

**Durable Dominance:**

**Dominant Mutual Funds Benefit from Increased Competitive Entry**

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**ABSTRACT**

A few large mutual funds, and the asset management firms that offer them, have consistently attracted a disproportionately large share of investor money, even as many similar competitors entered the market. The continued dominance of these funds and management firms in the face of increased competition belies predictions from straightforward application of established theories of industry disruption, structural advantage, and capability-based competition. This study proposes an explanation for such durable dominance, theorizing that increased competitive entry in an industry *benefits* and *entrenches* dominants. Regression analysis using thirty years of data on competition among mutual funds supports the theoretical predictions: While increased entrepreneurial entry reduced investment flows into incumbent funds on average, dominant mutual funds—those with order of magnitude higher assets under management compared to competitors with similar portfolio holdings—benefited from increased competition. Heightened entrepreneurial entry of similar competitors increased asset flows into dominant funds and entrenched them in their dominant positions. Such non-linear effects of increased competition may apply in a variety of settings.

Schumpeter famously argued that monopolistic structures in capitalist economies contained the seeds of their own “creative destruction”, providing an engine for continued innovation. The existence of a dominant firm provided the profits necessary to fund the development of industry-changing innovations, and the possibility of usurping a dominant industry position and appropriating monopoly profits motivated entrepreneurs to enter the industry. This viewpoint of repeated, innovation-driven industry disruption has become a recurrent theme in management discourse, especially after the attention-grabbing success of venture capital-funded, technology-based startups in the 1990s. Seminal studies portrayed a hyper-competitive world where dominant advantage was ever more fleeting. As the number of competitors and the pace of innovation increased, dominant companies needed to continually out-innovate these competitors or fall from their positions (D’Aveni, 1994). Dominant companies were often ill-equipped to embrace disruptive innovations, however, because dominants were constrained by the demands of their existing large customer base (Christensen and Bower, 1996).

Earlier management studies focused on stable industry structures between disruptions, and often sought to explain how dominant companies maintained their dominance. The structure-conduct-performance paradigm (Bain, 1968; Mason, 1939; Hunt, 1972) undergirded Porter’s (1980) influential viewpoint on competitive strategy, which asserted that industry structure (especially barriers to entry into the industry and between segments of the industry) explained sustained competitive advantage. Others asserted a stronger role for idiosyncratic firm characteristics, arguing that market dominance was the result of dominant firms’ sustained innovation (Stigler, 1968; Demsetz, 1973). Some posited that better-structured firms could maintain their advantage, with “better” defined variously, for example, as minimizing transaction

costs viz a viz the market (Williamson, 1991) or as optimally aligning principal-agent interests (Fama and Jensen, 1983). Some scholars asserted that sustained competitive advantage was possible if, and only if, dominants controlled unique resources (Penrose, 1959; Wernerfelt, 1984; Barney, 1991).

There are settings, however, where increased competition does not lead to the decline of dominants, and where such durable dominance cannot be attributed to the existence of structural barriers to entry and movement, better organization of dominants, or monopolization of resources. In the mutual fund industry, for example, Fidelity and Vanguard have maintained their dominance from the late 1970s onwards, even as the number of mutual funds offered in the United States increased 30-fold and the number of fund management companies quadrupled. Their durable dominance—dominance that endures in the face of mass competitive entry—cannot be easily explained by established theories of industry organization and competitive advantage. Barriers to entry were low and the resources needed to operate a mutual fund plentiful. Furthermore, no particular firm structure was correlated with dominance.

This paper proposes a new explanation for durable dominance in the mutual fund industry. I argue that the effect of increased competitive entry is non-linear, disadvantaging non-dominant funds and benefiting dominant funds, and test this prediction with historical data on investments into mutual funds. In the following section, I describe the mutual fund market in the United States, and consider explanations for durable dominance in this market from established theories of industry structure and firm heterogeneity. Next, I propose theory that predicts dominant mutual funds will benefit from increased competitive entry. This prediction results from considering the highly-skewed distribution of mutual funds' assets under management—the few dominant mutual funds dwarf their multitudinous competitors by at least

an order of magnitude. The theory's predictions are borne out in analysis using three decades of data covering over 5,000 mutual funds. I close by arguing that the theory's predictions—dominants benefiting from increased competition— should apply widely in a variety of modern settings.

### **THE PARADOX OF DURABLE DOMINANCE IN MUTUAL FUNDS**

Mutual funds have grown to occupy a central place in the U.S. economy. As of 2009, \$11.1 trillion was invested in U.S. mutual funds. This figure corresponded to more than one fifth of total U.S. household net worth, which stood at \$54.2 trillion. Mutual funds were not always so consequential, however. Mutual funds managed only \$51 billion in 1976, less than 1% of the total U.S. household net worth of \$5.8 trillion<sup>1</sup>. The tremendous growth (17.7% CAGR during the 33 years from 1976 to 2009) in mutual funds' assets under management was driven by several factors. The 1980s and 1990s were bull markets for both stocks and bonds, making them attractive alternatives to traditional bank offerings. More importantly, during this period, employer-managed, defined-benefit retirement plans were largely superseded by newly-available employee-managed, defined-contribution plans, such as 401(k)s and IRAs. 401(k) plans were first offered in 1982, and became hugely popular after the passage of the Tax Reform Act of 1986<sup>2</sup>. The 1986 Tax Reform Act also introduced individual retirement accounts (IRAs). By 2009, \$4 trillion was held in defined contribution plans (401(k), 403(b), 457) and another \$4.4 trillion in IRAs. Mutual funds managed a large portion of the assets in these self-managed retirement plans. Fifty-five percent of the assets in defined contribution plans and 45% of the

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<sup>1</sup> Data on investments in mutual funds and defined contribution plans from Investment Company Institute Fact Book (2012, 2010). Data on U.S. household net worth published by the Federal Reserve, downloaded from <http://www.federalreserve.gov/releases/Z1/20100311/z1r-1.pdf>, <http://.../Current/annuals/a1975-1984.pdf>.

<sup>2</sup> Employee Benefit Research Institute (2005), downloaded from <http://www.ebri.org/pdf/publications/facts/0205fact.a.pdf>.

assets in IRAs were held in mutual funds at the end of 2009. Innovation in the types of funds available was another factor driving demand (and vice versa). Money market, index, tax-exempt bond, sector, international, target date, and exchange-traded funds were all introduced in the late 1970s to 1990s.

Burgeoning consumer demand and an increased supply of experienced fund management professionals created a surge of entrepreneurial entry into the mutual fund management market. The number of asset management firms offering mutual funds increased from 134 to 584 from 1976 to 2009 (Khorana and Servaes, 2012). Accounting for exits, the number of new asset management firms entering the market during this period was in the thousands. The number of mutual funds also increased dramatically, as new entrants and incumbent management firms competed to offer more choices to investors. The number of open-end mutual funds increased from 385 in 1976 to 11,452 in 2009, a compound annual growth rate of 10.9% sustained over more than 30 years<sup>3</sup>.

Mutual funds, and the asset management firms that manage them, compete against each other to secure investor assets to manage. Yet despite the influx of new competitors and innovations, the top asset management firms maintained dominance. The top five firms collectively have continuously controlled more than 30% of total investor assets. Fidelity and Vanguard increased their shares of total investor assets under management from 6% and 3.6% respectively in 1976 to about 12% each in 2009 (Khorana and Servaes, 2012). Such continued dominance may suggest that the market for investors' assets was not competitive—perhaps because of “stickiness” of already-invested funds. Prominent critics (Bogle, 2003; Swensen, 2005; Spitzer, 2004; Freeman and Brown, 2001) argued that mutual funds did not compete in a

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<sup>3</sup> My analysis using data from Khorana and Servaes, 2012.

competitive market. Others (e.g., Coates and Hubbard, 2007; Wahal and Wang, 2011; Khorana and Servaes, 2012) responded, however, with economic arguments and empirical evidence suggesting that the mutual fund market was indeed a competitive market. Wahal and Wang's (2011) study was particularly suasive. They developed a portfolio-overlap measure of competitive intensity between incumbents and new entrants, and found that, after 1998, “[i]ncumbents that have a high overlap with entrants subsequently ... experience quantity competition through lower investor flows, have lower alphas, and higher attrition rates” (Wahal and Wang, 2011: 40).

How did Fidelity and Vanguard maintain their dominance even as many new competitors entered the competitive market? Established theories of performance heterogeneity suggest three bases of sustained competitive advantage: better organization, control of a protected market position, and monopolization of key resources. Yet straightforward application of these theories does not provide a satisfactory explanation for the top asset management firms' continued dominance.

Dominant firms may maintain dominance because their governance structures are superior to competitors. Structures may be better adapted to their environments (Thompson, 1967), minimize transaction costs (Williamson, 1991), resolve agency conflicts (Fama and Jensen, 1983), or allow for strategic flexibility (Teece, Pisano, and Shuen, 1997; Eisenhardt and Martin, 2000). The most salient structural differences between funds do not seem to explain dominance in the mutual fund market, however. By law and custom, the structure of mutual funds in the United States is uniform. Mutual funds are registered as corporations or business trusts, but typically have no employees. Instead, the mutual fund contracts with service providers to manage the fund, market to investors, and perform needed administrative and legal work.

These services are often provided by the asset management firms that offer the funds to investors. Asset management firms, on the other hand, do differ widely in how they are structured. No particular governance structure is correlated with dominance, however. Fidelity is family-controlled, with the Johnson family controlling almost half the voting shares, and the remaining stock owned by Fidelity employees. Vanguard is structured as a mutual company, owned by its funds, and indirectly its funds' investors. American Funds, with the third-largest assets under management, is a subsidiary of the Capital Group, which is privately owned. Other large and long-lived asset management firms, such as Franklin Templeton Investments and T. Rowe Price, are publicly traded.

Dominant mutual funds and asset management firms may still possess better governance structures, but in less externally visible ways. Siggelkow (2002) examined the Vanguard group, finding that its organizational configuration evolved over time. Dominant mutual funds or asset management firms may be those which have had the longest time to evolve. Alternatively, or in addition, dominant firms and funds may each possess an organizational structure that provides competitive advantage in its own way. Such idiosyncratic structures would, however, be difficult to disentangle from other properties of the individual fund or firm, and almost impossible to generalize to other funds and firms.

Beyond organizational structure, strategy scholars typically classify sources of firms' performance advantage (most often profit, but sometimes revenue or market share) as stemming from either privileged market positions or control of unique resources (e.g., Cool, Costa, and Dierickx, 2002). After the early 1980s, the barriers to entry into the mutual fund market were low. There were many experienced managers interested in starting new funds (Kacperczyk, 2012), and the hurdle for initial investment was low at only \$100,000 capitalization, while the

consumer demand for mutual funds and new types of mutual funds was high. As a result, the number of new entrants, both asset management firms and funds, exploded in the 1980s and 1990s.

Even when barriers to entry are low, dominant firms can protect their privileged positions through strategic commitments (or sunk costs; Sutton; 1991). Dominants making costly investments in building resources such as consumer recognition, distribution channels, management expertise, or customer service capacity may remove the incentive for challengers to similarly invest in increased assets and capabilities. Expected benefits from these investments are smaller for challengers than for dominants who have already built up their resources, because challengers who invest must split market share with incumbent dominants.

Even if challengers do invest in increasing their assets and capabilities, dominants can monopolize key resources in many ways, resulting in sustained dominance (Penrose 1959; Barney, 1991). For example, dominants can negotiate exclusive distribution agreements with desired channels. Dominants' resource advantages are particularly sustainable if they are based on rich-get-richer processes of resource accumulation. If challengers cannot purchase needed resources on "strategic factor markets" (Barney, 1986), but must accumulate them through operations, dominants can maintain their resource advantage longer (Dierickx and Cool, 1989). Challengers may also not be able to identify which resources or resource combinations led to the dominant's success, and invest in the wrong combination of assets and capabilities (Lippman and Rumelt, 1982; Reed and DeFillippi, 1990).

For mutual funds, available resources are highly correlated with assets under management. Mutual fund income—and hence capacity to invest in marketing and management—is largely determined by assets under management, since mutual funds collect

fees as a predetermined percentage of assets under management and new or withdrawn investments. Conversely, by the resource-based reasoning presented above, those with the highest levels of accumulated resources should attract and maintain higher proportions of investors' assets, with variations from this trend attributable to fund- and asset management firm-specific idiosyncrasies in resource accumulation.

The arguments presented above suggest that mutual funds' and asset management firms' competitive advantage monotonically increases as a function of funds' or firms' age and assets under management, controlling for idiosyncratic fund and firm differences. What is not clear, however, is whether these advantages can entrench incumbents' positions under the pressure of increased competitive entry. Indeed, the model described in the next section suggests that high levels of resources do not necessarily allow sustained dominance even in the absence of new competitive entry. Instead, the model predicts that the skewed distribution of resources in the industry affects competitive dynamics in ways that entrench dominants when competitive entry increases.

### **A MODEL OF DURABLE DOMINANCE**

The size distribution of mutual funds is highly skewed. A select few mutual funds have over \$100 billion of assets under management (AUM). Hundreds have smaller AUMs \$100 million. This pattern is repeated in each competitive niche. The income and resource distribution of mutual funds is therefore also highly skewed.

When this skewed distribution of resources is taken into account, theories of structural and resource-based competitive advantage converge on a novel prediction: increased competition *benefits* a small minority of the largest (compared to their competitors) mutual funds. I first support this prediction using a resource-based model of competitive release, and then follow with

a more succinct description of parallel arguments based on other theoretical mechanisms.

### **Classical dominant entrenchment**

As with mutual funds, the revenue distribution in most industries is highly-skewed, with a few firms possessing revenues many orders of magnitude above the mean (Schmalensee, 1989: 994). The existence of such a distribution does not require that the dominant firms possessed better organization or resources than their competitors *a priori*. If firms with higher revenues can invest more than those with lower revenues into building resources that contribute to future firm performance, a rich-get-richer Matthew effect (Merton, 1968) occurs. Even if two firms start off with the same level of managerial skill, revenues, and resources, the firm with some luck can grow many orders of magnitude larger than the unluckier. We can model these conditions by assuming that the magnitude of change in revenue during each time period is stochastic and proportional to the firm's current revenue:

$$R(f, t+1) = R(f, t) * [1+n(m,\sigma)] \quad (\text{Equation 1})$$

where a firm  $f$  has revenue  $R$  at time  $t$ , and  $n$  is a random value drawn for each firm and time step from a normal distribution with non-negative mean  $m$  and standard deviation  $\sigma$ . This equation approximates a random walk on a logarithmic scale, which after a sufficient number of time periods results in a highly-skewed, log-normal distribution of revenues across firms (cf. Gibrat, 1931).

Dominants naturally emerge under these conditions. Because of the multiplicative nature of the trajectories of revenues, one or two firms will end up with thousands or millions of times the revenue of the median firm after a sufficient period of time, even if all firms start with the same initial revenue and no firm is inherently better than another. On the other hand, the identity of the firm with the lion's share of revenues can and does change. Again because of the

compounding inherent in the Matthew effect, non-dominant firms can rise into dominant positions and dominant firms can lose their positions over sufficient time. Dominants' reigns are limited in duration, even though they possess order of magnitude higher resources than their competitors when they are dominant.

### **Change in resource distributions**

Dominants may become entrenched, however, if a large number of new entrants enter the market. Figure 1A presents stylized revenue distributions in an industry before competitive entry. The distribution of revenue levels is highly-skewed, approximating a power law distribution. If we assume that firms compete primarily against those with similar resources and revenues (Caves & Porter, 1977), firms with larger revenues will have fewer direct competitors. A firm with \$100 million in revenue may compete against only ten direct competitors, while a firm with \$10 million in revenue competes against 100 similar companies. This reasoning implies that the revenue distribution curve equates to a *competitive intensity curve*. Figure 1A represents an equilibrium distribution of this competitive intensity curve.

Figure 1B shows revenue distributions—the competitive intensity curve—after massive industry entry. Entering firms rarely enter with resources of the level of dominants, since dominant firms have resources that are of the order of magnitude of the total resources in the industry. Entrants often enter with resources greater than the median incumbent firm, however, since entry is endogenous—a firm will not enter the market unless its management believes that the firm possesses, or can quickly build, a competitive level of resources.

—Insert Figure 1 about here—

After mass entry, the competitive intensity curve flattens up to a revenue threshold corresponding to the thinning of the right tail of the new entrant revenue curve. Incumbents with

revenue an order of magnitude above this threshold (indicated by  $R_t$  in Figure 1B) do not experience appreciable changes in the number of similar-size competitors. Firms with revenue of the same order of magnitude as the threshold, on the other hand, experience a dramatic increase in the number of their direct competitors. These unfortunate incumbents are forced to devote more of their resources to competition against similar competitors, and have less slack left to challenge larger incumbents. To the extent that incumbent near-dominants must divert resources to defend against new entrants' advances, incumbents above the threshold—now durable dominants—face less threat from competition below and become entrenched in their dominant positions.<sup>4</sup>

This argument is not dependent on the specific shape of the competitive intensity curve after mass entry. The only assumption needed is that mass entry does not happen at the highest resource levels. If this assumption holds, there will be a point where the changed competitive intensity curve slopes down less severely than the equilibrium curve before mass entry. Those few incumbents to the left of this point benefit; those immediately to the right suffer. Those who benefit are always a small minority because of the skewed shape of the revenue distribution curve—the vast majority of incumbents have the lowest levels of resources.

### **Alternative mechanisms**

The model above is based on a mechanism of resource-based localized competition and competitive release. Similar arguments can be made using other causal mechanisms, including market position. An influx of new competitors may make resource investments by near-dominants more risky, as the new competitors complicate forecasting and diverted consumer demand reduces potential benefits. Near-dominants may no longer have rational

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<sup>4</sup> There is evidence that competitors react strongly to competitive crowding from below (Bothner, Kang, and Stuart, 2007). This effect would shift  $R_t$  to the left, leaving fewer dominants.

incentives to make investments in growth to challenge the dominant(s).

Sociological mechanisms also yield the same non-linear predictions. Population ecologists advanced theory on the population dynamics of firms (Carroll and Hannan, 2002, provides a broad overview of the field). Carroll (1985) advanced a theory of “resource partitioning”, arguing that the rise of large generalist firms will crowd out medium-size firms, while fostering specialists (Carroll, 1985). This process may work in reverse to create durable dominance: Instead of a dominant firm crowding out the middle and creating space for small peripheral competitors, a large mass of small peripheral competitors may crowd out the middle and allow the dominant to thrive. More recent scholarship considers the perceived position of a specific firm against the backdrop of the distribution of firms in an industry, with the most widely-accepted theory (Zuckerman, 1999) holding that firms conforming to category norms do better, as consumers are likely to accord such firms higher legitimacy. Durable dominance may result from a large influx of new entrants establishing the legitimacy of the industry niche. The firm dominant at the time of this legitimization may become entrenched as the paradigmatic exemplar of the niche.

Another cognitive mechanism foregrounds consumer attention. A mass influx of new competitors can cause a dilution of consumer attention given to non-dominants. Consider an industry with one dominant firm and ten near-dominant firms. Consumers may attempt to compare the offerings from each of these eleven firms when making a purchase decision. A lucky or good near-dominant may gain business and successfully challenge the dominant and take over its position. Successful challenges become unlikely if mass entry of new competitors creates 90 more near-dominant firms, however. Search costs will preclude consumers from carefully comparing offerings from the 101 dominant and near-dominant firms, and consumers

will become more likely to choose the dominant firm without comparing it one-by-one to non-dominants. A near-dominant firm attempting to overtake the dominant will find it harder to distinguish itself from other near-dominants, while the dominant firm will strengthen its distinctiveness and consumer share of mind.

### **Distinctive theoretical predictions**

Whatever the mechanisms in play, the reasoning above predicts distinctive non-linear effects of increased competition. Increased competitive entry will reduce flows of contested resources to non-dominant incumbents. Dominants, on the other hand, will benefit and receive an increased flow of contested resources compared to non-dominants.

**Hypothesis 1:** *Increased entry will increase flows of assets into dominant funds compared to flows into non-dominant incumbent funds.*

Figure 2 helps clarify the predictions of this hypothesis. We know from recent research (e.g., Wahal and Wang, 2011) that the average incumbent loses future flows of assets when similar funds enter the market. Hypothesis 1 predicts that this effect is not uniform across relative fund sizes (Figure 2, Panel A), nor linear in relative fund sizes (Panel B). The predicted effect is instead non-linear, with only a small minority of the largest in relative size funds benefiting from competitive entry, while all other funds suffer (Panel C).

—Insert Figure 2 about here—

The increased flows of assets into dominant funds will lead to dominant funds remaining dominant longer.

**Hypothesis 2:** *Increased entry will increase the probability of dominant funds remaining dominant for longer time periods.*

These predictions are quite different from straightforward predictions of established

theories of sustained competitive advantage. To my knowledge, previous work has not predicted a nonlinear effect of increased competition that benefits the few dominants in an industry.

## **EMPIRICAL RESULTS**

### **Data and variables**

Hypotheses 1 and 2 predict non-linear, interactive effects of increased competitive entry and fund size relative to competitors. Funds an order of magnitude larger than similar competitors should benefit from increased entry, while others suffer. To test the hypotheses, I created a dataset combining survivor-bias free mutual fund data from CRSP with holdings information from the Thomson Financial CDA/Spectrum database. I used the MFLINKS database to link mutual fund identifiers from the former to the latter. The dataset covers open-end U.S domestic equity mutual funds from 1980 to 2010 (the Thomson database starts its coverage in 1980 and covers only mutual funds with U.S. domestic equity holdings), and contains slightly over 130,000 fund-quarter observations of 5,532 mutual funds<sup>5</sup>.

Funds were defined as competing against each other to the extent that they held the same stocks in similar proportions. I calculated pair-wise cosine similarity measures between each pair of funds existing in the same time period (approximately 313 million pairs) using holdings data. Two funds were defined to be similar if they held the same stocks in similar proportions. A fund's holdings can be represented as a vector in a large-dimensional space where each dimension is one stock and the vector component along each dimension is the dollar amount of the fund's holdings in that stock. Two funds are similar to the degree that their holding vectors point in the same direction. If the funds hold exactly the same stocks in the same proportions, the

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<sup>5</sup> The analyses in the current paper use a subset of this data. The CDA/Spectrum dataset unfortunately omits fund holdings information for new funds during several quarters of its coverage. These quarters are not included in the regressions. I am currently working on ways to overcome this data limitation.

vectors are aligned, the angle between them is 0 degrees and the cosine of this angle equals one. If the vectors have no stocks in common, the vectors are perpendicular, and the cosine of this 90 degree angle equals zero.

The main dependent variables are 1) *flow of assets next 12 months* and 2) dichotomous variables indicating whether a fund is dominant one, two, and three year(s) later (*dominant in year+n*). I define dominant funds as those funds with an order of magnitude or larger assets under management compared to the average assets under management of similar competitors. The independent variable of interest is  $(\text{dominant fund}) \times (\text{new entrant overlap})$ , the interaction term of the similarity-averaged number of new entrants and whether the focal fund is currently dominant or not. Control variables include those identified in previous studies of mutual funds (e.g., Wahal and Wang, 2011), such as measures of previous flows of assets into the focal fund, fund returns and return volatility, fee level, portfolio turnover, size, and age. I add a measure of flow of assets into similar funds to control for overall segment growth, and controls for management firm size and age.

The three flow variables (flow of assets for the next 12 months, the previous 12 months, and flow into similar funds) vary over observations by multiple orders of magnitude. I utilize a piecemeal log transformation for these variables. Each observed value is rounded to the nearest integer. If the rounded value is zero or positive, I add 1 to the value and take the log with base 10. If the rounded value is negative, I take the negative of the log of the absolute value of the rounded value. This procedure yields a non-decreasing function of the untransformed flow variable, which is symmetrical around -0.5 and approximates a log transform when flow is positive. Fund and firm size and age, and fund turnover ratio, all of which can only have non-negative values, are log transformed to reduce skew. (See Table 1 for construct specifics and

Table 2 for descriptive statistics and correlations.)

—Insert Table 1 about here—

—Insert Table 2 about here—

Regressions include fixed effects for mutual funds, but not for asset management firms. Most funds remain with the same asset management firm throughout their existence, and so fixed effects for asset management firms are highly collinear with fixed effects for mutual funds. While this characteristic of the data prevents us from obtaining meaningful estimates for idiosyncratic mutual fund effects using fixed effects for firms, this characteristic also implies that mutual fund fixed effects effectively control for management firm characteristics (e.g., a Fidelity or Vanguard effect). I exploit this feature of the data to estimate a Fidelity fixed effect and to estimate the effect of increased competition on Fidelity's funds.

### **Analysis and results**

The first step in the analysis was to substantively replicate Wahal and Wang's (2011) results, which found that new competitive entry decreased flows into incumbent funds. Their data differ from mine in several ways. They ended their sample in 2005, their measure of new entrant overlap was defined differently, they used an ordinal variable coded 0, 1, and 2 for funds with bottom 20%, middle 60%, and top 20% performance respectively instead of a z-score, they included front-end load as a control variable, and they did not control for the size of total flows into similar funds. An additional difference is that Wahal and Wang used cross-sectional Fama-MacBeth regressions, while I use fixed-effect panel regressions. Notwithstanding these differences, the results are substantively identical. On average, new competitive entry led to decreased asset flow into incumbent funds.

The second regression tested the prediction (Hypothesis 1) that new entrant overlap

would be beneficial to dominant incumbents but deleterious to non-dominants, by adding the dominant fund variable and the  $(\text{dominant fund}) \times (\text{new entrant overlap})$  interaction term.

Results are shown in Model 1 of Table 3<sup>6</sup>. As predicted by the proposed theory, the coefficient of the interaction term was significant and positive. Expected asset flow over the next 12 months decreased by 22% for non-dominant funds with strong positive asset flow when *new entrant overlap* equaled 0.1 (that is, when the number of similar new entrants was one tenth the number of incumbent competitors) and fund outflows increased by 28% for non-dominant funds with negative asset flow. Dominant funds, on the other hand, *benefited* from increased competitive entry. Expected asset flow into dominant funds increased by a factor of 3.3 for dominant funds with positive asset flow when *new entrant overlap* was 0.1.

—Insert Table 3 about here—

To further check that the effect of new entrant overlap was indeed non-linear and not just a linear interaction effect with the size ratio, I examined the effects of increased new competitive entry at various levels of the *size ratio*. I created z-scores for the *size ratio* across each time period, then binned the observations using this z-score as shown in Table 4. I created dummy variables (*bin 1, bin 2, ..., bin 9*) for each bin, and re-ran the regression using (*bin 1, bin 2, ..., bin 11*) and  $(\text{bin 1, bin 2, ..., bin 9}) \times (\text{new entrant overlap})$  instead of *dominant fund* and  $(\text{dominant fund}) \times (\text{new entrant overlap})$ .

—Insert Table 4 about here—

Figure 3 and Model 2 in Table 3 show the results from this regression. The difference in

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<sup>6</sup> Including the lagged dependent variable on the right side of the fixed effect panel regression equation can lead to inconsistent and biased results. These errors should not substantively affect the reported results, however, given the current study's observed levels of residual autocorrelation and the large number of time periods. Additionally, estimates of the effects of non-lagged dependent variables will be biased downwards (Keele and Kelly, 2006), so the reported significant effects are, if anything, under-estimated.

the coefficient for  $(bin\ 9) \times (new\ entrant\ overlap)$  compared to the other interaction terms is striking. Non-dominants—about 96.6% of observations—lost assets when similar new competitors entered the market. By contrast, dominants—about 70 funds across the years comprising 3.4% of observations—gained tremendously from new competitive entry. Expected asset flow increased by a factor of 3.8 for dominant funds with positive asset flow. Both Models 1 and 2 support Hypothesis 1's prediction of a non-linear effect of competitive entry on dominants versus non-dominants.

—Insert Figure 3 about here—

Model 3 in Table 3 compares the effects of competitive entry on dominants to the effects of competitive entry dependent on fund- and asset management firm-specific characteristics. Examining the distribution of fund fixed effects revealed an almost-Gaussian distribution. I created a fund-level dummy variable, *high fixed effect*, which was set equal to 1 if a fund's fixed effect was more than two standard deviations higher than the mean. These funds *ceteris paribus* attracted more investment money than other funds, suggesting strengths in organization or resources. This advantage did not hold up when new competitors entered, however. The coefficient for  $(high\ fixed\ effect) \times (new\ entrant\ overlap)$  is significant and highly negative, indicating that increased competitive entry eroded the funds' advantages in garnering investor money. Similarly, while funds offered by Fidelity had an advantage in garnering investments in the absence of competitive entry, this advantage disappeared when more new competitors entered the market. The *Fidelity fund* dummy variable is set equal to 1 if the fund is a Fidelity offering. The coefficient of the non-interacted term is significant and positive, but the interaction with *new entrant overlap* is significant and negative. Fidelity funds' predicted advantage disappears if the number of new competitors equals one eighth the number of incumbent

competitors. On the other hand, management firms with a longer history and larger assets under management benefited from competitive entry. The effect sizes were small compared to those for dominant funds, however. A non-dominant fund's management firm would need to be about 400,000 years older or 200,000 times larger than a dominant fund's management firm to achieve the same predicted advantage from increased competition.

I next examined the effects of new entry on dominants' (non-dominants') chances of maintaining (attaining) dominance in later years to test Hypothesis 2. Table 5 shows the results of these regressions. Dominant funds' chances of staying dominant two or more years later were positively influenced by increases in new entrant overlap, as predicted by the theory. Entry by a number of new competitors equal to 1/10 of the number of incumbent competitors increased the probability the dominant fund would remain dominant in two years by about 6% and the effect stayed significant into the third year<sup>7</sup>. Currently being dominant in the absence of new competition was consequential in determining whether the fund was dominant only for the following year but not for subsequent years.

—Insert Table 5 about here—

These results support the predictions of the proposed theory. Increased entry of similar funds decreased non-dominant incumbents' future flows of assets, but increased dominants' future flows. Increased competitive entry also increased the probability of dominant funds maintaining their dominance in future years. In sum, increased entry disadvantaged non-dominant incumbents, but benefited and entrenched dominants.

### **Robustness checks**

A series of robustness checks provide additional support for these results. The effects described

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<sup>7</sup> The predicted effect size (obtained using the stata margins command) in the third year is quite small, even though the coefficient of the interaction term is larger than that in year two.

above are robust to defining competitors in different ways. Regressions using CRSP segment codes instead of overlap measures yield substantially similar results to those described above, even though CRSP segment codes are used inconsistently over the years.

Regressions using data from 1980 to 1998 show the same substantive results for the independent variables of interest. This is in contrast to Wahal and Wang's (2011) findings, which showed no effects of competitive entry on incumbent fund flows before 1998. One possible reason for their null result is that they were averaging across dominants and non-dominants. The mutual fund industry grew tremendously from 1980 to 1998. The large number of new entrants may have resulted in greatly increased flow to dominants that offset any decrease in flows to non-dominants, resulting in an average effect that was not significant. Another possible reason for their null result is that they did not control for total flows into similar funds. A rising tide may have lifted all boats.

### **Explaining Fidelity**

What do these findings tell us about competition among asset management firms, especially the durable dominance of Vanguard and Fidelity? Model 3 of Table 6 predicts that the typical, non-dominant Fidelity fund will lose assets if many new similar competitors enter the market. Fidelity's strengths in brand recognition, marketing, distribution, and administration provide Fidelity's funds an edge in attracting investment, but the entry of a large number of new competitors negates this advantage. These Fidelity-specific strengths cannot explain Fidelity funds' continued dominance.

A more likely explanation may be obtained by examining the dominant mutual funds

managed by Fidelity. As of 2009, five dominant funds<sup>8</sup> contributed 43% of Fidelity's total net assets under management. The remaining 57% of Fidelity's total net assets under management were split across 111 non-dominant funds. Explaining the durable dominance of the five dominant funds explains much of Fidelity's durable dominance.

Consider this plausible—congruent with known facts—account of Fidelity's durable dominance: Fidelity had a dominant fund as the number of mutual fund entrants soared. Many of these newly formed funds were similar in portfolio allocation to Fidelity's dominant fund. The current study predicts that the entry of similar competitors would drive more assets to the dominant fund. Fidelity took some of the profits from its now durably-dominant fund, and used them to establish many more funds with different portfolio strategies. If a new portfolio style emerged, Fidelity would create a fund of that type. Fidelity's new funds enjoyed advantages of firm scale compared to similar funds from smaller asset management firms. These advantages were not large enough to consistently accrue order of magnitude larger assets under management for the new Fidelity funds compared to similar competitors, however. Occasionally though, by luck or skill, a Fidelity fund would become dominant. If the Fidelity fund was dominant as the new fund type became fashionable, and many similar competitors entered the market, the Fidelity fund would become entrenched in its dominance. This now durably dominant fund provided Fidelity with further resources to establish new exploratory funds, thus increasing its chances of having yet another dominant fund.

## **DISCUSSION**

This paper proposes an explanation for durable dominance—dominant entrenchment in the face of mass entrepreneurial entry—in the mutual fund market. Considering the skewed distribution

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<sup>8</sup> Fidelity Growth Company, Fidelity Low Priced Stock, Fidelity Magellan Fund, Fidelity Contrafund, Fidelity Diversified International Fund.

of resources among competing mutual funds yields a novel prediction: a non-linear response to competition, wherein dominants benefit from increased competitive entry and become entrenched, while non-dominants suffer. This prediction is supported in thirty years of data from U.S. domestic equity open-end mutual funds. Dominant mutual funds—those with order of magnitude higher assets under management compared to their competitors—gained investor money when new similar competitors entered the market, while their incumbent competitors suffered decreased asset flow. This shift in asset flows led to dominant entrenchment. Dominant funds were more likely to remain dominant for two or more years when competitive entry was higher. When competitive entry occurred at moderate or high levels, the benefits of being dominant eclipsed the effects of firm- and fund-specific characteristics.

I described several possible mechanisms predicting the non-linear response to increased competition, drawing from theories of industry structure, resources, and consumer choice. These are far from the only plausible mechanisms leading to durable dominance<sup>9</sup>. Identifying which mechanisms in particular underlie the observed durable dominance of mutual funds is not an easy task—substantial data collection would be required to create measures for all the likely mechanisms—but certainly one that future studies of competitive dynamics in the mutual fund market should address. The current study limits its contribution to establishing the non-linear effect of competition for mutual funds and arguing for the probable presence of similar effects in other settings.

The variety of mechanisms predicting the same response suggests that durable dominance—dominants benefiting and becoming entrenched as a result of increased competition—is likely to be over-determined and thus commonplace. Durable dominance is

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<sup>9</sup> It seems every time I present this research, someone suggests a different mechanism.

predicted in any setting where the dominant have order of magnitude advantages over their competitors. In such settings, a few dominants, or one dominant, control resources of the order of magnitude of the total resources in the system. That these dominants react differently to exogenous shocks, typically occurring at scales much smaller than the order of magnitude of the dominants' resources, should be expected.

The conditions for such durable dominance are opposite those typically posited for sustaining dominance. While established theories of sustained competitive advantage suggest that dominants maintain dominance by limiting competition—excluding competitors from the market, colluding, or monopolizing key resources by keeping them “rare, imperfectly imitable, and non-substitutable” (Barney, 1991: 116)<sup>10</sup>—the current theory proposes that dominants can maintain dominance *because of* strong competition and the absence of monopolized resources. If revenue and resources are scalable—that is, levels of resources and revenue can differ between firms by many orders of magnitude— dominants can distinguish themselves by magnitude rather than exclusivity; more of each resource, not different resources. Such dominance is more durable when all competitors share and have access to the same types of resources or if only aggregate resource levels matter in determining competitiveness, with no resources that are crucial, and no resource combinations which are more potent than others. Such conditions preclude the rise of disruptive innovators (Christensen and Bower, 1996), who develop competitive advantage based on new types and combinations of resources.

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<sup>10</sup> An interesting parallel is found in sociological understandings of how elites maintain and transmit their dominance. A large number of social institutions—e.g., kinship ties, shared organizations, and business relationships—supporting cohesion and coordination among elites, and excluding non-elites, were identified during the twentieth century (Mills, 1956; Domhoff, 1967; 1970; Miliband, 1969; Useem, 1984; Mizruchi, 1992). Elites also distinguished themselves from non-elites by monopolizing certain types of resources—“economic, social, cultural, political, or knowledge capital” (Khan, 2012: 361; see also Tilly, 1998, on opportunity hoarding). U.S. elites during the Gilded Age sought to set themselves apart culturally by excluding non-elites from highbrow art and music, for example (Levine, 1990). Habits, tastes, and dispositions acquired at an early age helped elites succeed later in life (Bourdieu, 1984; DiMaggio and Mohr, 1985; Lamont, 1992).

Mutual funds present a paradigmatic case for testing the proposed theory. Mutual funds' resources are highly correlated with assets under management, with those with higher assets under management able to spend more on marketing, fund management, and administration. The level of assets under management thus serves as a reasonable proxy for all resources of the fund. Furthermore, assets under management are highly scalable—two funds' assets can differ by many orders of magnitude—allowing for the emergence of dominants with order of magnitude advantages over their competitors. That the predictions of the proposed theory are borne out in this setting is perhaps less surprising.

What remains to be seen is whether the proposed theory explains durable dominance in other less-paradigmatic settings, both industrial and social. There are many promising settings to examine, including, for example, the competition among beer producers for consumer purchases and the competition among individuals for wealth. Barriers to entry into the U.S. beer market have crumbled over the past thirty years. Manufacturing and distributing beer is no longer technically difficult—the expertise needed is widely available, as are contract brewers to scale production, and distributors to put product in stores. Yet Anheuser-Busch products have strengthened their domination of the U.S. beer market, maintaining almost 50% market share in the face of growth in the number of U.S. breweries from 82 in 1980 to 2,126 in mid-2012. While minorities and the poor in the United States are still disadvantaged in many ways, the opportunities available to non-elites have increased tremendously over the past fifty years. Overt categorical barriers to entry into social enclaves have all but disappeared. Social elites are less often set apart by their consumption patterns (Peterson and Kern, 1996; Khan, 2011). New technologies, lowered legal restrictions, and shifting business norms have democratized entrepreneurial entry into industries. Yet over the past forty years, the wealth gap between elite

and non-elite has dramatically increased (Piketty and Saez, 2003).

The proposed theory should apply to an increased number of settings in a financialized world where markets exist for scalable procurement of almost all types of resources.

Entrepreneurial resources previously available only to the rich and well-connected are now available for purchase by almost everyone. Individuals and companies typically need only a credit card and an Internet connection to access scalable sources of financing, manufacturing, marketing, and distribution. Money is inherently scalable and widely-held. If it can be used to buy all needed resources, then aggregate levels of cash become the key to determining success.

The theory presented in this study proposes a shift in how we think about dominant entrenchment. In addition to, or instead of, considering dominant tactics of exclusion, collusion, and monopolization, we need to identify the order of magnitude advantages dominants enjoy over their competitors and how these differences affect reactions to shocks to the system. If dominants possess resources of an order of magnitude greater than non-dominants, and non-dominants lack—or lose—a way to accumulate resources an order of magnitude greater than their current level, dominants will become entrenched.

As this study shows, increased competitive entry is one type of event that can cause non-dominants to lose their ability to overtake dominants. Other types of events may have similar effects. For example, dominants may become entrenched if the playing field in the competition for revenue growth is “leveled” by making increases in revenues independent of existing revenue size—i.e., eliminating the Matthew effect so the poor can gain or lose as much wealth in each time step as the rich. If Bill Gates was constrained to gain or lose \$1,000 a day, his position atop the wealth distribution would be frozen in place. Even if he lost \$1,000 every

day for 50 years, he would lose less than \$20 million of his \$70 billion<sup>11</sup> fortune. Conversely, a penniless graduate student gaining \$1,000 every day over the same period would amass less than \$20 million—a large sum to the student but much below Gates's wealth<sup>12</sup>. Leveling the playing field leads to entrenched dominants. Dominants' levels of contested resources never diminish to non-dominant levels, and non-dominants can never become dominant. Introducing a scale into a scale-free distribution freezes in place the positions of those at the top of the distribution.

More generally, the findings of this study suggest the need to consider dominants separately from non-dominants. One cannot assume that the very few with order of magnitude advantages over the very many will behave similarly to the majority. If highly-skewed distributions exist, taking the average effect of an independent variable over the population will not yield meaningful predictions for dominants. Log-scaling highly-skewed variables similarly elides consideration of dominant-specific effects.

The policy implications of the proposed theory for dominants are straightforward. Dominants may employ a strategy of opening their markets to new entrants and fostering small competitors. These upstarts will weaken potential challenges to the dominants' dominance from large but non-dominant incumbents. Whether guided by altruism or cunning, this seems precisely the strategy that Google, for example, is executing when it routinely provides funding, employees, technology, and platform access to startups. An elite business school worried about losing its elite status could conceivably attempt to entrench its position by investing resources in democratizing massive open online course (MOOC) creation and distribution. Giving away

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<sup>11</sup> Forbes, May 2013.

<sup>12</sup> Indeed, the introduction of this rule would cement Gates's position atop the list of the world's richest people, protecting him from being overtaken even by those such as Carlos Slim, whose net worth Forbes estimates at \$69.86 billion. Note that the graduate student could catch up to Gates's wealth if the daily flat bet was of an order of magnitude similar to Gates's wealth. This scenario—equivalent to debasing U.S. currency so that \$100 million is a reasonable day's wages—is unlikely, however.

access to world-class production and distribution technologies to even small colleges would flood the marketplace with new entrants, force other schools immediately below elite status to invest resources in developing their own MOOC capabilities, and ultimately entrench the hypothetical protagonist's elite position. Dominants may also protect their positions by sharing resources with competitors, for example, by opening a network platform (e.g., Google ecosystem, MOOC network) to competitors. Sharing the same resources (such as the network platform) is better for maintaining dominance than allowing competing—and possibly disruptive—sets of resources to be developed.

Policy-makers and non-dominants face a more difficult choice. Schumpeter ([1942] 1994) asserted that monopoly motivates disruption and innovation. When non-dominants and dominants possess different types of resources, non-dominants can disrupt the industry and dethrone the dominant (Christensen, 1997). But if financialization reaches near-ubiquity and strategic factor markets (Barney, 1986) approach efficient markets, companies may come to compete primarily on scale of financial assets, as mutual funds already seem to do. Disruptive innovation becomes unlikely in such an industry. Worse, the proposed theory predicts that the more open and competitive the industry, the stronger the dominants' hold. Current taken-for-granted measures for weakening monopoly may backfire, unless the measures are executed in tandem with reductions in dominants' resources to levels near their competitors' averages. Durable dominance may be a natural and inevitable consequence of an open society, where financial wealth is unlimited and eminently transposable, and competition is revered.

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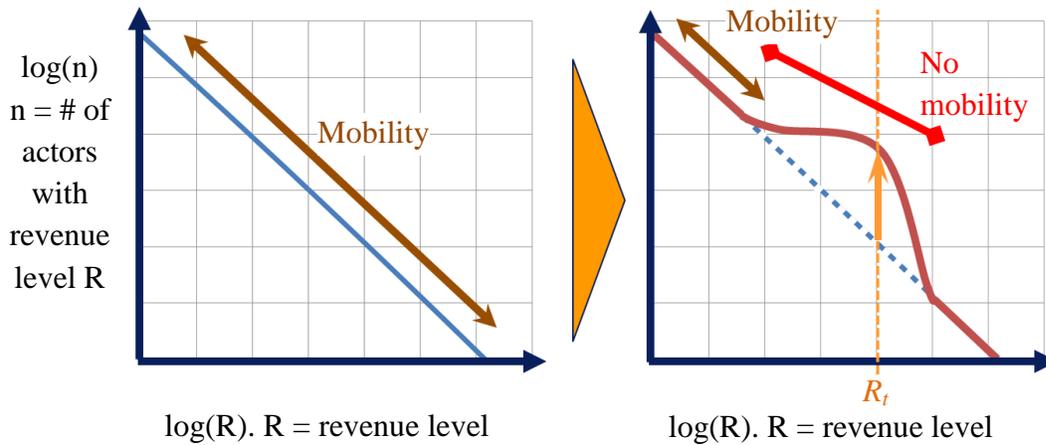
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**FIGURES AND TABLES**

**Figure 1. Revenue distributions (competitive intensity curve)**

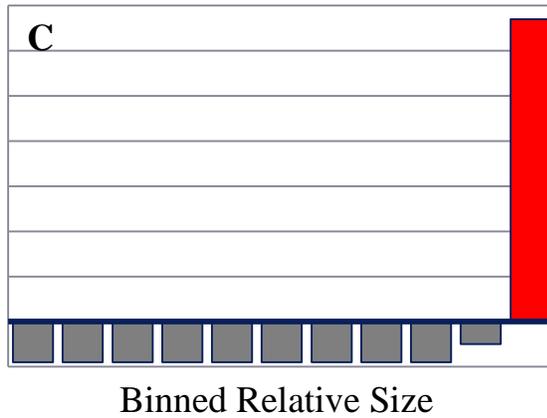
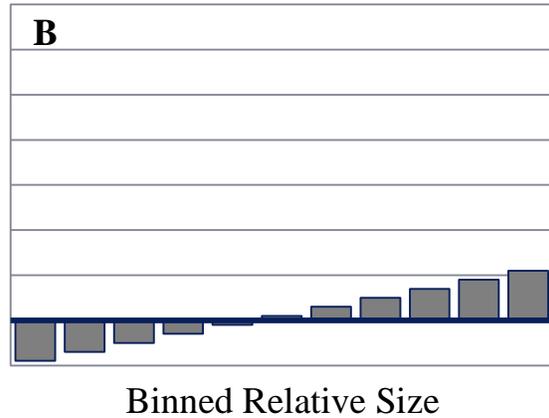
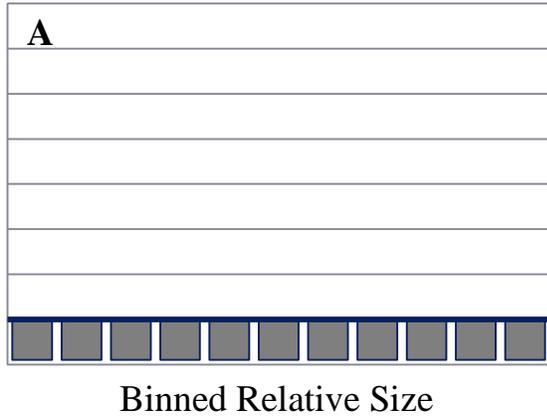
**A (left). With Matthew effect and no entry.** Stylized illustration of highly-skewed (power law) revenue distributions in a market with no exit or entry, and rich-get-richer dynamics. Companies with higher revenue levels have fewer competitors with similar revenues.

**B (right). With Matthew effect and mass entry.** Competitive intensity curve (solid line) after market is opened to entry. Mass entry of new competitors flattens the competitive intensity curve for those below a threshold, increasing competitive intensity by several orders of magnitude for firms slightly below the threshold. In the case depicted below, the number of similar competitors for an incumbent with revenue level  $R_t$  increases by almost two orders of magnitude.



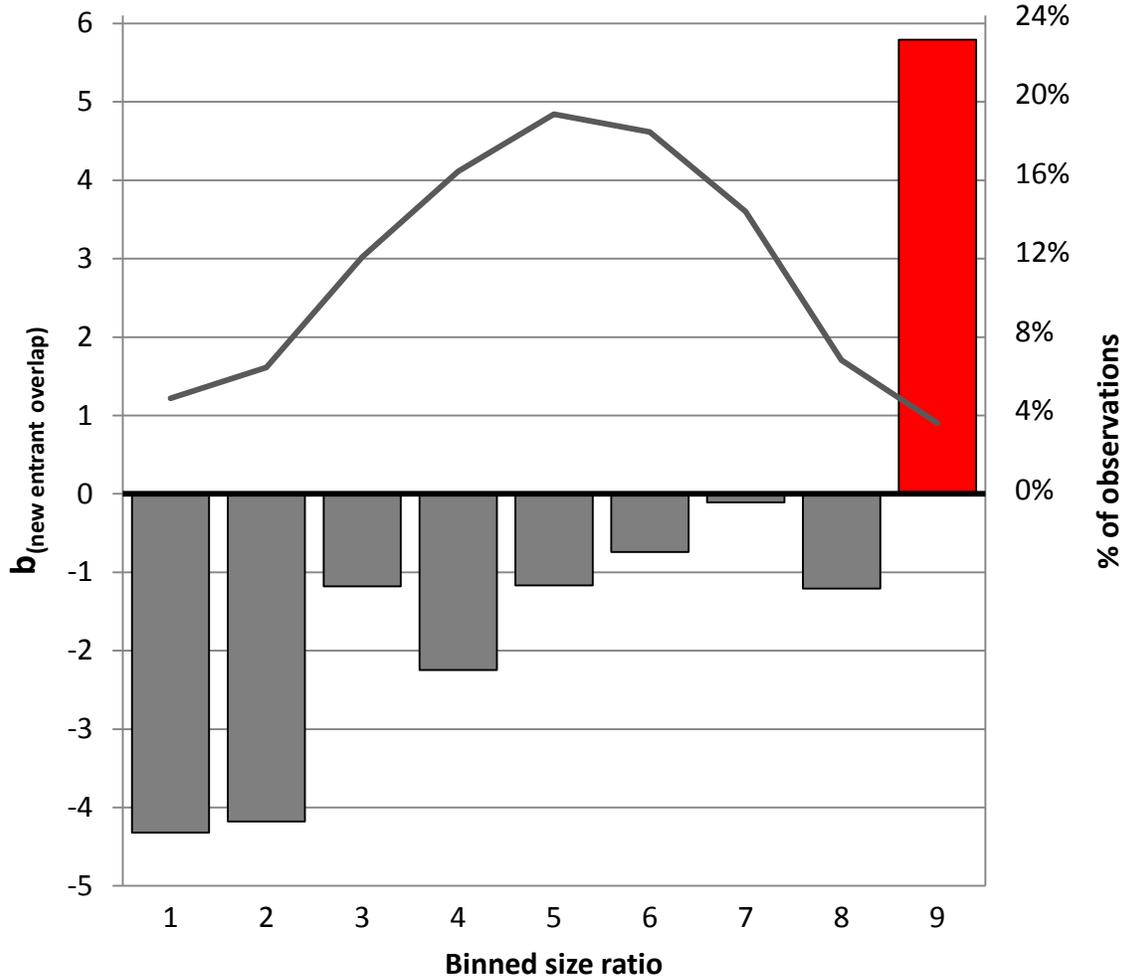
**Figure 2. Predicted non-linear effect of new competitive entry on flow of assets**

Bars in Panel C illustrate the predictions of Hypothesis 1. Increased competitive entry is predicted to have a non-linear effect on future flows of assets. Only the largest funds (in relative size of assets under management compared to competitors) will benefit.



**Figure 3. The non-linear effect of new competitive entry on flow of assets into mutual funds**

Bars and left axis indicate the predicted effect of a unit increase in new entrant overlap on the focal fund’s flow in the next 12 months. Line and right axis show the percentage of fund-quarter observations within each size ratio bin. See Table 4 and article text for details of the binning.



**Table 1. Data descriptions**

<b>Variable</b>	<b>Description</b>
<i>Flow of assets next 12 months (logged)</i>	The net flow of investments into the focal fund over the next 12 months, calculated as the net growth in fund assets beyond reinvested dividends and asset influx from mergers (cf. Sirri and Tufano, 1998). Flows for four quarters were summed to create twelve month trailing measures. I rounded the sum to the nearest integer. If the rounded value was zero or positive, I added 1 to the value and took the log with base 10. If the rounded value was negative, I took the negative of the log of the absolute value of the rounded value.
<i>Flow of assets previous 12 months (logged)</i>	The net flow of investments into the focal fund over the previous 12 months. See <i>Flow of assets next 12 months (logged)</i> above for measure details.
<i>Flow of assets into similar funds (logged)</i>	Cosine similarity-weighted average of flows into similar funds. Flow into the focal fund is included in the sum. See <i>Flow of assets next 12 months (logged)</i> above for details on logging procedure.
<i>Size ratio</i>	The ratio of the focal fund's total net assets to the cosine similarity-weighted average of its competitors' total net assets.
<i>Dominant fund</i>	A dichotomous variable that equals 1 when the focal fund's <i>size ratio</i> is greater than ten. <i>Dominant fund</i> = 1 for 554 observations (0.91% of total observations). Seventy-six funds are dominant in one or more time periods. I also use the z-score of the <i>size ratio</i> across contemporary funds as an alternate measure of dominance.
<i>Dominant in year+n</i>	A dichotomous variable that equals 1 if <i>Dominant fund</i> = 1 in year+n.
<i>Standardized return</i>	The focal fund's z-score (across all funds present in each time period) of 12-month fund returns from CRSP.
<i>Standard deviation of returns</i>	The standard deviation of the focal fund's past 12 months' monthly returns from CRSP.
<i>Expense ratio</i>	The fund's expense ratio from CRSP.
<i>Turnover ratio (logged)</i>	The base 10 log of the fund's turnover ratio from CRSP.
<i>Total net assets (logged)</i>	The base 10 log of the total net assets of the fund from CRSP.
<i>Age (logged)</i>	The base 10 log of the age of the fund in months from CRSP.
<i>Management firm size (logged)</i>	The base 10 log of the total net assets of the fund's management firm. The management company code from the Thomson database was used

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	to determine a fund's management firm.
<i>Management firm age (logged)</i>	The base 10 log of the number of years since the firm first had a fund entry in the dataset.
<i>New entrant overlap</i>	Number of new competitors as a proportion of number of existing competitors. The sum of pair-wise cosine similarities for the focal fund across all new entrants divided by the sum of pair-wise cosine similarities for the focal fund across all incumbents.

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**Table 2. Descriptive statistics and correlation coefficients**

<b>Variables</b>		<b>Mean</b>	<b>S.D.</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
1.	Flow of assets next 12 months (logged)	-0.19	1.73					
2.	Flow of assets previous 12 months (logged)	-0.01	1.73	0.539				
3.	Flow of assets into similar funds (logged)	1.58	3.26	0.075	0.210			
4.	Standardized return	0.02	0.97	0.239	0.247	0.192		
5.	Standard deviation of returns	0.04	0.02	0.030	0.052	-0.082	-0.001	
6.	Expense ratio	0.01	0.01	0.006	-0.014	-0.034	-0.006	0.184
7.	Turnover ratio (logged)	0.25	0.18	-0.007	-0.042	-0.051	-0.026	0.208
8.	Total net assets (logged)	2.33	0.82	-0.171	-0.013	0.092	0.067	-0.104
9.	Age (logged)	1.96	0.37	-0.244	-0.268	-0.017	-0.030	-0.186
10.	Management firm size (logged)	3.52	1.07	-0.089	-0.032	0.034	0.031	-0.084
11.	Management firm age (logged)	0.94	0.35	-0.072	-0.065	-0.041	-0.008	-0.149
12.	New entrant overlap	0.01	0.02	0.013	0.041	0.113	0.017	0.176
13.	Dominant fund	0.01	0.10	0.030	0.068	0.028	0.006	-0.029

<b>Variables</b>		<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
7.	Turnover ratio (logged)	0.244						
8.	Total net assets (logged)	-0.330	-0.208					
9.	Age (logged)	-0.158	-0.134	0.498				
10.	Management firm size (logged)	-0.196	-0.020	0.586	0.240			
11.	Management firm age (logged)	-0.028	-0.047	0.240	0.292	0.493		
12.	New entrant overlap	-0.004	-0.003	0.002	-0.063	-0.044	-0.142	
13.	Dominant fund	-0.096	-0.072	0.264	0.142	0.160	0.089	0.005

**Table 3. The effect of new competitive entry on flow of assets into mutual funds**

Fixed effect panel regressions. (\* p&lt;0.05, \*\* p&lt;0.01, \*\*\* p&lt;0.001. All tests two-tailed.)

<b>DV: Flow of assets next 12 months (logged)</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>
Flow of assets previous 12 months (logged)	0.34*** (71.33)	0.34*** (71.37)	0.34*** (70.84)
Flow of assets into similar funds (logged)	-0.00 (-1.83)	-0.00 (-1.45)	-0.00 (-1.93)
Standardized return	0.22*** (28.88)	0.22*** (28.65)	0.23*** (28.98)
Standard deviation of returns	0.62 (1.52)	0.59 (1.44)	0.49 (1.20)
Expense ratio	-2.42 (-0.76)	-3.89 (-1.22)	-2.99 (-0.94)
Turnover ratio (logged)	0.17* (2.25)	0.13 (1.66)	0.17* (2.28)
Total net assets (logged)	-1.33*** (-50.44)	-1.39*** (-34.58)	-1.33*** (-50.41)
Age (logged)	-0.24*** (-4.61)	-0.25*** (-4.71)	-0.23*** (-4.20)
Management firm size (logged)	0.09*** (4.84)	0.09*** (4.98)	0.07*** (3.68)
Management firm age (logged)	-0.18*** (-4.91)	-0.18*** (-4.86)	-0.22*** (-5.63)
New entrant overlap	-1.07*** (-3.50)	-1.13 (-1.82)	-7.18*** (-5.46)
(Standard deviation of returns) × (New entrant overlap)	2.70*** (9.68)	2.75*** (9.78)	2.60*** (9.30)
Dominant fund	0.14 (1.30)	0 (0)	0.04 (0.36)
(Dominant fund) × (New entrant overlap)	6.20* (2.38)	0 (0)	7.55** (2.82)
Bin 1		-0.70*** (-7.97)	
Bin 2		-0.34*** (-5.44)	
Bin 3		-0.19*** (-4.31)	
Bin 4		-0.06 (-1.89)	
Bin 5		(omitted)	

Bin 6		-0.05	
		(-1.62)	
Bin 7		-0.14***	
		(-3.42)	
Bin 8		-0.26***	
		(-4.48)	
Bin 9		-0.28**	
		(-3.21)	
(Bin 1) × (New entrant overlap)		-2.36	
		(-1.28)	
(Bin 2) × (New entrant overlap)		-3.07*	
		(-1.96)	
(Bin 3) × (New entrant overlap)		0.01	
		(0.01)	
(Bin 4) × (New entrant overlap)		-1.02	
		(-1.07)	
(Bin 5) × (New entrant overlap)		(omitted)	
(Bin 6) × (New entrant overlap)		0.37	
		(0.40)	
(Bin 7) × (New entrant overlap)		1.01	
		(1.08)	
(Bin 8) × (New entrant overlap)		-0.10	
		(-0.08)	
(Bin 9) × (New entrant overlap)		6.90***	
		(3.85)	
(High fixed effect) × (New entrant overlap)			-12.29***
			(-8.99)
Fidelity fund			0.68**
			(3.26)
(Fidelity fund) × (New entrant overlap)			-5.35*
			(-2.39)
(Logged age) × (New entrant overlap)			0.62
			(0.99)
(Logged management firm age)			1.34*
× (New entrant overlap)			(2.05)
(Logged management firm size)			1.43***
× (New entrant overlap)			(4.37)
Constant	3.18***	3.50***	3.27***
	(25.78)	(25.93)	(25.76)

**Table 4. Binning based on standardized size ratios**

<b>Bin number</b>	<b>Z-score range</b>	<b>% of observations</b>
1	< -1.75	4.66%
2	-1.25 - -1.75	6.21%
3	-0.75 - -1.25	11.80%
4	-0.25 - -0.75	16.12%
5	-0.25 - 0.25	19.02%
6	0.25 - 0.75	18.12%
7	0.75 - 1.25	14.10%
8	1.25 - 1.75	6.59%
9	> 1.75	3.39%

**Table 5. Effect of new competitive entry on log-odds of being dominant in n years**

Fixed effect panel logit. (\* p&lt;0.05, \*\* p&lt;0.01, \*\*\* p&lt;0.001. All tests two-tailed.)

<b>DV: Dominant in n years</b>	<b>Year + 1</b>	<b>Year + 2</b>	<b>Year +3</b>
Flow of assets previous 12 months (logged)	0.14** (2.97)	0.12** (2.89)	0.15*** (3.67)
Flow of assets into similar funds (logged)	0.01 (0.40)	0.03 (0.98)	-0.03 (-0.94)
Standardized return	0.40* (2.47)	0.51*** (3.43)	0.55*** (3.70)
Standard deviation of returns	2.93 (0.35)	1.17 (0.15)	-8.47 (-1.06)
Expense ratio	434.00* (2.54)	657.70*** (4.36)	356.69* (2.42)
Turnover ratio (logged)	-1.52 (-0.63)	-2.99 (-1.11)	0.50 (0.20)
Total net assets (logged)	4.39*** (5.04)	4.13*** (5.64)	1.01 (1.70)
Age (logged)	-2.85 (-1.25)	-6.03** (-3.13)	-5.83** (-3.22)
Management firm size (logged)	-0.39 (-0.51)	-1.69** (-2.88)	-1.52** (-2.58)
Management firm age (logged)	-1.20 (-1.19)	1.45* (2.37)	0.61 (1.10)
New entrant overlap	-0.90 (-0.20)	0.41 (0.10)	-10.86* (-2.32)
Dominant fund	0.64* (2.23)	-0.61 (-1.88)	-0.48 (-1.44)
(Dominant fund) x (New entrant overlap)	3.71 (0.53)	16.84* (2.19)	20.51** (2.82)