Fund Managers' Institutional Background and the Birth of Investment Management Companies

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Abstract

This paper presents new evidence on the origins of investment management companies. Specifically, we examine the characteristics and nature of those 'parent' fund companies from which at least one of their key fund manager personnel departed to establish their own independent firms. Covering the period 1980 and 2003, we create a unique hand-collected database of money management firm founders and their 'parents'. We find that larger, more reputable and more diversified firms with a significant presence in growth-oriented investment objectives are more likely to produce start-ups. Coming from larger companies increases the time it takes for a start-up to attain significant assets under management. Fund managers with experience in more diversified firms and those that are dominated by growth funds experience shorter time to 'significant' assets. Locating a start-up geographically closer to a founder's previous employer results in a faster time to market. An analysis of the similarities between parent and start-ups' stock holdings shows that there is almost double the commonality of stocks held, than previously documented for competing mutual funds. The main driver of commonality in stock selection is the number of founders coming from a single parent firm.

JEL Classification: G23 ; L22

Keywords: Investment management firms; Fund manager background; Entrepreneurial activities

I. Introduction

Many prominent investment management companies of today, including GMO, PIMCO and Vanguard, were started by former employees of established mutual fund companies. Surprisingly, the contribution and importance of the institutional background of founders of such firms has escaped the attention of academic researchers. Accordingly, our primary goal is to establish new insights into the origins of such new investment management companies ('start-ups') by examining the characteristics and nature of their 'parent' fund companies. Our basic research question is straightforward: are there particular 'parent' characteristics that significantly impact the birth of new fund companies?

A starting point provided by the theoretical literature is that firms are endowed with capabilities and resources that entrepreneurial employees could harness for the purposes of establishing competing businesses. The employee in the Rajan and Zingales (1998) model is granted access to a resource that is critical to the incumbent employer who expects that firm-specific investments will be made by the employee. In the process, however, the employee is also equipped with human capital that could also be invested outside the firm. Rajan and Zingales (2001) extend their earlier analysis to incorporate an employee that can expropriate the critical resource, particularly in human capital-intensive firms. Gompers et al. (2005) finding that public corporations with an established profile of entrepreneurial processes have a greater likelihood of "spawning" new enterprises, supports the theoretical predictions. Bhide (2000) documents that the

majority of entrepreneurs emerge from established, larger, firms in the same industry, and suggests that they capitalize on the experience gained from their employment.

In this paper, we investigate three related research questions with the common theme of advancing our understanding of the 'birth' of investment management companies. First, we investigate whether the institutional characteristics of previous employers of fund managers who start their own firms contribute to their emergence as entrepreneurs.[1] We motivate four main sets of characteristics, three of which derive from the industrial organization literature – namely, size, reputation and strategic diversity of the company. The fourth characteristic that we consider is the interaction of potential producers of entrepreneurial fund managers with market conditions. In the second part of the analysis, we examine the relationship between the parent firm's institutional characteristics and the time it takes for the start-up to attain a significant amount of assets under management. We include proxies for 'ties' that entrepreneurs may have to their former employers. The third and final research question that we examine is whether institutional background contributes to commonality between the product market strategies, represented by equity holdings, of parent firms and a matched sample of start-ups.

Constructing a rich sample to meaningfully examine the issues raised in this paper is a challenging task. The main difficulty lies in the non-existence of centralized data on entrepreneurial fund managers. Standard databases used in studies of fund manager turnover (e.g. Khorana, 1996, and Chevalier and Ellison, 1999) do not separate career moves inspired by entrepreneurial motives from general job changes. To circumvent this

[1] Throughout the paper we refer, interchangeably, to 'founders' or 'entrepreneurs' as 'entrepreneurial fund managers', and to their previous employers as 'parents'.

problem we use a unique hand-collected dataset of announcements of new firm starts by mutual fund managers obtained from a combination of public domain and proprietary electronic data sources. Notably, our sample design allows us to trace the origins of entrepreneurial fund managers, the dates on which they start their own firms, and the characteristics of their former employers. We are also able to identify when the new firms lodge their inaugural statutory report of significant assets under management.

The mutual fund industry presents an attractive setting in which to investigate whether large firms with an established industry profile are hotbeds of entrepreneurial activities by employees. The contribution of prior employment history to firm start-ups in industrial settings has been analyzed in a number of studies. Few studies, however, focus on start-ups in knowledge intensive industries. In particular, very little is known about the relation between fund managers' entrepreneurial activities and their institutional background. Successful value creation in the investment management industry is heavily influenced by the combination of personal skills on the part of the managers and infrastructure provided by employers. As one indication of the relative contributions from these two sources, Baks (2007) finds that, at most, managers are inherently responsible for 50% of the return performance of a fund. Therefore by implication, if fund companies via their infrastructure contribute significantly to what makes a successful fund manager, do they unwittingly create (future) competition for themselves in the form of new industry entrants?

The results of our study are of great interest to a range of market participants who should be concerned about the (double-edged) competitive effects of departures by entrepreneurial fund managers. First, for operators of investment companies, we provide

the first empirical evidence of the extent to which established mutual fund firms are *de facto* training grounds for managers who go on to start their own money management firms. The results may help fund companies in the formulation of employment policies concerning portfolio managers. Second, potential entrepreneurs in the investment management industry would draw important lessons from the findings. Third, investors would be interested in understanding hitherto undocumented institutional influences on the departure of managers from funds in which they are invested. Investors interested in the services offered by new investment advisory firms would benefit from knowing how manager backgrounds contribute to the birth of competing products which expand their range of choices and diversification possibilities. Fourth, regulators would value an improved understanding of the competitive effects of new firm start-ups, and potentially use the findings to inform debate on issues as far ranging as anti-trust policy through to the portability of entrepreneurial fund managers' performance records.

We organize the remainder of the paper as follows. Section II describes the hypotheses that we test. Section III summarizes our data sources. In Section IV we investigate the key institutional characteristics of firms that produce entrepreneurs. Section V examines the relationship between firm founders' institutional background and the time it takes for the new firm to attain significant assets under management. Section VI explores the link between institutional background and commonality of stock holdings. In Section VII we synthesize our main findings in the context of a brief discussion of their practical implications. Section VIII concludes.

II. Development of Hypotheses

In this section, we develop the hypotheses underpinning the analysis presented in the rest of the paper. While our review of the literature is not designed to be exhaustive, it offers an essential framework for organizing the hypotheses.[2] Importantly, we enrich the development of our hypotheses by careful reference to analogous theory and empirical studies in the industrial organization literature.

We examine three main sets of hypotheses concerning the contribution of entrepreneurs' institutional backgrounds to the process of new firm formation in the money management industry. The first set is founded on the null hypothesis that characteristics of the previous employer of an entrepreneur are *not* related to the probability of a fund manager leaving to form her own firm. The second hypothesis concerns the contribution of entrepreneurs' institutional background to the speed with which their firms attain significant levels of business. In our third hypothesis we analyze the relations between entrepreneurial fund managers' links with their last employers and similarities between the stock portfolios of parent firms and start-ups in the early part of the new firms' life-cycles. We discuss each set of hypotheses in turn.

A. Impact of Founders' Institutional Background on New Firm Formation

In Hellmann's (2007) model, employers are capable of identifying employees that, by virtue of their work routines, come to possess valuable ideas. When firms have weak claims to intellectual property rights, they dissuade employees from innovating. In addition, employers may react to increased entrepreneurial pressures by facilitating the

[2] For a detailed review of the literature on the emergence of entrepreneurs from public corporations see Gompers et al. (2005).

development of employees' innovations in-house. In support of Hellmann's (2007) predictions, Almazan et al. (2004) report investment constraints to be more prevalent in the case of more experienced managers. Anecdotal evidence suggests fund companies institute various pre-emptive as well as reactive measures against the threat of competing start-ups by their employees. Non-compete clauses are inserted in manager contracts and several law suits to enforce them have been reported.[3] Patents can also be registered under the "portfolio selection, planning and analysis" category with the U.S. Patent and Trademark Office. The net effect of the above may well be that we cannot observe links between entrepreneurs' institutional background and start-up activity.

However, there are at least four plausible alternatives to the irrelevance of the institutional background hypothesis.

Firm size. The relationship between parent size and employee entrepreneurship finds robust empirical support in Gompers et al. (2005). Both large, bureaucratic, organizations and small, innovative, firms are sources of entrepreneurs. Cooper (1985) proposes that since new firms are typically small, entrepreneurs generally come from smaller firms with directly applicable lessons for employees on how to start their own firms. In a recent study, Hvide (2005) presents a model in which small firms are less likely than large firms to lose their best employees for entrepreneurial reasons because smaller firms are more flexible in their wage policies. In the investment management industry it is likely that forming new firms will be attractive to fund managers wishing to

[3] One example is the civil suit filed by Wellington Asset Management against its former partner, Arnold Schneider, who left the company in December 1996 to start Schneider Capital Management. Several Wellington clients had followed Schneider to his new firm, and Wellington filed a suit claiming Schneider had violated the non-compete clause in his employment agreement with Wellington. The court stripped Schneider of his old Wellington clients. Similarly, the court case between Mellon Bank Corporation subsidiary Boston Company and Desmond Heathwood, former president of Boston Co.'s investment unit and six money managers who departed to form their own firm involved direct allegations of "a covert plan" to rob clients and company secrets according to the Boston Globe, April 22 1995, p. 69.

exercise greater control on their activities, a typical consideration of managers working for large, bureaucratic, fund companies. Accordingly, our size-related alternative hypothesis is:

H1a: Large firms are more likely to produce entrepreneurial fund managers

Reputation. The reputation of a start-up's founders and that of their prior affiliations signal the quality of the technical knowledge base of the firm and help investors in interpreting ex-ante information asymmetries (Audretsch and Stephan, 1996). Empirical evidence suggests entrepreneurial activities by former employees increase as incumbent firms experience a slow down in their main lines of business (Gompers et al. 2005). Accordingly, our reputation-related alternative hypothesis is:

H1b: The reputation of the parent firm (in terms of market visibility and performance) is related to its likelihood of producing entrepreneurial fund managers

Strategic diversity. Gompers et al. (2005) document that in an industrial setting, firms that are focused on a single line of business are more likely to produce entrepreneurs. However, some theories favor the role of diversified product lines. Work by Lazear (2004 and 2005) identifies entrepreneurs as those individuals who have acquired "balanced skills" to co-ordinate varied activities, suggesting that more diversified companies should produce more entrepreneurs. Hellmann (2007) argues that employees obtain entrepreneurial ideas from their exposure to tasks outside their main jobs. Given that investment management start-ups are typically boutique firms whose

executives take part in the general aspects of operating their business in addition to portfolio management, our third diversity-related alternative hypothesis is that:

H1c: Entrepreneurial fund managers are more likely to come from firms with more diversified product lines

Market conditions. In Hellmann (2007) the emergence of entrepreneurs from established firms is dependent on how favorable the environment is to entrepreneurship. Our final alternative hypothesis to the notion that institutional background does not contribute to the probability of observing fund managers departing established firms, is that such a link exists depending on conditions in money and capital markets. By incorporating market conditions, we wish to capture circumstances that could encourage entrepreneurs to leave established firms. In addition, we account for factors that may constrain entrepreneurial efforts, since access to funding is critical in determining who becomes an entrepreneur (see Banerjee and Newman, 1993, and Holtz-Eakin, Joulfaian and Rosen, 1994). Accordingly, a basic version of our market conditions-related alternative hypothesis is:

H1d: Market conditions impact the likelihood that a firm is a source of entrepreneurial fund managers

However, given the nature of the arguments above, it is quite possible that market conditions serve as a 'moderator' variable, which gives rise to an interesting variation of hypothesis H1d:

H1e: Market conditions moderate the link between the factors above (i.e. firm size; reputation and diversity) and the likelihood that a firm is a source of entrepreneurial fund managers

B. Impact of Institutional Background on Start-ups' Time to Market

Our second set of hypotheses targets one of the milestones of the early life of a start-up - its ability to bring a product to market (Hellmann and Puri, 2000). In the investment management industry the attainment of a certain (threshold) size shortly after commencing operations is one of the biggest challenges facing its founders. It is customary for the profile of an investment management firm to be 'defined' in the popular press and by clients in terms of its size or assets under management. Securing a sizeable amount of assets under management is not only important for the generation of fees to sustain the new firm's operations, it also gains the start-up external visibility and a base for earning market share. Our second null hypothesis is that institutional background does not impact the time it takes for a start-up to attain a significant amount of assets under management.

The discussion of the first null hypothesis suggests that if employers can successfully discourage entrepreneurship among those workers that they consider to have ideas which are valuable, then for those managers that become entrepreneurs, their activities in the product market are not likely to relate to their prior history. However, in Franco and Filson's (2007) model, a start-up's probability of surviving is increasing in its parent's know-how. In our context attaining significant assets under management is an important determinant of a new money management firm's survival. Following on from

this logic, as alternative hypotheses we conjecture that the same institutional factors which contribute to the formation of new businesses by fund managers are likely to continue to affect the fortunes of the start-up's operations. The size, reputation and degree of strategic diversity of the entrepreneur's previous employer reduce the time it takes for the fund manager to start successfully offering services to sizeable clients. Accordingly, a generic version of our time to market alternative hypothesis focusing on institutional factors is:

H2a: Time to market is influenced by firm size; reputation and strategic diversity of the entrepreneur's previous employer

It seems reasonable to expect that the ability of a fund manager to maintain direct and indirect links with her former employer could improve her chances of achieving sizeable assets under management. Such ties could come in the form of sub-advisory and other service arrangements between the start-up and its founder's employers.[4] A fund manager could also cannibalize clients from her previous employer. Where benefits accrue to a fund manager by virtue of physical proximity to former employers, such economies decay over a geographical distance (Jaffe et al. 1993). More formally, our alternative hypothesis involving parent 'ties' can be stated as:

H2b: Time to market is impacted by ties with the entrepreneurs' former employers

[4] For example, when Jeanie Wyatt left Frost National Bank's Financial Management Group after 19 years to start her own money-management firm, she maintained ties with her former employers and was reported as saying: "They are my family and my friends, … I will be using Frost Bank as a custodial institution for a lot of my accounts" (sourced from the *San Antonio Express*, October 25 2000).

C. Impact of Institutional Background on Portfolio Similarities

Recent models accommodate the imitation of former employers' know-how by founders of new firms (see, for example, Franco and Filson, 2007). In the final hypothesis we take a first step in examining whether entrepreneurs mimic the portfolio strategies of their last employers. We hypothesize that ties between start-ups and parent firms encourage the copying of portfolio strategies by new firms and (vice-versa). The market provides some anecdotal evidence of substantial overlap between entrepreneurial fund managers' stock portfolios and those of parent firms. For example, the Wall Street Journal (February 28 1997) highlighted such overlap between the stock holdings reported by Jeff Vinik's investment management company and stocks held by Fidelity Investments, Vinik's employer up to the preceding year. If common stock holdings between start-ups and their founders' last employers are purely random, we would not expect the overlap to be systematically related to institutional background. Moreover, given the "anti-competitive" constraints imposed on start-ups by incumbent firms (see Section II A), mimicry of parent firms' stock portfolios by entrepreneurial fund managers may well not be prevalent. Formally, the alternative version of this hypothesis becomes:

H3: The degree of common stock holdings between the parent and start-up fund is impacted by ties and institutional characteristics of the entrepreneur's previous employer

III. Data and Sampling

We use a unique hand-collected sample of entrepreneurial fund managers to empirically investigate the issues raised in this paper. We identify managers who leave paid positions

to form their own firms from a variety of newspaper and electronic sources. To generate the initial list of fund managers that leave established investment companies specifically to set up their own money management firms, we search the Lexis-Nexis, Factiva and ABI-Inform databases, supplemented with ADV Forms lodged by fund advisors when they register to practice through the Securities and Exchange Commission's Investment Advisor Public Disclosure. We also access managers' profiles on Morningstar discs. In addition, we identify start-ups and their founders in fund manager directories and from Web sites of mutual fund companies. The resulting dataset is a rich history of new mutual fund companies at their inception. The identities of the fund managers and parent fund families, and the identities and formation dates of start-ups are included. We also record details of the geographic location of both parent and start-up firms and the time a manager served with the parent firm.

We combine this information with Thomson Financial Services' mutual fund data detailing the portfolio holdings of the managers' parent firms. The portfolio holdings data enable us to ascertain attributes such as the asset size of the firm and the number of fund products offered. Combining the entrepreneurial fund manager and portfolio holdings datasets leaves us with a sample of 199 managers who become entrepreneurs between 1980 and 2003. Table 1 summarizes the parent firms from which entrepreneurs emerge most frequently in our base dataset. The list is dominated by well known fund organizations such as Fidelity Investments. Bank and insurance holding companies that operate investment management subsidiaries are also well represented on the list.

For start-ups that become sizeable institutional equity managers we obtain their portfolios from Thomson Financial Services' CDA/Spectrum Institutional (13f) Holdings

database, compiled from statutory six-monthly (and sometimes quarterly) returns required once the firms attain assets under management amounting to $100 million. Typically new money management firms begin their operations in institutional accounts rather than mutual funds, hence our reliance on the CDA/Spectrum database.

We also obtain rankings of firms by asset size from *Institutional Investor* America's Top 300 Money Managers Surveys of 1988, 1992, 1996 and 2001. Finally we obtain IPO data from Jay Ritter's homepage.[5]

IV. What Type of Fund Parent Produces Entrepreneurs?

We now turn to examining how the emergence of entrepreneurial fund managers relates to the characteristics of parent firms. We consider determinants of established firms producing start-ups along the dimensions motivated in Section II.

A. Definition of Variables

Firm size. We use the annual dollar value of a firm's assets under management based on stock holdings to measure asset size. For asset growth we take the percentage growth in a firm's asset size relative to the previous year's funds under management to capture the pressure that may be exerted on fund managers to leave a portfolio once it becomes too large to manage effectively. As an alternative to assets under management as a firm size measure we also count the number of fund products offered by the company. More specifically, we use counts of the organization's funds according to each

[5] The data are available at http://bear.cba.ufl.edu/ritter/. This database is described in detail in the appendix of Loughran and Ritter (2004).

of the four categories we can identify from our data – Balanced Funds, Growth/Income Funds, Growth Funds and Other Funds.

Reputation. We incorporate a measure of the prestige of an entrepreneur's former employer based on the firm's appearance in the America's Top 300 Money Managers surveys produced annually by the *Institutional Investor* magazine. A parent firm's Top Money Manager Profile is therefore represented by the number of times it appears in the four surveys to which we have access (1988, 1992, 1996 and 2001). We believe this measure, though somewhat noisy, reflects reputation in that it not only differentiates the top institutions from the rest of the market, but also establishes a ranking among the leading investors based on the frequency of their appearance on the list. We also utilize parent firms' performance track records as proxies for their reputation. We measure the overall return performance track record of parent firms as follows. We use the Characteristic Selectivity (CS) measure adopted from Daniel et al. (1997) and used in the context of fund manager track record by Wermers (2006). Synonymous to alpha, this measure gives us a performance track record for each likely parent firm. For the last three years of an entrepreneurial fund manager's tenure at a firm, we measure the CS track record for each fund operated by parent firm *i* at month *t* as:

$$(1) \qquad TrackRecord_{2,t}^{1} = \frac{1}{t - t_0^i} \sum_{t=t_0^i}^{t} \sum_{J=1}^{J_t} w_{j,\tau} \left(R_{j,\tau} - R_{\tau}^{bj,\tau} \right),$$

where $w_{j,\tau}$ is manager *i*'s portfolio weight on stock *j* at the end of the calendar quarter immediately preceding month τ; $R_{j,\tau}$ is the month τ return of stock *j*; $R_{\tau}^{bj,\tau}$ is the month τ return of stock *j*'s characteristic matched portfolio (matched on market capitalization, ratio of book-equity to market-equity, and the prior one-year return on stocks); J_τ

indicates the number of stocks held in the fund(s) managed by manager *i* at the end of the quarter preceding month τ.[6]

Strategic diversity. We utilize the variable Diversity, a simple index of fund category miscellany calculated for each parent firm and ranging from 0.25, where a company operates in only one of the four available categories, to 1 where a company operates in all four fund categories.

Market conditions. In considering variables that proxy for market conditions which might affect entrepreneurial activity, first we need to account for the effects of the performance of U.S. financial markets on fund managers' entrepreneurial activity. Inderst and Müller (2004) and Michelacci and Suarez (2004) show that stock market conditions are closely related to start-up activities. We therefore introduce the S&P 500 performance variable measured as the return on the S&P 500 index during year *t*-1. Second, as an alternative measure of economic performance, and one that relates to the market's receptiveness of new ventures, we include annual counts of all IPOs recorded in the stock market. The IPO market has been linked to market sentiment in theory (e.g. Ljungqvist et al. 2006) and in empirical work (e.g. Oehlera et al., 2004, and Chiu, 2005). According to our hypothesis, we expect that peaks in IPO activities should coincide with increased incidence of investment firm start-ups. Third, we also include the Federal Reserve interest rate, since Parker (1995) finds that the interest rate is an impediment to self-employment.

[6] For a comprehensive description of the procedure for computing the CS measure see Daniel et al. (1997) and Wermers (2006).

B. Univariate Comparisons

Table 2 compares the attributes highlighted in the preceding sub-section across our full sample of firms that produce at least one entrepreneur with all firms for which we have portfolio holdings data. One outstanding feature highlighted by the table is that parents of entrepreneurs tend to be larger in terms of asset size and the number of fund products offered. Parent firms are also more diversified, offering on average three out of four fund categories (mean Diversity measure of 0.76), compared to significantly more focused product strategies for the whole sample (mean Diversity measure of 0.41). Firms that employ entrepreneurial fund managers also perform approximately four times better than the whole sample. Although these univariate statistics begin to present interesting patterns in line with some of our hypotheses, we need to subject them to more rigorous scrutiny in the form of multivariate tests, a task we undertake below.

C. Regression Analyses

In Table 3 we examine the determinants of the probability of a firm producing an entrepreneur in a regression framework. The dependent variable is a binary dummy variable taking the value of unity for a firm that produces an entrepreneur over our sample period, and zero otherwise. We employ logistic and Poisson specifications in recognition of our dependent variable taking a binary form. We use a Poisson specification that accounts for potential over-dispersion in our data due to the fact that a large number of firms do not produce entrepreneurs for long periods of time, and many more do not enter the parent sample at all. The specification also adjusts for the existence

of repeat subjects where, for example, one firm produces entrepreneurs several times over the sample period. We concentrate on the Poisson regression in discussing our results.

In both regressions, we use as regressors the variables described above. In most cases the variables in our pooled regressions are averaged over the sample period following common practice in studies of this nature. However, our variables relating to market conditions coincide with the dates at which the start-ups in our sample were formed. As well, we include lags of these variables to account for the fact that entrepreneurial activities could respond to conditions in markets after a lag owing to the protracted nature of the process of planning to establish a new firm. The regressions follow Gompers et al. (2005) in that they are based on production functions found in the industrial organization literature where size and other firm characteristics are used as explanatory variables in modeling a firm's activities.

The results reject the null hypothesis of the irrelevance of institutional characteristics in the production of entrepreneurs in a number of instances. As we expected, larger firms produce more entrepreneurs (*H1a*). The coefficients on both the number of growth/income and the number of growth funds are positive and highly statistically significant. This finding indicates that firms with a greater exposure to these fund categories tend to produce more entrepreneurs. The negative coefficient on balanced fund counts and the number of other funds suggest that firms concentrating on these categories are less likely to produce start-ups. Firms with a strong reputation (*H1b*), represented by the number of times they appear in the list of top money managers, are also more likely to produce managers who form their own firms. The positive coefficient on Diversity (*H1c*) shows that being diversified in terms of product offerings also

contributes positively to the likelihood that a firm will (inadvertently) create entrepreneurs. Among our market variables IPOs and lagged stock returns are positively related to the probability of a firm producing an entrepreneur (*H1d*).

Notable for their insignificance are the coefficients on asset growth and return performance. A possible explanation for these results is that the variables, sampled at the firm level, are too far removed from the actions of the individual manager. We suspect that measuring them at the level of the funds operated by individual fund managers might give clearer results. However, with our focus on institutional rather than individual characteristics, individual fund performance is beyond the scope of our paper.

In summary, several of our proxies for firm size, reputation, strategic diversity and market conditions support the story that institutional background is relevant to the production of entrepreneurs by established fund companies. As such, we find evidence in favor of hypotheses *H1a – H1d.*

D. Further Analysis – The Interaction of Market Conditions with Institutional Variables

As suggested above in hypothesis *H1e*, it is quite possible that some of the variables that were not significant in our regression analysis (as well as those that were significant) could be found to influence entrepreneurship under certain market conditions. Accordingly, we perform additional analyses involving the interaction of our institutional characteristics with our market conditions proxies, namely, the stock and IPO market variables. We present our Poisson regression results in Table 4. In the table we define each market conditions proxy both contemporaneously (first and second columns) and lagged by one year (third and fourth columns). Most of the results we report above

remain valid when institutional characteristics are interacted with market conditions. The only reversal of our findings is on the asset size variable which changes to a negative sign, implying that when considered together with market returns, firm size discourages entrepreneurship by fund managers. Moreover, when interacted with IPO market activity, firm size loses significance. These findings prompt us to further investigate whether the direction of market movements matters.

In Table 5 we use Poisson regressions to analyze the interaction of stock markets with other explanatory variables by considering times of positive returns or 'up markets' (first and second columns) and negative returns or 'down markets' (third and fourth columns). Instead of market returns in general, our models now separately incorporate dummy variables denoting times when there is a positive or negative return on the market. Surprisingly, still firm size has a negative and statistically significant coefficient in both rising and falling markets. The remainder of our findings remain robustly valid in up markets. However, they are much weaker in times of falling returns, consistent with the idea that in such times little entrepreneurial activity takes place. It is worth noting though, that the presence of growth and income funds in incumbent firms continues to positively influence the emergence of start-ups, even in declining markets.

E. Robustness Checks on Models of Determinants of Start-up Spawning

We carried out a number of tests to check the robustness of our regressions of determinants of start-up spawning to alternative measures of the key variables. First, as an alternative dependent variable we used annual firm-level observations of the number of entrepreneurs produced. Since the results are qualitatively similar, we confined our

attention to reporting and interpreting those based on the binary dependent variable for brevity. Second, we explored alternative firm size proxies. Specifically, we found similar results after replacing asset size with the total number of funds operated by a firm, and after incorporating the total funds on offer in a category as a fraction of all the firm's funds instead of the number of funds per category. However, our models did not perform as well when we substituted asset sizes for the number of fund products per category. One possibility is that asset sizes in fund objectives sampled at the company level are a more noisy indicator of individual managers' responsibilities. For example, the control of the majority of dollar assets by star fund managers could mask the role played by managers of a lower profile who nevertheless become entrepreneurs themselves. Third, we also considered whether the asset size variable bears a non-linear relationship with the dependent variable; that is, whether both large and small firms tend to produce entrepreneurs per Gompers et al. (2005). Incorporating squared asset size in our models did not yield significant results.

V. Is 'Time to Market' Impacted by Entrepreneurs' Institutional Background and Parent Ties?

In this section, we examine the relation between a manager's institutional background and the time it takes for her to achieve 'significant' assets under management. We examine the link between the institutional background of founders and their first appearance in the CDA/Spectrum Institutional (13f) Holdings database once they attain assets under management amounting to $100 million. Strictly, the reporting of institutional assets does not represent the point in time at which the new firm starts

managing investments. Often start-up money management firms begin offering separate account management and sub-advisory services shortly after launching their own firms. Moreover, the CDA/Spectrum data may not capture some small holdings. However, we are concerned with the time it takes for the new firms to achieve a size that represents meaningful competition for incumbent firms.

A. Approach

To investigate this time to market research question, we utilize a Cox duration regression method in line with common practice in studies that use duration data. Time to market is the dependent variable in a model specified in its basic form as follows:

$$h_i(t) = \lambda_0(t) exp\{\beta_1 X_{i1} + \beta_2 X_{i2} + \beta_k X_{ik}\}. \quad (2)$$

In the Cox regression model, the hazard of a start-up *i* attaining significant assets is the product of a baseline hazard $\lambda_0(t)$ (which does not change across explanatory variables) and an exponentiated linear function of *k* fixed covariates. The model is estimated by finding values of β that maximize the partial likelihood of observing the event.[7]

We compute time to market as the number of years between a start-up's founding year and the year in which the firm makes its first report of assets exceeding $100 million to the SEC. We treat start-ups that have not reported assets by the end of our sample period as being "right-censored" (since they could report assets after the end of our sample period). Allowing for right-censoring, the average time to market in our sample is 3.86 years.

[7] See Hellmann and Puri (2000) for a comprehensive discussion of the advantages of using Cox regressions on duration data.

The independent variables include the measures of institutional characteristics utilized in Section IV. We also employ (without tabulation, for brevity) our proxies for market conditions around the time new firms are established to account for the fact that environmental conditions at the start-up stage, may affect the speed with which firms attain assets under management.

In addition, we incorporate three new variables to represent the extent of "ties" between a fund manager and her parent firm. One variable, collected in the process of compiling our entrepreneur dataset, is the number of years that the entrepreneur was employed by the parent organization. Our second measure of ties to parent firms is a count of the number of founders in a start-up that came from the same employer. The last variable is the distance, in kilometers, between the geographical location of the new firm and the parent organization. To each location, usually identified in source documents by city and then state, we assign latitude and longitude coordinates obtained from the Geographic Names Information System (GNIS).[8] We calculate distance between two places using their respective coordinates in spherical geometry as follows:

$$(3) \qquad d(A,B) = 6370.997 \times \{Ar\cos[\sin(latitude_A) \times \sin(latitude_B) \times \cos(latitude_A) \times \cos(latitude_B) \times \cos(|longitude_A - longitude_B|)\ ]\ \},$$

where latitude and longitude are measured in radians.[9] The constant, 6370.997, is the earth's radius in kilometers and converts the distance into units of one kilometer. In addition to continuous distance measured in this way, we also create a dummy variable

[8] Administered by the U.S. Department of the Interior/ U.S. Geological Survey and available online at: http://geonames.usgs.gov/

[8] See Ivković and Weisbenner (2005) for a similar application.

taking the value unity for entrepreneurs that locate very close (less than a kilometer) to their parent firms and zero otherwise.

B. Results

We summarize the results of our Cox regression analysis of start-ups' time to market in Table 6. In the table, Model B differs from Model A in that the former incorporates the three factors representing entrepreneurs' ties to their parents. In Cox regression models the hazard ratio[10] is interpreted as increasing the "hazard" of the event under examination, in our setting a ratio exceeding unity (not exceeding unity) expedites (delays) the attainment of 'significant' assets under management by our start-ups. In other words, a positive (negative) coefficient in the Cox regression indicates that the factor in question increases (decreases) the entrepreneur's chances of acquiring additional assets or equivalently decreases (increases) the time to market.

Referring to Table 6, two consistent results stand out in their rejection of the null hypothesis that institutional background is irrelevant to a start-up's product market (thus supporting *H2a*). The first result is that, based on the significantly negative estimated coefficient on asset size (i.e. hazard ratio < 1), coming from a larger firm tends to reduce the chances that the entrepreneur can acquire additional assets or, equivalently, *increases* an entrepreneurial fund manager's time to market. It is tempting to interpret the result as implying that entrepreneurs from smaller firms are more agile in their quest for business and so take a shorter time to attain significant assets. However, an alternative explanation is that large parent organizations are more successful in slowing down the advent of competition from new entrants, by enforcing non-compete agreements, for example.

[10] The hazard ratio relating to a given variable is the exponentiated coefficient attaching to that variable.

The second result highlighted by Table 6 is that entrepreneurial fund managers who leave firms, where those firms had a significant presence in growth funds relative to other fund categories experience shorter time to market (as reflected by the significantly positive estimated coefficient on this variable). The likelihood of attaining the $100 million dollar assets under management mark increases by a factor of up to 3.88 when a fund manager has a growth fund background. In contrast, our analysis shows that having an employment history with a firm which pursued combined growth and income strategies reduces the entrepreneur's chances of acquiring assets. Thus, for these cases the time to market increases.

We also report two other weaker, though potentially interesting findings on the link between institutional background and time to market. First, coming from parents with a history of significant asset growth seems to give entrepreneurs increased chances of attaining significant assets under management in their own firms (Model B only). Second, strategic diversity (being more diversified in product offerings) at the parent firm also has similar effects (Model A only). Indeed, the hazard ratio in this latter case is an amazing 5.76, i.e. the chance of attaining the $100 million threshold size increases by 272% if the parent firm is least focused (i.e. it covers all four fund categories) compared to an equivalent parent that is focused on just one solitary fund sector.[11]

On the effects of ties to parents on the time to market question, we observe two strong results in Model B, reported in Table 6. First, the hazard ratio estimate for the number of founders with the same parent indicates that for a unitary increase in the number of entrepreneurs with a common heritage, the likelihood of attaining the

[11] The figure of 272% is derived from evaluating the exponentiated value of coefficient times the differential value of diversity: {exp[1.75*(1-0.25)]}-1.

threshold size increases by 56%. As such, the time to acquiring significant assets reduces considerably. Second, we see a positive coefficient (significant at the 5% level) on the 'distance to parent < 1km' variable which indicates that being in close geographic proximity to an entrepreneur's parent, improves the chances of achieving the $100 million threshold size (an increase of 91%) and, hence, dramatically shortens time to product.[12] A possible explanation for this finding is that start-ups that locate close to their parents do so to take advantage of their established networks and experience relative success in reaching significant asset size. Finally, we note that the 'years of service' ties variable was not found to be important in the Cox regression setting. Taken together however, we find convincing evidence in favor of hypothesis *H2b* that parent ties are important in the time to market experienced by start-up funds.

VI. Is the Extent of Common Stock Holdings Impacted by Institutional Background and Parent Ties?

In this section we explore whether ties to an entrepreneur's institutional background induce the portfolio manager of a start-up to mimic the portfolios of its founders' former employer. Mimicry of investment strategies between start-up and parent firms may be of independent interest. For example, fund managers' skills can be assessed by comparing their stock holdings with those of successful peers (see Cohen et al., 2005). However, in this paper our primary motivation is to simply measure the extent of common equity holdings between parent and start-up firms and to examine whether it bears a systematic relation with founders' institutional background.

[12] We detect this effect using the discrete variable denoting whether or not entrepreneurs locate very close (a kilometer or less) to their parents rather than a continuous geographic distance.

A. Approach

We focus our analysis on similarities in stock holdings between start-ups and parent firms at as early a stage in the new firms' lifecycles as we can possibly observe. For matched parent-start-up pairs, we extract stock holdings data at the end of the first year in which a new firm begins to report significant assets under management to the SEC. We compute a measure of common stock holdings (*Common Holdings*) for each matched pair using an approach similar to Elton et al. (2007) as follows:

(4) $CommonHoldngs(A,B) = \sum_i min(X_{Ai}, X_{Bi})$,

where X_{Ai} is the fraction of parent firm A's portfolio invested in stock *i* and X_{Bi} is the fraction of start-up B's portfolio invested in stock *i*. In other words, the *CommonHoldings* measure is calculated by summing the weights of each commonly held portfolio position. Since common stock holdings may have different weights between parent and start-up firms, we take the smaller (*min*) of the two. In this way the *CommonHoldings* measure is always the same for both firms.

We regress *Common Holdings* on our set of variables denoting entrepreneurs' ties to their institutional history: counts of founders in a start-up with the same parent, the dummy variable denoting an entrepreneur's close geographic proximity to her former employers, and the number of years served in the fund manager's last job. We include the parent firm's status as a top money manager and a dummy variable for financial centers, as well as size, measured as the value of assets held, of both employer and start-up firms

to control for institutional characteristics. We use Tobit regressions since our dependent variable is censored at zero.[13]

B. Results

We find that, on average, parent firms and start-ups hold similar stocks representing 16 percent of the value of their total equity portfolios. For comparison, in Elton et al. (2007), mutual funds within the same fund family hold a mean of 18.5 percent of their portfolios in similar holdings, while commonality in stock holdings between mutual funds that are not related organizationally is only 8.5 percent. Notably, our *Common Holdings* measure is much closer to what is observed for funds within the same organization.

In exploring the association between *Common Holdings* and institutional background, we first present some univariate statistics on the association of *Common Holdings* with institutional factors. We partition each variable into a sub-sample equal to and above the sample median, and a sub-sample representing observations below the sample median. We report in Table 7, the outcome of difference in means tests on the *Common Holdings* measures associated with each sub-sample. We see that when the number of entrepreneurs from the same parent within a start-up equates or exceeds the sample median (equal to two managers), *Common Holdings* stand at 18 percent - a value significantly above the 14 percent found for observations below the sample median.

However, it appears less 'reputable' and smaller parent firms have a significantly higher overlap in their stock holdings with those of start-ups they spawn than the larger, higher profile firms. Specifically, parent firms with a below (above) median standing in

[13] We also compute OLS coefficient estimates but do not report them since they yield qualitatively similar results.

Top Money Manager rankings have 19 percent (10 percent) of stock in common with their corresponding start-ups. Smaller parent firms have 20 percent of their portfolio in common with start-ups, while larger parents have only 13 percent in common. Larger start-ups have a significantly higher percentage of common holdings (18 percent) relative to their parent companies compared to smaller firms (15 percent).

Common Holdings are not differentiated with statistical significance on the basis of proximity to parent firms, or on the basis of the entrepreneurs' number of years in employment. Start-ups that take a shorter time to attain significant assets hold more stocks in common with their parent firms (20 percent) than those that take longer (12 percent). Finally, we separately compute *Common Holdings* for entrepreneurs located in financial centers and find that 17 percent of their portfolios overlap with their parent firms' holdings compared to 13 percent for founders based outside financial centers. The difference is statistically significant.

Our results for the analysis of the determinants of commonality in stock holdings between parent firms and start-ups are presented in Table 8. The positive and significant estimate on the number of founders from the same parent company indicates that similarities in stock holdings are at least in part due to the transfer of stock selection strategies from the parent firm by its former employees. The insignificance of the coefficient on Years Service suggests the length of time served is irrelevant to the occurrence of common stock holdings between start-ups and parent firms.

Interestingly, our results suggest that when entrepreneurs locate very close to their origins, they tend to reduce stock holdings that would overlap those held by their former employers. However, this evidence registers at a low level of statistical significance. The

reputation of the parent firm, as proxied by its status in the Top Money Manager rankings is also negatively related to *Common Holdings*. In other words, it is less likely that there will be an overlap in stock holdings in cases where the parent has a high reputation. A possible explanation for this finding is that having a professional background associated with large, reputable firms gives entrepreneurs the confidence and resources required to venture outside familiar stock selection strategies. Also potentially plausible is the view that fund managers shun replicating portfolios of large institutions which are likely to be followed closely by the market and, hence, not offer much competitive advantage. It also may reflect the degree of effectiveness in any 'non-compete' clauses that may be put in place by highly reputable parents. Finally, larger start-ups are associated with greater levels of *Common Holdings*. Taken together, the evidence supports hypothesis *H3* that parent ties are influential on the commonality of stock holdings between parents and start-up funds.

VII. Discussion of Practical Implications of Main Findings

In economic environments like the investment management industry, where the history of patents that protect intellectual property is relatively nascent (see Lerner, 2002), established firms may suffer and face costs associated with the expropriation of 'knowledge' by seasoned fund managers' entrepreneurial activities. The findings presented in this paper dispel the notion that the institutional background of parent funds is unimportant to fund start-ups. Moreover, we document three critical aspects of the advent of new firms that potentially go on to pose a competitive threat to incumbents: market entry, time to product and formulation of business strategies. It would appear that

at the market entry level, the large, reputable and diversified firms we document to be most active in producing entrepreneurial managers have little room to avoid being affected by this phenomenon. We arrive at this conjecture given that the characteristics most strongly associated with entrepreneurial spawning cannot be readily altered to discourage entrepreneurship-related resignations. To give an extreme example, a firm cannot be expected to deliberately reduce its reputational appeal in order to protect itself from the risk that its employees could leave to form their own firms. However, one area in which our findings could be useful would be in guiding general employment and succession planning activities in well established investment companies.

A common thread that runs through our results which gives further potential insights on practicable lessons for institutions is the role of fund managers organized in groups (and not necessarily only in formal teams working on the same funds) in the entrepreneurial process. For example, we find that start-ups which have more founders from the same former employer experience shorter time to product and are more likely to have portfolios that mimic their parent firms' stock selections. This possibility seems to have been overlooked by the investment industry in its quest to dilute the role of individual star managers in the fund management process through deliberate emphasis on team management. To the extent that our findings are representative of the migration of fund managers for entrepreneurial purposes, one implication is that teams are also 'costly' to fund companies when they form new competition. Regulators and professional associations such as the CFA Institute could also consider looking into the implications of manager teams regarding the question of portability of track records. Current debate seems to focus on whether or not individual fund managers should be allowed to carry

track records established in paid employment to their own firms. The results of our study imply that the focus should expand beyond the individual manager to 'teams' in any debate involving startups and the transfer of fund managers' track records.

VIII. Conclusion

In this paper we use a rich and unique dataset of founders of investment management firms to examine the role of the institutional characteristics of their previous employers in the birth of investment advisory firms. To the best of our knowledge, this is the first empirical study of firms that produce entrepreneurs in the mutual fund industry and the attributes of founders' prior history that contribute to their attainment of significant assets under management and commonality of stock holdings. As such, we have presented a wide range of new evidence and novel insights into fund births and entrepreneurship. Our main findings can be easily summarized, according to our three main research questions.

Our first research question involves the fundamental issue of start-ups and the role that entrepreneurs' institutional background and market conditions have on the birth of new funds. We find that larger, more reputable and diversified firms with a significant presence in growth-oriented funds are more likely to produce entrepreneurs. Favorable conditions in capital markets are positively related to the probability of a firm producing an entrepreneur.

Our second research question relates to the link between the 'time to market' of start-ups and the entrepreneurs' institutional background and parent ties. In this context, we find that coming from larger companies increases the time it takes for a start-up to attain significant assets under management. Further, fund managers with experience in

strategically more diversified (or less focused) firms and those that are dominated by growth funds experience shorter time to market. Time to market is also shortened by increasing the number of entrepreneurs from one former employer. Locating a start-up geographically closer to founders' prior employers may result in faster time to market.

Our third and final research question examines the relation between the commonality across the equity portfolio holdings (of parent firms and the start-ups they spawn) and the entrepreneurs' institutional background and parent ties. In this context, we find levels of common holdings that are comparable to levels that have been previously documented for mutual funds within a single fund family, and almost double the counterpart commonality measures recorded between competing funds. The main positive drivers of similarities in stock selection are the number of founders coming from the same parent firm and the size of the start-up. Notably, there are two factors that seem to have a negative impact on the commonality of holdings: geographic proximity and parent reputation.

Our findings have important implications for the literature. From a mutual funds perspective, our results contribute to the fund management literature by examining a "new" source of fund manager migration – namely, entrepreneurship. Demonstrating the relevance of fund companies' institutional characteristics on the formation and product outcomes of new firms raises potentially interesting opportunities for further research. For example, how do incumbent firms react to the threat of entry by their former employees' firms? With evidence presented in this paper suggesting a reasonably strong tendency for new firms to replicate the portfolios of their founders' employers, a detailed comparison of portfolio management strategies is likely to be very fruitful.

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TABLE 1

Most Frequently Represented Employers of Entrepreneurial Fund Managers

The table lists companies that spawned the greatest number of entrepreneurial fund managers and the number of such managers over for each the sample period of 1980 to 2003. The data were obtained from a variety of sources, including news articles, Morningstar discs, and the Securities Exchange Commission's Investment Advisor Public Disclosure.

Company Name	Number	Company Name	Number
Fidelity Investments	15	Batterymarch Financial Management	4
Bankers Trust	9	Clarica Life Insurance	4
Loomis Sayles & Co	8	Fox Asset Management	4
Delaware Investment Advisers (DIA)	7	Goldman Sachs	4
Meridian Investment Company	7	IDS Financial Corporation	4
Oppenheimer Management Corp	7	Invesco	4
Firstar Corp	6	John Hancock	4
Lazard Asset Management	6	Merrill Lynch	4
Stein Roe & Farnham	6	Merus Capital Management	4
TCW Asset Management	6	Morgan Stanley	4
The Boston Company	6	Munder Capital Management	4
Associated Bank	5	National City Corp	4
Barnett Capital Advisors	5	Provident National Bank	4
Canterbury Capital Services	5	Scudder, Stevens & Clark Inc	4
Janus Twenty	5	Stratton Management Company	4
Salomon Smith Barney	5	Strong/Corneliuson Capital Management	4
Standish, Ayer & Wood	5	T.Rowe Price Associates	4
Axe-Houghton Associates	4	Templeton Investment Counsel	4

TABLE 2

Characteristics of Parent Firms of Entrepreneurs and other Fund Companies

The table reports mean values of mutual fund company characteristics for parent firms (i.e. funds that have spawned entrepreneurs) versus all funds. Tests of equality of means are also reported. The sample consists of 8937 firm-year observations of investment management companies with data in the Center for Research in Security Prices (CRSP) mutual fund database over the period 1980 and 2003. Parent firms are those firms that produce entrepreneurs. Asset Size is total dollar value of a firm's assets under management sampled annually. Asset Growth is the increase/decrease in assets under management from the previous year. Top Money Manager Profile is the number of times a company appears on the *Institutional Investor* America's Top 300 Money Managers Surveys of 1988, 1992, 1996 and 2001. Fund categories are obtained from CRSP. Diversity is an index of fund category miscellany ranging from 0.25 (where a company operates only one of the available four fund categories) to 1. Return Track Record is the Characteristic Selectivity measure (adopted from Daniel et al., 1997) for all funds operated by the firm, averaged for the years for which there are observations. The tests of equality are based on simple difference in means tests. *** denotes statistical significance at the 1 percent level.

Variable	Parent Firms	All Firms	*t*-statistic	
Mean Asset Size	17.556	15.277	16.99	***
Mean Asset Growth	0.236	0.931	0.32	
Mean Top Money Manager	2.233	0.688	18.17	***
Mean Ln(1+No. of Balanced Funds)	0.630	0.169	19.08	***
Mean Ln(1+No. of Growth/Income Funds)	1.159	0.289	24.87	***
Mean Ln(1+No. of Growth Funds)	2.020	0.748	24.59	***
Mean Ln(1+No. of Other Funds)	1.309	0.754	9.57	***
Mean Diversity	0.760	0.411	22.03	***
Mean Return Track Record	8.595	2.140	15.08	***

TABLE 3

Regression Analysis of the Determinants of Fund Company Births

The table reports results of Logistic and Poisson regressions of the determinants of fund company births. The sample consists of 8937 firm-year observations of investment management companies with data in the Center for Research in Security Prices (CRSP) mutual fund database over the period 1980 to 2003. The dependent variable is a 1,0 indicator of a company that has a fund manager that forms her own firm in a given year. Asset Size is total dollar value of a firm's assets under management sampled annually. Asset Growth is the increase/decrease in assets under management from the previous year. Top Money Manager Profile is the number of times a company appears on the *Institutional Investor* America's Top 300 Money Managers Surveys of 1988, 1992, 1996 and 2001. Fund categories are obtained from CRSP. Diversity is an index of fund category miscellany ranging from 0.25 (where a company operates only one of the available four fund categories) to 1. Return Track Record is the Characteristic Selectivity measure (adopted from Daniel et al., 1997) for all funds operated by the firm, averaged for the years for which there are observations. Federal Interest Rate is the money market rate on Federal Reserve funds quoted daily by New York brokers. Market Return is the annual return on the S&P500 index. The Poisson model is robust for over dispersion in the data. Standard errors are heteroskedasticity-adjusted. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Variable	Logisitc Specification			Poisson Specification		
	Coefficient Estimate	Std. Error		Coefficient Estimate	Std. Error	
Constant	-13.266	2.94	***	-12.521	1.096	***
Asset Size	0.062	0.077		0.074	0.029	**
Asset Growth	-0.019	0.066		-0.019	0.026	
Top Money Manager Profile	0.162	0.058	***	0.144	0.022	***
Ln(1 + No. of Balanced Funds)	-0.4	0.227	*	-0.428	0.085	***
Ln(1 + No. of Growth/Income Funds)	0.572	0.179	***	0.457	0.067	***
Ln (1 + No. of Growth Funds)	0.496	0.158	***	0.416	0.059	***
Ln(1 + No. of Other Funds)	-0.067	0.126		-0.103	0.048	**
Diversity	1.931	0.582	***	2.158	0.215	***
Return Track Record	0.007	0.012		0.002	0.004	
Federal Interest Rate$_t$	0.039	0.104		0.011	0.039	
Federal Interest Rate$_{t-1}$	0.025	0.072		0.032	0.027	
Ln(No. of IPOs)$_t$	0.481	0.283	*	0.383	0.105	***
Ln(No. of IPOs)$_{t-1}$	0.481	0.271	*	0.402	0.101	***
Market Return$_t$	0.341	0.674		0.286	0.249	
Market Return$_{t-1}$	1.407	0.827	*	1.227	0.312	***
McFadden R^2/PseudoR^2	0.24			0.22		
Log Likelihood	-574.74			-4083.8		

TABLE 4

Effects of the Interaction of Market Conditions and Institutional Characteristics in Explaining Fund Company Births

The table reports results of Poisson regressions of the determinants of fund company births interacting with market conditions. Results are presented separately for interactions of institutional characteristics with year *t* (Contemporaneous - first and second columns) and year *t*-1 (Lagged – third and fourth columns) market variables. The sample consists of 8937 firm-year observations of investment management companies with data in the Center for Research in Security Prices (CRSP) mutual fund database over the period 1980 to 2003. The dependent variable is a 1,0 indicator of a company that has a fund manager that forms her own firm in a given year. Asset Size is total dollar value of a firm's assets under management sampled annually. Asset Growth is the increase/decrease in assets under management from the previous year. Top Money Manager Profile is the number of times a company appears on the *Institutional Investor* America's Top 300 Money Managers Surveys of 1988, 1992, 1996 and 2001. Fund categories are obtained from CRSP. Diversity is an index of fund category miscellany ranging from 0.25 (where a company operates only one of the available four fund categories) to 1. Return Track Record is the Characteristic Selectivity measure (adopted from Daniel et al., 1997) for all funds operated by the firm, averaged for the years for which there are observations. Federal Interest Rate is the money market rate on Federal Reserve funds quoted daily by New York brokers. Market Return is the annual return on the S&P500 index. Standard errors are heteroskedasticity-adjusted. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

Panel A: Interactions of stock market returns and institutional characteristics

	Contemporaneous			Lagged		
Variable	Coeff. Est.	Std. Error		Coeff. Est.	Std. Error	
Constant	-9.426	2.438	***	-6.871	2.327	***
Asset Size*Market Return	-0.600	0.092	***	-0.515	0.096	***
Asset Growth*Market Return	-0.289	0.401		-0.061	0.243	
Top Money Manager Profile*Market Return	0.754	0.229	***	0.703	0.206	***
Ln(1 + No. of Balanced Funds)*Market Return	-0.916	0.859		-1.687	0.833	
Ln(1 + No. of Growth/Income Funds)*Market Return	1.920	0.694	**	1.603	0.609	**
Ln (1 + No. of Growth Funds)*Market Return	1.954	0.612	***	1.583	0.559	***
Ln(1 + No. of Other Funds)*Market Return	0.470	0.463		-0.464	0.438	
Diversity*Market Return	5.841	2.200	**	9.360	1.970	***
Average Return*Market Return	0.027	0.052		0.054	0.041	
Federal Interest Rate$_t$	-0.025	0.084		0.163	0.089	*
Federal Interest Rate$_{t-1}$	0.077	0.084		-0.175	0.101	*
Ln(No. of IPOs)$_t$	0.614	0.279	**	0.289	0.266	
Ln(No. of IPOs)$_{t-1}$	0.365	0.247		0.263	0.263	
Log likelihood	-633.18			-620.98		
Pseudo-R^2	0.17			0.18		

TABLE 4
(Continued)

Panel B: Interactions of IPO activity and institutional characteristics

	Contemporaneous			Lagged		
Variable	Coeff. Est.	Std. Error		Coeff. Est.	Std. Error	
Constant	-7.144	1.052	***	-6.856	1.033	***
Asset Size*Ln(No. of IPOs)	0.009	0.011		0.006	0.011	
Asset Growth*Ln(No. of IPOs)	-0.004	0.011		-0.002	0.010	
Top Money Manager Profile*Ln(No. of IPOs)	0.025	0.009	**	0.025	0.009	**
Ln(1 + No. of Balanced Funds)*Ln(No. of IPOs)	-0.066	0.035	*	-0.065	0.035	*
Ln(1 + No. of Growth/Income Funds)*Ln(No. of IPOs)	0.080	0.028	***	0.079	0.028	***
Ln (1 + No. of Growth Funds)*Ln(No. of IPOs)	0.069	0.025	**	0.066	0.024	**
Ln(1 + No. of Other Funds)*Ln(No. of IPOs)	-0.017	0.020		-0.016	0.020	
Diversity*Ln(No. of IPOs)	0.357	0.089	***	0.373	0.089	***
Average Return*Ln(No. of IPOs)	0.000	0.002		0.001	0.002	
Federal Interest Rate$_t$	0.142	0.085		0.028	0.092	
Federal Interest Rate$_{t-1}$	-0.119	0.087		-0.001	0.091	
Market Return$_t$	0.365	0.584		0.303	0.576	
Market Return$_{t-1}$	1.590	0.774	**	1.514	0.772	*
Log likelihood	-590.82			-591.15		
Pseudo-R^2	0.22			0.22		

TABLE 5

Effects of the Interaction of Rising and Falling Markets and Institutional Characteristics in Explaining Fund Company Births

The table reports results of Poisson regressions of the determinants of fund company births interacting with market condition dummy variables. Results are presented separately for interactions of institutional characteristics with a dummy variable denoting positive returns on the S&P500 index ('up markets') in the first and second columns, and another dummy variable denoting negative returns on the S&P500 index ('down markets'), in the third and fourth columns. The sample consists of 8937 firm-year observations of investment management companies with data in the Center for Research in Security Prices (CRSP) mutual fund database over the period 1980 to 2003. The dependent variable is a 1,0 indicator of a company that has a fund manager that forms her own firm in a given year. Asset Size is total dollar value of a firm's assets under management sampled annually. Asset Growth is the increase/decrease in assets under management from the previous year. Top Money Manager Profile is the number of times a company appears on the *Institutional Investor* America's Top 300 Money Managers Surveys of 1988, 1992, 1996 and 2001. Fund categories are obtained from CRSP. Diversity is an index of fund category miscellany ranging from 0.25 (where a company operates only one of the available four fund categories) to 1. Return Track Record is the Characteristic Selectivity measure (adopted from Daniel et al., 1997) for all funds operated by the firm, averaged for the years for which there are observations. Federal Interest Rate is the money market rate on Federal Reserve funds quoted daily by New York brokers. Market Return is the annual return on the S&P500 index. Standard errors are heteroskedasticity-adjusted. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

	Up Markets		Down Markets	
Variable	Coefficient Estimate	Std. Error	Coefficient Estimate	Std. Error
Constant	-9.267	2.352***	-10.901	2.451***
Asset Size*Market Return	-0.187	0.028***	-0.123	0.058**
Asset Growth*Market Return	-0.029	0.077	0.318	0.166*
Money Management Rank*Market Return	0.235	0.059***	-0.284	0.164*
Ln(1 + No. of Balanced Funds)*Market Return	-0.303	0.229	-0.164	0.661
Ln(1 + No. of Growth/Income Funds)*Market Return	0.551	0.178***	1.089	0.444**
Ln (1 + No. of Growth Funds)*Market Return	0.545	0.160***	0.411	0.422
Ln(1 + No. of Other Funds)*Market Return	0.093	0.120	-0.271	0.347
Diversity*Market Return	1.911	0.569***	2.212	1.523
Average Return*Market Return	0.008	0.013	0.008	0.023
Federal Interest Ratet	0.031	0.090	0.095	0.097
Federal Interest Ratet-1	0.031	0.088	-0.024	0.093
Ln(No. of IPOs)t	0.519	0.274*	0.750	0.280**
Ln(No. of IPOs)t-1	0.452	0.248*	0.426	0.250*
Log likelihood	-609.20		-732.48	
Pseudo-R^2	0.20		0.04	

TABLE 6

Cox Regression Estimation for Fund Start-ups' Time to Market

The table presents results of a Cox regression with time varying co-variates. The dependent variable is Time-to-Market, the number of years from the establishment of a start-up to the date the firm first reports assts (in excess of $100 million) to the Securities Exchange Commission. The independent variables are as follows. Asset Size is total dollar value of a firm's assets under management sampled annually. Asset Growth is the increase/decrease in assets under management from the previous year. Top Money Manager Profile is the number of times a company appears on the *Institutional Investor* America's Top 300 Money Managers Surveys of 1988, 1992, 1996 and 2001. Fund categories are obtained from CRSP. Diversity is an index of fund category miscellany ranging from 0.25 (where a company operates only one of the available four fund categories) to 1. Return Track Record is the Characteristic Selectivity measure (adopted from Daniel et al., 1997) for all funds operated by the firm, averaged for the years for which there are observations. Unreported coefficients are estimated for the year the start-up was established. Model A reports the results when the regression does not include: the number of founders in a firm from the same last employer (Founders Ex_Same Parent), the entrepreneur's number of Years Service and Distance to Parent < 1km, which are included in Model B. ***, ** and * denote statistical significance at the 1, 5 and 10 percent levels, respectively.

	Model A				Model B			
Variable	Coefficient Estimate	Std. Error	Hazard Ratio		Coefficient Estimate	Std. Error	Hazard Ratio	
Asset Size	-0.436	0.103	0.65	***	-0.383	0.120	0.68	***
Asset Growth	0.215	0.134	1.24		0.431	0.198	1.54	**
Top Money Manager	0.045	0.062	1.05		-0.049	0.092	0.95	
Ln(1+No. of Balanced Funds)	-0.464	0.252	0.63	*	0.260	0.385	1.30	
Ln(1+No. of Growth/Income Funds)	-0.518	0.215	0.60	**	-0.545	0.296	0.58	*
Ln(1+No. of Growth Funds)	1.191	0.211	3.29	***	1.354	0.331	3.88	***
Ln(1+No. of Other Funds)	0.076	0.158	1.08		-0.153	0.200	0.86	
Diversity	1.750	0.697	5.76	**	1.087	0.919	2.97	
Return Track Record	-0.011	0.009	0.99		-0.012	0.009	0.99	
Founders Ex-Same Parent					0.445	0.088	1.56	***
Years Service					0.018	0.028	1.02	
Distance to Parent < 1km					0.647	0.251	1.91	**
Number of Entrepreneurs	199				156			
Model χ^2	911.03				564.90			
Model *p*-value	0.00				0.00			

TABLE 7

Common Parent and Start-up Stock Holdings Relative to Selected Variables Partitioned on their Median Values

The table reports the results of simple difference in means tests on measures of commonality in the stock holdings (*Common Holdings*) of parent and start-up firms, against variables partitioned between observations equal to, or above the sample median. Common Holdings are measured as the sum of the minimum fraction of the portfolio held in any stock *i* between matched parent and start-up firms, sampled at the end of the first year in which a start-up reports significant assets under management to the Securities and Exchange Commission (SEC). Founders Ex-Same Parent is a count of the number of entrepreneurs in a start-up that were employed by the same parent. Distance to Parent is measured in kilometers between an entrepreneur's new location and her last place of employment. Years Service is the length of time the founder was at her last place of employment. Top Money Manager Profile is the number of times a company appears on the *Institutional Investor* America's Top 300 Money Managers Surveys of 1988, 1992, 1996 and 2001. Total Assets is the market value of the stocks held by the matched Parent and Start-up firms at the end of the first year in which a start-up reports significant asset holdings to the SEC.

		Mean *Common Holdings*			
Variable	Obs	Variable Equal/Above Median	Variable Below Median	*t*-statistic	
Founders Ex-Same Parent	243	0.18	0.14	2.23	**
Distance to Parent	243	0.17	0.14	1.38	
Years Service	193	0.16	0.16	0.03	
Top Money Manager	243	0.10	0.19	4.26	***
Start-up Total Assets	243	0.18	0.15	3.03	***
Parent Total Assets	243	0.13	0.20	2.72	**
Time to Market	243	0.12	0.20	2.00	*

TABLE 8

Determinants of Common Parent and Start-up stock Holdings

The table reports the results of Tobit regressions with common stock holdings (Common Holdings) between parent and start-up firms as the dependent variable. Common Holdings are measured as the sum of the minimum fraction of the portfolio held in any stock *i* between matched parent and start-up firms, sampled at the end of the first year in which a start-up reports significant assets under management to the Securities and Exchange Commission (SEC). Founders Ex-Same Parent is a count of the number of entrepreneurs in a start-up that were employed by the same parent. Distance to Parent < 1km is a dummy variable taking the value of unity when the distance in kilometers between an entrepreneur's new location and her last place of employment is closer than one kilometer, and zero otherwise. Years Service is the length of time the founder was at her last place of employment. Fincenter is a dummy variable taking a value of unity for entrepreneurs located in the cities of Boston, Chicago, Los Angeles, New York, Philadelphia or San Francisco, and zero otherwise. Top Money Manager Profile is the number of times a company appears on the *Institutional Investor* America's Top 300 Money Managers Surveys of 1988, 1992, 1996 and 2001. Total Assets is the market value of the stocks held by the matched Parent and Start-up firms at the end of the first year in which a start-up reports significant asset holdings to the SEC.

Variable	Coefficient Estimate	Std. Error	
Constant	-0.302	0.223	
Founders Ex-Same Parent	0.021	0.008	**
Distance to Parent < 1km	-0.043	0.023	*
Years Service	0.002	0.002	
Top Money Manager	-0.035	0.008	***
Fincenter	-0.038	0.024	
Parent Total Assets	0.006	0.004	
Start-up Total Assets	0.016	0.006	**
Adj R^2	0.23		
Obs	193		