CMPO Working Paper Series No. 01/33

Fund Manager Performance of Segregated UK Pension Funds

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August 2001

Abstract

This paper examines the performance of fund managers responsible for managing the investment decisions of UK pension funds. The paper examines both individual fund manager performance of pension funds under management, and also the persistence of this performance over time. Previous work on UK pension funds has found little evidence of fund manager persistence, but we suggest that this might be due to survivorship bias which may disguise true persistence. Using a large sample of pension funds over the period 1983-97 we find evidence of positive and negative individual fund manager abnormal performance. Further we find strong evidence of persistence in abnormal returns over one year time horizons.

JEL Classification: G23
Keywords: pension funds, fund management, performance measurement.

Acknowledgements

The data used in this study was provided by CAPS Ltd, and we are grateful for the assistance of Alan Wilcock and Ian Ibbotson. This paper has benefited from comments made at seminars at University of Bristol, Financial Markets Group LSE, Lancaster University and Said Business School, Oxford.

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CMPO is funded by the Leverhulme Trust.

Non-technical summary

Do fund managers add value to the performance of the funds under their management? This is a general question in the context of delegated portfolio management, which we examine within the specific area of the investment decisions of pension funds. A number of recent policy documents in the UK have argued that pension contributions should be investing in tracker funds, on the basis that “there is little evidence that active fund management can deliver superior investment returns"

This paper challenges this conclusion by examining the performance of fund managers responsible for managing the investment decisions of UK pension funds, and finds evidence of both individual fund manager out-performance, and also the persistence of this performance over time.

Previous work on UK pension funds has found little evidence of fund manager persistence, but we suggest that this might be due to survivorship bias which may disguise true persistence. Using a large sample of pension funds over the period 1983-97 we calculate measures of abnormal returns to pension funds, and then examine whether thse abnormal returns are attributable to individual fund management houses. We report evidence of individual fund manager abnormal performance, and we further find strong evidence of persistence in abnormal returns to fund managers over one year time horizons.

I Introduction

Do fund managers add value to the performance of the funds under their management? This is a general question in the context of delegated portfolio management, which we examine within the specific area of the investment decisions of pension funds. Pension funds are major investors in financial markets, owning 35 per cent of UK corporate equity (Economic Trends, 1992). A number of recent policy documents in the UK have argued that pension contributions should be investing in tracker funds, on the basis that "there is little evidence that active fund management can deliver superior investment returns for the consumer"[1]. The purpose of this paper is to assess this claim making use of a large dataset on quarterly returns to UK pension funds, in which the fund manager managing the pension fund in each quarter is identified.

In the UK pension fund trustees typically delegate the management of the pension fund portfolio to fund managers. These fund managers may be in-house. employed directly by the pension fund, or the trustees may out-source the management of the fund to an fund management house. The pension funds in our sample are segregated funded occupational pension schemes. Occupational pension schemes are usually funded and require contributions throughout the employees working life. In a funded scheme an employee pays into a fund which accumulates over time, and then is allowed to draw on this fund in retirement. These schemes are provided by an employer and may pay on a defined benefit or a defined contribution basis. Defined benefit (or final salary) schemes offer a pension, guaranteed by the employer, usually defined in terms of some proportion of final year earnings, and are related to the number of years of employment. Defined contribution (or money purchase) schemes are always funded and convert the value of the pension fund at retirement into an annuity. The fund is administered by trustees, usually nominated by the employer, and the trustees, following advice from actuaries, decide whether to invest the assets of the fund in a pooled or segregated investment vehicle. In a pooled vehicle, the fund simple purchases units of a diversified investment from a financial institution such as an insurance company. In a segregated vehicle the trustees hire a fund manager (in-house or out-sourced) to make the investment decisions on behalf of the fund according to some specified mandate. The length of this contract is usually three years with the fund manager reporting back to the trustees on a quarterly basis. In fact Lakonishok, Shleifer and Vishney (1992) refer to this institutional set up as a double agency problem, since the employee, who will eventually become the recipient of the pension, is the principal but delegates pension fund decisions to the trustees who in turn delegates the investment allocation decisions to a fund manager.

[1] para. 420, p. 71 Office of Fair Trading (1997). See also Consumers' Association (1997); Department of Social Security (1998); Financial Services Agency (1999)

The objective of this paper is to analyse the performance and consistency of individual fund management houses who have been appointed as fund managers of occupational pension funds. Is it possible for a pension fund trustee to identify fund managers who systematically outperforms the benchmark?

The significance of this work for trustees and plan advisors is compelling. At the most fundamental asset allocation level, the conclusions of the analysis of the distribution of returns will aid trustees in their decision as to whether to invest their pension fund monies in an active or in a passive vehicle. In addition this analysis will provide an assessment of the ability of individual management houses to provide consistency in performance over a range of market conditions.

II Previous Evidence on Performance of Managed Funds

The early literature of the performance of mutual funds in the US [Jensen (1968)] found that simple tests of abnormal performance did not yield significant returns. More recent work by Daniel, Grinblatt, Titman and Wermers (1997) using normal portfolio analysis shows that mutual fund managers – in particular aggressive-growth funds, exhibit some selectivity ability but that funds exhibit no timing ability. They introduce measures that identifies if a manager can time the market, size, book to market, or momentum strategies. For the UK Blake and Timmermann (1997) examine the returns on 2300 UK open ended mutuals over 23 year period (1972- 1995) gross of fees. Over the period the data includes 973 dead and 1402 surviving funds, and by studying the termination of funds, they are able to shed light on the extent of survivorship bias. They find economically and statistically very significant underperformance that intensifies as the termination date approaches, and they conclude that survivorship does not alter the results significantly.

The evidence on the average performance of pension funds relative to external benchmarks has also been disappointing. Ippolito and Turner (1987) examined returns on 1,526 US pension funds and find underperformance relative to the S&P500 Index. Lakonishok, Shleifer and Vishney (1992) provide evidence on the structure and performance of the Money Management Industry in the US in general, but focus on the role of pension funds, examining 769 pension funds, with total assets of $129 billion at the end of 1989. They find the equity performance of funds under-performed the S&P 500 by 1.3% per year throughout the eighties. They emphasise that although there is a long literature on the under-performance

of mutual funds, pension funds also under-perform relative to mutual funds on average. Coggin, Fabozzi and Rahman (1993) investigate the investment performance of a random sample of 71 US equity pension fund managers for the period January 1983 through December 1990, and find that the average selectivity measure is positive and average timing ability is negative. Though both selectivity and timing are sensitive to the choice of benchmark when management style is taken into consideration. For example they find that funds that target value strategies yielded outperformance of 2.1 per cent per annum, but funds that adopted growth strategies underperformed by -0.96 per cent.

In the UK Blake, Lehmann, & Timmermann, (1999) examine the asset allocations of a sample of 364 UK pension funds who retained the same fund manager over the period 1986-1994. They find that the total return is dominated by asset allocation. Average return from stock selection is negative, and average return to market timing very negative. Although UK equity managers comparatively good at selecting equities – although only 16% of sample beat peer group average. Thomas and Tonks (2001) in a large sample of pension funds find little evidence of any abnormal performance, but find that pension funds seem to follow very similar investment strategies, so that identifying out-performance is difficult.

Although on average fund managers do not outperform, in any sample there is a distribution to the performance, and more recently research on performance measurement has investigated whether the outperformers in the sample continue to outperform in the future. Grinblatt and Titman (1992) find that differences in mutual fund performance between funds persist over 5-year time horizons and this persistence is consistent with the ability of fund managers to earn abnormal returns. Hendricks, Patel and Zeckhauser (1993) analysed the short-term relative performance of no-load, growth orientated mutual funds, and found the strongest evidence for persistence in a one year evaluation horizon. Malkiel (1995) however argues that survivorship bias is more critical than previous studies have suggested.[2] When an allowance is made for survivorship bias in aggregate, funds have underperformed benchmark portfolios both after management expenses and even gross of expenses. Further he finds that whilst considerable performance persistence existed in the 1970s, there was no consistency in fund returns in the 1980s. Brown and Goetzmann (1995) examine the performance persistence of US mutual funds and claim that the persistence is mostly due to funds that lag the S&P. They demonstrates that relative performance pattern depends on period observed and is correlated across managers, suggesting that that persistence is probably not due to individual managers – it is a group phenomenon, due to a common strategy that is not captured

[2] Malkiel points out that only the more successful mutual funds survive. Higher risk funds that fail tend to be merged into other products to hide their poor performance.

by standard stylistic categories or risk adjustment procedures. This is consistent with herding theories of behaviour (Grinblatt, Titman and Wermers, 1994). They suggest that the market fails to discipline underperformers, and their presence in the sample contributes to the documented persistence. Carhart (1997) demonstrates that common factors in stock returns and investment expenses explain persistence in equity mutual funds' mean and risk-adjusted returns. The only significant persistence not explained, is concentrated in strong underperformance by the worst return mutual funds. His results do not support the existence of skilled or informed mutual fund portfolio managers. Brown, Draper and McKenzie (1997) examine the consistency of UK Pension Fund Performance, and find limited evidence of persistency of performance for a small number of fund managers. Their sample consists of 232 funds 1981-90 and 409 funds 1986-92, and they construct their sample such of funds that retained a single fund manager. They find that this limited consistency holds over different time horizons, samples and classification schemes.

III Measuring Fund Performance

The method we use to assess fund manager performance is based on Jensen's technique. Rather than run time series regressions for each pension fund and average across funds, we run pooled regressions over time and across funds and managers, which identifies the contribution of individual funds and individual fund managers, to fund performance. If we denote R_{FPt} as the return on pension fund P managed by fund manager F in time period t, to identify out-performance we regress the excess returns above the risk free rate $R_{FPt} - r_{ft}$ against a three factor model. The standard three factors are the excess return on the market $R_{mt} - r_{ft}$, the returns on a size factor SMB_t which is the difference between the returns on a portfolio of small companies and a portfolio of large companies, and a book-to-market factor HML_t which is the difference in returns on a portfolio of high book-to-market companies and low book-to-market companies.

$$R_{FPt} - r_{ft} = \alpha + \beta_P (R_{mt} - r_{ft}) + \gamma_P SMB_t + \lambda_P HML_t + u_F + u_P + \varepsilon_{FPt} \qquad (1)$$

The error term in the expression is decomposed into a fund manager fixed effect u_F (pension fund specific u_P) and a standard error term ε_{FPt}. Under the null hypothesis of no-abnormal performance the α coefficient should be equal to zero, and there should be no fixed effects. To implement the test in equation *(1)*, we adopt a two stage procedure. In the first stage we specify that the fund must have at least twelve time-series observations, to produce meaningful coefficients. We run a time series regression of excess returns on each fund against the three factors, and save the pension fund specific parameters β_P, γ_P, and δ_P. This enables us to calculate the abnormal return on each fund, as the excess return minus the fitted

values of the three factors. In the second stage we regress the abnormal returns on a constant and on the pension fund and fund manager fixed effects.

Ferson and Schadt (1996) advocate allowing for the benchmark parameters to be conditioned on economic conditions: called conditional performance evaluation, on the basis that some market timing skills may be incorrectly credited to fund managers, when in fact they are using publicly available information to determine future market movements. In which case Ferson and Schadt argue that the predictable component of market movements should be removed in order to assess fund managers private market timing skills. Under a conditional version of the three-factor model, the Jensen regression becomes

$$R_{FPt} - r_{ft} = \alpha + \beta_P (Z_{t-1}) (R_{mt} - r_{ft}) + \gamma_P SMB_t + \lambda_P HML_t + u_F + u_P + \varepsilon_{FPt} \qquad (2)$$

where Z_{t-1} is a vector of instruments for the information available at time t (and is therefore specified as $t-1$) and $\beta_P(Z_t)$ are time conditional betas, and their functional form is specified as linear

$$\beta_P (Z_t) = b_0 + B'z_{t-1} \qquad (3)$$

where $z_{t-1} = Z_{t-1} - E(Z)$ is a vector of deviations of the Zs from their unconditional means. Implementing this approach involves creating interaction terms between the market returns and the instruments. The instruments used in this study are: lagged treasury bill rate, dividend yield, a default premium (the difference between low and high quality corporate bonds), and the slope of the term structure (the difference between long and short run government bond yields). To implement the conditional performance evaluation tests, we follow the same two step procedure outlined earlier, though we now require 20 time-series observations to produce meaningful coefficients. First for each fund we run a time series regression of excess returns against the three factors, with the interaction terms included, which enables us to calculate the abnormal return on each fund. In the second stage we regress the abnormal return on a constant and on the pension fund and fund manager fixed effects.

In addition to testing for evidence of fund manager out-performance, we are also interested in examining the consistency or persistence of fund manager performance. That is, rather than solely be concerned with whether a fund manager out-performs over a specified time-period, we wish to assess whether a fund manager who has performed well in one period can repeat this feat in subsequent periods. Our dataset consists of the returns on pension funds managed by fund managers, and so to assess the performance of a

specific fund manager we average abnormal returns across the funds under management to a particular fund manager. This averaging across pension funds is equally weighted, though it could be argued that fund managers put greater effort into managing larger funds. We have also examined value-weighted average returns, but the results are not greatly altered.

There are a number of tests for persistence, and recently Carpenter and Lynch (1999) have assessed the power of these difference tests particularly in the presence of different types of survivorship bias. Carpenter and Lynch classify persistence tests into two types: performance ranked portfolio strategies, and contingency tables.

Performance ranked portfolio tests sort fund manager each year into portfolios based on past performance. The measure that we use of fund manager performance is the average abnormal returns on the funds under management, where the abnormal returns from equation (1) are averaged over each fund and over each quarter in the ranking period. We then compute the equally weighted average portfolio abnormal return of the top and bottom portfolios over the subsequent evaluation period. We report the average abnormal returns AV5 and AV1 of the top and bottom portfolios in the evaluation period, averaged over all time periods. These procedures are followed for overlapping periods throughout the full period of the dataset, and we compute DIF as AV5-AV1, and then report TDIF, which is a t-statistic on DIF, which is calculated after allowing for the autocorrelation induced by the overlapping observations. From their simulations Carpenter and Lynch find that the that the persistence test based on TDIF is the best specified under the hypothesis of no persistence, and the most powerful against the alternatives considered.

In these persistency tests we examine alternative ranking and evaluation time periods, since it may be the case that persistency is only apparent at particular time intervals. For example to test for long run persistency 3YR3YE means we form portfolios on the basis of three-year ranking period and three year evaluation period. To test for short-run persistency, or the "hot-hands" phenomenon, we examine 1QR1QE, which means one quarter ranking and one quarter evaluation period.

Contingency tables classify funds as winners or losers in each of two consecutive time periods, and the numbers of winner-winner (WW), winner-loser (WL), loser-winner (LW), and loser-loser (LL) combinations are counted. We compute the following related statistics: a) Cross-product ratio CP = (WW x LL)/(WL x LW); b) Chi-Squared test with 1 d.o.f. where CHI = $\{(WW - N/4)^2 + (WL - N/4)^2 + (LW - N/4)^2 (LL - N/4)^2\}/N/4$; c) Percentage of repeat winners, PRW = WW/(N/2); and d) TCS is the t-statistic

for the slope coefficient in the cross-section OLS regression of evaluation period alphas on ranking period alphas. We may reject independence if CHI exceeds the critical value of 3.84 for a 5% test

IV Data

The data used in this study was provided by the Combined Actuarial Performance Services Ltd (CAPS). It consists of quarterly returns on UK equity portfolios of 2,175 UK pension funds from March 1983 to December 1997. Typically a UK pension fund will invest about 57% of assets in UK equities, so that our dataset consists of returns on the major asset class in which UK pension funds invest. In addition for each fund-quarter the manager of the fund and the size of the fund is provided. CAPS provide a performance measurement service for about half of all segregated pension fund schemes in the UK. There is one other major provider of pension fund performance: WM Ltd. The full dataset consists of a total of 59,509 observations on quarterly returns and fund size, and the maximum number of Quarters is 56.

Table 1, Panel A illustrates the Distribution of fund quarters over the dataset, and shows that 50 per cent funds have 24 or less observations, and the average life of a fund in the data is just less than seven years. This high attrition rate is partly explained by the closure of funds due to the sponsoring companies merging, or becoming insolvent, but the predominant reason is due to the fund switching to an alternative performance measurement service. As we have already mentioned there are two major performance measurement services in the UK: CAPS and WM, and pension funds will typically subscribe to one or other of these two services. When a pension fund changes fund manager, it may be that the fund manager has a preference to be assessed by one of these two measurement services. If the new fund manager has been appointed following a run of poor performance by the previous fund manager, and the new fund manager switches performance measurement services, there is a possibility of survivorship biases, which bedevils performance evaluation studies. However this switching between measurement services should be symmetric: so that although a pension fund may drop out of our dataset because of poor performance, there will be new entrants into our dataset as pension funds that have previously been assessed by the alternative measurement service, and changed fund manager because of poor performance, switch into the CAPS measurement service. In effect our sample loses pension funds due to poor performance, but they are replaced by poor performers from the alternative measurement service. Carhart (1997) draws a distinction between survivorship bias and look-ahead bias. True survivorship bias is a property of the sample selection method, and results from only including funds in a sample that survive until the end of the sample period. Look-ahead bias is a property of the test methodology, and results from imposing conditions on the funds in the sample to produce meaningful econometric results. In our study true survivorship problems should

not be a concern, since we have replacement of poorly performing funds with other poorly performing funds. However look-ahead bias will affect our results, and we will return to this point later

Panel B shows that the management of pension fund equity portfolios is relatively concentrated: There are a total of 189 different fund managers (including in-house managers), 2 per cent of fund managers manage only 17 quarters or less (across funds), and 50 per cent manage across 45 quarters or less. Since the average life of a fund is just under seven years (28 quarters), this implies that fifty per cent of fund managers in the dataset are managing only two funds. Panel C provides further evidence on the concentration of fund management. We have ranked the fund managers is terms of the number of fund-quarters under management. The top ranked fund manager[3] (1RMan) managers 10.8% of observations, the second ranked 2RMan managers 5.6% and 3RMan managers 4.8%, and another 14 fund managers (4RMan-18RMan) manage a total of 23.14% of observations. 1RMan manages across 244 funds, and 81.04% of these funds' observations are using 1RMan. There is also a multi-manager category and a change of manager category (Δman). Most funds use a single fund manager in any quarter, but 659 funds have multiple fund managers at some time, classified as fund manager category #2, and 29.07% of all observations have multiple fund managers. In the case of the multi-manager category we do not have information on the identity of the multiple managers, and further the definition of multiple fund manager has changed over time. Early in the sample, funds employed a number of general managers, whereas later in the sample, funds employed specialist managers. Only 85 funds use the same fund manager over the fund's life

Tables 2 provides descriptive statistics on the returns to, and the size of, the UK equity portfolios of the pension funds in our dataset. From Panel A, the average discrete quarterly return over all funds over all quarters is 4.32%, compared with an average discrete return of 4.38% for the FT-All Share Index. The overall standard deviation of these returns is 8.67%, and the distribution of returns also emphasises the variability in returns. But these pooled measures disguises an important statistic that is made clear in Panel C, which is that the between funds standard deviation is much less than the within fund distribution. This implies that for a particular quarter the distribution of fund returns is tightly packed around the mean, but that over time the variability of returns is much higher. In fact the correlation between the time series values of the FT-All Share index and the average return each quarter across the pension funds is 0.995. The contrast in the within and between standard deviations might be indicative of the herding behaviour of pension funds suggested by Lakonishok et al. The between variation of fund returns by manager is much

[3] This fund manager is actaully identified as #28, in our dataset - all the fund managers are identified by a code.

smaller than the within manager standard deviation, which implies that is may be difficult to identify individual fund manager performance. Our subsequent results of manager performance are all the more striking, given this feature of the data.

Table 2 Panel A also report on the distribution of returns weighted by the value of the fund at the beginning of each quarter. The value weighted average return of 3.80% implies that small funds have a higher return than large funds and this is an issue we will return to later. In the subsequent regression analysis, we require a minimum number of observations to undertake a meaningful statistical analysis, and we imposed the requirement that time series fund parameters are only estimated when there were 12 or more quarterly returns for that fund. This cut-off value of three years accords with the typical fund mandate. Table 2 Panel A reports the distribution of returns of the sub-sample of 1724 funds with at least 12 time series observations, and this may be compared with the distribution of returns across the whole sample, to check that the sub-sample is indeed representative. Similarly Panel A also reports the distribution of returns of those 284 funds that remained in existence over all 56 quarters in our dataset.

In Panel B of Table 2 we report statistics of the size of the equity portion of the pension funds in our sample, at three different dates at the start, in the middle and at the end of our sample. The size distribution is highly skewed with a large number of very small funds. For example in 1997 the median size fund had an equity portfolio of 28 million pounds. Whereas the largest fund had an equity portfolio of over 9 billion pounds. In Panel C we also report the distribution of fund size across funds and across fund managers. We report two measures of fund size: smv is the starting market value of the equity portfolio of the fund at the start of each quarter; smv97 is the starting market value of the funds, with the fund value inflated to December 1997 values. This measure of fund size at constant prices is obtained by compounding to December 1997 fund size (smv) in each quarter by the average rate of return over the life of the fund. Panel C shows that the distribution of firm size when measured at non-constant prices is bigger between funds than within funds. This difference in the between and within distribution of fund size is much sharper when size is measured at constant prices, where the within variation is only a fifth of the between variation. This statistic emphasises that pension fund size is relatively constant over time, with most variation occurring between funds.

In this study we use data on all UK pension funds irrespective of whether they change manager. The Brown et al (1997), and Blake et al (1999) studies of UK pension funds specify that the pension fund have the same fund manager over the length of their respective samples. It is likely that survivorship bias is more of

an issue in same manager funds, since pension funds have deliberately continued to hire the same manager, with the presumption that their performance has satisfied the pension fund trustees. The simulation results of Carpenter and Lynch (1999) suggest that persistence is weaker in samples that exhibit survivorship bias. This is because survivorship bias induces spurious reversals, since if survival depends on performance over a number of periods, in order to survive early losers must subsequently win. We might expect that since our sample does not suffer from survivorship bias, we will be likely to identify to identify persistence.

V Results

In table 3 we report the results of estimating equation (1) to assess whether there is any evidence of pension fund and fund manager fixed effects. In the first stage we estimated the abnormal return each quarter on each fund by regressing a time series on the excess return on the fund over the risk free rate against the three factor model. The abnormal returns on each fund in each quarter where then retained for the second stage estimation. In the second stage we estimated a fixed effects panel regression of the abnormal returns on the fund each quarter, where the cross-sectional unit was specified as either the pension fund or the fund manager. Table 3 panel A reports the results of the panel estimation where the cross-section fixed effects variable was specified as the pension fund itself. It can be seen that the intercept coefficient which represents the average out-performance of funds in the sample is significantly negative, indicating that on average pension funds underperform the three factor benchmark. However an *F*-test on the joint insignificance of all of the pension fund fixed effects could be rejected. This rejection of the joint insignificance of the fixed effects was much stronger in the case of the fund manager fixed effects as can be seen from Panel B. Here the F-test decisively rejects the null hypothesis of no fund manager fixed effects.

We repeat the estimation of these fixed effect models for abnormal returns derived from the conditional three factor model in equation (2). In Panel C we report the results of model where the cross-sectional unit is the pension fund, and in Panel D when the grouped variables are the fund managers. Again the intercept coefficients are significantly negative indicating under-performance on average across funds and fund managers. The *F*-test on the joint insignificance of the fixed effects is not such a decisive rejection as in the unconditional three factor model, though with this model the insignificance of fund manager fixed effects still rejected. In estimating the conditional three factor model we required a fund had a minimum of 20 time series observations be included in the calculation of abnormal returns. This will have induced additional "look-ahead" biases into the results, in addition to the look-ahead biases in estimating equation (1), where we only required a minimum of 12 observations per fund. One of the reasons for the weaker fixed effects in the conditional rather than the unconditional models may be due to this additional bias.

The rejection of the null hypothesis of no fund manager fixed effects, we further investigated this feature of the data by examining individual fund manager dummy variables in explaining the variability of abnormal returns. In Table 4 we report the results of a step-wise regression which regresses abnormal returns from equation (1) against individual fund manager dummy variables, which take on the value of unity if the pension fund is manager by a particular fund manager and zero otherwise. In this step-wise regression insignificant dummy variables are identified and removed from the estimating equation, and the regression is then re-estimated. Table 4 reports the results of only including those dummy variables which had a 99 per cent statistical significance. There were 41 dummy variables that satisfied this criteria, and their coefficients and t-values are reported in the table in descending order of the size of the estimated coefficient. Again the intercept term is significantly negative, and the results show that there are eight fund managers who outperform the average. Of these eight, three are the major fund managers which were identified in Table 1 as managing around twenty percent of pension funds. This is a striking finding, because it demonstrates that the large fund managers do indeed outperform other fund management houses. The extent of this outperformance varies from almost half a percentage point a year for fund manager #26 to over one percent a year for fund manager #28. Note there are a great deal more fund managers who are underperforming rather than the eight who are outperforming.

We include in this table some characteristics of each of these fund managers. We can see that the average size of the equity portfolios managed by these three large fund managers is around £50 million at 1997 values. For those fund managers that are generating significant negative abnormal returns, we can see that some of the funds under management are quite large: £128.57 million for fund manager #9, and £683.12 million for fund manager #3. There also seems to be a preponderance of single manager funds in the section of the table showing negative performance.

We now turn to the persistency tests. Given the results in tables 3 and 4 we might expect to find some evidence of persistence since identifying significant fund manager over and under-performance in a panel of pension funds, is likely to also generate persistency in performance. In the persistency tests of fund manager rather than examine the abnormal performance of the pension funds, we need to convert the performance of the funds under management to the performance of the fund manager. We do this by taking the equally weighted average abnormal return of the funds under management in a particular quarter, as a measure of the fund manager's performance in that quarter.

The persistency tests are reported in Table 5. Panel A reports the performance ranked portfolio tests, and Panel B the contingency table tests. Each panel has three rows representing the number of time periods over which the ranking and evaluation periods have been evaluated. The first two columns in Panel A report the average evaluation period returns of top and bottom quintile portfolios, formed on the basis of ranking period abnormal returns. It can be seen that for each row the mean return on the high quintile portfolio is always greater than that on the low quintile portfolio (DIF is always positive). The one quarter on one quarter results (1QR1QE) show only weak evidence of persistency as measured by TDIF, though the longer term abnormal returns show much stronger evidence of persistency. Recall that Carpenter and Lynch (1999) suggest that the TDIF measure is the most powerful from among the alternative tests for persistency. The results in Panel A suggest that there is some persistency at all time horizons, with the strongest at one year.

These findings are confirmed from the contingency table tests in Panel B. The chi-squared test on independence is easily rejected for the one year horizon abnormal returns. Similarly the t-statistic on the slope coefficient in the pooled regression of one-year abnormal returns on lagged one year abnormal returns is 6.30 for the one year abnormal returns, indicating significant persistency. One slight inconsistency in these tables is that CHI implies that quarterly abnormal returns are more persistent that three year returns, whereas all the other measures suggest that it is the longer term returns are more persistent than the short-term measures. All of the persistency tests are agreed that the strongest evidence of persistency is at the one-year horizon. The results from Table 4 suggested that a number of fund managers exhibited negative abnormal performance, and it might be speculated that this consistent negative performance could be responsible for the observed persistence. Note however that the percentage of repeat winners (PRW) in Panel B of Table 5, is close to 0.6 for all time-horizons, suggesting that it is not only the poor performers who are generating the persistence.

VI Conclusions

With the advent of low cost stakeholder pensions in the UK, there has been a continuing trend into index funds and a movement away from active fund management, as a portfolio strategy for pension funds. However the results in this paper, from a large sample of occupation pension funds, suggest that there appears to be a role for active fund management of pension funds.

We have measured the abnormal returned generated by fund management houses in managing the equity portfolios of UK pension funds over the period 1983-97. We have found evidence of significant positive

and negative abnormal performance by individual fund managers. Interestingly it seems that three of the largest fund managers, in terms of the number of pension fund under management, have generated small (up to one per cent per year) but significantly positive abnormal returns for the pension funds that they manage. These results on fund manager fixed effects have been confirmed by a range of persistency tests, which have examined whether the performance of a fund manager in one period is related to the performance in subsequent periods. Previous work on UK pension fund managers did not discover much evidence of persistence, but this may have been due to survivorship biases in funds managed by the same fund manager, since simulation work has shown that survivorship biases weaken the evidence for persistence. Our sample has less survivorship bias than previous studies and we have identified strong evidence of persistence in fund manager abnormal returns.

Two caveats are in order. First we have made no allowance for the costs of fund management. We have found that some fund managers generate abnormal returns above the benchmark portfolios, but whether these abnormal returns outweigh the costs of active fund management is not an issue that we have addressed. Second, we have examined the performance of fund managers managing relatively large segregated pension funds. These pension funds will be controlled by trustees who employ the fund managers, and monitor their performance. Stakeholder pensions and other defined contribution schemes that operate as pooled investment schemes will not have the same monitoring process of fund managers, that regular meetings between fund managers and trustees imply. The fact that fund managers may out-perform when they must regularly report their performance, and risk losing their investment mandate, does not mean that the same fund managers will outperform when the monitoring technology is removed.

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Table 1: Descriptive Statistics on Pension Funds and Fund Managers

Panel A: *Fund-Quarters*

No. of Funds	2,175		No. of Quarters		59,509
Distribution of Fund-Quarters					
min	5%	25%	50%	75%	95%	max
1	4	12	24	41	56	56

Panel B: *Manager-Quarters*

No. of Managers	191		No. of Quarters		59,509
Distribution of Manager-Quarters					
min	5%	25%	50%	75%	95%	max
2	4	17	45	179	1,063	17,299

Panel C: Distribution of Managers Across Funds

Fman code	Overall		Between		Within
	Freq	%	Freq.	%	%
Multi-manager (#2)	17,299	29.07	659	30.3	78.10
1RMan(#28)	6,410	10.77	244	11.22	81.04
2RMan(#26)	3,318	5.58	184	8.46	59.55
3RMan(#85)	2,881	4.84	116	5.33	73.40
4RMan-17RMan[#]	13,758	23.14	681	31.31	68.16
18RMan-189RMan	15,595	26.22	965	44.65	58.84
ΔMan (#169)	248	0.42	225	10.34	2.64
Total	59,509	100.0	3,074 (n=2,175)	141.33	63.43

where total within = (659*78.1+244*81.04+ .....)/3,074; [#] denotes that each of these fund managers had at least 1% of the overall frequency

Table 2: Descriptive Statistics

Panel A: Returns Across Quarters and Funds

Returns	All	Weighted by smv	>12 Quarters	= 56 Quarters	FT-All ShareRets
Mean	0.0432	0.0380	0.0428	0.0444	0.0438
Std. Dev.	0.0867	0.0814	0.0867	0.0858	0.0834
Distribution of returns:					
10%	-0.0543	-0.0537	-0.0543	-0.0536	
25%	0.0016	0.0016	0.0015	0.0021	
50%	0.0463	0.0441	0.0459	0.0469	
75%	0.0896	0.0747	0.0885	0.0926	
90%	0.1525	0.1346	0.1527	0.1511	
Obs.	59,317	59,314	56,403	15,842	56
No. of Funds	2170	2170	1724	284	

Panel B: Distribution of Fund Size Across Funds

	Size at start of Quarter (£m)		
	March 1983	Dec 1990	Dec 1997
Mean	25.02	50.24	102.27
Std. Dev.	85.01	194.45	387.30
Distribution of Fund size:			
10%	0.441	1.36	6.02
25%	1.06	3.31	12.39
50%	3.20	8.35	28.12
75%	14.25	27.36	70.14
90%	51.64	102.88	221.90
Obs.	833	1131	1004

Panel C: Returns and Fund Size Across Funds and Across Fund Managers

Variable		Mean	Std. Dev	Min	Max	Observations	
ret	overall	0.04323	0.08672	-0.5257	0.8707	N	59317
	between funds		0.01652	-0.1285	0.2366	n	2170
	within funds		0.08628	-0.5144	0.71385	T-bar	27.335
	between managers		0.0177	-0.1147	0.117045	n	189
	within managers		0.0866	-0.5241	0.872249	T-bar	313.847
smv	overall	58.4044	240.130	0	9,108.619	N	59453
	between funds		174.391	0.013	5,096.643	n	2175
	within funds		89.5995	-3,352.67	4070.38	T-bar	27.3347
	between managers		506.0059	0.2137	6,747.353	n	190
	within managers		164.8412	-2,865.32	4,258.418	T-bar	312.911
smv97	overall	204.1711	869.1149	0	24,411.38	N	59437
	between funds		1,049.211	0.0044241	21,804.67	n	2170
	within funds		189.6773	-5,106.381	7,187.195	T-bar	27.3903
	between managers		1,001.512	0.0849746	11,851.75	n	189
	within managers		733.1108	4,268.246	24,260.76	T-bar	314.481

where ret is the quarterly return; and smv is the fund market value at the beginning of the quarter

Table 3: Fixed-effects (within) regressions of Conditional and Unconditional Abnormal Returns

Panel A: Group variable: Pension fund (P)
Dependent Variable: Abnormal Returns from Unconditional Fama French equation (1)

Variable	Coef.	t-stat
constant	-.0002975	-4.25
Number of obs =	56,312	
Number of groups =	1714	
F test: $u_P = 0 \ \forall P$:	F(1713, 54598) = 2.03	

Panel B: Group variable: Fund manager (F)
Dependent Variable: Abnormal Returns from Unconditional Fama French equation (1)

Variable	Coef.	t-stat
constant	-.0002975	-4.22
Number of obs =	56,312	
Number of groups =	170	
F test: $u_F = 0 \ \forall F$:	F(169, 56142) = 6.80	

Panel C: Group variable: Pension fund (P)
Dependent Variable: Abnormal Returns from Conditional Fama French equation (2)

Variable	Coef.	t-stat
constant	-.0005049	-7.50
Number of obs =	50,144	
Number of groups =	1304	
F test: $u_P = 0 \ \forall P$:	F(1303, 48840) = 1.07	

Panel D: Group variable: Fund manager *(F)*
Dependent Variable: Abnormal Returns from Conditional Fama French equation (2)

Variable	Coef.	t-stat
constant	-.0005049	-7.51
Number of obs =	50,144	
Number of groups =	153	
F test: $u_F = 0 \ \forall F$:	F(152, 49991) = 2.16	

These tables report the results of estimating a panel regression of the abnormal returns estimated from either equation (1) (Unconditonal three factor model) or equation (2) (conditional three factor model) on fixed effects for either fund managers or for pension funds.

Table 4: Further Regression of Abnormal Returns against Fund Manager Fixed Effects, with associated characteristics of the fund managers

Fund manager	Abnormal Return	t-stat	# funds under management	# fund-quarters under management	Average size of fund under management at Dec 1997 values (£m)
constant	-0.00032	-3.54			
dum92	0.008298	3.68	2	55	64.89
dum129	0.005834	3.5	5	101	34.13
dum131	0.005319	3.83	8	146	17.96
dum66	0.003624	2.98	6	190	59.30
dum28	0.003548	15.35	213	6,207	49.40
dum39	0.001468	2.99	57	1,202	46.91
dum85	0.001221	3.71	105	2,800	46.07
dum26	0.001064	3.39	148	3,097	58.04
dum64	-0.00161	-2.8	36	871	17.96
dum47	-0.00184	-3.16	31	850	21.64
dum21	-0.00218	-3.86	39	900	28.42
dum6	-0.00247	-4.91	47	1,140	49.35
dum99	-0.0026	-2.87	21	345	72.13
dum49	-0.00279	-2.82	12	288	44.02
dum94	-0.00308	-3.5	28	365	14.94
dum98	-0.00337	-4.37	30	477	59.90
dum105	-0.00358	-5.02	21	561	14.42
dum104	-0.00362	-2.66	8	151	13.01
dum9	-0.00371	-5.22	24	563	128.57
dum137	-0.00399	-5.35	20	512	5.58
dum35	-0.00427	-3.36	7	174	18.62
dum45	-0.00455	-3.61	11	177	69.28
dum56	-0.00471	-2.62	5	87	31.93
dum15	-0.00481	-7.31	46	661	44.06
dum8	-0.0055	-2.71	4	68	512.54
dum87	-0.006	-2.89	4	65	132.61
dum74	-0.00604	-3.06	6	72	432.66
dum10	-0.0065	-5.19	19	179	65.97
dum3	-0.00697	-3.12	3	56	683.12
dum118	-0.00796	-2.69	4	32	20.95
dum25	-0.00831	-4.57	5	85	20.46
dum29	-0.00847	-2.77	1	30	199.35
dum135	-0.00988	-2.71	1	21	8.84
dum146	-0.01137	-3.11	1	21	7.16
dum73	-0.01168	-4.58	3	43	92.83
dum67	-0.01214	-2.99	1	17	21.59
dum106	-0.01755	-9.43	3	81	70.04
dum143	-0.0183	-4.24	1	15	11.29
dum51	-0.01988	-2.91	1	6	99.83
dum133	-0.02483	-5.14	1	12	1.75
Number of obs	56,312				
F(41, 56270)	22.95	R-sq =	0.0164		

Table 5: Persistency Tests based on Abnormal Returns of Fund Manager Performance

Panel A. Performance ranked portfolio tests of fund manager performance

	AV5	AV1	DIF	TDIF
3YR3YE	0.0013	-0.0005	0.0018	2.80
1YR1YE	0.0016	-0.0023	0.0040	7.06
1QR1QE	-0.0002	-0.0018	0.0016	1.44

Funds managers are sorted each year into quintile portfolios based on past performance of the pension funds under management - average abnormal returns of each fund over the ranking period. The equally weighted average portfolio abnormal returns of the top and bottom portfolios over the subsequent evaluation period is computed; AV5 and AV1 are the abnormal returns of the top and bottom portfolios in the evaluation period, averaged over all time periods in the sample. There are three different ranking and evaluation periods: 3YR3YE means three-year ranking period and three year evaluation period, and 1QR1QE means a one quarter ranking period and one quarter evaluation period. This procedure is followed for overlapping periods throughout the full period of the dataset, and DIF is AV5-AV1, and TDIF is a t-statistic on DIF, allowing for the autocorrelation induced by using overlapping observations.

Panel B: Contingency tables of fund manager performance

	N	CP	CHI	PRW	TCS
3YR3YE	192	1.226	1.625	0.573	1.02
1YR1YE	1,154	1.603	18.416	0.588	6.30
1QR1QE	5,310	1.126	5.310	0.522	0.29

Funds managers are classified as winners or losers based on abnormal returns in each of two consecutive time periods, and the numbers of winner-winner (WW), winner-loser (WL), loser winner (LW) and loser-loser (LL) are counted. The following statistics are computed: a) Cross-product ratio CP = (WW x LL)/(WL x LW); b) Chi-Squared test with 1 d.o.f. where CHI = $\{(WW - N/4)^2 + (WL - N/4)^2 + (LW - N/4)^2 (LL - N/4)^2\}/N/4$, and N is the number of pairs; c) Percentage of repeat winners, PRW = WW/(N/2); and d) TCS is the t-statistic for the slope coefficient in the pooled cross-section OLS regression of evaluation period abnormal returns on ranking period abnormal returns