

# Intolerance of Failure? Evidence from U.S. Private Equity

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## I. Introduction

The lack of gender and racial diversity in finance is hardly a novel issue. Mounting evidence points to a severe underrepresentation of women and ethnic minorities among the professional staff of asset management firms.<sup>1</sup> In recent years, the scope of the diversity discussion has widened to include women and minority *ownership* of U.S. asset management firms. For example, the Knight Foundation's *2018 Diverse Asset Management Firm Assessment* found that only 4.5% and 5.2% of asset management firms were owned by women or minorities, and their shares of assets under management were far lower.<sup>2</sup> In addition, the study found little evidence of performance differences between diverse-owned and non-diverse-owned asset managers.

An important follow-on issue is to understand the explanation for these patterns. One frequently offered rationale is that low levels of diverse ownership might be explained by disparate treatment of such managers by investors. While researchers have found some evidence of biases against diverse fund *managers*, to our knowledge the literature is silent on whether investor behavior towards diverse asset management firm owners differs.<sup>3</sup>

In this paper, we explore the hypothesis that investor intolerance of failure can explain at least part of the lack of diverse ownership in alternative asset management. According to this explanation, investors may be more likely to terminate funding relationships with poorly performing diverse-owned firms than with non-diverse-owned firms with similar performance.<sup>4</sup> Interviews with industry practitioners also suggest, at least anecdotally, some type of double-standard for diverse-owned managers. To the extent that diverse-owned managers face relatively high penalties for failure, they may have a greater likelihood of exiting the industry during times of low returns.

The hypothesis that diverse-owned managers experience a relatively large penalty for failure is testable. Using data from Preqin, a leading information provider on alternative investments, we examine how past financial performance affects future fundraising outcomes for U.S.-headquartered diverse-owned and non-diverse-owned private equity (PE) fund managers. Where the data allow, we also study the relationships between performance and fundraising for women- and minority-owned managers. If an intolerance of failure exists, we should expect poor performance to have a more adverse impact on diverse-owned managers' ability to raise funds relative to non-diverse-owned managers. Equivalently, we would find that the fundraising activities of non-diverse-firms are less vulnerable to dips in performance.

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<sup>1</sup> See for example, Sargis, Madison. Lutton, Laura. "Fund Managers by Gender: The Global Landscape." *Morningstar Research*. 28 November 2016; Also see, "Diversity in the Finance Industry." *The U.S. Equal Employment Opportunity Commission*. 2006.

<sup>2</sup> Lerner, Josh et al. "Diverse Asset Management Project Firm Assessment." *Bella Private Markets*. <https://bellaprivatemarkets.com/diversity-report.pdf>. May 2017. In this calculation, we define a firm as diverse-owned if women or minority owners held at least 50% of the firm's equity. We include mutual funds, hedge funds, private equity funds, and real estate funds.

<sup>3</sup> See for example, Niessen-Ruenzi, Alexandra. Ruenzi, Stefan. "Sex Matters: Gender Bias in the Mutual Fund Industry." *Management Science*. April 30, 2018.

<sup>4</sup> Hereafter, we use managers to refer to asset management firms.

First, we examine the probability that a manager raises a new fund in a given year as a function of a PE firm's past performance. Our preferred measure of performance is a firm's average excess net multiple on all prior funds in our dataset, relative to its peers. We define a firm as underperforming (overperforming) if their average excess net multiple is less than (greater than) zero. On average, we find that an underperforming non-diverse-owned manager is 9.6 percentage points less likely to raise a new fund compared to overperforming non-diverse-owned managers. For a diverse-owned manager, the impact of underperformance is a 24.9 percentage point reduction in the probability of raising a new fund—indicating a significantly larger penalty for failure.

Second, we ask whether a manager's past performance affects the sizes of follow-on funds. Specifically, we look at the relationship between our firm-level performance metrics and the percentage change in the size of follow-on funds. One difficulty in assessing the influence of performance on fundraising size is the relatively small sample size. Despite this, we find some evidence that growth in fund size is more sensitive to past performance for diverse-owned managers compared to non-diverse-owned managers.

It is important to note that we are not suggesting an intolerance of failure is the only explanation for the observed lack of diverse ownership in asset management. Rather, we view it as one of many potential causes. For example, some researchers have suggested gender differences in the willingness to compete, mentorship, and occupational choices as potential explanations for underrepresentation.<sup>5</sup> While such explanations are potentially important drivers of the lack of diverse ownership, we leave their investigation to future work.

Most similar to the spirit of our paper is Niessen-Ruenzi and Ruenzi (2018), who find experimental evidence of an implicit bias against women-managed mutual funds.<sup>6</sup> In addition, Niessen-Ruenzi and Ruenzi find that women-managed mutual funds receive lower capital inflows after controlling for fund performance. In a related paper, Kumar et al (2015) conduct an experiment showing that mutual fund managers with foreign-sounding names receive about 10% lower annual inflows.<sup>7</sup> Our work extends the literature, which has primarily focused on investor biases toward diverse asset *managers*, by examining differences in the implied penalty for failure between diverse-owned and non-diverse-owned PE managers.

The remainder of our paper proceeds as follows. **Section II** describes the data and measurement. **Section III** presents our methodology and results. **Section IV** discusses robustness checks. **Section V** concludes the paper.

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<sup>5</sup> Sutter, Matthias. Glätzle-Rützler, Daniela. "Gender Differences in the Willingness to Compete Emerge Early in Life and Persist." *Management Science*. Volume 61, Issue 10. October 2015. Pages iv-vii, 2281-2547. See also, Polachek, Solomon William. "Occupational Self-Selection: A Human Capital Approach to Sex Differences in Occupational Structure." *Review of Economics and Statistics* 63. 1981. Pages 60-69. We thank our advisory committee for suggesting differences in mentorship as a potential explanation.

<sup>6</sup> Niessen-Ruenzi, Alexandra. Ruenzi, Stefan. "Sex Matters: Gender Bias in the Mutual Fund Industry." *Management Science*. April 30, 2018.

<sup>7</sup> See Kumar, Alok. Niessen-Ruenzi, Alexandra. Spalt, Oliver G. "What's in a Name? Mutual Fund Flows When Managers Have Foreign-Sounding Names." *The Review of Financial Studies*. Volume 28, Issue 8, 1 August 2015. Pages 2281-2321.

## II. Data and Measurement

### A. A Brief Introduction to Private Equity

Investors, known as limited partners (LPs), supply capital to PE managers who ultimately invest in private companies. PE managers may take positions in start-ups or early stage companies, in the case of venture capital (VC), or may take majority stakes in larger firms, in the case of buyouts. LPs may be large institutional investors such as pension funds, foundations, university endowments, or insurance companies. In other cases, LPs are accredited individual investors or family offices. PE funds are typically structured as limited partnership agreements (LPAs) with terms of 10-12 years, and the resulting profits are split between LPs and fund managers.<sup>8</sup>

The lifecycle of a PE fund consists of three key phases: fundraising, investing, and exits. In the fundraising phase, successful PE firms obtain capital commitments, or promises to invest, in a new fund. The launch year of a fund is known as the fund's "vintage year," and a fund is said to have a final "close" when its last investors have made commitments to invest. During the investing phase, firms will build a portfolio by taking equity positions in private companies. Often, PE managers attempt to increase the value of their portfolio companies through operational improvements. Finally, PE funds sell, or liquidate, their portfolio positions and return capital to their LPs.

After liquidation, investors are in a position to evaluate their fund's financial return. While a full discussion of performance evaluation is beyond the scope of this paper, we briefly describe our key measure of fund performance, the net multiple. A fund's net multiple is the number of times an investor receives her committed capital (less carry and fees) over the life of a fund. For example, a net multiple of 2.2x indicates that investors receive 2.2 times their initial cash investment. We prefer the use of net multiples as funds are more likely to report them, relative to net IRRs, and they avoid instances where the net IRR is difficult to calculate or not meaningful. A potential drawback of the net multiple is that it does not account for the timing of cashflows, i.e., how quickly an investor receives returns.

#### *Data Collection on Private Equity*

To collect information on PE fundraising and performance we rely on Preqin, a commercial data provider for the alternative asset industry. Preqin is among the top sources of data on alternative assets managers and is one of two databases most often used in PE research.<sup>9</sup> For our study, we rely on Preqin's PE Funds Database, which provides fund-level variables on several fundraising outcomes. In addition, we obtain performance measures for funds using Preqin's PE Performance Database. In the remainder of this section, we describe each of our datasets in greater detail.

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<sup>8</sup> Firms differ in terms of fees and the share of profits kept by managers, known as "carried interest" or "carry." It is common for many PE managers to keep 20% of the profits as carry, with LPs receiving the remaining 80%.

<sup>9</sup> Robinson, David and Berk Sensoy, "Private Equity in the 21<sup>st</sup> Century: Liquidity, Cash Flows, and Performance 1984-2010," *NBER Working Paper*, July 15, 2011. See also, Brown, Gregory W. and Harris, Robert S. and Jenkinson, Tim and Kaplan, Steven Neil and Robinson, David T., What Do Different Commercial Data Sets Tell Us About Private Equity Performance? (December 21, 2015). Available at SSRN: <https://ssrn.com/abstract=2706556>.

## B. Fundraising Data

Our fundraising data consist of 5,900 fund-level observations with vintage years in the 2006-2017 period. We are able to observe information about the types of fund being raised, number of months to final close, and fund size.<sup>10</sup> In our paper, we examine two key fundraising outcomes: (i) whether a firm in our sample starts a fund in a given vintage year, and (ii) the growth in final fund size.

One empirical challenge for calculating the growth in the size of a manager's funds is that a firm must have at least two comparable funds. Moreover, large firms frequently raise several sequences of funds that are not directly comparable, e.g. China Ventures I, II, III; India Ventures I, II. To make meaningful comparisons, we calculate percentage changes in final fund size using a firm's current fund and the most recently raised fund within the same sequence. If the last fund raised is not available, we use the most recent fund for which information is available. Because of data entry anomalies, we are required to manually code whether a fund belongs to a particular sequence. While this is a straightforward exercise for most funds, some judgement calls were made regarding the comparability of other funds.

Some fundraising variables, most notably final fund size, are reported in current year U.S. dollars. To ensure comparability over time, we convert all variables into constant 2012 U.S. dollars using the Personal Consumption Expenditure (PCE) price index obtained from the U.S. Bureau of Economic Analysis (BEA).

## C. Performance Data and Measurement

We gather PE performance information from Preqin's Performance Database. Our performance dataset consists of PE funds reporting net multiples on a quarterly basis with vintage years covering period from 1980 to 2014. For example, a fund established in 1990 with complete data will report their net multiple "as at" every quarter from 1990 through the quarter in which the fund is liquidated. Once a fund is liquidated, the fund reports their last net multiple, as at the liquidation quarter, in all future periods.

To examine the relationship between firm performance and fundraising outcomes, we construct an annual, firm-specific performance measure using the net multiples reported by each firm's prior funds. More specifically, in any given year,  $t$ , we gather all net multiples reported as at the fourth quarter of year  $(t-1)$  for all funds operated by firm  $i$  that were established after 1980.<sup>11</sup> We drop any funds that are two years old or less, on the grounds that their performance numbers are unlikely to be meaningful.<sup>12</sup> For each fund, we compute the excess net multiple by subtracting from a fund's net multiple the mean net multiple for all funds established in the same vintage year. We then average the excess net multiples of all the prior funds to create a measure that we

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<sup>10</sup> One limitation of our data is the small number of funds with information on months to final close. Therefore, we are unable to explore fundraising duration as one of our outcome variables.

<sup>11</sup> Because some firms do not report net multiples in every quarter, we use the most recently reported excess net multiple from the time interval  $[t-2, t-1]$ , i.e. within the last eight quarters prior to the start of year  $t$ .

<sup>12</sup> In particular, we drop all funds if the following condition is true: (reporting year - vintage year) < 2.

call, *Excess Multiple<sub>it</sub>*. In our **Robustness** section, we carry out the same procedure using net IRRs to estimate diversity-related differences in the penalty for failure.

We repeat the steps in the preceding paragraph for each year from 2006 to 2017. The firm-year performances measures are matched with our fundraising data.

#### **D. Diversity Data**

A major advantage of using Preqin data is the availability of diverse-ownership indicators for asset managers. Preqin’s diversity information allows us to identify women- and minority-owned managers in our sample in cases where at least 50% of the firm’s equity is held by women or minorities.

It should be noted that data collection on diverse ownership is a relatively recent development. As a result, we cannot guarantee that our study has identified every diverse-owned manager. Therefore, we supplement Preqin’s diverse ownership variables with our own hand-compiled lists of diverse-owned managers. These lists were obtained by searching through publicly available reports from pension funds, government agencies, and non-profit organizations.

The table below summarizes the public sources for our lists of diverse-owned firms. In some cases, the public sources provide diversity information for multiple years.

<b>Public Sources on PE Manager Diversity</b>
<i>Association of Black Foundation Executives (ABFE) Directory of Minority and Women-Owned Investment Management Firms</i>
<i>Dow Jones Private Equity Analyst Report, 2012</i>
<i>Illinois Municipal Retirement Fund</i>
<i>Maryland Governor's Office of Minority Affairs</i>
<i>Office of the New York State Comptroller</i>

The lists of diverse-owned PE firms from the sources above were combined with Preqin’s diversity database. Reassuringly, there is considerable overlap between Preqin’s list of diverse-owned managers and our hand-collected list. In cases where a firm appears in both lists, we rely on information from Preqin’s diversity indicators. We generate indicator variables for women- and minority-owned firms and merge them with our full dataset from section **II.C**.

## **E. Final Sample Adjustments**

We make a number of important additional adjustments to our final sample:

- For PE fundraising dataset, the observations are limited to funds with vintage years in the 2006-2017 period, allowing us to construct a sample of funds that should be currently operating based on the typical life of funds with a limited partnership structure. However, we utilize data on past performance and historical fund sizes going back to 1980.
- Funds-of-funds (FoFs) managers are dropped from our dataset because they invest in other funds that are likely to be observations in our dataset. In some cases, fund performances would be “double counted” in our data.
- Although Preqin collects data on foreign-headquartered managers, we restrict our sample to those based in the U.S. as the data are likely to be more comprehensive. Moreover, our internal lists of diverse-owned managers only cover U.S.-headquartered firms.
- Regional locations of firms are assigned based on the manager’s office address. The regions are defined as follows. **Northeast:** Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont. **South:** Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, Puerto Rico, South Carolina, Tennessee, Texas, Virgin Islands, Virginia, Washington, DC, West Virginia. **Midwest:** Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, South Dakota, North Dakota, Wisconsin. **West:** Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, Wyoming.
- Preqin classifies fund types into a number of different categories. We regroup PE funds into two broad groups: PE and VC. **PE** includes Buyout, Growth, Mezzanine, Co-Investment Multi-Manager, Co-Investment, Balanced, Direct Secondaries, Distressed Debt, Hybrid, PIPE, Natural Resources, Timber, Special Situations, Turnaround, Secondaries, Infrastructure, Infrastructure Fund of Funds, Infrastructure Secondaries, Fund of Funds, and Hybrid Fund of Funds. **VC** includes Early Stage, Early Stage: Seed, Early Stage: Start-Up, Expansion/Late State, Venture (General), and Venture Debt.



### III. Methodology and Results

#### A. Probability of Raising a New PE Fund

We now examine whether women- or minority-owned PE managers face an intolerance of failure for poor performance. Using fundraising data from 2006 to 2017, we analyze the relationship between firm-specific performance and the likelihood of raising a new fund. Firms are excluded if they have not started at least one fund, as they are likely to be inactive during our sample period.

In **Table 1**, we report summary statistics. Our full sample consists of 6,543 firm-year observations matched with our performance measures. Reflecting the low level of diverse-ownership in the industry, we find that women- and minority-owned managers make up only 3.7% and 4.2% of all observations. These figures differ slightly from estimates of women and minority ownership in our *2018 Diverse Asset Management Firm Assessment* because our sample only includes firms with performance data. In some models, we control for the average size of a firm's prior funds. Therefore, we compute *Average Size of Past Funds* as the mean of a firm's previous funds going back to 1980.

Our aim is to evaluate whether poor historical performance reduces the likelihood of raising a new fund for diverse-owned managers by a greater percentage relative to their non-diverse-owned, similarly performing, peers. In this section, our fundraising outcome of interest is *Raised Fund*. In a given year, *Raised Fund* takes a value of one if a firm raises at least one fund and a value of zero otherwise.<sup>13</sup> In our sample, 26.4% of managers raise a new fund in any given year.

We assume that LPs make their investment decisions based on the performance of a firm's prior funds. Therefore, our preferred measure of manager performance is the *Excess Multiple*, which is the average excess net multiple of a firm's funds as of a particular year. We describe the calculation of *Excess Multiple* in section **II.C**. As an additional check, we replicate our analysis using net IRRs in our **Robustness** section. As expected, the means for both performance measures are close to zero. Unlike in our *Enhanced Performance Analysis*, we do not use Public Market Equivalents (PMEs) in our analysis because of the limited number of funds reporting historical cashflows.

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<sup>13</sup> Because most PE funds do not report fundraising launch dates, we use a fund's vintage year to proxy for the year in which the fund was raised.



**Table 1.** Summary Statistics on the Full Sample for Selected Variables.

Variable	Observations	Mean	Std. Dev.	Min	Max
<i>Women-Owned</i>	6,543	0.036528	0.187613	0	1
<i>Minority-Owned</i>	6,543	0.041877	0.200323	0	1
<i>Diverse-Owned</i>	6,543	0.061745	0.240711	0	1
<i>Excess Multiple</i>	6,543	0.088666	1.043575	-2.635	14.84725
<i>Excess IRR (%)</i>	5,873	1.777438	16.54293	-80.5278	183.931
<i>Average Size of Past Funds (mn of 2012 \$)</i>	6,365	656.4425	934.4949	1.421779	7850.086
<i>Raised Fund?</i>	6,543	0.264099	0.440886	0	1
<i>West</i>	6,543	0.303378	0.459752	0	1
<i>Midwest</i>	6,543	0.128076	0.3342	0	1
<i>South</i>	6,543	0.13801	0.344937	0	1
<i>Northeast</i>	6,543	0.430537	0.495189	0	1
<i>Venture Capital (VC) Firm</i>	6,543	0.350298	0.4771	0	1

We begin our study by examining the likelihood that diverse-owned and non-diverse-owned managers raise a new fund in any given year over different levels of performance. If an intolerance of failure exists, we would expect underperforming diverse-owned firms to be less likely to start a new fund compared to underperforming non-diverse owned firms. It should be noted that the results of our descriptive analysis do not necessarily have a causal interpretation. It is useful, however, to examine whether any pattern emerges before undertaking a more formal analysis.

First, we divide our sample into observations with negative and positive values of *Excess Multiple*. We define an underperforming (overperforming) manager as a firm with a negative (positive) value of *Excess Multiple*. Second, for both performance categories, we compute the average of *Raised Fund* for women-, minority-, and non-diverse-owned managers to estimate the probabilities of raising a new fund.

**Figure 1** below shows the likelihood that a manager raises a fund in any given year based on diversity status for underperforming managers. We can see that underperforming women- and minority-owned firms are less likely to raise a fund. The estimated probability that an underperforming women-owned firm will raise a new fund is about 18% compared to 22% for non-diverse-owned firms. For underperforming minority-owned firms the probability of raising a new fund is even lower at 16%. It is important to note that while there are relatively few women- and minority-owned observations in each performance-ownership pair, our formal regression analysis makes use of both underperforming and overperforming observations. In some of our models, we also combine women and minority ownership into a single diverse-ownership category.

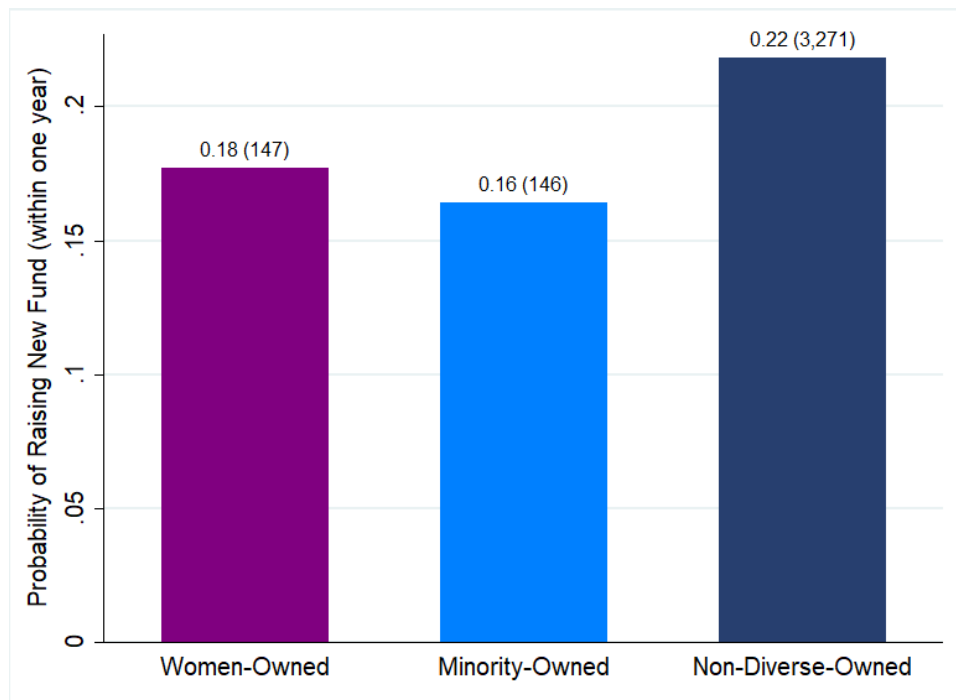
So far, our descriptive statistics are consistent with an industry in which poor performance reduces the ability of diverse-owned firms to raise capital relative to non-diverse owned-firms. On the other hand, it is possible that women- and minority-owned managers are less likely to

raise funds regardless of their performance. We explore this possibility by showing the likelihood of fundraising for overperforming managers.

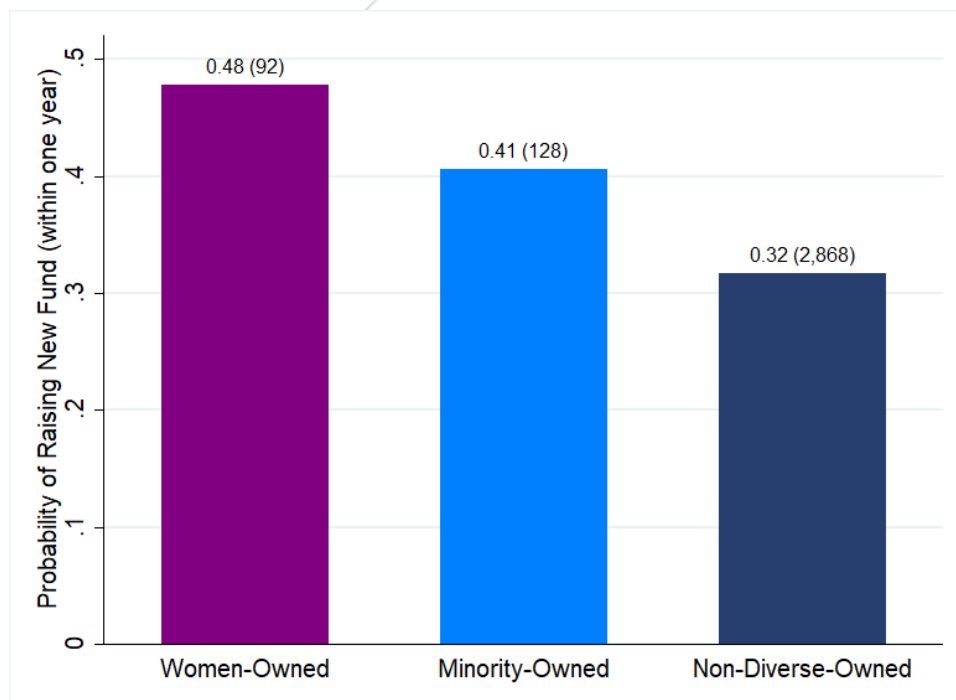
**Figure 2** shows the estimated probabilities of raising new funds for different ownership categories for overperforming managers. Interestingly, overperforming women- and minority-owned managers are significantly more likely to raise new funds compared to non-diverse-owned managers. The estimated probability that an overperforming women-owned firm will raise a new fund in any particular year is 48% compared to 32% for non-diverse-owned firms. For overperforming minority-owned firms the probability of raising a new fund is 41%, 9 percentage points higher relative to non-diverse owned firms. In light of this pattern, it is unlikely that the pattern seen in **Figure 1** can be explained by a lower propensity to fundraise by diverse-owned managers. Rather, our descriptive evidence hints at the possibility that the fundraising efforts of women- and minority-owned firms may be more sensitive to past performance compared to non-diverse-owned firms.

At this point, we should mention that one limitation of our methodology is the inability to directly observe PE investor behavior. Ultimately, the impact of past performance on fundraising depends on decisions made by both investors and firm managers. For example, we cannot rule out the possibility that diverse-owned managers may be more likely to forgo raising a fund during periods of low performance. In other words, we cannot be certain that the patterns we find are caused by disparate treatment by investors towards diverse-owned firms, or differences in fundraising strategies between diverse-owned or non-diverse-owned firms. Nevertheless, we proceed by assuming diverse-owned and non-diverse-owned firms, conditional on our controls, behave similarly when making the decision to raise a new fund.

**Figure 1.** Estimated Probabilities of Raising a New Fund for Underperforming Managers (number of firm-year observations in parentheses).



**Figure 2.** Estimated Probabilities of Raising a New Fund for Overperforming Managers (number of firm-year observations in parentheses).



**Table 2.** Estimated Probabilities of Raising a New Fund by Ownership Status and Performance with Standard Deviations.

	Women-Owned	Minority-Owned	Non-Diverse-Owned
<b>Underperforming</b>	0.177	0.164	0.218
Standard Deviation	0.383	0.372	0.413
Observations	147	146	3,271
<b>Overperforming</b>	0.478	0.406	0.317
Standard Deviation	0.502	0.493	0.465
Observations	92	128	2,868

While our results are largely consistent with the existence of an intolerance of failure in the PE industry, the descriptive patterns could easily be driven by differences in the distribution of firms over vintage years or other firm-level characteristics that influence performance. For instance, if more diverse-owned firms were launched during the 2008 financial crisis they may experience both lower returns and an inability to find investors relative to lower performing non-diverse firms during good economic times. Therefore, we now turn to a more formal investigation of the impact of performance on fundraising that explicitly accounts for relevant fundraising characteristics.

We use linear regression models to estimate the average impact of past performance on the probability of raising a new fund.<sup>14</sup> These models allow us to control for the influence of different vintage years, firm type, diversity status, firm location, and average size of historical funds raised. Our regression models are estimated using the same sample as was used in our descriptive analysis. Full results from our econometric models can be found in the **Appendix**.<sup>15</sup>

Our first set of regression results display the average impact of a 1-unit increase in a manager’s *Excess Multiple* on the probability of raising a new fund for women-, minority-, and non-diverse-owned managers. A 1-unit increase in the *Excess Multiple* can be thought of as a manager increasing their performance from the benchmark to a multiple one time better than the benchmark.

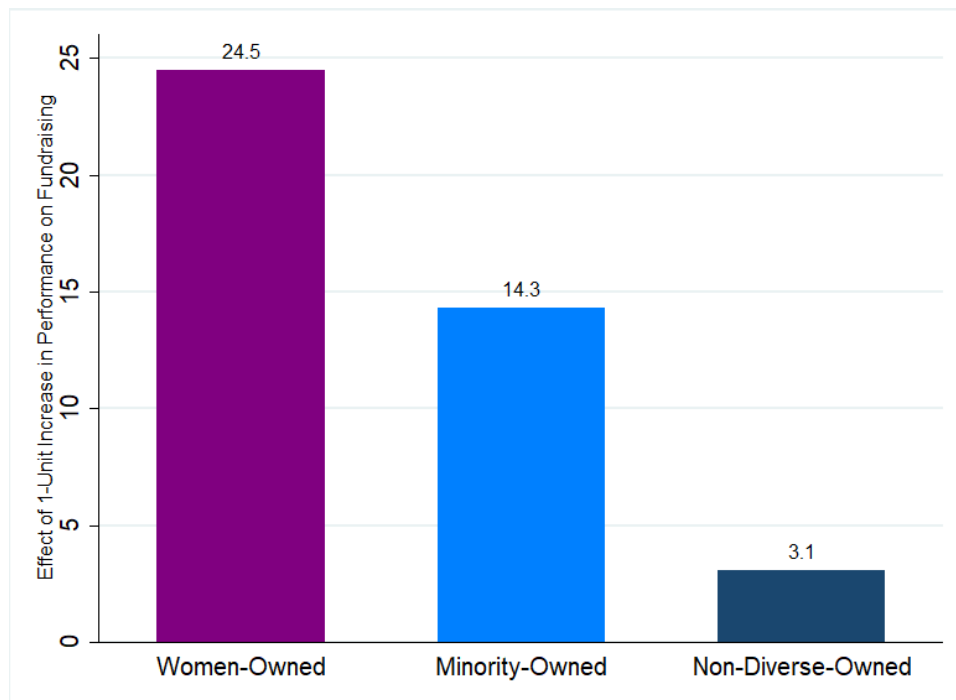
In our model with additional controls, results shown in **Figure 3**, we find that a 1-unit increase in performance increases the probability of raising a new fund by 24.5, 14.3, and 3.1 percentage points for women-, minority-, and non-diverse-owned managers, respectively. Similarly, results from **Figure 4** imply that a 1-unit increase in performance for a diverse-owned manager is associated with a 22.9 percentage point increase in the probability of raising a fund compared to a 3.1 percentage point increase for non-diverse-owned managers. The estimated impacts from **Figure 3** and **Figure 4** are economically meaningful and statistically significant at conventional levels.<sup>16</sup>

<sup>14</sup> We use an ordinary least squares (OLS) specification, rather than a logit or probit one, because of the large number of interaction terms and fixed effects.

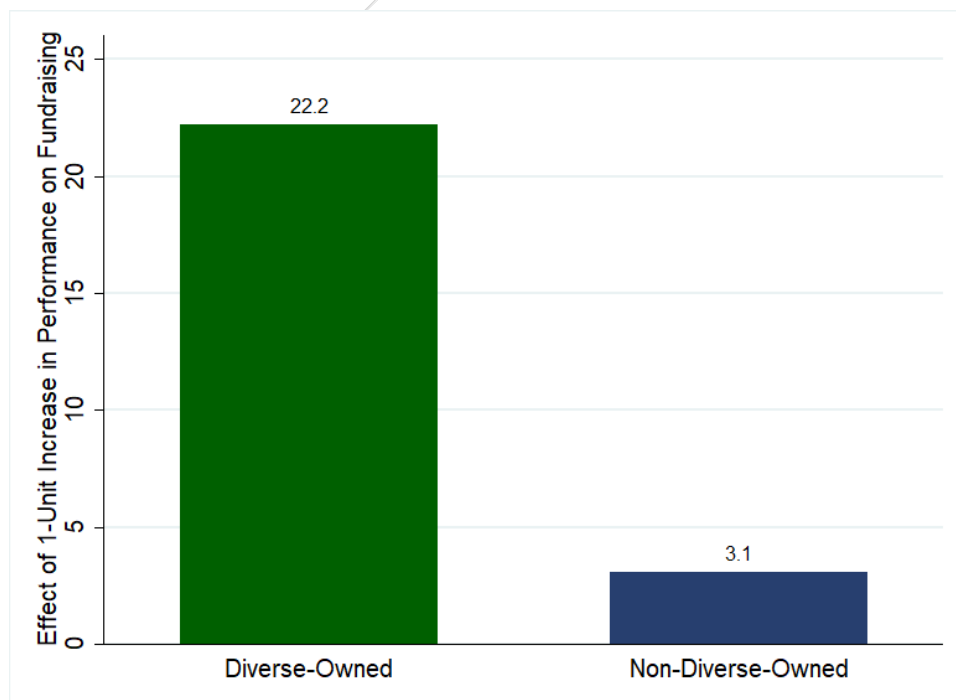
<sup>15</sup> All bar graphs show regression results from our model with additional controls; however, we provide additional specifications in the **Appendix**.

<sup>16</sup> In this paper, an estimate is statistically significant if its p-value is less than 0.05, and it is weakly significant with a p-value of less than 0.1.

**Figure 3.** Estimated Impact of 1-Unit Increase in Firm Performance on the Probability of Raising a New PE Fund.



**Figure 4.** Estimated Impact of 1-Unit Increase in Firm Performance on the Probability of Raising a New PE Fund (combined model).

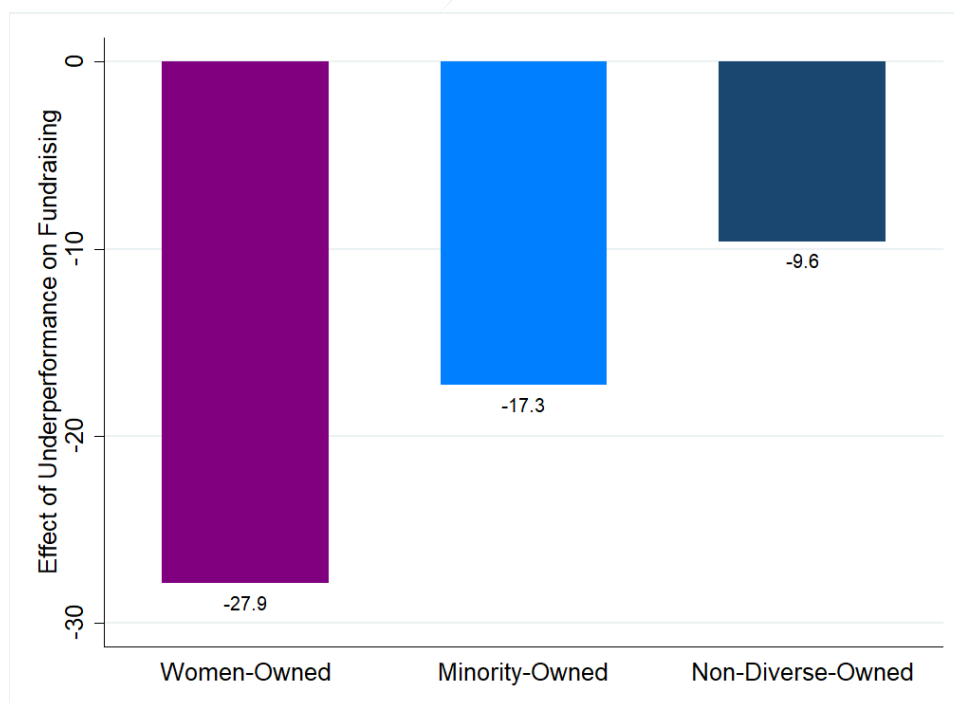


Next, we model the impact of underperformance on the likelihood of raising a new fund. As with our descriptive analysis we define underperformance (overperformance) as a manager whose average fund has a negative (positive) net multiple.

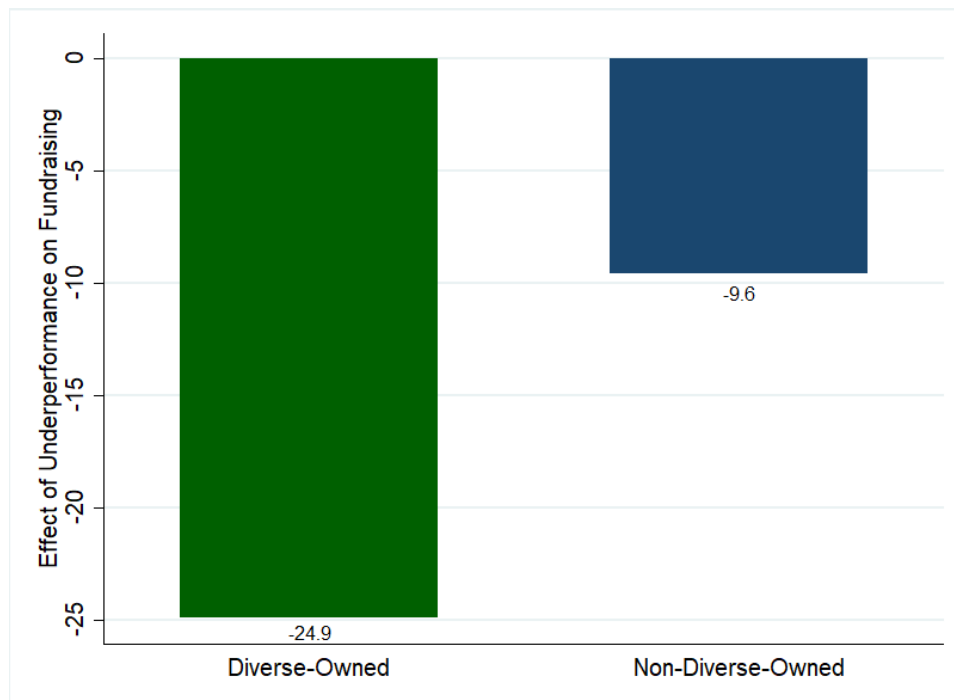
**Figure 5** shows the effects of underperformance (measured relative to overperformance) for women- and minority-owned managers compared to non-diverse-owned managers. On average, we find that underperformance by women-owned and minority-owned managers reduces their chances of raising a fund by 27.9 and 17.3 percentage points. However, the difference in the effects of underperformance is only statistically significant for women-owned firms. For non-diverse-owned managers, the effect of underperformance is a smaller 9.6 percentage point reduction in the likelihood of fundraising. The difference in the effect of underperformance, relative to non-diverse-owned firms, is only statistically significant for women-owned firms.

**Figure 6** shows similar results for our combined model. On average, underperformance by diverse-owned firms is associated with a 24.9 percentage point reduction in the probability of raising a new fund relative to diverse-owned firms that overperform. For non-diverse-owned managers, the estimate impact is a 9.6 percentage point reduction. If we interpret our estimated impacts as penalties for failure, it appears that diverse-owned firms face much larger penalties. Moreover, the difference in the penalties for failure between diverse-owned and non-diverse-owned firms are statistically significant.

**Figure 5.** Estimated Impact of Firm Underperformance on the Probability of Raising a New PE Fund.



**Figure 6.** Estimated Impact of Firm Underperformance on the Probability of Raising a New PE Fund (combined model).



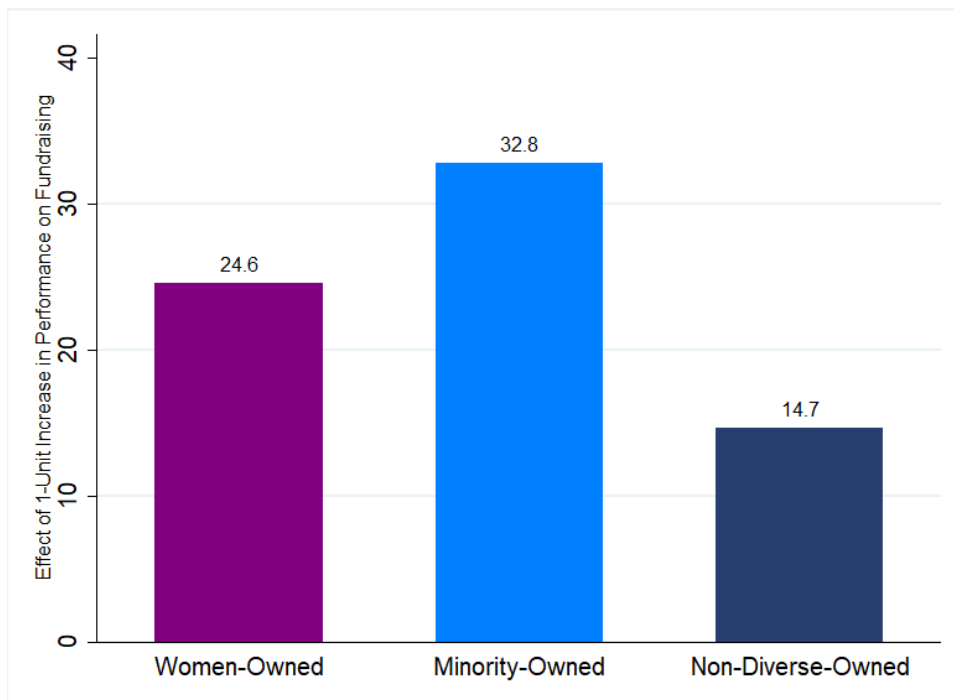
Finally, we estimate a piecewise regression model that allows the impact of a change in performance to vary depending on whether a manager is overperforming or underperforming. For example, changes in performance may affect a manager’s ability to fundraise when underperforming; however, improving performance when a firm is already overperforming may have a smaller additional benefit.

**Figure 7** and **Figure 8** show the results from our piecewise analysis. We find that decreases in performance have a large and statistically significant effect on fundraising when managers are underperforming. In contrast, changes in performance have a very small impact when managers are overperforming. Therefore, we focus our attention on interpreting the impacts of dips in performance for diverse-owned and non-diverse-owned firms when managers are underperforming.

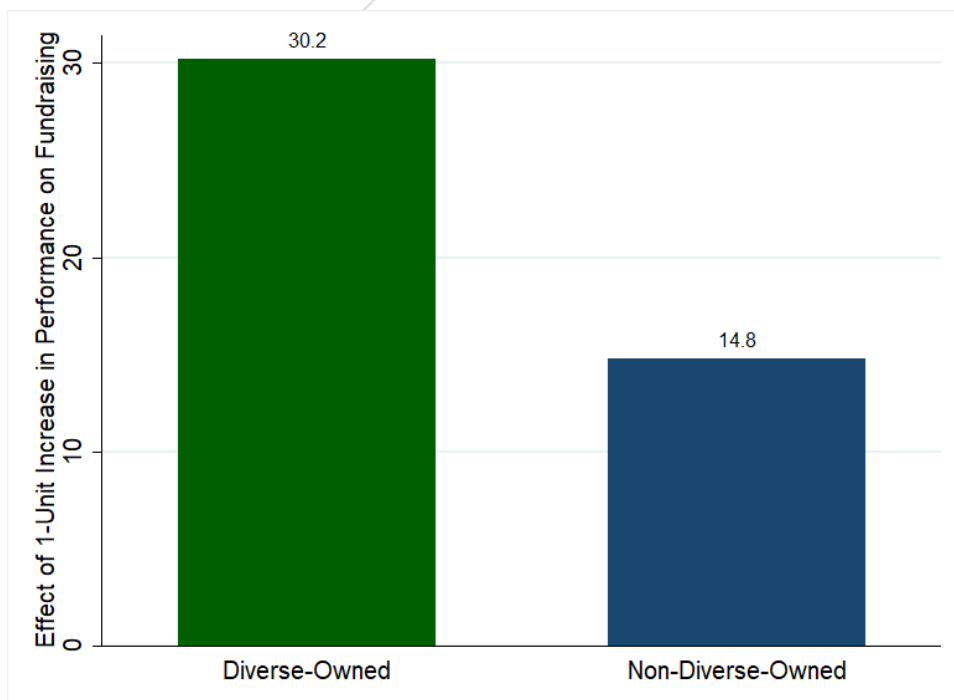
A 1-unit decrease in an underperforming manager’s *Excess Multiple* leads to a 24.6 and 32.8 percentage point reduction in the probability of raising a new fund for women- and minority-owned managers. The same estimated impact falls to a 14.7 percentage point reduction for non-diverse-owned managers. The difference in effects between diverse-owned and non-diverse-owned firms is only statistically significant for minority-owned firms. In our combined model, we find that a unit decrease in performance reduces the fundraising probabilities for diverse- and non-diverse-owned managers by 30.2 and 14.8 percentage points—a difference that is statistically significant.



**Figure 7.** Estimated Impact of 1-Unit Increase in Firm Performance on the Probability of Raising a New PE Fund (underperforming managers).



**Figure 8.** Estimated Impact of 1-Unit Increase in Firm Performance on the Probability of Raising a New PE Fund (underperforming managers, combined model).



To summarize, we have shown evidence of relatively large and statistically significant differences in the impact of performance on fundraising between diverse-owned and non-diverse-owned PE managers. In addition, our findings hold after the inclusion of additional controls across three different statistical models. While we cannot measure investor behavior and attitudes directly, our evidence is consistent with an intolerance of failure in the U.S. PE industry. Future research to disentangle the precise mechanisms driving our results in greater detail would be valuable.

## **B. *The Impact of Past Performance on the PE Fund Size***

In this section, we assess whether past performance has a differential effect on the ability of diverse-owned managers to raise capital relative to non-diverse-owned managers. Specifically, we ask how manager performance affects the size of a follow-on funds relative to the last fund raised by the same manager. As with our previous analysis, we use fundraising data on funds raised between 2006 and 2017. Our full sample consists of 4,677 fund-level observations.

As discussed in our **Data** section, large firms frequently raise several sequences of funds that are not directly comparable, e.g. China Ventures I, II, III; India Ventures I, II. Therefore, we compute our dependent variable as the percentage change in real final fund size, denoted by *% Change in Fund Size*, using a firm's current fund and the most recently raised fund within the same sequence. Formally, our dependent variable is,

$$\% \text{ Change in Fund Size} = \left( \frac{\text{Real Final Fund Size}_t - \text{Real Final Fund Size}_{t-j}}{\text{Real Final Fund Size}_{t-j}} \right) \times 100\%.$$

Where,

*Real Final Fund Size<sub>t</sub>* is the real fund size at final close of a PE fund raised in period *t*,

*Real Final Fund Size<sub>t-j</sub>* is the real fund size at final close of the most recently raised comparable PE fund raised in period (*t-j*).

One limitation of our fundraising size analysis is the relatively small number of comparable observations in the final dataset. Only 43% of funds are comparable with other funds raised by the same firm. Moreover, we require funds with information on final fund size and the corresponding firm's historical performance. For each fund, we code a comparability variable that indicates whether a fund is comparable to the corresponding firm's most recently raised fund. We require that two comparable funds have identical, or nearly similar fund names, and the most recent fund must have a larger fund number.<sup>17</sup> As a result of this procedure, our final regression sample consists of 919 fund-level observations.

<sup>17</sup> We also exclude reference funds in period (*t-j*) that are in the same vintage year as the fund raised in period *t*.

In **Table 3** below, we report descriptive statistics on our full fundraising sample. On average, the percentage change between consecutive funds, as we have measured it, is 58%. In **Table 4**, we report descriptive statistics for comparable funds with data on final fund size and past performance. In our final sample, the average percentage change between consecutive funds is 32% and the average size of a manager’s previously raised funds is \$846 million.

**Table 3.** Descriptive Statistics on Selected Variables for the Full Sample.

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>% Change in Fund Size</i>	1,663	58.00833	153.6872	-95.8265	3768.529
<i>Average Fund Size (mn of 2012 \$)</i>	1,971	927.3846	1202.783	2.08894	7850.086
<i>Comparable Fund?</i>	4,677	0.427411	0.494756	0	1
<i>Diverse-Owned</i>	4,677	0.058585	0.234871	0	1
<i>Excess Multiple</i>	1,966	0.328636	1.292107	-2.635	14.84053
<i>Excess IRR (%)</i>	1,812	6.15006	16.15907	-38.2213	184.6822
<i>West</i>	4,670	0.315203	0.464647	0	1
<i>Midwest</i>	4,670	0.113705	0.317486	0	1
<i>South</i>	4,670	0.185011	0.388348	0	1
<i>Northeast</i>	4,670	0.386081	0.486902	0	1
<i>Venture Capital (VC) Firm</i>	4,677	0.394698	0.488838	0	1

**Table 4.** Descriptive Statistics on Selected Variables for the Final Sample.

Variable	Obs.	Mean	Std. Dev.	Min	Max
<i>% Change in Fund Size</i>	919	32.41667	76.68686	-95.8265	935.3069
<i>Average Fund Size (mn of 2012 \$)</i>	916	845.8461	1069.696	2.330492	7850.086
<i>Diverse-Owned</i>	919	0.054407	0.226943	0	1
<i>Excess Multiple</i>	919	0.381898	1.308619	-2.42755	14.84053
<i>Excess IRR (%)</i>	847	6.818166	14.70771	-31.2603	121.9713
<i>West</i>	919	0.305767	0.460983	0	1
<i>Midwest</i>	919	0.103373	0.304612	0	1
<i>South</i>	919	0.138194	0.345291	0	1
<i>Northeast</i>	919	0.452666	0.498026	0	1
<i>Venture Capital (VC) Firm</i>	919	0.291621	0.454756	0	1

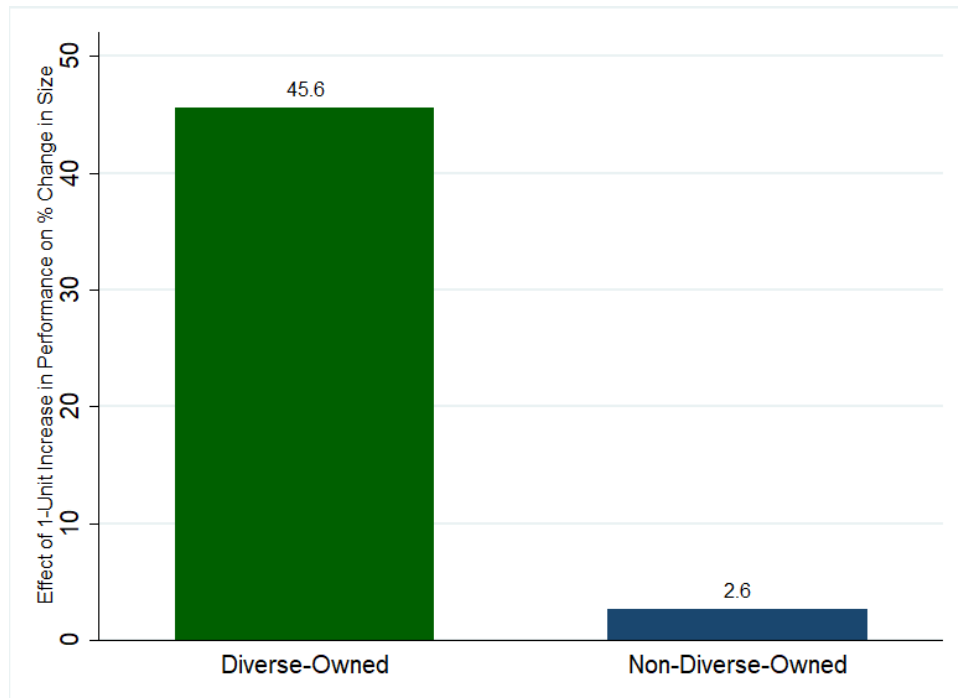
We estimate regression models similar to those in **III.A** to test for an intolerance of failure with *% Change in Fund Size* as our outcome variable. One major difference is that we are forced to estimate less flexible models because of the limited number of funds. For one, we do not attempt to separate our analysis according to women- and minority-owned firms. In addition, we forgo models that allow the impact of performance to vary for overperforming and underperforming

firms. Instead, we focus primarily on the linear relationship between a firm's *Excess Multiple* and the percentage change in fund size.

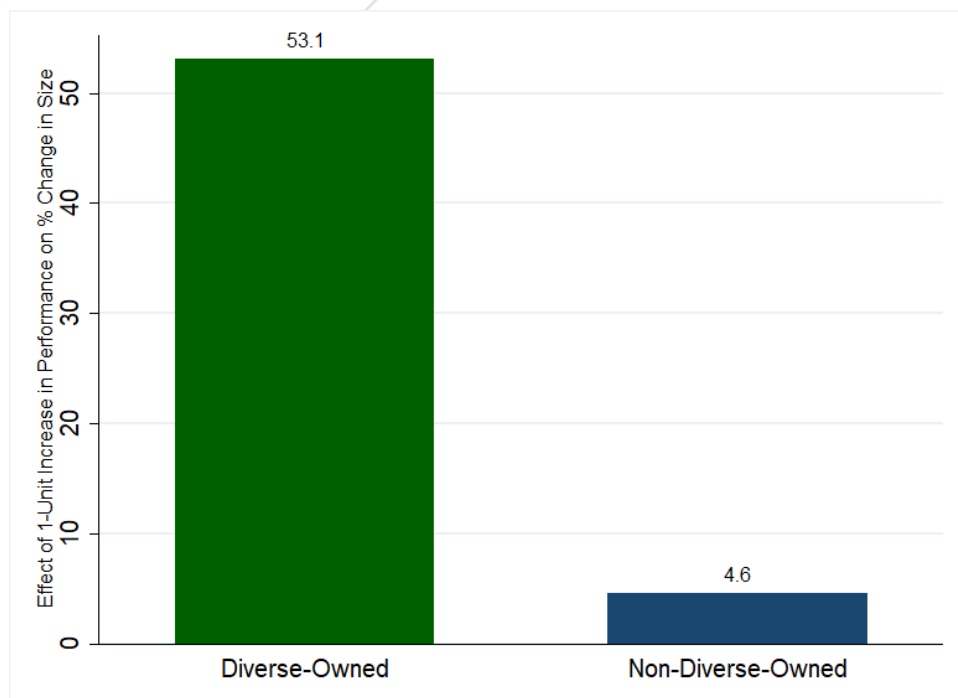
**Figure 9** shows the estimated impacts of a 1-unit increase in a firm's *Excess Multiple* on the percentage change in fund size from a baseline regression. Our baseline regression includes fixed effects for the number of years between comparable funds and fundraising year fixed effects. While it is clear that the estimate impact is much larger for diverse-owned firms, the effects are not statistically significant at conventional levels.

**Figure 10** shows the estimate impacts of performance on the percentage change in fund size from a model with additional control variables. Specifically, we add to our baseline model controls for the average size of a firm's prior funds, firm type (VC or buyout), firm location, and the industry focus of the fund being raised in period  $t$ . We find that a 1-unit increase in firm performance leads to a 53.1 and a 4.6 percentage point increase in fund growth for diverse-owned and non-diverse-owned funds. The difference in the estimated impacts shown in **Figure 10** is statistically significant. While the economic impact of performance on fundraising is exceptionally large, we exercise caution in interpreting our results because of the large degree of statistical imprecision associated with our estimates. Nevertheless, the findings are consistent with our results in section III.A, and reinforce the claim that diverse-owned firms face relatively large penalties for poor performance.

**Figure 9.** Estimated Impact of 1-Unit Increase in Firm Performance on the Percentage Change in Fund Size (baseline model).



**Figure 10.** Estimated Impact of 1-Unit Increase in Firm Performance on the Percentage Change in Fund Size (additional controls model).



#### IV. Robustness

We test the robustness of our main results from **Methodology and Results** section **III.A** by using fund net IRRs to calculate alternative measures of firm-specific performance.<sup>18</sup> Net IRRs are calculated by solving for the discount rate that makes the present value of cashflows (net of carry and fees) into and out of the fund, plus the current value of unrealized investments, equal zero. We calculate our firm-specific performance measures uses the same procedure outlined in **II.C**.

Unlike net multiples, net IRRs account for the timing of distributions, i.e. how quickly an investor receives returns. Net IRRs also have significant limitations. The calculation of net IRRs assumes that investors are able to reinvest early cash distributions and earn the same rate-of-return generated by the fund. Beyond the mathematical limitations of net IRRs, funds in our performance dataset are less likely to report net IRRs relative to net multiples. The underreporting of net IRRs introduces two possible sources of error. First, fewer observations in our analysis sample may reduce the precision of our estimates. Second, our alternative measure of firm performance contains more measurement error, potentially biasing our estimated effects towards zero. Despite these concerns, we are interested in whether our alternative net IRR models yield estimates of similar signs compared to our results in **III.A**.

We report results from the same regression models used in **III.A**, in **Tables E, F, and G** in the **Appendix**. Results from **Model 1**, in **Table E**, show the estimated impact of a one percentage point increase in a firm's average excess net IRR, hereafter *Excess IRR*, on the probability of raising a new fund. In **Model 2**, we find estimated effects of 0.8, 0.4, and 0.2 percentage points for women-, minority-, and non-diverse-owned firms, respectively. However, the difference in the effect size between diverse-owned and non-diverse-owned firms is only significant for women. In **Model 4**, which combines women and minority ownership, we find estimated effects of 0.6 and 0.2 percentage points for diverse-owned and non-diverse-owned firms. In **Model 4**, the difference in the effect of past performance between diverse-owned and non-diverse-owned firms is only weakly significant.

In **Table F** in the **Appendix**, we report results from a model using a dummy variable for underperformance that takes a value of one if a firm's *Excess IRR* is positive, and zero otherwise. In **Table G**, we estimate the same piecewise specification estimated in **III.A** using *Excess IRR* instead of *Excess Multiple*. While we find that past performance is a significant determinant of the probability of raising a new fund, we find little evidence that the size of the effect differs between diverse-owned and non-diverse-owned firms.

To conclude, we find some evidence of an intolerance of failure when replicating our main analysis in **III.A** using an alternative measure of fund performance, net IRR. The likelihood of fundraising appears more sensitive to changes in performance for diverse-owned firms compared to non-diverse-owned firms. Differences in the impact of performance among different ownership types, however, are not statistically significant in other specifications.

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<sup>18</sup> We omit a robustness check for the results in **III.B** because of sample size limitations.

## V. Conclusion

In this paper, we use data from Preqin to test a potential explanation for the lack of diverse ownership in alternative asset management: an intolerance of failure. According to this hypothesis, poorly performing diverse-owned managers are more likely to struggle raising additional capital compared to non-diverse-owned managers with similar performance. Consequently, periods of low returns may cause many women- and minority-owned PE managers to exit the industry after failing to raise follow-on funds.

Our study finds evidence that diverse-owned firms face relatively large penalties for failure in the U.S. PE industry. Specifically, we model the likelihood that a manager raises a new fund as a function of past performance. We find that the fundraising success of women- and minority-owned managers is more sensitive to underperformance relative to non-diverse-owned managers. On average, underperformance by a diverse-owned manager leads to a 24.9 percentage point reduction in the probability of raising a follow-on fund. In contrast, underperformance by a non-diverse-owned manager causes a 9.6 percentage point reduction in the likelihood of raising a new fund. We also find that the likelihood of successful fundraising for diverse-owned managers is more sensitive to changes in past performance as measured using net multiples.

In addition, we examine whether past performance has a differential impact on the amount of capital raised for diverse- and non-diverse-owned funds. In our preferred specification, we find that a 1-unit increase in a firm's *Excess Multiple* causes a 53.1 and a 4.6 percentage point increase in fund growth for diverse- and non-diverse-owned funds. We note that our estimates are imprecise because of the relatively small sample of comparable funds. Despite this limitation, we interpret our findings as being consistent with a larger penalty for failure facing diverse-owned managers in the PE industry.



## VI. Appendix

### A. Model for the Probability of Raising a New Fund as a Function of a Firm's Excess Net Multiple.

The table below shows estimates from a linear regression of *Raised Fund* on diverse-ownership indicators, *Excess Multiple*, and their interactions. In models (1) and (3), we control for fundraising (vintage) year fixed effects. In models (2) and (4), we add additional controls for the average size of a firm's prior funds, *Average Fund Size (mn of 2012 \$)*, regional dummies, and a VC dummy.

Outcome: Raised Fund?				
Explanatory Variables	Model 1	Model 2	Model 3	Model 4
Women-Owned	0.0664 (0.0407)	0.0720* (0.0424)		
Minority-Owned	-0.00611 (0.0299)	0.000224 (0.0303)		
Diverse-Owned			0.0243 (0.0285)	0.0361 (0.0286)
Excess Multiple	0.0302** (0.0135)	0.0310** (0.0135)	0.0299** (0.0134)	0.0308** (0.0135)
Women-Owned x Excess Multiple	0.226*** (0.0643)	0.214*** (0.0641)		
Minority-Owned x Excess Multiple	0.113*** (0.0384)	0.112*** (0.0388)		
Diverse-Owned x Excess Multiple			0.197*** (0.0426)	0.191*** (0.0401)
Average Fund Size (mn of 2012 \$)		4.58e-05*** (1.06e-05)		4.60e-05*** (1.06e-05)
West		0.0110 (0.0163)		0.0101 (0.0164)
Midwest		-0.0312* (0.0186)		-0.0315* (0.0187)
South		0.0207 (0.0223)		0.0208 (0.0223)
Venture Capital (VC) Firm		-0.0293** (0.0133)		-0.0288** (0.0132)
Fundraising Year Fixed Effects?	Yes	Yes	Yes	Yes
Constant	0.431*** (0.0276)	0.406*** (0.0302)	0.430*** (0.0277)	0.405*** (0.0302)
Observations	6,543	6,365	6,543	6,365
R-squared	0.029	0.042	0.028	0.041

Robust standard errors in parentheses (clustered by firm)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## B. Model for the Probability of Raising a New Fund as a Function of an Indicator for Underperformance

The table below shows estimates from a linear regression of *Raised Fund* on diverse-ownership indicators, *Underperformance*, and their interactions. In models (1) and (3), we control for fundraising (vintage) year fixed effects. In models (2) and (4), we add additional controls for the average size of a firm's prior funds, *Average Fund Size (mn of 2012 \$)*, regional dummies, and a VC dummy.

<b>Outcome:</b> Raised Fund?				
<b>Explanatory Variables</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Women-Owned	0.144** (0.0620)	0.158*** (0.0591)		
Minority-Owned	0.0297 (0.0456)	0.0335 (0.0441)		
Diverse-Owned			0.0867* (0.0442)	0.103** (0.0431)
Underperform	-0.103*** (0.0133)	-0.0956*** (0.0133)	-0.103*** (0.0133)	-0.0957*** (0.0134)
Women-Owned x Underperform	-0.160** (0.0694)	-0.183*** (0.0673)		
Minority-Owned x Underperform	-0.0777 (0.0506)	-0.0775 (0.0491)		
Diverse-Owned x Underperform			-0.138*** (0.0469)	-0.153*** (0.0458)
Average Fund Size (mn of 2012 \$)		4.37e-05*** (1.02e-05)		4.38e-05*** (1.02e-05)
West		0.0119 (0.0160)		0.0110 (0.0161)
Midwest		-0.0387** (0.0190)		-0.0392** (0.0190)
South		0.0183 (0.0217)		0.0187 (0.0217)
Venture Capital (VC) Firm		-0.0119 (0.0134)		-0.0111 (0.0134)
Fundraising Year Fixed Effects?	Yes	Yes	Yes	Yes
Constant	0.491*** (0.0288)	0.459*** (0.0305)	0.491*** (0.0288)	0.459*** (0.0305)
Observations	6,543	6,365	6,543	6,365
R-squared	0.037	0.048	0.036	0.047

Robust standard errors in parentheses (clustered by firm)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### C. Piecewise Regression Model for the Probability of Raising a New Fund as a Function of a Firm's Excess Net Multiple

The table below shows estimates from a linear regression of *Raised Fund* on diverse-ownership indicators, *Excess Multiple*, *Excess Multiple+* (equals zero when *Excess Multiple* is negative, and equals *Excess Multiple* otherwise), and their interactions. In models (1) and (3), we control for fundraising (vintage) year fixed effects. In models (2) and (4), we add additional controls for the average size of a firm's prior funds, *Average Fund Size (mn of 2012 \$)*, regional dummies, and a VC dummy.

<b>Outcome:</b> Raised Fund?				
<b>Explanatory Variables</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Women-Owned	0.0390 (0.0553)	0.0369 (0.0609)		
Minority-Owned	0.0262 (0.0449)	0.0302 (0.0458)		
Diverse-Owned			0.0295 (0.0409)	0.0336 (0.0422)
Excess Multiple	0.149*** (0.0228)	0.147*** (0.0247)	0.150*** (0.0229)	0.148*** (0.0249)
Excess Multiple+	-0.138*** (0.0268)	-0.134*** (0.0292)	-0.140*** (0.0269)	-0.135*** (0.0293)
Women-Owned x Excess Multiple	0.118 (0.0820)	0.0991 (0.0868)		
Minority-Owned x Excess Multiple	0.197** (0.0857)	0.181** (0.0912)		
Diverse-Owned x Excess Multiple			0.175** (0.0760)	0.154** (0.0770)
Women-Owned x Excess Multiple+	0.117 (0.202)	0.151 (0.217)		
Minority-Owned x Excess Multiple+	-0.169 (0.143)	-0.151 (0.150)		
Diverse-Owned x Excess Multiple+			-0.0408 (0.110)	-0.00856 (0.114)
Average Fund Size (mn of 2012 \$)		4.35e-05*** (1.01e-05)		4.34e-05*** (1.01e-05)
West		0.0122 (0.0158)		0.0116 (0.0159)
Midwest		-0.0272 (0.0190)		-0.0282 (0.0190)
South		0.0232 (0.0223)		0.0228 (0.0224)
Venture Capital (VC) Firm		-0.0113 (0.0136)		-0.0112 (0.0135)
Fundraising Year Fixed Effects?	Yes	Yes	Yes	Yes
Constant	0.467*** (0.0285)	0.433*** (0.0304)	0.468*** (0.0285)	0.434*** (0.0304)
Observations	6,543	6,365	6,543	6,365
R-squared	0.037	0.048	0.036	0.047

Robust standard errors in parentheses (clustered by firm)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**D. Model for the Percentage Change in Real Fund Size (in Constant 2012 \$) as a Function of a Firm's Excess Net Multiple**

The table below shows estimates from a linear regression of *% Change in Fund Size*, a diverse-ownership indicator, *Excess Multiple*, and their interaction. In models (1) and (3), we control for fundraising (vintage) year and years between funds fixed effects. In models (2) and (4), we add additional controls for the average size of a firm's prior funds, *Average Fund Size (mn of 2012 \$)*, regional dummies, a VC dummy, and industry focus fixed effects.

<b>Outcome:</b> % Change in Fund Size				
<b>Explanatory Variables</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Diverse-Owned			-3.920 (9.089)	-4.533 (8.676)
Excess Multiple	2.747 (2.580)	4.723** (2.126)	2.610 (2.642)	4.620** (2.187)
Diverse-Owned x Excess Multiple			43.00* (25.51)	48.44** (23.91)
Average Fund Size (mn of 2012 \$)		-0.00889*** (0.00259)		-0.00891*** (0.00259)
West		6.370 (5.934)		5.967 (5.852)
Midwest		5.017 (7.713)		4.474 (7.711)
South		2.082 (9.357)		2.274 (9.392)
Venture Capital (VC) Firm		-24.34*** (8.614)		-24.83*** (8.482)
Fundraising Year FE	Yes	Yes	Yes	Yes
Years Between Funds FE	Yes	Yes	Yes	Yes
Fund Industry Focus FE	No	Yes	No	Yes
Constant	94.61*** (34.53)	113.9*** (34.54)	93.61*** (33.99)	112.3*** (34.11)
Observations	919	916	919	916
R-squared	0.081	0.129	0.084	0.132

Robust standard errors in parentheses (clustered by firm)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### E. Model for the Probability of Raising a New Fund as a Function of a Firm's Excess Net IRR

The table below shows estimates from a linear regression of *Raised Fund* on diverse-ownership indicators, *Excess IRR*, and their interactions. In models (1) and (3), we control for fundraising (vintage) year fixed effects. In models (2) and (4), we add additional controls for the average size of a firm's prior funds, *Average Fund Size (mn of 2012 \$)*, regional dummies, and a VC dummy.

<b>Outcome:</b> Raised Fund? <b>Explanatory Variables</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Women-Owned	0.0803* (0.0453)	0.0804 (0.0499)		
Minority-Owned	-0.0108 (0.0342)	-0.00479 (0.0349)		
Diverse-Owned			0.0219 (0.0312)	0.0302 (0.0321)
Excess IRR	0.00246*** (0.000686)	0.00234*** (0.000659)	0.00245*** (0.000686)	0.00233*** (0.000660)
Women-Owned x Excess IRR	0.00714*** (0.00256)	0.00611** (0.00283)		
Minority-Owned x Excess IRR	0.00149 (0.00230)	0.00180 (0.00246)		
Diverse-Owned x Excess IRR			0.00423** (0.00213)	0.00385* (0.00214)
Average Fund Size (mn of 2012 \$)		4.57e-05*** (1.19e-05)		4.61e-05*** (1.18e-05)
West		0.00824 (0.0175)		0.00718 (0.0176)
Midwest		-0.0255 (0.0198)		-0.0261 (0.0199)
South		0.0162 (0.0231)		0.0154 (0.0232)
Venture Capital (VC) Firm		-0.0185 (0.0147)		-0.0178 (0.0146)
Fundraising Year Fixed Effects?	Yes	Yes	Yes	Yes
Constant	0.428*** (0.0295)	0.405*** (0.0322)	0.428*** (0.0295)	0.405*** (0.0323)
Observations	6,040	5,904	6,040	5,904
R-squared	0.030	0.041	0.029	0.040

Robust standard errors in parentheses (clustered by firm)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**F. Model for the Probability of Raising a New Fund as a Function of an Indicator for Underperformance (Excess Net IRR < 0)**

The table below shows estimates from a linear regression of *Raised Fund* on diverse-ownership indicators, *Underperformance*, and their interactions. In models (1) and (3), we control for fundraising (vintage) year fixed effects. In models (2) and (4), we add additional controls for the average size of a firm’s prior funds, *Average Fund Size (mn of 2012 \$)*, regional dummies, and a VC dummy.

<b>Outcome:</b> Raised Fund?				
<b>Explanatory Variables</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Women-Owned	0.0742 (0.0668)	0.0616 (0.0756)		
Minority-Owned	0.00480 (0.0417)	0.0192 (0.0428)		
Diverse-Owned			0.0255 (0.0401)	0.0306 (0.0422)
Underperform (IRR)	-0.118*** (0.0129)	-0.108*** (0.0134)	-0.118*** (0.0129)	-0.108*** (0.0134)
Women-Owned x Underperform	-0.0153 (0.0855)	0.00508 (0.0922)		
Minority-Owned x Underperform	-0.0257 (0.0666)	-0.0454 (0.0680)		
Diverse-Owned x Underperform			-0.0202 (0.0587)	-0.0203 (0.0603)
Average Fund Size (mn of 2012 \$)		4.17e-05*** (1.19e-05)		4.17e-05*** (1.19e-05)
West		0.0106 (0.0171)		0.0103 (0.0172)
Midwest		-0.0309 (0.0202)		-0.0317 (0.0202)
South		0.0177 (0.0230)		0.0160 (0.0231)
Venture Capital (VC) Firm		-0.00443 (0.0143)		-0.00293 (0.0144)
Fundraising Year Fixed Effects?	Yes	Yes	Yes	Yes
Constant	0.493*** (0.0308)	0.462*** (0.0329)	0.493*** (0.0308)	0.462*** (0.0330)
Observations	6,040	5,904	6,040	5,904
R-squared	0.037	0.046	0.037	0.046

Robust standard errors in parentheses (clustered by firm)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

### G. Piecewise Regression Model for the Probability of Raising a New Fund as a Function of a Firm's Excess Net IRR

The table below shows estimates from a linear regression of *Raised Fund* on diverse-ownership indicators, *Excess IRR*, *Excess IRR+* (equals zero when *Excess IRR* is negative, and equals *Excess IRR* otherwise), and their interactions. In models (1) and (3), we control for fundraising (vintage) year fixed effects. In models (2) and (4), we add additional controls for the average size of a firm's prior funds, *Average Fund Size (mn of 2012 \$)*, regional dummies, and a VC dummy.

<b>Outcome:</b> Raised Fund?				
<b>Explanatory Variables</b>	<b>Model 1</b>	<b>Model 2</b>	<b>Model 3</b>	<b>Model 4</b>
Women-Owned	0.0780 (0.0585)	0.0824 (0.0612)		
Minority-Owned	-0.0438 (0.0436)	-0.0378 (0.0439)		
Diverse-Owned			-8.49e-05 (0.0436)	0.00698 (0.0442)
Excess IRR	0.00823*** (0.000898)	0.00756*** (0.000942)	0.00824*** (0.000900)	0.00760*** (0.000949)
Excess IRR+	-0.00779*** (0.00123)	-0.00698*** (0.00125)	-0.00781*** (0.00123)	-0.00704*** (0.00126)
Women-Owned x Excess IRR	0.00442 (0.00330)	0.00453 (0.00334)		
Minority-Owned x Excess IRR	-0.00337 (0.00315)	-0.00293 (0.00348)		
Diverse-Owned x Excess IRR			-0.000327 (0.00292)	-0.000255 (0.00303)
Women-Owned x Excess IRR+	0.000642 (0.00923)	-0.000932 (0.00900)		
Minority-Owned x Excess IRR+	0.00713 (0.00604)	0.00707 (0.00638)		
Diverse-Owned x Excess IRR+			0.00486 (0.00613)	0.00456 (0.00614)
Average Fund Size (mn of 2012 \$)		4.38e-05*** (1.12e-05)		4.42e-05*** (1.11e-05)
West		0.0115 (0.0169)		0.0108 (0.0170)
Midwest		-0.0238 (0.0200)		-0.0239 (0.0200)
South		0.0176 (0.0233)		0.0167 (0.0235)
Venture Capital (VC) Firm		-0.00216 (0.0144)		-0.00118 (0.0144)
Fundraising Year Fixed Effects?	Yes	Yes	Yes	Yes
Constant	0.478*** (0.0311)	0.442*** (0.0331)	0.478*** (0.0311)	0.442*** (0.0331)
Observations	6,040	5,904	6,040	5,904
R-squared	0.038	0.048	0.037	0.047

Robust standard errors in parentheses (clustered by firm)

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1