Growing the Asset Management Franchise: Evidence from Hedge Fund Firms

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Abstract

We explore the capital raising activities of hedge fund firms. We find that hedge fund firms have strong incentives to launch multiple funds so as to circumvent fund level capacity constraints and take advantage of the non-netting of incentive fees across funds. They do so principally by leveraging on the performance of their first funds or flagships. Firms with successful flagships are able to raise follow-on funds that charge higher fees, set more onerous redemption terms, and attract greater inflows. Such capital raising activities are detrimental to fund investors. Non-flagship funds conceived by fund families underperform flagship funds by up to 3.48 percent per year after adjusting for co-variation with the Fung and Hsieh (2004) factors. Consequently, firms that have launched many funds significantly underperform single fund firms. Despite the underperformance of these multiple product firms, they generate greater fee revenues for their management companies than do single product firms, even after controlling for firm assets under management. These results shed light on the agency problems confronting the asset management industry.

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1. Introduction

Hedge funds are investment vehicles in which investors place their capital at risk alongside talented investment professionals who act as managers of the vehicle. Hedge fund managers lend their investment skills to generate trading profit in exchange for a compensation formula which typically involves a fixed and variable incentive component indexed to their ability to generate new profit over different accounting periods.[1] The precise arrangements between investors (the principals) and hedge fund managers (the agents) vary over different investment vehicles but this basic profit sharing format has survived since Alfred Winslow Jones launched the first hedge fund in 1949.[2]

The rules of engagement between investors and their hedge fund managers may have idiosyncratic features that differentiate themselves from management arrangements for conventional, long-biased funds. There is however one important commonality that has escaped the scrutiny of researchers since academic interest in hedge funds emerged during the late 1990s. While investors of a fund, conventional or alternative, benefit from the profitable application of their capital they do not participate in the non-pecuniary benefits of a successful investment history of the fund—a not inconsequential benefit that accrue solely to the fund manager—or the value of the fund's track record. There have been studies on the benefits of a successful track record in mutual fund families, but little is known on how the track record of hedge fund managers can be monetized and on the value of the track record per se. We believe this omission stems largely from the way hedge fund data is organized—by individual hedge funds—which masks the importance of a successful track record to the hedge fund management company. This paper explores the development paths of hedge fund

[1] See Goetzmann, Ingersoll, and Ross (2003) for a discussion on this principal-agent relationship.
[2] See Loomis (1966) for an account of A.W. Jones's hedge fund. These principal-agent arrangements are many and varied as a consequence of the lightly regulated and private nature of hedge fund vehicles.

management companies and documents the empirical properties of alternative growth strategies hedge fund managers employ to develop their business. These results are both timely and critical to our understanding of the hedge fund industry. In a recent study, Edelman, Fung, and Hsieh (2012) report that the majority of the assets in the hedge fund industry reside in the hands of a limited number of successful mega hedge fund management companies. Furthermore, their results suggest that this concentration of the industry's AUM in the hands of a small number of successful mega hedge fund firms has persisted over the past decade and shows no sign of abatement. It is therefore incumbent upon researchers to explore and to uncover the motivating factor behind this empirical phenomenon so that investors can form expectations on the future direction of the hedge fund industry.

Our story begins with the recognition of some empirical studies that provide insight into the commonality between hedge fund managers capitalizing on a successful track record and the documented evidence on how mutual fund managers have gone about this task. Here we are referring to the empirical literature on the impact of a star or flagship fund in a family of mutual funds which is sometimes refer to as the "halo effect". Ex-post, hedge fund management companies or firms, similar to their mutual fund counterparts, often manage more than one fund. Not all hedge funds managed by a hedge fund firm command the same regard from investors. Anecdotal evidence suggests that the reputation of the hedge fund firm is heavily influenced by the performance of its flagship.[3] For example, in the fall of 2011, the Financial Times reported that Man Group's stock rose buoyed by the outperformance of its

[3] Rarely does a hedge fund firm have multiple flagship funds. An example of a hedge fund firm with more than one flagship is Citadel which counts Kensington and Wellington as its flagship funds. See "Hedge funds fall short of incentive fee mark," Financial Times, 23 January 2012.

flagship AHL fund, while Paulson and Co. extended its losing streak with the underperformance of its flagship Paulson Advantage Plus fund.[4]

Theory suggests and casual empirical evidence confirms that changing market conditions often place fund managers under capacity constraints at the individual fund level (Berk and Green, 2004). Consequently hedge fund firms regularly face the twin challenge of protecting the performance of their flagship funds on the one hand and growing their business on the other. By making the reasonable assumption that the value of a hedge fund company is positively correlated to its revenue growth which is primarily driven by fees, we can express the conundrum a hedge fund manager faces as a trade off between growing the firm's recurrent fixed-fee base which can conflict with maximizing expected performance fees should capacity constraints become binding. Furthermore, performance deterioration affects not only the current period performance fees but can also negatively impact future prospect of assets under management (henceforth AUM) growth. One possible solution is to limit capital inflow to a successful flagship that is capacity constrained while launching new funds or non-flagship funds ("non-flagships") to leverage on the halo effect generated by the flagship fund and continue the AUM growth of the firm as a whole. Indeed, Jim Simon's Renaissance Technologies, which limits investors in its flagship Medallion fund to firm employees and only allows outside investors to invest through its non-flagship Nova and Renaissance Institutional Equities funds, appears to have adopted this strategy[5].

Motivated by these considerations, we ask the following questions: How do firms leverage on stellar flagship fund performance to raise additional funds? Are there spillover effects from flagships to non-flagships managed by the same firm? Specifically, how does

[4] See "Man Group outperforms as flagship fund sparkles," Financial Times, 24 September 2011, and "Paulson losing streak continues with flagship fund down 21.6%," Financial Times, 5 August 2011.
[5] Note that maximizing future expected fee income may well call for keeping key staffs fully engaged which may run contrary to limiting the size of a flagship fund which can result in a reduction in human resource requirements.

flagship's performance impact the fees, redemption terms and flows into the non-flagships launched by same hedge fund firm and do flagships outperform non-flagships? Are the capital raising activities of hedge fund firms detrimental to fund investors? How do such activities impact the total fee revenue that accrues to the management company of the hedge fund firm?

Our results are striking. We find that hedge fund firms have strong incentives to deliver superior performance with their flagship funds. We show that firms with successful flagships are able to launch non-flagships that charge higher performance fees, set longer redemption periods, and attract greater inflows. These effects prevail even after controlling for the performance of the non-flagships launched by the same firm. Indeed, past flagship performance predicts future non-flagship flow over and above the explanatory power of past own-fund performance. These empirical observations confirm that the halo effect is an important tool in a hedge fund manager's campaign to grow the firm's AUM. We refer to a firm that engages in multiple, separate fund launches as a multiple product firm whose AUM growth is primarily achieved through increasing the number of product offerings.

Do hedge fund investors benefit from the asset gathering activities of multiple product hedge fund firms? We find that flagships outperform non-flagships by 2.75 percent per annum after adjusting for co-variation with the Fung and Hsieh (2004) seven-factors and controlling for the other variables that can explain fund performance. The effect is statistically significant at the one percent level. Moreover, the difference between flagship and non-flagship performance is stronger for the later non-flagships launched. The abnormal return spread between the flagship and the 2^{nd} to 5^{th} fund launched is a statistically reliable but economically modest 1.50 percent, while the analogous spread between the flagship and the 11^{th} to 20^{th} fund launched is an impressive 3.48 percent per year. These findings cannot be explained by differences in fund age (Aggarwal and Jorion, 2010), size (Berk and Green,

2004), return smoothing behavior (Getmansky, Lo, and Makarov, 2004), fees (Agarwal, Daniel, and Naik, 2009), share restrictions and illiquidity (Aragon, 2007), and backfill and incubation bias (Fung and Hsieh, 2009).

In addition, we show that hedge fund firm performance is negatively correlated with the number of funds launched. Multiple product firms on average underperform single product firms by a statistically reliable 2.80 percent per annum after adjusting for risk. At the same time we show that despite underperforming single product firms, multiple product firms are able to generate significantly more total fee revenue (fixed fees plus performance fees) than their single product counterparts. The larger AUM of the multiple product firms explains some of the difference in fee revenue. However, even after controlling for AUM, we find that multiple product firms dominate single product firms in terms of fee income. This suggests that multiple product firms derive significant benefits from the fact that incentive fees are calculated based on the performance of the individual funds in their stable and not on the net performance of the firm as a whole, as is the case for single product firms.

Why does the superior flagship performance not compensate for the underperformance of non-flagships in multiple product firms? We show that the outperformance of the flagship fund is driven by the strong initial performance of the flagship which does not extend beyond the launch of the first non-flagship. Prior to non-flagship launches, flagships of multiple product firms outperform flagships in other firms by 3.11 percent per year after adjusting for risk. However, upon the launch of the first non-flagship fund, flagship alpha deteriorates by 4.83 percent per year. Consequently post launch of non-flagships, the average flagship performance of multiple product firms reverts to the performance of the non-flagship products. For the most part, instead of protecting the flagship's performance by limiting its AUM growth, multiple product firms typically grow

AUM across all products--flagship as well as non-flagship. This in part explains performance deterioration for multiple product firms once they embark on a pure asset-gathering strategy.

The findings in this paper contribute to several strands of literature. We resonate with the burgeoning literature on hedge funds and agency problems. Bollen and Pool (2008, 2009) find that in response to the risk of capital flight, hedge funds tend to fully report gains but delay reporting losses leading to conditional serial correlation in their returns. They subsequently show in Bollen and Pool (2012) that such suspicious patterns in hedge fund returns are indicators of a heightened risk of fraud. Teo (2011) presents empirical evidence that suggests that hedge funds, especially those susceptible to agency issues, tend to load up excessively on liquidity risk, so as to generate impressive returns and draw investor capital. We argue that in an effort to raise capital, hedge fund firms generate superior performance with their flagship funds so as to raise additional funds. On balance, their capital raising efforts are detrimental to the returns earned by the average investor as they hurt the performance of the firm.

We also complement the literature on mutual fund families. Nanda, Wang, and Zheng (2004) show that a star mutual fund affects the flow of new money to itself and to other funds in the mutual fund family. Gaspar, Massa, and Matos (2006) argue that this creates incentives for mutual fund families to cross-subsidize the star performers at the expense of low value funds. In line with Nanda, Wang and Zheng (2004), we show that flagship fund performance affects the flow of new capital to itself and to other non-flagship funds in the hedge fund firm. However, we find that non-flagship funds do not engender positive spillover effects onto other hedge funds launched by the same firm. Therefore, in the hedge fund space, the star performer effect only applies to flagship funds.

The remainder of this paper is organized as follows: Section 2 provides a description of the data and methodology. Section 3 reports the results from the empirical analysis while Section 4 presents a series of robustness tests. Section 5 concludes.

2. Data and methodology

We evaluate hedge funds using monthly net–of–fee returns and assets under management data of live and dead hedge funds reported in the TASS, HFR, and BarclayHedge datasets from January 1990 to December 2010.[6] Because TASS, HFR and BarclayHedge started distributing their data in 1994, the data sets do not contain information on funds that died before December 1993. This gives rise to survivorship bias. We mitigate this bias by focusing on data from January 1994 onward.

In our fund universe, we have a total of 21,842 hedge funds, of which 8,217 are live funds and 13,625 are dead funds. The funds are roughly evenly split between the three databases. While 3,174 funds appear in all three databases and 4,732 funds appear in two databases, many funds belong to only one database. Specifically, there are 4,211 funds, 4,229 funds, and 5,496 funds peculiar to the TASS, HFR, and BarclayHedge databases, respectively. This highlights the advantage of obtaining data from multiple sources. In our analysis, we also include robustness tests on the sample of funds without duplicate share classes due to concerns that funds with multiple share classes could cloud the analysis. Removing duplicate share classes from the sample leaves us with a total of 15,808 hedge funds, of which 5,666 are live funds and 10,142 are dead funds.

Other than monthly return and size information, our sample also captures data on fund

[6] The results are robust to using pre–fee returns.

characteristics such as management fee, performance fee, redemption frequency, notification period, investment style, fund leverage indicator, and fund minimum investment. Because minimum investments are sometimes quoted in currencies other than the US dollar, we convert all minimum investments to US dollars using exchange rates on December 31, 2010, so as to facilitate meaningful comparison.

Following Agarwal, Daniel, and Naik (2009), we classify funds into four broad investment styles: Security Selection, Multi–process, Directional Trader, and Relative Value. Security Selection funds take long and short positions in undervalued and overvalued securities, respectively, and reduce systematic risks in the process. Usually, they take positions in equity markets. Multi–process funds employ multiple strategies that take advantage of opportunities created by significant transactional events, such as spin–offs, mergers and acquisitions, bankruptcy reorganizations, recapitalizations, and share buybacks. Directional Trader funds bet on the direction of market prices of currencies, commodities, equities, and bonds in the futures and cash market. Relative Value funds take positions on spread relations between prices of financial assets and aim to minimize market exposure.

We define flagship funds as the first fund launched by each hedge fund firm.[7] Non-flagship funds are the other funds launched by hedge fund firms. To determine flagship status, we sort our sample of funds based on fund inception date within the firm. To ensure that there is only one flagship per firm, when more than one fund is launched on the same month within a firm, the funds are merged into a composite fund. The fund attributes and monthly returns of the composite fund are simply the average fund attribute and average monthly returns of its component funds, respectively. The monthly assets under management

[7] An out-of-sample test conducted on Eurekahedge data and reported in Section 4 confirms that our definition for a flagship fund is reasonable.

of the composite fund is the sum of the monthly assets under management of its component funds.

Table 1 breaks down the funds in the sample by investment strategy and reports the flagship and non-flagship fund distribution as well as the number of live and dead funds in each strategy. To facilitate comparison with our overall fund sample, the flagship funds reported in Table 1 include all the component flagship funds launched by hedge fund firms. So, there are more flagship funds reported in Table 1 than there are firms. We note that there are 6,940 firms in our sample. When the component funds are grouped together to form composite funds so that each firm is linked to only one flagship fund, we find that there are 3,994 firms with only one fund, 2,462 firms with two to five funds, 325 firms with six to ten funds, 121 firms with 11 to 20 funds, and 38 firms with more than 20 funds.

[Insert Table 1 here]

Hedge fund data are susceptible to many biases (Fung and Hsieh, 2000; 2009). These biases stem from the fact that, due to the lack of regulation amongst hedge funds, inclusion in hedge fund databases is voluntary. As a result, there is a self–selection bias. For instance, funds often undergo an incubation period in which they rely on internal funding before seeking capital from outside investors. Incubated funds with successful track records then go on to list in various hedge fund databases while the unsuccessful funds do not, resulting in an incubation bias. Separate from this, when a fund is listed on a database, it often includes data prior to the listing date. Again, because successful funds have a strong incentive to list and attract capital inflows, these backfilled returns tend to be higher than the non backfilled returns. In the analysis that follows, we will repeat the tests after dropping the first 12 months of return data from each fund so as to ensure that the results are robust to backfill and incubation bias.

Throughout this paper, we model the risks of hedge funds using the Fung and Hsieh (2004) seven–factor model. The Fung and Hsieh factors are the excess return on the Standard and Poor's (S&P) 500 index (*SNPMRF*); a small minus big factor (*SCMLC*) constructed as the difference between the Wilshire small and large capitalization stock indices; the yield spread of the US ten–year Treasury bond over the three–month Treasury bill, adjusted for duration of the ten–year bond (*BD10RET*); the change in the credit spread of Moody's BAA bond over the ten–year Treasury bond, also appropriately adjusted for duration (*BAAMTSY*); and the excess returns on portfolios of look back straddle options on currencies (*PTFSFX*), commodities (*PTFSCOM*), and bonds (*PTFSBD*), which are constructed to replicate the maximum possible return from trend following strategies (see Fung and Hsieh, 2001) on their respective underlying assets.[8] These seven factors have been shown by Fung and Hsieh (2004) to have considerable explanatory power on hedge fund returns.

3. Empirical results

3.1. Tests of non-flagship fund attributes and flows

Our first set of tests focuses on the incentives of hedge fund firms. Are hedge fund firms incentivized to deliver superior performance with their flagship funds? How does stellar flagship fund performance benefit the non-flagships managed by the same firm? We explore these spillover effects by testing the attributes of non-flagships as well as flows into non-flagships, conditional on the performance of the flagship fund. Specifically, we estimate OLS regressions on the management fee, performance fee, redemption period, redemption notice period, and monthly inflows of non-flagship funds with flagship performance as an

[8] The trend following factors can be downloaded from http://faculty.fuqua.duke.edu/~dah7/DataLibrary/TF-Fac.xls.

independent variable. The regressions include controls for the performance of the other non-flagships managed by the same family. The monthly inflow regression also include as controls past own fund monthly return to account for the effect of fund performance on future inflows. Therefore, the fund attribute and fund flow regressions can be expressed as

$$FUND\_ATTRIBUTE_i = a + bFLAGSHIP\_RET_i + cNONFLAGSHIP\_RET_i + \varepsilon_i \quad (1)$$

$$\begin{aligned} FLOW_{im} = {} & a + bFLAGSHIP\_RET_{im-12,m-1} + cFUND\_RET_{im-12,m-1} \\ & + dNONFLAGSHIP\_RET_{im-12,m-1} + \varepsilon_{im} \end{aligned} \quad (2)$$

where $FLAGSHIP\_RET_i$ and $NONFLAGSHIP\_RET_i$ in Eq. (1) are the flagship and other non-flagship monthly return averaged over the last 12 months prior to the launch of fund *i*, respectively. $FUND\_ATTRIBUTE_i$ is either fund management fee in percentage, fund performance fee in percentage, fund redemption period in months, or fund redemption notice period in months. We assume that fund attributes are determined at fund launch. In Eq. (2), $FLAGSHIP\_RET_{im-12,m-1}$ and $NONFLAGSHIP\_RET_{im-12,m-1}$ are the flagship and other non-flagship monthly return averaged over the last 12 months, respectively. $FUND\_RET_{im-12,m-1}$ is own fund monthly return averaged over the last 12 months. We also estimate variants of the Eq. (1) and Eq. (2) regressions where the independent variables are returns averaged over the last 24 months or returns averaged over the last 36 months. [9]

The results reported in Panels A to C of Table 2 indicate that stellar flagship fund performance confers a variety of benefits to the other non-flagships managed by the same firm. The coefficient estimates on *FLAGSHIP_RET* in the fund attribute regressions suggest

[9] There are concerns that funds may not diligently update their AUM numbers every month. Instead they may only do so once a quarter. Therefore, monthly fund flows computed from changes in monthly AUM may not be an accurate reflection of capital flows into a fund. To address this issue, we estimate variants of Eq. (2) based on quarterly flows. Specifically, we evaluate the explanatory power of flagship, other non-flagship, and own fund returns on quarterly non-flagship flows were the returns are averaged over the last two quarters, four quarters, and eight quarters. We find that inferences do not change with this alternative set up. The coefficient estimates on flagship returns over the last two quarters and four quarters are statistically significant at the 5 percent level while that on flagship returns over the last eight quarters is statistically significant at the 10 percent level.

that controlling for the performance of the other funds within the same firm, firms with stellar flagships are able to raise non-flagships that charge higher performance fees as well as set longer redemption periods and notification periods. The impact of past flagship fund performance on non-flagship fund redemption period is statistically significant at the one percent level regardless of whether we average flagship returns over the 12-month, 24-month, or 36-month period prior to the launch of the non-flagship. Similarly, the effect of past flagship fund performance on non-flagship fund notification period is statistically significant at the five percent level for all return horizons. While the impact on non-flagship performance fee is somewhat weaker statistically, it is still statistically significant at the one percent level for two of the three return horizons considered.

[Insert Table 2 here]

Excellent flagship performance also allows hedge fund firms to raise more capital for their non-flagships. The coefficient estimates on *FLAGSHIP_RET* in the fund flow regressions indicate that controlling for own fund past return and the past performance of other non-flagships within the same family, flows into non-flagship funds are positively associated with the past performance of the flagship fund within the same family. The impact of flagship performance on non-flagship fund flow is statistically significant at the five percent level over all return horizons considered. Specifically, when the average monthly flagship fund returns measured over the last 24 months increase by one percent, inflows into non-flagships increase by 0.139 percent. We note however that the impact of flagship performance on non-flagship flow is small especially when compared to the impact of own non-flagship performance on non-flagship flow. This suggests that the incentive for firms to protect flagship performance once non-flagships have been launched may be relatively weak.

Nonetheless, the fund attribute results indicate that hedge fund firms face strong incentives to deliver stellar performance with their flagship funds so as to raise follow-on funds.[10]

3.2. Tests of flagship and non-flagship fund performance

To test whether the incentives to generate superior performance with flagships documented in the previous subsection impacts actual performance, we evaluate the performance of flagship funds relative to the performance of non-flagship funds. We sort funds within each hedge fund firm into twenty portfolios based on fund inception date. The n^{th} portfolio corresponds to the n^{th} fund launched by the firm. The 1^{st} portfolio is simply the flagship fund portfolio. The other portfolios are the non-flagship fund portfolios sorted by launch date within the firm. Next, we average the returns of each portfolio across hedge fund firms and evaluate the performance of the flagship fund, the 2^{nd} to 5^{th} fund launched, the 5^{th} to 10^{th} fund launched, and the 11^{th} to 20^{th} fund launched relative to the Fung and Hsieh (2004) seven-factor model. The 2^{nd} to 5^{th} fund launched portfolio is simply the average of the 2^{nd} to 5^{th} fund inception portfolios. The other non-flagship portfolios are defined analogously.

The results from the fund inception date sort are reported in Table 3. Clearly, flagship funds outperform non-flagship funds. Flagships deliver an average return of 7.38 percent per annum after adjusting for co-variation with the Fung and Hsieh (2004) factors, while the 2^{nd} to 5^{th} funds launched deliver an average risk-adjusted return of 5.88 percent. The risk-adjusted spread between these two portfolios is statistically significant at the one percent level (*t*-statistic = 4.74) but economically modest at 1.50 percent per annum after adjusting for risk. The abnormal spread rises to a more impressive 3.48 percent per annum when we move from the 2^{nd} to 5^{th} fund portfolio (i.e., portfolio B) to the 11^{th} to 20^{th} fund portfolio (i.e.,

[10] Inferences do not change when we replicate the Table 2 tests using abnormal risk-adjusted returns instead of raw returns.

portfolio D). These results suggest that the later funds launched by a hedge fund firm tend to underperform the earlier funds launched by the same firm.

[Insert Table 3 and Figure 1 here]

Figure 1 complements the results from Table 3. It illustrates the monthly cumulative average residuals (henceforth CARs) from the portfolio of flagship funds (portfolio A) and the portfolios of non-flagship funds (portfolios B, C, and D). CAR is the cumulative difference between a portfolio's excess return and its factor loadings (estimated over the entire sample period) multiplied by the Fung and Hsieh (2004) risk factors. The CARs in Figure 1 indicate that portfolio A consistently outperforms portfolios B, C, and D over the entire sample period and suggest that the outperformance of flagships relative to non-flagships is not peculiar to a particular year.[11]

There are concerns that the portfolio sort results could be due to hedge fund self–selection biases, serial correlation in hedge fund returns induced by thin trading, or the imputation of fund fees. Flagship funds could backfill or incubate their returns more than non-flagship funds. Further, serial correlation in fund returns could arise from linear interpolation of prices for infrequently traded securities, the use of smoothed broker dealer quotes, or, in some cases, deliberate performance smoothing behavior. This could inflate some of the test statistics that we use to make inferences from the sort results. Finally, flagship funds could charge lower fees and hence earn higher returns on a post–fee basis. To allay such concerns, I redo the portfolio sorts after adjusting for backfill and incubation bias by removing the first 12 months of return data for each fund, after unsmoothing fund returns using the algorithm of Getmansky, Lo, and Makarov (2004), and after adding back fees to form pre–fee returns. The results from these robustness tests are presented in Table 4 and

[11] A plot of the cumulative raw returns for the flagship and non-flagship portfolios delivers similar results. The cumulative raw return plot is available upon request.

indicate that the superior performance of the flagship fund portfolio is not driven by backfill and incubation bias, thin trading–induced serial correlation, or lower fees.[12]

[Insert Tables 4 and 5 here]

To further test the performance difference between flagships and non-flagships, we estimate the following pooled OLS regression:

$$\begin{aligned} ALPHA_{im} = a + bFLAGSHIP_i + c\log(SIZE_{im-1}) + dFLAGSHIP_{im} * \log(SIZE_{im-1}) \\ + eMGT\_FEE_i + fPERF\_FEE_i + gREDEMPTION_i + hAGE_{im} + \varepsilon_{im} \end{aligned} \quad (3)$$

where *ALPHA* is fund monthly abnormal return after stripping away co-variation with the Fung and Hsieh (2004) seven factors, *FLAGSHIP* is an indicator variable that takes a value of one when a fund is a flagship fund and a value of zero otherwise, *SIZE* is fund monthly assets under management in millions of US$, *MGT_FEE* is fund management fee in percentage, *PERF_FEE* is fund performance fee in percentage, *REDEMPTION* is fund redemption period in months, and *AGE* is fund age in decades. The primary variable of interest is the coefficient estimate on *FLAGSHIP* which provides an indication of the spread in risk-adjusted performance between flagship and non-flagship funds. The log(*SIZE*) variable captures capacity constraints at the fund level (Berk and Green, 2004). We include an independent variable for the interaction between *FLAGSHIP* and log(*SIZE*) to allow for the possibility that flagships are more sensitive to capacity constraints than are non-flagships. *MGT_FEE* and *PERF_FEE* capture the impact of fund incentives on managerial performance (Agarwal, Daniel, and Naik, 2009) while *REDEMPTION* caters for the view expounded by Aragon (2007) that funds with longer redemption periods take on more liquidity risk and therefore achieve higher returns. We include *AGE* as a response to the Agaarwal and Jorion (2010)

[12] There are also concerns that hedge funds that are very small and therefore less relevant to large institutional investors are driving the spread between flagships and non-flagships. Hence I redo the sorts after removing funds with assets under management less than US$20 million. The sort results are virtually unchanged with this adjustment, suggesting that they are not driven solely by the smallest funds.

finding that younger funds outperform older funds. To facilitate the estimation of fund alpha, we only include results for funds with at least 36 months of return data. We also estimate the analogous regression on raw monthly fund returns to ensure that our findings are not an artefact of the risk adjustment methodology.

The results from the cross-sectional regression analysis are reported in columns one and two of Table 5. They corroborate the findings of the portfolio sorts and indicate that flagships outperform non-flagships. Specifically, the coefficient estimate on *FLAGSHIP* in the alpha regression reported in column two of Table 5 indicates that, controlling for other factors that could explain fund performance, flagship funds outperform non-flagship funds by 2.64 percent per annum after adjusting for risk. The coefficient estimates on the interaction variable confirm our prior intuition that flagship funds are more susceptible to capacity issues than are non-flagships. Take together, the coefficient estimates on the log(SIZE) variable and on the interaction variable imply that the impact of fund size on flagship alpha is 1.53 times that on non-flagship alpha. The coefficient estimates on the other control variables accord with the extant literature. Higher powered incentives or fees (Agarwal, Daniel and Naik, 2009) and longer redemption periods (Aragon, 2007) are associated with superior performance while fund age is linked to poorer performance (Agaarwal and Jorion, 2010). Inferences do not change when we estimate the regression on raw returns suggesting that our prior findings are not driven by our risk adjustment technology.

To check for robustness, we estimate Fama and MacBeth (1973) regressions in place of the OLS regressions. Specifically, we first run cross-sectional regressions for each month. Then, we report the time-series averages of the coefficient estimates, and use the time-series standard errors of the average slopes to draw inferences. The Fama and MacBeth regressions control for correlation in residuals across different firms within the same month. We compute the standard errors using the method of Newey and West (1987) with a three-month lag to

adjust for dependence across time. The Fama and MacBeth (1973) results reported in columns three and four of Table 5 echo our previous findings and indicate that they are robust to alternative model specifications.

3.3. Tests of hedge fund firm performance

Do investors benefit when hedge fund firms deliver superior performance with their flagship funds and subsequently raise capital via non-flagships? Conceivably, the superior performance of flagship funds may more than compensate for the inferior performance of the other funds launched by hedge fund firms, especially when fund performance is weighted by assets under management. To investigate, every January 1st we sort firms into five portfolios based on the number of funds previously launched. The first portfolio consists of firms that have launched only one fund. The other firms are sorted equally into the other four portfolios. The post-formation returns on these five portfolios during the next 12 months are linked across years to form a single return series for each portfolio. We then evaluate the performance of the portfolios relative to the Fung and Hsieh (2004) model. The alpha of the spread between portfolio 1 (firms with one fund) and portfolio 5 (firms with many funds) represents the dispersion in risk-adjusted returns across firms as a result of the variation in number of funds per firm launched. To calculate hedge fund firm returns, we weight all the funds with return observations within each firm by fund assets under management.

The results from the hedge fund firm sort are reported in Panel A of Table 6. They indicate that the practice of generating superior flagship performance and raising capital via non-flagships does not benefit fund investors. Firms managing many funds underperform firms managing one fund by 2.42 percent per annum. After adjusting for co-variation with the Fung and Hsieh (2004) factors, this spread rises to 2.80 percent per annum. Both the raw return and risk-adjusted return spreads are statistically significant at the one percent level. In

addition, returns decrease almost monotonically as we move from portfolio 1 to portfolio 5. In Panel B of Table 6, we report the results when we equal weight funds to obtain firm returns. They indicate that our findings are robust to the way we weight fund returns within each firm.

[Insert Table 6 and Figure 2 here]

Figure 2 illustrates the findings from Panel A of Table 6. It plots the monthly cumulative average residuals or CARs from the portfolio of firms with one fund (portfolio 1) and the portfolio firms with many funds (portfolio 5). As discussed, CAR is the cumulative difference between a portfolio's excess return and its factor loadings (estimated over the entire sample period) multiplied by the Fung and Hsieh (2004) risk factors. The CARs in Figure 2 indicate that portfolio 1 consistently outperforms portfolio 5 over the entire sample period, suggesting that the outperformance of firms with few funds relative to firms with many funds is not confined to a particular sub-period.

3.4. Tests of hedge fund firm total fee revenue

How does raising multiple funds affect the total fee revenue that accrues to the firm management company? In this section, we explore the impact of multiple fund launches on hedge fund firm revenue. By launching multiple funds, hedge fund firms can raise additional capital while delaying the impact of fund-level capacity constraints. Moreover, the total fee revenues accruing to multiple product firms benefit from the non-netting of gains and losses across the separate funds housed within the same firm. However, as shown in the previous section, multiple product firms underperform single product firms by a significant margin. Therefore, it is not clear ex-ante that such an organizational strategy is necessarily helpful to firm revenue.

To investigate, we sort firms into five portfolios based on the number of funds launched as in Table 6. Next, we evaluate the total firm fee revenue (management fee plus performance fee) over the subsequent one-year period. The results in Panel A of Table 7 suggests that hedge fund firm management companies benefit significantly from launching multiple funds or offering multiple products. Multiple product firms harvest an annual fee revenue of US$25.85 million, which is US$23.15 million greater than that harvested by single product firms. Some of the fee revenue difference is driven by the greater AUM of the multiple product firms. On average firms in portfolio 5 (firms with many funds) manage US$872.27 million, while firms in portfolio 1 (firms with one fund) manage only US$76.17 million. However, when we control for firm AUM in a double sort (see Panel B of Table 7), we find that multiple product firms within each AUM quintile still harvest greater fee income than do single product firms within the same AUM quintile. The difference in fee revenue between multiple and single product firms is positive across all AUM quintiles and is statistically significant at the one percent level for three of the five AUM quintiles. The results from the double sort on firm AUM and the number of funds launched suggest that multiple product firms benefit from the fact that gains and losses for each fund are not netted when determining firm performance fee. Indeed, the non-netting of performance fees is so beneficial to total firm revenue that it more than compensates for the fact that multiple product firms underperform single product firms. On balance, these findings indicate that hedge fund firms are highly incentivized to launch multiple products so as to maximize fee revenue.

[Insert Table 7 here]

3.5. Discussion

Why do flagship funds outperform non-flagship funds? Are firms highly motivated to generate superior performance with their flagships so as to raise follow-on funds? Or do firms protect the performance of their flagship funds while simultaneously operating other non-flagships? To investigate, we first plot the monthly returns of the average flagship fund 36 months before to 36 months after the launch of the first non-flagship fund by the same firm. To accommodate the 36 month window, the sample we analyze only includes flagships whose firm raised a subsequent fund between January 1997 and December 2007. The resultant graph in Figure 3 suggests that flagship fund performance deteriorates once the firm launches a subsequent fund. The average annual flagship return prior to the non-flagship launch is 17.79 percent, while the analogous return after the non-flagship launch is 9.84 percent. This implies that flagship performance deteriorates by 7.94 percent once the firm launches another fund.[13] In Figure 3, we also plot the assets under management of the average flagship fund over the same event window. We find that despite the dramatic deterioration in flagship performance, flagship funds are able to increase their assets under management by 56 percent in the 36-month period after the launch of the follow-on fund by the same firm. This represents a substantial increase in assets under management growth from just 16 percent over the 36-month period prior to the launch. The time-series pattern in flagship returns and assets under management depicted in Figure 3 suggest that following a bout of stellar performance at their flagship fund, hedge fund firms aggressively raise capital by launching new funds and marketing the flagship funds to investors. The resultant increase

[13] The difference is statistically significant at the one percent level (*t*-statistic = 11.07). The spread is not driven by a wave of hedge fund firms spawning new funds following a good year for the hedge fund industry. We repeat the analysis using hedge fund returns after subtracting away the average return of all the hedge funds in the database. We find that the average industry-adjusted flagship return is 5.96 and 0.37 percent per year before and after the launch of the first non-flagship, respectively. The industry-adjusted return difference is statistically significant at the one percent level (*t*-statistic = 9.52).

in assets under management at the flagships may explain, at least in part, their subsequent underperformance.

[Insert Table 8 and Figure 3 here]

To investigate further, every month we sort flagship funds managed by firms that will launch or have launched subsequent funds into two portfolios based on whether the first non-flagship has been launched. We then estimate the performance of those flagship fund portfolios relative to the Fung and Hsieh (2004) seven-factor model and report the results in Panel A of Table 8. The estimates in Table 6 indicate that flagships on average deliver an alpha of 10.24 percent per year before the launch of the first non-flagship but only produce an alpha of 5.41 percent per year after the launch. This suggests that flagship risk-adjusted performance wanes post non-flagship launch by 4.83 percent per year, which is statistically significant at the one percent level (*t*-statistic = 11.96). In addition, we show in Table 8 that flagships in firms that will launch other funds outperform other flagships managed by firms that will not conceive other funds (at least during our sample period) by a risk-adjusted 3.31 percent per year. Post launch, however, the former flagships underperform the latter flagships by a risk-adjusted 1.52 percent per year (see spreads A–D and B–D). Also, flagships in firms that have launched other funds do not outperform non-flagships (see spread B–C). The last result suggests that firms do not protect the performance of flagships that are managed side-by-side other non-flagships.

To test whether the drop in flagship performance can be explained by the increase in assets under management of the flagship fund post launch of the first non flagship, we estimate OLS regressions on monthly fund alpha analogous to that in Eq. (3) but with *FLAGSHIP_PRELAUNCH* as an additional independent variable. The indicator variable *FLAGSHIP_PRELAUNCH* takes a value of one if the fund is the flagship fund managed by a

firm and the firm will but has yet to launch another fund, and a value of zero, otherwise. In results not reported, we find that the outperformance of the flagship fund is largely confined to the period prior to the launch of the subsequent fund by the same firm. The coefficient estimate on *FLAGSHIP_PRELAUNCH* is large and statistically significant at the one percent level. It suggests that flagship abnormal returns decrease by 5.15 percent per year after the launch of non-flagship funds.[14] By contrast, the coefficient estimate on *FLAGSHIP* is much smaller but nonetheless still statistically significant at the one percent level. It indicates that flagships outperform non-flagships by 1.79 percent per year on a risk-adjusted basis even after the launch of the subsequent fund by the same firm. Since we control for the log of monthly assets under management in these regressions, i.e., $\log(SIZE)$, the results suggest that while the greater assets under management of flagship funds post launch of non-flagships may erode performance, it does not completely explain away the decline in flagship performance.[15] On balance, the findings indicate that hedge fund firms take advantage of stellar flagship fund performance to raise capital by expanding the flagship and by launching new funds. These capital raising activities in turn hurt the performance of the flagship fund. These results also nicely explain why we find in Table 6 that firms managing many funds underperform firms managing just one fund.

4. Robustness tests

In this section, we present a series of robustness tests to ascertain the strength of our empirical results.

[14] Inferences do not change when we control for backfill and incubation biases. After removing the first 12 months of returns from each fund, we find that flagship alpha shrinks by a statistically reliable 4.34 percent per year after the launch of the first non-flagship by the same firm.

[15] We believe there are three possible explanations for the drop in flagship performance. First, flagship funds may have been simply lucky and firms take advantage of the spate of stellar early returns to raise capital and launch additional funds. Second, firm partners at flagship funds that launch other funds may be too busy raising capital to devote much of their time to driving the investment process at the flagship. Third and related to the second point, firm partners may be less incentivized to deliver superior performance with the flagship fund now that they have raise enough capital to achieve critical mass at the firm level.

4.1. Dynamic risk exposures

One concern is that the beta loadings of the fund portfolios might not stay constant over time. As a result, the risk–adjustment for, say, Tables 3 and 6 might not be accurate. To account for dynamic factor loadings, we impose structural breaks for August 1998 (LTCM crisis and Russian ruble default) and September 2008 (collapse of Lehman Brothers and the height of the 2008 financial crisis), and redo the Table 3 and 6 analyses. As shown in Panel A of Table 9, with the structural break adjustment, the abnormal spread between portfolios A and D in Table 3 widens marginally to 3.46% per annum (*t*–statistic = 5.36). Similarly, the abnormal spread between portfolios 1 and 5 from the hedge fund firm sort increases incrementally to 3.02% per annum (*t*–statistic = 6.14).

[Insert Table 9 here]

Another way to account for dynamic risk exposures is to calculate the factor loadings using a rolling window approach and use those factor loadings to calculate abnormal returns one month forward. When we do that using a 24–month window, we find that the abnormal spread between portfolios A and D in the fund inception sort increases to an impressive 4.05% per annum (*t*–statistic = 5.04). With the rolling window approach, the abnormal spread between portfolios 1 and 5 in the hedge fund firm sort also increases to 3.74% per annum (*t*–statistic = 6.33). These results are reported in Panel B of Table 9.

4.2. Additional risk factors

The presence of additional risk factors could cloud the portfolio sort analyses. Relative to non-flagship funds, flagship funds could be loading up more on some risk factor, say emerging markets, that has done well over the sample period. This could explain why there is a return spread between flagship and non-flagship funds. Hence, we augment the

Fung and Hsieh (2004) model with an emerging markets factor derived from the MSCI Emerging Markets Index return and redo the sorts for Table 3 and Panel A of Table 6. The fund inception date and firm portfolio spread alphas easily survive the inclusion of the emerging markets factor. After accounting for exposure to the emerging markets factor, the aforementioned spread alphas as reported in Panel C of Table 9 are 3.47 percent per annum (*t*–statistic = 5.02) and 2.82 percent per annum (*t*–statistic = 5.21), respectively. To cater for hedge fund exposure to option based strategies (Mitchell and Pulvino, 2001), we also augment the Fung and Hsieh (2004) model with out–of–the–money S&P 500 call and put option–based factors from the Agarwal and Naik (2004) model and report the results in Panel D of Table 9.[16] Again, the portfolio spread alphas are robust to the inclusion of these two additional risk factors.

4.3. Fund termination

There are concerns that because funds that drop out from the database could have terminated their operations, the portfolio alphas could be biased upward. This is because in Table 3 when a fund in the portfolio drops out of the database, we take the equal–weighted average return of the funds in the portfolio that remain in the database. Likewise in Table 6 when a fund drops out of the database, we take the value-weighted average return of the funds in the firm that remain in the database. To allay concerns regarding hedge fund termination, we assume that, for the month after a fund drops out of the database, its return is -10%. Thereafter, money is reallocated to the remaining funds in the portfolio. With that adjustment, the alphas of the portfolios A and D in Table 3 fall to 6.19% and 3.05% per annum, respectively. However, as shown in Panel E of Table 9, the alpha of the spread between portfolios A and D remains significant at 3.13% per annum (*t*-statistic = 4.58).

[16] We are grateful to Vikas Agarwal for supplying these factors. Since they are only available up to August 2009, we conduct the sorts with the out-of-the-money factors for the period from January 1994 to August 2009.

Similarly, the alphas of portfolios 1 and 5 in Panel A of Table 6 decline to 5.97% and 3.49% per annum, respectively.[17] Still, the hedge fund firm portfolio spread alpha remains significant at 2.48% per annum (*t*–statistic = 4.64). This suggests that the baseline results are robust to the self–reporting and delisting biases inherent in hedge fund data.

4.4. Out-of-sample tests

To allay concerns that our findings may be driven by data snooping biases, we perform the baseline portfolio sorts on hedge fund data from Eurekahedge, a global hedge fund database that has been used by several researchers to study hedge funds (see, for example, Teo (2009)). At the end of 2010, there are 9,403 funds in the Eurekahedge database, of which 5,661 are live and 3,742 are dead. These funds belong to 3,601 distinct hedge fund firms. When funds within each firm that are launched during the same month are grouped together to form composite funds, we find that there are 2,169 firms with only one fund, 1,240 firms with two to five funds, and 192 firms with more than five funds. Constrained by the smaller sample, we re-do the sorts in Table 3 focusing on the difference between portfolio A (flagship funds) and portfolio B (2^{nd} to 5^{th} fund launched). As shown in Panel F of Table 9, in the out-of-sample test, portfolios A and B deliver abnormal returns of 9.55 percent per annum and 7.99 percent per annum, respectively. The spread between these two portfolios of 1.56 percent per annum is statistically significant at the one percent level and is comparable to the 1.50 percent per annum alpha spread in Table 3. For the sort on the number of funds launched, the spread between portfolio 1 (firms with few funds) and portfolio 5 (firms with many funds) also survives the out-of-sample test. The alpha of the spread is 3.02 percent per annum and is statistically significant at the one percent level.

[17] To value weight the returns of funds within the hedge fund firm and compute firm returns, we assume that the fund termination assets under management is the same as the assets under management of the month just prior to fund termination.

4.5. An alternative definition for flagship funds

An advantage of the Eurekahedge database is that it includes data on whether a fund is a flagship fund within its firm. We find that in the Eurekahedge database, 90 percent of the first funds launched by hedge fund firms are also labelled as flagship funds, indicating that our original definition for flagship funds is reasonable. To test whether our results are sensitive to the definition for flagship, we re-do the Table 3 portfolio sorts using the Eurekahedge flagship data again focusing on the difference between portfolios A and B. The results presented in Panel G of Table 9 indicate that our findings extend to this alternative, albeit self-reported, definition as well.[18] In Eurekahedge, self-reported flagships outperform the 1st to 4th self-reported non-flagships launched by hedge fund firms by 3 percent per annum after adjusting for risk.

Conclusion

Hedge fund investors make allocations to hedge funds in part based on the reputation of the hedge fund firm managing the fund. Yet, the academic literature has largely ignored the hedge fund firm dimension when investigating hedge funds. In this paper we shed light on the agency problems in the hedge fund industry by exploring the behavior of hedge fund firms. We marshal evidence that suggests that hedge fund firms have strong incentives to launch multiple funds so as to grow AUM and raise fee revenue. Firms do so by leveraging on the halo effect generated by stellar flagship performance that allows firms to raise follow-on funds. Firms with successful flagships are able to charge higher fees, set more onerous redemption terms, and raise more capital for their subsequent non-flagship funds. Investors

[18] The disadvantage of the self-reported flagship measure, which is available only at the end of the sample, is that hedge fund firms may re-label as flagships funds that performed well in the past.

do not benefit from the capital raising activities of hedge fund firms. Non-flagship funds underperform flagship funds by between 1.50 percent per year and 3.84 percent per year after adjusting for risk. In general, funds that were conceived later by firms tend to underperform funds were conceived earlier. Moreover, firms that launch many funds tend to underperform firms that do not. Ironically despite underperforming single product firms, multiple product firms are able to generate greater fee revenue. This is driven both by their greater AUM and by the non-netting of performance fees across the separate funds within the same firm. On balance, these findings suggest that there are important agency forces at work that shape hedge fund firm behavior. Our study is one of the first to explore the implications of firm behavior on hedge fund performance and fee revenue. We believe that going forward further research along similar lines will prove fruitful.

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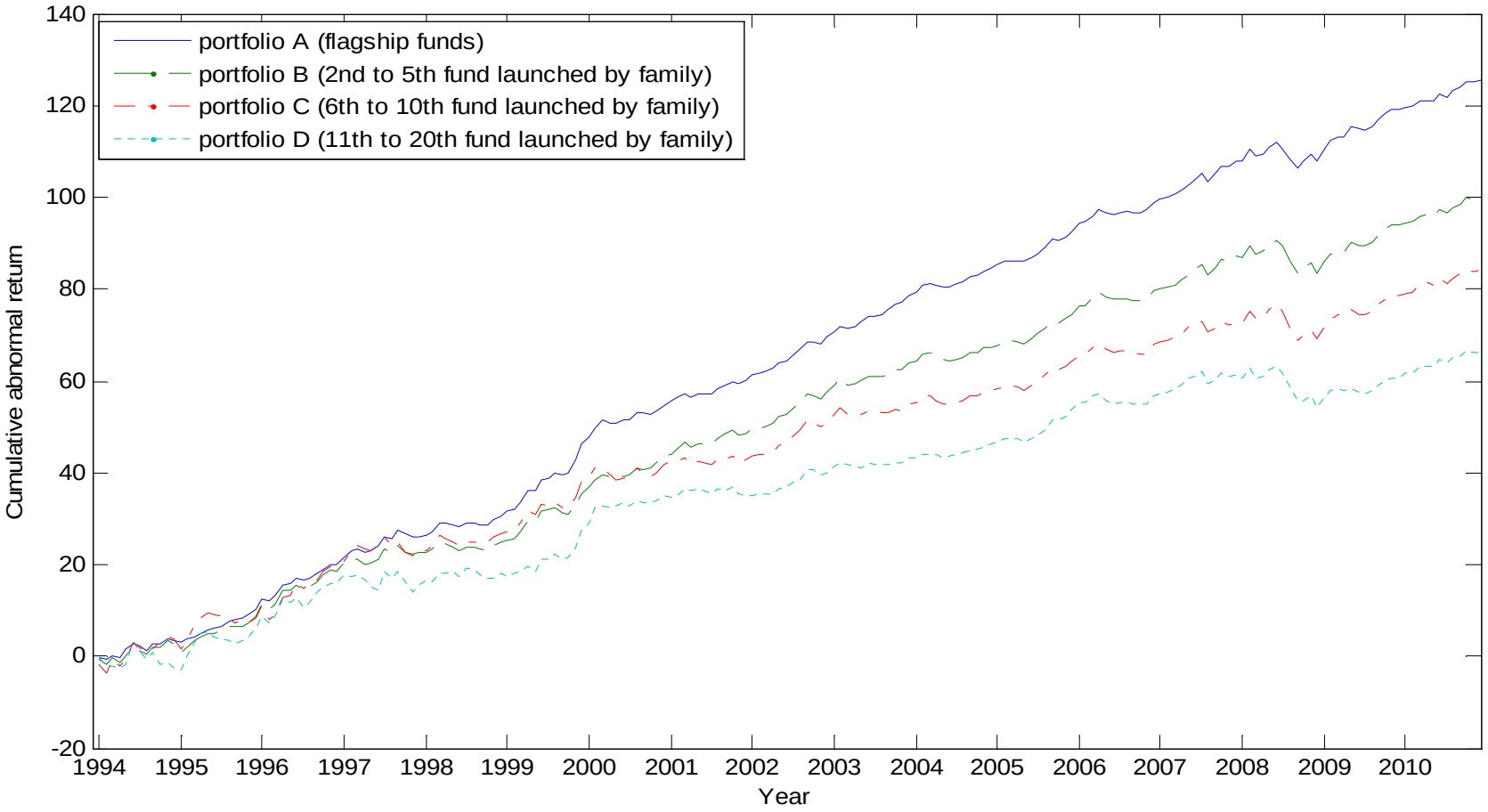

Fig 1: Cumulative abnormal return of funds sorted on fund inception date. Portfolios of hedge funds are constructed by sorting funds based on fund inception date. For each hedge fund firm, the flagship fund is the first fund launched by the firm. The flagship fund portfolio is the equal-weighted return of the flagships across firms. The other portfolios are defined analogously. Cumulative abnormal return is the difference between a portfolio's excess return and its factor loadings multiplied by risk factors from the Fung and Hsieh (2004) seven-factor model. Factor loadings are estimated over the entire evaluation period. The evaluation period is from January 1994 to December 2010.

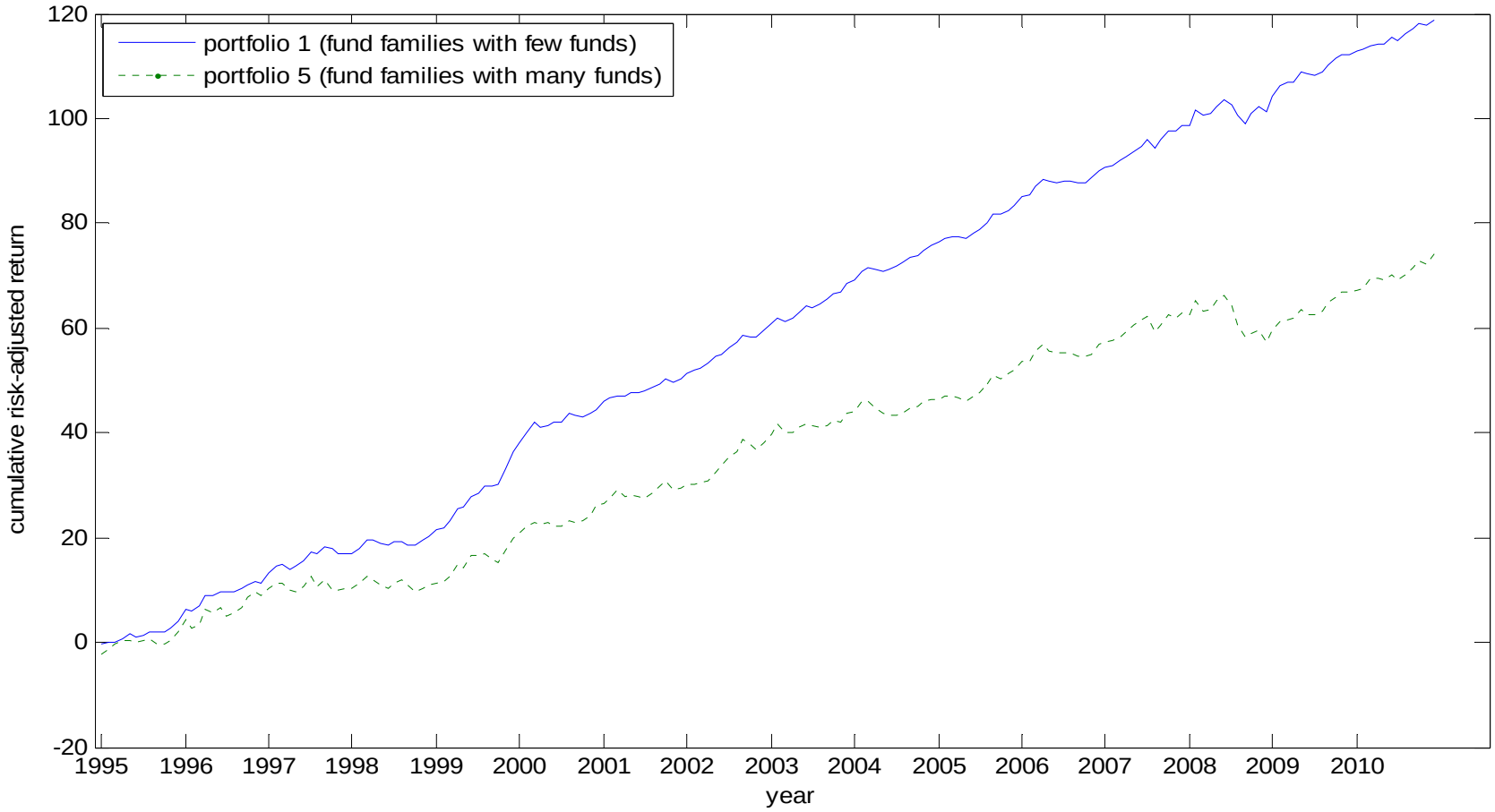

Fig 2: Cumulative abnormal returns of hedge fund firms sorted by number of funds launched. Every January 1st, fund firms are sorted into five groups based on the number of funds previously launched by the firm. Portfolio 1 consists of firms which have only launched one fund. The rest of the firms are equally divided into the four remaining groups based on the number of funds launched. Portfolio 5 consists of the group with the largest number of funds launched. Firm returns are constructed by value-weighting returns across all funds managed by the firm. Returns are reported after adjusting for risk relative to the Fung and Hsieh (2004) model. The sample period is from January 1994 to December 2010.

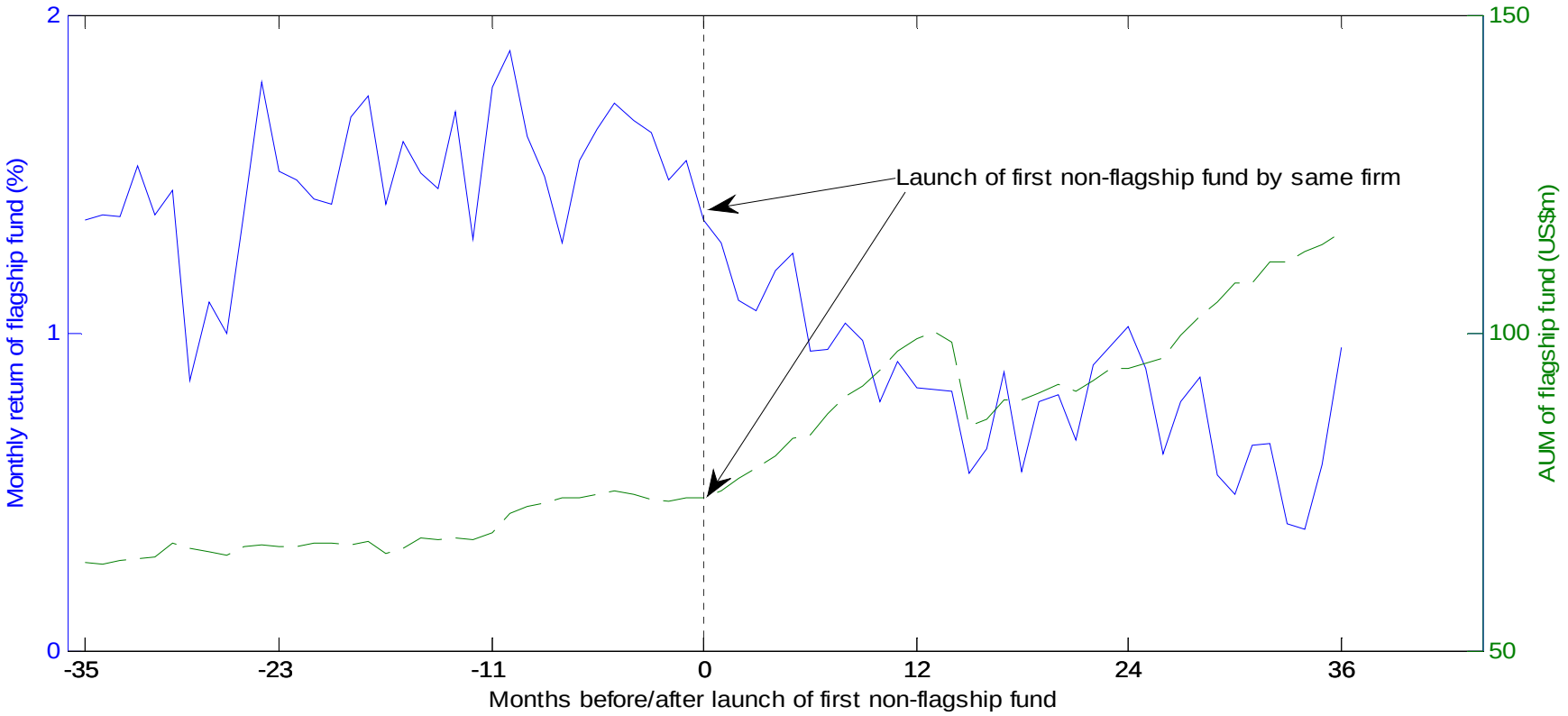

Fig 3: Average monthly return and asset under management of flagship funds before and after launch of the first non flagship fund by the same firm. For each hedge fund firm, the flagship fund is the first fund launched by the firm. Flagship returns and assets under management (AUM) are averaged across firms. The sample includes firms that will launch or have launched at least one non-flagship fund. Month 0 denotes the inception month for the first non-flagship fund managed by the same firm. The return graph is represented by the solid line (y-axis on the left) while the AUM graph is represented by the dashed line (y-axis on the right). The evaluation period is from January 1994 to December 2010.

Table 1

Summary statistics

The sample period is from January 1994 to December 2010. Funds are grouped according to their primary investment strategy. Security Selection funds take long and short positions in undervalued and overvalued securities, respectively, and reduce systematic risks in the process. Usually, they take positions in equity markets. Multi-process funds employ multiple strategies that take advantage of opportunities created by significant transactional events, such as spin-offs, mergers and acquisitions, bankruptcy reorganizations, recapitalizations, and share buybacks. Directional Trader funds bet on the direction of market prices of currencies, commodities, equities, and bonds in the futures and cash market. Relative Value funds take positions on spread relations between prices of financial assets and aim to minimize market exposure.

			Flagship funds	Non flagship funds			
Investment strategy	Total funds	Dead funds	1st fund launched	2nd-5th fund launched	6th-10th fund launched	11th-20th fund launched	Return months
Panel A: Full sample							
Security Selection	8,826	5,462	3,469	3,159	949	641	502,860
Directional Trader	5,660	3,631	2,352	2,230	587	274	305,080
Relative Value	2,688	1,664	874	1,001	409	258	149,680
Multi-process	2,799	1,456	871	1,034	345	331	155,270
Others	1,869	1,412	936	685	136	93	75,031
Total	21,842	13,625	8,502	8,109	2,426	1,597	1,187,900
Panel B: Without duplicate share classes							
Security Selection	5,918	3,780	2,984	1,984	494	284	344,240
Directional Trader	4,653	3,098	2,191	1,841	362	156	250,130
Relative Value	1,750	1,143	721	666	203	87	96,942
Multi-process	1,961	948	712	663	215	227	106,010
Others	1,526	1,173	886	519	82	38	61,165
Total	15,808	10,142	7,494	5,673	1,356	792	858,490

Table 2

Regressions on non-flagship fund fees, redemption terms, and flows

Regressions are estimated on the fees, redemption terms, and flows for non-flagship funds managed by each hedge fund firm. For each firm, the flagship fund is the first fund launched by the firm. In the fund attribute regressions, the independent variables include FLAGSHIP_RET and NONFLAGSHIP_RET, where FLAGSHIP_RET is return of the flagship fund within the same firm averaged over the last x months prior to the launch of the non-flagship and NONFLAGSHIP_RET is the return of the other non-flagship funds within the same firm averaged over the last x months prior to the launch of the non-flagship. In the fund flow regressions, the independent variables include FLAGSHIP_RET, NONFLAGSHIP_RET, and FUND_RET where FUND_RET is own fund return averaged over the last x months, and FLAGSHIP_RET and NONFLAGSHIP_RET are the returns of the flagship and other non-flagship funds within the same firm averaged over the last x months. The t-statistics, derived from White (1980) standard errors, are in parentheses. In Panel A, the independent variables are returns averaged over the last 12 months. In Panel B, the independent variables are returns averaged over the last 24 months. In Panel B, the independent variables are returns averaged over the last 36 months. The evaluation period is from January 1994 to December 2010. * Significant at the 5% level; ** Significant at the 1% level.

	Dependent variables				
Independent variables	Non-flagship management fee	Non-flagship performance fee	Non-flagship redemption period	Non-flagship notification period	Non-flagship monthly flow
Panel A: Regressions with past one-year returns					
FLAGSHIP_RET	-0.008	0.083	1.94	0.586	0.075
	(-1.38)	(1.47)	(3.03)	(2.63)	(2.20)
NONFLAGSHIP_RET	0.007	0.069	0.350	-0.435	-0.021
	(0.62)	(0.77)	(0.33)	(-1.25)	(-0.51)
FUND_RET					1.082
					(34.55)
Panel B: Regressions with past two-year returns					
FLAGSHIP_RET	0.000	0.226	3.034	0.830	0.139
	(0.00)	(2.79)	(3.58)	(2.67)	(2.71)
NONFLAGSHIP_RET	0.004	0.041	1.845	0.068	0.011
	(0.21)	(0.32)	(1.32)	(0.14)	(0.19)
FUND_RET					1.130
					(23.33)
Panel C: Regressions with past three-year returns					
FLAGSHIP_RET	0.006	0.296	4.404	0.871	0.174
	(0.45)	(2.65)	(3.88)	(2.22)	(2.45)
NONFLAGSHIP_RET	-0.015	-0.065	0.226	0.351	-0.068
	(-0.72)	(-0.38)	(0.14)	(0.65)	(-0.91)
FUND_RET					1.062
					(15.99)

Table 3

Sorts on fund inception

Hedge funds are sorted based on their launch date within each hedge fund firm. For each firm, the flagship fund is the first fund launched by the firm. The flagship fund portfolio is the equal-weighted return of the flagships across firms. Alpha is estimated relative to the Fung and Hsieh (2004) seven-factor model. The Fung and and Hsieh (2004) factors are S&P 500 return minus risk free rate (SNPMRF), Wilshire small cap minus large cap return (SCMLC), change in the constant maturity yield of the U.S. 10-year Treasury bond adjusted for the duration of the 10-year bond (BD10RET), change in the spread of Moody's BAA bond over 10-year Treasury bond appropriately adjusted for duration (BAAMTSY), bond PTFS (PTFSBD), currency PTFS (PTFSFX), and commodities PTFS (PTFSCOM), where PTFS is primitive trend following strategy. The *t*-statistics are derived from White (1980) standard errors. The evaluation period is from January 1994 to December 2010.

Fund portfolio	Excess Ret. (pct/ year)	*t*-stat of excess return	Alpha (pct/ year)	*t*-stat of alpha	SNPMRF	SCMLC	BD10RET	BAAMTSY	PTFSBD	PTFSFX	PTFSCOM	Adj. R^2
Portfolio A (Flagship funds)	8.28	6.21	7.38	9.57	0.24	0.15	0.02	0.14	0.00	0.01	0.01	0.69
Portfolio B (2nd to 5th fund launched)	6.90	5.12	5.88	6.49	0.21	0.13	0.06	0.18	0.00	0.02	0.01	0.58
Portfolio C (6th to 10th fund launched)	6.05	4.19	4.96	4.46	0.20	0.11	0.07	0.21	0.00	0.02	0.02	0.47
Portfolio D (11th to 20th fund launched)	4.86	3.43	3.90	3.58	0.19	0.12	0.05	0.19	0.01	0.01	0.01	0.44
Spread (A - B)	1.38	3.95	1.50	4.74	0.03	0.02	-0.04	-0.03	0.00	-0.01	0.00	0.22
Spread (A - C)	2.24	3.47	2.42	3.87	0.04	0.04	-0.05	-0.07	0.00	-0.01	-0.01	0.18
Spread (A - D)	3.43	4.91	3.48	5.05	0.05	0.02	-0.03	-0.05	0.00	0.00	0.00	0.08

Table 4

Sorts on fund inception, sensitivity analysis

Hedge funds are sorted based on their launch date within each hedge fund firm. For each firm, the flagship fund is the first fund launched by the firm. The flagship fund portfolio is the equal-weighted return of the flagships across firms. Alpha is estimated relative to the Fung and Hsieh (2004) seven-factor model. The Fung and and Hsieh (2004) factors are S&P 500 return minus risk free rate (SNPMRF), Wilshire small cap minus large cap return (SCMLC), change in the constant maturity yield of the U.S. 10-year Treasury bond adjusted for the duration of the 10-year bond (BD10RET), change in the spread of Moody's BAA bond over 10-year Treasury bond appropriately adjusted for duration (BAAMTSY), bond PTFS (PTFSBD), currency PTFS (PTFSFX), and commodities PTFS (PTFSCOM), where PTFS is primitive trend following strategy. The *t*-statistics are derived from White (1980) standard errors. The evaluation period is from January 1994 to December 2010. Panel A reports results after removing the first 12 months of returns for each fund to adjust for backfill and incubation bias. Panel B reports results after unsmoothing returns using the Getmansky, Lo, and Makarov (2004) algorithm. Panel C reports results after adding back fees to form pre-fee returns.

Fund portfolio	Excess Ret. (pct/ year)	*t*-stat of excess return	Alpha (pct/ year)	*t*-stat of alpha	SNPMRF	SCMLC	BD10RET	BAAMTSY	PTFSBD	PTFSFX	PTFSCOM	Adj. R^2
Panel A: Adjusted for backfill and incubation bias												
Portfolio A (Flagship funds)	6.91	5.04	5.94	7.47	0.24	0.15	0.02	0.16	0.00	0.01	0.01	0.69
Portfolio B (2nd to 5th fund launched)	5.78	4.07	4.65	4.88	0.22	0.13	0.06	0.20	0.00	0.02	0.02	0.58
Portfolio C (6th to 10th fund launched)	5.32	3.36	4.19	3.40	0.21	0.10	0.07	0.24	0.00	0.02	0.02	0.45
Portfolio D (11th to 20th fund launched)	3.01	2.07	1.98	1.78	0.20	0.10	0.08	0.20	0.01	0.01	0.01	0.44
Spread (A - D)	3.90	4.79	3.96	4.94	0.04	0.05	-0.06	-0.04	0.00	0.00	0.00	0.08
Panel B: Adjusted for serial correlation												
Portfolio A (Flagship funds)	8.31	5.83	7.37	9.20	0.27	0.16	0.03	0.13	0.00	0.01	0.01	0.71
Portfolio B (2nd to 5th fund launched)	6.92	4.82	5.84	6.23	0.24	0.14	0.07	0.16	0.00	0.01	0.01	0.60
Portfolio C (6th to 10th fund launched)	6.06	3.98	4.92	4.30	0.22	0.12	0.08	0.20	0.00	0.02	0.02	0.49
Portfolio D (11th to 20th fund launched)	4.88	3.23	3.89	3.36	0.21	0.14	0.06	0.18	0.01	0.01	0.01	0.45
Spread (A - D)	3.43	4.60	3.49	4.74	0.06	0.02	-0.03	-0.05	0.00	-0.01	0.00	0.08
Panel C: Adjusted for fund fees												
Portfolio A (Flagship funds)	12.81	9.43	11.91	15.06	0.24	0.14	0.02	0.15	0.00	0.01	0.01	0.68
Portfolio B (2nd to 5th fund launched)	11.05	8.09	10.02	10.92	0.22	0.13	0.05	0.19	0.00	0.02	0.01	0.58
Portfolio C (6th to 10th fund launched)	9.88	6.77	8.81	7.84	0.20	0.10	0.07	0.22	0.00	0.02	0.02	0.47
Portfolio D (11th to 20th fund launched)	8.14	5.70	7.17	6.51	0.19	0.12	0.05	0.20	0.01	0.01	0.01	0.43
Spread (A - D)	4.66	6.56	4.73	6.77	0.05	0.02	-0.04	-0.04	0.00	0.00	0.00	0.09

Table 5

Regressions on hedge fund performance

OLS and Fama-Macbeth (1973) regressions are estimated on the cross-section of hedge fund performance. The dependent variable is hedge fund monthly return or alpha. Alpha is estimated relative to the Fung and Hsieh (2004) seven-factor model. FLAGSHIP is an indicator variable that takes a value of one when a fund is a flagship fund and a value of zero otherwise. For each hedge fund firm, the flagship fund is the first fund launched by the firm. SIZE is last month fund assets under management. MGT_FEE is fund management fee in percentage. PERF_FEE is fund performance fee in percentage. REDEMPTION is fund redemption period in months. AGE is fund age in decades. The *t*-statistics are in parentheses. For the OLS regressions, they are derived from White (1980) standard errors, while for the Fama-MacBeth regressions, they are derived from Newey and West (1987) standard errors. The evaluation period is from January 1994 to December 2010. * Significant at the 5% level; ** Significant at the 1% level.

	Independent variables			
	OLS		Fama-MacBeth	
Dependent variables	Fund return	Fund alpha	Fund return	Fund alpha
FLAGSHIP	0.289	0.220	0.270	0.219
	(9.72)	(8.10)	(7.04)	(5.29)
Log(SIZE)	-0.078	-0.058	-0.048	-0.048
	(-17.2)	(-14.22)	(-3.55)	(-3.94)
Log(SIZE)*FLAGSHIP	-0.049	-0.031	-0.038	-0.027
	(-7.12)	(-4.94)	(-4.36)	(-2.96)
MGT_FEE	0.061	0.082	0.072	0.091
	(5.41)	(7.9)	(1.52)	(2.81)
PERF_FEE	0.01	0.008	0.01	0.01
	(9.04)	(8.58)	(2.51)	(4.12)
REDEMPTION	0.027	0.021	0.025	0.017
	(10.76)	(10.43)	(1.99)	(3.04)
AGE	0.008	-0.009	-0.013	-0.017
	(10.56)	(-14.99)	(-3.09)	(-4.36)

Table 6

Sorts on number of funds launched, performance analysis

Every January 1st, hedge fund firms are sorted into five groups based on the number of funds previously launched by the firm. Portfolio 1 consists of firms which have only launched one fund. The rest of the firms are equally divided into the four remaining groups based on the number of funds launched. Portfolio 5 consists of the group with the largest number of funds launched. Alpha is estimated relative to the Fung and Hsieh (2004) seven-factor model. The Fung and and Hsieh (2004) factors are S&P 500 return minus risk free rate (SNPMRF), Wilshire small cap minus large cap return (SCMLC), change in the constant maturity yield of the U.S. 10-year Treasury bond adjusted for the duration of the 10-year bond (BD10RET), change in the spread of Moody's BAA bond over 10-year Treasury bond appropriately adjusted for duration (BAAMTSY), bond PTFS (PTFSBD), currency PTFS (PTFSFX), and commodities PTFS (PTFSCOM), where PTFS is primitive trend following strategy. The t-statistics are derived from White (1980) standard errors. The evaluation period is from January 1994 to December 2010. In Panel A, firm returns are constructed by value-weighting returns across all funds within the firm. In Panel B, firm returns are constructed by equal-weighting returns across all funds within the firm.

Hedge fund firm portfolio	Excess Ret. (pct/ year)	*t*-stat of excess return	Alpha (pct/ year)	*t*-stat of alpha	SNPMRF	SCMLC	BD10RET	BAAMTSY	PTFSBD	PTFSFX	PTFSCOM	Adj. R^2
Panel A: Fund returns value-weighted within firm												
Portfolio 1 (firms with one fund)	8.47	6.02	7.44	9.18	0.25	0.16	0.01	0.12	0.00	0.01	0.01	0.70
Portfolio 2	6.73	3.89	5.18	5.57	0.30	0.18	0.02	0.21	0.00	0.01	0.01	0.75
Portfolio 3	7.54	5.49	6.28	6.78	0.21	0.12	0.07	0.17	0.00	0.02	0.02	0.59
Portfolio 4	6.31	4.56	5.16	5.67	0.21	0.13	0.06	0.16	0.01	0.01	0.02	0.60
Portfolio 5 (firms with many funds)	6.06	4.21	4.63	4.46	0.20	0.13	0.08	0.20	0.00	0.02	0.02	0.52
Spread (1 - 5)	2.42	4.01	2.80	5.20	0.05	0.03	-0.07	-0.08	0.00	-0.01	-0.01	0.23
Panel B: Fund returns equal-weighted within firm												
Portfolio 1 (firms with one fund)	8.73	6.18	7.68	9.73	0.25	0.15	0.01	0.13	0.00	0.01	0.01	0.72
Portfolio 2	6.89	4.09	5.37	6.02	0.29	0.18	0.02	0.20	0.00	0.01	0.01	0.75
Portfolio 3	8.27	6.21	7.04	7.97	0.21	0.12	0.06	0.16	0.00	0.01	0.01	0.60
Portfolio 4	6.61	4.82	5.48	6.19	0.22	0.13	0.06	0.16	0.01	0.01	0.02	0.61
Portfolio 5 (firms with many funds)	5.89	4.20	4.40	4.42	0.19	0.12	0.08	0.21	0.00	0.02	0.01	0.54
Spread (1 - 5)	2.84	4.77	3.28	6.12	0.06	0.03	-0.08	-0.08	0.00	-0.01	-0.01	0.26

Table 7

Sorts on number of funds launched, total fee revenue analysis

Every January 1st, hedge fund firms are sorted into five groups based on the number of funds previously launched by the firm. Portfolio 1 consists of firms which have only launched one fund. The rest of the firms are equally divided into the four remaining groups based on the number of funds launched. Portfolio 5 consists of the group with the largest number of funds launched. Annual firm total fee revenue in US$m are reported for each portfolio.Total fee revenue include management fee and performance fee. The evaluation period is from January 1994 to December 2010. In Panel A, the full sample of firms are sorted into five groups based on the number of funds launched. In Panel B, firms are first sorted into quintiles based on firm AUM and then into five groups within each AUM quintile based on the number of funds launched. * Significant at the 5% level; ** Significant at the 1% level.

	Firm annual total fee revenue					
	Panel A: Sort on number of funds launched	*Panel B: Double sort on firm AUM and number of funds launched*				
Hedge fund firm portfolio	Full sample	AUM quintile 1 (small firms)	AUM quintile 2	AUM quintile 3	AUM quintile 4	AUM quintile 5 (large firms)
Portfolio 1 (firms with one fund)	2.70	0.07	0.36	1.15	3.61	22.68
Portfolio 2	7.14	0.03	0.22	0.80	2.97	19.12
Portfolio 3	5.16	0.08	0.41	1.41	3.96	32.07
Portfolio 4	11.80	0.29	0.44	1.25	3.96	32.77
Portfolio 5 (firms with many funds)	25.85	0.24	0.44	1.38	4.18	60.96
Firm annual fee revenue spread (5 - 1)	23.15**	0.17	0.08**	0.23	0.57**	38.28**
Average AUM (US$m)	258.93	1.59	9.84	32.65	111.81	1137.80

Table 8

Sorts on fund inception, conditional on the launch of non flagship funds

Hedge funds are sorted based on their launch date within each hedge fund firm. For each hedge fund firm, the flagship fund is the first fund launched by the firm. The flagship fund portfolio is the equal-weighted return of the flagships across firms. Alpha is estimated relative to the Fung and Hsieh (2004) seven-factor model. The Fung and and Hsieh (2004) factors are S&P 500 return minus risk free rate (SNPMRF), Wilshire small cap minus large cap return (SCMLC), change in the constant maturity yield of the U.S. 10-year Treasury bond adjusted for the duration of the 10-year bond (BD10RET), change in the spread of Moody's BAA bond over 10-year Treasury bond appropriately adjusted for duration (BAAMTSY), bond PTFS (PTFSBD), currency PTFS (PTFSFX), and commodities PTFS (PTFSCOM), where PTFS is primitive trend following strategy. The *t*-statistics are derived from White (1980) standard errors. The evaluation period is from January 1994 to December 2010. Panel A reports the performance of flagship and non flagship funds in firms that will launch or have launched non flagship funds. Panel B reports the performance of flagships in firms that will not launch non flagship funds.

Fund portfolio	Excess Ret. (pct/ year)	*t*-stat of excess return	Alpha (pct/ year)	*t*-stat of alpha	SNPMRF	SCMLC	BD10RET	BAAMTSY	PTFSBD	PTFSFX	PTFSCOM	Adj. R^2
Panel A: Firms that will launch / have launched non flagship funds												
Portfolio A (Flagships before launch of first non flagship fund)	10.89	8.73	10.24	11.85	0.21	0.13	0.02	0.09	0.00	0.01	0.02	0.55
Portfolio B (Flagships after launch of first non flagship fund)	6.50	4.65	5.41	6.18	0.23	0.15	0.05	0.19	0.00	0.01	0.01	0.64
Portfolio C (First non flagship fund)	6.96	5.28	5.94	7.44	0.23	0.14	0.05	0.17	0.00	0.01	0.01	0.66
Panel B: Firms that will not launch non flagship funds												
Portfolio D (Flagships of firms that will not launch non flagship funds)	7.74	5.70	6.93	9.36	0.26	0.16	0.00	0.12	0.00	0.01	0.01	0.72
Spread (A - B)	4.39	9.93	4.83	11.96	-0.02	-0.02	-0.03	-0.10	0.00	0.00	0.00	0.29
Spread (A - D)	3.16	6.52	3.31	8.11	-0.05	-0.03	0.03	-0.03	0.00	0.00	0.01	0.33
Spread (B - D)	-1.23	-3.05	-1.52	-3.81	-0.02	-0.01	0.05	0.07	0.00	0.00	0.01	0.13
Spread (B - C)	-0.46	-2.75	-0.53	-3.07	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.10

Table 9

Robustness tests

The leftmost columns report results when hedge funds are sorted based on their launch date within each hedge fund firm. The rightmost columns report results when hedge fund firms are sorted every January 1st into five groups based on the number of funds previously launched by the fund family. For each firm, the flagship fund is the first fund launched by the firm. In the hedge fund firm sort, fund returns are value-weighted within each firm. Alpha is estimated relative to the Fung and Hsieh (2004) seven-factor model. The Fung and and Hsieh (2004) factors are S&P 500 return minus risk free rate (SNPMRF), Wilshire small cap minus large cap return (SCMLC), change in the constant maturity yield of the U.S. 10-year Treasury bond adjusted for the duration of the 10-year bond (BD10RET), change in the spread of Moody's BAA bond over 10-year Treasury bond appropriately adjusted for duration (BAAMTSY), bond PTFS (PTFSBD), currency PTFS (PTFSFX), and commodities PTFS (PTFSCOM), where PTFS is primitive trend following strategy. The t-statistics are derived from White (1980) standard errors. The evaluation period is from January 1994 to December 2010.

Sorts on fund inception			Sorts on number of funds launched		
Fund portfolio	Alpha (pct/ year)	*t*-stat of alpha	Firm portfolio	Alpha (pct/ year)	*t*-stat of alpha
Panel A: Adjusted for structural breaks					
Portfolio A (Flagship funds)	7.25	9.82	Portfolio 1 (firms with few funds)	7.25	9.50
Portfolio D (11th to 20th fund)	3.69	3.50	Portfolio 5 (firms with many funds)	4.23	4.14
Spread (A - D)	3.56	5.36	Spread (1-5)	3.02	6.14
Panel B: Adjusted for dynamic risk exposures using 36-month rolling betas					
Portfolio A (Flagship funds)	7.24	7.32	Portfolio 1 (firms with few funds)	7.19	6.95
Portfolio D (11th to 20th fund)	3.19	2.36	Portfolio 5 (firms with many funds)	3.45	2.73
Spread (A - D)	4.05	5.04	Spread (1-5)	3.74	6.33
Panel C: Fung and Hsieh (2004) model augmented with an emerging markets equity factor					
Portfolio A (Flagship funds)	7.31	11.14	Portfolio 1 (firms with few funds)	7.29	10.70
Portfolio D (11th to 20th fund)	3.84	3.77	Portfolio 5 (firms with many funds)	4.46	4.87
Spread (A - D)	3.47	5.02	Spread (1-5)	2.82	5.21
Panel D: Fung and Hsieh (2004) model augmented with out-of-the money call and put option factors					
Portfolio A (Flagship funds)	7.07	8.23	Portfolio 1 (firms with few funds)	6.95	7.73
Portfolio D (11th to 20th fund)	3.25	2.39	Portfolio 5 (firms with many funds)	3.87	3.25
Spread (A - D)	3.81	4.36	Spread (1-5)	3.08	4.67
Panel E: Adjusted for fund termination					
Portfolio A (Flagship funds)	6.19	8.08	Portfolio 1 (firms with few funds)	5.97	7.49
Portfolio D (11th to 20th fund)	3.05	2.80	Portfolio 5 (firms with many funds)	3.49	3.37
Spread (A - D)	3.13	4.58	Spread (1-5)	2.48	4.64
Panel F: Out-of-sample tests					
Portfolio A (Flagship funds)	9.55	10.59	Portfolio 1 (firms with few funds)	9.39	8.50
Portfolio B (2nd to 5th fund)	8.00	7.18	Portfolio 5 (firms with many funds)	6.38	4.84
Spread (A - B)	1.56	2.64	Spread (1-5)	3.02	3.52
Panel G: Alternative definition of flagship funds					
Portfolio A (Flagship funds)	9.63	10.48			
Portfolio B (2nd to 5th fund)	6.63	6.67			
Spread (A - B)	3.00	4.47			