CFA, MBA or Both: Further Evidence on Mutual Fund Performance

Yuhong Fan
Weber State University

M. Imtiaz Mazumder
St. Ambrose University

This study examines mutual fund performance by using a distinct method to identify and measure fund managers' educational and professional qualifications at a fund level irrespective of managerial turnover. Fund performance is measured by eight Morningstar variables which are more practitioner focused and easily accessible to investors. Empirical results document that funds with a higher intensity of managers' qualifications underperform. There is a statistically significant performance difference between managers with either a CFA designation or an MBA degree (or both) and managers without any of these attributes. Managers with an MBA degree perform moderately better than managers with a CFA designation. These findings are robust to fund sizes, fund styles, different performance metrics, and methodologies used.

INTRODUCTION

This paper reexamines the relationship between fund performance and intensity of managerial educational and professional qualifications by using a set of performance metrics as defined by Morningstar. Using a more recent (2009–2013) sample of 365 domestic equity mutual funds from USA, we offer further evidence on the attribution of mutual fund performance to managerial educational qualification (MBA – *Masters of Business Administration* is used as a proxy) and professional qualification (CFA – *Chartered Financial Analyst* is used as a proxy).

Our major contribution in this study is to offer a distinct method of measuring mutual fund managers' educational and professional qualifications. Most of the previous studies focus on using the SAT (Scholastic Aptitude Test) or GMAT (Graduate Management Admission Test) scores, length of tenure (e.g. age, job experiences), with or without a CFA designation, quality of MBA or undergraduate programs etc. to measure individual manager's educational and professional qualifications and backgrounds [for example, Shukla and Singh (1994), Golec (1996), Chevalier and Ellison (1999), Gottesman and Morey (2006), Switzer and Huang (2007), Dincer, Gregory-Allen, and Shawky (2010)]. Our objective is neither to contest how a proxy for educational or professional qualification is defined nor the methodological weaknesses of relevant literature but to extend the contents by examining managers' educational and professional qualifications at a fund level. Accordingly, we measure the qualification intensity of a mutual fund manager using variables like the percentage of CFA-month, the percentage of MBA-month, and the percentage of CFA&MBA-month to capture the fund level qualification attributes irrespective of managerial turnover. This measurement approach is very unique and has not appeared in other studies.

Second, we contribute to the current literature by using eight Morningstar defined mutual fund performance variables which are more practitioner-oriented and easily accessible to both individual and institutional investors. The 5-year performance metrics that we use from Morningstar include two return measurements (fund 5-year annualized return and 5-year annualized above-category return), two Morningstar defined performance measurements (fund 5-year Morningstar rating and 5-year Morningstar ranking), and four risk-adjusted return measurements (fund 5-year alpha, 5-year Sharpe ratio, 5-year Treynor ratio, and 5-year Sortino ratio). Alpha, Sharpe, and Treynor ratios are widely used performance metrics in finance literature but the simultaneous uses of 8 Morningstar defined performance variables are exceptional and add value to the current academic literature since these performance metrics are very easy to understand and calculate, readily available to both individual and institutional investors, and positioned towards practitioners. A large section of investment advisers, portfolio managers and mutual fund companies use Morningstar performance variables to market and promote their funds (Gerrans, 2006). Further, using these 8 Morningstar defined performance metrics makes this study distinct from most other relevant academic studies where multifactor models are used to measure a fund's abnormal performance [for example, Fama and French (1993), Carhart (1997), and Wagner & Winter (2013)].[1] The multifactor models capture various risk exposures of mutual funds and are popular in academic research to examine fund performance. As an alternative, we also segregate our empirical analysis in terms of fund sizes (large, mid, and small-cap) and fund styles (growth, blend, and value), which are considered as two major risk-exposures of equity mutual funds.

Third and finally, most of the pertinent studies on US-based mutual funds used a variety of pre-2008 samples but our 5-years of post-financial crisis sample (2009–2013) should be viewed as a continuous examination of prior studies and provide us with further evidences of the effects of managers' educational qualification and professional background on mutual fund performance. This is particularly interesting to unveil how the performance relationships, as noted in extant literature, have changed over time especially after the 2007–08 financial crisis.

Empirical results of this study document that more than 50% of sample funds, in general, are managed by managers with either a CFA designation or an MBA degree although the variations across fund sizes (large, mid, and small-cap) and styles (growth, blend, and value) are prevalent. However, the proportion of funds simultaneously managed by managers with both the CFA designation and MBA degree are lower than those managed by managers with either a CFA designation or an MBA degree. The 5-year annualized return measure and 5-year annualized above category return measure exhibit slightly higher returns (statistically not significant though) for funds managed by managers with either a CFA designation or an MBA degree (or both). The 5-year Morningstar ranking and 5-year Morningstar rating measures do not exhibit any significant performance differences for managers' educational and professional qualifications. In terms of risk-adjusted measures (the 5-year Alpha, 5-year Sharpe ratio, 5-year Treynor ratio, and 5-year Sortino ratio), there seems to be a significant shift in performance suggesting that fund managers with either a CFA designation or an MBA degree (or both) underperform. However, fund managers with an MBA degree slightly over-perform relative to fund managers with a CFA certification. These findings are robust to fund sizes (large, mid, and small-cap), fund styles (growth, blend, and value), different risk-adjusted performance measures and methodologies used.

The rest of this study is organized as follows. Section 2 presents the relevant literature. Section 3 presents the selection, construction and characteristics of sample funds and measurements of managers' educational and professional qualifications. Section 4 presents methodologies of fund performance measurements. Section 5 presents and clarifies empirical findings. Section 6 concludes the paper.

LITERATURE REVIEW

Extant literature examine the relationship between fund managers' educational qualification, training, job experience, professional background etc. and fund performance. However, the outcomes are mixed and whether the CFA designation is a decisive proxy for quality of management performance and investment return is questionable. The earliest literature by Shukla and Singh (1994) investigate 223

equity mutual funds' monthly return from July 1988 to December 1992 and document that funds managed by at least one or more CFA-designated manger are typically riskier but better diversified and outperform funds managed by a non-CFA charter-holder. However, the differential performances between fund managers with or without a CFA designation in diversified style categories are not always statistically significant. Moreover, both groups fail to outperform the S&P 500 index. Brockman and Brooks (1998), Hsiao and Lee (2005), Fortin and Michelson (2006), and Franco and Zhou (2009) also document that financial analysts with a CFA designation produce statistically significant higher abnormal returns than non-CFA analysts.

Golec (1996) examines whether the differential performances (returns and alpha), risks (systematic and unsystematic) and fees (management fees, expense ratio, and turnover) of mutual fund classes are explained by managers' age, educational background, training and experiences. Using a sample of 530 equity funds' returns (subject to survivorship biases) between 1988 and 1990, Golec (1996) finds that younger managers (<46 years) with an MBA degree and longer tenure at their funds (>7 years) exhibit better risk-adjusted performance.

Using a sample of 492 mutual fund managers between 1988 and 1994, Chevalier and Ellison (1999) examine the relationship between mutual fund performance and managers' educational attributes and professional backgrounds and document that managers with higher SAT scores in their undergraduate institutions have superior risk-adjusted excess returns. However, they do not find any significant performance differences in funds managed by managers with either an MBA or a non-MBA degree. Gottesman and Morey (2006) examine the relationship between mutual fund performance and a set of educational attributes of managers (e.g. quality of MBA program they attended, whether they hold a CFA designation or other graduate degrees such as PhD) for a sample of 518 funds during the period of 2000 – 2003 and find that the positive fund performance is significantly related to managers with higher GMAT scores. In addition, managers with an MBA degree from top 30-ranked business programs significantly outperform their counterparts. However, they find no statistically significant outperformance of fund managers with a CFA designation.

Switzer and Huang (2007) investigate whether the performance of small and mid-cap funds are related to managers' level of education (e.g. MBA) and professional training (e.g. CFA) and find that the CFA-managers outperform the non-CFA managers by approximately 58 basis points per year but the superior performance dissipate when fund performance is estimated jointly with risk, expense, and turnover. Dincer, Gregory-Allen, and Shawky (2010) examine the impact of managers' education (MBA, CFA etc.) and work/investment experiences on performance using a sample of equity funds between 2005 and 2007 but find no significant return differences for managers with or without MBA, CFA, and work experiences etc. However, they find significantly different portfolio risk attributes between managers with either CFAs or longer work experiences (who reduce risks) and managers with MBAs (who increase risks). These findings are robust irrespective of different portfolio performance measures [Benchmark adjusted return, Market adjusted return, Jensen (1968) single-factor model, Fama-French (1993) 3-factor model and Carhart (1997) 4-factor model etc.], portfolio risk measures (portfolio beta and tracking errors), bullish or bearish period, and with or without risk-controls. In a recent paper, Andreu and Puetz (2015) compare the performance, risk, and style of equity mutual fund managers with both the CFA designation and MBA degree to managers with only one of these qualifications for the period of 1996–2009 but find no statistically significant performance differences between both groups.

The relationship between fund performance and managerial educational traits is also mixed in other financial markets. Fang and Wang (2015) examine the performance of Chinese mutual funds and find that managers with either a CFA or an MBA qualification have greater excess returns and superior stock picking ability. Naidenova, Parshakov, Zavertiaeva, and Tome (2015) also find positive connection between performance of fund managers in Russia and their level of education. However, Gallagher (2003) find no linkage between the level of education and fund managers performance in Australian mutual fund industry. Li, Zhang, and Zhao (2011) find robust influence of managers' undergraduate educational qualifications (e.g. SAT scores) on hedge fund performances but find no significant return differences for managers with or without the CPA (Chartered Public Accountant), CFA and MBA etc.

Sample Selection and Characteristics

Sample mutual funds are identified and data are collected for this study through Morningstar Investment Research Center. We follow Fan (2018) and use several major criteria to construct the final sample, including, (i) all sample funds were incepted prior to 2009 and are actively traded through 2013, (ii) exclusion of institutional funds, index or enhanced index funds, socially conscious funds, and life cycle funds due to their typical differences from traditional equity funds, (iii) if a mutual fund family offers multiple share classes from the same fund with different fee and cost structures and characteristics, only one fund (typically Class A share) from the same offering is employed, (iv) in order to fairly compare funds with the same asset class holdings, international funds (i.e. funds with more than 5% of non US stock holdings) and bond funds are excluded since these funds might require different managerial skill-focus as opposed to the domestic equity funds. The final sample includes 365 domestic equity mutual funds for a 5-year period (2009 through 2013) with zero percent of bond holdings.

Survivorship bias may exist since funds liquidated before the end of 2013 are not included in our sample. However, the disappearance (survivorship bias) of some funds should not be a major concern since disappearing funds would likely be poor performing firms. With equity funds, the poor performance may be attributed to managers' poor security selection, market timing, and high fund expenses due to elevated costs incurred by both the poor management and excessive trading of underlying fund securities (Mazumder, Miller and Varela, 2010). If disappearing funds were managed by managers with either a CFA designation or an MBA degree (or both), one can question about the value of their educational qualifications/professional certifications and fund performances. However, if disappearing funds were managed by managers with none of the above qualifications, one can claim that the poor performance is predominantly attributed to the managers' poor educational background and professional qualification. However, this is inconclusive as we lack empirical evidences in support of this argument.

Morningstar discloses the managers' educational qualifications for each fund, for example, whether a manager holds an MBA degree or a CFA designation, and a manager's beginning and ending tenure time within a fund. We calculate the percentage of CFA-month, percentage of MBA-month, and percentage of CFA&MBA-month and use these as main variables to measure a fund's managerial education intensity. Accordingly, we identify that a fund with the 100% of CFA-month indicates that all managers of that fund during the sample period of 2009 to 2013 have a CFA designation. Similarly, a fund with the 100% of MBA-month implies that all managers of that fund have an MBA degree during the sample period. Likewise, if all managers of a fund during the sample period have both the CFA designation and MBA degree, its CFA&MBA-month would be 100%. This refers to the fact that the 100% CFA&MBA-month fund should also have 100% CFA-month and 100% MBA-month. The percentage of CFA-month, MBA-month and CFA&MBA-month are unique definitions and measures of managers' educational and professional qualifications but not used in previous studies.

The percentage (%) of CFA-month, MBA-month, and CFA&MBA-month are computed as follows: (i) % of CFA-month = Total month of managers with CFA designation/Total managers' month; (ii) % of MBA-month = Total month of managers with MBA degree/Total managers' month; (iii) % of CFA&MBA-month = Total month of managers with both CFA designation and MBA degree/Total managers' month. It should be mentioned here that the total managers' month is the sum of all working months for all managers during the sample period. The above definition and calculation can be better understood by an illustration. For example, a fund has two managers, the first manager possesses only a CFA designation and has worked for the 5-year sample period. The second manager has both the CFA designation and MBA degree but has worked only for last three years of the sample period. The total managers' month would be 60 months for the first manager plus 36 months for the second manager, which equals 96 months. The percentage of CFA-month for this fund would be 96 divided by 96, i.e. 100%. Similarly, the percentage of MBA-month would be 36 divided by 96, i.e. 37.5%; and the percentage of CFA&MBA-month would also be 36 divided by 96, i.e. 37.5%. If the second manager has neither a CFA designation nor an MBA degree, the percentage of CFA-month would be 60 divided by 96, i.e. 62.5% but both the percentage of MBA-month and percentage of CFA&MBA-month would be 0%.

A fund with the 100% CFA&MBA-month represents the highest level of educational and professional qualification intensity of fund managers. In contrast, a fund with any of the following attributes, the 0% CFA-month, or 0% MBA-month, or 0% CFA&MBA-month, represents the least possible managers' educational and professional qualification intensity. The major focus of this study is to reexamine if the intensity of managers' educational and professional qualifications has some sort of impacts on fund performance.

Table 1 summarizes the sample fund characteristics based on fund size and investment style. The sample has more large-cap and small-cap funds than mid-cap funds. Large-cap funds appear to have the lowest 5-year average expense ratio. As expected, the expense ratios are higher for both the small-cap and mid-cap funds irrespective of their styles. The 5-year average turnover ratio is computed by averaging the reported annual turnover ratio of sample funds between 2009 and 2013. The mean turnover ratio for the sample funds is 65.81%. However, both the small-cap growth and large-cap growth funds have relatively larger 5-year average turnover ratios (83.49% and 73.96%, respectively). The turnover ratios of value funds are relatively low. The low turnover ratio might explain the view that value funds like to follow a contrarian strategy that requires longer period to realize profit.

Table 1 also exhibits that the percentages of CFA-month are more than 50% for all categories of fund size and style except the large-cap blend and large-cap value funds. Mid-cap blend funds have the lowest percentage of MBA-month. The percentages of CFA&MBA-month for small-cap funds are significantly higher than those of large and mid-cap funds. Overall, both the CFA designation and MBA degree are very common across different fund categories, as documented by the percentages of CFA-month and percentages of MBA-month having been over 50%, in general.

Methods of Morningstar Performance Measurement

In this study, fund performance during the sample period of 2009–2013 is measured by eight variables obtained from Morningstar Investment Research Center database. The performance measurement metrics are listed below:

(1) *Fund 5-year annualized return*, which is the geometric mean of a fund's five annual net returns.

(2) *Fund 5-year annualized above-category return*, which is the 5-year annualized return difference between a fund and a portfolio of funds with similar investment objectives. In other words, it measures the excess return of a fund from its relevant benchmark portfolio return. Since it is a benchmark adjusted return, it can capture risks which might not be captured by the factor models (Livingston & Zhou, 2015). The positive or negative sign of this measure indicates outperformance or underperformance of a fund relative to its peers over a 5-year period. Morningstar states that a relative return, such as annualized above-category return, is useful because it compares a fund to an appropriate peer group but excludes performance factors that are generally beyond the control of a fund manager.

(3) *Fund 5-year Morningstar ranking*, as defined by a fund's total 5-year return percentile relative to a portfolio of funds in the same category. The highest (or most favorable) percentile rank is 1 and the lowest (or least favorable) percentile rank is 100. Thus, the top-performing fund in a category will always receive a rank of 1.

(4) *Fund 5-year Morningstar rating*, which is based on how well funds perform after adjusting for risks and sales charges with reference to comparable funds. The top 10% funds receive five-star rating and the bottom 10% receive one-star rating. The Morningstar fund rating (1 to 5 star) is labeled as one of the most popular and well known performance measure.

(5) *Fund 5-year Alpha*, which shows a fund's abnormal performance relative to the corresponding benchmark or market. Morningstar calculates each fund's Alpha by subtracting its expected return from actual return adjusted for beta (systematic risk). Therefore, a higher Alpha indicates a better fund performance after adjusting for market risk.

TABLE 1
CHARACTERISTICS OF SAMPLE FUNDS IN TERMS OF SIZES AND STYLES

Table 1 summarizes characteristics of sample funds. Column 1 shows the categories of sample funds. Morningstar classifies the sample funds by the *Size* or market capitalization (large, mid, and small-cap) and *Style* (growth, blend, and value). Column 2 exhibits the number of funds in each of the sub-categories. Column 3 through 8 document the 5-year average total net assets, 5-year expense ratio, 5-year turnover ratio, 5-year percent CFA–month, 5-year percent MBA–month, and 5-year percent CFA&MBA–month, respectively.

Size and Style of Sample Fund	Number of funds	5-year average total net assets (million $)		5-year expense ratio (%)		5-year turnover ratio (%)		5-year percent CFA–month		5-year percent MBA–month		5-year percent CFA&MBA–month	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
All	365	558	124	1.31	1.30	65.81	55.00	56.6%	56.8%	61.1%	64.8%	36.7%	31.2%
Large cap													
Blend	42	898	162	1.25	1.25	59.13	31.2	42.5%	47.0%	56.0%	56.6%	24.7%	0.0%
Growth	66	907	169	1.15	1.18	73.96	69	63.1%	87.0%	53.5%	50.0%	37.1%	32.5%
Value	34	271	123	1.17	1.17	51.09	45.7	46.7%	49.4%	68.1%	71.9%	30.0%	23.5%
Mid cap													
Blend	23	353	138	1.45	1.30	68.32	55	50.0%	50.0%	46.2%	50.0%	27.3%	0.0%
Growth	35	795	156	1.33	1.33	55.93	45.8	59.1%	61.2%	63.1%	75.0%	34.6%	27.9%
Value	21	508	58	1.35	1.31	60.37	62.4	52.7%	52.4%	59.9%	60.0%	28.4%	32.3%
Small cap													
Blend	45	315	113	1.40	1.40	62.17	49.6	60.0%	66.7%	64.0%	71.4%	42.9%	46.5%
Growth	60	346	88	1.45	1.37	83.49	74.5	61.6%	61.2%	64.8%	65.2%	44.9%	49.7%
Value	39	396	131	1.35	1.34	59.35	43.8	61.4%	65.5%	71.8%	71.4%	46.5%	43.8%

(6) *Fund 5-year Sharpe ratio*, which is a fund's annualized excess return divided by its annualized standard deviation within a 5-year sample period. It uses the excess return and standard deviation to determine reward per unit of risk. The higher the Sharpe ratio, the better the fund's historical risk-adjusted performance.[2]

(7) *Fund 5-year Treynor ratio*, which is a fund's annualized excess return divided by its beta (systematic risk) within a 5-year sample period. The Treynor ratio is a risk-adjusted measure similar to the Sharpe ratio but uses beta as a risk (volatility) measure. The higher the Treynor ratio, the better the fund's historical risk-adjusted performance.[3]

(8) *Fund 5-year Sortino ratio*, which is a fund's annualized excess return divided by its annualized downside standard deviation within a 5-year sample period. Downside standard deviation (also known as bad volatility) is caused by negative returns and is considered undesirable by investors. Unlike the Sharpe ratio which uses total standard deviation as a risk measure, the Sortino ratio can help investors to better assess risk by distinguishing volatility caused by unfavorable returns. Consequently, the higher the Sortino ratio, the better the fund's risk-adjusted performance.[4]

This study utilizes the first two variables, fund 5-year annualized return and fund 5-year annualized above-category return, as proxies for return measures. The next two variables, fund 5-year Morningstar ranking and fund 5-year Morningstar rating are widely accepted as Morningstar self-created measures for fund ranking and rating, respectively. Finally, the last four variables, fund 5-year Alpha, fund 5-year Sharpe ratio, fund 5-year Treynor ratio, and fund 5-year Sortino ratio, are used as proxies for risk-adjusted return measures.

The sample funds have an average Morningstar ranking and rating of 48.13% and 2.84, respectively suggesting that our sample is a very well-representative since a typical fund should have an average ranking of nearly 50% and an average rating close to 3. The sample funds have a 5-year annualized return of 19.67% as opposed to 17.94% market return (i.e. S&P 500) between 2009 and 2013, showing the emergence of a bullish US equity market after recovering from the pre-2008 financial crisis. Small-cap funds relatively perform better in terms of 5-year annualized returns than those of large and mid-cap funds. In terms of risk-adjusted performance measures, large-value funds outperform with better 5-year Alpha, Sharpe, Treynor and Sortino ratios relative to other categories of sample funds.

EMPIRICAL RESULTS

Fund performance is examined on the basis of percentage of managers' CFA-month, percentage of managers' MBA-month, and percentage of managers' CFA&MBA-month. Each of the three variables is further classified into four intensity levels of managers' educational and professional qualifications. For example, the CFA-month is classified as (i) funds with the 0% of managers' CFA-month, (ii) funds with more than the 0% but less than or equal to 50% of managers' CFA-month, (iii) funds with more than the 50% but less than 100% of managers' CFA-month, and (iv) funds with the 100% managers' CFA-month. Similarly, the MBA-month and CFA&MBA-month funds are divided into above four sub-categories based on the managers' professional and educational qualifications intensity. As stated before a 0% CFA-month fund indicates that the corresponding fund has no manager at all with a CFA designation during the sample period. Similarly, a 100% CFA-month fund indicates that all managers of the corresponding fund have a CFA designation throughout the sample period. Likewise, a 100% CFA&MBA-month fund indicates that all managers of the respective fund have both the CFA designation and MBA degree for the 5-year sample period. Although the four levels from 0% to 100% are arbitrarily chosen but represent funds from the least to the highest intensity of managers' educational and professional qualifications, respectively. As a result, one would expect better performance of managers with higher intensity of educational and professional qualifications.

TABLE 2
FUND PERFORMANCE SORTED BY THE PERCENTAGE OF MANAGER'S CFA-MONTH, MBA-MONTH, AND CFA&MBA-MONTH

Table 2 exhibits fund performance on the basis of the percentage of managers' CFA-month, percentage of MBA-month, and percentage of CFA&MBA-month, respectively. Column 1 lists four sub-categories of the CFA-month, MBA-month and CFA&MBA-month funds. For example, the CFA-month funds are divided into funds with 0% of managers' CFA-month, more than 0% but less than or equal to 50% of managers' CFA-month, more than 50% but less than 100% of managers' CFA-month, and 100% of managers' CFA-month, respectively. The MBA-month and CFA&MBA-month funds are also divided accordingly. The four levels from 0% to 100% represent funds from the least intensity of managers' educational and professional qualifications to the highest intensity of managers' educational and professional qualifications. Column 2 shows the number of funds. Column 3 through 10 document eight performance metrics as defined by Morningstar. Column 11 through 13 exhibit the 5-year expense ratio, 5-year average total net assets and 5-year turnover ratio, respectively.

	Number of funds	5-year annualized return (%)	5-year annualized return above category (%)	5-year Morningstar ranking (%)	5-year Morningstar rating (Out of 5 stars)	5-year Alpha	5-year Sharpe ratio	5-year Treynor ratio	5-year Sortino ratio	5-year Expense ratio (%)	5-year average total net assets (Million $)	5-year turnover ratio (%)
CFA-month												
CFA = 0	76	19.0%	-0.18	49.3	2.74	-1.70	1.03	14.71	1.80	1.38	1051	52.6
0<CFA≤50%	88	20.0%	0.42	47.8	2.97	-1.69	1.03	14.50	1.78	1.31	268	65.6
50%<CFA<100%	83	19.7%	0.24	48.8	2.87	-2.12	1.00	14.14	1.72	1.26	324	76.8
CFA = 100%	118	19.8%	0.03	47.3	2.80	-2.37	0.99	13.74	1.69	1.31	622	66.7
MBA-month												
MBA = 0	53	19.5%	-0.03	48.2	2.77	-2.05	1.01	14.31	1.74	1.40	366.9	65.5
0<MBA≤50%	92	19.6%	0.17	46.8	2.96	-1.62	1.04	14.54	1.81	1.28	442.0	55.6
50%<MBA<100%	113	19.8%	0.07	49.7	2.83	-1.97	1.01	14.37	1.74	1.31	415.8	69.8
MBA = 100%	107	19.7%	0.22	47.6	2.79	-2.37	0.98	13.74	1.68	1.30	903.8	70.5
CFA&MBA-month												
CFA&MBA = 0	126	19.3%	0.01	48.1	2.79	-1.84	1.03	14.51	1.77	1.33	775.1	61.2
0<CFA&MBA≤50%	123	19.8%	0.22	48.6	2.91	-1.78	1.02	14.34	1.78	1.29	354.9	61.7
50%<CFA&MBA<100%	69	19.6%	0.20	48.9	2.88	-2.36	0.98	13.97	1.68	1.33	300.1	83.4
CFA&MBA = 100%	47	20.3%	0.08	45.9	2.74	-2.56	0.96	13.46	1.64	1.32	888.8	63.3

Table 2 shows that there are 118 funds with the 100% CFA-month, while there are 76 funds with the 0% CFA-month. There are 107 funds with the 100% MBA-month but only 53 funds with the 0% MBA-month. However, the number of funds with all managers having both the CFA designation and MBA degree is only 47. These findings suggest that managers with either a CFA designation or an MBA degree are popular and desirable in the mutual fund industry. However, fund managers with both the CFA designation and MBA degree are not the majority. One remarkable phenomenon is that the number of 5-year total net assets is extremely larger for the 0% CFA-month funds ($1,051 million) than those of other categories of CFA-month fund. This might indicate that managers without a CFA designation are probably more senior folks and already have a long history of building up their clientele. Golec (1996) also find that managers' tenure appear to be the most statistically significant predictor of fund performance but not the educational background or training. This might also explain the possession of higher total net assets by managers with longer tenure. The expense ratios are slightly higher for the 0% CFA-month and 0% MBA-month funds. In contrast, the turnover ratio is the lowest for 0% CFA-month (52.6%) but highest for the 50% to 100% CFA&MBA-month (83.4%) funds. This suggests that the turnover is positively related to the intensity level of a managers' educational and professional qualification.

Table 2 also documents that the 5-year annualized returns are very similar among all categories of CFA-month, MBA-month, and CFA&MBA-month funds. The double digit return represents the five years of bullish US stock market immediately after the 2007–08 financial crisis. The annualized return difference between the highest return funds (CFA&MBA = 100%) and the lowest return funds (CFA = 0%) is only 1.3% but statistically insignificant. However, funds with the 0% CFA-month and 0% MBA-month appear to have the negative 5-year annualized above category returns (-0.18% and -0.03%, respectively), suggesting that both groups (i.e. CFA = 0% and MBA = 0%) slightly underperform relative to their peers. Funds with the CFA-month between more than 0% and less or equal to 50% have the highest 5-year annualized above category return (0.42%). The 5-year Morningstar rankings do not exhibit any clear patterns to distinguish significant variations among the sample fund categories. The 100% CFA&MBA-month funds have the lowest Morningstar ranking (45.9 – the lower the ranking, the better the performance) but also have the lowest Morningstar rating (2.74).

For risk-adjusted fund performance measures, the pattern is relatively clear. The higher the intensity of fund managers' educational and professional qualifications, the worse the fund performances. Funds with the 100% CFA-month, 100% MBA-month, and 100% CFA&MBA-month all have one of the worst risk-adjusted performance as shown by the 5-year Alpha, 5-year Sharpe ratio, 5-year Treynor ratio, and 5-year Sortino ratio. However, these ratios are relatively better for different sub-categories of non-100% CFA-month, non-100% MBA-month, and non-100% CFA&MBA-month funds. This suggests that fund managers without either a CFA designation or an MBA degree (or both) outperform fund managers with any of these qualifications, on aggregate.

Further, we investigate the relationship between the intensity of managers' educational and professional qualifications and fund performance by implementing regression analysis where each of the eight performance measures is used as a dependent variable and the percentage of CFA-month, percentage of MBA-month, and percentage of CFA&MBA-month funds are used as independent variables. Table 3 documents fund performance with the percentage of CFA-month and MBA-month funds as independent variables and Table 4 shows fund performance with the percentage of CFA&MBA-month funds as an independent variable. The control variables included in each of the regression equation are the following: (1) natural logarithm of 5-year average fund Total Net Assets (TNA), (2) 5-year average fund expense ratio, and (3) 5-year average fund turnover ratio. We include only the most commonly used control variables in regression equations since our objective is not to predict the performance but to illustrate it. The regression results in Table 3 and Table 4 are based on the following equation (1) and equation (2), respectively.

$$5\text{-}year\ Performance_i = \alpha + \beta_1[Percentage\ of\ CFA\text{-}month_i] + \beta_2[Percentage\ of\ MBA\text{-}month_i] + \beta_3[Ln(5\text{-}year\ TNA_i)] + \beta_4[5\text{-}year\ Expense\ Ratio_i] + \beta_5[5\text{-}year\ Turnover_i] + \varepsilon_i \qquad (1)$$

$$5\text{-}year\ Performance_i = \alpha + \beta_1[Percentage\ of\ CFA\&MBA\text{-}month_i] + \beta_2[Ln(5\text{-}year\ TNA_i)] + \beta_3[5\text{-}year\ Expense\ Ratio_i] + \beta_4[5\text{-}year\ Turnover_i] + \varepsilon_i \qquad (2)$$

A positive (negative) coefficient of an independent variable would indicate that it increases (decreases) fund performance for a dependent variable except Morningstar ranking (because the higher the Morningstar ranking, the worse the fund performance). The goal of our regression analysis it to explain but not to predict the fund performance

Regression results of Table 3 and Table 4 document similar patterns of fund performances as described before in Table 2 i.e. the intensity of managers' educational and professional qualifications appear to be negatively correlated to the risk-adjusted performance measures, in general. Most of the coefficients for raw returns (e.g. 5 year annualized returns) seem to be positive but none of these is statistically significant. However, most of the estimated coefficients for Morningstar rating and 4 risk-adjusted returns are negative and many of these are statistically significant. For example, regression coefficients of the percentage of CFA-month funds are negative irrespective of any of the four risk-adjusted performance measures (5-year Alpha, 5-year Sharpe ratio, 5-year Treynor ratio, and 5-year Sortino ratio) and statistically significant at 1% level. The R-squared values of the regression for risk-adjusted returns are relatively higher than those for raw returns, Morningstar ranking, and rating. The coefficients of the percentage of MBA-month funds are also negative for all four risk-adjusted performance measures but statistically significant only in two out of four regressions (Sharpe ratio and Sortino ratio). Overall, the negative impact of fund performance (as measured by the regression coefficients) is more pronounced for the percentage of CFA-month funds than the percentage of MBA-month funds. Similarly, the coefficients of the percentage of CFA&MBA-month funds are negative for all four risk-adjusted performance measures and statistically significant. This suggests that fund managers with an MBA degree have slightly better skills than managers with a CFA designation.5

Table 3 and Table 4 also report the regression results of three control variables. The size of total net assets under management has a positive impact on fund performance, in general, irrespective of the CFA, MBA, and CFA&MBA-month funds, though most of these are statistically insignificant. The expense ratios exhibit significantly negative impacts on performance, in general, irrespective of the CFA, MBA, and CFA&MBA-month funds. However, the findings for turnover ratios are mixed and mostly insignificant.6

We then use the standard dummy variable in our regression model (equation 3) to examine whether a fund with exclusively 100% CFA-month managers performs significantly different from a fund with exclusively 0% CFA-month managers. In equation 3, D_i represents a dummy variable which equals to 1 for a fund with exclusively 100% CFA-month managers and 0 for a fund with exclusively 0% CFA-month managers. A positive (negative) coefficient of dummy variable in regression equation (3) suggests a better (worse) performance for fund managers with a CFA designation. We also use the similar control variables in equation (3): (1) natural logarithm of 5-year average fund total net assets, (2) 5-year average fund expense ratio, and (3) 5-year average fund turnover ratio

$$5\text{-}year\ Performance_i = \alpha + \beta_1 D_i + \beta_2[Ln(5\text{-}year\ TNA_i)] + \beta_3[5\text{-}year\ Expense\ Ratio_i] + \beta_4[5\text{-}year\ Turnover_i] + \varepsilon_i \qquad (3)$$

The dummy variable regression results of equation (3) are reported in Table 5 for sample funds with 100% vs. 0% CFA-month managers. In terms of raw returns (5-year annualized return, 5-year annualized above category return, 5-year Morningstar Ranking, and 5-year Morningstar Rating), it appears that the funds with 100% CFA-month managers perform better than those with 0% CFA-month managers (most of these are statistically insignificant though). However, the coefficients of all of the four risk-adjusted

performance metrics (5-year Alpha, 5-year Sharpe ratio, 5-year Treynor ratio, and 5-year Sortino ratio) are negative and statistically significant in 3 out of the 4 cases. Overall, these findings suggest that the funds with 100% CFA-month managers underperform on a risk-adjusted return basis.

Further we replicate the dummy variable regression equation (3) to examine the differential performances between 100% and 0% MBA-month managers and between 100% and 0% CFA&MBA-month managers, respectively. The results for sample funds with 100% vs. 0% MBA-month managers are reported in Table 6 and for sample funds with 100% vs. 0% CFA&MBA-month managers are reported in Table 7. The results in Table 6 and Table 7 are qualitatively similar to the results reported in Table 5. In general, the results of Table 5, Table 6 and Table 7 suggest that the risk-adjusted returns of the 100% CFA, 100% MBA, and 100% CFA&MBA-month fund managers are negative and significantly different from their 0% counterparts. Table 5, Table 6 and Table 7 also report the coefficients of three control variables where the results are qualitatively very similar to those previously reported in Table 3 and Table 4, respectively.[7]

TABLE 3
REGRESSION RESULTS WITH THE PERCENTAGE OF MANAGERS' CFA-MONTH AND MBA-MONTH AS INDEPENDENT VARIABLES

Table 3 shows regression coefficients (equation 1) of fund performance for the CFA-month fund managers and MBA-month fund managers. Column 1 exhibits each of the independent variables and R-squared values of the regressions, respectively. Column 2 through 9 exhibit each of the eight dependent variables. t-values are in parenthesis.

Independent Variables (Regression Coefficients)	5-year annualized return[a]	5-year annualized return above category	5-year Morningstar ranking	5-year Morningstar rating	5-year Alpha	5-year Sharpe ratio	5-year Treynor ratio	5-year Sortino ratio
Percent CFA- month (β_1)	5.25	-0.17	-0.56	-0.05	-0.82	-0.05	-1.00	-0.11
	(1.13)	(-0.62)	(-1.13)	(-0.38)	(-2.67)***	(-2.77)***	(-2.97)***	(-2.72)***
Percent MBA- month (β_2)	1.68	0.2	0.488	-0.07	-0.32	-0.04	-0.49	-0.08
	(0.33)	(0.66)	(0.23)	(-0.49)	(-0.96)	(-1.76)*	(-1.34)	(-1.68)*
LOG total net assets (β_3)	2.44	0.04	-1.04	0.05	0.03	.003	0.07	0.01
	(2.17)**	(0.66)	(-2.19)**	(1.35)	(0.46)	(0.57)	(0.88)	(0.54)
Expense ratio (β_4)	6.73	-1.55	4.69	-0.7	-2.25	-0.17	-2.07	-0.33
	(1.22)	(-4.68)***	(2.00)**	(-4.26)***	(-6.15)***	(-7.28)***	(-5.15)***	(-6.61)***
Turnover ratio[a] (β_5)	0.01	3.38	-16.92	0.84	-3.42	-0.31	-4.12	-0.76
	(0.28)	(1.59)	(-1.13)	(0.79)	(-1.46)	(-2.06)**	(-1.60)	(-2.37)**
R-squared value (%)	1.7	8.8	4.7	8.6	15.8	21.3	14.1	19.2

[a] The coefficient is multiplied by 1000 for scaling purpose

***significant at 0.01 level
**significant at 0.05 level
*significant at 0.10 level

TABLE 4
REGRESSION RESULTS WITH THE PERCENTAGE OF MANAGERS' CFA&MBA-MONTH AS INDEPENDENT VARIABLE

Table 4 shows regression coefficients (equation 2) of fund performance for the CFA&MBA-month fund managers. Column 1 exhibits each of the independent variables & R-squared values of the regressions, respectively. Column 2 through 9 exhibit each of the dependent variables. t-values are in parenthesis.

Independent Variables (Regression Coefficients)	5-year annualized return[a]	5-year annualized return above category	5-year Morningstar ranking	5-year Morningstar rating	5-year Alpha	5-year Sharpe ratio	5-year Treynor ratio	5-year Sortino ratio
Percent CFA&MBA- month (β_1)	5.54	-0.03	-0.86	-0.03	-0.74	-0.06	-0.94	-0.13
	(1.12)	(-0.09)	(-0.41)	(-0.21)	(-2.24)**	(-2.97)***	(-2.59)**	(-2.84)***
LOG total net assets (β_2)	2.46	0.05	-1.05	0.05	0.03	0.003	0.07	0.005
	(2.19)**	(0.67)	(-2.20)**	(1.36)	(0.44)	(0.53)	(0.84)	(0.50)
Expense ratio (β_3)	6.20	-1.54	4.7	-0.69	-2.16	-0.16	-1.95	-0.32
	(1.13)	(-4.68)***	(2.02)**	(-4.23)***	(-5.91)***	(-7.01)***	(-4.86)***	(-6.35)***
Turnover ratio[a] (β_4)	2.46	3.35	-16.72	0.77	-3.93	-0.34	-4.79	-0.83
	(2.19)**	(1.59)	(-1.12)	(0.73)	(-1.68)*	(-2.31)**	(-1.86*)	(-2.62)***
R-squared value (%)	1.6	8.6	4.7	8.5	14.8	20.5	12.9	18.4

[a] The coefficient is multiplied by 1000 for scaling purpose

***significant at 0.01 level
**significant at 0.05 level
*significant at 0.10 level

TABLE 5
REGRESSION RESULTS WITH THE PERCENTAGE OF MANAGERS' CFA-MONTH AS A DUMMY VARIABLE

Table 5 shows regression results of fund performance for the CFA-month managers where % of CFA-month is used as a dummy variable (i.e. 1 for the 100% CFA-month managers and 0 for the 0% CFA-month managers). Column 1 exhibits each of the independent variables and R-squared values of the regressions, respectively. Column 2 through 9 exhibit each of the dependent variables. t-values are in parenthesis.

Independent Variables (Regression Coefficients)	5-year annualized return[a]	5-year annualized return above category	5-year Morningstar ranking	5-year Morningstar rating	5-year Alpha	5-year Sharpe ratio	5-year Treynor ratio	5-year Sortino ratio
Percent CFA month Dummy (β_1)	9.30 (1.85)*	0.07 (0.22)	-1.78 (-0.87)	0.05 (0.31)	-0.79 (-2.26)**	-0.16 (-1.50)	-1.60 (-2.98)**	-0.12 (-2.41)**
LOG total net assets (β_2)	1.60 (1.10)	0.11 (1.26)	-1.16 (-1.97)**	0.02 (0.44)	0.06 (0.56)	0.02 (0.66)	0.05 (0.31)	0.01 (0.98)
Expense ratio (β_3)	5.34 (0.82)	-1.44 (-3.60)***	3.40 (1.29)	-0.62 (-3.02)***	-2.42 (-5.40)***	-0.49 (-3.50)***	-2.70 (-3.90)***	-0.32 (-5.01)***
Turnover ratio[a] (β_4)	-0.06 (-1.17)	1.44 (0.48)	7.06 (0.35)	0.15 (0.10)	-5.10 (-1.50)	-1.17 (-1.10)	-7.48 (-1.43)	-0.74 (-1.55)
R-squared value (%)	3.0	12.0	6.2	7.2	21.9	11.6	15.5	21.6

[a] The coefficient is multiplied by 1000 for scaling purpose

***significant at 0.01 level
**significant at 0.05 level
*significant at 0.10 level

TABLE 6
REGRESSION RESULTS WITH THE PERCENTAGE OF MANAGERS' MBA-MONTH AS A DUMMY VARIABLE

Table 6 shows regression results of fund performance for the MBA-month managers where % of MBA-month is used a dummy variable (i.e. 1 for the 100% MBA-month manager and 0 for the 0% MBA-month managers). Column 1 exhibits each of the independent variables and R-squared values of the regressions, respectively. Column 2 through 9 exhibit each of the dependent variables. t-values are in parenthesis.

Independent Variables (Regression Coefficients)	5-year annualized return[a]	5-year annualized return above category	5-year Morningstar ranking	5-year Morningstar rating	5-year Alpha	5-year Sharpe ratio	5-year Treynor ratio	5-year Sortino ratio
Percent MBA month Dummy (β_1)	2.39 (0.41)	0.09 (0.24)	0.17 (0.07)	-0.08 (-0.43)	-0.51 (-1.28)	-0.04 (-1.70)*	-0.74 (-1.75)*	-0.09 (-1.66)*
LOG total net assets (β_2)	2.03 (1.19)	0.06 (0.58)	-1.03 (-1.46)	0.05 (1.03)	0.01 (0.10)	0.002 (0.30)	0.03 (0.25)	0.002 (0.19)
Expense ratio (β_3)	5.87 (0.75)	-1.32 (-2.80)***	4.87 (1.49)	-0.74 (-3.09)***	-1.96 (-3.64)***	-0.14 (-4.25)***	-1.74 (-3.07)***	-0.28 (-4.02)***
Turnover ratio[a] (β_4)	-0.006 (-0.11)	4.09 (1.38)	-10.45 (-0.51)	0.71 (0.47)	-4.10 (-1.21)	-0.29 (-1.34)	4.38 (1.23)	-0.69 (-1.55)
R-squared value (%)	1.1	9.4	6.0	11.7	12.9	17.5	11.1	16.2

[a] The coefficient is multiplied by 1000 for scaling purpose

***significant at 0.01 level
**significant at 0.05 level
*significant at 0.10 level

TABLE 7
REGRESSION RESULTS WITH THE PERCENTAGE OF MANAGERS' CFA&MBA-MONTH AS A DUMMY VARIABLE

Table 7 shows regression results of fund performance for the CFA&MBA-month managers where % of CFA&MBA-month is used a dummy variable (i.e. 1 for the 100% CFA&MBA-month managers and 0 for the 0% CFA&MBA-month managers). Column 1 exhibits each of the independent variables and R-squared values of the regressions, respectively. Column 2 through 9 exhibit each of the dependent variables. t-values are in parenthesis.

Independent Variables (Regression Coefficients)	5-year annualized return[a]	5-year annualized return above category	5-year Morningstar ranking	5-year Morningstar rating	5-year Alpha	5-year Sharpe ratio	5-year Treynor ratio	5-year Sortino ratio
Percent CFA&MBA month Dummy (β_1)	9.70 (1.58)	0.09 (0.26)	-2.38 (-0.94)	-0.03 (-0.16)	-0.67 (-1.21)	-0.06 (-2.34)**	-1.01 (-2.22)**	-0.12 (-2.14)**
LOG total net assets (β_2)	2.01 (1.23)	0.19 (1.93)*	-1.19 (-1.76)*	0.10 (2.18)**	0.21 (1.40)	0.01 (1.77)*	0.18 (1.51)	0.03 (1.71)*
Expense ratio (β_3)	7.86 (1.00)	-1.05 (-2.28)**	4.07 (1.25)	-0.55 (-2.47)	-2.08 (-2.91)***	-0.14 (-4.01)***	-1.68 (-2.88)***	-0.27 (-3.68)***
Turnover ratio[a] (β_4)	-0.04 (-0.69)	3.38 (1.12)	-0.41 (-0.02)	0.084 (0.57)	-5.70 (-1.22)	-0.38 (-1.68)*	-6.42 (-1.68)*	-0.89 (-1.84)*
R-squared value (%)	2.8	10.1	5.8	11.8	12.7	21.8	15.2	19.9

[a] The coefficient is multiplied by 1000 for scaling purpose

***significant at 0.01 level
**significant at 0.05 level
*significant at 0.10 level

One possible explanation of our results is that fund managers with either a CFA designation or an MBA degree might like to pursue a riskier strategy than managers without any of these qualifications. The riskier strategy might increase a fund's net returns, but hurt the risk-adjusted fund performances. The second possible explanation may be attributed to the behavioral finance theories since our sample funds exhibit better performance in terms of net returns but worse performance in terms of risk-adjusted returns. Moskowitz (2000), Glode (2011), and Kosowski (2011) document that the risk-adjusted returns of mutual fund managers are worse in a bullish market. Fund managers tend to generate better performance (i.e. raw returns) in recessions because investors are willing to pay higher premiums for extra returns during bad times as their marginal utility of consumption is higher during poor economic/business conditions. Empirical results of this study are to some extent consistent with this notion since our sample (2009–2013) covers mostly the post-crisis bullish US markets.[8]

The superior performance as documented by fund managers with MBA degree over CFA designation implies that fund industry may hire more MBA managers down the road. This is consistent with the empirical findings and theoretical motivations of Golec (1996) and Gottesman and Morey (2006) on the outstanding knowledge, training, skills, and talent that MBA managers possess over CFA managers. The results of this paper may also have implications not only for the US-based mutual fund managers but also for the global fund industry since mixed-results are reported by Fang and Wang (2015), Naidenova, Parshakov, Zavertiaeva, and Tome (2015), Gallagher (2003), Li, Zhang, and Zhao (2011) etc. on the relationship between fund performance and managers' educational and professional qualifications for other security markets and countries.

CONCLUSION

This paper examines mutual fund performance on the basis of intensity of fund managers' educational qualifications (MBA as a proxy) and professional qualifications (CFA as a proxy). Several criteria are used to construct the final sample of 365 equity funds from the US-based mutual fund industry over a 5-year period (2009–2013). Fund performance is measured by eight Morningstar defined performance variables: (1) fund 5-year annualized return, (2) fund 5-year annualized above-category return, (3) fund 5-year Morningstar ranking, (4) fund 5-year Morningstar rating, (5) fund 5-year Alpha, (6) fund 5-year Sharpe ratio, (7) fund 5-year Treynor ratio, and (8) fund 5-year Sortino ratio. Our empirical results exhibit the well-documented underperformance of fund managers irrespective of managers' educational and professional qualifications. The most notable finding is that there is a statistically significant risk-adjusted return difference between fund managers with either a CFA designation, or an MBA degree, (or both) and fund managers without any of these qualifications. Our findings exhibit that fund managers with either a CFA designation or an MBA degree (or both) significantly underperform at least during the sample period of 2009 –2013. This is to some extent consistent with Chevalier and Ellison (1999) and Gottesman and Morey (2006) especially with respect to underperformance of fund managers with a CFA designation. Our result to some extent are also coherent with Dincer, Gregory-Allen, and Shawky (2010) and Andreu and Puetz (2015) especially with respect to the fact that fund managers especially with a CFA designation do not add value since they find no return differences between fund managers with and without a CFA certification. It would be interesting to examine whether a fund is a team-managed or individually managed and if that impacts the relationship between managerial qualifications and performances. However, this investigation is left for a possible future extension of this paper.

ENDNOTES

1. It should be noted here that Morningstar's Alpha is derived from the single factor model (market return as a risk factor) of Jensen (1968). Fama and French (1993) introduce a three-factor model that includes size (market capitalization) and valuation (market to book ratio) as risk factors along with market return. Carhart (1997) extends it to a four-factor model by adding momentum factor. Wagner and Winter (2013) further extend it to a six-factor model by adding liquidity risk and idiosyncratic risk.
2. Sharpe ratio = (Average return of the fund − Average return of the risk-free rate) / Standard deviation of the fund. The Sharpe ratio was introduced by Sharpe (1966).
3. Treynor ratio = (Average return of the fund − Average return of the risk-free rate) / Beta of the fund. The Treynor ratio was introduced by Treynor (1965).
4. Sortino ratio = (Average return of the fund − Average return of the risk-free rate) / Downside standard deviation of the fund. The Sortino ratio was introduced by Sortino and van deer Meer (1991).
5. Regression results between funds with 100% CFA-month managers and 100% MBA-month managers also reveal that the MBA managers have an edge over CFA managers in terms of risk-adjusted returns. The results are not reported to conserve space but available upon request.
6. Since the Pearson correlation between the percentage of CFA-month and percentage of MBA-month funds is only 0.157, we include both in equation 1 above (i.e. no multicollinearity problem). However, we also perform separate regressions using each of the three (i.e. percentage of CFA-month, percentage of MBA-month, and percentage of CFA&MBA-month funds) as an independent variable. Further, we use all of the three simultaneously as independent variables. However, the estimated coefficients and their level of significance are qualitatively similar to those reported in both Table 3 and Table 4. Again, these results are not reported to conserve space but available from the authors upon request.
7. We also conduct the empirics for equation 1 through 3 by controlling for fund sizes (large, mid, and small-caps) and styles (growth, blend, and value). It appears that the major results of this paper are still valid irrespective of fund sizes and styles. These findings are not reported to conserve space but available from the authors upon request.
8. It should be noted here that the relationship between fund performance during the bullish/bearish market and fund managers with or without a CFA designation/MBA degree is inconclusive since mixed results are reported by Chevalier and Ellison (1999), and Dincer, Gregory-Allen, and Shawky (2010).

REFERENCES

Andreu, L. & Puetz, A. (2015). Choosing two business degrees versus choosing one: What does it tell about mutual fund managers' investment behavior? *Working Paper*, University of Cologne, Germany.

Brockman, C. M. & Brooks, R. (1998). The CFA charter: Adding value to the market. *Financial Analysts Journal*, 54(6), 81–85.

Carhart, M. M. (1997). On persistence in mutual fund performance. *Journal of Finance*, 52(1), 57–82.

Chevalier, J. & Ellison, G. (1999). Are some mutual fund managers better than others? Cross-sectional patterns in behavior and performance. *Journal of Finance*, 54(3), 875–899.

Dincer, O., Gregory-Allen, R. B. & Shawky, H. A. (2010). Are you smarter than a CFA'er? Manager qualifications and portfolio performance. *Working Paper*, University of Illinois, USA.

Fama, E. F. & French, K. R. (1993). Common risk factors in the returns on stocks and bonds, *Journal of Financial Economics*, 33(1), 3–56.

Fan, Y. (2018). Position adjusted turnover ratio and mutual fund performance. *Studies in Economics and Finance,* Forthcoming.

Fang, Y. & Wang, H. (2015). Fund manager characteristics and performance. *Investment Analysts Journal*,44(1), 102–116.

Fortin, R. & Michelson, S. (2006). The earnings forecast accuracy of financial analysts who are CFA charterholders. *Journal of Investing*, 15(3), 19–24.

Franco, G. D. & Zhou, Y. (2009). The performance of analysts with a CFA designation: The role of human-capital and signaling theories. *The Accounting Review*, 84(2), 383–404.

Gallagher, D. R. (2003). Investment manager characteristics, strategy, top management changes and fund performance. *Accounting and Finance*, 43(3), 283-309.

Gerrans, P. (2006). Morningstar ratings and future performance. *Accounting and Finance*, 46(4), 605–628.

Glode, V. (2011). Why mutual funds underperform? *Journal of Financial Economics*, 99(3), 546-559.

Golec, J. H. (1996). The effects of mutual fund managers' characteristics on their portfolio performance, risk and fees. *Financial Services Review*, 5(2), 133–147.

Gottesman, A. A. & Morey, M. R. (2006). Manager education and mutual fund performance. *Journal of Empirical Finance*, 13(2), 145–182.

Hsiao, P. & Lee, W. Y. (2005). CFA designation, geographical location and analyst performance. In *Advances in Quantitative Analysis of Finance and Accounting* by Cheng-Few Lee (ed.), Vol. 2, World Scientific Publishing, USA, 205–218.

Jensen, M. C. (1968). The performance of mutual funds in the period 1945–1964. *Journal of Finance*, 23(2),389–416.

Kosowski, R. (2011). Do mutual funds perform when it matters most to investors? US mutual fund performance and risk in recessions and expansions. *Quarterly Journal of Finance*, 1(3), 607–664.

Li, H., Zhang, X. & Zhao, R. (2011). Investing in talents: Manager characteristics and hedge fund performances. *Journal of Financial and Quantitative Analysis*, 46(1), 59–82.

Livingston, M. & Zhou, L. (2015). Brokerage commissions and mutual fund performance. *Journal of Financial Research*, 38(3), 283–303.

Mazumder, M. I., Miller, E. M. & Varela, O. A. (2010). Market timing the trading of international mutual funds: Weekend, weekday and serial correlation strategies. *Journal of Business Finance and Accounting*, 37(7/8), 979–1007.

Moskowitz, T. J. (2000). Mutual fund performance: An empirical decomposition into stock-picking talent,style, transaction costs, and expenses: Discussion. *Journal of Finance*, 55(4), 1695–1703.

Naidenova, I., Parshakov, P., Zavertiaeva, M. & Tome, E. (2015). Look for people, not for alpha: Mutual funds success and managers intellectual capital. *Measuring Business Excellence*, 19(4), 57–71.

Sharpe, W. F. (1966). Mutual fund performance. *Journal of Business*, 39(1, part II), 119–138.

Shukla, R. & Singh, S. (1994). Are CFA charterholders better equity fund managers? *Financial Analysts Journal*, 50(6), 68–74.

Sortino, F. A. & Meer, R. V. D. (1991). Downside risk. *Journal of Portfolio Management*, 17(4), 27–31.

Treynor, J. L. (1965). How to rate management of investment funds. *Harvard Business Review*, 43(1), 63–75.

Switzer, L. N. and Huang, Y. (2007). How does human capital affect the performance of small and mid -cap mutual funds? *Journal of Intellectual Capital*, 8(4), 666–681.

Wagner, N. & Winter, E. (2013). A new family of equity style indices and mutual fund performance: Do liquidity and idiosyncratic risk matter? *Journal of Empirical Finance*, 21, 69–85.