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Evidence from Mutual Fund Managers' Education

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ABSTRACT

We analyze what a second business degree reveals about the investment behavior of professional investors. Specifically, we compare performance, risk, and style of equity mutual fund managers having a CFA designation and an MBA degree to managers with only one of these qualifications. We document that the performance between these groups does not significantly differ. However, managers with both degrees show less extreme and more persistent performance. Furthermore, consistent with the performance results, managers who gather both degrees also show less extreme and more stable risk levels and investment styles.

JEL classification: G23

Keywords: Education, Investment behavior, Professional investors, Mutual funds

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1 Introduction

"An age-old question among those headed into the finance world is whether they need to obtain a CFA, an MBA, or both. Do you think there is a benefit to doing both?" This question Bloomberg Businessweek's journalist Alison Damast recently asked the CFA Institute Managing Director Thomas Robinson.[1] As important as this question is for those who head into the finance world, as interesting it is from fund investors' point of view to know which impact the manager's education has on the performance, risk, and style of the investors' fund. In particular, the influence of an MBA and a CFA are of special interest since these are the most common degrees among mutual fund managers.[2] Several academic studies so far have analyzed the distinct impact of each single degree on fund performance (see, e.g., Shukla and Singh (1994), Golec (1996), Chevalier and Ellison (1999a), and Gottesman and Morey (2006)). In this paper, we examine whether the investment behavior of mutual fund managers who decide to earn both degrees, i.e., a CFA designation additionally to an MBA degree and vice versa, differs from those who earn only one degree.

On the one hand, earning a second degree might advance new insights by the interaction of knowledge from both educational paths which go beyond just summing up both degrees' distinct knowledge. Despite the fact that there is an overlap between MBA and CFA, these two degrees are seen as supplements to each other (see, e.g., Gottesman and Morey (2006)). While the MBA is assumed to provide more general management skills, the CFA should go more in depth in finance topics. Thus, the knowledge of the single degrees might amplify each other, e.g., in terms of better performance.

On the other hand, the managers' decision to gather a second degree could reveal something about their personal attitudes and characteristics. Gottesman and Morey (2006)

[1] See Damast (2011), URL: http://www.businessweek.com/bschools/content/apr2011/bs20110426_844533.htm.
[2] According to Gottesman and Morey (2006), about 74 percent of the managers in their sample have an MBA or a CFA.

document that among managers with at least an MBA or a CFA, 55 percent have only one of those degrees, i.e., either an MBA or a CFA. This suggests that having one of those degrees is typically sufficient to work in the mutual fund industry. Nevertheless, the other 45 percent of those managers gathered both degrees, i.e., an MBA as well as a CFA.[3] Given the large additional effort in terms of time and money to attain a second degree, compared to a relatively small increase in compensation,[4] this raises the question what it reveals about the managers if they decide to go the extra mile and earn the second degree.

We conjecture that the decision to gather a second degree could be driven by the managers' commitment to their profession and their career, as, according to Aryee and Tan (1992) and London (1983), higher commitment is positively related to more skill development.[5] Commitment typically expresses in (1) the belief in, and acceptance of, the goals and values of the profession, (2) a willingness to exert considerable effort on behalf of the profession, and (3) a definite desire to maintain membership in the profession (see Aranya, Pollock, and Amernic (1981) and Porter, Steers, Mowday, and Boulian (1974)).

Consistent with these characteristics of commitment, we expect it to affect managers' investment behavior broadly in two main aspects: First, the committed managers' desire to maintain membership in the profession will make them spend higher effort to avoid the risk of dismissal.[6] According to Chevalier and Ellison (1999b) and Scharfstein and Stein (1990), such managers, i.e., managers with stronger career concerns, will take lower risk levels, in

[3] The numbers from Gottesman and Morey (2006) are calculated from conditional probabilities based on the descriptive statistics given in their article. These numbers are consistent with our sample where, from those managers with at least one degree, 59 percent have one degree and 41 percent have two degrees.

[4] Anecdotal evidence suggests that earning the first business degree is related to an increase in compensation of about 30-40 percent. In contrast, the increase in compensation from the first to the second business degree is just about 10 percent. See http://www.lifeonthebuyside.com/mba-vs-cfa/.

[5] In the psychological literature, the definitions of career commitment and professional commitment are not completely congruent with each other, but generally aim at similar meanings (see Aryee and Tan (1992) and Morrow and Wirth (1989) for a more detailed classification). Thus, for simplicity, we only use the word commitment in the rest of the paper.

[6] See also Aryee and Tan (1992) who confirm that commitment is negatively related to career and job withdrawal intentions.

particular unsystematic risk, and follow more conventional investment styles, since they fear to fail with unconventional investment styles.[7]

Second, as more committed managers should be more in line with the goals and values of the profession, we would expect them to more strongly act in the interest of the funds' investors which, in turn, could make them less prone to agency issues. This idea is supported by, e.g., O'Boyle (1985) and Mowday, Porter, and Steers (1982) who suggest that a lack of commitment can even serve as an explanation for a variety of corporate ills such as employee theft or reductions in employee effort.

Consequently, consistent with both aspects, we hypothesize that managers with two business degrees are more inclined to and thus implement less extreme and more stable risk and investment styles which eventually should lead to less extreme and more stable performance outcomes. This is desirable from an investor's point of view, because extremely low and frequently changing performance outcomes are particularly harmful to investors.[8] Furthermore, more extremely negative performance outcomes will increase the probability for managers to be dismissed and thus they will be more inclined to avoid them if they are more committed to their job. Beyond that, high reliability with respect to a fund's investment style and risk level might be also a desirable feature for a fund investor per se. If investors buy shares of a fund, they might have adjusted their portfolio according to the fund's promised style. Thus, if committed managers are more focused and aware of these issues, we would expect them to seek more constancy in risk and investment style.

Therefore, in this paper we examine whether the decision to additionally gather the second degree reveals differences in fund managers' investment behavior. Thus, we compare

[7] Scharfstein and Stein (1990) motivate their analysis with the words of Keynes (1936): "Worldly wisdom teaches that it is better for reputation to fail conventionally than to succeed unconventionally."

[8] For example, if a fund from initial 100 USD earns 10 percent and loses 10 percent in two consecutive periods, respectively, the fund is left with 99 USD which is equivalent to a 1 percent loss of the initial wealth. In contrast, if the fund consecutively earns and loses only 5 percent, it is left with 99.75 USD, which is equivalent to only a 0.25 percent loss of the initial wealth.

the investment behavior of US equity mutual fund managers having both degrees to managers having only one degree. We start our empirical investigation by analyzing the performance of these managers and find that managers with both degrees do not outperform those with one degree. From this we conclude that the knowledge of the single degrees do not necessarily amplify each other in terms of better average performance.

However, regarding the predictions from fund managers' commitment, we next analyze whether managers with both degrees show less extreme and more stable performance compared to managers with one degree. Our results confirm our hypothesis: Managers with both degrees achieve significantly less extreme and more persistent performance than managers with one degree. We test several alternative explanations for our findings: We document that differences in fund characteristics cannot explain our results. Also manager characteristics like age, gender, tenure, or the quality of a manager's MBA degree do not explain the more constant and less extreme performance of managers with both degrees.

Having documented the less extreme and more stable performance, in a second step we examine whether this behavior also expresses in the managers' risk-taking and investment style. Our results show that managers which attain both degrees also take lower risk levels and follow moderate investment styles. Furthermore, they keep their risk level and style exposure more constant than managers with only one degree.

Our paper is related to a growing literature on the influence of manager characteristics on investment behavior. As stated above, several studies have analyzed the distinct impact of single educational degrees on fund performance: Shukla and Singh (1994) find that funds with a manager holding a CFA outperform those without a CFA. Golec (1996) shows that fund managers with an MBA show higher risk-adjusted performance than managers without an MBA. In contrast, Chevalier and Ellison (1999a) do not find a difference in risk-adjusted performance between MBA managers and non-MBA managers. Gottesman and Morey (2006)

even document lower performance for managers with an MBA from a low prestige institution, but higher performance of managers with an MBA from a top school. Additionally, they find that a CFA designation or a non-MBA master's degree are unrelated to mutual fund performance. Instead of proxying for ability by the quality of education, Grinblatt, Keloharju, and Linnainmaa (2012) use the IQ as a direct measure for skill and show that high-IQ investors exhibit superior investment performance.

Besides education and skill, also age and experience are related to fund managers' behavior. Chevalier and Ellison (1999b) find that younger managers hold less unsystematic risk and have more conventional portfolios. Similarly, the results of Avery and Chevalier (1999) suggest that managers may herd early in their careers and diverge in their actions later. Ding and Wermers (2009) document that more experienced managers outperform if they manage large funds. Also the managers' gender plays a role in explaining differences in investment behavior. Niessen-Ruenzi and Ruenzi (2011) show that female fund managers follow more persistent investment styles than male managers, and performances are virtually identical.

We contribute to this literature as our study is the first that examines the incremental impact of a second business degree on investment behavior compared to the first business degree. To our knowledge, so far, only Dincer, Gregory-Allen, and Shawky (2010) explicitly controlled for having both an MBA and a CFA at the same time while analyzing the distinct impact of each single degree on performance. However, they do not analyze the incremental impact from having two compared to having one business degree and do not investigate differences in extremity and variability of those managers' investment behavior.

The remainder of this paper is organized as follows. In Section 2, we describe the data and give an overview on the differences of fund and manager characteristics between managers with one and two business degrees. In Section 3, we analyze performance

differences between both groups. Section 4 presents results on their risk and investment style and Section 5 concludes.

2 Data

2.1 Data Sources

For our empirical analysis, we mainly rely on two data sources: First, we gather information on fund returns, total net assets, investment objectives, and other fund characteristics from the CRSP Survivor Bias Free Mutual Fund database which covers virtually all US open-end mutual funds.[9] Second, to collect information on fund managers' characteristics, we use a set of Morningstar Principia CDs which provide information on the managers' name, the date on which a manager assumed responsibility for the fund, their educational degrees, the schools a manager attained, and the job history of the manager. As the Morningstar information on manager characteristics is available from 1996 on, our sample starts in 1996 and ends in 2009.

We use the Strategic Insight (SI) objective codes provided in the CRSP database to define the market segment in which a fund operates. We focus on actively managed, domestic equity funds and exclude bond, money market, and index funds. We exclude bond and money market funds because they are not directly comparable to equity funds. We analyze funds from the following six domestic equity fund segments: Aggressive Growth (AG), Balanced

[9] Source: CRSP, Center for Research in Security Prices. Graduate School of Business, The University of Chicago. Used with permission. All rights reserved.

(BL), Growth and Income (GI), Income (IN), Long Term Growth (LG), and Sector Funds (SE).[10]

Many funds offer multiple share classes which are listed as separate entries in the CRSP database. They usually only differ with respect to their fee structure or minimum purchase requirements. However, the different share classes of a fund are always backed by exactly the same portfolio of assets and have the same portfolio manager. Thus, to avoid multiple counting, we aggregate all share classes of the same fund.[11]

To gather information on the managers' characteristics, we match all funds from the CRSP database to the funds in the Morningstar database using fund ticker, fund name, and manager name. Through this, we get Morningstar's information on the managers' educational degrees, e.g. whether the manager holds an MBA, a CFA, a non-business master's degree, or a PhD, the school from which a manager attained a specific degree, as well as the year in which they earned their MBA and their undergraduate's degree.[12] Furthermore, for all managers with an MBA degree we obtain information on the average matriculates' GMAT score of the institution where they earned their MBA from the websites mba.com, businessweek.com, and entrepreneur.com. We calculate the managers' industry tenure from the year that Morningstar reports for a manager to be the first year managing a fund in the Morningstar database. As the managers' age is not explicitly given in Morningstar, we compute their age from the year in which they got their college degree. To do this, we follow Chevalier and Ellison (1999b) and assume that a manager was 21 upon college graduation.

[10] Unfortunately, the SI classification is only available till 1998. Thus, we use an alternative classification (the Lipper objective codes) to classify funds after 1998. To get consistent segment classifications over our entire sample period, we match each Lipper objective code to a SI objective code based on the frequency with which funds of a specific Lipper objective code belong to one of the SI objective codes in those consecutive years in which the availability of the SI codes ends and the availability of Lipper begins. The resulting translation table is presented in the Appendix.

[11] Through 2002 we identify the share classes of a fund by matching fund names and characteristics such as fund management structures, turnover, and fund holdings in asset classes. From 2003 on, the CRSP database reports a unique portfolio number for each fund, which is used to aggregate share classes from 2003 through 2009.

[12] Unfortunately, Morningstar does not report the year in which the managers earned their CFA designation.

Finally, to collect information on the managers' gender, we follow Niessen-Ruenzi and Ruenzi (2011) and compare the managers' first name to a list published by the United States Social Security Administration (SSA) that contains the most popular first names by gender for the last 10 decades. Additionally, we identify the gender of managers with ambiguous first names from several internet sources like the fund prospectus, press releases, or photographs that reveal their gender.

Since the focus of our study is to examine the additional value of a second business degree compared to the first, we only keep those observations where the respective managers have at least one business degree, i.e., either an MBA or a CFA. Furthermore, we focus on single managed funds, because Bär, Kempf, and Ruenzi (2011) show that team managed funds and single managed funds behave differently and it is not clear how the skills and education of single team members translate into the skills and education of a team. This allows us to cleanly analyze the impact of a second business degree on managerial behavior without being influenced by the fund's management structure. Thus, we exclude fund year observations for which Morningstar reports a management team or gives multiple manager names. Finally, we only keep fund year observations for which 12 months of return data is available.

2.2 Fund Characteristics

Our final sample consists of 5,826 fund year observations which come from a total of 1,175 distinct funds. Table 1 reports summary statistics for funds' total net assets (TNA), expense ratio, and funds' age.

– Please insert TABLE 1 approximately here –

The number of funds in our sample increases from 408 in 1996 to 524 in 2002. From 2003 the number of funds in the sample monotonically decreases which is likely because team management became more popular and several funds might have changed their management structure.[13] These funds drop out of our sample, because we only look at single managed funds. The average fund size in our sample has nearly monotonically increased over the sample period from about one billion USD in 1996 to about 1.6 billion USD in 2009 with only two break downs around the dotcom bubble and the subprime crisis with their minima in 2002 and 2008. The funds' expense ratio slightly increased from 1.29 percent in 1996 to 1.44 percent in 2003, but then declined again to 1.26 percent in 2009. The funds' age slightly increased throughout the sample period from 13 to 19 years.

2.3 Business Education Overview

The purpose of this study is to analyze what it reveals about managers' investment behavior if they decide to gather a second business degree compared to those managers that only gather one. To conduct our analyses, we group managers by the number of business degrees, i.e., whether they attain exactly one of those degrees (MBA or CFA) or both degrees (MBA and CFA). We assign managers to one of these two groups based on all degrees that are reported by Morningstar in any year of the sample period. Thus, also managers which start with one degree, but earn their second degree during the sample period are assigned to the group of managers with two business degrees. This is based on the intuition that we also want to capture the managers' personal attitudes, in particular their commitment, which they reveal with the educational degrees they attain over time. If managers earn a second degree within

[13] See Bär, Kempf, and Ruenzi (2011) for an overview on the development of team-managed mutual funds.

the sample period, it is likely that this decision is based on their personal attitudes which should be manager-specific and time-invariant.[14]

To get a first sense on differences in the personal characteristics and funds between both groups, Table 2 reports summary statistics on several fund and manager characteristics.

– Please insert TABLE 2 approximately here –

From all fund-year observations in our sample, about 41 percent are managed by managers with two business degrees. They seem to manage larger funds, but the difference is not statistically significant. The funds of these managers show significantly lower expense ratios and are on average two years older than those funds of managers with only one business degree. As expected, managers with two degrees are on average older and have a longer tenure in the fund industry. The fraction of female managers is significantly lower among managers with two business degrees. Furthermore, managers with two business degrees are significantly less likely to also have a non-business master's degree, but are significantly more likely to additionally have a PhD degree.

3 Performance

We start our empirical investigation by analyzing the impact of a second business degree on fund performance. In Section 3.1, we examine whether having two business degrees is related to better performance in general. In Section 3.2, we study whether the performance extremity differs, and in Section 3.3, we analyze whether managers who gather two business degrees are more likely to show higher performance persistence.

[14] Unfortunately, as Morningstar does not report the year in which managers attained their CFA designation, we are not able to distinguish between the influence of the managers' personal attitudes that motivate them to gather the second degree and the additional knowledge that is generated through the second degree. We can only observe the joined effect.

3.1 Overall

First, we examine whether those managers that gather a second business degree show better performance on average. Therefore, we regress yearly performance measures on the dummy variable *MBA and CFA* that equals one if both business degrees are reported for a specific manager and zero otherwise. We use four different performance measures as dependent variables in the following regressions: raw return, Jensen (1968)'s one-factor alpha, Fama and French (1993) three-factor alpha, and Carhart (1997) four-factor alpha.[15] All analyses are done at the fund-year level using pooled OLS. To take into account the panel structure of our data, we cluster the standard errors in our regressions by fund.[16] Results are presented in Panel A of Table 3.

– Please insert TABLE 3 approximately here –

The results suggest that having two business degrees is not related to a meaningful increase in performance compared to having only one business degree. None of the coefficients of *MBA and CFA* is significantly different from zero in any specification.

To make sure that the lack of performance differences is not driven by some alternative explanations, we also add several control variables to our above regressions. In particular, we focus on two strands of possible alternative explanations: First, as shown in Table 2, managers with two business degrees typically manage funds with different characteristics compared to managers with only one business degree. Thus, to control for fund characteristics, we add the logarithm of a fund's lagged size, its lagged expense ratio, and the

[15] The latter three alpha measures are determined based on a yearly estimation of the respective factor models. The factor-mimicking portfolio returns for the respective factors and the risk-free rate were taken from Kenneth French's website, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

[16] In addition to the pooled OLS approach, we also ran the above and all following regressions using a Fama and MacBeth (1973) approach by first estimating each model separately for each year. The coefficients and significance levels were then determined based on the time series of the yearly estimates using Newey and West (1987) standard errors. Results (not reported) are very similar and are available upon request.

fund's age as additional explanatory variables. Second, we take into account that managers with two business degrees typically exhibit different personal characteristics. In particular, we also control for a manager's other educational degrees by adding dummy variables for a non-business master and a PhD. Next, we add a dummy that equals one for a female manager and zero otherwise. Furthermore, we add the managers' industry tenure and the managers' age to the regressions. Since the managers' age is calculated from the year in which they earned their undergraduate degree and this year is missing in a lot of cases, we once run regressions including the managers' age and once excluding it. Finally, we check whether our findings are influenced by the skill of a manager. To do this, we run the previous regressions among a subsample of managers who hold at least an MBA degree. Within this subsample we are able to proxy for the managers' skill based on the quality of their MBA program. Therefore, we add a dummy (*Top MBA School)* as independent variable which equals one if a manager earned her MBA degree from one of the top 30 MBA schools according to their average graduate's GMAT score.[17] Additionally, to control for any unobservable time or segment effects that could equally affect all funds in a given year or a particular market segment, respectively, we also include time- and segment-fixed effects in these regressions.

Given that, as described above, the inclusion of control variables leads to four different subsamples, for the sake of brevity we only report regression results using the Carhart (1997) four-factor alpha as dependent variable, which is presumably the most comprehensive measure. Results are reported in Panel B of Table 3.[18] The first two columns, (1) and (2), exclude the managers' age while the last two columns include it. The Columns (2) and (4) represent the results within the MBA manager subsample.

[17] Gottesman and Morey (2006) show that MBA managers from one of the top 30 business schools outperform their peers from other business schools.
[18] Results using the other performance measures are qualitatively the same and are available upon request.

Taking into account various control variables does not change the results from Panel A. Having two business degrees still does not improve performance compared to only having one business degree.

The coefficients of the control variables typically show a lower performance for larger funds and funds with higher expense ratios which both is consistent with previous literature.[19] In contrast, the fund's age has no significant impact on fund performance. Surprisingly, *Other Master* has a positive impact on fund performance. However, it is only significant in two cases. Furthermore, it does not matter for performance whether a fund is managed by a female manager or a manager with a PhD.[20] Moreover, the managers' age has no significant impact while more experienced managers show worse performance which is, however, only significantly different from zero in one specification. Finally, consistent with the findings of Gottesman and Morey (2006), managers from a top 30 MBA school show a significantly better performance than other managers.

The above findings suggest that a manager's second business degree is not related to a better average yearly performance. Thus, if these managers earn higher compensation than managers with one business degree (even if this difference is only small), it is at least questionable how employing managers with two business degrees benefits a fund's investors. As depicted above, gathering two business degrees is likely to be a sign of a higher commitment among these managers. Thus, we would expect them to behave more in accordance with the goals and values of the profession and to spend more effort to avoid the risk of dismissal. Consequently, we conjecture that these managers are more inclined to act in the interest of the funds' investors which could possibly legitimate their higher compensation. We hypothesize that they implement less extreme and more stable risk and investment styles

[19] See, e.g., Chen, Hong, Ming, and Kubik (2004), Berk and Green (2004), or Carhart (1997).
[20] The lack of performance differences between male and female managers are consistent with the findings of Niessen-Ruenzi and Ruenzi (2011).

which eventually should lead to less extreme and more stable performance outcomes. Therefore, in the following two sections we are going to examine the performance extremity and performance persistence of these managers.

3.2 Extremity

To quantify performance extremity we follow the approach of Bär, Kempf, and Ruenzi (2011) and calculate an extremity measure EM^P in each year:

$$EM_{i,t}^{P} = \frac{| P_{i,t} - \overline{P}_{k,t} |}{\frac{1}{N^k} \cdot \sum_{j=1}^{N^k} | P_{j,t} - \overline{P}_{k,t} |} \quad (1)$$

where P stands for the respective performance measure. We measure the performance extremity EM^P as the absolute deviation of a fund's performance from the average performance of all funds in the same market segment and divide it by the average absolute deviation of all funds in the segment. We then regress each performance extremity measure on the *MBA and CFA* dummy introduced above. Regression results are presented in Panel A of Table 4. In a next step, we include the same control variables as in the previous section to rule out any alternative explanation for differences between managers with one and two business degrees. Regression results with control variables are presented in Panel B of Table 4.[21]

– Please insert TABLE 4 approximately here –

Managers with two business degrees achieve less extreme performance outcomes than managers with only one business degree. The coefficient of *MBA and CFA* is significantly

[21] For the sake of brevity, in Panel B we only report regression results using the extremity measure based on the Carhart (1997) four-factor alpha as dependent variable. Results using the other performance extremity measures are qualitatively the same and are available upon request.

negative for all performance measures in Panel A as well as in all subsamples considering several control variables in Panel B.

The control variables show that larger funds realize less extreme performance outcomes. Funds with a higher expense ratio exhibit a larger performance extremity. This is consistent with the idea that higher expense ratios typically are a sign of worse fund governance which eventually can lead to higher risk taking, more extreme investment styles, and thus, to more extreme performance outcomes.[22] Also female managers and younger managers show significantly less extreme performance outcomes.

3.3 Persistence

Next, we examine whether managers with two business degrees also show more persistent performance. We analyze the performance persistence as in Niessen-Ruenzi and Ruenzi (2011) by calculating the standard deviation of the yearly performance ranks of a specific manager during the time she manages a particular fund in a particular segment. The performance ranks are calculated compared to all other funds within the same market segment. Through this, we get a measure for the performance rank volatility of each manager-fund combination which reads:

$$PerfRankVola^{P}_{l,k} = Std(Performance\ Rank^{P}_{l,k,t})_{l,k} \tag{2}$$

where $Performance\ Rank^{P}_{l,k,t}$ stands for the performance rank of the manager-fund combination *l* in segment *k* in year *t*. *P* represents the respective performance measure. A high value of *PerfRankVola* stands for low performance persistence.

[22] See, e.g., Cremers, Driessen, Maenhout, and Weinbaum (2009), Guercio, Dann, and Partch (2003), and Tufano and Sevick (1997) for a discussion on the negative relation between fund fees and governance.

Similar to the previous sections, we then regress the performance rank volatility on the *MBA and CFA* dummy. We only keep those observations for which *PerfRankVola* was calculated from at least three yearly observations. Results are reported in Table 5.[23]

– Please insert TABLE 5 approximately here –

At first sight, the results from Panel A suggest that there is no relation between a second business degree and performance persistence, since in only one out of four specifications there is a significant coefficient for *MBA and CFA*. However, if we include additional control variables, we find that managers with two business degrees realize more persistent performance than managers with only one business degree. The results for the Carhart alpha from Panel B show that there is a significantly negative relation between *MBA and CFA* and the volatility of performance ranks in three out of four specifications.[24]

The control variables suggest that performance persistence increases with fund size. Furthermore, consistent with Niessen-Ruenzi and Ruenzi (2011), female managers show more performance persistence. Managers with more tenure and older managers typically exhibit more volatile performance ranks and thus less persistence.

4 Risk and Style

In the next set of analyses, we examine the impact of having two business degrees on risk-taking behavior and investment style of mutual fund managers. Having established that managers with two degrees, who are presumably more committed to their profession, achieve

[23] As this analysis is run at the manager-fund level, the dependent variable in the regressions represents an aggregation of several yearly observations, i.e., the persistence measure is based on the standard deviation of performance ranks of those years in which the manager continuously managed a specific fund. Thus, we cannot use the same yearly control variables as in the previous regressions. Therefore, we calculate the average of each control variable, introduced in the previous section, across the same years that the persistence measure is calculated from. Through this, we get average control variables at the manager-fund level and use these averages in the regressions for Panel B.

[24] Results using the other performance measures are qualitatively the same and are available upon request.

less extreme and more stable performance outcomes, we conjecture that these managers also take lower and more stable risk levels and follow less extreme and less variable investment styles. In Section 4.1 we focus on the level of risk and style: First, we analyze whether managers with both degrees tend to take less risk and second, we explore whether they tend to take less extreme style bets, i.e., follow moderate investment styles. In Section 4.2 we turn to the variability in risk-taking and investment style. Specifically, we examine whether these managers keep their risk level and style exposure relatively constant.

4.1 Level and Extremity

4.1.1 Risk Level

In this section, we analyze the impact of having two business degrees on three dimensions of a fund's risk: the total risk, measured by the fund's volatility, the systematic, and the unsystematic risk. To determine the fund's volatility, for each fund in each year, we calculate the annualized standard deviation of a fund's monthly returns $\sigma_{i,t}$. To measure the fund's systematic and unsystematic risk, we first estimate the following Jensen (1968) one-factor model for fund *i* in year *t*:

$$r_{i,m,t} - r_{f,m,t} = \alpha_{i,t} + \beta_{i,t}^{Mkt} \cdot (r_{Mkt,m,t} - r_{f,m,t}) + \varepsilon_{i,m,t} \quad (3)$$

where $r_{i,m,t}$ is the monthly return of fund *i* in month *m* of year *t*, $r_{f,m,t}$ is the risk-free rate, and $r_{Mkt,m,t}$ is the market return. We then use the fund's beta $\beta_{i,t}^{Mkt}$ as measure for systematic risk and compute its unsystematic risk by the standard deviation of the regression's residuals $\sigma_{i,t}^{\varepsilon}$. To make our risk measures comparable across market segments and types of risk, we rescale all our measures by the average risk measure of all funds within the same market segment. We then regress our risk level measures ($RL^{Total}, RL^{System}, RL^{Unsystem}$) on the

MBA and CFA dummy as in the previous sections. Results are reported in Table 6. As the risk level measure for total risk covers the other two risk measures, we only report results for this measure with the control subsamples in Panel B.

– Please insert TABLE 6 approximately here –

Managers with two business degrees choose significantly lower risk levels than managers with one business degree. In Panel A, the coefficient of *MBA and CFA* is significantly negative for all types of risk. This finding is also confirmed after including the control variables in Panel B.

Regarding the control variables, funds with higher expense ratios show higher risk levels, which is generally in line with Niessen-Ruenzi and Ruenzi (2011). The age of the fund is positively related to the level of risk in two out of four cases. Regarding the other manager characteristics, we document that managers with a PhD and female managers show lower risk levels and that managers with more experience reduce their level of risk. The latter finding is consistent with the findings of Gottesman and Morey (2006) and Chevalier and Ellison (1999a). Finally, the impact of higher manager skill as proxied by an MBA degree from a top MBA school suggests a negative relation between skill and risk, but the coefficient is only significant in one case.

4.1.2 Style Extremity

Next, we analyze whether fund managers with two business degrees also follow less extreme investment styles. To measure the extremity of a fund manager's investment style, we first estimate the following Carhart (1997) four-factor model for each fund *i* in each year *t*:

$$r_{i,m,t} - r_{f,m,t} = \alpha_{i,t} + \beta_{i,t}^{Mkt} \cdot (r_{Mkt,m,t} - r_{f,m,t}) + \beta_{i,t}^{SMB} \cdot SMB_{m,t} + \beta_{i,t}^{HML} \cdot HML_{m,t} + \beta_{i,t}^{MOM} \cdot MOM_{m,t} + \varepsilon_{i,m,t} \quad (4)$$

where $r_{i,m,t}$, $r_{i,f,t}$, and $r_{Mkt,m,t}$ are defined as above while *SMB*, *HML*, and *MOM* are the returns of factor-mimicking portfolios. In particular, the size factor, *SMB*, is calculated as the return difference between small and large capitalization stocks, the value factor, *HML*, calculated as the return difference between high and low book-to-market stocks, and the momentum factor, *MOM*, calculated as the return difference between stocks with high and low past returns. Then, following Bär, Kempf, and Ruenzi (2011), to quantify a fund's style-extremity, we construct three extremity measures, one for each style, as:

$$EM_{i,t}^{S} = \frac{|\beta_{i,t}^{S} - \overline{\beta}_{k,t}^{S}|}{\frac{1}{N^{k}} \cdot \sum_{j=1}^{N^{k}} |\beta_{j,t}^{S} - \overline{\beta}_{k,t}^{S}|} \tag{5}$$

where S represents the investment style analyzed (*SMB*, *HML*, and *MOM*, respectively) and N^{k} gives the number of funds in a specific market segment k in a given year t. $EM_{i,t}^{S}$ shows high values for funds which strongly deviate in their exposure to a specific style ($\beta_{i,t}^{S}$) from the average exposure of their market segment ($\overline{\beta}_{k,t}^{S}$) in absolute terms. Thus, a significantly higher or a significantly lower factor loading as compared to the market segment's average will result in a large extremity measure. To normalize the extremity measure, we divide it by the average style deviation in the corresponding market segment and respective year. This normalization makes our style extremity measure comparable across styles, segments, and time. Additionally, we compute an average style extremity measure for each fund across the three investment styles as:

$$EM_{i,t} = \frac{1}{3} \cdot \left(EM_{i,t}^{SMB} + EM_{i,t}^{HML} + EM_{i,t}^{MOM} \right)$$

We then regress the three style extremity measures as well as the average style extremity measure on the *MBA and CFA* dummy. The results are reported in Table 7.

– Please insert TABLE 7 approximately here –

Managers with two business degrees follow less extreme investment styles than managers with only one business degree. The coefficient of *MBA and CFA* is significantly negative for all styles (Panel A) and in all subsamples (Panel B).

The impact of the control variables is typically consistent with results in the previous literature. For example, larger funds are associated with less style extremity which is consistent with the findings of Bär, Kempf, and Ruenzi (2011). Furthermore, funds with higher expense ratios follow more extreme investment styles and female managers follow less extreme investment styles.

4.2 Variability

Regarding risk and investment style, so far our results revealed that having two business degrees is typically accompanied by lower risk levels and less extreme investment styles. This suggests that more committed managers try to stay on the safe side with their investments and stay away from gambling a particular investment style or taking high risks to enhance their performance measures. In this section, we examine whether these managers are also more likely to show more constant investment behavior, i.e., a more constant risk level as well as a more constant style. If they are reluctant to gamble on style or risk, they are very likely to show less risk shifting or style switching behavior than managers with only one business degree. Thus, in Section 4.2.1 we are going to examine whether two business degrees are related to less variability in a fund's risk and in Section 4.2.2 we analyze the variability in a fund's exposure to particular investment styles.

4.2.1 Risk Variability

To quantify the variability in a fund's risk, we create a measure that follows the idea of the style variability measure introduced in Niessen-Ruenzi and Ruenzi (2011) and is similar to the performance persistence measure introduced in Section 3.3. For each type of risk, we calculate the standard deviation of the yearly risk measures over the time period a specific manager is in charge of a fund. Through this, we get a variability measure for each type of risk and for each manager-fund combination *l*. Then, we rescale the variability measure by the average variability measure of all manager-fund combinations in the same market segment. By this, we get the following risk variability measure:

$$RVM_{l,k}^{R} = \frac{Std(Risk\ measure_{l,k,t}^{R})_{l,k}}{\frac{1}{L^{k}}\sum_{j=1}^{L^{k}} Std(Risk\ measure_{j,k,t}^{R})_{j,k}} \tag{6}$$

where $Risk\ measure^{R}$ represents the respective type of risk ($\sigma_{i,t}$, $\beta_{i,t}^{Mkt}$, $\sigma_{i,t}^{\varepsilon}$) and L^{k} gives the number of manager-fund observations in the respective market segment *k*. A high value of *RVM* means that the respective manager has shifted the risk level to a larger degree than other managers in the same segment. To estimate the impact of having two business degrees on risk shifting behavior, we regress the risk variability measures on *MBA and CFA*. Each risk variability measure is the dependent variable in a separate regression, respectively. In these regressions, each manager-fund combination is a unit of observation. We only keep those observations for which the risk variability measure was calculated from at least three yearly observations. The results of these regressions are presented in Table 8.[25]

– Please insert TABLE 8 approximately here –

Managers with both degrees exhibit significantly less variability in their risk taking behavior. The coefficients of *MBA and CFA* are significantly negative in all specifications in

[25] In Panel B, we again use the average control variables as introduced in Section 3.3.

Panel A. Regarding the impact on total risk variability taking into account the control variables in Panel B, the results typically also show a significantly negative coefficient. Only in the last subsample, which is the subsample with the fewest observations, the coefficient is not significant at conventional levels anymore.

Regarding the control variables, managers with a non-business master also show a negative and significant impact on the risk variability in two out of four cases. Furthermore, female managers choose more constant risk levels, too.

4.2.2 Style Variability

Finally, we examine the style variability of managers with two business degrees. We quantify style variability similar to the risk variability in the previous section. In equation (6) we replace the respective risk measure with the factor loading to a specific style, as estimated from the Carhart (1997) four-factor model in equation (4). Thus, our style variability measure reads:

$$SVM_{l,k}^{S} = \frac{Std(\beta_{l,k,t}^{S})_{l,k}}{\frac{1}{L^{k}}\sum_{j=1}^{L^{k}} Std(\beta_{j,k,t}^{S})_{j,k}} \tag{7}$$

Equivalently to the risk variability, a high value of *SVM* means that a specific manager shifts from one style extreme to another more heavily than the average manager in the corresponding market segment. As for the style extremity, we also calculate an average measure of style variability and regress it on the *MBA and CFA* dummy, using only observations for which the style variability measure was calculated from at least three years. The results are presented in Table 9.

– Please insert TABLE 9 approximately here –

Managers with two business degrees show significantly lower style variability compared to managers with only one business degree. Both, for the different investment styles in Panel A as well as for the average style variability taking into account the control variables in Panel B, the coefficient of the *MBA and CFA* dummy is significantly negative in all specifications.

The control variables suggest that large funds, funds with low expense ratios, funds with female managers, and funds with younger managers show less style variability. Also less experienced managers exhibit a less variable investment style, but the coefficient for the industry tenure is only significant in one of four cases.

5 Conclusion

The impact of education on fund managers' investment behavior has been examined in several academic studies. These studies usually focused on the distinct impact of an MBA degree and a CFA designation as these are the most common qualifications among fund managers. One aspect that has yet been neglected in these studies is the question whether those managers who decide to gather both degrees differ from those who only gather one degree. However, this decision might be a proxy for personal attitudes, such as a higher career or professional commitment, which eventually will impact those managers' investment behavior.

In this paper, we compare managers which gather both an MBA degree and a CFA designation at the same time to managers which only gather one of these qualifications. We document several new findings: First, the performance does not significantly differ between the two groups. Second, managers who gather both degrees show less extreme and more persistent performance than managers with only one degree. Third, managers with both

degrees show significantly lower risk levels, less extreme investment styles, and more stability in risk and style compared to managers with exactly one business degree.

In robustness examinations, we rule out several alternative explanations. Our results are not driven by fund characteristics such as size, expense ratio, or fund age. Similarly, manager characteristics like the managers' age, their tenure, or their gender do not explain our results. Finally, we can rule out that higher skills among managers with two business degrees are responsible for their less extreme and more stable investment behavior.

Overall, our results contribute to a growing strand of research on the impact of education on investment behavior. We show that managers which gather both an MBA as well as a CFA show less extreme and more reliable investment outcomes which is desirable from an investor's point of view.

REFERENCES

Aranya, Nisim, J. Pollock, and Joel Amernic, 1981, An Examination of Professional Commitment in Public Accounting, *Accounting, Organizations and Society* 6, 271-280.

Aryee, Samuel, and Kevin Tan, 1992, Antecedents and Outcomes of Career Commitment, *Journal of Vocational Behavior* 40, 288-305.

Avery, Christopher N., and Judith A. Chevalier, 1999, Herding over the Career, *Economics Letters* 63, 327 - 333.

Bär, Michaela, Alexander Kempf, and Stefan Ruenzi, 2011, Is a Team Different from the Sum of its Parts? Evidence from Mutual Fund Managers, *Review of Finance* 15, 359-396.

Berk, Jonathan B., and Richard C. Green, 2004, Mutual Fund Flows and Performance in Rational Markets, *Journal of Political Economy* 112, 1269-1295.

Carhart, Mark M., 1997, On Persistence in Mutual Fund Performance, *Journal of Finance* 52, 57-82.

Chen, Joseph, Harrison Hong, Huang Ming, and Jeffrey D. Kubik, 2004, Does Fund Size Erode Mutual Fund Performance? The Role of Liquidity and Organization, *American Economic Review* 94, 1276-1302.

Chevalier, Judith, and Glenn Ellison, 1999a, Are Some Mutual Fund Managers Better Than Others? Cross-Sectional Patterns in Behavior and Performance, *Journal of Finance* 54, 875-899.

Chevalier, Judith, and Glenn Ellison, 1999b, Career Concerns of Mutual Fund Managers, *Quarterly Journal of Economics* 114, 389-432.

Cremers, Martijn, Joost Driessen, Pascal Maenhout, and David Weinbaum, 2009, Does Skin in the Game Matter? Director Incentives and Governance in the Mutual Fund Industry, *Journal of Financial And Quantitative Analysis* 44, 1345-1373.

Damast, Alison, 2011, Q&A: Becoming a Chartered Financial Analyst, BusinessWeek (April 28, 2011).

Dincer, Oguzhan C., Russell B. Gregory-Allen, and Hany A. Shawky, 2010, Are You Smarter than a CFA'er? Manager Qualifications and Portfolio Performance, Working Paper.

Ding, Bill, and Russell Wermers, 2009, Mutual Fund Performance and Governance Structure: The Role of Portfolio Managers and Boards of Directors, Working Paper.

Fama, Eugene F., and Kenneth R. French, 1993, Common Risk Factors in the Returns on Stocks and Bonds, *Journal of Financial Economics* 33, 3-56.

Fama, Eugene F., and James D. MacBeth, 1973, Risk, Return and Equilibrium: Empirical Tests, *Journal of Political Economy* 81, 607-636.

Golec, Joseph H., 1996, The Effects of Mutual Fund Managers' Characteristics on Their Portfolio Performance, Risk and Fees, *Financial Services Review* 5, 133-148.

Gottesman, Aron A., and Matthew R. Morey, 2006, Manager Education and Mutual Fund Performance, *Journal of Empirical Finance* 13, 145-182.

Grinblatt, Mark, Matti Keloharju, and Juhani T. Linnainmaa, 2012, IQ, Trading Behavior, and Performance, *Journal of Financial Economics* 104, 339-362.

Guercio, Diane Del, Larry Y. Dann, and M. Megan Partch, 2003, Governance and Boards of Directors in Closed-End Investment Companies, *Journal of Financial Economics* 69, 111-152.

Jensen, Michael C., 1968, The Performance of Mutual Funds in the Period 1945-1964, *Journal of Finance* 23, 389-416.

Keynes, John Maynard, 1936. *The General Theory of Employment*, London: Macmillan.

London, Manuel, 1983, Toward a Theory of Career Motivation, *Academy of Management Review* 8, 620 - 630.

Morrow, Paula C., and Rosemary E. Wirth, 1989, Work Commitment among Salaried Professionals, *Journal of Vocational Behavior* 34, 40-56.

Mowday, Richard T., Lyman W. Porter, and Richard M. Steers, 1982. *Employee-Organization Linkages: The Psychology of Commitment, Absenteeism, and Turnover*, New York, London: Academic Press.

Newey, Whitney K., and Kenneth D. West, 1987, A Simple, Positive Semi-Definite, Heteroskedasticity and Autocorrelation Consistent Covariance Matrix, *Econometrica* 55, 703-708.

Niessen-Ruenzi, Alexandra, and Stefan Ruenzi, 2011, Sex Matters: Gender and Prejudice in the Mutual Fund Industry, Working Paper.

O'Boyle, Thomas F., 1985, Loyalty Ebbs at Many Companies As Employees Grow Disillusioned, *Wall Street Journal* 206, 27.

Porter, Lyman W., Richard M. Steers, Richard T. Mowday, and Paul V. Boulian, 1974, Organizational Commitment, Job Satisfaction, and Turnover among Psychiatric Technicians, *Journal of Applied Psychology* 59, 603-609.

Rogers, William, 1993, Regression Standard Errors in Clustered Samples, *Stata Technical Bulletin* 13, 19-23.

Scharfstein, David S., and Jeremy C. Stein, 1990, Herd Behavior and Investment, *American Economic Review* 80, 465.

Shukla, Ravi, and Sandeep Singh, 1994, Are CFA Charterholders Better Equity Fund Managers?, *Financial Analysts Journal* 50, 68-74.

Tufano, Peter, and Matthew Sevick, 1997, Board Structure and Fee-Setting in the U.S. Mutual Fund Industry, *Journal of Financial Economics* 46, 321-355.

Appendix: Matching of Market Segments

This table contains the rules according to which Strategic Insights segment classifications are matched with the Lipper segment classifications.

Market Segment	SI Code Name	SI Code	Lipper Code	Lipper Code Name
AG	Equity USA Aggressive Growth	AGG	CA	Capital Appreciation Funds
	Equity USA Small Companies	SCG	SG	Small-Cap Funds
			MR	Micro-Cap Funds
BL	Asset Allocation USA Balanced	BAL	B	Balanced Funds
GI	Equity USA Growth & Income	GRI	GI	Growth and Income Funds
IN	Equity USA Income & Growth	ING	EI	Equity Income Funds
LG	Equity USA Growth	GRO	G	Growth Funds
SE	Equity USA Environmental	ENV		
	Equity USA Financial Sector	FIN	FS	Financial Services Funds
	Equity USA Health	HLT	H	Health/Biotechnology Funds
	Equity Natural Resources & Energy	NTR	NR	Natural Resources Funds
	Equity USA Real Estate	RLE	RE	Real Estate Funds
	Equity USA Misc Sectors	SEC	S	Specialty/Miscellaneous Funds
	Equity USA Technology	TEC	TK	Science & Technology Funds
			TL	Telecommunication Funds
	Equity USA Utilities	UTI	UT	Utility Funds

Table 1 – Descriptive Statistics

This table presents summary statistics for our sample of US equity mutual funds during the 1996-2009 sample period. It includes actively managed, domestic equity funds from the following six segments: Aggressive Growth, Balanced, Growth and Income, Income, Long Term Growth, and Sector Funds. The sample only contains funds which are managed by a single manager who has at least an MBA or a CFA. Furthermore, all fund year observations are excluded for which less than 12 months of return data is available.

Year	Number of Funds	Mean TNA in Million USD	Mean Expense Ratio	Mean Fund Age
1996	408	996.7	1.29%	13
1997	419	1266.6	1.24%	14
1998	439	1475.0	1.29%	14
1999	487	1684.7	1.30%	13
2000	513	1554.7	1.33%	13
2001	524	1359.1	1.37%	13
2002	524	953.2	1.40%	13
2003	482	1383.2	1.44%	14
2004	467	1523.1	1.37%	15
2005	408	1719.7	1.33%	16
2006	346	1871.7	1.30%	15
2007	311	2105.0	1.25%	16
2008	270	1238.2	1.23%	17
2009	228	1666.5	1.26%	19
Total Sample	1175	1460.9	1.32%	14

Table 2 – Fund and Manager Characteristics and Education

This table presents summary statistics on several fund and manager characteristics for managers with one business degree (*MBA Or CFA*), managers with two business degrees (*MBA and CFA*), and the difference between the two groups. We assign managers to one of these two groups based on all degrees that are reported by Morningstar in any year of the sample period. Thus, also managers which start with one degree, but earn their second degree during the sample period, are assigned to the group of managers with two business degrees for the whole sample period. The fund and manager characteristics examined are: the fraction of funds managed, the fund's size as measured by the TNA in million USD, the expense ratio, the fund's age, the manager's age, the industry tenure, the fraction of female managers, the fraction of managers with a non-MBA master, and the fraction of managers with a PhD. The managers' age is computed from the year in which they got their college degree. Following Chevalier and Ellison (1999b), we assume that a manager was 21 upon college graduation. The managers' industry tenure is calculated from the year that Morningstar reports for a manager to be the first year managing any fund in the Morningstar database. The manager's gender is determined following Niessen-Ruenzi and Ruenzi (2011) by comparing the manager's first name to a list published by the United States Social Security Administration (SSA) that contains the most popular first names by gender for the last 10 decades. Additionally, we identify the gender of managers with ambiguous first names from several internet sources like the fund prospectus, press releases, or photographs that reveal their gender. The significance levels for the difference in means between both groups are based on t-tests. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

	One Business Degree (*MBA or CFA*)	**Two Business Degrees (*MBA and CFA*)**	**Difference**
Funds Managed (fraction in %)	59.1	40.9	-
Fund Size (in million USD)	1291.6	1485.4	193.7
Expense Ratio (%)	1.34	1.29	-0.05***
Fund Age	13	15	2***
Manager Age	46	48	2***
Industry Tenure	10	11	1***
Female Managers (fraction in %)	11.85	8.96	-2.89***
Other Master (fraction in %)	17.02	8.48	-8.54***
PhD (fraction in %)	1.25	3.4	2.15***

Table 3 –Performance

This table presents results from pooled OLS regressions of yearly fund performance measures on the dummy variable *MBA and CFA*. This dummy equals one if both degrees (a CFA and an MBA) are reported for a specific manager and zero otherwise. In Panel A, we use four different performance measures as dependent variables: raw return, Jensen (1968)'s one-factor alpha, Fama and French (1993) three-factor alpha, and Carhart (1997) four-factor alpha. Panel B reports regression results from different model specifications including control variables as well as time and segment fixed effects. The dependent variable in Panel B is Carhart's alpha. *Ln(Size)* is defined as the natural logarithm of a fund's lagged TNA. *Expense Ratio* is the fund's lagged expense ratio. All other variables are defined as in Table 2. Robust p-values, presented in parentheses, are based on Rogers (1993) standard errors clustered by fund. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Performance and Two Business Degrees

Dependent variable:	*Raw Return*	*Jensen Alpha*	*FF Alpha*	*Carhart Alpha*
MBA and CFA	0.0077	0.0009	-0.0026	-0.0023
	(0.127)	(0.772)	(0.384)	(0.450)
Constant	0.0862***	0.0018	-0.0037*	-0.0020
	(<0.001)	(0.413)	(0.074)	(0.339)
Observations	5826	5826	5826	5826
R^2	0.00%	0.00%	0.00%	0.00%

Panel B: Performance, Two Business Degrees, and Controls

Dependent variable:	*Carhart Alpha*			
Model #:	(1)	(2)	(3)	(4)
MBA and CFA	-0.0004	0.0047	0.0004	0.0084
	(0.910)	(0.311)	(0.920)	(0.105)
Ln(Size)	-0.0030***	-0.0016	-0.0031***	-0.0009
	(<0.001)	(0.173)	(0.002)	(0.474)
Expense Ratio	-0.0154***	-0.0226***	-0.0124***	-0.0171***
	(<0.001)	(<0.001)	(0.004)	(0.005)
Fund Age	-0.0000	-0.0000	-0.0002	-0.0002
	(0.659)	(0.850)	(0.125)	(0.168)
Other Master	0.0021	0.0126*	0.0044	0.0160**
	(0.649)	(0.088)	(0.373)	(0.043)
PhD	-0.0024	-0.0079	-0.0061	-0.0101
	(0.795)	(0.543)	(0.447)	(0.291)
Female	-0.0014	0.0000	-0.0019	-0.0052
	(0.768)	(0.999)	(0.727)	(0.377)
Industry Tenure	-0.0003	-0.0006*	-0.0000	-0.0003
	(0.286)	(0.074)	(0.995)	(0.444)
Manager Age			-0.0003	-0.0004
			(0.199)	(0.310)
Top MBA School		0.0113***		0.0100**
		(0.009)		(0.047)
Constant	0.0269***	0.0289**	0.0408***	0.0340
	(0.005)	(0.046)	(0.004)	(0.131)
Observations	5319	2689	3691	1983
R^2	10.40%	11.50%	9.80%	10.50%

Table 4 –Performance Extremity

This table presents results from pooled OLS regressions of yearly performance extremity measures on the dummy variable *MBA and CFA*. To quantify performance extremity we follow the approach of Bär, Kempf, and Ruenzi (2011) and calculate an extremity measure EM^P in each year:

$$EM_{i,t}^{P} = \frac{| P_{i,t} - \overline{P}_{k,t} |}{\frac{1}{N^k} \cdot \sum_{j=1}^{N^k} | P_{j,t} - \overline{P}_{k,t} |}$$

where *P* stands for the respective performance measure. Performance extremity EM^P is measured as the absolute deviation of a fund's performance from the average performance of all funds in the same market segment and divided by the average absolute deviation of all funds in the segment. In Panel A, we use the extremity of all four performance measures as dependent variables. Panel B reports regression results from different model specifications including control variables as well as time and segment fixed effects. The dependent variable in Panel B is the performance extremity based on Carhart's alpha. The independent variables are defined in Tables 2 and 3. Robust p-values, presented in parentheses, are based on Rogers (1993) standard errors clustered by fund. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Performance Extremity and Two Business Degrees

Dependent variable:	*Raw Return Extremity*	*Jensen Alpha Extremity*	*FF Alpha Extremity*	*Carhart Alpha Extremity*
MBA and CFA	-0.0811**	-0.0842**	-0.1015***	-0.0889**
	(0.021)	(0.014)	(0.005)	(0.013)
Constant	1.0332***	1.0345***	1.0415***	1.0364***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Observations	5826	5826	5826	5826
R^2	0.20%	0.20%	0.30%	0.20%

Panel B: Performance Extremity, Two Business Degrees, and Controls

Dependent variable:	*Carhart Alpha Extremity*			
Model #:	(1)	(2)	(3)	(4)
MBA and CFA	-0.1080***	-0.0965*	-0.1320***	-0.1544***
	(0.004)	(0.078)	(0.003)	(0.008)
Ln(Size)	-0.0512***	-0.0417***	-0.0504***	-0.0374**
	(<0.001)	(0.002)	(<0.001)	(0.012)
Expense Ratio	0.2308***	0.3641***	0.2378***	0.3143***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Fund Age	0.0030*	0.0009	0.0045*	0.0010
	(0.091)	(0.552)	(0.087)	(0.628)
Other Master	-0.0392	-0.0281	-0.0492	-0.0264
	(0.425)	(0.699)	(0.399)	(0.745)
PhD	-0.0535	-0.0979	-0.1626	-0.2342
	(0.507)	(0.463)	(0.142)	(0.105)
Female	-0.2144***	-0.2374***	-0.1925***	-0.2591***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Industry Tenure	0.0060*	0.0022	0.0024	-0.0030
	(0.063)	(0.645)	(0.538)	(0.544)
Manager Age			0.0057**	0.0148***
			(0.027)	(<0.001)
Top MBA School		-0.0090		0.0492
		(0.848)		(0.370)
Constant	0.8797***	0.6932***	0.6062***	0.1564
	(<0.001)	(<0.001)	(<0.001)	(0.485)
Observations	5319	2689	3691	1983
R^2	3.90%	6.30%	5.20%	8.00%

Table 5 –Performance Persistence

This table presents results from OLS regressions of performance rank volatility measures on the dummy variable *MBA and CFA*. We calculate performance rank volatility by the standard deviation of the yearly performance ranks of a specific manager during the time she manages a particular fund in a particular segment:

$$PerfRankVola^{P}_{l,k} = Std(Performance\ Rank^{P}_{l,k,t})_{l,k}$$

where $Performance\ Rank^{P}_{l,k,t}$ stands for the performance rank of the manager-fund combination *l* in segment *k* in year *t*. *P* represents the respective performance measure. We only keep those observations for which *PerfRankVola* was calculated from at least three yearly observations. Each manager-fund combination is a unit of observation in the regressions. In Panel A, we use the rank volatility of all four performance measures as dependent variables. Panel B reports regression results from different model specifications including control variables as well as segment fixed effects. The dependent variable in Panel B is the rank volatility based on Carhart's alpha. As this analysis is run at the manager-fund level, the control variables represent averages of the control variables introduced in Tables 2 and 3, calculated across the same years that the rank volatility measure is calculated from. Robust p-values, presented in parentheses, are based on Rogers (1993) standard errors clustered by fund. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Performance Rank Volatility and Two Business Degrees

Dependent variable:	*PerfRankVola Raw Return*	*PerfRankVola Jensen Alpha*	*PerfRankVola Fama/French Alpha*	*PerfRankVola Carhart Alpha*
MBA and CFA	-0.0060	-0.0088	-0.0115*	-0.0108
	(0.398)	(0.214)	(0.090)	(0.116)
Constant	0.2618***	0.2688***	0.2660***	0.2652***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Observations	824	824	824	824
R^2	0.10%	0.20%	0.40%	0.30%

Panel B: Performance Rank Volatility, Two Business Degrees, and Controls

Dependent variable:	*PerfRankVola Carhart Alpha*			
Model #:	(1)	(2)	(3)	(4)
MBA and CFA	-0.0143**	-0.0184*	-0.0104	-0.0255**
	(0.039)	(0.067)	(0.214)	(0.024)
Ln(Size)	-0.0078***	-0.0096***	-0.0068***	-0.0066**
	(<0.001)	(<0.001)	(0.002)	(0.031)
Expense Ratio	0.0156*	0.0128	0.0150	0.0161
	(0.081)	(0.244)	(0.169)	(0.277)
Fund Age	0.0004	0.0004	0.0003	-0.0000
	(0.123)	(0.247)	(0.429)	(1.000)
Other Master	0.0006	0.0260*	-0.0071	0.0060
	(0.953)	(0.069)	(0.544)	(0.712)
PhD	-0.0022	-0.0661*	0.0259	-0.0207
	(0.932)	(0.055)	(0.500)	(0.669)
Female	-0.0341***	-0.0150	-0.0318***	-0.0184
	(0.001)	(0.341)	(0.008)	(0.315)
Industry Tenure	0.0012**	0.0020**	0.0004	0.0015
	(0.040)	(0.026)	(0.581)	(0.170)
Manager Age			0.0012**	0.0007
			(0.043)	(0.458)
Top MBA School		-0.0045		-0.0094
		(0.645)		(0.429)
Constant	0.2757***	0.2896***	0.2246***	0.2594***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Observations	816	407	547	288
R^2	5.50%	9.10%	7.60%	10.10%

Table 6 – Risk Level

This table presents results from pooled OLS regressions of yearly risk level measures on the dummy variable *MBA and CFA*. We use three dimensions of a fund's risk: the total risk, measured by the fund's volatility, the systematic, and the unsystematic risk. To determine the fund's volatility, for each fund in each year, we calculate the annualized standard deviation of a fund's monthly returns $\sigma_{i,t}$. To measure the fund's systematic and unsystematic risk, we first estimate the following Jensen (1968) one-factor model for fund *i* in year *t*:

$$r_{i,m,t} - r_{f,m,t} = \alpha_{i,t} + \beta_{i,t}^{Mkt} \cdot (r_{Mkt,m,t} - r_{f,m,t}) + \varepsilon_{i,m,t}$$

where $r_{i,m,t}$ is the monthly return of fund *i* in month *m* of year *t*, $r_{f,m,t}$ is the risk-free rate, and $r_{Mkt,m,t}$ is the market return. We then use the fund's beta $\beta_{i,t}^{Mkt}$ as measure for systematic risk and compute its unsystematic risk by the standard deviation of the regression's residuals $\sigma_{i,t}^{\varepsilon}$. We rescale all our measures by the average risk measure of all funds within the same market segment. In Panel A, we use all three risk level measures as dependent variables. Panel B reports regression results from different model specifications including control variables as well as time and segment fixed effects. The dependent variable in Panel B is the total risk level. The independent variables are defined in Tables 2 and 3. Robust p-values, presented in parentheses, are based on Rogers (1993) standard errors clustered by fund. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Risk Level and Two Business Degrees

Dependent variable:	*RL(Total)*	*RL(System)*	*RL(Unsystem)*
MBA and CFA	-0.0563***	-0.0597***	-0.0675**
	(<0.001)	(0.001)	(0.013)
Constant	1.0230***	1.0244***	1.0276***
	(<0.001)	(<0.001)	(<0.001)
Observations	5826	5826	5826
R^2	0.80%	0.60%	0.40%

Panel B: Risk Level, Two Business Degrees, and Controls

Dependent variable:	*RL(Total)*			
Model #:	(1)	(2)	(3)	(4)
MBA and CFA	-0.0503***	-0.0573**	-0.0548***	-0.0612**
	(0.002)	(0.021)	(0.006)	(0.038)
Ln(Size)	0.0030	0.0100	-0.0003	0.0069
	(0.516)	(0.167)	(0.957)	(0.422)
Expense Ratio	0.1076***	0.1542***	0.1086***	0.1463***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Fund Age	0.0012*	0.0004	0.0022**	0.0013
	(0.078)	(0.624)	(0.021)	(0.229)
Other Master	0.0206	-0.0017	0.0293	0.0158
	(0.355)	(0.966)	(0.244)	(0.718)
PhD	-0.1181***	-0.0913***	-0.1534***	-0.1465***
	(<0.001)	(0.009)	(<0.001)	(<0.001)
Female	-0.0791***	-0.0991***	-0.0755***	-0.0935***
	(<0.001)	(<0.001)	(<0.001)	(0.005)
Industry Tenure	-0.0023*	-0.0054**	-0.0022	-0.0072**
	(0.096)	(0.023)	(0.229)	(0.015)
Manager Age			-0.0003	0.0021
			(0.839)	(0.359)
Top MBA School		-0.0443*		-0.0128
		(0.058)		(0.624)
Constant	0.8699***	0.8191***	0.8708***	0.7463***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Observations	5319	2689	3691	1983
R^2	4.10%	7.70%	5.10%	7.40%

Table 7 – Style Extremity

This table presents results from pooled OLS regressions of yearly style extremity measures on the dummy variable *MBA and CFA*. To measure the extremity of a fund manager's investment style, we first estimate the following Carhart (1997) four-factor model for each fund *i* in each year *t*:

$$r_{i,m,t} - r_{f,m,t} = \alpha_{i,t} + \beta_{i,t}^{Mkt} \cdot (r_{Mkt,m,t} - r_{f,m,t}) + \beta_{i,t}^{SMB} \cdot SMB_{m,t} + \beta_{i,t}^{HML} \cdot HML_{m,t} + \beta_{i,t}^{MOM} \cdot MOM_{m,t} + \varepsilon_{i,m,t}$$

where $r_{i,m,t}$, $r_{i,f,t}$, and $r_{Mkt,m,t}$ are defined as above while *SMB*, *HML*, and *MOM* are the returns of factor-mimicking portfolios. Then, following Bär, Kempf, and Ruenzi (2011), to quantify a fund's style-extremity, we construct three extremity measures, one for each style, as:

$$EM_{i,t}^{S} = \frac{|\beta_{i,t}^{S} - \overline{\beta}_{k,t}^{S}|}{\frac{1}{N^k} \cdot \sum_{j=1}^{N^k} |\beta_{j,t}^{S} - \overline{\beta}_{k,t}^{S}|}$$

where *S* represents the investment style analyzed (*SMB*, *HML*, and *MOM*, respectively) and N^k gives the number of funds in a specific market segment *k* in a given year *t*. To normalize the extremity measure, we divide it by the average style deviation in the corresponding market segment and respective year. Additionally, we calculate the average style extremity measure, *EM,* for each fund across the three investment styles as:

$$EM_{i,t} = \frac{1}{3} \cdot \left(EM_{i,t}^{SMB} + EM_{i,t}^{HML} + EM_{i,t}^{MOM} \right)$$

In Panel A, we use the three style extremity measures and the average style extremity measure as dependent variables. Panel B reports regression results from different model specifications including control variables as well as time and segment fixed effects. The dependent variable in Panel B is the average style extremity measure. The independent variables are defined in Tables 2 and 3. Robust p-values, presented in parentheses, are based on Rogers (1993) standard errors clustered by fund. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Style Extremity and Two Business Degrees

Dependent variable:	*EM*	*EM(SMB)*	*EM(HML)*	*EM(MOM)*
MBA and CFA	-0.0823***	-0.0751**	-0.1084***	-0.0635*
	(0.004)	(0.031)	(0.001)	(0.080)
Constant	1.0337***	1.0307***	1.0443***	1.0260***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Observations	5826	5826	5826	5826
R^2	0.40%	0.20%	0.40%	0.10%

Table 7 – Continued

Panel B: Style Extremity, Two Business Degrees, and Controls				
Dependent variable:	*EM*			
Model #:	(1)	(2)	(3)	(4)
MBA and CFA	-0.0878***	-0.0984**	-0.0759**	-0.1158**
	(0.003)	(0.018)	(0.039)	(0.025)
Ln(Size)	-0.0267***	-0.0207**	-0.0288***	-0.0204*
	(<0.001)	(0.030)	(<0.001)	(0.063)
Expense Ratio	0.1980***	0.2565***	0.1888***	0.2451***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Fund Age	0.0012	-0.0006	0.0026	-0.0003
	(0.421)	(0.591)	(0.232)	(0.835)
Other Master	-0.0001	0.0214	-0.0119	0.0171
	(0.998)	(0.673)	(0.789)	(0.767)
PhD	-0.0913*	-0.0596	-0.1081	-0.1419
	(0.093)	(0.489)	(0.183)	(0.161)
Female	-0.1695***	-0.1377***	-0.1971***	-0.2038***
	(<0.001)	(0.007)	(<0.001)	(<0.001)
Industry Tenure	0.0039	0.0011	0.0018	-0.0035
	(0.102)	(0.720)	(0.546)	(0.354)
Manager Age			0.0025	0.0069*
			(0.269)	(0.057)
Top MBA School		-0.0265		-0.0048
		(0.428)		(0.904)
Constant	0.8501***	0.7810***	0.7280***	0.5296***
	(<0.001)	(<0.001)	(<0.001)	(0.002)
Observations	5319	2689	3691	1983
R^2	4.80%	7.60%	5.40%	8.60%

Table 8 – Risk Variability

This table presents results from OLS regressions of risk variability measures on the dummy variable *MBA and CFA*. We create risk variability measures for each dimension of risk by calculating the standard deviation of the yearly risk measures for each manager-fund combination *l*. Then, we rescale the variability measure by the average variability of all manager-fund combinations in the same market segment:

$$RVM^{R}_{l,k} = \frac{Std(Risk\ measure^{R}_{l,k,t})_{l,k}}{\frac{1}{L^k}\sum_{j=1}^{L^k} Std(Risk\ measure^{R}_{j,k,t})_{j,k}}$$

where $Risk\ measure^{R}$ represents the respective type of risk ($\sigma_{i,t}$, $\beta^{Mkt}_{i,t}$, $\sigma^{\varepsilon}_{i,t}$) and L^k gives the number of manager-fund observations in the respective market segment *k*. We only keep those observations for which *RVM* was calculated from at least three yearly observations. Each manager-fund combination is a unit of observation in the regressions. In Panel A, we use the risk variability of all three risk dimensions as dependent variables. Panel B reports regression results from different model specifications including control variables as well as segment fixed effects. The dependent variable in Panel B is the total risk variability. The control variables are calculated as in Table 5. Robust p-values, presented in parentheses, are based on Rogers (1993) standard errors clustered by fund. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Risk Variability and Two Business Degrees

Dependent variable:	*RVM(Total)*	*RVM(System)*	*RVM(Unsystem)*
MBA and CFA	-0.1038***	-0.1040**	-0.1071**
	(0.004)	(0.016)	(0.036)
Constant	1.0430***	1.0430***	1.0443***
	(<0.001)	(<0.001)	(<0.001)
Observations	824	824	824
R^2	1.00%	0.70%	0.50%

Panel B: Risk Variability, Two Business Degrees, and Controls

Dependent variable	*RVM(Total)*			
Model #:	(1)	(2)	(3)	(4)
MBA and CFA	-0.1222***	-0.0999*	-0.0846**	-0.0817
	(0.001)	(0.085)	(0.046)	(0.171)
Ln(Size)	0.0080	0.0112	0.0077	0.0112
	(0.458)	(0.514)	(0.548)	(0.573)
Expense Ratio	0.0602	0.1225*	0.1000*	0.1121
	(0.194)	(0.070)	(0.061)	(0.151)
Fund Age	0.0002	-0.0015	-0.0002	-0.0029
	(0.885)	(0.341)	(0.894)	(0.126)
Other Master	-0.1027**	-0.1005	-0.1056*	-0.0560
	(0.035)	(0.236)	(0.054)	(0.507)
PhD	-0.0937	-0.1044	-0.0886	-0.1876
	(0.275)	(0.287)	(0.411)	(0.161)
Female	-0.1271***	-0.0884	-0.1597***	-0.0943
	(0.006)	(0.288)	(0.003)	(0.372)
Industry Tenure	0.0013	0.0009	0.0047	0.0057
	(0.652)	(0.855)	(0.249)	(0.393)
Manager Age			-0.0048	-0.0017
			(0.119)	(0.768)
Top MBA School		0.0219		0.0612
		(0.696)		(0.300)
Constant	0.9443***	0.9066***	1.0447***	0.9311***
	(<0.001)	(<0.001)	(<0.001)	(0.002)
Observations	816	407	547	288
R^2	2.40%	3.60%	4.10%	5.90%

Table 9 – Style Variability

This table presents results from OLS regressions of style variability measures on the dummy variable *MBA and CFA*. We create variability measures for the same styles as in Table 7. Style variability measures are calculated for each manager-fund combination *l* as:

$$SVM^{S}_{l,k} = \frac{Std(\beta^{S}_{l,k,t})_{l,k}}{\frac{1}{L^{k}}\sum_{j=1}^{L^{k}} Std(\beta^{S}_{j,k,t})_{j,k}}$$

where $\beta^{S}_{l,k,t}$ represents the respective sensitivity to factor *S* and L^{k} gives the number of manager-fund observations in the respective market segment *k*. We only keep those observations for which *SVM* was calculated from at least three yearly observations. As for the style extremity we also calculate an average measure of variability, *SVM*, across the three styles. Each manager-fund combination is a unit of observation in the regressions. In Panel A, we use the three style variability measures and the average style variability measure as dependent variables. Panel B reports regression results from different model specifications including control variables as well as segment fixed effects. The dependent variable in Panel B is the average style variability measure. The control variables are calculated as in Table 5. Robust p-values, presented in parentheses, are based on Rogers (1993) standard errors clustered by fund. ***, **, and * denote statistical significance at the 1%-, 5%-, and 10%-level, respectively.

Panel A: Style Variability and Two Business Degrees

Dependent variable:	*SVM*	*SVM(SMB)*	*SVM(HML)*	*SVM(MOM)*
MBA and CFA	-0.1126***	-0.1188***	-0.1221***	-0.0967**
	(0.002)	(0.004)	(0.004)	(0.027)
Constant	1.0466***	1.0492***	1.0505***	1.0400***
	(<0.001)	(<0.001)	(<0.001)	(<0.001)
Observations	824	824	824	824
R^2	1.20%	1.00%	1.00%	0.60%

Panel B: Style Variability, Two Business Degrees, and Controls

Dependent variable:	*SVM*			
Model #:	(1)	(2)	(3)	(4)
MBA and CFA	-0.1244***	-0.1536***	-0.1477***	-0.1854***
	(0.001)	(0.005)	(0.001)	(0.005)
Ln(Size)	-0.0349***	-0.0374**	-0.0280**	-0.0327
	(0.002)	(0.020)	(0.033)	(0.100)
Expense Ratio	0.2017***	0.2363***	0.2294***	0.2534***
	(<0.001)	(<0.001)	(<0.001)	(0.002)
Fund Age	0.0024	0.0013	0.0028	0.0004
	(0.128)	(0.396)	(0.245)	(0.844)
Other Master	-0.0204	-0.0823	-0.0340	-0.0875
	(0.672)	(0.270)	(0.550)	(0.320)
PhD	-0.0125	-0.0594	-0.0174	-0.0835
	(0.885)	(0.622)	(0.906)	(0.643)
Female	-0.1620***	-0.0709	-0.1589***	-0.0482
	(0.001)	(0.440)	(0.007)	(0.690)
Industry Tenure	0.0065**	0.0038	0.0001	-0.0054
	(0.039)	(0.395)	(0.974)	(0.311)
Manager Age			0.0057**	0.0106**
			(0.045)	(0.013)
Top MBA School		-0.0018		0.0307
		(0.970)		(0.609)
Constant	0.8652***	0.9256***	0.5767***	0.4823**
	(<0.001)	(<0.001)	(<0.001)	(0.048)
Observations	816	407	547	288
R^2	8.80%	13.20%	11.00%	15.70%

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