vanguard have limited incentives to engage in corporate governance because of the scope of their holdings and limited ability to deviate from their benchmarks. The rise of low-cost index funds, in particular, suggests 'corporate governance will take a backseat' (*The Economist Intelligence Unit* 2017) and is 'bad for capitalism' because index funds cannot 'sell their stocks if they dislike the actions of management' (*The Economist* 2017). However, our findings suggest that large institutions like Blackrock gain substantially when their holdings do well, by virtue of the additional management fees they stand to receive if AUM increases. Indeed, the largest institutional investors—*because* of their size—actually have stronger incentives than many activist investors, a group we explore in more detail below.[9]

At the same time, the steady decline in management fees during the sample tends to reduce incentives, since it reduces the gains going to asset managers from any increase in firm value. For example, the dollar incentives for indexers in Fig. 2 would be much higher ($384,100 vs. $114,000) if their management fees were 0.50% rather than 0.15% from 2015–2017. Indeed, indexers have weaker incentives than other large institutions primarily because their fees are so much lower.

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 rebounded to just over 3% in the last 10 years. The decline and subsequent rebound mirror changes in

[9] Our discussion here focuses on dollar incentives. In contrast, the percentage incentives of the largest institutions are small because they have diversified holdings. This could be relevant in some contexts, for example, if money managers face short-run resource constraints and only find engagement worthwhile if it has a meaningful percentage impact on their cash flows (see, e.g., Gilje, Gormley, and Levit 2019).

institutions' average portfolio weight (not shown), which drops from 2.5% in March 1980 to around 1.6% in recent years. At the same time, the average institution has become bigger over time, especially during the market boom in the 1990s. As a consequence, average dollar incentives increase dramatically from $14,000 in March 1980 to $175,100 in June 2000 (in 2017 dollars). Dollar incentives have not grown since that point, fluctuating with the level of the stock market and average AUM.

5.2 Activist investors

Our estimates imply that large institutions earn $184,400 in extra fees annually if a stockholding increases 1% in value. These incentives seem economically meaningful, but it might be useful to benchmark them against the incentives of 'activists' who file Schedule 13D, explicitly indicating an intention to influence the firm. In particular, Schedule 13D must be filed with the SEC when an investor, or coalition of investors, acquires more than a 5% stake in a firm unless the investor intends to remain passive (in which case Schedule 13G can often be filed). Activist investors choose to engage with firms, so their expected gains must be strong enough to compensate for engagement costs.

Our sample of 13D filings comes from *WhaleWisdom*, a data provider that collects and aggregates SEC filings. We merge *WhaleWisdom's* 13D data with our main sample in order to build a database of activist investments by institutional investors. To help ensure the integrity of the data, we require the institution to have a 13F filing in the same quarter as the 13D filing and to report holding at least 5% of shares outstanding at quarter end. We also restrict the sample to 13D holdings by institutions identified as investment advisors, hedge funds, or activist investors by *WhaleWisdom* (the full 13D dataset includes a small number of trusts, banks, foreign pension funds, and other investors). These filters produce a sample of 1,252 13D filings by 206 different institutional investors from 2015–2017.[10]

[10] The sample includes amended filings that are made when an ownership stake changes after an initial filing. We find similar results if we restrict the sample to the 242 initial 13D filings in the data. In addition, we conducted an internet search for these 242 filings to verify that they reflect truly 'activist' investments and found information about specific, active engagement in about 60% of the cases (examples include having or seeking a board set; proposing strategic alternatives for the firm; supporting an asset sale or merger; or opposing an acquisition). For the remainder, we only found a fairly generic statement in the 13D describing the 'purpose of transaction.'

Table 4 shows incentives estimates for the sample of 13D holdings, i.e., we estimate how much an institution gains when a 13D holding increases 1% in value. An observation in the table corresponds to an institution-quarter-13D filing, with percentage and flow incentives determined by the investment's weight in the institution's broader portfolio. (The table summarizes the institution's overall stock portfolio, but non-13D investments are otherwise excluded from the analysis.)

We report three sets of estimates for activists' dollar incentives. The first two assume that institutions with 13D filings have the same management fees as the broader population of institutions (a 0.5% fee in the first approach or a size-matched percentage fee in the second approach). However, since many activists are private equity or hedge funds, we also report incentives assuming institutions earn a 1.3% management fee and 20% performance fee (close to average fees in recent years).[11] A complication here is that the performance fee is a *one-time* fee earned for good returns, while management fees are earned annually. To put the two on a comparable basis, we annualize the performance fee by dividing it by ten, i.e., we report the equivalent annual value if the performance fee is converted to a perpetuity at an interest rate of 10%.[12]

The average 13D holding in Table 4 is $175 million (Panel A) and represents 7.5% of an institution's portfolio on an equal-weighted basis and 13.4% of the portfolio on a value-weighted basis. These weights are much higher than for non-13D holdings and lead to incentives that are larger than the typical institutional holding. For example, if activist institutions earn the same management fees as the wider population of institutions (using our second, size-matched approach), the value-weighted average direct incentive is $70,900 and the average flow incentive is $97,800, implying total dollar incentives of $168,700 for 13D holdings. The latter

[11] See, e.g., www.institutionalinvestor.com/article/b18qnnl4krg3ty/hedge-fund-management-fees-fall-to-record-low.

[12] Our analysis of activist incentives comes with a few caveats. First, we assume for simplicity that activist institutions have the same flow-to-performance sensitivity as the full sample (the actual value we estimate for the activist sample is slightly lower, equal 1.15 with a standard error of 0.34). Second, performance fees may be less than 20% in practice because they are paid only on gains above a previously set 'high water mark' (which can vary from investor-to-investor). Third, managers of private equity and hedge funds typically have their own money invested in the fund, which provides additional incentives to increase value. Lim, Sensoy, and Weisbach (2016) estimate that hedge fund managers receive, on average, a conservatively estimated $0.39 in present value for every $1 earned by fund investors, representing the sum of all current and expected management and performance fees plus the increase the manager's own personal investment in the fund. On an annualized basis, using a 10% interest rate, the implied gain of $0.039 annually per $1 is similar to the total gain we estimate in Table 4 using a 1.3% management fee and 20% performance fee (direct + flow + annualized performance fee ≈ $0.051 per $1 increase in AUM).

number grows to $316,000 if activist instead earn a 1.3% management fee, and annualized performance fees would add another $204,300. These incentives compare with value-weighted average incentives of $112,600 for the full population of institutions and $184,400 for large non-index institutions (as reported earlier).

It is also interesting to note that activist incentives are highly skewed and often quite modest. For example, from Panel A, 75% of 13D holdings are smaller than $145 million and have dollar incentives below $45,000 using our measure with a 1.3% management fee, performance-fee incentives below $29,000, and total combined incentives below $74,000.

The picture that emerges from Table 4 is two-fold: First, the costs of much activism may be relatively small, since the costs should be bounded above by the potential gains that activists expect (as reflected in the incentive measures). Second, while activists overall have stronger incentives, larger institutions in our main sample often have incentives that are comparable to those of activist investors.

5.3 Firm-level estimates

The analysis above focuses on incentives at the institutional level. An alternative is to measure incentives at the firm level, averaging across a 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 either for all institutions holding a given firm (Table 5) or for just the firm's largest institutional shareholders (Table 6), weighting by the value of their holdings. Again, we focus initially on the most recent period, 2015–2017, but show results for the full sample later.

In some ways, the message from Table 5 is similar to our conclusions from the institutional-level estimates: incentives often seem small but vary substantially across firms. For the equal-weighted average firm in Panel A, institutions own 58% of shares outstanding and invest, on average, 1.15% of AUM in the firm (conditional on holding the stock). Average percent incentives are relatively strong, 2.72%, but average dollar incentives are just $13,000 (based on our second, more conservative approach), reflecting the modest size of the typical

institutional holding.

Incentives are stronger for larger firms, as reflected in the value-weighted estimates in Panel B. Institutions own 72% of the value-weighted average firm and invest, on average, 1.63% of AUM in the firm. Average percent incentives equal 3.33% and, because the investments are larger in absolute terms, dollar incentives, $117,900, are about an order of magnitude greater than for the equal-weighted average firm. Incentives are more than $162,100 (per institution) for firms that make up 25% of total market cap and as high as $533,800 at the value-weighted 99th percentile. 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 portfolios, an issue we consider shortly).

Flow incentives are, on average, a significant portion of total incentives in Table 5, but a key feature is that flow incentives can be negative if an institution invests only a small fraction of AUM in the firm (smaller than the portfolio weight 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, 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, 22.1% of institutional shares are held by institutions with negative flow incentives and 5.6% 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 6, dollar incentives are roughly twice as strong for a firm's five biggest institutional shareholders (institutions with the largest stakes, not institutions with the largest AUM). The five biggest shareholders own roughly a quarter of total shares outstanding and gain an estimated $231,100 in annual management fees (per institution) if the value-weighted average firm increases 1% in value. Average dollar incentives for these shareholders are greater than $139,300 for firms that make up more than half of total market cap (as indicated by the value-weighted median in Panel B of Table 6) and greater than $306,900 for firms that make up one quarter of total market cap (as indicated by the 75th percentile). 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 impact 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 3,823 firms with an average market cap of $1.7 billion, while group 4 has the largest 24 firms with an average market cap of $287.8 billion.

The most striking result in the figure is that percentage 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 as a percent of AUM in the firm as the average institutional shareholder of a large firm, despite the fact that large firms are more than 100 times bigger. This reflects the fact that, conditional on holding a small stock, the average fractional ownership is greater (4.1% vs. 2.1%) and the fact that smaller institutions are more 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 $173,700 and average flow incentives equal $74,000, implying that institutional shareholders in the largest firms earn an estimated $247,700 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 the five largest shareholders of the firm.)

5.4 Discussion

Our results suggest that larger institutions often have meaningful incentives to be engaged shareholders. Of course, whether institutions act on these incentives depends on the costs of being engaged and the expected impact on a firm's value. Our comparison with activist investors in Section 5.2 provides indirect evidence that incentives can be strong enough to induce engagement, but a few studies provide direct evidence on the costs, impact, and frequency of different types of institutional engagement.

Gantchev (2013) estimates the costs of activist campaigns using a structural model. Most activist campaigns are resolved through negotiations, but some include demands of board representation, proxy threats, and, in rare cases, proxy fights. The paper finds that campaigns ending in a proxy fight (7% of the sample) cost $10.7 million, while costs are 50% to 75% lower in less hostile cases. On the benefit side, the average returns to activism range from 2% to 8% and, on average, activists earn positive returns net of costs. (Similarly, Brav et al. 2008 report average announcement returns of 7–8% around 13D filings.) In comparison, our estimates imply that institutions gain roughly $115,000 in annual cash flow if firm value goes up 1%, or $1.15 million in present value if capitalized as a perpetuity at 10%.

At the same time, most institutions do not engage in public activist campaigns (in our sample, only 206 institutions file Schedule 13D in the period 2015–2017).[13] However, many institutions do choose less confrontational forms of engagement. McCahery, Sautner, and Starks (2016) survey 143 large institutions and find that 63% of respondents conduct private discussions with management in response to concerns about corporate governance and disagreements about a firm's strategy. Surveys by Institutional Shareholder Services (2014) and Ernst and Young (2016) report similar results and find that such engagement has been increasing in recent years.

The impact of behind-the-scenes engagement is difficult to quantify. The skeptical view is that most institutions lack the expertise to identify value-enhancing changes to a firm's strategy or the power to pressure managers because, unlike activists, they refrain from public confrontation. This view is consistent with mixed evidence that institutional engagement has a significant impact on firm value (Wahal 1996; Strickland, Wiles, and Zenner 1996; Carleton, Nelson, and Weisbach 1998; Del Guercio and Hawkins 1998). On the other hand, Carleton, Nelson, and Weisbach show that, of 43 firms targeted for governance changes by TIAA-CREF from 1992–1996, all but one reached an agreement with TIAA-CREF, typically through private negotiations without a shareholder vote (see also Pozen 1994; Nesbitt 1994; Wahal, 1996; Gillan and Starks 2000). In addition,

[13] One reason may be that an institutional shareholder might also manage a firm's 401(k) assets. Cvijanović, Dasgupta, and Zachariadis (2016) find that mutual fund companies with business ties to the firm are more likely to vote with management in closely contested situations (see also Davis and Kim 2007).

Bushee (1998), Hartzell and Starks (2003), Aghion, Van Reenen, and Zingales (2013), Fich, Harford, and Tran (2015) and others provide evidence that institutional owners affect a variety of corporate decisions. Firms may pay attention to the views of their largest shareholders because they have considerable voting power, the ability to sway others, or simply because the CEO and board want to maintain a good relationship with the firm's shareholders. These institutions seem to have both the incentive and ability to engage with firms, even if they are not 'activist' investors.

6 Rival incentives

The estimates above focus on how much an institution gains 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 owned by the institution. Casual observation suggests this phenomenon has become more widespread in recent years and has led to growing concerns about the possible 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, we estimate how much the firm's institutional shareholders gain or lose when other firms in the industry ('rivals') increase in value, by virtue of the institutions' holdings of those firms. Specifically, 'rival incentives' for a given institutional shareholder of firm *i* are measured as:

$$Direct\ rival\ incentives_{i,t} = p * AUM_t * \sum_j w_{j,t}, \quad (8)$$

$$Flow\ rival\ incentives_{i,t} = p * AUM_t * \beta * \sum_j \left(w_{j,t} - v_{j,t}\right), \quad (9)$$

where p is the institution's percentage management fee, j indexes other firms in the same industry as firm i, w_j and v_j are weights in the institution's portfolio and benchmark portfolio, respectively, and β is the estimated flow-to-performance sensitivity for institutions. (Eqs. 8 and 9 give the dollar change in management fees from a 100% increase in rivals' value; as before, we divide by $p*AUM$ to express incentives on a percentage basis or divide by 100 to get the gain or loss from a 1% increase in value.) The estimates provide a simple measure of an institution's incentives to consider the impact on a firm's competitors when voting on shareholder

proposals, engaging with management, etc.[14]

A distinguishing feature of our framework is that rival incentives depend not just on an institution's holdings in the industry (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 been considered by the prior literature.

Part of our goal here is to inform the debate on how common ownership might affect competition among firms. An important consideration is that common ownership and any impact 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 more- and less-concentrated industries, sorting either by the number of competitors or the fraction of sales coming from the four largest firms (the four-firm concentration ratio).

6.1 Estimates of rival incentives

Table 7 reports estimates of rival incentives and, for comparison, the 'own-firm' measure of incentives from Table 5 (i.e., incentives for firm *i* itself). We estimate incentives for all institutions holding a given firm, take the holding-weighted average across shareholders, and report the value-weighted cross-sectional distribution of the firm-level estimates. Own-firm incentives represent the gain to a firm's institutional shareholders if that firm goes up in value, while rival incentives represent the gain to the same institutions if other firms in the industry go up in value. We focus on firm-level estimates here in order to study how much rival incentives

[14] Our measure is based on an overall increase in the value of a firm's competitors, assuming that all rivals go up by 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.

might impact the engagement choices of a given firm's shareholders. For brevity, we report dollar incentives using only our second approach for estimating management fees, which allows percentage fees to vary with an institution's size and investment approach.

Panel A focuses on firms in the most-concentrated industries, defined here as 3-digit SIC codes with 2–6 firms (we consider alternative definitions later).[15] In these industries, an average institutional shareholder in a given firm invests 1.46% of AUM in that firm but a smaller amount, 0.29%, in total in all of the firm's rivals. The first number represents a large overweight relative to other institutions' investment in the firm (0.26%), while the second number is slightly higher than the benchmark weight (0.18%).[16] Thus, an institution that invests in one firm in the most-concentrated industries sometimes invests in the firms' rivals, but the size of the investment is relatively modest. As a consequence, rival incentives are, on average, much smaller than own-firm incentives in these industries, 0.43% in percentage terms and $31,400 in dollar terms, compared with own-firm incentives of 3.13% and $78,100, respectively.

A key result in Panel A is that, if an institution invests in one firm in the most-concentrated industries, it often underweights rivals (even though the average overweight is slightly positive). In particular, the row labeled 'negative flow incentives' shows that 65.3% of institution-held shares are held by institutions that underweight rival firms. These institutions may invest some in a firm's competitors, producing positive direct incentives, but an increase in rivals' value reduces the institutions' performance relative to other institutions and predicts lower subsequent flow. Remarkably, 46.2% of institution-held shares for the average firm in Panel A 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 provide a potentially powerful counterweight to other shareholders that might favor policies that benefit rivals.

[15] The most-concentrated industries include 404 firms per quarter, the medium-concentration industries (with 7–18 firms) include 818 firms per quarter, and the least-concentrated industries (19 or more firms) include 2,855 firms per quarter. The results are similar if we use a finer partition, classifying industries with 2–5 firms as 'most-concentrated.' We drop 98 firms, relative to the full dataset, that have missing SIC codes or zero competitors.

[16] The average benchmark weights are similar to average market-cap weights. It is interesting to note that, in the most-concentrated industries, the largest one or two firms often represent a large fraction of the industry's total market cap. For example, for the most-concentrated industries in Panel A, the value-weighted average firm represents 0.33% of the market portfolio (compared with a benchmark weight of 0.26%) and has industry rivals that collectively represent 0.20% of the market (compared with a benchmark weight of 0.18%).

Common ownership is, of course, more pervasive in industries with more firms, where the scope for cross-ownership is greater. In industries with 7–18 firms (Panel B), the average institutional shareholder in a firm invests 1.31% of AUM in that firm and 0.76% of AUM in all other firms in the industry. The first number is much higher than the firm's weight in the benchmark portfolio (0.21%), while the second number is marginally higher than the benchmark weight (0.51%). The majority (56.2%) of institutional shares are held by institutions that underweight rivals.

In industries with more than 18 firms (Panel C), the total value of rivals is larger and common ownership is greater. Conditional on investing in one firm in those industries, the average institution invests an additional 4.70% of AUM in other firms in the industry. This weight is higher than the firms' weight of 3.88% in the benchmark portfolio held by other institutions, and roughly half of institutional shares in a given firm are held by institutions that underweight rivals.

6.2 Discussion

At one level, the interpretation of Table 7 is simple: common ownership of firms in the same industry is indeed common, especially in industries with many firms. A decision by one firm in an institution's portfolio, if it has broader industry effects, will often impact multiple firms held by the institution. 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 are perhaps more important to consider. One interpretation, as discussed earlier, is that dollar incentives equal the maximum annualized amount an institution would be willing to spend to bring about a one-time 1% increase in value. This number is relatively modest for rival firms in the most-concentrated industries: the average institution would be willing to spend $31,400 annually in exchange for a 1% increase in the total value of all rival firms, equivalent to just $8,100 per rival (compared with own-firm incentives of $78,100; the per-rival numbers are not tabulated). Rival incentives are larger for industries with many firms, since a 1% increase in the value of a big portfolio represents a bigger dollar increase, but remain small on a per-rival basis: rival incentives are $446,900 in the least-concentrated industries in Panel C, equivalent to just

$3,700 per rival. Across all industries, the incentives per rival firm are relatively modest, with a value of just $35,500 even at the 99th percentile of the distribution. The per-rival numbers imply that the average institutional shareholder of one firm gains much more if that firm goes up 1% in value ($118,400 on average across all firms) than if another firm in the industry goes up 1% ($4,600 on average).

To put the numbers in perspective, suppose regulators are worried that institutional investors 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 in the industry by 1%, an average institutional shareholder would gain $4,600 per rival from such a policy (in addition to the own-firm effect). Thus, the typical institution would only find it optimal to promote collusion if the engagement and coordination costs—not to mention the legal risks—per firm 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.

As a second example of anticompetitive incentives, 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 0.77% loss for the average rival firm in the same SIC code.[17] Based on our estimates in Table 7, a 1% increase in firm value leads to an $118,400 increase in annual cash flow for the average institutional shareholder of the firm (own-firm effect), offset by a $51,400 decrease in annual cash flow caused by the institution's losses from the drop in value of rival firms. The latter number varies from $32,300 in the most-concentrated SIC codes to $61,300 in the least-concentrated SIC codes. Institutions' cross-holdings in the industry tend to reduce by roughly 40% the average institution's incentive to support a policy that helps the firm at the expense of industry rivals.

[17] This value of 0.77% implies that, on a value-weighted basis, the average size of a firm is 77% 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 winsorize the ratio at 1,000% to mitigate the impact of a small number of extreme outliers.

6.3 Extensions

Table 8 repeats the analysis using two alternative definitions of industry concentration, the first based on four-firm concentration ratios and the second based on Hoberg and Phillips' (HP 2010, 2016) industries. For the latter, we use HP's recommended 'TNIC-3' dataset that identifies a firm's closest competitors from product descriptions in 10-K filings (the 'coarseness' is designed to be similar to 3-digit SIC codes). An important feature is that the TNIC-3 datasets is not transitive, i.e., firm A may compete with firms B and C even though B and C do not compete with each other. Thus, the TNIC-3 data does not identify distinct industries, per se, but instead gives us a measure of how many competitors a firm has. We sort firms into three groups based on this count (1–5 competitors vs. 6–17 competitors vs. 18 or more competitors), mirroring the sort using SIC codes in Table 7. (The sample drops to 3,407 firms in Panel B because the HP dataset does not have competitors for all firms.)

The results in Table 8 are similar to those in Table 7 (for brevity, Table 8 reports only the value-weighted mean of the firm-level estimates). In industries with the highest four-firm concentration ratios in Panel A, an institutional shareholder in a given firms invests, on average, 1.50% in that firm and 0.64% in all of the firms' rivals, leading to own-firm incentives that are about twice as large as rival incentives ($105,300 vs. $59,300). In Panel B, an institutional shareholder in a firm with few competitors invests, on average, 1.25% of AUM in that firm and 0.27% in all of its competitors, implying own-firm incentives that are about three times stronger than rival incentives ($78,900 vs. $27,500). Again, institutional shareholders invest more in competitors when the number of competitors is larger, increasing to 1.11% of AUM when there are 6–17 competitors (compared with an own-firm investment of 1.77%) and 5.01% of AUM when there are 18 or more competitors (compared with an own-firm investment of 1.58%).

Table 9 replicates the analysis using just a firm's five largest institutional shareholders (i.e., those with the largest stakes). The results are similar to those in Tables 7 and 8 except that dollar incentives here are about twice as big. 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, more than half of large shareholders in the most-concentrated industries underweight rivals,

implying that a substantial fraction of a firm's largest shareholders have negative rival flow incentives and about one-quarter have negative total rival incentives. 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 greater common ownership in the industry.

Table 10 considers an alternative way to identify large shareholdings, in this case focusing on each institution's largest holding within an industry (3-digit SIC code). The idea is that an institution's largest holding in the industry might be regarded as its 'main' holding and command a disproportionate share of the institution's attention. We estimate incentives for this set of holdings and report the distribution of institution-level estimates. Own-firm incentives for these holdings are much larger than rival incentives. For example, in the most-concentrated industries, an institution invests 0.98% of its portfolio in its largest holding in the industry but just 0.14% in all of the firm's rivals, leading to own-firm incentives that are many times larger than rival incentives, 2.00% vs. 0.14% in percentage terms and $80,600 vs. $13,300 in dollar terms. At the same time, rival incentives reach as high as $116,300 at the 99th percentile.[18]

Table 11 looks at the link between rival incentives and indexing. Many of the recent concerns about common ownership focus on large indexers like Blackrock and Vanguard that often invest in multiple firms in the same industry. It seems interesting, then, to compare rival incentives for the large indexers in our data (Schwab, Dimensional, State Street, Blackrock, and Vanguard) with rival incentives of other institutions. For brevity, Table 11 focuses on the most-concentrated industries, where concerns about the impact of common ownership are likely to be greatest.

Indexers have stronger dollar incentives than the average non-indexer. As observed earlier, indexers hold very diversified portfolios, with portfolio weights that are similar to the benchmark portfolio held in aggregate by

[18] It is useful to note that own-firm and rival incentives are positively correlated but observations with the highest rival incentives are not necessarily the same as those with the highest own-firm incentives. We have also estimated the cross-sectional distribution of net incentives, defined as own-firm minus rival incentives. This variable is nearly always positive, with a median of $44,200 and first percentile of $500 for firms in the most-concentrated industries (the mean, of course, equals the difference in the means of own-firm vs. rival incentives, $67,300).

other institutions.[19] For example, in Panel A, the average index shareholder in a given firm (in the most concentrated industries) invests 0.33% of AUM in that firm and only slightly less, 0.20%, in the firms' rivals, closely matching the benchmark weights (0.27% and 0.19%, respectively). Indexers' own-firm incentives are about twice as large as their rival incentives in both percentage (0.42% vs. 0.22%) and dollar ($80,400 vs. $45,300) terms. In comparison, non-index institutions invest 2.35% of AUM in a given stock-holding and 0.31% of AUM in the firm's rivals. Non-indexers tend to be smaller but earn higher management fees, and the net effect is that their own-firm dollar incentives are similar to indexers' ($78,900 vs. $80,400) while their rival-firm incentives are weaker ($26,600 vs. $45,300). Thus, common ownership is relatively more important for large indexers than for other institutions.

The conclusions are similar from the other panels in Table 11, which identify highly-concentrated industries using four-firm concentration ratios (Panel B) and number of Hoberg-Phillips competitors (Panel C). The main difference is that, in Panel B, indexers' rival incentives are slightly higher than their own-firm incentives. Conditional on investing in one firm in a high-concentration-ratio industry (0.45% of AUM), indexers invest an additional 0.55% of AUM in the firm's rivals. Both percentages are similar to the weights in the benchmark portfolio, but the results show that index shareholders in one firm often have significant exposure to other firms in the same industry. In dollar terms, an index shareholder gains, on average, $113,900 in annual management fees when the firm goes up 1% in value and $119,000 in fees when all other firms in the industry go up 1% in value. The latter number equals $10,600 per rival. This suggests that, while indexers gain from an overall increase in industry value, they would only find it optimal to promote collusion if the engagement, coordination, and legal costs per firm are relatively small.

For additional perspective, consider again a policy that increases the value of one firm at the expense of industry rivals, dollar-for-dollar, with the drop in rivals' values distributed in proportion to their market caps. In Panel A, the $80,400 gain in management fees for the average indexer (own-firm effect) would be offset by

[19] Indexers' weights are also close to, but deviate somewhat from, market cap weights. Deviations from the market portfolio may come from the fact that the institutions manage a mix of funds indexed to different segments of the market (e.g., small caps or value stocks); offer some non-indexed funds (e.g., Vanguard's Strategic Equity Fund); and do not perfectly match the underlying indices even in their index funds.

a $58,600 loss in management fees from the drop in rivals' values; for non-indexers, the own-firm gain of $78,900 would be offset by a $23,400 loss from the drop in rivals' values. In Panel B, the own-firm gain of $113,900 for indexers would be offset by a $92,600 loss from the drop in rivals' values, while the own-firm gain of $106,600 for non-indexers would be offset by a loss of $26,800. Like other institutions, the indexers benefit from policies that increase the value of a firm at the expense of rivals, but their greater ownership of multiple firms in an industry means their net gains are much smaller.

Figure 5 explores how incentives have changed since 1980. For the most-concentrated industries (SIC codes), rival incentives are always much lower than own-firm incentives. Rival incentives in Panel A fluctuate around 0.4% throughout the sample, compared to roughly 3.0% for own-firm incentives. In less-concentrated industries (Panel B), rival incentives 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% in the 1980s to 5–6% in recent years, with an additional and fairly significant rise to nearly 7% at the very end of the sample, while own-firm incentives drop from about 4–5% in the 1980s to 3–4% 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 (except, perhaps, for the rise in less-concentrated industries in 2017).

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 80% 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 when an institution invests 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 75% to 45% 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

The growth of institutional investors raises fundamental questions about their role in corporate governance. Our paper studies the financial incentives that institutions have to be active shareholders: How much does an institution gain from taking an action—monitoring the firm, engaging with management, voting on shareholder proposals—that affects firm value? We measure incentives as the increase in an institution's annual management fee caused by a 1% increase in the value of a portfolio firm, considering both the direct impact of an increase in AUM and the indirect effect via relative performance and subsequent fund inflows.

Our estimates suggests that institutions' incentives are frequently modest but can be strong, especially for larger firms and larger institutions. The typical institution holds a fairly concentrated portfolio, with a portfolio weight of 1.56% invested in an average (value-weighted) holding in 2017, far higher than the firm's weight in the aggregate portfolio held by other institutions. As a result, institutions gain an extra $129,000 in annual management fees, on average, if a holding goes up 1% in value (taking into account both direct and flow incentives, and allowing management fees to vary with an institution's size). Our estimate varies from $31,300 for small institutions, to $133,000 for large institutions with sizable index funds, and to $219,500 for other large institutions. These numbers can be interpreted as the maximum annualized amount an institution would be willing to spend to bring about a one-time, 1% increase in firm value, suggesting that large institutions have meaningful incentives to be engaged shareholders. (To be sure, incentives are much smaller for many holdings.) Indeed, the incentives of largest institutions, by virtue of their size, are comparable to the incentives of many activist investors.

We also study an institution's incentives to consider how firm policies affect other firms in the industry. As prior studies point out, such incentives arise because institutions often invest in multiple firms in an industry. We find that rival incentives can be significant, especially for large indexing institutions, but are generally weak in the most-concentrated industries (in which concerns about strategic interactions might be larger). We also find that, for a significant fraction of institutional shareholders in a given firm, rival incentives are actually negative because the institution underweights rival firms relative to competing institutions, implying that an increase in the value of a rival hurts the institution's relative performance and, hence, subsequent flows. This

flow effect has a potential to counteract the incentives of other shareholders that gain when other firms in the industry do well.

Our approach complements the recent literature on institutional ownership by offering a direct estimate of institutions' financial incentives to be engaged. The approach can be extended in several ways. First, while our analysis focuses on the potential gains from being active, the costs of engagement remain relatively poorly understood. Second, more research is needed to understand how institutions can affect managerial decisions, and in general, whether institutional engagement is successful and has a significant impact on value. Finally, institutions may be engaged shareholders for non-financial reasons, such as for legal, social, or political reasons, and the relative importance of these motives is not well understood.

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Appendix

Our main dataset is the Thomson Reuters 13F data provided by Wharton Research Data Services (WRDS). WRDS documents serious problems with the data starting in 2013Q2 and provides a supplemental dataset for June 2013–December 2017 based on institutions' original 13F filings on EDGAR. This Appendix summarizes how we clean the dataset and merge it with Thomson Reuters.

To start, we identify and fix a variety of errors in the raw 13F filings, including (i) errors in CUSIP numbers; (ii) transposed 'share' and 'value' columns; (iii) inconsistent reporting of Berkshire Hathaway shares (presumably due to the unusually high price of BRK.A shares, some institutions multiply their shares held by 100 and, implicitly, divide the share price by 100); (iv) inconsistent treatment of stock splits that occur between the reporting and filing dates; and (v) inconsistent labeling of whether an amended filing 'adds new holdings' or 'is a restatement.' We identified errors by comparing the reported value of holdings in the 13F file to the value calculated using CRSP stock prices or looking for anomalous changes in holdings or portfolio value from one quarter to the next.[20]

Institutions in the WRDS 13F database are then linked to institutions on Thomson Reuters by name and, where possible, comparing AUM and number of holdings as secondary checks. (Much of the matching was done by hand, given the variety of abbreviations and naming conventions used by Thomson Reuters.) In many cases where an initial match was not found, we traced the issue (via EDGAR or an internet search) to name changes in 13F filings not reflected in the Thomson Reuters database. In a relatively small number of cases, Thomson Reuters appears to aggregate or disaggregate 13F filings, i.e., some institutions on Thomson Reuters file under multiple CIKs (which Thomson Reuters combines) and some institutions have holdings reported by another

[20] Institutions report both 'value' and 'shares' for each CUSIP. We rely exclusively on the 'shares' number, using 'value' only to help identify and fix errors. Our filters flagged many filings as having potential errors that we ultimately judged to be fine (in terms of 'shares') because (i) an institution seems to have reported 'value' using prices that were not end-of-quarter (i.e., the reported 'value' for each holding is similar to, but randomly different from, our calculated value) or (ii) some non-U.S. institutions appear to report 'value' in foreign currency (i.e., the reported 'value' for every holding deviates from our calculated value by the same percentage amount, consistent with the exchange rate at the time for the country identified in the institution's business address). On a few occasions, where our filters flagged a possible error, we also used 'name of issuer' to fix mistakes with a reported CUSIP number. Finally, in a few instances where our filters flagged an error that we could not explain and fix, we dropped the institution-quarter observation from the sample. However, our approach was to assume 'shares' were correct unless there was a clear, material error.

institution (which Thomson Reuters reports separately). In the end, we are able to link the vast majority of institutions in the two databases.

It might be useful to note that the accuracy of the link has a very limited effect on our tests. Combining the datasets simply allows us create a consistent time series of holdings for a given institution, before and after 2013Q2 (using Thomson Reuters data before and WRDS 13F data after). However, we only use the time series for a given institution when we estimate flow-to-performance sensitivities; our main results otherwise require only the cross section of holdings at a given point in time.

More generally, the results in the paper are not sensitive to whether we (i) ignore errors in the WRDS 13F data (other than doing basic consistency checks, such as ensuring that shares held is less than shares outstanding); (ii) use Thomson Reuters' updated data that at least partially fixes the problems identified by WRDS; or (iii) use a linking table provided by WRDS rather than our own links (the WRDS linking table was used in previous drafts of the paper, with similar results).

Table 1: Descriptive statistics, 1980–2017

This table reports descriptive statistics for our sample of institutions and firms (cross-sectional average, median, standard deviation, and 1st, 25th, 75th, and 99th percentiles) from 1980–2017. Panels A and B report statistics *by institution* for assets under management (in 2017 dollars) 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 shareholders 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 is aggregated to the firm level using CRSP's PERMCO variable, keeping only firms with common stock outstanding.

Period	Avg	Med	Std	p1	p25	p75	p99	N
Panel A: Assets under management ($ millions), by institution								
1980–1984	2,395	855	3,947	35	401	2,444	18,504	540
1985–1989	2,907	831	6,201	20	354	2,568	30,966	785
1990–1994	3,225	671	8,912	16	272	2,274	39,172	1,006
1995–1999	5,743	689	23,911	27	284	2,484	95,765	1,342
2000–2004	5,948	491	31,184	18	201	1,874	110,373	1,815
2005–2009	5,113	380	31,614	10	149	1,496	83,621	2,468
2010–2014	4,745	325	35,165	5	128	1,344	71,078	2,945
2015–2017	5,292	302	47,913	4	113	1,159	75,986	3,648
Panel B: Number of firms held, by institution								
1980–1984	192	128	193	13	76	233	920	540
1985–1989	225	125	328	10	66	256	1,584	785
1990–1994	242	114	403	11	64	253	1,933	1,006
1995–1999	269	112	488	9	62	244	2,476	1,342
2000–2004	260	96	509	7	53	208	2,884	1,815
2005–2009	228	81	470	6	40	183	2,716	2,468
2010–2014	212	76	425	5	35	176	2,522	2,945
2015–2017	212	76	429	5	32	175	2,576	3,648
Panel C: Number of institutional shareholders, by firm								
1980–1984	19	3	43	0	0	14	232	5,259
1985–1989	28	8	59	0	2	25	319	6,226
1990–1994	39	13	73	0	4	37	388	6,281
1995–1999	48	17	88	0	6	52	455	7,504
2000–2004	81	37	126	0	10	100	661	5,933
2005–2009	113	66	155	1	20	140	811	4,956
2010–2014	148	89	200	1	30	175	1,038	4,225
2015–2017	186	110	253	4	40	215	1,384	4,175
Panel D: Institutional ownership (fraction of shares), by firm								
1980–1984	0.12	0.05	0.16	0.00	0.00	0.19	0.59	5,259
1985–1989	0.17	0.11	0.19	0.00	0.01	0.29	0.70	6,226
1990–1994	0.23	0.16	0.22	0.00	0.04	0.38	0.79	6,281
1995–1999	0.28	0.22	0.25	0.00	0.06	0.47	0.89	7,504
2000–2004	0.36	0.31	0.29	0.00	0.10	0.60	0.97	5,933
2005–2009	0.50	0.51	0.32	0.00	0.21	0.79	1.00	4,956
2010–2014	0.54	0.59	0.32	0.00	0.24	0.84	1.00	4,225
2015–2017	0.58	0.65	0.32	0.00	0.30	0.87	1.00	4,175

Table 2: Flow-to-performance sensitivity, 1980–2017

This table estimates the flow-to-performance sensitivity for institutional investors based on average slopes from cross-sectional regressions of net inflow on lagged benchmark-adjusted returns (intercepts are not reported). In Panel A, net inflow in quarters t+1, t+2, …, t+12 is regressed on benchmark-adjusted returns in quarter t (separate regressions for each horizon). In Panel B, net inflow is regressed on 12 lags of benchmark-adjusted returns (combined regression; the slope on lag k is reported under horizon 't+k'). Net inflow is the growth rate of assets under management minus the institution's quarterly return. Benchmark-adjusted return is an institution's return minus the value-weighted 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 six lags. The cumulative slope for t+k is the sum of the quarterly slopes for t+1 to t+k. 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	t+11	t+12
Panel A: Simple regressions												
Slope	0.10	0.19	0.21	0.18	0.14	0.12	0.11	0.09	0.05	0.05	0.06	0.08
t	4.00	7.37	7.63	6.94	7.77	4.26	5.41	5.18	2.08	2.54	2.32	3.75
Cumulative	0.10	0.29	0.50	0.67	0.81	0.93	1.04	1.13	1.18	1.23	1.29	1.37
t	4.00	6.80	8.47	9.38	10.20	9.58	9.56	9.50	9.14	8.68	8.34	8.52
Panel B: Combined regression												
Slope	0.04	0.20	0.19	0.23	0.14	0.16	0.11	0.05	0.05	0.03	0.09	0.09
t	1.81	6.43	7.14	8.20	5.95	5.94	4.33	2.00	1.84	1.36	2.59	3.76
Cumulative	0.04	0.24	0.43	0.66	0.81	0.97	1.08	1.13	1.18	1.21	1.30	1.39
t	1.81	5.95	8.51	9.81	11.82	12.47	12.14	12.26	11.59	11.89	11.97	12.01

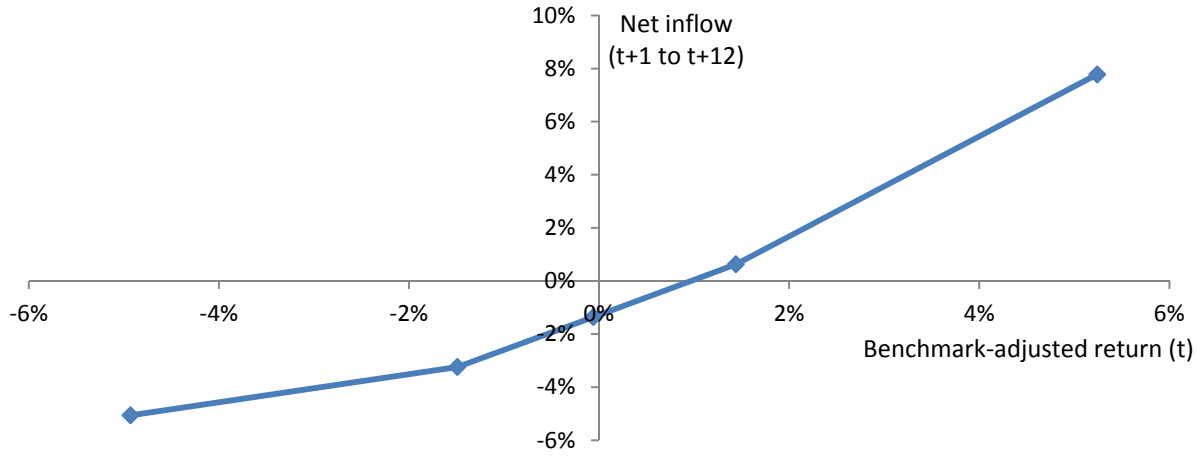

Fig. 1: Flow-to-performance sensitivity, 1980–2017. The figure plots the cumulative net inflow from quarter t+1 to t+12 against the quarterly benchmark-adjusted return in quarter t for institutions sorted into relative-return quintiles. Net inflow is the quarterly growth rate of assets under management 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, 2015–2017

This table reports the cross-sectional distribution of institutions' stock holdings and incentives. We calculate the variables for each institution (holding-weighted averages, except for AUM 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 equal-weighted in Panel A and value-weighted in Panel B. %Incentives_Direct = weight of the firm in an institution's portfolio; %Incentives_Flow = 1.39 × (portfolio weight – benchmark), where 1.39 is the estimated flow-to-performance sensitivity and 'benchmark' is the 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 a firm in the institution's portfolio goes up 100% in value). Dollar incentives equal % incentives × AUM × estimated management fee × 1% (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 (in 2017 dollars).

	Mean	Med	Std	p1	p25	p75	p99
Panel A: Institutions are equal weighted							
AUM ($ million)	5,292	302	47,912	4	113	1,159	75,986
Firms	212	76	429	5	32	175	2,576
%Incentives_Direct	0.0571	0.0319	0.0661	0.0037	0.0175	0.0673	0.3206
%Incentives_Flow	0.0745	0.0387	0.0925	0.0014	0.0189	0.0893	0.4419
%Incentives_Total	0.1316	0.0706	0.1586	0.0056	0.0364	0.1565	0.7631
$Incentives_Direct[1]	4.2	0.5	21.3	0.0	0.2	2.0	62.1
$Incentives_Flow[1]	4.4	0.6	23.0	0.0	0.2	2.3	67.2
$Incentives_Total[1]	8.6	1.2	43.0	0.0	0.4	4.3	127.8
$Incentives_Direct[2]	5.2	0.8	21.3	0.0	0.3	2.9	74.5
$Incentives_Flow[2]	5.9	0.9	26.8	0.0	0.3	3.3	87.5
$Incentives_Total[2]	11.0	1.7	47.7	0.1	0.6	6.3	162.5
Panel B: Institutions are value weighted							
AUM ($ million)	440,450	145,383	571,959	266	23,432	715,484	1,637,891
Firms	1,917	2,036	1,382	14	601	3,236	3,831
%Incentives_Direct	0.0159	0.0061	0.0304	0.0021	0.0049	0.0115	0.1604
%Incentives_Flow	0.0168	0.0028	0.0426	-0.0001	0.0010	0.0110	0.2193
%Incentives_Total	0.0327	0.0087	0.0729	0.0022	0.0059	0.0225	0.3789
$Incentives_Direct[1]	130.8	56.4	150.4	0.3	13.3	271.0	379.0
$Incentives_Flow[1]	53.6	24.7	102.7	-0.5	5.6	66.6	300.4
$Incentives_Total[1]	184.3	81.2	229.5	0.6	20.2	345.4	629.9
$Incentives_Direct[2]	70.9	52.3	89.2	0.5	15.7	92.5	273.3
$Incentives_Flow[2]	41.6	14.1	103.6	-0.5	6.8	35.6	367.2
$Incentives_Total[2]	112.6	70.5	186.9	0.9	24.8	150.2	640.6

[1] Assumes a management fee of 0.5% AUM for all institutions.

[2] Percentage management fees are estimated using the CRSP mutual fund database, either matching institutions to specific fund companies or to size-based quartiles, as described in the text.

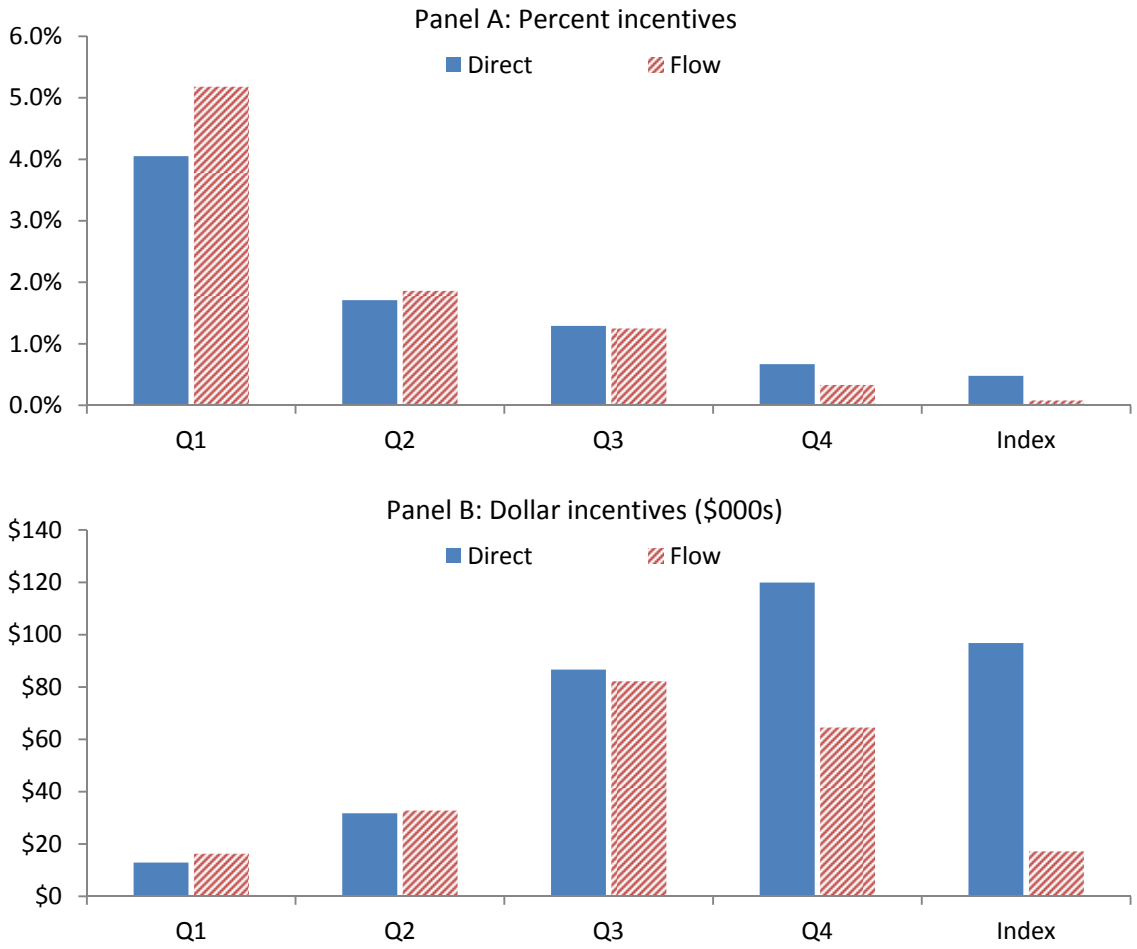

Fig. 2: Institutions' incentives, 2015–2017. The figure plots percent (Panel A) and dollar (Panel B) incentives for institutional investors sorted into indexers and value-weighted size quartiles. The 'index' group includes Schwab, Dimensional, State Street, Blackrock, and Vanguard. The remaining institutions are then sorted into size quartiles, each with 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, allowing for percent management fees to vary across groups as described in the text.

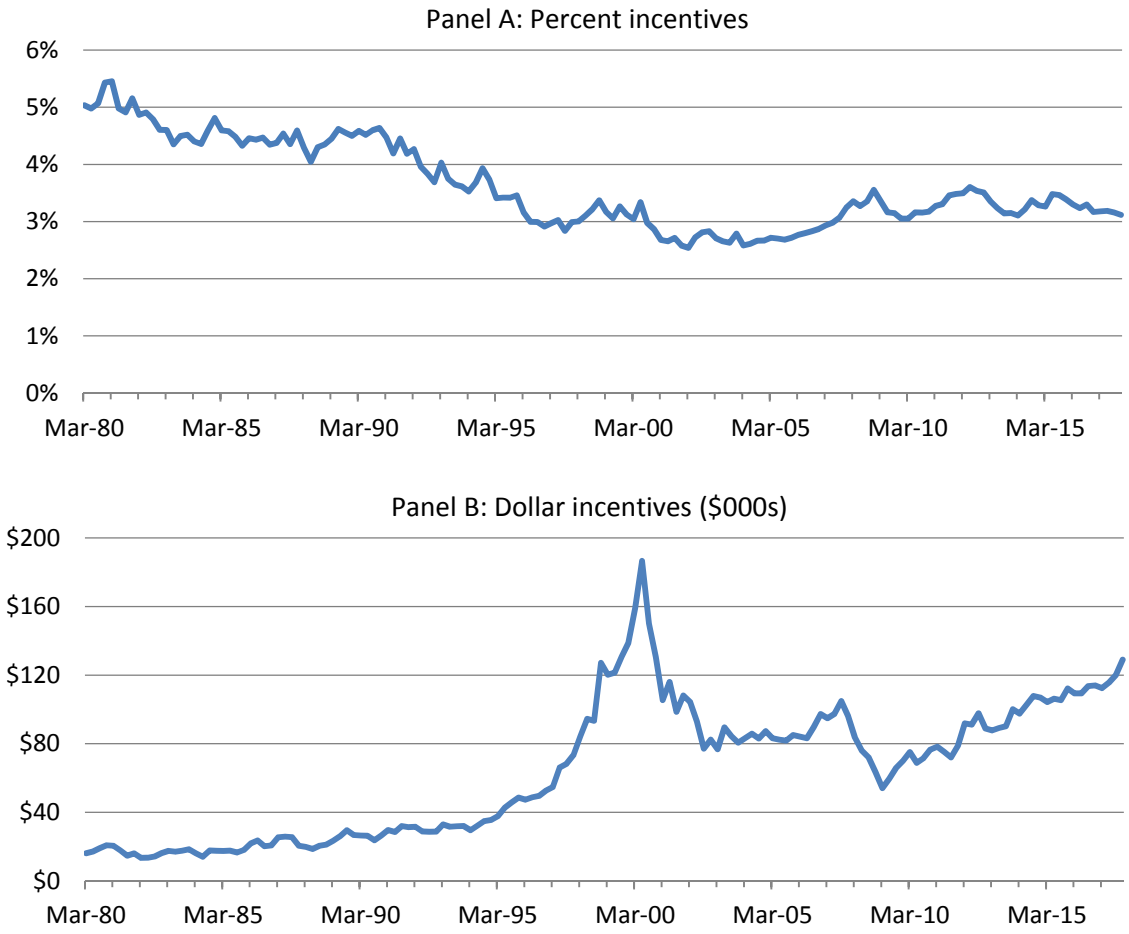

Fig. 3: Institutions' incentives, 1980–2017. The figure plots average percent (Panel A) and dollar (Panel B) incentives for institutional investors, quarterly, from 1980–2017. Institutions are value-weighted, and dollar incentives are measured in 2017 dollars. Incentives measure the impact on annual management fees of a 100% (Panel A) or 1% (Panel B) increase in the value of a firm in the institution's portfolio, allowing for percentage management fees to vary across institutions, as described in the text.

Table 4: Activist investors, 2015–2017

This table reports the cross-sectional distribution (mean, median, std deviation, and 1st, 25th, 75th, and 99th percentiles) of institutions' 13D holdings. An observation corresponds to an investor–quarter–13D filing. Observations are equal-weighted in Panel A and value-weighted in Panel B (based on the value of the 13D holding). 'AUM' and 'Firms' are the institution's total AUM and number of firms held, respectively. '13D holding' is the value (at quarter end) of the stockholding for which the 13D is filed. %Incentives_Direct = weight of the 13D holding in the institution's portfolio; %Incentives_Flow = 1.39 × (portfolio weight – benchmark), where 1.39 is the estimated flow-to-performance sensitivity and 'benchmark' is the 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 fee if the 13D holding doubles in value). Dollar incentives equal % incentives × AUM × estimated management fee × 1% (this represents the dollar increase in annual management fees if the 13D holding goes up 1%). '$Performance fee (ann.)' is the dollar fee resulting from a 1% increase in firm value if the institution gets 20% of the increase, expressed on an annualized basis (for comparability) assuming a 10% interest rate. Dollar incentives are reported in $1,000s (in 2017 dollars).

	Mean	Med	Std	p1	p25	p75	p99
Panel A: 13D holdings are equal weighted							
AUM ($ million)	6,225	1,702	15,906	56	399	9,275	36,436
Firms	161	29	332	5	15	108	756
13D holding ($ million)	175	45	385	1	14	145	1,937
%Incentives_Direct	0.0751	0.0400	0.0914	0.0003	0.0085	0.1098	0.3969
%Incentives_Flow	0.1043	0.0555	0.1270	0.0004	0.0118	0.1525	0.5517
%Incentives_Total	0.1794	0.0955	0.2185	0.0007	0.0204	0.2623	0.9487
$Incentives_Direct[1]	8.7	2.2	19.2	0.1	0.7	7.3	96.9
$Incentives_Flow[1]	12.1	3.1	26.5	0.1	1.0	10.1	134.6
$Incentives_Total[1]	20.8	5.4	45.8	0.2	1.7	17.3	231.5
$Incentives_Direct[2]	12.3	3.2	26.7	0.1	1.0	10.3	136.3
$Incentives_Flow[2]	17.1	4.5	36.8	0.1	1.4	14.2	188.2
$Incentives_Total[2]	29.4	7.7	63.5	0.2	2.4	24.6	324.5
$Incentives_Total[3]	54.2	14.0	119.0	0.4	4.4	45.0	601.9
$Performance fee (ann.)	35.0	9.0	77.0	0.3	2.8	29.0	387.5
$Combined	89.2	23.0	196.0	0.7	7.2	74.0	989.4
Panel B: 13D holdings are value weighted							
AUM ($ million)	12,106	9,275	24,063	183	3,211	13,467	169,300
Firms	131	21	466	6	13	41	3,126
13D holding ($ million)	1,022	722	1,021	14	235	1,439	4,362
%Incentives_Direct	0.1344	0.1091	0.1033	0.0020	0.0517	0.2089	0.4384
%Incentives_Flow	0.1862	0.1514	0.1434	0.0027	0.0718	0.2893	0.6091
%Incentives_Total	0.3206	0.2605	0.2468	0.0047	0.1235	0.4983	1.0475
$Incentives_Direct[1]	51.1	36.1	51.0	0.7	11.7	71.9	218.1
$Incentives_Flow[1]	70.5	49.9	69.9	1.0	16.2	99.1	302.4
$Incentives_Total[1]	121.6	86.0	121.0	1.7	28.0	171.1	520.5
$Incentives_Direct[2]	70.9	51.2	69.2	1.0	16.7	99.2	305.7
$Incentives_Flow[2]	97.8	71.1	95.1	1.4	23.2	137.6	423.9
$Incentives_Total[2]	168.7	122.3	164.3	2.4	39.9	236.8	729.5
$Incentives_Total[3]	316.0	223.6	314.5	4.3	72.7	444.8	1,353.3
$Performance fee (ann.)	204.3	144.3	204.1	2.8	46.9	287.8	872.4
$Combined	520.4	368.0	518.7	7.1	119.7	732.6	2,225.7

[1] Assumes a management fee of 0.5% AUM for all institutions in the sample.

[2] Percentage management fees are estimated using the CRSP mutual fund database, either matching institutions to specific fund companies or to size-based quartiles, as described in the text.

[3] Assumes a management fee of 1.3% AUM for all institutions in the sample.

Table 5: Institutions' incentives by firm, 2015–2017

This table reports the cross-sectional distribution across firms of institutional ownership and incentives. We calculate the variables for each firm (holding-weighted averages, 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 equal-weighted in Panel A and value-weighted in Panel B. %Incentives_Direct = weight of the firm in the institution's portfolio; %Incentives_Flow = 1.39 × (Portfolio weight – benchmark), where 1.39 is the estimated flow-to-performance sensitivity and 'benchmark' is the 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). Dollar incentives equal % incentives × AUM × estimated management fee × 1% (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 (in 2017 dollars).

	Mean	Med	Std	p1	p25	p75	p99
Panel A: Firms are equal weighted							
Size ($ million)	6,425	672	27,236	7	139	2,971	106,020
Institutional investors	186	111	254	4	41	215	1,386
Institutional ownership	0.58	0.65	0.32	0.00	0.30	0.87	1.00
%Incentives_Direct	0.0115	0.0050	0.0224	0.0000	0.0021	0.0116	0.1115
%Incentives_Flow	0.0157	0.0066	0.0311	0.0000	0.0028	0.0154	0.1550
%Incentives_Total	0.0272	0.0116	0.0535	0.0000	0.0049	0.0270	0.2665
$Incentives_Direct[1]	9.7	1.5	33.3	0.0	0.3	6.0	148.0
$Incentives_Flow[1]	6.1	1.4	21.0	0.0	0.3	4.5	80.3
$Incentives_Total[1]	15.8	2.8	52.0	0.0	0.6	10.6	222.2
$Incentives_Direct[2]	6.8	1.4	21.3	0.0	0.3	4.8	92.1
$Incentives_Flow[2]	6.2	1.5	21.2	0.0	0.4	4.9	70.1
$Incentives_Total[2]	13.0	2.9	41.5	0.0	0.7	9.8	160.1
Panel B: Firms are value weighted							
Size ($ million)	121,932	54,014	158,741	452	14,738	169,303	695,507
Institutional investors	1,026	907	662	64	446	1,606	2,335
Institutional ownership	0.72	0.74	0.18	0.12	0.63	0.84	1.00
%Incentives_Direct	0.0163	0.0119	0.0165	0.0015	0.0070	0.0203	0.0789
%Incentives_Flow	0.0170	0.0111	0.0218	0.0019	0.0071	0.0183	0.1075
%Incentives_Total	0.0333	0.0237	0.0378	0.0034	0.0147	0.0403	0.1864
$Incentives_Direct[1]	139.9	72.0	164.3	0.7	22.6	209.4	690.8
$Incentives_Flow[1]	57.4	29.7	74.6	0.6	11.6	79.2	251.8
$Incentives_Total[1]	197.3	107.3	226.6	1.3	36.7	301.9	904.9
$Incentives_Direct[2]	74.6	45.4	85.0	0.7	15.7	105.3	318.2
$Incentives_Flow[2]	43.3	27.2	66.4	0.8	11.9	52.1	246.3
$Incentives_Total[2]	117.9	75.4	143.0	1.5	28.5	162.1	533.8

[1] Assumes a management fee of 0.5% AUM for all institutions.

[2] Percentage management fees are estimated using the CRSP mutual fund database, either matching institutions to specific fund companies or to size-based quartiles, as described in the text.

Table 6: Incentives for the largest institutional shareholders in each firm, 2015–2017

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 (holding-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 equal-weighted in Panel A and value-weighted in Panel B. %Incentives_Direct = weight of the firm in the institution's portfolio; %Incentives_Flow = 1.39×(Portfolio weight – benchmark), where 1.39 is the estimated flow-to-performance sensitivity and 'benchmark' is the 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 shareholders if the firm goes up 100% in value). Dollar incentives equal % incentives × AUM × estimated management fee × 1% (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 (in 2017 dollars).

	Mean	Med	Std	p1	p25	p75	p99
Panel A: Firms are equal weighted							
IO of 5 largest institutions	0.28	0.29	0.14	0.00	0.19	0.36	0.66
%Incentives_Direct	0.0146	0.0037	0.0317	0.0000	0.0009	0.0130	0.1660
%Incentives_Flow	0.0199	0.0048	0.0440	0.0000	0.0010	0.0176	0.2305
%Incentives_Total	0.0345	0.0085	0.0757	0.0000	0.0020	0.0305	0.3965
$Incentives_Direct[1]	20.2	2.5	74.7	0.0	0.4	11.6	347.5
$Incentives_Flow[1]	11.8	2.2	41.0	0.0	0.4	7.8	169.8
$Incentives_Total[1]	32.1	4.7	110.9	0.0	0.8	19.7	497.6
$Incentives_Direct[2]	12.1	2.1	38.9	0.0	0.4	8.2	168.2
$Incentives_Flow[2]	10.9	2.3	37.6	0.0	0.5	7.8	134.1
$Incentives_Total[2]	23.0	4.5	74.5	0.0	1.0	16.2	289.0
Panel B: Firms are value weighted							
IO of 5 largest institutions	0.27	0.26	0.08	0.06	0.22	0.31	0.51
%Incentives_Direct	0.0165	0.0090	0.0259	0.0003	0.0038	0.0175	0.1290
%Incentives_Flow	0.0173	0.0056	0.0358	0.0002	0.0022	0.0137	0.1781
%Incentives_Total	0.0338	0.0147	0.0614	0.0006	0.0065	0.0313	0.3070
$Incentives_Direct[1]	325.3	157.6	395.6	1.2	46.6	470.7	1,693.9
$Incentives_Flow[1]	130.1	62.0	164.7	-5.8	20.9	183.9	619.3
$Incentives_Total[1]	455.3	231.3	534.7	2.2	74.8	694.3	2,272.6
$Incentives_Direct[2]	144.2	85.1	166.4	1.1	27.8	202.5	668.0
$Incentives_Flow[2]	86.9	48.4	129.3	0.8	18.0	104.2	626.2
$Incentives_Total[2]	231.1	139.3	280.0	2.2	48.7	306.9	1,251.7

[1] Assumes a management fee of 0.5% AUM for all institutions.

[2] Percentage management fees are estimated using the CRSP mutual fund database, either matching institutions to specific fund companies or to size-based quartiles, as described in the text.

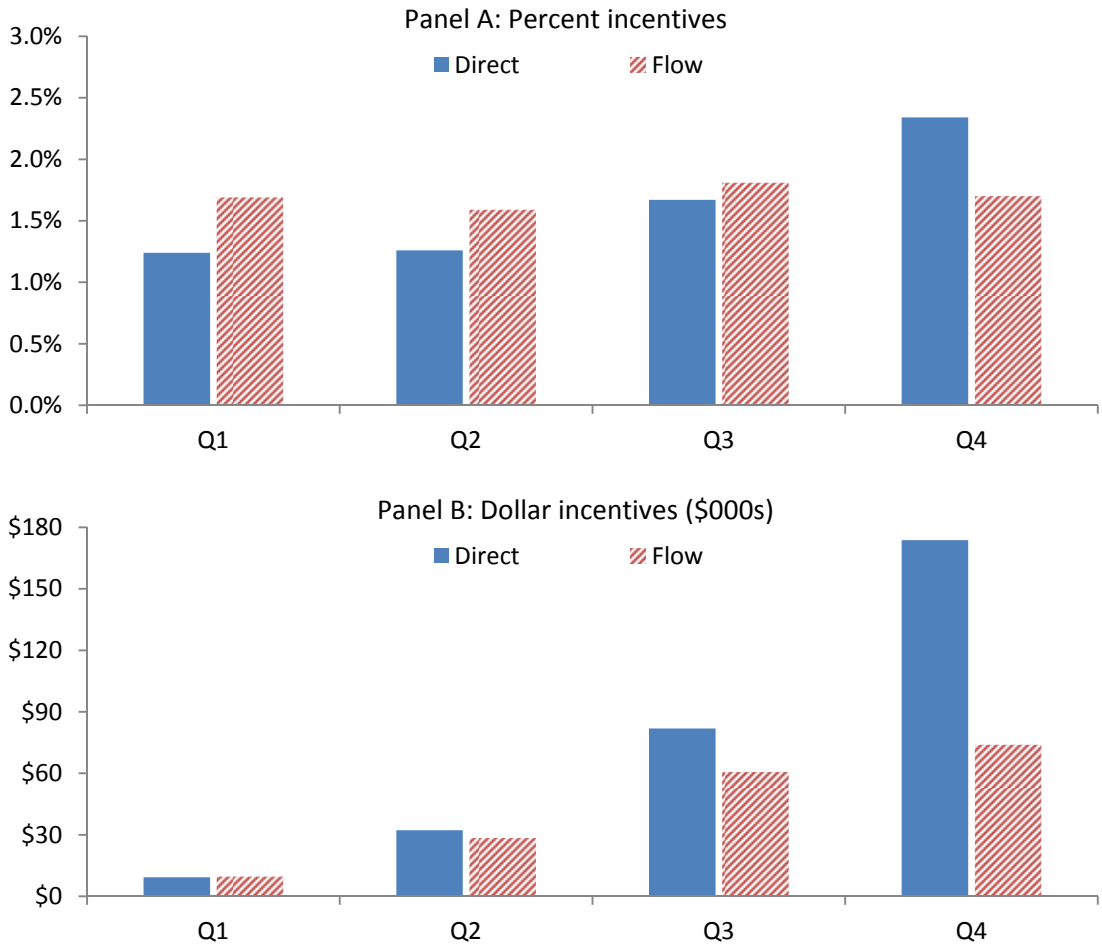

Fig. 4: Incentives vs. firm size, 2015–2017. The figure plots percent (Panel A) and dollar (Panel B) incentives for institutional shareholders for firms sorted into value-weighted size quartiles. Each group has roughly 25% of total market cap. Incentives measure the impact on annual management fees for the average institutional investor if the firm goes up 100% (Panel A) or 1% (Panel B) in value, allowing for percentage management fees to vary across institutions, as described in the text.

Table 7: Own-firm vs. rival incentives, 2015–2017

This table reports institutional incentives for firms in high, medium, and low concentration industries. We calculate the variables for each firm (holding-weighted averages based on institutional ownership) and report the value-weighted cross-sectional distribution of the firm-level estimates. Own-firm incentives represent an institution's gain if that firm increases in value, while rival incentives represent the institution's gain if the firm's competitors increase in value. %Incentives_Direct = weight of the firm (or rival firms) in the institution's portfolio; %Incentives_Flow = 1.39 × (Portfolio weight – benchmark), where 1.39 is the estimated flow-to-performance sensitivity and 'benchmark' is the weight of the firm or of rival firms 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 or rivals go up 100% in value. Dollar incentives equal %incentives×AUM×management fee×1% (this represents the dollar increase in annual management fees if the firm or rivals go up 1% in value. Dollar incentives are reported in $1,000s.

		Mean	Med	Std	p1	p25	p75	p99
Panel A: 3-digit SIC codes with 2–6 firms								
Own-firm incentives	%Incentives_Direct	0.0146	0.0100	0.0161	0.0015	0.0061	0.0171	0.0655
	%Incentives_Total	0.0313	0.0202	0.0377	0.0033	0.0133	0.0357	0.1561
	$Incentives_Direct	49.1	33.0	44.0	0.9	11.6	78.9	139.5
	$Incentives_Total	78.1	56.7	68.1	1.9	21.1	125.5	252.4
Rival incentives	%Incentives_Direct	0.0029	0.0009	0.0044	0.0000	0.0002	0.0030	0.0167
	%Incentives_Flow	0.0015	0.0001	0.0035	-0.0009	0.0000	0.0008	0.0131
	%Incentives_Total	0.0043	0.0011	0.0076	-0.0002	0.0001	0.0036	0.0295
	$Incentives_Direct	24.2	6.2	36.0	0.0	1.4	27.0	126.7
	$Incentives_Flow	7.2	0.1	17.2	-6.4	-0.7	4.8	58.2
	$Incentives_Total	31.4	5.9	52.1	-0.9	0.6	31.3	183.4
	Negative flow incentives	0.6529	0.6762	0.1889	0.2751	0.4912	0.8151	0.9813
	Negative total incentives	0.4618	0.4401	0.2214	0.0962	0.2914	0.6118	0.9748
Panel B: 3-digit SIC codes with 7–18 firms								
Own-firm incentives	%Incentives_Direct	0.0131	0.0100	0.0142	0.0014	0.0061	0.0153	0.0626
	%Incentives_Total	0.0283	0.0204	0.0338	0.0033	0.0126	0.0316	0.1479
	$Incentives_Direct	41.9	33.3	37.4	0.9	12.7	55.5	148.1
	$Incentives_Total	69.8	56.1	64.7	1.8	23.2	92.4	298.4
Rival incentives	%Incentives_Direct	0.0076	0.0051	0.0077	0.0002	0.0021	0.0102	0.0363
	%Incentives_Flow	0.0035	0.0009	0.0073	-0.0028	0.0000	0.0031	0.0336
	%Incentives_Total	0.0110	0.0063	0.0145	-0.0007	0.0023	0.0126	0.0689
	$Incentives_Direct	55.0	40.4	50.1	1.2	15.6	82.0	211.2
	$Incentives_Flow	6.5	1.3	20.0	-26.4	-2.2	7.7	91.3
	$Incentives_Total	61.5	43.5	63.6	-0.6	14.2	85.8	277.5
	Negative flow incentives	0.5624	0.5575	0.1572	0.2458	0.4397	0.6819	0.8870
	Negative total incentives	0.2962	0.2636	0.1507	0.0778	0.1819	0.3747	0.7715
Panel C: 3-digit SIC codes with 19 or more firms								
Own-firm incentives	%Incentives_Direct	0.0175	0.0129	0.0168	0.0015	0.0077	0.0234	0.0849
	%Incentives_Total	0.0348	0.0256	0.0382	0.0035	0.0157	0.0418	0.2008
	$Incentives_Direct	89.5	56.8	96.3	0.7	18.2	125.3	318.2
	$Incentives_Total	139.9	90.6	163.2	1.4	32.8	185.3	562.5
Rival incentives	%Incentives_Direct	0.0470	0.0304	0.0403	0.0020	0.0141	0.0781	0.1571
	%Incentives_Flow	0.0115	0.0044	0.0279	-0.0226	0.0011	0.0131	0.1309
	%Incentives_Total	0.0585	0.0383	0.0618	0.0013	0.0162	0.0911	0.2847
	$Incentives_Direct	414.6	265.0	361.6	11.6	118.3	687.1	1,321.7
	$Incentives_Flow	32.3	12.1	79.4	-152.5	-9.5	59.3	324.5
	$Incentives_Total	446.9	292.9	405.7	7.5	118.3	734.1	1,554.3
	Negative flow incentives	0.5034	0.5154	0.1587	0.1302	0.3913	0.6187	0.8263
	Negative total incentives	0.1395	0.1060	0.1130	0.0072	0.0594	0.1854	0.5408

Percentage management fees are estimated using the CRSP mutual fund database, either matching institutions to specific fund companies or to size-based quartiles, as described in the text.

Table 8: Own-firm vs. rival incentives, alternative industry concentration measures, 2015–2017

This table reports institutional incentives for firms in high, medium, and low concentration industries defined by four-firm sales concentration ratios (Panel A) or number of Hoberg–Phillips competitors (Panel B). We calculate the variables for each firm (holding-weighted averages based on institutional ownership) and report the value-weighted cross-sectional mean of the firm-level estimates. Own-firm incentives represent an institution's gain if that firm increases in value, while rival incentives represent the institution's gain if the firm's competitors increase in value. %Incentives_Direct = weight of the firm (or rival firms) in the institution's portfolio; %Incentives_Flow = 1.39 × (Portfolio weight – benchmark), where 1.39 is the estimated flow-to-performance sensitivity and 'benchmark' is the weight of the firm or of rival firms 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 or rivals go up 100% in value. Dollar incentives equal % incentives × AUM × estimated management fee × 1% (this represents the dollar increase in annual management fees if the firm or rivals go up 1% in value. Dollar incentives are reported in $1,000s.

	Most concentrated		Middle		Least concentrated	
	Own	Rival	Own	Rival	Own	Rival
Panel A: 3-digit SIC codes sorted by 4-firm concentration ratio: more than 80% vs. 50–80% vs. less than 50%						
%Incentives_Direct	0.0150	0.0064	0.0166	0.0404	0.0173	0.0588
%Incentives_Flow	0.0158	0.0017	0.0165	0.0079	0.0190	0.0204
%Incentives_Total	0.0309	0.0081	0.0331	0.0483	0.0363	0.0792
$Incentives_Direct*	66.8	54.9	78.1	380.8	78.7	455.1
$Incentives_Flow*	38.4	4.4	39.4	31.3	57.7	36.0
$Incentives_Total*	105.3	59.3	117.6	412.1	136.4	491.1
Benchmark weight	0.0037	0.0051	0.0047	0.0348	0.0036	0.0441
Negative flow incentives	0.2111	0.5786	0.2324	0.5244	0.2119	0.4814
Negative total incentives	0.0555	0.3334	0.0555	0.1681	0.0568	0.1037
Panel B: Firms sorted by number of Hoberg-Phillips competitors: 1–5 firms vs. 6–17 firms vs. 18 or more firms						
%Incentives_Direct	0.0125	0.0027	0.0177	0.0111	0.0158	0.0501
%Incentives_Flow	0.0136	0.0011	0.0196	0.0033	0.0153	0.0144
%Incentives_Total	0.0262	0.0039	0.0373	0.0144	0.0311	0.0645
$Incentives_Direct*	50.2	23.0	73.9	96.0	81.0	443.5
$Incentives_Flow*	28.7	4.5	50.1	10.4	40.9	47.2
$Incentives_Total*	78.9	27.5	124.1	106.5	121.9	490.7
Benchmark weight	0.0027	0.0019	0.0036	0.0087	0.0048	0.0397
Negative flow incentives	0.2126	0.6208	0.2187	0.5251	0.2364	0.4433
Negative total incentives	0.0570	0.4275	0.0606	0.2504	0.0523	0.1093

Percentage management fees are estimated using the CRSP mutual fund database, either matching institutions to specific fund companies or to size-based quartiles, as described in the text.

Table 9: Own-firm vs. rival incentives for the largest shareholders, 2015–2017

This table reports incentives for the five institutions with the largest holdings in each firm for firms in high, medium, and low concentration industries. We calculate the variables for each firm (holding-weighted averages based on institutional ownership) and report the value-weighted cross-sectional mean of the firm-level estimates. Industries are defined by 3-digit SIC code in Panels A and B and by number of Hoberg–Phillips competitors in Panel C. Own-firm incentives represent an institutions' gain if that firm increases in value, while rival incentives represent the institutions' gain if the firm's competitors increase in value. %Incentives_Direct = weight of the firm (or rival firms) in the institution's portfolio; %Incentives_Flow = 1.39 × (Portfolio weight – benchmark), where 1.39 is the estimated flow-to-performance sensitivity and 'benchmark' is the weight (of the firm or of rival firms) 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 (for own-firm incentives) or if rival firms go up 100% in value (for rival-firm incentives)). Dollar incentives equal % incentives × AUM × estimated management fee × 1% (this represents the dollar increase in annual management fees if the firm goes up 1% in value (own-firm incentives) or rival firms go up 1% in value (rival-firm incentives)). Dollar incentives are reported in $1,000s (in 2017 dollars).

	Most concentrated		Middle		Least concentrated	
	Own	Rival	Own	Rival	Own	Rival
Panel A: 3-digit SIC codes sorted by number of firms: 2–6 firms vs. 7–18 firms vs. 19 or more firms						
%Incentives_Direct	0.0139	0.0027	0.0134	0.0078	0.0178	0.0461
%Incentives_Flow	0.0158	0.0012	0.0157	0.0038	0.0179	0.0101
%Incentives_Total	0.0297	0.0039	0.0292	0.0117	0.0357	0.0562
$Incentives_Direct*	90.3	45.6	79.2	100.4	174.3	765.6
$Incentives_Flow*	54.2	16.2	54.4	11.5	102.5	55.4
$Incentives_Total*	144.5	61.8	133.7	112.0	276.8	821.0
Benchmark weight	0.0026	0.0018	0.0021	0.0051	0.0050	0.0388
Negative flow incentives	0.1786	0.5947	0.2042	0.5035	0.1960	0.5123
Negative total incentives	0.0043	0.3370	0.0075	0.1938	0.0077	0.0806
Panel B: 3-digit SIC codes sorted by 4-firm concentration ratio: more than 80% vs. 50–80% vs. less than 50%						
%Incentives_Direct	0.0153	0.0063	0.0163	0.0394	0.0188	0.0582
%Incentives_Flow	0.0162	0.0017	0.0162	0.0064	0.0213	0.0193
%Incentives_Total	0.0314	0.0080	0.0325	0.0458	0.0401	0.0775
$Incentives_Direct*	127.1	100.4	152.9	719.7	151.9	810.2
$Incentives_Flow*	78.5	10.6	79.4	52.3	114.2	60.2
$Incentives_Total*	205.6	111.0	232.3	772.0	266.0	870.4
Benchmark weight	0.0036	0.0051	0.0047	0.0348	0.0035	0.0443
Negative flow incentives	0.1701	0.5124	0.2260	0.5356	0.1785	0.5051
Negative total incentives	0.0039	0.2289	0.0091	0.1028	0.0086	0.0503
Panel C: Firms sorted by number of Hoberg-Phillips competitors: 1–5 firms vs. 6–17 firms vs. 18 or more firms						
%Incentives_Direct	0.0120	0.0027	0.0170	0.0109	0.0160	0.0488
%Incentives_Flow	0.0128	0.0010	0.0188	0.0031	0.0156	0.0127
%Incentives_Total	0.0249	0.0037	0.0358	0.0140	0.0316	0.0615
$Incentives_Direct*	95.5	42.8	139.6	177.8	158.6	817.7
$Incentives_Flow*	58.0	10.0	96.3	21.1	84.4	87.7
$Incentives_Total*	153.5	52.8	235.9	198.9	243.0	905.4
Benchmark weight	0.0028	0.0019	0.0035	0.0087	0.0048	0.0397
Negative flow incentives	0.1789	0.5349	0.1675	0.4872	0.2313	0.4079
Negative total incentives	0.0061	0.2985	0.0102	0.1677	0.0049	0.0506

* Percentage management fees are estimated using the CRSP mutual fund database, either matching institutions to specific fund companies or to size-based quartiles, as described in the text.

Table 10: Own-firm vs. rival incentives for institutions' largest holdings, 2015–2017

This table reports incentives for institutions' largest holdings in high, medium, and low concentration industries. We calculate holding-weighted averages for each institution, keeping only the institution's largest holding in each 3-digit SIC code, and report the cross-sectional distribution of the institution-level estimates. Own-firm incentives represent an institution's gain if that firm increases in value, while rival incentives represent the institution's gain if the firm's competitors increase in value. %Incentives_Direct = weight of the firm (or rival firms) in the institution's portfolio; %Incentives_Flow = 1.39 × (Portfolio weight – benchmark), where 1.39 is the estimated flow-to-performance sensitivity and 'benchmark' is the weight of the firm or of rival firms 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 or rivals go up 100% in value. Dollar incentives equal %incentives×AUM×management fee×1% (this represents the dollar increase in annual management fees if the firm or rivals go up 1% in value. Dollar incentives are reported in $1,000s.

		Mean	Med	Std	p1	p25	p75	p99
Panel A: 3-digit SIC codes with 2–6 firms								
Own-firm incentives	%Incentives_Direct	0.0098	0.0046	0.0208	0.0013	0.0036	0.0083	0.0877
	%Incentives_Total	0.0200	0.0072	0.0499	0.0020	0.0048	0.0169	0.2067
	$Incentives_Direct	50.0	37.4	50.2	0.3	10.2	71.1	193.7
	$Incentives_Total	80.6	57.6	90.5	0.5	17.7	106.6	385.3
Rival incentives	%Incentives_Direct	0.0014	0.0012	0.0030	0.0000	0.0006	0.0014	0.0081
	%Incentives_Flow	0.0000	-0.0002	0.0040	-0.0041	-0.0007	0.0002	0.0083
	%Incentives_Total	0.0014	0.0009	0.0070	-0.0040	-0.0001	0.0015	0.0165
	$Incentives_Direct	13.2	7.8	16.4	0.0	0.9	17.6	67.5
	$Incentives_Flow	0.1	-0.4	12.6	-27.6	-2.6	1.4	50.4
	$Incentives_Total	13.3	4.0	25.5	-15.9	-0.1	19.2	116.3
	Negative flow incentives	0.7352	0.7446	0.1876	0.3421	0.5936	0.8901	1.0000
	Negative total incentives	0.5381	0.5436	0.3004	0.0463	0.2883	0.7823	1.0000
Panel B: 3-digit SIC codes with 7–18 firms								
Own-firm incentives	%Incentives_Direct	0.0124	0.0048	0.0248	0.0025	0.0037	0.0099	0.1215
	%Incentives_Total	0.0262	0.0080	0.0597	0.0035	0.0049	0.0206	0.2884
	$Incentives_Direct	54.7	40.3	56.6	0.3	13.6	77.0	248.4
	$Incentives_Total	91.1	56.6	111.6	0.7	23.9	138.8	564.3
Rival incentives	%Incentives_Direct	0.0042	0.0035	0.0080	0.0000	0.0030	0.0039	0.0249
	%Incentives_Flow	0.0002	-0.0005	0.0108	-0.0081	-0.0014	-0.0001	0.0273
	%Incentives_Total	0.0044	0.0031	0.0187	-0.0078	0.0017	0.0037	0.0519
	$Incentives_Direct	37.0	26.4	39.0	0.0	5.0	51.6	131.2
	$Incentives_Flow	-4.6	-2.8	17.8	-36.4	-10.1	-0.2	36.5
	$Incentives_Total	32.4	19.5	42.0	-9.7	2.8	46.1	120.9
	Negative flow incentives	0.6698	0.6671	0.1591	0.3630	0.5367	0.7779	1.0000
	Negative total incentives	0.3870	0.3787	0.2849	0.0085	0.0910	0.5746	1.0000
Panel C: 3-digit SIC codes with 19 or more firms								
Own-firm incentives	%Incentives_Direct	0.0233	0.0132	0.0333	0.0054	0.0117	0.0187	0.1822
	%Incentives_Total	0.0461	0.0204	0.0810	0.0099	0.0154	0.0361	0.4315
	$Incentives_Direct	144.4	103.9	156.7	0.6	28.6	173.3	458.3
	$Incentives_Total	228.7	153.1	287.3	1.2	50.2	287.5	1006.7
Rival incentives	%Incentives_Direct	0.0286	0.0251	0.0192	0.0060	0.0237	0.0289	0.1021
	%Incentives_Flow	0.0005	-0.0021	0.0250	-0.0347	-0.0041	0.0005	0.0884
	%Incentives_Total	0.0291	0.0228	0.0438	-0.0231	0.0201	0.0285	0.1912
	$Incentives_Direct	275.4	200.5	295.1	0.2	41.4	349.6	953.9
	$Incentives_Flow	-9.6	-8.0	58.3	-120.3	-36.8	0.9	156.8
	$Incentives_Total	265.7	192.7	300.6	-20.8	33.9	319.2	1040.9
	Negative flow incentives	0.6285	0.6297	0.1411	0.2925	0.5429	0.6961	1.0000
	Negative total incentives	0.2264	0.1572	0.2261	0.0011	0.0170	0.3628	0.9233

Percentage management fees are estimated using the CRSP mutual fund database, either matching institutions to specific fund companies or to size-based quartiles, as described in the text.

Table 11: Own-firm vs. rival incentives in concentrated industries, indexers vs. other institutions, 2015–2017
This table reports incentives for the five 'index' institutions (Schwab, Dimensional, State Street, Blackrock, Vanguard) compared with all other institutions for firms in the most-concentrated industries (number of competitors < 6 or four-firm concentration ratio > 0.80). We calculate the variables for each firm (holding-weighted averages based on institutional ownership) and report the value-weighted cross-sectional mean of the firm-level estimates. Industries are defined by 3-digit SIC code in Panels A and B and Hoberg–Phillips industries in Panel C. Own-firm incentives represent an institutions' gain if that firm increases in value, while rival incentives represent the institutions' gain if the firm's competitors increase in value. %Incentives_Direct = weight of the firm (or rival firms) in the institution's portfolio; %Incentives_Flow = 1.39 × (Portfolio weight – benchmark), where 1.39 is the estimated flow-to-performance sensitivity and 'benchmark' is the weight (of the firm or of rival firms) 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 (for own-firm incentives) or if rival firms go up 100% in value (for rival-firm incentives)). Dollar incentives equal % incentives × AUM × estimated management fee × 1% (this represents the dollar increase in annual management fees if the firm goes up 1% in value (own-firm incentives) or rival firms go up 1% in value (rival-firm incentives)). Dollar incentives are reported in $1,000s (in 2017 dollars).

	Indexers		Other institutions	
	Own	Rival	Own	Rival
Panel A: 3-digit SIC codes with 2–6 firms				
%Incentives_Direct	0.0033	0.0020	0.0235	0.0031
%Incentives_Flow	0.0009	0.0002	0.0291	0.0018
%Incentives_Total	0.0042	0.0022	0.0526	0.0049
$Incentives_Direct*	64.8	40.7	43.9	18.7
$Incentives_Flow*	15.6	4.6	34.9	7.9
$Incentives_Total*	80.4	45.3	78.9	26.6
Benchmark weight	0.0027	0.0019	0.0026	0.0018
Negative flow incentives	0.4059	0.5354	0.1741	0.6935
Negative total incentives	0.0962	0.1402	0.0618	0.5590
Panel B: 3-digit SIC codes with four-firm concentration greater than 80%				
%Incentives_Direct	0.0045	0.0055	0.0258	0.0065
%Incentives_Flow	0.0011	0.0005	0.0308	0.0019
%Incentives_Total	0.0056	0.0060	0.0567	0.0085
$Incentives_Direct*	91.0	109.9	59.7	36.1
$Incentives_Flow*	22.9	9.2	46.9	2.6
$Incentives_Total*	113.9	119.0	106.6	38.7
Benchmark weight	0.0037	0.0051	0.0036	0.0051
Negative flow incentives	0.3636	0.4512	0.1897	0.6288
Negative total incentives	0.0789	0.0673	0.0642	0.4203
Panel C: Firms with 1–5 Hoberg-Phillips competitors				
%Incentives_Direct	0.0034	0.0021	0.0152	0.0029
%Incentives_Flow	0.0009	0.0002	0.0173	0.0014
%Incentives_Total	0.0043	0.0022	0.0326	0.0044
$Incentives_Direct*	68.4	41.4	41.2	17.0
$Incentives_Flow*	18.4	3.3	29.5	5.0
$Incentives_Total*	86.8	44.7	70.7	22.1
Benchmark weight	0.0028	0.0019	0.0028	0.0019
Negative flow incentives	0.3434	0.4747	0.1903	0.6701
Negative total incentives	0.0417	0.1194	0.0676	0.5226

* Percentage management fees are estimated using the CRSP mutual fund database, either matching institutions to specific fund companies or to size-based quartiles, as described in the text.

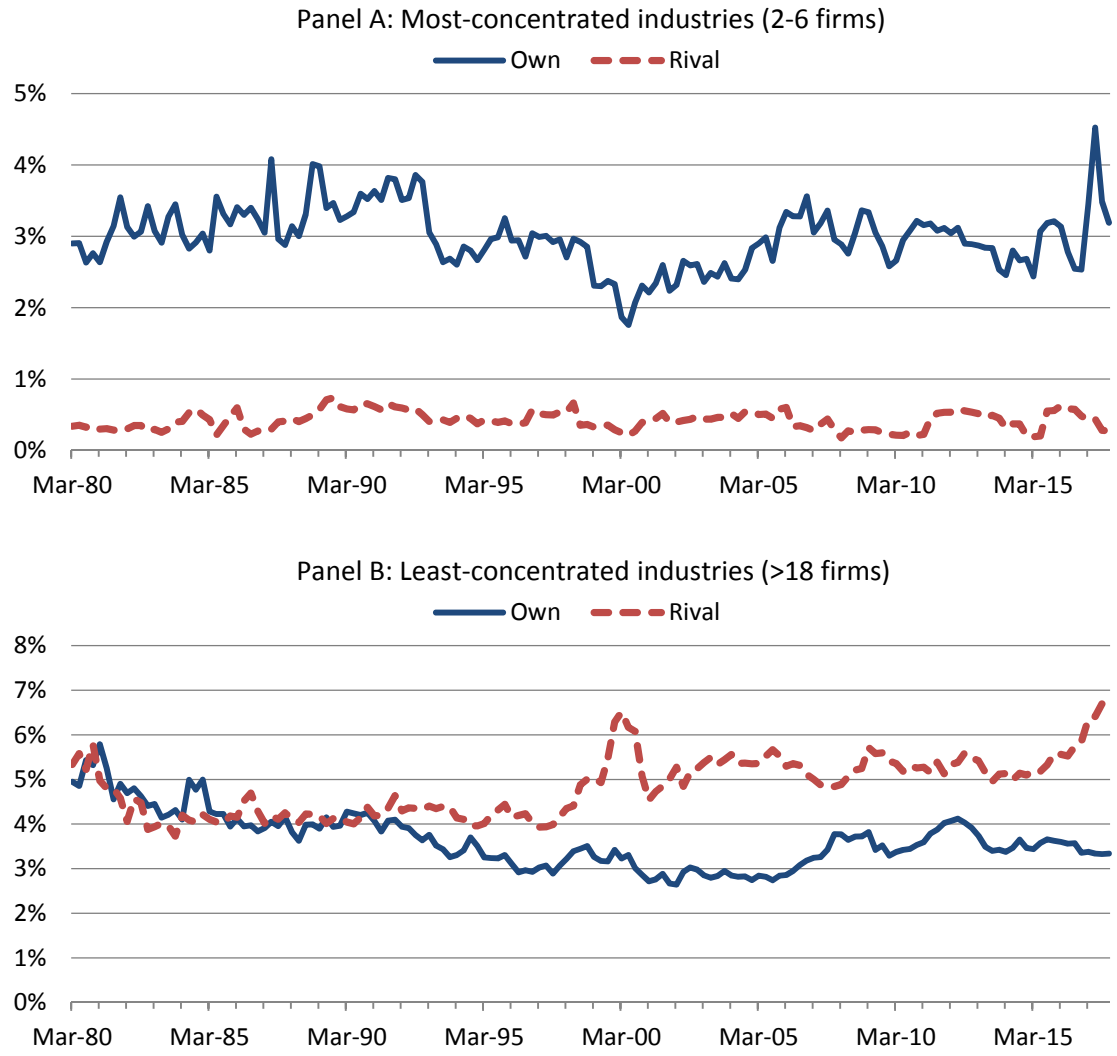

Fig. 5: Own-firm vs. rival incentives, 1980–2017. The figure plots average percent incentives for institutional investors in industries (3-digit SIC codes) with 2–6 firms (Panel A) or greater than 18 firms (Panel B), quarterly, from 1980–2017. Institutions are value-weighted. Incentives equal the percent 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.

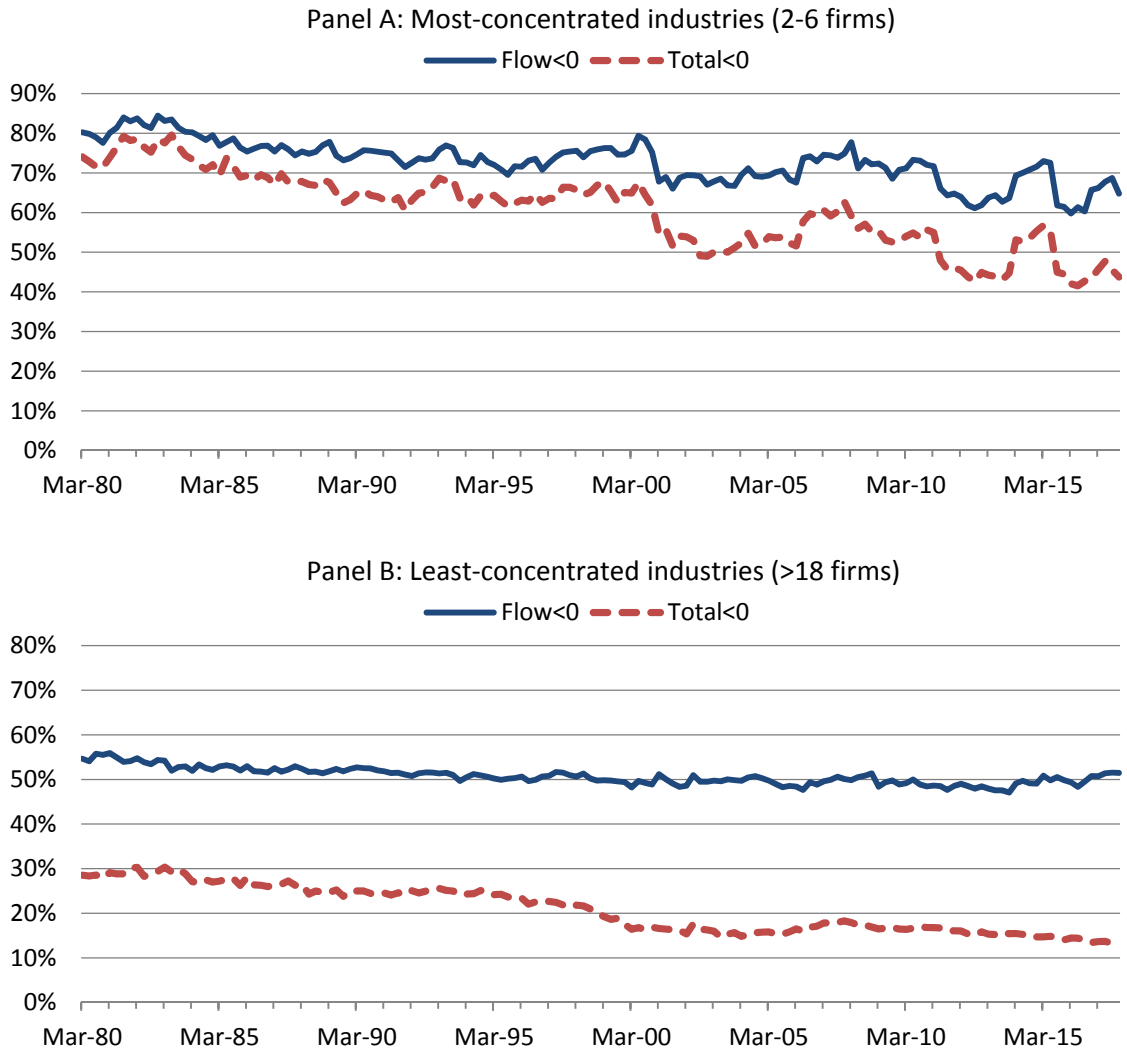

Fig. 6: Frequency of negative rival incentives, 1980–2017. The figure plots the fraction of institution-held shares for which the institution has rival flow incentives that are negative (the institution underweights rivals) or rival total incentives that are negative (the institution gains if rival firms drop in value). Panel A shows results for industries (3-digit SIC codes) with 2–6 firms and Panel B shows results for industries with greater than 18 firms.