Does Alpha Really Matter? Evidence from Mutual Fund Incubation, Termination and Manager Change *

Richard B. Evans†

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Abstract

This paper examines the importance of risk-adjusted versus total returns in mutual fund family investment offering and manager succession decisions. Incubated funds with higher total returns are more likely to be offered to the public, and seasoned funds with lower total returns are more likely to be terminated, but risk-adjusted returns are unrelated to these decisions. Managers with higher (lower) risk-adjusted performance are more likely to be promoted (demoted), but total returns are unrelated. These results provide a new perspective on the "puzzle" of active management and the role of risk-adjusted versus total returns in investor decision-making.

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†Finance Department, Carroll School of Management, Boston College, Fulton Hall 234D, Chestnut Hill, MA 02467, evansrb@bc.edu, o.(617)552-2842, f.(617)552-0431

1 Introduction

The assumption that investors account for both risk and return in their investment decisions is widely used in academic finance. In his seminal paper on portfolio choice, Markowitz (1952) rejected the notion that investors maximize expected return in isolation, in favor of the alternative that investors maximize expected return while minimizing risk. While the idea that investors should account for both risk and return was not new, Markowitz provided a statistical framework to explicitly account for risk and return in portfolio choice. Using the benefit of diversification as the motivation, Markowitz made an unassailable case for the importance of accounting for risk in allocation decisions.

Despite the economic rationale for risk-adjustment, there is evidence that some investors deviate from this assumption. Research on the investment decisions of retail mutual fund investors using survey data (Capon, Fitzsimons, and Prince (1996)) and analyzing investment flows (Gruber (1996), Sirri and Tufano (1998), and DelGuercio and Tkac (2002)) has suggested that controlling for risk-adjusted returns, total returns influence investor decision-making as well.

This empirical evidence regarding the role of total returns in investor decision-making stands in contrast to the common assumption that investors risk-adjust. In this paper, I present evidence that suggests many mutual fund investors do not risk-adjust, from an analysis of the decisions of fund families who observe their investing behavior. Specifically, I examine the role of risk-adjusted versus total returns in strategic fund family investment offering decisions. I make the assumption that as rational, profit-maximizing entities, fund families know what performance measures are important to their investors and that they account for those preferences in their decisions of which investment products to offer. If this assumption is true, the performance measures that guide fund family decisions are the same measures that investors use to make their allocation decisions.

The evidence I present here has important implications for the puzzle of active management. This puzzle, first described by Gruber (1996), is that investors purchase actively managed mutual funds in spite of their poor risk-adjusted performance. A number of papers have proposed explanations for this puzzle that assume investors use risk-adjusted performance in their allocation decisions.[1] The evidence presented in this paper suggests that many fund investors don't risk-adjust. This points to an alternative explanation for the puzzle, which is that investors purchase funds with poor risk-adjusted performance because investors don't use risk-adjusted returns in their allocation decisions. While I don't examine this alternative hypothesis here, my results suggest that this in an area for future research.

The three mutual fund family operational decisions I examine are: first, which "incubated" or start-up funds to open to the public; second, which seasoned funds to close or terminate; and third, which fund managers to promote or demote. To examine which incubated funds are opened to the public, I use a novel database of incubated funds. Incubation, a strategy that some fund families use to develop new fund offerings, involves opening multiple new funds with a small amount of capital. At the end of an evaluation period some of the funds are opened to the public and the others are shut down. I use logistic regressions to examine the factors related to this decision. I find evidence that incubated funds with higher total returns are more likely to be offered to the public, but that risk-adjusted returns are unrelated to this decision.

To analyze the decision of which seasoned funds are terminated, I apply hazard regressions to funds from the CRSP mutual fund database. A fund can be terminated through merger or liquidation and I identify the determinants of these termination decisions. I find evidence that seasoned funds with lower total returns are more likely to be terminated, but that risk-adjusted returns are unrelated to this decision. Both the incubation and termination results are consistent with investors seeking total-returns.

Finally, I examine the decision to promote or demote a manager by re-orienting the CRSP database. By following a given manager's career over time and across funds, and aggregating the returns of all of the funds run by that manager, I create a manager return time-series. I also examine manager changes to determine if they are promotions or demotions. If a manager moves from a smaller to a larger fund or adds an additional fund to her management responsibilities, this is defined as a promotion. A demotion is defined similarly. With the

[1]e.g., Baks, Metrick, and Wachter (2001), Lynch and Musto (2003), Berk and Green (2004)

manager return time-series and the identified promotion and demotion events, I use hazard regressions to examine the relative importance of risk-adjusted and total manager returns in promotion and demotion decisions. I find evidence that managers with higher (lower) risk-adjusted performance are more likely to be promoted (demoted), but that total return is unrelated to these decisions. This might seem surprising, given the premise of this paper, but at the level of a fund family, a manager who delivers positive alpha will also deliver a higher total return relative to an unskilled manager. Hiring managers based on their ability to generate alpha is also consistent with families wanting to deliver high total return investment products to investors.

The results for family-level fund and manager decisions demonstrate the importance of total returns. The evidence is consistent with a scenario in which many investors use total returns to make their investment decisions, and fund families recognize this behavior. As a result, these fund families manage their portfolio of fund offerings based on total return. At the same time, recognizing that a manager who adds alpha can generate superior total returns, fund families attempt to identify manager talent using risk-adjusted performance.

The paper proceeds as follows: Section 2 examines the practice of incubation; Section 3 discusses the decision to terminate funds; Section 4 analyzes manager promotion and demotion decisions; Section 5 examines the role of manager characteristics in investor decision-making; and Section 6 concludes.

2 Mutual Fund Incubation

The basic strategy of incubation can be described as follows: a fund family uses a small amount of seed money raised internally (either from the management company or from employees of the management company) to start a number of funds. After the funds are run for a long enough period to generate a track record, a decision is made as to which funds will be opened to the public (incubation survivors) and which funds will be closed down (incubation non-survivors). It seems logical that fund families will only open funds that they believe investors will want to buy. If this is true, the determinants of incubation survival provide insight into what fund characteristics the fund families believe are important to investors.

The practice of incubation has been recognized by the popular press and by academics. The CRSP Survivor-Bias Free Mutual Fund Database identifies private incubation as a known bias in the database, and Elton, Gruber, and Blake (2001) suggest that successful funds may have track records that are back-filled. The "instant history" or back-fill bias in hedge fund databases is similarly recognized by Park (1995) and Fung and Hsieh (2002).

The lack of data regarding the non-survivors from the incubation process has precluded an investigation of incubation.[2] Certain regulatory restrictions placed on mutual funds, however, require that the histories of the non-surviving funds from incubation be preserved in their SEC filings. Additional details regarding these regulatory restrictions can be found in Section A.1 of Appendix A. Using a novel database of the returns for both survivors and non-survivors of incubation, I examine the factors related to opening an incubated fund to the public. The details regarding the construction of this database can be found in Section A.2.

2.1 Incubation Examples

The Putnam Research Fund is an example of a surviving incubated fund. Figure 1 shows the size and performance of Putnam Research. The fund began operation in October 1995 with approximately $3 million under management. All of the seed capital was provided by Putnam (as indicated in the prospectus), and because the fund was not advertised by the fund family until the middle of 1998, there were few inflows from outside investors before that date. For a fund that Morningstar categorized as large-cap blend, the average annual return of around 28% over the first three years is impressive, given an average annual return of 13% for the rest of the large-cap blend funds over the same period.[3] In the middle of 1998

[2]In the mutual fund literature, the closest related research is Arteaga, Ciccotello, and Grant (1998) and Wisen (2002). Both papers examine the bias in returns for new funds and, in that context, discuss the issue of incubation. Arteaga, Ciccotello, and Grant (1998) include an analysis of five surviving incubated funds as an indication of the type of bias that may be induced by failure to include return data for the incubation non-survivors in fund databases.

[3]The average is calculated as the value-weighted return, between November 1995 and December 1998, of all mutual funds identified as large-cap blend in the Morningstar database.

Putnam first advertised the fund in its marketing materials[4], and the fund began appearing in the Morningstar database shortly thereafter.

An example of a non-surviving incubated fund is the Putnam Japan Fund. The fund began operations in December 1995 with approximately $3 million in assets. The average annual return of the fund over its life was just under -4% compared to the value-weighted average return of Japanese Equity funds over the same period of -5%.[5] In early 1999 the fund was shut down.

In 1998 a decision was made to open the Putnam Research fund to the public. Given the rapid growth of the fund from $3.4 million at its inception to more than $2.4 billion at its peak in January of 2001, it seems that Putnam made the right decision. The Putnam Japan fund, however, was shut down and was never opened to the public. In the analysis that follows, the relevant question is: What factors are used in the decision to open one incubated fund, such as Putnam Research, but to eliminate another incubated fund, such as Putnam Japan?

2.2 Data

Incubated funds can be separated into two categories: funds that survived the incubation period and were opened to the public (survivors) and funds that did not (non-survivors). To identify the survivors I used two criteria. First, the fund must have been reported to both CRSP and Morningstar with a lag between the fund inception date and the first reporting date. The existence of the lag indicates that the fund returns were back-filled, a characteristic of incubated funds. Second, the fund family must have been identified as the principal shareholder (ownership $>$ 25%) during the incubation period. This is an indicator that the fund family was sponsoring the fund during the years that the fund was not reporting to Morningstar and CRSP. I also checked the prospectus for an end of incubation date. If

[4]Lexis-Nexis shows the first full prospectus for the Putnam Research fund appears in October 1995. The first advertisement of the Putnam Research fund in the prospectus of another Putnam fund, however, appears in July 1998. In that prospectus, Putnam Research is included in a list of all the Putnam funds available for purchase.

[5]The average is calculated as the value-weighted return, between January 1996 and January 1999, of all mutual funds identified as Japanese equity funds in the Morningstar database.

the end of the incubation period was not clearly identified in the prospectus, then I used the date the company first submitted information about the fund to Morningstar as the incubation period end date.

To identify non-survivors of the incubation process I examined prospecti and SEC semi-annual report forms (N-SAR) for families in which surviving incubated funds were identified. I include all funds for which the manager or fund family was a principal shareholder over the life of the fund. If the fund was closed while the fund family was still a principal shareholder, I designated the fund as a non-surviving incubated fund. I took the returns for these funds from CRSP[6] or constructed them from data taken from the N-SAR filings.

2.3 Results

2.3.1 Descriptive Statistics

I compare the returns of surviving and non-surviving incubated funds in Table 1. The table reports the mean, the median, the standard deviation, and the p-value from a difference in means test between the surviving and non-surviving incubated funds. The return measures reported in the table include total returns, investment objective alphas, for the full sample and 1-factor, 4-factor alphas for funds with 12 or more months of incubation period return data. I calculated the investment objective alpha by subtracting the average return of funds in the same investment objective from the fund's return. I included the investment objective alphas because the incubated sample includes international equity, high yield and sector funds for which the standard factor models may not be effective in risk-adjusting performance. The 1-factor or Jensen's alpha is the excess return from the CAPM (Jensen (1968)). The 4-factor alpha is the excess return from the Fama-French 3-factor model plus a momentum factor (Fama and French (1993) and Carhart (1997)).

Incubated funds that are opened to the public have a significantly higher total return than incubation non-survivors. The difference in total return between the two groups is more than 13% per year. None of the differences in the risk-adjusted return measures between

[6] For a small sample of non-surviving incubated funds, the monthly returns were reported to CRSP even though they never appeared in Morningstar.

the two groups are statistically significant.[7] These univariate statistics suggest that total returns, not risk-adjusted returns, are used to determine which incubated funds are opened to the public and which are terminated.

2.3.2 Logistic Regression Results

The univariate statistics in Table 1 are striking, but there are other factors that must be taken into account when analyzing incubation success or failure. I present the results of a logistic regression of incubation survival in Table 2. In the regression, I estimate the probability of a fund being opened to the public at the end of incubation as a function of an intercept, alpha, total return, fund age in months, net investment flows to the investment objective as identified by CRSP (in percent), an indicator of whether the fund family has another fund of the same investment objective, and the fund family size decile.

The central result is the positive and statistically significant coefficient on total return in the logistic model. A 1% increase in total return increases the probability of the incubated fund being opened to the public by 8 to 11%, depending on the alpha specification. The t-test fails to reject the null that the coefficient on alpha is zero for all three specifications of alpha. Overall, the evidence indicates that total return is the performance measure of interest.

The other coefficients in the model are economically sensible. The positive coefficient on flows to the investment objective indicates that, as the share of money flowing into an objective increases, the probability of an incubated fund, in that investment objective, being opened to the public increases. The positive coefficient on the fund family size decile shows that larger fund families, those with greater resources, are less apt to terminate incubated funds. The negative coefficient on age indicates that the longer a fund is kept in incubation, and not opened to the public, the higher the probability that it will be terminated. The duplicate investment objective indicator relates to the hypothesis that fund families incubate to replace poorly performing funds in their portfolio. The coefficient, however, is not statistically different from zero.

[7]Using a non-parametric test to compare the two samples does not change the results.

3 Mutual Fund Termination

In the same way that the determinants of incubation provide insight into what investors want in a fund, fund termination should provide insight into what characteristics investors avoid. If we assume that, as rational, profit-maximizing entities, fund families will terminate funds (either through merger or liquidation) that are no longer of interest to investors, the determinants of fund termination provide insight into what return measures are important to investors. The determinants of fund termination have been previously discussed in the literature. Brown and Goetzmann (1995) show that risk-adjusted returns are a determinant of fund closure. Using UK data, Lunde, Timmermann, and Blake (1999) show that the probability of a fund being terminated is negatively related to changes in its three-factor alpha and average fund sector return. Jayaraman, Khorana, and Nelling (2002) find that investment-objective adjusted performance is negatively related to the probability of within-family mergers. Similarly, Khorana, Tufano, and Wedge (2005) find that investment-objective adjusted performance is negatively related to the probability of both within-family and across-family fund mergers, controlling for mutual fund board characteristics. Each of these papers assumes that risk-adjusted return is the appropriate performance measure. Conversely, this paper finds that total return is a better performance measure for predicting fund termination.

3.1 Data

The source of data for this section is the CRSP Survivor-Bias Free US Mutual Fund Database. Fund mergers and liquidations as designated by CRSP are defined as fund termination events. The sample is all domestic equity funds from 1995 to 2002, in which fixed income, precious metal, international, and utility funds as identified by the CRSP ICDI objective are removed. To eliminate double counting of returns, I compute a single value-weighted average return series for each fund with multiple share classes.

3.2 Results

To study the factors related to fund termination, I use the Cox proportional hazards regression model. The Cox framework is well suited for this purpose because the model can account for non-linear age dependence. The hazard function or instantaneous rate of fund termination is graphed in Figure 2. The figure shows a low hazard rate for both young funds and old funds but a higher hazard rate for middle-aged funds. This pattern indicates that the rate of fund termination is low for young and old funds but higher for middle-aged (3 to 5 years) funds. Using UK data, Lunde, Timmermann, and Blake (1999) also find evidence of the non-linear age dependence of fund closure.

Table 3 reports the results of the Cox model. The independent variables in the regression are alpha, total return, average net flows to the fund, and average net flows to the investment objective (both in percent), calculated over 12-month and 36-month lagged intervals. Also included is the log of fund size lagged one month (t-1); the expense ratio; and an indicator variable that takes a value of 1 if the fund's investment advisor has merged with, acquired, or been acquired by another investment advisor in the previous 12 months.[8] Fund management company and yearly fixed effects are also included in the specification, but the coefficients are not reported here.

The regression in Table 3 estimates the probability of a fund termination. A negative coefficient for a given variable or a hazard ratio (HR) less than one indicates that the variable is inversely related to the probability of termination. The hazard ratio of a variable is a comparison of the probability of termination of two hypothetical funds that differ only in the magnitude of that variable. For example, the hazard ratio of 0.75 for total return in the 1-factor alpha, 12-month specification means that a fund with a total return that is 1 standard deviation higher than the mean has a probability of termination that is approximately 75% of the probability of termination for a fund with average total return (holding all the other

[8]The investment advisor merger variable is constructed by examining the prospecti and news reports for advisors of funds involved in across-family fund mergers. If the advisors for the two merging funds merged, or one was acquired by the other, the date of that merger/acquisition is identified. If the investment advisors merged, acquired, or were acquired in the previous 12 months, the variable is set to 1. Otherwise, the variable is set to 0.

regression variables constant). For the continuous variables, the hazard ratios are calculated for a 1 standard deviation increase in the variable.[9] For the indicator variables, the hazard ratios are calculated for a 1-unit change in the variable.

The evidence shown in Table 3 strongly agrees with the incubation results. Total return is a statistically significant predictor of fund termination.[10] I fail to reject the null hypotheses that the coefficients on alpha are zero. The size of the fund and the flows to the investment objective are statistically significant in both the 12- and 36-month results. The negative coefficient on the size of the fund is consistent with a firm profitability argument. Because the fund family's compensation is proportional to assets under management, funds become less profitable as they get smaller and therefore have a higher probability of being shut down. The negative coefficient for average flows to the investment objective means that funds in an investment objective that has recently received high flows are less likely to be terminated. The percent flows to the fund variable generates statistically significant coefficients in the 12-month specification. The negative coefficient for average flows to the fund over the previous 12 months indicates that if a fund has recent high average flows, it is less likely to be terminated. In the 36-month specification, the investment advisor merger variable is statistically significant. The positive coefficient on this variable indicates that, if the fund's advisor has merged with, acquired, or been acquired by another investment advisor during the previous 12 months, the fund has a higher probability of termination. This is consistent with a consolidation of some funds from the two advisors following an advisor merger. Even if the merger or acquisition of an investment advisor is principally motivated by product diversification considerations (i.e., the desire to increase the number of available investment options), as argued by Khorana and Servaes (1999) and Jayaraman, Khorana, and Nelling (2002), it is still possible that such a merger would result in some redundancy in investment objectives. This variable would capture the increase in probability of termination due to such redundancy.

[9] This is calculated by taking the exponent of the product of the standard deviation of the variable and its Cox model coefficient.

[10] Also, I split the sample by the size of the fund family (largest decile versus all other deciles) and by the method of termination (merger versus liquidation). The results with these subsamples consistently show that total return is a statistically significant determinant of fund termination.

4 Manager Promotion and Demotion

In addition to incubation and termination decisions, I also examine the decision of fund families to promote and demote managers. Reorienting the database by manager return instead of by fund return, I examine the role of managers' risk-adjusted and total returns in promotion and demotion decisions. I construct the manager return by tracking a manager over time as she moves from fund to fund. Because a manager who can deliver positive alpha can also deliver a higher total return relative to an unskilled manager, hiring a manager based on her ability to generate alpha is another way to deliver total return to investors.

Several papers examine the determinants of manager promotion and demotion by focusing on risk-adjusted returns. Khorana (1996) examines the determinants of manager replacement and identifies a negative relationship between performance and manager turnover. Chevalier and Ellison (1999) classify manager turnover as promotion or demotion and find that risk-adjusted performance is negatively related to manager demotion. Hu, Hall, and Harvey (2000) examine both total return and Jensen's alpha in separate specifications, and find the first lag of each to be negatively related to demotion. They also find the previous year's total return to be significant in predicting promotion. Baks (2003) finds that managers who leave a fund due to demotion have lower total returns and four-factor alphas than their counterparts who do not experience a change. Similarly, he finds that managers who enter a fund due to promotion have higher total returns and four-factor alphas than their counterparts.

4.1 Data

To analyze promotions and demotions, I constructed a manager database by combining CRSP and Morningstar manager data and supplementing where necessary from the mutual fund's prospectus. The manager data consists of domestic equity managers from 1995 to 2002, where managers of fixed-income, precious metal, international and utility funds were removed from the sample. The details of this database are described in Appendix C. I constructed manager returns by tracking a manager's performance record over time as she moves from fund to fund. If multiple funds are managed at the same time I value-weight the returns, creating for each manager a single return history. While changes in management are identified in the database, the nature of the change (i.e., promotion or demotion) is not specified. I use the same decision rule as Chevalier and Ellison (1999), Hu, Hall, and Harvey (2000), and Baks (2003) in identifying promotions and demotions. The rule classifies a manager change as a promotion if the total assets under management (adjusting for fund growth) for the 12 months after the change is greater than the assets under management for the 12 months before the change.[11] The rule would classify a manager who moves from managing a small fund to a larger fund, or who adds an additional fund to her management responsibilities as being promoted. For the purposes of designating a change as a promotion or a demotion in the case of a management team of two or more managers, the assets are equally divided among the members of the team.

4.2 Results

Figures 3 and 4 depict, respectively the hazard functions associated with demotions and those associated with promotions. The hazard rate is the instantaneous rate of demotion or promotion. The plot of the demotion hazard rate in Figure 3 shows that, as manager tenure increases, the rate of demotion decreases. In other words, those managers that remain in the sample longer have a lower probability of demotion. As revealed in Figure 4, the rate of promotion increases with manager tenure. These two results are not surprising, since management companies learn about a manager by observing his or her returns. The important conclusion that we can draw from these figures is that promotion depends on manager tenure in an increasing fashion and demotion depends on manager tenure in a decreasing fashion. While this dependence on manager tenure could be dealt with in a number of ways, one advantage of using a Cox proportional hazards regression is that it

[11] Each of the three papers mentioned uses a slightly different rule to classify promotions and demotions. I have run the promotion and demotion regression results with each of these different rules. To control for the growth in assets after the change, I have used the fund's return, the average return of other funds in the same investment objective, and the average return of all funds in the analysis. In addition to using the change in assets under management as the decision rule for identifying promotions and demotions, I have repeated the analysis using a change in the number of funds under management as the decision rule. Specifically, an increase (decrease) in the number of funds under management is classified as a promotion (demotion). In each case the results are qualitatively similar.

allows us to account for this dependence in a non-parametric fashion.

Tables 4 and 5 contain estimates of coefficients from the Cox models of, respectively, the probability of demotion and promotion. In each table the probability is estimated as a function of total returns, alphas, average net flows to the fund, and average net flows to all funds in the investment objective (in percent) over 12- and 36-month lagged intervals. Also included in the analysis are the log of fund size, an indicator function of whether the manager is part of a team, the log of the mutual fund family aggregate assets, and the number of promotions and demotions that the manager has experienced to date. In both tables risk-adjusted returns are a statistically and economically significant predictor. As risk-adjusted performance increases, the probability of demotion (promotion) decreases (increases). Total return, however, is not a statistically significant predictor of promotion or demotion.

Across both the 12- and 36-month estimates, the demotion probability is positively related to the log of fund size and the number of previous demotions but negatively related to alpha. While the positive relationship between fund size and demotion probability is surprising, it is consistent with results in Chevalier and Ellison (1999) and Hu, Hall, and Harvey (2000). It is tempting to interpret this positive coefficient as a greater sensitivity to the performance of larger funds; however, when I include an interaction term between returns and a large/small fund indicator (top size quintile versus the bottom 4 quintiles), the size coefficient is still positive and statistically significant. The sign of the coefficient is an unfortunate side effect of using the demotion definition described above. This demotion rule classifies a manager as demoted if the total net assets she manages decrease after a manager change. This rule, however, requires the manager to remain in the sample. As a result, the only observed demotions are those of managers with high initial fund assets.

For promotion, the team indicator is negative and statistically significant for the 12-month results. The demotion results in Table 4 also show a negative, but statistically insignificant, coefficient on teams. A priori, we might expect teams to have positive synergies. These results, however, are consistent with the hypothesis that managing by team makes performance harder to attribute to any one individual. An alternative interpretation for these results is that, by diversifying managerial effort across funds (three managers jointly managing three funds versus three managers each managing their own fund), managers decrease demotion probability but decrease promotion probability as well. In both the promotion and demotion results, the sign on past promotions and demotions is economically intuitive and statistically significant, with the sole exception of past promotions in Table 4, which is statistically insignificant.

In comparing the regression results to those discussed in the literature, we find some disagreement regarding the role of risk-adjusted versus total returns. While Khorana (1996), Chevalier and Ellison (1999), and Baks (2003) all find a strong role for various forms of risk-adjusted returns, Hu, Hall, and Harvey (2000) find that total return matters for promotion but that Jensen's alpha does not. It is important to note, however, that the sample used by Hu, Hall, and Harvey (2000) consists of only growth funds. In a cross-sectional analysis such as theirs, it is the variation in each fund's return relative to the sample average that drives the results. The coefficient on total returns in their regression, therefore, can be interpreted as the coefficient on an objective-adjusted return (for funds in the growth investment objective), a crude form of risk adjustment. Additionally, the demotion and replacement results both find a role for risk-adjusted returns and the sample size of 44 promotion events is much smaller than the 1041 promotion events analyzed here.

The central message of Tables 4 and 5 is that, in making the decision to promote and demote managers, mutual fund families account for risk. Given the mixed evidence in the literature on fund performance persistence, the decision to promote and demote based on risk-adjusted performance may not seem economically justified. Previous tests of performance persistence, however, have used fund returns rather than manager returns. While this is a question for further study, there is some evidence in the literature that suggests manager performance is persistent. Baks (2003) shows that 4-factor alphas calculated from manager returns exhibit statistically significant persistence. While this study constitutes only an initial investigation into this area of research, its results suggest that there is economic merit to assessing manager ability using risk-adjusted performance.

5 Managers vs. Funds: The Role of Manager Characteristics in Investor Decision-Making

In my previous analysis of fund incubation and fund termination, I have assumed that typical investors are unlikely to focus on manager characteristics when making their allocation decisions. On one hand, the anecdotal evidence supports this assumption; retail mutual fund data sources, such as Morningstar, do provide some information about managers, but return and ratings information is organized primarily by fund. On the other hand, while there is not a direct comparison of the role of manager versus fund characteristics in the literature, Chevalier and Ellison (1999) offer some evidence that manager demotion results in a decrease in outflows. The economic significance of this result is small, however, and the authors find no statistically significant relationship between promotion and investment flows.

In order to support my assumption, I examine the roles of manager and fund characteristics in investor decision-making in two ways: first, by analyzing fund family decisions, and second, by analyzing investor flows. With regard to the first method, we would expect that, if investors don't focus on manager characteristics in making their allocation decisions, the family decision of which funds to open and close should be unrelated to manager characteristics. While manager information for funds in incubation is not always readily available, there are numerous funds from the termination sample for which both fund and manager data is available. I repeat the fund termination regression on this sample, including those variables that were found to be statistically significant in Table 3, as well as the manager's return and 4-factor alpha. The results indicate that the manager return variables do not predict fund termination, while fund total return does. Because these results do not differ qualitatively from those shown in Table 3, I do not include them here, but they are available upon request.

As my second method of examining the roles of manager and fund characteristics in investor decision-making, I compare manager and fund returns directly as determinants of investor flows. Using a subset of the manager database described in section 4 that includes all managers that have worked at three or more funds, in a framework similar to that of

Bertrand and Schoar (2003), I examine the role of managers versus funds in attracting investment flows. Bertrand and Schoar (2003) compare the F-test results of firm fixed effects to manager fixed effects to analyze the impact of executives on a number of firm-level variables. In this paper, I analyze the power of fund fixed effects and manager fixed effects in explaining the cross-section of investment flows.

Table 6 contains an analysis of the impact of managers and funds on monthly net investment flows. The base specification includes the log of lagged fund size, average net flows to the fund's investment objective, and yearly fixed effects. Column I of the table reports the R^2 of this base specification; column II adds fund and manager fixed effects to it; and columns III and IV add a performance measure interacted with the fund and manager fixed effects. To account for the heterogeneous nature of the flows data, residuals are clustered by fund. The table reports the fixed effects F-test value and its significance. In every specification, the F-test for fund fixed effects is strongly statistically significant, while the F-test for manager fixed effects is not. This evidence that investors use fund track records to make their investment decisions is consistent with the economic intuition of managing fund offerings using total return, and promoting and demoting managers as a function of their risk-adjusted performance.

6 Conclusion

The assumption that investors risk-adjust when measuring performance is prevalent in academic finance. Empirical evidence on the investment decisions of retail mutual fund investors, however, suggests that controlling for risk-adjusted returns, total returns also play a role.

In this paper, I examine the role of risk-adjusted versus total returns in certain fund family operational decisions. I find that total returns play an important role in these decisions. Assuming that fund families know what performance characteristics are important to their customers and that they act on this information, we can deduce from the evidence in the paper that fund families offer investment products with high total returns because they understand this is the performance measure that many of their investors are seeking.

This result has important implications for the puzzle of active management. Several papers have proposed explanations for the puzzle that assume investors risk-adjust. The evidence presented in this paper, however, suggests an alternative explanation, which is that many investors don't risk-adjust when making investment decisions.

The economic picture that emerges is intuitive. Many investors use total return, an intuitive and readily available performance measure, when making mutual fund investment decisions. Management companies recognize this behavior in their customers and manage their fund offerings accordingly. At the same time, fund families recognize that a manager who adds alpha can generate superior total returns. Therefore, they identify manager talent using risk-adjusted performance measures, and they promote and demote accordingly.

A Appendix A: Regulation and Incubation Sample Collection

A.1 Regulatory Restrictions on Incubation

The availability of data on the non-survivors of the incubation process is due to the regulations regarding fund incubation. The legal issues associated with incubation have been established through a series of no-action letters from the Securities and Exchange Commission (SEC). In February 1997, the SEC responded to a query about incubation from a private citizen.[12] The response, which became part of the public record, outlines the SEC's position on incubation:

> You ask whether a mutual fund sponsor can establish a number of lightly capitalized private pools for the purpose of generating performance track records. In the situation you describe, the sponsor ... would select the pools with the best returns and take them public, touting their excellent past performance .... The hypothetical you raise is one that the Division term the "incubator fund" problem. The Division has consistently, for close to thirty years, expressed severe

[12]The inquiry was made by Dr. William Greene, then a department chair at the Stern School of Business.

> reservations about these funds. In particular, the Division has been concerned that a mutual fund is likely to be managed differently than it was during its "incubation period" and that it is potentially misleading for a fund sponsor of a number of incubator funds organized at the same time to select and cite the performance of a single incubator fund without disclosing the performance of other similar, but less successful, incubator funds. These concerns underlie the Division's longstanding position that ... incubator fund performance should not be included in a mutual fund's prospectus in the absence of extremely clear disclosure explaining the sponsor's purpose in establishing the incubator fund.

In outlining its position, the SEC also provides its definition of an incubated fund. There are two principal components of this definition. First, the SEC restricts the classification to private funds, or those funds that are not registered with the SEC. Second, the SEC only classifies funds as incubated that are started "for the purpose of generating performance track records". This terminology refers to a situation in which multiple funds of the same or similar investment objective are incubated.[13] If a fund meets these criteria, the SEC considers it an incubated mutual fund.

In practice, fund families that incubate circumvent the SEC's definition in two ways. First, while the SEC definition would only classify private funds as incubated, a fund family can ensure its fund is technically public by filing the registration and prospectus with the SEC. By not reporting the fund to Morningstar or other mutual fund data sources, however, the family can ensure that its "public" fund is effectively private. Second, by incubating funds with different investment objectives, the family can avoid the second aspect of the

[13] In addition to the restrictions placed on incubation described in the NYU no-action letter, the conversion of a private account to a public one (incubated or otherwise) is subject to a number of other restrictions. These additional restrictions are described in a previous no-action letter to Mass Mutual Institutional Funds (publicly available Sept. 28, 1995). In the letter the SEC outlines its criteria for allowing a mutual fund sponsor to adopt the performance record of an unregistered predecessor account. The requirements are fourfold: the investment adviser remains the same; the predecessor account is not created for the purpose of incubation; the investment strategy remains the same; and the management practices remain the same. Additionally, the SEC requires the fund company to provide the following disclosures when using the past performance: that the performance data includes unregistered account data, that the fund was not subject to the pertinent SEC restrictions, and that the fund's performance might have suffered if it had been subject to those restrictions (Pierce 1999).

SEC's definition described above. Diversification across investment objectives is economically sensible, as it increases the probability of obtaining at least one fund with a superior track record. While non-survivors of the incubation process won't appear in Morningstar, the actions of the fund family in filing the appropriate documents with the SEC, make it possible to gather data for these funds through their prospecti and N-SAR filings.

A.2 Sample Collection

In this section, I provide additional details of the incubation sample collection procedure. The procedures were as follows: first, I determined the date of inclusion of the fund in the CRSP and Morningstar databases. If the fund was reported to both CRSP and Morningstar with a lag between the inception date and the first reporting date, then I flagged it as a potentially incubated fund. In Morningstar, the database has both an inception date and a date of addition to the database. The date of addition can be determined by examining the Funds Added section of the Fund Changes help menu. When a fund is first included in the database, the month and year of its inclusion is contained in this section. In CRSP, delayed inclusion of a fund and the associated backfilling of returns is manifested by a missing name variable. If 12 months or more of returns of a fund appear in CRSP without a name variable, the returns are assumed to be backfilled. The first year that the fund returns are accompanied by the name variable is assumed to be the year the fund began reporting to CRSP. There are instances in CRSP where the name is missing for reasons other than backfilling. Requiring that funds be reported to both databases with a lag in order to be included in the incubation sample, however, prevents the misclassification of these funds as incubated.

Second, I examined the principal shareholders of all funds that meet the backfilling filters described above. If the fund family was identified as the principal shareholder (ownership $>$ 25%) during the incubation period , I classify the fund as an incubated fund. By examining the prospectus and the accompanying statement of additional information (SAI) filed with the SEC, information on principal shareholders can be found. For example, the October 2, 1995, SAI of the Putnam Research Fund (the fund used as an example in section 2.1) lists the following principal shareholder information under the heading of Share Ownership:

> On August 31, 1995, the officers and Trustees of the Trust as a group owned 3.44% of the outstanding shares of Putnam Balanced Fund, 7.27% of the outstanding shares of Putnam Basic Value Fund, 3.67% of the outstanding shares of Putnam Global Utilities Fund, 6.56% of the outstanding shares of Putnam Real Estate Opportunities Fund and to the knowledge of the Trust no person owned of record or beneficially 5% or more of the shares of any fund of the Trust, ***except that Putnam Investments, Inc. owned of record and beneficially*** 100% of Putnam American Renaissance Fund, 95.30% of Putnam Balanced Fund, 84.90% of Putnam Basic Value Fund, 96.00% of Putnam Global Utilities Fund, 91.50% of Putnam Real Estate Opportunities Fund and ***100% of Putnam Research Fund.***

It is not surprising that Putnam Investments owned 100% of the Research Fund at inception. Providing seed capital for funds is common in the mutual fund industry and does not, in and of itself, constitute incubation as described here. However, until 1998 Putnam continued to be a principal shareholder of the fund. I use the delayed reporting of the fund to Morningstar and CRSP along with the fact the family is the principal shareholder of the fund to identify the fund as incubated.

To identify the end of the incubation period for each fund, I checked the prospectus. If the end of the incubation period was not clearly identified in the prospectus, then I used the date that the company first submitted information about the fund to Morningstar as the incubation period end date. To implement these incubation criteria, I identified all funds that were backfilled in CRSP and Morningstar databases. Using tickers, I matched the two databases and only those funds that were backfilled in both were examined to see if they met the ownership criterion.

B Appendix B: Cox Proportional Hazards Model

I used the Cox proportional hazards regression model to identify the determinants of fund termination and manager promotion and demotion. The Cox model methodology was first developed to analyze failure and survival data (Cox (1975b)); the method allowed identification of the determinants of a survival event (e.g., the efficacy of a drug in treating an illness), accounting for age dependence of survival. Extensions of the model allow for multiple failure outcomes of varying types (Wei, Lin, and Weissfeld (1989)). This ability to account for age dependence of an unspecified nature, is the reason why the Cox framework is well suited for examining fund survival and manager promotion and demotion issues.

While the Cox regression techniques have also been employed with respect to mutual funds in a similar context by Lunde, Timmermann, and Blake (1999), and in a very different context by Johnson (2004), they are not commonly used in finance. For this reason, a brief econometric description of the methodology follows.

Let random variable T represent the time of death of a mutual fund. Consequently, T is a continuous random variable that lies in the interval $(0, \infty)$.[14] In the analysis that follows, the paper examines the impact of a number of variables on the time of death or alternatively, the survival time of that mutual fund. The survival function of a mutual fund is defined as the probability that the fund survives until time t:

$$S(t) = Pr(T \geq t) \tag{1}$$

The survival function, $S(t)$, can be thought of as the fraction of funds that survives until time t. Comparing $S(t)$ to the cumulative distribution function (CDF) of survival times, $F(t)$, the relationship is:

$$S(t) = 1 - F(t) \tag{2}$$

[14]The data used in this sample are discrete in that termination events are only measured on a monthly basis. However, the bias inherent in estimating a continuous-time proportional hazards model using discrete data is estimated by Ryu (1995). As long at the ratio of the time-interval used (1 month) to total time examined (over 84 months) is less than .1, the impact is negligible.

While the CDF could be the starting point for developing the methodology, the survival function is used as the starting point here to more clearly establish the connection between the Cox estimator and $S(t)$. Taking the first derivative of (2) with respect to time, the relationship between the probability density function (PDF), $f(t)$, and the survival function is seen to be:

$$f(t) = -\frac{dS(t)}{dt} \tag{3}$$

The hazard function, $h(t)$, is the frequency of fund termination for those funds remaining at time t. In other words, the hazard function is the instantaneous rate of fund death conditional on survival of the fund until time t.

$$h(t) = \lim_{\Delta \to 0^+} \frac{Pr(t \leq T < t + \Delta | T \geq t)}{\Delta} \tag{4}$$

Recalling the definition of a PDF, we can write the hazard function as:

$$h(t) = -\frac{f(t)}{S(t)} \tag{5}$$

Substituting (3) into (5) and integrating, the relationship between the survival function and the hazard function is expressed as:

$$S(t) = \exp\left(-\int_0^t h(u)du\right) \tag{6}$$

It is this relationship between survival and the hazard function that motivates the form of the Cox proportional hazards model.

The Cox proportional hazard model falls into the class of semi-parametric hazard models. It is semi-parametric because the underlying survival time distribution is unspecified, but the relationship between the covariates and the hazard function has the following parametric form:

$$h(t, Z)dt = h^0(t)\exp\left(Z(t)'\beta\right)dt \tag{7}$$

Here $h^0(t)$ is an unspecified baseline hazard function that captures the time or age dependence of the mutual fund termination rate. $Z(t)$ is a vector of possibly time-dependent covariates. Equation (7) expresses the fundamental assumption behind the Cox framework. To estimate the model, a likelihood approach is used. The contribution to the likelihood function for fund i, with observed failure time t_i is:

$$L_i(\beta) = \frac{h(t_i, Z_i)dt_i}{\sum_{\ell \in O(t_i)} h(t_i, Z_\ell)dt_i} \tag{8}$$

Here, $O(t)$ is the set of mutual funds remaining and observable at time t. The basic intuition behind the equation is that the numerator represents the probability that fund i will be terminated at t_i, and the denominator represents the probability that one of the funds remaining at time t_i will be terminated. Replacing the hazard function in (8) with (7), and taking the product over the k funds for which termination is observed, gives:

$$L(\beta) = \prod_{i=1}^{k} \frac{\exp(Z_i(t_i)'\beta)}{\sum_{\ell \in O(t_i)} \exp(Z_\ell(t_i)'\beta)} \tag{9}$$

The coefficients of interest are then estimated via likelihood maximization.

By assuming the exponential parametric form in equation (7), and thereby allowing the baseline hazard function to be cancelled out as in equation (9), the model can account for unspecified time dependence of the survival function. By eliminating the baseline hazard function in the numerator and denominator, (9) is not a likelihood in the traditional probabilistic sense. It is referred to as a partial likelihood, but has been shown to have the same asymptotic properties as traditional likelihood estimators (Cox (1975a)). Estimates of the vector of coefficients, β, are then obtained by solving for the first order condition. Using the notation of Kalbfleisch and Prentice (2002), the first-order condition is:

$$\frac{\partial logL}{\partial\beta} = \sum_{i=1}^{k}[Z_i(t_i) - \mathcal{E}(\beta, t_i)] \tag{10}$$

Here $\mathcal{E}$ is the weighted-average of the covariates for those funds that are at risk in period t_i.

$$\mathcal{E}(\beta, t_i) = \sum_{\ell\in O(t_i)} Z_\ell(t_i)\left[\frac{\exp(Z_\ell(t_i)'\beta)}{\sum_{j\in O(t_i)}\exp(Z_j(t_i)'\beta)}\right] \tag{11}$$

Equation (7) shows that $\exp(Z(t)'\beta)$ enters as a multiplicative constant that increases or decreases the hazard rate of an individual fund relative to the baseline hazard rate. Setting equation (10) equal to zero, Newton-Raphson or alternative maximization routines are applied to identify the coefficients β.

The above discussion abstracts from the issues of left truncation and right censorship, although the Cox model is robust to both. For this sample, left truncation is an issue for mutual funds that were alive in 1995 when the sample begins but had an inception date before 1995. In such a case, pre-1995 observations for that fund were truncated from the sample. For example, if a fund was started in 1990, all observations for that fund before 1995 (age zero to four years) would not be included in the analysis. However, all observations for the fund after 1995 (age five and greater) would be included in the calculations. Right censorship is an issue for funds that were still alive at the end of 2002 or stopped reporting before they were terminated. Because these funds were still alive when they were removed from the sample, the date of termination was unknown and consequently was censored. In the notation above, the use of risk-set $O(t)$ takes these cases into account. The contribution to the likelihood for fund j that fails at time t_j (eq. (8)) includes in the denominator only those funds that were at-risk ($\in O(t_j)$). If a fund was left-truncated or right-censored at time t_j, then it would not belong to this set.

C Appendix C: Construction of the Manager Database

I constructed the manager database by comparing the CRSP and Morningstar databases. The sample consists of managers from domestic equity mutual funds (fixed-income, precious metal, international and utility funds were removed from the sample) between 1995 and 2002. Both databases list the start date and the name of each manager. The end date for a manager is assumed to be 1 month before the starting date of the next manager listed for the fund.

In some cases there were discrepancies between CRSP and Morningstar as to manager name or starting date. When the databases disagreed, I checked the original prospectus to ensure accuracy. Also, if multiple managers were identified, a separate record was created for each manager. The sample consists of managers who worked for at least two different mutual funds during this time period.

As described in Appendix B, the Cox proportional hazard regressions controls for manager age. Because the CRSP and Morningstar data I use to construct the database does not contain manager birthdates, I use manager tenure as a proxy for the age variable. Manager tenure is inferred by setting the first instance a manager appears in the database as $t = 0$. A manager may run multiple funds at the same time. In these cases, alpha, total return and the other continuous variables for the manager are calculated as value-weighted averages for all funds under management.[15]

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[15]The estimation is also undertaken using equal-weighted averages. The results are qualitatively similar and are consequently not reported.

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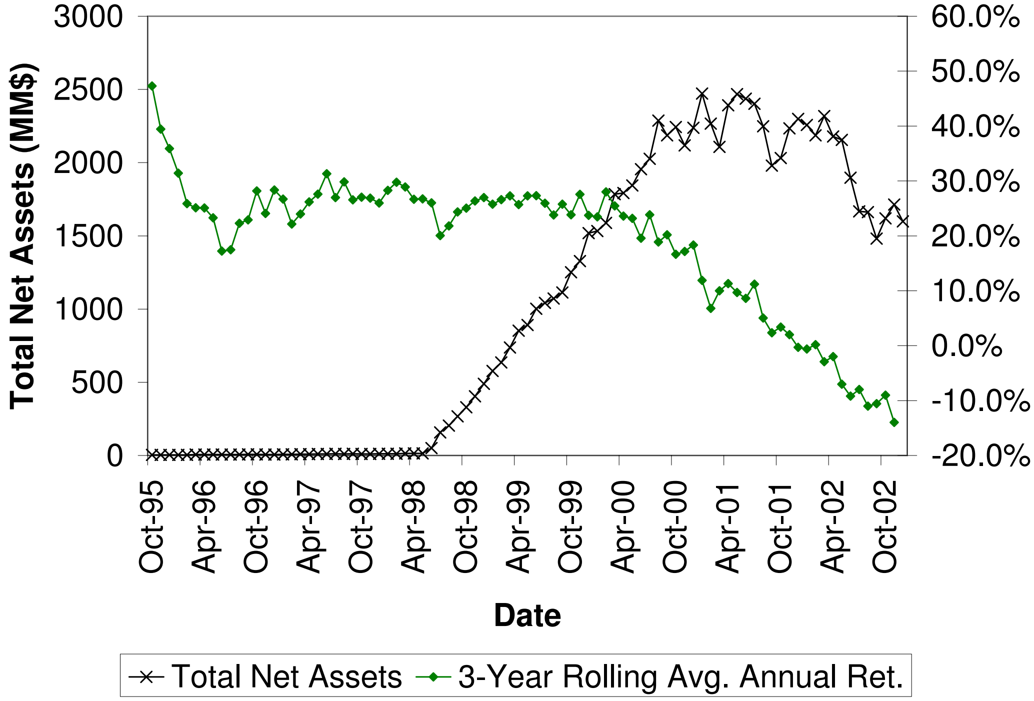
Figure 1: Putnam Research Fund - Size and Performance



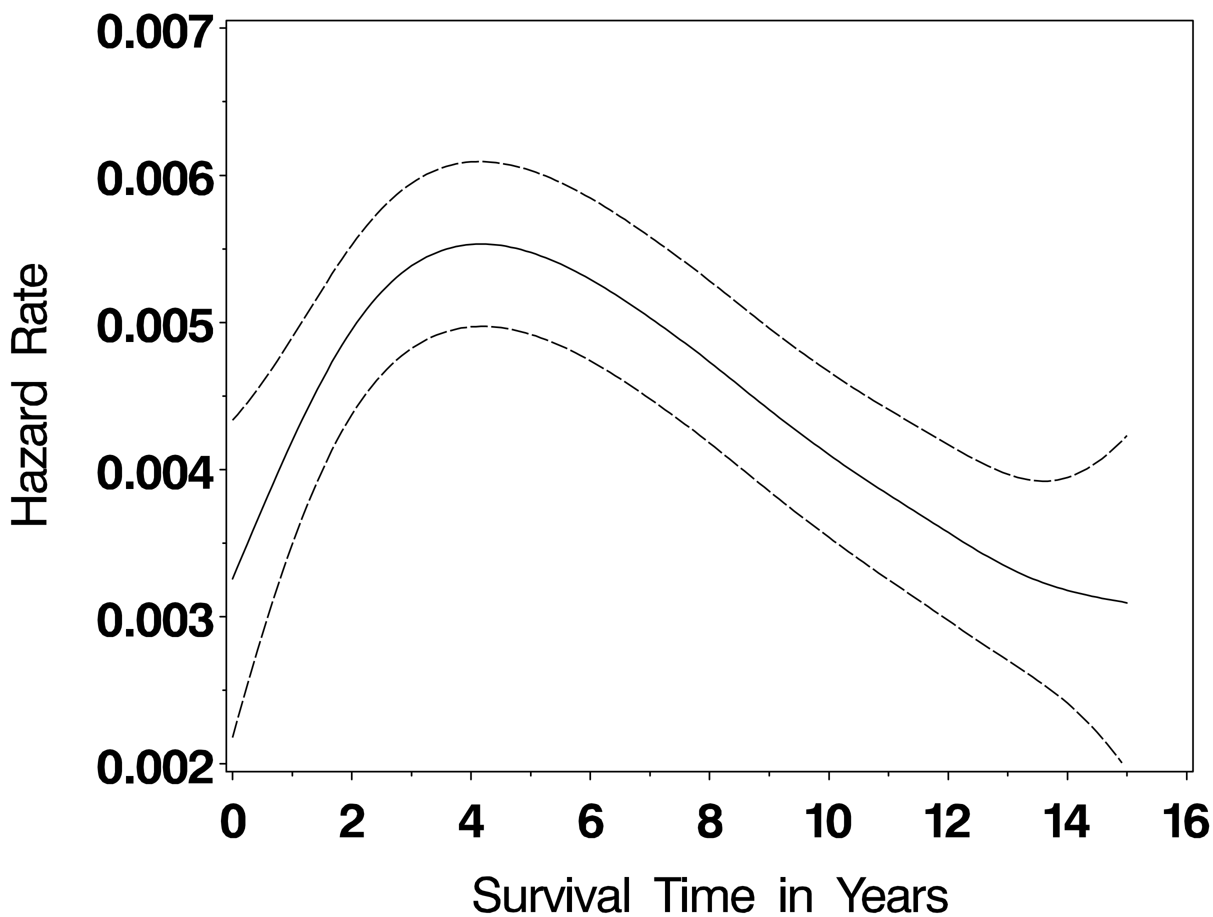
The performance and total net assets (in millions of $) for the Putnam Research Fund is reported. The 3-year rolling annualized average of the monthly return (value-weighted across all shareclasses) is shown.

Table 1: Descriptive Statistics: Surviving vs. Non-Surviving Incubated Funds

Variable	Mean	Median	StdDev	t-test
Non-Surviving Funds - Incubation Period Performance (Sample Size of 55)				
1-Factor Alpha (20 Obs.)	0.275	0.159	1.16	0.605
4-Factor Alpha (20 Obs.)	0.123	0.187	1.39	0.577
Investment Objective Alpha	-0.011	0.203	2.06	0.957
Total Return	0.176	0.008	1.18	<.001
Surviving Funds - Incubation Period Performance (Sample Size of 172)				
1-Factor Alpha (119 Obs.)	0.428	0.156	1.49	
4-Factor Alpha (119 Obs.)	0.313	0.110	1.38	
Investment Objective Alpha	0.302	0.385	2.21	
Total Return	1.310	1.456	2.53	

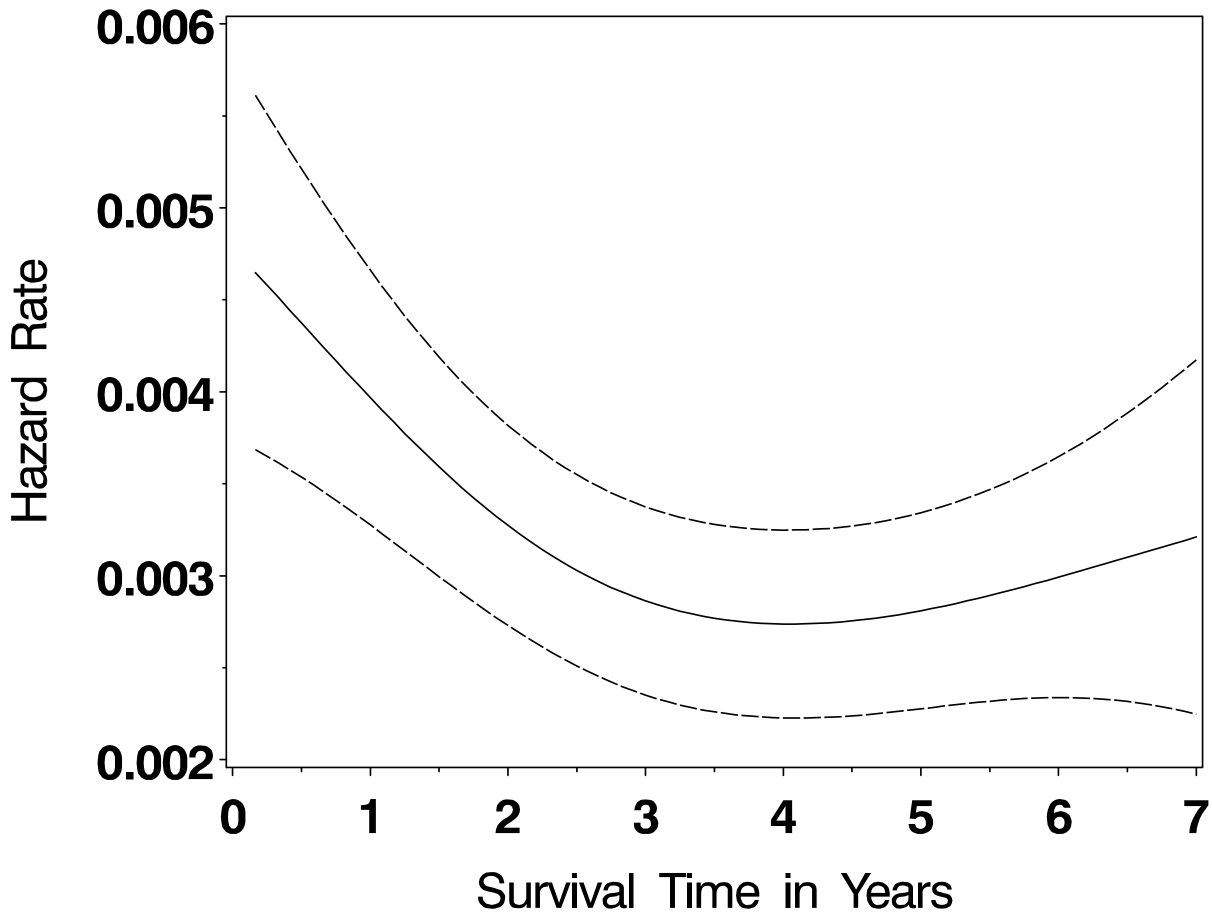
The incubation period performance of surviving and non-surviving incubated funds is examined. The table is divided into two groups: incubation survivors (those funds that are introduced to the public) and non-survivors (those funds that are closed before ever being introduced to the public). The 1-factor alpha is Jensen's (1968) alpha. The 4-factor alpha combines the Fama-French 3 factors (1993) plus Carhart's momentum factor (1997). The investment objective alpha is the fund average return less the average return for all funds with the same investment objective as identified by CRSP. The Jensen's alpha and the 4-factor alpha are calculated for those funds that have at least 12 monthly returns and, as a result, the sample size is smaller. The t-test column reports the p-value of a difference in means test, comparing the surviving to the non-surviving funds for each variable. The statistics are given in units of percent per month.

Figure 2: Fund Termination Hazard Function



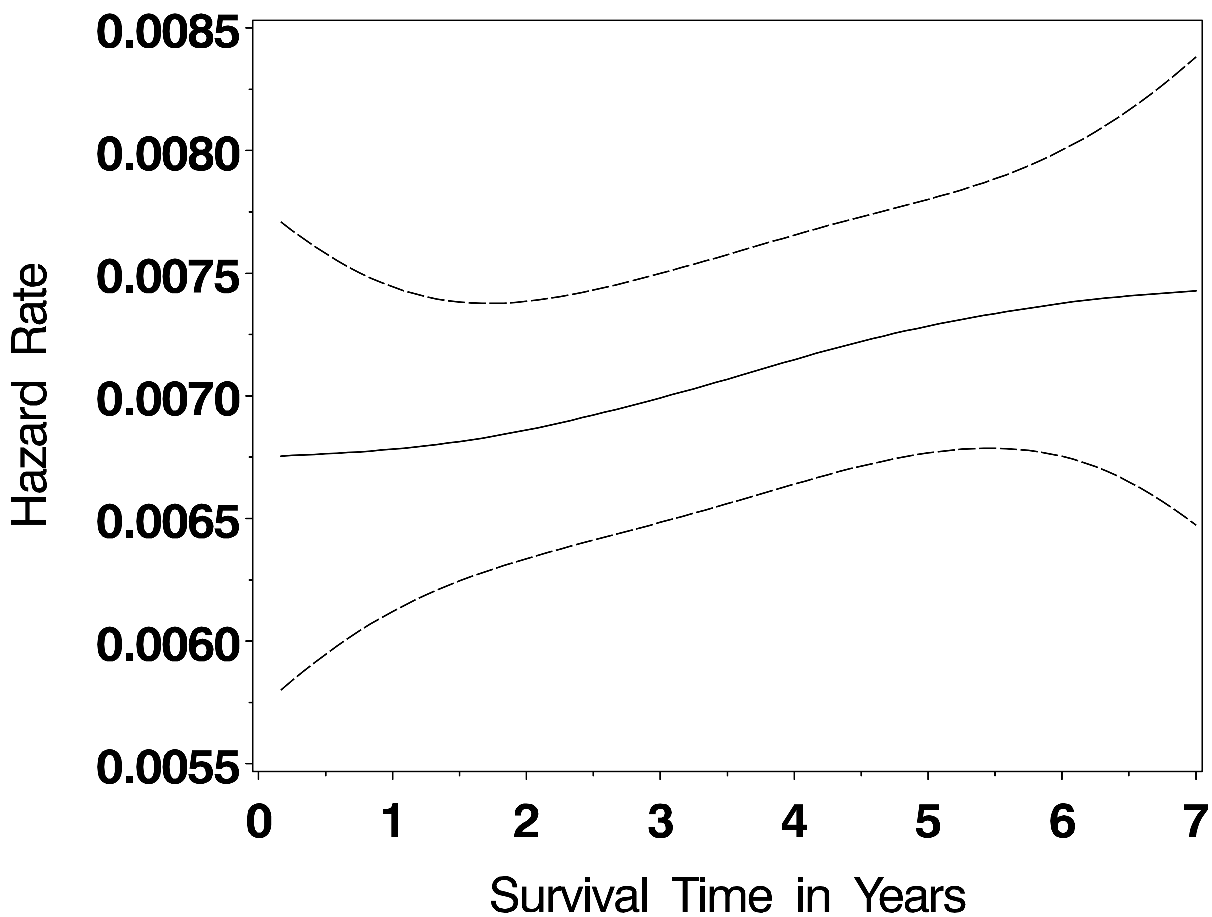
The hazard rate or instantaneous rate of fund termination at month $t+1$, conditioning on survival to month t, is plotted as a function of survival time or age of the fund. The hazard rate is reported in monthly terms. Empirical estimates of the hazard function are calculated and fit via cubic spline. The 5% and 95% confidence intervals from the cubic spline fit are plotted alongside the hazard rate.

Figure 3: Manager Demotion Hazard Function



The hazard rate or instantaneous rate of manager demotion at month $t+1$, conditioning on survival to month t, is plotted as a function survival time, or equivalently, manager tenure. Only managers who first appear in CRSP after January 1, 1992, are included in the analysis. The graph accounts for multiple demotions for each manager. The hazard rate is given in monthly terms. Empirical estimates of the hazard function are calculated and fit via cubic spline. The 5% and 95% confidence intervals from the cubic spline fit are plotted alongside the hazard rate.

Figure 4: Manager Promotion Hazard Function



The hazard rate or instantaneous rate of manager promotion at month $t+1$, conditioning on survival to month t, is plotted as a function of survival time, or equivalently, manager tenure. Only managers who first appear in CRSP after January 1, 1992, are included in the analysis. The graph accounts for multiple promotions for each manager. The hazard rate is given in monthly terms. Empirical estimates of the hazard function are calculated and fit via cubic spline. The 5% and 95% confidence intervals from the cubic spline fit are plotted alongside the hazard rate.

Table 2: Mutual Fund Incubation

Variable	Coef		ME	Coef		ME	Coef		ME
Intercept	10.66	**		7.32	*		7.49	*	
Invest. Obj. Alpha	-0.08		-0.02						
1-Factor Alpha				-0.39		-0.10			
4-Factor Alpha							-0.29		-0.07
Total Return	0.34	*	0.08	0.54	*	0.11	0.53	*	0.11
Fund Age (Months)	-0.009	*	0.00	-0.006		0.00	-0.006		-0.001
Flows to Invest. Objective (%)	1.53	***	0.29	1.13	*	0.25	1.11	*	0.24
Duplicate Objective Funds ID	-0.65		-0.16	-0.95		0.24	-0.99		-0.25
Fund Family Size Decile	1.27	**	0.00	0.86	*	0.00	-0.89	*	0.00
Terminated Funds	55			20			20		
Surviving Funds	172			119			119		
Total Observations	227			139			139		
McFadden's R^2	30.5%			28.9%			28.8%		

Incubation survival (the act of opening a fund to the public after accumulating an incubation track record) is modeled with a logistic regression. The regression measures the probability of a fund being opened to the public as a function of the stated independent variables. The investment objective alpha is the fund average return less the average return for the fund's self-declared investment objective identified by CRSP. The 1-factor alpha is Jensen's (1968) alpha. The 4-factor alpha combines the 3 Fama-French factors with a momentum factor (Fama and French (1993) and Carhart (1997)). Fund age is the number of months since the fund began incubation. Flows to investment objective is the average monthly flows to all funds with the same investment objective. The duplicate objective funds ID is an indicator for whether the fund family had another fund with the same investment objective (1=yes, 0=no). The fund family size decile is the decile of the fund family that is managing the incubated fund (9=Largest Family, 0=Smallest Family). The asterisks denote statistical significance in the following manner: *** significant at 0.1%, ** significant at 1%, and * significant at 5%. The ME column gives the marginal effect of each variable. For the continuous variables, ME is calculated for a 1-standard deviation increase from the variable's mean. For the discrete variables, the marginal effect is calculated for a single-step transition in the variable (e.g., from 0 to 1).

Table 3: Mutual Fund Termination

	12-Month Estimates								
	1-Factor Alpha			3-Factor Alpha			4-Factor Alpha		
Variable	Coef		HR	Coef		HR	Coef		HR
Alpha	-0.067		0.91	0.026		1.04	0.000		1.00
Total Return	-0.145	***	0.75	-0.203	***	0.67	-0.189	***	0.69
Fund Flows (%)	-1.953	***	0.00	-2.023	***	0.00	-2.005	***	0.00
Objective Flows (%)	-14.54	*	0.88	-13.59		0.89	-13.84	*	0.89
Log(Fund Assets)	-0.598	***	0.30	-0.602	***	0.30	-0.600	***	0.30
Expense Ratio	12.38		1.11	13.40		1.12	12.85		1.12
Investment Advisor Merger	0.363		1.05	0.371		1.05	0.367		1.05
Total Observations	236954			236954			236954		
Event Observations	1141			1141			1141		
Pseudo-R^2	20.9%			20.9%			20.9%		
	36-Month Estimates								
	1-Factor Alpha			3-Factor Alpha			4-Factor Alpha		
Variable	Coef		HR	Coef		HR	Coef		HR
Alpha	0.153		1.12	0.210		1.15	0.135		1.09
Total Return	-0.507	***	0.63	-0.533	***	0.62	-0.469	***	0.66
Fund Flows (%)	-0.125		0.23	-0.124		0.23	-0.121		0.24
Objective Flows (%)	-23.97	*	0.84	- 23.48	*	0.84	-23.80	*	0.84
Log(Fund Assets)	-0.654	***	0.27	-0.659	***	0.27	-0.655	***	0.27
Expense Ratio	12.17		1.11	13.74		1.13	12.45		1.11
Investment Advisor Merger	0.785	**	1.11	0.794	**	1.12	0.793	**	1.12
Total Observations	181889			181889			181889		
Event Observations	784			784			784		
Pseudo-R^2	22.3%			22.3%			22.3%		

The Cox proportional hazards model is applied to fund termination. The regression is run using either 12- or 36-month lagged performance estimates. The 1-factor or Jensen's alpha is the excess return from the CAPM model (Jensen (1968)). The 3-factor alpha is the excess return from the 3-factor model of Fama and French (1993). The 4-factor alpha is the excess return from the 3-factor model of Fama and French plus a momentum factor (Carhart (1997)). The Fund Flows variable is the net flows to the fund (in %) averaged over the same period as the performance measures (either 12 or 36 months). The Objective Flows variable is the average of the net flows variable to all funds of the same investment objective as identified by CRSP. The Log(Fund Assets) variable is the natural log of fund size lagged one month. The Expense Ratio variable is the percent fee charged by the management company to investors. The investment advisor merger variable is an indicator of whether or not the fund's investment advisor has merged with, acquired, or been acquired by another investment advisor in the previous 12 months (1=yes, 0=no). Also included in the specification, but not shown in the table, are fund management company and yearly fixed effects. HR refers to the Hazard Ratio calculated for a one standard deviation change in the continuous variables and a single-step transition in the discrete variables. The Pseudo R-Squared is calculated as 1-(Log Likelihood with covariates)/(Log likelihood without covariates). The asterisks denote statistical significance in the following manner: *** significant at 0.1%, ** significant at 1%, and * significant at 5%.

Table 4: Manager Demotion

	12-Month Estimates								
	1-Factor Alpha			3-Factor Alpha			4-Factor Alpha		
Variable	Coef		HR	Coef		HR	Coef		HR
Alpha	-0.208	***	0.77	-0.133	**	0.87	-0.113	**	0.89
Total Return	0.052		1.11	-0.017		0.97	-0.029		0.94
Fund Flows (%)	-0.0006		0.91	-0.0007		0.90	-0.0007		0.90
Objective Flows (%)	15.92	**	1.11	14.58	*	1.10	14.98	*	1.10
Log(Fund Assets)	0.228	***	1.66	0.226	***	1.65	0.225	***	1.65
Team Indicator	-0.129		0.88	-0.134	*	0.88	-0.130		0.88
Log(Fund Family Assets)	0.030		1.07	0.031		1.07	0.030		1.07
Number of Promotions	-0.005		1.00	-0.003		1.00	-0.003		1.00
Number of Demotions	0.075	***	1.08	0.074	***	1.08	0.075	***	1.08
Total Observations	66228			66228			66228		
Event Observations	964			964			964		
Pseudo-R^2	2.9%			2.7%			2.7%		

	36-Month Estimates								
	1-Factor Alpha			3-Factor Alpha			4-Factor Alpha		
Variable	Coef		HR	Coef		HR	Coef		HR
Alpha	-0.275	**	0.84	-0.267	*	0.87	-0.300	*	0.86
Total Return	-0.043		0.96	-0.071		0.94	-0.079		0.93
Fund Flows (%)	0.018		12.77	0.017		11.15	0.017		11.38
Objective Flows (%)	5.274		1.03	7.439		1.04	6.008		1.03
Log(Fund Assets)	0.226	***	1.65	0.228	***	1.66	0.227	***	1.65
Team Indicator	-0.065		0.94	-0.062		0.94	-0.076		0.93
Log(Fund Family Assets)	0.033		1.08	0.031		1.07	0.030		1.07
Number of Promotions	-0.002		1.00	0.00008		1.00	-0.0009		1.00
Number of Demotions	0.067	**	1.07	0.069	**	1.07	0.066	**	1.07
Total Observations	38607			38607			38607		
Event Observations	681			681			681		
Pseudo-R^2	2.6%			2.6%			2.6%		

The determinants of manager demotion are modeled with a Cox proportional hazards regression. Individual managers in the CRSP database are followed from 1995 to 2002. The regression is run for both 12- and 36-month averages of the performance and flow variables. Demotions are defined as a manager change in which the manager has fewer total assets under management after the change than before, controlling for fund growth. The 1-factor or Jensen's alpha is the excess return from the CAPM model (Jensen (1968)). The 3-factor alpha is the excess return from the 3-factor model of Fama and French (1993). The 4-factor alpha is the excess return from a model combining a 3-factor model of Fama and French plus a momentum factor (Carhart (1997)). The Fund Flows variable is the net flows to the fund (in %) averaged over the same period as the performance measures (either 12 or 36 months). The Objective Flows variable is the average of the net flows variable to all funds of the same investment objective as identified by CRSP. The Log(Fund Assets) variable is the natural log of fund size lagged one month. The Team Indicator variable is an indicator of whether or not the fund is managed by a team or by an individual manager (1=team 0=no team). The Log(Fund Family Assets) variable is the log of the size of the fund family's assets under management. The Number of Promotions (Demotions) variable is the total number of promotions (demotions) the manager has experienced to that date. Fund management company and yearly fixed effects are included in the regression but not reported in the results. HR refers to the Hazard Ratio calculated for a one standard deviation change in the continuous variables and a single step transition in the discrete variables. The Pseudo R-Squared is calculated as 1-(Log Likelihood with covariates)/(Log likelihood without covariates). The asterisks denote statistical significance in the following manner: *** significant at 0.1%, ** significant at 1%, and * significant at 5%.

Table 5: Manager Promotion

	12-Month Estimates								
	1-Factor Alpha			3-Factor Alpha			4-Factor Alpha		
Variable	Coef		HR	Coef		HR	Coef		HR
Alpha	0.100	**	1.14	0.120	**	1.13	0.099	*	1.11
Total Return	-0.028		0.95	-0.012		0.98	0.0004		1.00
Fund Flows (%)	-0.084		0.00	-0.085		0.00	-0.084		0.00
Objective Flows (%)	18.25	**	1.13	17.12	**	1.12	17.16	**	1.12
Log(Fund Assets)	-0.005		0.99	-0.002		1.00	-0.001		1.00
Team Indicator	-0.162	*	0.85	-0.160	*	0.85	-0.160	*	0.85
Log(Fund Family Assets)	0.260	***	1.82	0.259	***	1.81	0.258	***	1.81
Number of Promotions	0.082	***	1.09	0.082	***	1.09	0.082	***	1.09
Number of Demotions	-0.103	**	0.90	-0.105	**	0.90	-0.105	**	0.90
Total Observations	66228			66228			66228		
Event Observations	1041			1041			1041		
Pseudo-R^2	4.6%			4.6%			4.6%		

	36-Month Estimates								
	1-Factor Alpha			3-Factor Alpha			4-Factor Alpha		
Variable	Coef		HR	Coef		HR	Coef		HR
Alpha	0.132		1.09	0.317	*	1.19	0.305	*	1.16
Total Return	-0.101		0.92	-0.173		0.86	-0.141		0.88
Fund Flows (%)	-0.041		0.00	-0.041		0.00	-0.041		0.00
Objective Flows (%)	30.84	**	1.17	25.55	*	1.14	27.21	*	1.15
Log(Fund Assets)	0.014		1.03	0.017		1.04	0.018		1.04
Team Indicator	-0.199	*	0.82	-0.206	*	0.81	-0.195	*	0.82
Log(Fund Family Assets)	0.192	***	1.55	0.189	***	1.54	0.190	***	1.54
Number of Promotions	0.071	***	1.07	0.069	***	1.07	0.070	***	1.07
Number of Demotions	-0.157	**	0.85	-0.162	**	0.85	-0.161	**	0.85
Total Observations	38607			38607			38607		
Event Observations	537			537			537		
Pseudo-R^2	6.6%			6.7%			6.7%		

The determinants of manager promotion are modeled with a Cox proportional hazards regression. Individual managers in the CRSP database are followed from 1995 to 2002. The regression is run for both 12- and 36-month averages of the performance and flow variables. Promotions are defined as a manager change in which the manager has more total assets under management after the change than before, controlling for fund growth. The 1-factor or Jensen's alpha is the excess return from the CAPM model (Jensen (1968)). The 3-factor alpha is the excess return from the 3-factor model of Fama and French (1993). The 4-factor alpha is the excess return from a model combining a 3-factor model of Fama and French plus a momentum factor (Carhart (1997)). The Fund Flows variable is the net flows to the fund (in %) averaged over the same period as the performance measures (either 12 or 36 months). The Objective Flows variable is the average of the net flows variable to all funds of the same investment objective as identified by CRSP. The Log(Fund Assets) variable is the natural log of fund size lagged one month. The Team Indicator variable is an indicator of whether or not the fund is managed by a team or by an individual manager (1=team 0=no team). The Log(Fund Family Assets) variable is the log of the size of the fund family's assets under management. The Number of Promotions (Demotions) variable is the total number of promotions (demotions) the manager has experienced to that date. Fund management company and yearly fixed effects are included in the regression but not reported in the results. HR refers to the Hazard Ratio calculated for a one standard deviation change in the continuous variables and a single step transition in the discrete variables. The Pseudo R-Squared is calculated as 1-(Log Likelihood with covariates)/(Log likelihood without covariates). The asterisks denote statistical significance in the following manner: *** significant at 0.1%, ** significant at 1%, and * significant at 5%.

Table 6: Managers vs. Funds: Determinants of Investor Flows

	F-test - Fixed Effects			
Variable	I	II	III	IV
Fund		2.41***	2.26***	1.65***
		(392)	(379)	(379)
Manager		0.47	0.79	0.82
		(70)	(68)	(68)
Fund*Total Return			2.18***	
			(379)	
Manager*Total Return			0.53	
			(68)	
Fund*Alpha				1.42***
				(379)
Manager*Alpha				0.45
				(68)
R^2	0.006	0.076	0.122	0.114
Observations	20441	20441	20441	20441

The monthly flows of a sample of 269 managers managing 591 funds is analyzed. From the full sample, only those managers who manage more than two funds over time are included in this analysis. Fund-level monthly flows (in percent) are regressed on the log of lagged fund size, average net flows to the fund's investment objective and yearly fixed effects. Column I shows the R^2 value for this specification. Column II shows the results from the same exercise, accounting for manager and fund fixed effects. Columns III and IV then add manager and fund fixed effects interacted with total return and a 1-factor Jensen's alpha. Residuals are clustered by fund. The F-test fixed effects results are reported as well as the degrees of freedom (in parentheses). The asterisks denote statistical significance in the following manner: *** significant at 0.1%, ** significant at 1%, and * significant at 5%.