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The performance of long-serving fund managers

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Abstract

Apparently *"there is no substitute for experience"*. This and similar phrases are often heard in the worlds of politics, business, sport and others. It is the sort of proposition that makes sense to people. However, while the performance of actively managed funds has attracted a great deal of attention in the past, the performance of managers with long track records has attracted relatively little. In this paper we focus on managers with track records of at least ten years, that is, managers that have been the sole manager of a fund for at least a decade. We find that the average, net of fee, risk-adjusted performance of these managers over the ten years of our sample is attractive compared to similar values calculated for wider samples of the manager population. However, this result may be a reflection of survivorship bias, since we find little evidence of performance persistence from year to year among these managers, and evidence to suggest that risk-adjusted performance over the ten year sample period declined. However, for those investors that would still prefer to invest with an experienced fund manager, the disaggregated analysis in this paper reveals certain key traits that are related to positive risk-adjusted performance of long-serving managers, such as relatively low fund fees, more concentrated portfolios and a small cap style bias.

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1. Introduction

The vast majority of papers that have focussed on fund performance have used fund level data[2]. In other words, they examine the performance of funds rather than the performance of fund managers. But over any sample period more than one manager may have been responsible for the management of that fund, particularly as the sample period increases. Some researchers have analysed fund performance by augmenting their analysis with fund characteristics that are often found to have an impact on risk-adjusted returns. For example, some researchers have looked at: the impact on performance of fund fees (see Elton, et al (2003)); the location of the manager relative to the assets being managed (see Shukla and Inwegen (1995), or Otten and Bams (2007)); the flows of money into and out of funds (see Sirri and Tufano (1998)); and the status of the fund within the fund group, or 'family' offered by the asset management company (see for example Gaspar et al (2006)).

However, far fewer papers have attempted to understand the relationship between risk-adjusted performance on the one hand and the characteristics of the manager on the other. Arguably the main reason for the relative paucity of such research, relative to the more abundant fund level performance analysis, is the availability of a consistent set of data that captures manager characteristics relating, for example, to gender and education. However, a growing body of research has attempted to enhance mutual fund performance analysis with information about the fund manager – what might be referred to as fund manager level research. Chevalier and Ellison (1999) find evidence to suggest that fund performance is positively correlated with manager education and that older managers tended to underperform. Bliss and Potter (2002) find that female managers of both US and international equity mutual funds tended to achieve higher raw returns than their male

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[2] See Cuthbertson et al (2008) for a survey of the fund management performance literature.

colleagues. Baks (2003) tracks managers as they move between funds, and concludes that the fund typically has a greater influence on future performance than the manager. Atkinson et al (2003) find that there is no significant performance difference between male and female managers, while Niessen and Ruenzi (2007) find that although female and male managers do not differ in average performance, female managers receive significantly lower inflows.

In this paper we also focus on a manager level characteristic that we can refer to as experience. We focus on this characteristic because apparently "*there is no substitute for experience*". This and similar phrases are often heard in the worlds of politics, business, sport and others. It is the sort of proposition that makes sense to people, but relatively few papers have shone the spotlight on the role of experience as a manager "characteristic". Porter and Trifts (1998) however, focus on the role that experience plays in manager performance. Using Morningstar data spanning the period from 1986 to 1995, the researchers examine the performance of 93 "experienced" fund managers, that is, managers that had managed the same fund for at least ten years. Funds that were "team managed" were excluded from the analysis. The mean tenure of this set of fund managers was found to be 17.4 years. Using annual fund manager performance rankings the researchers find little evidence of performance persistence amongst these managers, including no evidence that performance over the first five years of the sample was in any way predictive of performance over the last five years of the sample.

Using the sample period from 1986 to 1995 Costa and Porter (2003) examine the performance of 112 managers with at least ten years' experience of managing the same fund. To investigate the impact of experience they estimate a factor model of returns for each fund in the sample, which includes a zero-one dummy variable that takes the value of one when a

manager's experience is greater than ten years. The authors find no significant evidence of additional alpha from the experienced fund managers and, additionally, little evidence of short-term performance persistence.

Porter and Trifts (2012) find even less encouraging results with regard to the performance of long-serving managers. The researchers examine the performance 6,645 funds and 10,605 managers from fund inception up until Dec 2008. This sample included 289 managers of 355 actively managed funds with at least a ten year tenure, having a mean tenure 14.5 years. They calculate risk-adjusted returns against the broadly diversified CRSP index, and also using the Carhart four-factor model. Using this extensive dataset, they find an inverse relationship between tenure and performance, that is, a decline in performance as managers become more experienced. They also find evidence to suggest that managers earn their reputations by outperforming early on in their careers thus helping to extend those careers despite less than impressive subsequent performance. In a more recent paper, and using a similarly extensive database, Porter and Trifts (2014) also found no evidence of performance persistence amongst long-serving managers and instead came to the conclusion that the key to a successful career in fund management had much more to do with avoiding underperformance rather than generating outperformance. Thus they find evidence in support of the fund manager strategy of "benchmark hugging".

The rest of this paper is organised as follows: in section 2 we present the data; in Section 3 we discuss the results of preliminary analysis of the data; we present the results of tests of performance persistence and of regression analysis in Section 4; while we close the paper with a summary in Section 5.

2. Data

To investigate the performance and characteristics of long-serving fund managers the research began by identifying all of those US active managers of US equity portfolios contained in the Morningstar database that had a tenure in excess of ten years as at December 2014, and that are the named, single manager of the fund. The related funds managed by these managers were also identified. Using this information, which comprised 357 unique manager/fund observations in total, we then constructed the base data set that consisted of: performance-related fund data along with other information about the funds; and a second set of data that was focussed on the fund manager and their characteristics. Although the Morningstar database has a fairly comprehensive set of biographies for managers, from which important features of the manager's background can be abstracted, some biographies were either missing, or embodied relatively little detail. In those instances where key details on the manager's gender and educational background were missing, a web-based search was conducted using the manager's name and fund manager's employer. In all cases it was possible to find the missing details using this technique.

2.1 Manager level data

Using a combination of the text-based Morningstar manager biographies and the biographical information garnered from the web, it was possible to build a database comprising each manager's gender and educational background. The database contains information on the manager's undergraduate degree type – BA or BS; the manager's undergraduate major – for example, Economics, Finance, etc; which university the manager attended; whether the manager held a Master's degree, an MBA or a PhD; whether the manager is CFA[3] qualified;

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[3]Shulka and Singh (1994) examine the impact on fund performance of having at least one manager of a fund as a CFA holder. Although they find evidence of superior performance from those funds where a CFA holder plays a part in managing the portfolio, the results are difficult to interpret because they cannot separate the impact of the others managing the fund. In our paper we focus on funds managed by a single named manager.

and the manager's gender; and finally the manager's tenure as at December 2014. Although this is a rich database, unfortunately it was not possible to find a reliable source to identify the ages of the managers.

2.2 Fund level data

For each of the 357 funds in the sample we collected the end month net of fee, total returns for that fund from January 2005 to December 2014. To calculate the total return on a fund in each month, Morningstar takes the change in the net asset value (NAV) of the month, reinvesting all income and capital gains distributions over the course of the month, and then divides this by the fund's NAV at the start of the month. The total returns are net of management, administrative, 12b-1 fees and other costs. For each fund we also collected: monthly information on fund assets; data on the total assets of the fund management group; data on the number of holdings in each fund; the fund's management fee as a % of AUM; and the fee income generated by each fund.

Using the monthly returns on each fund we calculate risk-adjusted performance by subtracting the monthly return on the fund's stated 'primary' benchmark using Morningstar. Given that the performance-related element of a fund manager's remuneration is nearly always based upon the performance of their fund relative to the performance of their fund's stated benchmark, this is arguably the most appropriate way of risk-adjusting the manager's performance. Other researchers, including Angelidis *et al* (2013), Cremers *et al* (2012) and Agyei-Ampomah *et al* (2015) all argue that it is more appropriate to use the financial market benchmark against which the manager is judged as a way of risk-adjusting returns. Indeed, these authors argue that it is inappropriate to judge managers using factor models, where these factors are essentially arbitrage portfolios that, when we take account of shorting

restrictions, transactions costs and in particular the costs associated with shorting even very large stocks, are uninvestible. These factor models are still valuable in understanding performance, but as benchmarks they cannot be replicated and do not represent the opportunity sets available to fund managers.

3. Data analysis

3.1 Manager characteristics

Table 1 presents the set of manager characteristics. The first row of Panel A in this table shows that the average manager tenure of this set of managers are 16 years, the shortest tenure is ten years – by construction. These are all certainly experienced fund managers. This row in the table also shows that just over 7% of the managers are female (a figure similar to that identified by other researchers that have sought to identify a relationship between gender and fund performance); 86.5% of the managers hold a BA undergraduate degree while 21.6% hold a BS – indicating that a small number have both a BA and BS. These long-serving managers studied a fairly diverse range of undergraduate subjects, however, 36.6% of the sample had a degree in either Economics or Finance. In a similar vein, the universities attended by the sample was fairly diverse and were largely US universities. However, given the status of the Ivy League universities in the US educational system (and because previous researchers have focussed on this aspect of manager educational background) we identified all those managers in the sample that had attended an Ivy League University. This group of managers made up 12.7% of the sample population. With regard to postgraduate education, while just over one in five of the managers hold a Masters' degree, two in five are MBA qualified, only 1.73% of the sample have a PhD. Finally, 41.8% of the sample held the CFA charter, essentially the industry standard qualification for asset management and analysis.

In section 4 we will use these characteristics to try and understand their impact on fund performance, and so for completeness the other rows in the table give the breakdown of manager characteristics for subsets of the managers. The second row in the table presents this break down for female fund managers. For example, the women managers in this sample have been manging their funds for an average of 14.8 years, and 52% of them hold the CFA charter, the highest proportion amongst any of the other sub-groups of manager. The table also shows that nearly 39% of MBA holders are also CFA holders.

3.2 Fund characteristics

Panel A of Table 2 presents some descriptive information about the funds managed by the long-serving managers. The arithmetic average fund size is just over $2.2bn, however the median fund size is $938m indicating that there are a small number of very large funds in this sample. Similarly, the arithmetic mean group assets is just under $145bn, while the median is $44bn. However, there is less variation when it comes to average holdings. The arithmetic average fund holdings is 78 stocks, compared with a median of 76. This fund characteristic indicates that the managers are far from being benchmark huggers given the number of stocks in the typical benchmarks, with the most common one being the S&P 500 Composite Index. Finally, the last two rows in Panel B of the table present information about the management fee as a percentage of AUM and in annual dollar terms. The average fixed fee is 0.75%, giving an arithmetic average annual income of just over $23m and a median of $9.6m per annum.

Panels B to I of Table 2 present the same statistics for subsets of the full sample. Each of these panels also offers additional information regarding the significance of any difference

between that sub-sample and the full sample. Column 2 presents the average difference between the full sample and the sub-sample; while column 3 presents a t-statistic for the significance of this difference. On the whole column 3 finds little significant variation in the characteristics – most of the t-values indicate that we should accept the null that there is no difference between the respective samples at conventional levels of statistical confidence. The main exception relates to the average number of stocks in the funds. On average, female fund managers, those educated at an Ivy League University, those that have an MBA and the sub-sample consisting of those with a CFA affiliation each manage portfolios with significantly higher stocks than the full sample comparator. Those with a BS, on average, manage portfolios with fewer stocks a result that the t-value of -2.41 indicates that the result is statistically significantly different.

3.3 Fund manager performance

Table 3 presents some basic information about the raw monthly fund returns and monthly returns in excess of the fund benchmark. Again Panel A presents the results for the full sample, while panels B to I present sub-sample results with differences in mean values along with a test for the significance of these mean differences.

Panel A shows that the average monthly net of fee return on the funds over this sample period was 0.79%, but that the net of fee return in excess of the benchmark averaged 0.04%, a figure that annualises to just under 0.50%pa. Compared with other studies in this area, this excess benchmark figure is high: almost 50bps a year, net of fees for ten years in excess of the benchmark. The benchmark-adjusted performance figures look impressive for this sample of managers, but of course there is an element of survivorship bias here. Presumably managers with a good track record are more likely to stay in their role than those with a poor one.

However, this average outperformance does not appear to be well defined given the relatively high standard deviation of these excess returns across managers. Furthermore, the final column in Table 3 reports the proportion of managers that have outperformed their benchmarks over the ten year period. We find that just over 60% of the managers outperform their benchmarks on a net of fee basis. Nevertheless, this figure suggests that choosing a manager with at least a ten year track record may be one way of identifying a manager that may perform well in the future.

The remaining panels in Table 3 show remarkably little variation in benchmark-adjusted performance across the different sub-samples. Perhaps the only exception to this uniformity is seen in Panel B where we find that the benchmark-adjusted performance for female managers averages -0.03% per month, or around -0.36%pa over the ten year sample period. The last column in Panel B shows that only 36% of female managers managed to outperform their benchmarks over this period. This average underperformance is however not found to be statistically significant.

3.3 Value and small cap exposures

In the regression analysis that we present in section 4.2 below we include the value and small cap coefficients generated from the Fama and French three factor model (see Fama and French, 1992, 1993). For each fund, over the full ten year period, we estimate the following familiar expression using OLS:

$$R_{it} - R_{ft} = \alpha_0 + \beta_1 ERM_t + \beta_2 HML_t + \beta_3 SMB_t + \varepsilon_{it} \qquad (1)$$

where R_{it} is the return on fund i at time t; R_{ft} represents the risk free rate, proxied by the monthly return on a 1 month US T-Bill; ERM, HML and SMB are the components of the three factor model, collected from the Kenneth French[4] website; α_0 is a constant; β_1, β_2 and β_3 are OLS coefficients that capture the relationship between the return on fund i in excess of the risk free rate; and ε_{it} is a white noise error term. Estimating this expression for each fund gives 357 estimates of the three betas, one set for each fund. We use the estimates of β_2 and β_3 in the regression analysis.

4.   Results

Despite the caveats, most notably that of survivorship bias, Table 3 appears to suggest that fund managers with at least ten years of experience might be able to generate positive, benchmark-adjusted returns for investors over time. In this section of the paper we delve a little deeper into the performance of these long-serving managers by undertaking some tests of performance persistence and also using regression analysis to try and identify the characteristics of successful long serving managers.

4.1 Performance persistence

To investigate the performance of these managers further we look at performance on an annual basis over the sample period and conduct some simple performance persistence experiments, using the benchmark-adjusted fund returns.

Panel A of Table 4 presents the average monthly, benchmark-adjusted returns for the managers for each year in the sample period, broken down into performance deciles. The annual benchmark-adjusted performance of each decile are also presented in this table. The

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[4] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/

top decile of funds produced benchmark-adjusted returns that ranged from 0.72% to 2.15% per month, while for the bottom decile of performers the range was -0.60% to -1.65%. The figures in bold in the table indicate where these benchmark-adjusted returns are significantly different from zero at at least the 95% level of confidence. Unsurprisingly, given the selection criteria, most of these decile returns, over most years, are highly significant. The penultimate row in Panel A labelled "1 minus 10" reports the difference between the average monthly benchmark adjusted returns produced by the top-performing decile of funds and the bottom-performing decile of funds for each year. This difference ranges from 1.32% to 3.71%. This is an enormous difference when annualised.

The last row in Panel A presents the average monthly returns, in excess of the benchmark on an annual basis. Recall that the average over the full ten years was 0.04% per month. This average is negative for six of the ten years in this sample, and perhaps more interestingly was negative over the last four years, essentially the post crisis period.

There is evidence then, that this the collective ability of these managers to outperform their benchmarks waned over this ten year period. It is possible that as these managers matured further that their appetite for risk declined, hence explaining the decline in benchmark-adjusted performance. To investigate this possibility we calculated the tracking error of each manager for every year in the sample. Figure 1 presents the average annual manager tracking errors. There is no obvious trend in average tracking error, although manager tracking error does rise during the crisis period, making it difficult to conclude that manager risk appetite declined over this period. Another explanation might relate to 'style drift' over this period. To investigate this possibility we estimated the FF three factor model, for each fund for each year in the sample. Figures 2A and 2B present the average SMB and HML coefficients

respectively on an annual basis. The evidence in Figure 2A suggests no obvious trend in average exposure to small cap relative to large cap stocks. However, Figure 2B does show a more pronounced trend with regard to average exposure to the high book-to-mark-value relative to low book-to-mark-value risk factor. There seems to have been an increasing exposure to "growth risk" at the expense of "value risk" over this period, and it is possible that this change drove the decline in average benchmark-adjusted performance.

Panel A of Table 4 does indicate that each year there was a set of managers that managed to produce high benchmark-adjusted returns. Panel B essentially presents a test of the hypothesis that investors can identify these high performing managers by observing their performance in year t, and investing with them over year t+1. In other words, the panel presents tests of manager performance persistence. The first column in Panel B of Table 4 shows the average benchmark-adjusted returns over 2006 for those funds sorted into their performance deciles based on their performance in 2005. The second column presents analogous results for 2007 where funds were sorted into deciles based upon their performance in 2006, and so on. The values in the first row of Panel B present the average benchmark-adjusted returns achieved by funds that were top decile performers in the previous year: in six of the nine years these averages are estimated to be negative, suggesting an absence of positive performance persistence. When we consider the performance of those funds that were in the bottom decile of performers in the previous year, we find positive alphas in seven of the nine years. Furthermore, none of these averages were found to be statistically significant at even the 90% level of confidence. The values in the row entitled "one minus ten" are much smaller than equivalent values in Panel A of the Table. Overall then, these results suggest little evidence of annual performance persistence. The final row of Panel B, which presents the correlation of fund returns from one year to the next, confirms

the lack of persistency amongst manager' returns over this period. These correlations range from 52% to -54%; for seven of the nine pairs of years the correlation coefficient is negative.

Taken together these results show first, that the performance of this set of managers deteriorated over the ten year sample period and that although their average performance over the ten year period was relatively good, from year to year there was little evidence of performance persistence.

4.2 Regression analysis

Having tested for performance persistence amongst this group of managers, we now take a more disaggregated approach to analysing the performance. More specifically, we use OLS regression techniques to try and establish whether the performance of the managers is related to either their personal or fund characteristics. To do this we estimate the following expression:

$$\widetilde{R_\iota} = \alpha + \sum_{j=1}^{k} \beta_k X_{ik} + \varepsilon_i \tag{2}$$

where $\widetilde{R_\iota}$ is the average monthly return over the ten year sample period on fund *i* in excess of the fund's benchmark; X_{ik} is manager *i*'s kth fund and personal 'characteristic'; β_k is an OLS coefficient which captures the sensitivity of average benchmark-adjusted performance with the kth manager characteristic; α is a constant; and ε_i is on OLS error term. We include the following continuous variables: the average holdings in the manager's portfolio (*Avehold*); the annual fund fee (*Fee*); the natural logarithm of the fund's AUM (*LAUM*) and the natural logarithm of the fund management groups' assets (LGROUP); the manager's tenure in excess of ten years (tenure); and the fund's value and size betas, β_2 and β_3, from expression 1, we denote these generated variables as *HML* and *SMB* respectively in the results for clarity. We

also, include a set of dummy variables to capture manager characteristics. The variable *F* takes the value 1 if the manager is a female, zero otherwise; the variable *Ecofin* takes the value 1 if the manager has studied either finance or economics as an undergraduate, zero otherwise; the variables *BS* and *BA* take the values of 1 if the manager's Bachelor's degree is a BS or a BA respectively, zero otherwise; the variable *Ivy* takes the value 1 if the manager has studied at an Ivy league university, zero otherwise; the variable *MBA* takes the value 1 if the manager has an MBA, zero otherwise; and finally the variable *CFA* takes the value 1 if the manager holds the CFA charter, zero otherwise.

Table 5 presents the results of estimating expression (2). We find a negative relation between benchmark-adjusted, net of fee returns and both average holdings (Avehold) and fund fees (Fee). The t-statistics for these two variables indicate that these relationships are highly significant. The results suggest that investors should, other things equal, pick funds where the manager holds fewer stocks on average and charges a lower fund fee. The coefficients on fund and group size (LAUM and LGROUP) are also found to be significant at conventional levels of confidence. However, the signs of the coefficients are different. We find a positive relationship between excess returns and fund size, but a negative relationship between excess returns and the size of group assets. This result may have implications for the "family fund" literature which seeks to establish whether there is a relationship between the status of a fund as part of the fund, or family group. Our result here suggests that larger funds in smaller fund groups tend to outperform smaller funds in larger fund groups. The coefficient on the variable Tenure is found to be negative, that is, as the tenure of the manager increases performance in excess of the benchmark declines. However, since the sample only includes those managers that have been in place for at least ten years it is not surprising that this variable is found to be insignificantly different from zero. Essentially

there is little cross-sectional variation in this variable. The coefficients on the two measure of manager style, HML and SMB, are both found to be significant. However, the coefficients have opposite signs. The coefficient on the measure of value bias, HML, indicates that this bias tended to subtract from performance against their benchmarks. By contrast, we find that those managers with a small cap bias in their portfolios, gauged by the SMB coefficient, tended to outperform their benchmarks.

Table 5 also presents the coefficients on the manager characteristics. The only dummy variable found to be statistically different from zero is the marker for gender. We find that the female managers in this group tended to underperform relative to their male peers. Although the remaining coefficients are not found to be statistically significant, one could be: 65% sure that having a degree in economics or finance might enhance returns; and 67.5% certain that a Bachelor of Science would enhance returns.

5. Summary and conclusions

In this paper we have examined the performance of US mutual fund industry's longest serving equity fund managers. As a group this set of managers produced a relatively impressive performance in excess of fees and their benchmarks of around 0.40% pa for ten years. This is relatively high compared with the findings of other studies, which often document negative values for average alphas (see for example Agyei-Ampomah et al (2015)) who use comparable benchmark-adjusted approach over a similar sample period). However, when we delve deeper into the performance of these long-serving fund managers we find a deterioration of excess performance over time and, in addition, little evidence to suggest that performance persists from one year to the next. However, for those investors that would still prefer to invest with an experienced fund manager than with an inexperienced one, our

disaggregated OLS analysis shows that there are certain traits to look out for in an experienced fund manager.   In particular we find that funds with: lower fees; that are comprised of fewer holdings; that are large relative to the size of the fund management company; that have a positive bias towards small stocks and a negative bias towards value stocks; and that are managed by a male fund manager – have tended to produce higher risk-adjusted returns over time.

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Table 1: Manager Characteristics

This Table presents the set of manager characteristics, based on a sample of 357 managers with at least a ten-year, track record as the manager of a single fund of US equities, identified using the Morningstar database. Tenure indicates the tenure of the manager (in years); female indicates the gender of the manager; BA and BS represent Bachelor of Arts and Bachelor of Science respectively; Eco/Fin indicates that the manager's undergraduate degree was either in Economics of Finance; Ivy indicates whether the manager went to an Ivy League University; Masters, MBA and PhD indicates that the manager has a Masters' degree, and MBA or PhD respectively; and CFA indicates whether the manager is a CFA charter holder.

	Tenure (yrs)	Female	BA	BS	Eco/Fin	Ivy	Masters	MBA	PhD	CFA
Full	16.3	7.2%	86.5%	21.6%	36.6%	12.7%	20.2%	41.8%	1.7%	41.8%
Female	14.8	100.0%	88.0%	16.0%	20.0%	24.0%	40.0%	40.0%	4.0%	52.0%
BA	16.3	7.3%	100.0%	19.0%	37.0%	14.0%	20.7%	48.3%	1.3%	37.0%
BS	15.0	5.3%	76.0%	100.0%	40.0%	9.3%	25.3%	52.0%	4.0%	46.7%
Eco/Fin	16.4	3.9%	87.4%	23.6%	100.0%	15.0%	26.8%	48.8%	2.4%	47.2%
Ivy	16.3	13.6%	95.5%	15.9%	43.2%	100.0%	6.8%	72.7%	4.5%	36.4%
Masters	16.2	14.3%	88.6%	27.1%	48.6%	4.3%	100.0%	28.6%	1.4%	44.3%
MBA	15.8	6.9%	100.0%	26.9%	42.8%	22.1%	13.8%	100.0%	1.4%	38.6%
PhD	18.18	14.3%	71.4%	42.9%	42.9%	42.9%	14.3%	28.6%	100.0%	28.6%
CFA	15.9	9.0%	76.6%	24.1%	41.4%	11.0%	21.4%	38.6%	1.4%	100.0%

Table 2: Fund Characteristics

This Table presents the fund characteristics of the 357 funds managed by managers with at least a ten-year, track record as the manager of a single fund of US equities, identified using the Morningstar database. Each panel presents descriptive statistics on: fund assets; group assets; the number of fund holdings; fund management fee as a proportion of AUM; and total fee income. These statistics are presented for each of the manager characteristics identified in Table 1 (with the exception of PhD), where: Female indicates the gender of the manager; BA and BS represent Bachelor of Arts and Bachelor of Science respectively; Eco/Fin indicates that the manager's undergraduate degree was either in Economics of Finance; Ivy indicates whether the manager went to an Ivy League University; Masters and MBA PhD indicates that the manager has a Masters' degree or MBA respectively; and CFA indicates whether the manager is a CFA charter holder. The column headed t-stat presents a t-statistic for a test of the difference between the sub-sample fund characteristic (Panels B to I) and the mean value presented in Panel A for the full sample.

	Mean	Mean Diff	t-stat	Median	St. Dev	Max	Min
A. Full							
Fund Assets ($mns)	2268	-		938	4631	48867	78
Group Assets ($mns)	144992	-		44434	278603	1564176	209
# of holdings	78	-		76	31	150	21
Man Fee (% AUM)	0.01	-		0.01	0.00	0.02	0.00
Fee income ($mns)	23.04	-		9.58	39.15	306.65	0.73
B. Female							
Fund Assets ($mns)	1444	-824		820	2194	11281	173
Group Assets ($mns)	105097	-39895		61163	131764	577205	4035
# of holdings	91	13	11.51	83	28	147	45
Man Fee (% AUM)	0.74%	-0.01%	-0.001	0.75%	0.16%	1.15%	0.40%
Fee income ($mns)	16.22	-6.82		9.06	20.75	98.37	1.63
C. BA							
Fund Assets ($mns)	2404	136		989	4911	48867	78
Group Assets ($mns)	136809	-8183		53222	255298	1564176	209
# of holdings	78	0	0.31	76	31	150	21
Man Fee (% AUM)	0.75%	0.00%	0.01	0.75%	0.21%	1.75%	0.30%
Fee income ($mns)	24.47	1.42		9.86	41.33	306.65	0.73
D. BS							
Fund Assets ($mns)	1,733	-535		1,181	1,979	12,809	130
Group Assets ($mns)	194,616	49,623		83,439	326,162	1,521,943	362
# of holdings	76	-2	-2.41	73	31	150	22
Man Fee (% AUM)	0.74%	-0.01%	-0.02	0.71%	0.20%	1.50%	0.35%
Fee income ($mns)	22.39	-0.65		9.90	31.83	173.54	1.38
E. Eco/Fin							
Fund Assets ($mns)	2175	-93		902	3968	35269	78
Group Assets ($mns)	133954	-11039		58646	235110	1521943	519
# of holdings	77	-1	-1.4	73	31	150	22
Man Fee (% AUM)	0.79%	0.04%	0.01	0.75%	0.22%	1.75%	0.31%
Fee income ($mns)	24.39	1.35		9.87	39.75	305.54	0.95

Table 2: Continued

This Table presents the fund characteristics of the 357 funds managed by managers with at least a ten-year, track record as the manager of a single fund of US equities, identified using the Morningstar database. Each panel presents descriptive statistics on: fund assets; group assets; the number of fund holdings; fund management fee as a proportion of AUM; and total fee income. These statistics are presented for each of the manager characteristics identified in Table 1 (with the exception of PhD), where: Female indicates the gender of the manager; BA and BS represent Bachelor of Arts and Bachelor of Science respectively; Eco/Fin indicates that the manager's undergraduate degree was either in Economics of Finance; Ivy indicates whether the manager went to an Ivy League University; Masters and MBA PhD indicates that the manager has a Masters' degree or MBA respectively; and CFA indicates whether the manager is a CFA charter holder. The column headed t-stat presents a t-statistic for a test of the difference between the sub-sample fund characteristic (Panels B to I) and the mean value presented in Panel A for the full sample.

	Mean	Mean Diff	t-stat	Median	St. Dev	Max	Min
F. Ivy League							
Fund Assets ($mns)	2358	90		1440	3297	17741	97
Group Assets ($mns)	94006	-50986		82592	112594	577205	645
# of holdings	89	11	11.31	93	34	147	22
Man Fee (% AUM)	0.72%	-0.03%	-0.04	0.74%	0.18%	1.15%	0.33%
Fee income ($mns)	23.78	0.74		13.87	32.18	144.06	1.47
G. Masters							
Fund Assets ($mns)	1771	-497		832	2237	11281	113
Group Assets ($mns)	78753	-66240		32992	187263	1521943	256
# of holdings	79	1	1.08	78	30	148	23
Man Fee (% AUM)	0.78%	0.03%	0.05	0.75%	0.16%	1.15%	0.30%
Fee income ($mns)	19.23	-3.81		7.97	24.65	98.37	0.73
H. MBA							
Fund Assets ($mns)	2476	208		1038	5602	48867	78
Group Assets ($mns)	133624	-11368		64519	239483	1521943	275
# of holdings	80	2	3.73	75	32	150	21
Man Fee (% AUM)	0.72%	-0.03%	-0.07	0.74%	0.18%	1.50%	0.31%
Fee income ($mns)	23.63	0.59		9.37	42.02	305.54	0.95
I. CFA							
Fund Assets ($mns)	2,182	-86		938	4,765	48,867	78
Group Assets ($mns)	123,677	-21,316		44,070	224,654	1,521,943	256
# of holdings	80	2	2.73	80	33	146	21
Man Fee (% AUM)	0.76%	0.01%	0.02	0.75%	0.22%	1.75%	0.32%
Fee income ($mns)	24.23	1.19		10.65	42.22	306.65	1.38

Table 3: Descriptive statistics for monthly raw and benchmark-adjusted returns

This Table presents performance statistics of the 357 funds managed by managers with at least a ten-year, track record as the manager of a single fund of US equities, identified using the Morningstar database. The returns are all net of fees. Each panel presents descriptive statistics for raw monthly returns (Returns) and for returns in excess of each funds' benchmark (Excess Returns), based on the manager characteristics presented in Table 1, where: Female indicates the gender of the manager; BA and BS represent Bachelor of Arts and Bachelor of Science respectively; Eco/Fin indicates that the manager's undergraduate degree was either in Economics of Finance; Ivy indicates whether the manager went to an Ivy League University; Masters and MBA PhD indicates that the manager has a Masters' degree or MBA respectively; and CFA indicates whether the manager is a CFA charter holder. The column headed t-stat presents a t-statistic for a test of the difference between the return produced by the manager sub-samples (Panels A to I) and the return produced by the full sample (Panel A).

	Mean	Mean Diff	t-stat	Median	St. Dev	Max	Min	% +ve
A. Full								
Returns	0.79%			0.80%	0.14%	1.35%	0.28%	
Excess Returns	0.04%			0.04%	0.16%	0.65%	-0.51%	60.5%
B. Women								
Returns	0.79%	-0.01%	-0.01	0.78%	0.18%	1.23%	0.39%	
Excess Returns	-0.03%	-0.08%	-0.09	-0.02%	0.18%	0.35%	-0.40%	36.0%
C. BA								
Returns	0.79%	0.00%	-0.01	0.80%	0.14%	1.35%	0.28%	
Excess Returns	0.04%	0.00%	-0.02	0.03%	0.16%	0.65%	-0.51%	59.0%
D. BS								
Returns	0.80%	0.00%	0.00	0.81%	0.14%	1.23%	0.52%	
Excess Returns	0.04%	0.00%	0.01	0.03%	0.17%	0.35%	-0.40%	61.3%
E. Eco/Fin								
Returns	0.78%	-0.01%	-0.03	0.81%	0.14%	1.04%	0.28%	
Excess Returns	0.04%	0.00%	0.00	0.05%	0.15%	0.41%	-0.51%	62.2%
F. Ivy League								
Returns	0.79%	-0.01%	-0.01	0.79%	0.13%	1.23%	0.48%	
Excess Returns	0.04%	-0.01%	-0.01	0.02%	0.13%	0.31%	-0.20%	54.6%
G. Masters								
Returns	0.79%	-0.01%	-0.01	0.79%	0.14%	1.05%	0.28%	
Excess Returns	0.01%	-0.03%	-0.05	0.01%	0.16%	0.35%	-0.51%	55.7%
H. MBA								
Returns	0.79%	0.00%	-0.01	0.81%	0.14%	1.23%	0.28%	
Excess Returns	0.05%	0.01%	0.02	0.04%	0.16%	0.41%	-0.51%	62.1%
I. CFA								
Returns	0.8%	0.0%	0.05	0.8%	0.1%	1.2%	0.5%	
Excess Returns	0.1%	0.0%	0.04	0.0%	0.2%	0.5%	-0.3%	62.1%

Table 4: Persistence of benchmark-adjusted returns

This Table presents average, net of fee returns for the 357 funds managed by managers with at least a ten-year, track record as the manager of a single fund of US equities, identified using the Morningstar database, where the sample has been split into ex post (Panel A) and ex ante (Panel B) performance deciles. The row entitled "1 Yr Correl" presents the correlation coefficient of the performance of each fund in year t, with its performance in year t+1.

Panel A: Average, benchmark-adjusted monthly returns, ex post decile ranking

Years	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Decile										
1	1.08%	1.14%	2.15%	1.36%	2.13%	1.31%	1.07%	0.72%	1.20%	0.97%
2	0.65%	0.44%	1.29%	0.81%	1.20%	0.76%	0.51%	0.24%	0.36%	0.31%
3	0.47%	0.23%	0.87%	0.59%	0.85%	0.46%	0.29%	0.12%	0.21%	0.10%
4	0.37%	0.08%	0.61%	0.30%	0.60%	0.24%	0.10%	0.05%	0.10%	-0.01%
5	0.26%	-0.04%	0.39%	0.09%	0.38%	0.07%	-0.03%	-0.02%	-0.02%	-0.11%
6	0.12%	-0.15%	0.19%	-0.09%	0.18%	-0.08%	-0.13%	-0.09%	-0.12%	-0.21%
7	0.01%	-0.27%	0.00%	-0.29%	0.02%	-0.21%	-0.27%	-0.17%	-0.25%	-0.32%
8	-0.10%	-0.45%	-0.21%	-0.55%	-0.14%	-0.33%	-0.40%	-0.26%	-0.38%	-0.42%
9	-0.27%	-0.70%	-0.58%	-0.89%	-0.47%	-0.58%	-0.58%	-0.38%	-0.60%	-0.57%
10	-1.20%	-1.23%	-1.57%	-1.55%	-0.99%	-1.08%	-1.13%	-0.60%	-1.65%	-1.12%
1 minus 10	2.28%	2.37%	3.71%	2.92%	3.12%	2.40%	2.20%	1.32%	2.85%	2.09%
Average	0.14%	-0.09%	0.31%	-0.02%	0.38%	0.06%	-0.06%	-0.04%	-0.12%	-0.14%

Panel B: Average, benchmark-adjusted monthly returns, ex ante decile ranking

Years	2006	2007	2008	2009	2010	2011	2012	2013	2014
Decile									
1	0.09%	-0.23%	-0.68%	-0.08%	0.76%	0.21%	-0.15%	0.12%	-0.58%
2	0.02%	-0.13%	-0.43%	-0.05%	0.52%	-0.28%	-0.14%	-0.02%	-0.35%
3	-0.10%	0.00%	-0.34%	0.16%	0.20%	-0.18%	-0.14%	-0.28%	-0.31%
4	-0.13%	0.14%	0.02%	0.19%	0.07%	-0.12%	-0.08%	-0.27%	-0.22%
5	-0.46%	0.18%	0.00%	0.28%	-0.01%	-0.19%	-0.10%	-0.03%	-0.17%
6	-0.19%	0.27%	0.17%	0.41%	0.00%	-0.09%	-0.04%	-0.26%	-0.16%
7	-0.06%	0.34%	0.17%	0.44%	-0.09%	-0.01%	0.00%	-0.11%	0.01%
8	-0.16%	0.59%	0.10%	0.68%	-0.10%	-0.14%	-0.01%	-0.04%	0.09%
9	-0.16%	0.68%	0.52%	0.51%	-0.37%	0.19%	-0.04%	-0.02%	-0.09%
10	0.21%	1.31%	0.25%	1.22%	-0.42%	0.04%	0.31%	-0.25%	0.39%
1 minus 10	-0.12%	-1.54%	-0.92%	-1.30%	1.18%	0.17%	-0.46%	0.37%	-0.98%
1Yr Correl	-14.9%	-45.3%	-32.0%	-44.4%	52.0%	-2.2%	-33.0%	10.2%	-54.2%

Table 5: Modelling benchmark-adjusted performance

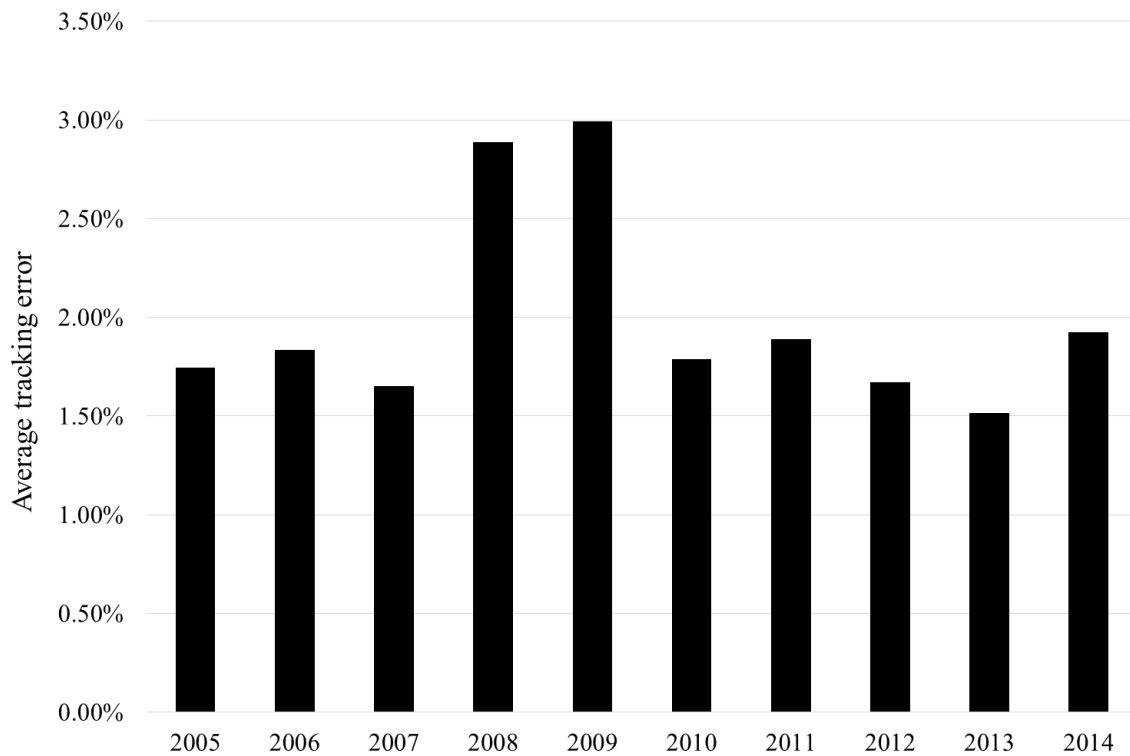This Table presents the results of OLS estimates of the following expression:

$$\widetilde{R}_\iota = \alpha + \sum_{j=1}^{k} \beta_k X_{ik} + \varepsilon_i$$

where $\widetilde{R}_\iota$ is the average return on fund i in excess of the fund's benchmark; X_{ik} is manager i's kth 'characteristic'; β_k is an OLS coefficient which captures the sensitivity of average benchmark-adjusted performance with the kth manager characteristic; α is a constant; and ε_i is on OLS error term. The following are continuous variables: the average holdings in the manager's portfolio, *AVEHOLD*; the annual fund fee, *FEE*; the natural logarithm of the fund's AUM, *LAUM* and the natural logarithm of the fund management groups' assets, *LGROUP*; the manager's tenure in excess of ten years, *TENURE*; and the fund's value and size betas *HML* and *SMB* estimated from expression 1 in the text. The following variables are included as zero-one dummies: *F* takes the value 1 if the manager is a female, zero otherwise; the variable *ECOFIN* takes the value 1 if the manager has studied either finance or economics as an undergraduate, zero otherwise; the variables *BS* and *BA* take the values of 1 if the manager's Bachelor's degree is a BS or a BA respectively, zero otherwise; the variable *IVY* takes the value 1 if the manager has studied at an Ivy League university, zero otherwise; the variable *MBA* takes the value 1 if the manager has an MBA, zero otherwise; and finally the variable *CFA* takes the value 1 if the manager holds the CFA charter, zero otherwise. The coefficients t-stats and probability values in bold indicate that the variable is significant at at least the 90% level of confidence.

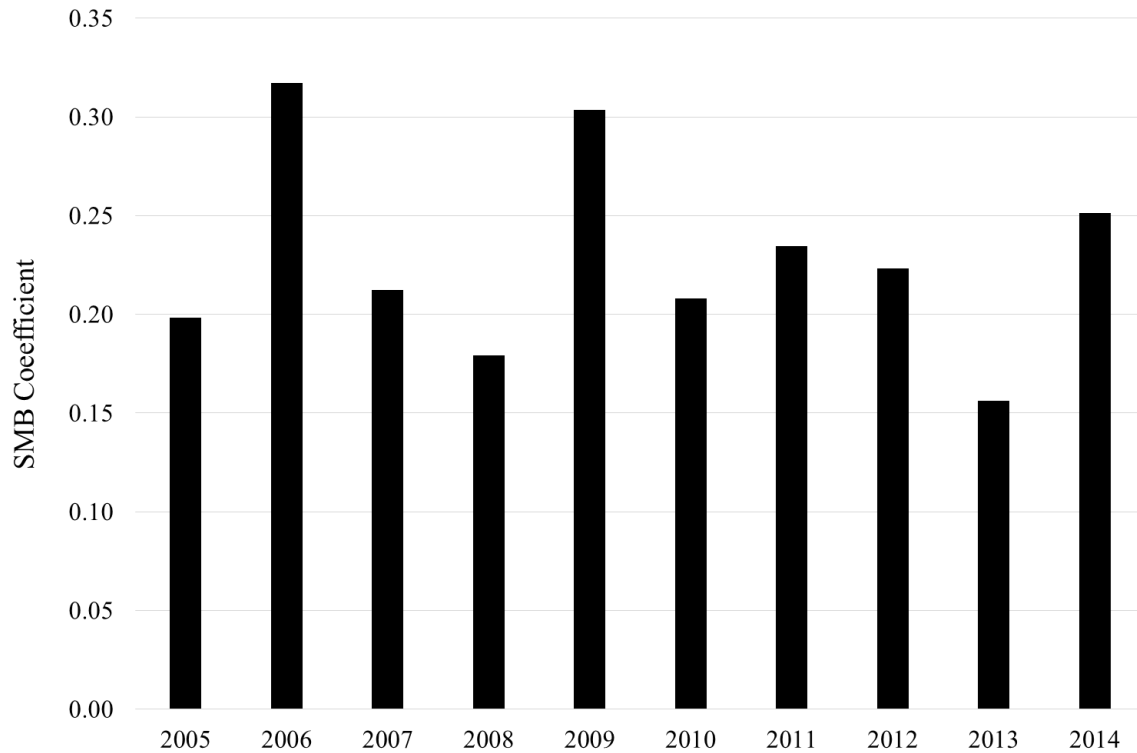| Variable	Coefficient	t-stat	Prob.
C	-0.0002	-0.33	74.2%
AVEHOLD	**0.0000**	**-3.44**	**0.1%**
FEE	**-0.1076**	**-2.70**	**0.7%**
LAUM	**0.0001**	**2.06**	**4.0%**
LGROUP	**-0.0001**	**-1.62**	**10.0%**
TENURE	0.0000	-0.62	53.8%
HML	**-0.0008**	**-2.12**	**3.5%**
SMB	**0.0015**	**6.39**	**0.0%**
F	**-0.0008**	**-1.92**	**5.6%**
ECOFIN	0.0002	0.92	35.6%
BS	0.0002	0.99	32.5%
BA	0.0000	0.17	86.8%
IVY	-0.0001	-0.35	73.0%
MBA	0.0001	0.30	76.6%
CFA	0.0001	0.66	50.9%
R-squared	14%	Mean dependent var	0.04%
Adjusted R-squared	11%	S.D. dependent var	0.16%
S.E. of regression	0.0015	Akaike info criterion	-10.09
Sum squared resid.	0.0008	Schwarz criterion	-9.93
Log likelihood	1832	Hannan-Quinn criterion	-10.03

Figure 1

This Figure presents the average, annual tracking error of the 357 funds managed by managers with at least a ten-year, track record as the manager of a single fund of US equities, identified using the Morningstar database. The returns needed to calculate this performance figure are all net of fees.

Figure 2A

Figures 2A and 2B present the average SMB (2A) and HML (2B) coefficients estimated using the Fama-French three factor model, on an annual basis for the 357 funds managed by managers with at least a ten-year, track record as the manager of a single fund of US equities, identified using the Morningstar database. The returns needed to calculate this performance figure are all net of fees.

Figure 2B