IS INTERNATIONAL TRUST PERFORMANCE PREDICTABLE OVER TIME?

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ABSTRACT

We examine whether different past performance measures have significant predictive ability of future excess returns and group-adjusted excess returns of U.K. unit trusts with international equity objectives. We find little evidence of significant positive predictive ability of future excess returns by different past performance measures. However when we control for the role of the investment sector using group-adjusted excess returns, there is significant positive predictive ability of group-adjusted excess returns using different past performance measures. This persistence is not driven by trusts with poor past performance. We also find that conditional measures of past performance do not have better predictive ability than unconditional measures of future group-adjusted excess returns.

I Introduction

A major issue in the fund performance literature that is of interest to practitioners and academics alike is whether past performance provides a guide to future performance. There is now a large literature that shows that fund performance is predictable over time for different types of managed funds (see Grinblatt and Titman(1992) and Carhart(1997) for U.S. mutual funds, Christopherson, Ferson and Glassman(1998) for U.S. pension funds, and Blake and Timmermann(1998) for U.K. unit trusts among many others). This persistence has been found to exist over short-run (Bollen and Busse(2004)) and long-run (Grinblatt and Titman(1992), Elton, Gruber and Blake(1996)) horizons. Persistence in performance is important for investors and managed funds. Investors often use past performance as the principal determinant for selecting funds and mutual funds who perform well in league tables can increase their fee income as they receive the lion share of new cash flows into funds (Sirri and Tufano(1998)).

Although there is strong evidence supporting the view that fund performance is predictable, it is less clear whether this persistence is a manifestation of superior stock selection skill. Theoretical papers by Lynch and Musto(2003) predict persistence among winning funds whereas Berk and Green(2004) predict no significant persistence in fund performance in a competitive market. Carhart(1997) argues that common factors in stock returns and expenses can explain a large proportion of U.S. mutual fund persistence. The persistence that remains is for the funds with the poorest performance. However, Kosowski, Timmermann, White and Wermers(2004) find that the top performing U.S. mutual funds do have significant persistent superior performance after controlling for random sampling variation. Wermers(2004) find significant persistence in the stock selection skill of U.S. mutual funds gross of expenses and trading costs using the Characteristic Selectivity measure of Daniel, Grinblatt, Titman and Wermers(1997).

In spite of the voluminous evidence on the persistence of domestic fund performance, there is little research on the persistence of international fund performance. Our study fills this gap in the literature. We address two main research questions in our study. First, does past performance have any predictive ability of future international fund excess returns? We examine whether conditional measures of past performance provide better predictive ability of unconditional measures following Christopherson et al(1998) (see also Christopherson, Ferson and Turner(1999)). We also examine whether any persistence is a short-run or long-run phenomenon. Second, does the investment sector of the trust have any impact on the persistence in performance? This question follows from recent studies by Daniel et al(1997) and Kosowski et al(2004) that show that the investment sector of the fund can have a significant impact on performance and studies by Teo and Woo(2001), Davis(2001), and Wermers(2004) that show that investment style has a significant impact on persistence tests.

We examine our two research questions by using a sample of U.K. unit trusts[1] with international equity objectives between January 1985 and December 2000. Since the abolition of exchange controls in the U.K. in 1979, there has been a large growth in the number of unit trusts with international investment objectives. By October 2002, the market value of sectors with international equity objectives in the U.K. had grown to over £90,000m (U.K. Investment Management Association November 2002). Given the size of the international unit trust sector, the study of performance persistence for this group of funds is important in its’ own right.

[1] U.K. unit trusts are equivalent to open-ended U.S. mutual funds.

There are four main findings in our study. First, the investment sector of the trust plays a critical role in detecting the presence of significant positive persistence in trust performance. We only find significant positive persistence using the group-adjusted trust excess returns. Second, we find that conditional measures of past performance are not more informative of future group-adjusted trust excess returns than unconditional measures of past performance. Third, we find that the positive persistence in performance is not driven by trusts with poor past performance. Fourth, we find that the evidence of persistence in group-adjusted excess returns is greater when we only use trusts that are in investment sectors that allow trusts to invest in a reasonable geographical spread of countries. Our findings suggest that different past performance measures have significant predictive ability of future group-adjusted excess returns of international trusts over different return horizons.

Our study makes two contributions to the literature. First, we extend the literature on international fund performance by examining the persistence of international fund performance. Prior studies by Tkac(2001) among others for U.S. mutual funds and Fletcher and Marshall(2004) for U.K. unit trusts provide evidence of overall fund performance ability. Second, we extend the evidence on the persistence of domestic U.K. unit trust performance by studies such as Blake and Timmermann(1998), Rhodes(2000), Quigley and Sinquefield(2000), Fletcher and Forbes(2002) among others, by focusing on the persistence of U.K trusts with international equity objectives.

The paper is organized as follows. Section II reports the research methods. Section III describes the data. Section IV reports the empirical results. The final section concludes.

II Method

Our main persistence tests focus on whether different measures of past performance have any predictive ability of future excess fund returns. We use the two-stage cross-sectional regression approach of Fama and MacBeth(1973) as applied by Christopherson et al(1998) and Myers(2004) to examine this issue. The Fama and MacBeth approach has the attractive feature that is straightforward to incorporate different past performance measures into the analysis, and explore persistence over short-run and long-run return horizons.

In the first-stage of the Fama and MacBeth(1973) approach, the past performance of each trust is estimated using the previous sixty return observations. We use five different performance measures to estimate past performance. The first is the average excess return of the trust during the past sixty months. The second and third measures are the unconditional Jensen(1968) performance of the trust based on international asset pricing models. The final two measures use the conditional performance measure of Christopherson et al(1998) based on international asset pricing models. The international asset pricing models we use share the common assumption that capital markets are integrated. Integrated capital markets imply that two assets with the same exposures to global risk factors have identical expected returns. Recent studies by Zhang(2003) and Hentschel and Long(2004) provide support for market integration in developed capital markets.

We estimate the Jensen(1968) performance measure by the following regression:

$$r_{it} = \alpha_i + \sum_{k=1}^{K} \beta_{ik} r_{kt} + \varepsilon_{it} \qquad (1)$$

where r_{it} is the excess return on trust i during period t, r_{kt} is the excess return on global risk factor k during period t (for k = 1,….,K, where K is the number of factors in the international asset pricing model), ε_{it} is a random error term with $E(\varepsilon_{it})$ equal to zero and $E(\varepsilon_{it} r_{kt})$ equal to zero for k = 1,….,K. The β_{ik} coefficients are the betas of trust i for each of the global risk factors in the international asset pricing model. The intercept α_i is the Jensen measure of trust i.

We estimate the Christopherson et al(1998) performance measure by the following regression:

$$r_{it} = \alpha_i + \sum_{l=1}^{L} \alpha_{il} z_{lt-1} + \sum_{k=1}^{K} \beta_{ik} r_{kt} + \sum_{k=1}^{K} \sum_{l=1}^{L} \delta_{ikl} r_{kt} z_{lt-1} + \varepsilon_{it} \qquad (2)$$

where z_{lt-1} is the de-meaned lth global information variable (l = 1,…..,L) at time t-1, α_i is the average conditional performance measure, the α_{il} coefficients are the estimated coefficients of the conditional performance function, β_{ik} is the average conditional beta of trust i for each of the global risk factors, and the δ_{ikl} coefficients are the estimated coefficients of trust i in the conditional beta function for the kth risk factor for each of the L information variables. The conditional measure of Christopherson et al assumes that the alpha and beta of the fund are a linear function of a set of common information variables. We estimate the coefficients in the conditional performance function using the previous sixty months data. We multiply the coefficients in the conditional performance function by the current values of the information variables to get the conditional performance of the trust at time t.

In the second-stage of the Fama and MacBeth(1973) procedure, we estimate the following cross-sectional regression each month:

$$r_{i,t+n} = \gamma_{0t+n} + \gamma_{1t+n} \alpha_{it} + u_{it+n} \qquad (3)$$

where $r_{i,t+n}$ is the compounded excess returns of trust i over the return horizon from month t to month n, α_{it} is the past performance of trust i estimated from the first-stage, and n is the number of months in the return horizon. The monthly cross-sectional regression in equation (3) generates a time-series of γ_{0t+n} and γ_{1t+n}. The Fama and MacBeth estimate of γ_0 and γ_1 are the time-series average of the monthly coefficients γ_{0t+n} and γ_{1t+n}. The standard errors of γ_0 and γ_1 are estimated from the time-series of the monthly coefficients γ_{0t+n} and γ_{1t+n}. The Fama and MacBeth approach of calculating the standard errors corrects for the effects of cross-sectional correlation in the residuals in equation (3). We estimate the cross-sectional regression in equation (3) using future compounded excess returns from return horizons of 1-month, 3-month, 6-month, 12-month, 18-month, 24-month, and 36-month as in Christopherson et al(1998). Under the null hypothesis that past performance provides no predictive ability of future excess returns, the average slope coefficient γ_1 will equal zero. If the average slope coefficient is positive and significant using the Fama and MacBeth *t*-statistic, then trusts with good (bad) past performance have higher (lower) future excess returns.

When the return horizon is greater than one-month, the monthly cross-sectional regressions will have overlapping observations, which will create serial correlation in the monthly coefficients. We correct the standard errors for the effects of serial correlation of (n-1) lags using the method of Newey and West(1987) as in Christopherson et al(1998). For a trust to be included in a monthly cross-sectional regression, we require sixty return observations to calculate past performance and return observations over the number of months in the future return horizon.

We estimate the cross-sectional regression in equation (3) using Weighted Least Squares as in Christopherson et al(1998). The weights are the inverse of the standard deviation of the residuals that arise from estimating the past performance measures in the first-stage. Christopherson et al argue that this approach has the advantage of minimizing some of the impact of survivorship bias by reducing cross-sectional differences in performance related to variance as highlighted by Brown, Goetzmann, Ibbotson and Ross(1992).

The dependent variable in the cross-sectional regression in equation (3) uses the excess return of the trusts. Using the excess returns of the trusts focuses on the question of most interest to many investors as that of predicting future return performance (Christopherson et al(1998)). Christopherson et al also point out if the same performance measure is used on both sides of the regression equation, then this approach might generate spurious persistence. The spurious persistence can arise because any biases in the estimated performance e.g. missing risk factors, will most likely be correlated over time.

Our initial tests estimate the future compounded returns of the trusts as the excess return of the trust over the one-month U.K. Treasury Bill. Recent research explores the impact on investment style on fund persistence tests (Teo and Woo(2001), Davis(2001), Wermers(2004), and Myers(2004) among others). We consider the role of investment sector in the persistence tests by estimating the future compounded returns of the trusts as the group-adjusted excess returns of the trusts. We calculate the group-adjusted excess returns of the trusts as the return of the trust minus the return on an equal weighted portfolio of trusts of the investment sector to which the trust belongs. We run the persistence tests in equation (3) using the group-adjusted excess returns of the trusts as the dependent variable.

The monthly slope coefficients in equation (3) are the excess returns of a zero-cost portfolio of trusts formed on the basis of past performance (see Fama(1976)).

However such portfolios can involve large long and short positions in the underlying trusts and so the excess returns might not be attainable by investors. As an alternative persistence test, we evaluate the out-of-sample performance of monthly trading strategies where a Winners and Losers portfolio of trusts is formed on the basis of past performance. At the start of 1990, we rank all trusts on the basis of their performance during the past sixty months using one of the five past performance measures. The top (bottom) 20% of trusts are grouped into a Winners (Losers) portfolio. We estimate the equal weighted excess returns and group-adjusted excess returns of the Winners and Losers portfolio during the next month. This process is repeated each month.

We evaluate the out-of-sample performance of the Winners and Losers portfolio using the average excess returns, the Sharpe(1966) performance measure, the unconditional Jensen(1968) measure as in equation (1), and the conditional Ferson and Schadt(1996) (FS) measure. The FS measure is calculated as in equation (2) except there are no α_{il} terms. If past performance provides no predictive ability of future performance, we expect the performance of the Winners and Losers portfolios to be similar.

III Data

All of the returns used in this study are in U.K. sterling.

A) Unit Trust Sample

We explore the persistence in the performance of international U.K. unit trusts between January 1985 and December 2000. Our sample of unit trusts is all trusts with international equity objectives at the start of 1985 from the 1985 Unit Trust Yearbook (published by the Financial Times Business Information). We include trusts that have international equity objectives of International, North America, Europe, Australia, Japan, and Far Eastern. The history of each trust is tracked through to the end of 2000. Name changes and transfers of the trusts are treated as a continuation of the original trusts. Trusts that were taken over or wound up during the sample period are treated as a termination. Where a trust changes its' investment objective to a non international equity objective or changes to an open-ended investment company, we treat this as a termination. We collect monthly returns on the trusts up until their termination or change in objective. Our approach should minimize the impact of survivorship bias (Carhart et al(2002)). There are 282 trusts in our sample of unit trusts.

We calculate the monthly returns of each trust from monthly offer prices and dividends paid by the trust in the month that the dividend is declared ex-dividend. Offer prices are collected from the Finstat managed fund database provided by the Financial Times Information Service and Money Management. Dividend information is collected from the Finstat database and the annual Extel U.K. Dividend and Fixed Interest Record. We use the monthly returns on a one-month U.K. Treasury Bill as the risk-free asset from Thomson Financial Datastream. Our approach to calculating unit trust returns implies that trust returns are gross of the load charge and trading costs but net of the annual charge. We collect the investment objective of each trust at the start of each year from the annual Unit Trust Yearbooks.

We form six equal weighted portfolios of trusts sorted by investment sector. At the start of 1985, all trusts are ranked into six portfolios according to their investment objective at the start of the year. We calculate the equal weighted portfolio excess return during the next twelve months for each portfolio. We include all trusts with a return observation in a given month. This process is repeated at the start of each year.

Panel A of Table 1 reports summary statistics of the six investment sector portfolios of trusts. The summary statistics include the mean, standard deviation, minimum, and maximum of monthly excess returns. There is a wide spread in average excess returns and standard deviations across the six investment sector portfolios of trusts. The average excess return ranges between 0.043% (Australia) to 0.748% (Europe). The Far East sectors not only have the lowest average excess returns but also the highest standard deviations. The International sector portfolio has the lowest standard deviation of 4.601%. Panel A of Table 1 suggests that the investment sector of the trusts might have an impact on the persistence in performance.

Table 1 here

B) International models and information variables

We evaluate trust performance using two different international asset pricing models. We collect all of the data on the factors and information variables from Thomson Financial Datastream. Our models include:

1) World CAPM

This model is a single factor model that uses the excess returns on the world equity index. We use the Datastream world equity index as the market index.

2) Carhart(1997) (Carhart)

This model is a four-factor international version of Carhart(1997). This model includes the world equity index in addition to self-financing portfolios that capture the size (SMB), value/growth (HML), and momentum (WML) effects in international stock returns. The Datastream world equity index is used as the market index. We form the SMB, HML, and WML factors using Datastream industry portfolios from seventeen developed markets similar to Dahlquist and Sallstrom(2002) (see Appendix).

Panel B of Table 1 reports summary statistics of the factors used in the different models. The mean excess return on the world equity index is 0.410% but not more than two standard errors from zero. The HML factor has the highest mean excess returns and is more than two standard errors from zero. The finding of a strong value effect in international stock returns supports Dahlquist and Sallstrom(2002). In contrast, the average excess returns on the SMB and WML factors are small and insignificant. The average excess returns of the SMB, HML, and WML factors are of a similar size to Capaul(1999). The surprising result in panel B is the absence of a strong momentum effect in the country industry portfolios. This result suggests that the WML factor will have little impact in explaining any persistence.

The use of the conditional performance measures of the trusts requires that the information set of investors be specified. We use instruments that previous studies have found to be important in predicting international stock returns (Ferson and Harvey(1993,1999), Solnik(1993) among others). The instruments are the lagged dividend yield on the Datastream world equity index, lagged one-month U.S. risk-free return (Salomon Smith Barney), and the lagged excess return on the three-month U.S. Treasury Bill (Salomon Smith Barney).

IV Empirical Results

We begin our analysis by exploring whether the five past performance measures have any predictive ability of the future excess returns of the trusts over the seven return horizons. Table 2 reports the time-series average of the monthly slope coefficients from the cross-sectional regressions in equation (3) and the corresponding Fama and MacBeth(1973) *t*-statistics in parentheses. The Bonf value is the Bonferroni[2] p value of the joint test that the average slope coefficients across the seven return horizons are jointly equal to zero.

Table 2 here

Table 2 shows that there is only limited evidence of significant positive persistence of future trust excess returns by any of the five performance measures. There is significant positive persistence using the average excess returns and unconditional CAPM measures for the 36-month return horizon. The conditional CAPM measure has significant positive persistence at the 3-month and 6-month return horizons. However the significant positive persistence disappears when we consider the joint test across the different return horizons. The Bonf p value is not able to reject the null hypothesis that the average slope coefficients across the seven return horizons are jointly equal to zero for the average, unconditional CAPM, and conditional CAPM measures.

In contrast to the lack of significant positive persistence in Table 2, there is significant negative persistence in performance using the unconditional and conditional Carhart models. There is a significant negative relation between the unconditional Carhart performance and future trust excess returns for all return

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[2] The Bonferroni p value is calculated as N*smallest p value of the seven individual *t*-statistics, where N is the number of return horizons. The Bonferroni p value is used in studies such as Ferson and Schadt(1996) and Christopherson et al(1998) among others.

horizons except the 24-month horizon. There is a significant negative relation between the conditional Carhart performance and future relative excess returns at the 12-month, 18-month, 24-month, and 36-month return horizons. The Bonf p value is able to reject the null hypothesis that the average slope coefficients across the seven return horizons are jointly equal to zero for both the unconditional and conditional Carhart measures.

Table 2 shows that the relation between past performance and future excess returns depends upon the performance measure used. This finding mirrors the sensitivity of fund performance to the benchmark model used in studies such as Lehmann and Modest(1987) among others. Table 2 also shows that conditional measures do not provide better predictive ability of future excess returns than unconditional measures. This finding differs from Christopherson et al(1998) and Myers(2004).

The absence of any significant positive performance persistence in Table 2 is surprising given the large body of evidence that shows that the fund performance is predictable. However the absence of any significant positive persistence might be due to the fact that the international trusts come from very different investment sectors. We explore whether the investment sector of the trust has any impact on the persistence tests in Table 2. We repeat the tests of Table 2 but use the group-adjusted excess returns of the trusts to estimate the future compounded excess returns. This approach addresses the question of whether past performance can predict the future relative group-adjusted excess returns of the trusts[3]. Table 3 reports the results.

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[3] We also repeat the tests using the group-adjusted excess returns to estimate past performance and find similar results to Table 3.

Table 3 here

Table 3 shows that the investment sector of the trust has a dramatic effect on the persistence tests. Four of the five performance measures have significant positive predictive ability of the future group-adjusted excess returns of the trusts. There is a significant positive relation between the past performance of the trusts using the average excess returns, unconditional CAPM, and conditional CAPM measures and future group-adjusted excess returns across all seven return horizons. There is a significant positive relation between the past performance of the trusts using the unconditional Carhart model and future group-adjusted excess returns at the 6-month, 12-month, 18-month, and 36-month return horizons. The Bonf p value rejects the null hypothesis that the slope coefficients are jointly equal to zero across the seven return horizons for the average excess returns, unconditional and conditional CAPM, and the unconditional Carhart measures.

Table 3 also shows that using the group-adjusted excess returns removes the finding of negative persistence for the Carhart model in Table 2. However the strength of the relation between past performance and future group-adjusted excess returns varies across the performance measures. There is no predictive ability by the conditional Carhart measure. Comparing the unconditional measures to the conditional measures, we find that using conditional performance measure does not lead to greater predictive ability for future international trust group-adjusted excess returns as in Table 2.

Table 3 suggests that there is significant positive persistence using group-adjusted excess returns. We next explore whether it is positive or negative past performance that is driving the persistence in Table 3. Prior research by

Carhart(1997), Christopherson et al(1998) suggests that persistence is much stronger in poor performance. We define inferior (superior) performance where the past performance from the linear factor models is negative (positive). We repeat the tests of Table 3 where we only include the trusts with negative (positive) past performance. Table 4 (5) reports the persistence tests for the trusts with only negative (positive) past performance.

Table 4 here

Table 5 here

Table 4 shows that persistent inferior performance has some impact on the persistence tests in Table 3. There is significant positive persistence using the unconditional CAPM measure for all return horizons except the 1-month horizon. There is significant positive persistence for the unconditional Carhart measure at the 36-month horizon and significant negative persistence for the conditional Carhart measure at the 24-month and 36-month return horizons. However much of the statistical significance disappears in the joint tests. The Bonf p value can only reject the null hypothesis that the average slope coefficients across the seven return horizons are jointly equal to zero for the unconditional Carhart measure.

Table 5 shows that there is a stronger relation between past performance and future group-adjusted excess returns when the tests only include trusts with positive past performance. There is a significant positive relation between the past unconditional CAPM performance and future group-adjusted excess returns across all return horizons. There is likewise a strong positive relation using the conditional CAPM measure. The Bonf p value is able to reject the null hypothesis that the slope coefficients are jointly equal to zero for both these measures. In contrast, there is no significant persistence using the conditional Carhart measure and there is only significant positive persistence for the unconditional Carhart measure at the 36-month horizon. However even this statistical significance for the unconditional Carhart measure disappears in the joint test using the Bonf p value.

Tables 3 to 5 show that there is significant positive persistence in group-adjusted excess returns using a number of past performance measures. The persistence of group-adjusted excess returns is similar to Teo and Woo(2001). However the positive persistence is not driven by the poor past performance as the relation between past performance and future group-adjusted excess returns is stronger when we only include trusts with positive past performance. This finding differs from Christopherson et al(1998). The findings in Tables 3 to 5 also differ from Christopherson et al in that conditional measures do not provide any better predictive ability of future group-adjusted excess returns than unconditional measures. This difference might be due to a different time period chosen or the use of global instruments or a different type of fund.

The slope coefficients in the monthly cross-sectional regressions are the actual group-adjusted excess returns of a zero-cost portfolio of trusts formed on the basis of past performance (see Fama(1976)). However the portfolio of trusts formed allows for large long and short positions in the underlying trusts and will not be attainable for investors if short selling is not allowed. We examine the performance of simple trading strategies[4] where we form equal weighted Winners and Losers portfolios each

[4] Our approach to forming trading strategies is not likely to exploit all the implications of persistence in fund performance. A recent study by Avramov and Wermers(2004)

month on the basis of one of the five past performance measures. Table 6 reports the out-of-sample performance and *t*-statistics in parentheses of the group-adjusted excess returns of the Winners and Losers portfolios between January 1990 and December 2000.

Table 6 here

Table 6 shows that the Winners portfolio has better out-of-sample performance than the Losers portfolio regardless of the performance measure used. The performance of the WL portfolio is positive in every single case. There is significant positive Jensen and FS performance of the WL portfolio, except the FS-CAPM measure, formed using the unconditional CAPM measure. The performance of the WL portfolio is also significant using the Jensen and FS measures relative to the Carhart model when the conditional CAPM measure is used to form the portfolios. There is less statistical significance of the WL portfolio when the Carhart model is used to form the portfolios. This finding is similar to our earlier results in Tables 3 to 5.

Table 6 also shows that the positive performance of the WL portfolio is driven mainly by the positive performance of the Winners portfolio and not the negative performance of the Losers portfolio. The performance of the Losers portfolio in most cases is small in numerical terms and not significant. The exception to this result is the significant negative Jensen performance of the Losers portfolio when the unconditional CAPM measure is used to form the portfolios. In contrast, the

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develop an approach that uses portfolio theory to construct optimal trading strategies in mutual funds that exploits predictability in fund performance.

performance of the Winners portfolio is larger in numerical terms than the Losers portfolio and is significant in some cases. There is significant positive Jensen and FS performance for the Winners portfolio when the unconditional and conditional CAPM measures are used to form the portfolios. This finding suggests that superior performance is more of a driver of the persistence of group-adjusted excess returns and is similar to the results in Tables 4 and 5.

Our findings in Table 6 are similar to what we observe in Tables 3 to 5. One issue that arises in our analysis is that the use of international models might not be appropriate for evaluating the performance of trusts within certain investment sectors that are only allowed to invest in a limited number of countries. For such sectors, the use of a more local factor model might be more appropriate. This issue is important because the choice between domestic and international versions of factor models can have a major impact in practical applications (see Griffin(2002) for the Fama and French(1993) model). In related work, Fletcher and Marshall(2004) find that local versions of the Carhart model are more reliable than the global Carhart model in evaluating trust performance for investment sectors that restrict trusts to a limited number of countries. To examine this issue in more detail, we evaluate the persistence tests using only trusts within investment sectors that allow a reasonable geographical spread in countries i.e. International, Europe, and Far East.

We repeat the persistence tests of Tables 3 to 5 using only trusts within the International, Europe, and Far East sectors. Table 7 reports the persistence tests using only trusts within these three sectors. Table 8 reports the persistence tests where we split the sample into only negative past performance (Panel A) or only positive past performance (Panel B).

Table 7 here

Table 8 here

Table 7 show that there is significant positive persistence in performance when we only include trusts from the International, Europe, and Far East sectors. There is a significant positive slope coefficient across all return horizons using the average and unconditional CAPM measures. There is a significant positive slope coefficient across all return horizons, except the 1-month, using the unconditional Carhart and conditional CAPM measures. There is only significant positive persistence at the 36-month horizon using the conditional Carhart measure. For all performance measures, except the conditional Carhart measure, the Bonf p value is able to reject the null hypothesis that the average slope coefficients are jointly equal to zero.

When we split the sample into only including trusts with inferior past performance, panel A of Table 8 shows that there is only limited evidence of significant positive persistence. There is a significant positive relation using the unconditional CAPM measure at all return horizons except 1-month and 3-month. There is a significant positive relation using the conditional CAPM measure at the 36-month horizon and a significant negative relation at the 24-month and 36-month horizons using the conditional Carhart measure. However the significant persistence disappears using the Bonf p value.

In contrast to panel A, panel B of Table 8 shows that there is much greater significant positive persistence when we only include trusts with positive past performance. The unconditional CAPM and Carhart measures have significant predictive ability of future group-adjusted excess returns across all return horizons.

There is a significant positive relation using the conditional CAPM measure across all return horizons except 1-month. There is significant positive persistence at the 36-month horizon using the conditional Carhart measure. The Bonf p values reject the null hypothesis that the average slope coefficients across the seven return horizons are jointly equal to zero for all four models. Table 8 suggests that the persistence in group-adjusted excess returns in Table 7 is driven mainly by trusts with positive past performance.

Tables 7 and 8 suggests that the persistence in performance using group-adjusted excess returns is stronger when we only use trusts from the International, Europe, and Far East sectors. Comparing the results to Tables 3 to 5, there is not only more statistical significance but the size of slope coefficients is greater in Tables 7 and 8. The role of positive past performance on the overall persistence is also greater when we only use trusts from the International, Europe, and Far East sectors. These findings again highlight the important role that the investment sector plays in international trust performance.

V Conclusions

We examine whether different past performance measures have any predictive ability of future actual and group-adjusted excess returns of international U.K. unit trusts over short-run and long-run return horizons. There are four main findings in our study. First, the investment sector of the trust plays a critical role in detecting the presence of significant positive persistence. There is little evidence of significant positive predictive ability of future trust excess returns over different horizons but there are significant reversals in performance using the Carhart(1997) model. When we use group-adjusted excess returns to control for the investment sector, there is significant positive persistence of future group-adjusted excess returns using four out the five past performance measures. This result holds across the short-run and long-run return horizons. This finding is similar to Teo and Woo(2001) among others that highlight the role of investment style on U.S. mutual fund persistence.

Second, we find that conditional measures of past performance are not more informative of future group-adjusted excess returns than unconditional measures of past performance. Using the conditional version of the Carhart(1997) model, there is very little evidence of any significant predictive ability. This finding differs from Christopherson et al(1998), Christopherson et al(1999) and Myers(2004) who U.S. pension funds.

Third, we find that the positive persistence is not driven mainly by trusts with poor past performance. The relation between past performance and future group-adjusted excess returns is stronger when we restrict the sample to trusts with positive past performance. This finding differs from studies such as Christopherson et al(1998) for U.S. pension funds, Carhart(1997) for U.S. mutual funds, and Fletcher and Forbes(2002) for domestic unit trusts that persistence in inferior performance is more common. However recent studies by Kosowski et al(2004) and Wermers(2004) suggest that there is some significant persistence of superior performance by U.S. mutual funds.

Fourth, we find that the evidence of persistence in group-adjusted excess returns and the role that positive past performance plays is greater when we only use trusts that are in investment sectors which allow for a reasonable geographical spread of countries to invest in. This finding again highlights the importance of the investment sector but also that the use of global models to evaluate past performance is more informative when we use trusts within certain investment sectors.

Our findings suggest that different past performance measures does provide a guide to future group-adjusted excess returns over different horizons. An interesting extension to our study would be to explore the persistence in emerging market funds. Another interesting issue would be to examine the performance of optimal trading strategies that exploit any predictability along the lines of Avramov and Wermers(2004). We leave these issues to future research.

Appendix

Construction of the Carhart(1997) factor portfolios

We form the SMB, HML, and WML factors from 27 portfolios formed on the basis of size, price-earnings ratio (PE), and momentum. The 27 portfolios are formed using Datastream (Level 4) country industry portfolios as in Dahlquist and Sallstrom(2002). The industry portfolio monthly returns, market values, and PE ratios are collected from Datastream for 17 developed equity markets. The countries include Australia, Belgium, Canada, Denmark, France, Germany, Hong Kong, Ireland, Italy, Japan, Netherlands, Norway, Singapore, Sweden, Switzerland, U.K., and U.S. There is some data on 521 industry portfolios.

We form the 27 size/PE/momentum portfolios as follows. At the beginning of July 1984, all industry portfolios are ranked on the basis of their market value at the end of June 1984 and allocated to three size groups. Within each size group, all industry portfolios are ranked on the basis of their PE ratio at the end of December 1983 and allocated to three groups. Within each PE group, all industry portfolios are ranked on the basis of their cumulative 11 month returns, lagged one month (July to May) and allocated to three groups. To be included in the 27 portfolios, the industry portfolios must have non-zero market values and PE ratios, and twelve return observations to calculate momentum. We calculate the monthly value weighted return over the next 12 months. This process is repeated each year. We construct the self-financing portfolios using a similar approach to Liew and Vassalou(2000). The factors are self-financing portfolios of a given factor that is long in one group of portfolios and short in another group of portfolios holding the other two characteristics constant.

Table 1 Summary Statistics on Trusts and Factors

Panel A Trusts	Mean	Standard Deviation	Minimum	Maximum
International	0.285	4.601	-29.440	10.726
North America	0.443	5.573	-33.785	15.929
Europe	0.748	5.050	-27.529	17.608
Australia	0.043	7.167	-48.704	17.153
Japan	0.096	6.931	-19.692	21.418
Far East	0.179	6.560	-35.931	19.404
Panel B Factors	**Mean**	**Standard Deviation**	**Minimum**	**Maximum**
Market	0.410	4.685	-20.558	11.613
SMB	0.193	2.604	-7.480	7.469
HML	0.502	2.655	-11.140	6.985
WML	-0.047	1.738	-8.580	4.532

The table reports summary statistics of the monthly excess returns (%) of six equal weighted portfolios of international unit trusts (Panel A) and the factors used in the international models (Panel B) between January 1985 and December 2000. The summary statistics are the mean, standard deviation, minimum, and maximum monthly excess returns. The equal weighted portfolios of trusts are sorted by investment sector. The six investment sectors are International, North America, Europe, Australia, Japan, and Far East. The factors include the world market index (market) and self-financing portfolios of the size (SMB), value/growth (HML), and momentum (WML) effects in international stock returns.

Table 2 Predictive Tests of International Trusts Excess Returns

Horizons (Months)	Average	Unconditional CAPM	Unconditional Carhart	Conditional CAPM	Conditional Carhart
1	0.320	0.381	-0.539	0.168	-0.089
	(1.21)	(1.48)	(-1.97)**	(1.47)	(-0.71)
3	0.939	1.187	-1.702	0.642	-0.346
	(1.24)	(1.50)	(-2.71)***	(2.00)**	(-1.25)
6	1.767	2.362	-3.379	1.207	-0.954
	(1.11)	(1.36)	(-2.89)***	(1.79)*	(-1.60)
12	1.587	2.196	-3.597	1.216	-1.051
	(0.80)	(1.00)	(-2.80)***	(1.44)	(-1.70)*
18	2.291	4.969	-8.440	3.157	-4.435
	(0.48)	(0.90)	(-1.97)**	(1.04)	(-4.33)***
24	3.247	6.560	-10.071	3.855	-5.972
	(0.58)	(1.01)	(-1.54)	(1.04)	(-3.66)***
36	9.212	12.468	-15.984	4.823	-5.958
	(1.84)*	(2.15)**	(-1.82)*	(1.56)	(-1.80)*
Bonf	0.448	0.217	0.026	0.313	0

* Significant at 10%
** Significant at 5%
*** Significant at 1%

The table reports the Fama and MacBeth(1973) average time-series slope coefficients (and *t*-statistics) in parentheses from the monthly cross-sectional regressions in equation (3) between January 1990 and December 2000. The past performance of the trusts is estimated using the average excess returns during the past 60 months, the Jensen(1968) measure for the unconditional CAPM and Carhart models, and the time-varying measure of Christopherson, et al(1998) for the conditional CAPM and Carhart models. The future compounded excess returns of the trusts is estimated over monthly horizons of 1, 3, 6, 12, 18, 24, and 36 months. The cross-sectional regressions are estimated using Weighted Least Squares where the weights are the inverse of the standard deviation of the residuals from the estimation of past performance. The *t*-statistics are corrected for the effects of heteroskedasticity and serial correlation of (N-1) lags using the method of Newey and West(1987) where N is the number of months over which future compounded excess returns are calculated. Bonf is the Bonferroni p value of the null hypothesis that the slope coefficients across the seven return horizons are jointly equal to zero.

Table 3 Predictive Tests of International Trusts Group-Adjusted Excess Returns

Horizons (Months)	Average	Unconditional CAPM	Unconditional Carhart	Conditional CAPM	Conditional Carhart
1	0.133	0.132	0.039	0.054	0.016
	(1.77)*	(2.16)**	(0.46)	(2.01)**	(0.49)
3	0.457	0.474	0.226	0.169	0.038
	(2.44)**	(2.92)***	(1.04)	(3.07)***	(0.52)
6	0.940	0.994	0.691	0.326	0.084
	(3.16)***	(3.65)***	(1.81)*	(3.47)***	(0.61)
12	1.100	1.117	0.803	0.360	0.112
	(4.16)***	(4.52)***	(2.08)**	(3.96)***	(0.77)
18	2.353	2.588	1.310	0.616	0.028
	(2.96)***	(3.23)***	(1.70)*	(3.90)***	(0.13)
24	3.325	3.510	1.366	0.626	-0.213
	(3.01)***	(3.19)***	(1.03)	(3.11)***	(-0.51)
36	5.926	5.847	3.683	1.338	0.032
	(5.22)***	(4.76)***	(2.70)***	(6.68)***	(0.05)
Bonf	0	0	0.047	0	1

* Significant at 10%
** Significant at 5%
*** Significant at 1%

The table reports the Fama and MacBeth(1973) average time-series slope coefficients (and *t*-statistics) in parentheses from the monthly cross-sectional regressions in equation (3) between January 1990 and December 2000. The past performance of the trusts is estimated using the average excess returns during the past 60 months, the Jensen(1968) measure for the unconditional CAPM and Carhart models, and the time-varying measure of Christopherson, et al(1998) for the conditional CAPM and Carhart models. The future compounded group-adjusted excess returns of the trusts is estimated over monthly horizons of 1, 3, 6, 12, 18, 24, and 36 months. The cross-sectional regressions are estimated using Weighted Least Squares where the weights are the inverse of the standard deviation of the residuals from the estimation of past performance. The *t*-statistics are corrected for the effects of heteroskedasticity and serial correlation of (N-1) lags using the method of Newey and West(1987) where N is the number of months over which future compounded group-adjusted excess returns are calculated. Bonf is the Bonferroni p value of the null hypothesis that the slope coefficients across the seven return horizons are jointly equal to zero.

Table 4 Predictive Tests of International Trusts Group-Adjusted Excess Returns: Negative Past Performance Only

Horizons (Months)	Unconditional CAPM	Unconditional Carhart	Conditional CAPM	Conditional Carhart
1	0.068	0.023	-0.069	0.003
	(0.56)	(0.20)	(-1.09)	(0.07)
3	0.506	0.373	-0.069	-0.027
	(1.70)*	(1.24)	(-0.51)	(-0.27)
6	1.066	0.974	-0.081	-0.260
	(2.22)**	(1.49)	(-0.29)	(-1.15)
12	1.178	1.008	-0.072	-0.236
	(2.34)**	(1.29)	(-0.27)	(-1.03)
18	3.261	1.801	-0.567	-0.512
	(1.83)*	(1.12)	(-1.05)	(-1.15)
24	4.627	2.737	-0.417	-0.787
	(2.08)**	(1.61)	(-0.61)	(-2.16)**
36	8.334	5.454	0.887	-2.256
	(2.43)**	(2.69)***	(0.81)	(-1.88)*
Bonf	0.103	0.049	1	0.212

* Significant at 10%
** Significant at 5%
*** Significant at 1%

The table reports the Fama and MacBeth(1973) average time-series slope coefficients (and *t*-statistics) in parentheses from the monthly cross-sectional regressions in equation (3) between January 1990 and December 2000. The past performance of the trusts is estimated using the Jensen(1968) measure for the unconditional CAPM and Carhart models, and the time-varying measure of Christopherson, et al(1998) for the conditional CAPM and Carhart models. The tests only include trusts with negative past performance. The future compounded group-adjusted excess returns of the trusts is estimated over monthly horizons of 1, 3, 6, 12, 18, 24, and 36 months. The cross-sectional regressions are estimated using Weighted Least Squares where the weights are the inverse of the standard deviation of the residuals from the estimation of past performance. The *t*-statistics are corrected for the effects of heteroskedasticity and serial correlation of (N-1) lags using the method of Newey and West(1987) where N is the number of months over which future compounded group-adjusted excess returns are calculated. Bonf is the Bonferroni p value of the null hypothesis that the slope coefficients across the seven return horizons are jointly equal to zero.

Table 5 Predictive Tests of International Trusts Group Adjusted Excess Returns: Positive Past Performance Only

Horizons (Months)	Unconditional CAPM	Unconditional Carhart	Conditional CAPM	Conditional Carhart
1	0.298	0.048	0.144	0.073
	(1.56)	(0.21)	(1.85)*	(1.15)
3	0.992	0.292	0.389	0.142
	(1.96)**	(0.50)	(2.28)**	(1.24)
6	2.365	1.440	0.608	0.275
	(2.50)**	(1.35)	(1.85)*	(1.12)
12	2.599	1.657	0.659	0.292
	(2.40)**	(1.38)	(1.72)*	(1.13)
18	4.938	3.652	1.245	0.579
	(2.26)**	(1.51)	(2.02)**	(0.78)
24	5.059	3.766	1.087	0.390
	(2.03)**	(1.57)	(1.37)	(0.51)
36	7.641	4.276	2.273	1.011
	(3.15)***	(2.01)**	(4.55)***	(1.07)
Bonf	0.011	0.301	0	1

* Significant at 10%
** Significant at 5%
*** Significant at 1%

The table reports the Fama and MacBeth(1973) average time-series slope coefficients (and *t*-statistics) in parentheses from the monthly cross-sectional regressions in equation (3) between January 1990 and December 2000. The past performance of the trusts is estimated using the Jensen(1968) measure for the unconditional CAPM and Carhart models, and the time-varying measure of Christopherson, et al(1998) for the conditional CAPM and Carhart models. The tests only include trusts with positive past performance. The future compounded group-adjusted excess returns of the trusts is estimated over monthly horizons of 1, 3, 6, 12, 18, 24, and 36 months. The cross-sectional regressions are estimated using Weighted Least Squares where the weights are the inverse of the standard deviation of the residuals from the estimation of past performance. The *t*-statistics are corrected for the effects of heteroskedasticity and serial correlation of (N-1) lags using the method of Newey and West(1987) where N is the number of months over which future compounded group-adjusted excess returns are calculated. Bonf is the Bonferroni p value of the null hypothesis that the slope coefficients across the seven return horizons are jointly equal to zero.

Table 6 Out-of-Sample Performance of Trading Strategies

Past Performance	Mean	Sharpe	Jensen - CAPM	Jensen - Carhart	FS - CAPM	FS – Carhart
Average						
Losers	-0.052	-0.091	-0.051	-0.052	-0.034	-0.026
			(-1.02)	(-0.95)	(-0.66)	(-0.54)
Winners	0.132	0.112	0.118	0.141	0.107	0.136
			(1.20)	(1.40)	(1.04)	(1.53)
WL	0.184		0.169	0.193	0.141	0.162
	(1.42)		(1.35)	(1.52)	(1.05)	(1.45)
Unc CAPM						
Losers	-0.085	-0.148	-0.088	-0.091	-0.064	-0.062
			(-1.74)*	(-1.73)*	(-1.26)	(-1.27)
Winners	0.149	0.130	0.139	0.177	0.122	0.154
			(1.45)	(1.88)*	(1.19)	(1.84)*
WL	0.234		0.227	0.268	0.186	0.216
	(1.89)*		(1.86)*	(2.18)**	(1.43)	(1.98)**
Unc Carhart						
Losers	-0.031	-0.052	-0.031	-0.050	-0.011	-0.001
			(-0.60)	(-1.04)	(-0.21)	(-0.02)
Winners	0.081	0.066	0.072	0.114	0.075	0.102
			(0.70)	(1.13)	(0.68)	(1.03)
WL	0.112		0.103	0.164	0.086	0.103
	(0.82)		(0.77)	(1.27)	(0.60)	(0.79)
Con CAPM						
Losers	-0.010	-0.021	-0.012	-0.012	-0.018	-0.008
			(-0.28)	(-0.28)	(-0.42)	(-0.20)
Winners	0.177	0.150	0.172	0.225	0.162	0.203
			(1.72)*	(2.25)*	(1.49)	(2.25)**
WL	0.187		0.184	0.237	0.180	0.211
	(1.59)		(1.60)	(2.12)*	(1.45)	(1.96)*
Con Carhart						
Losers	-0.024	-0.045	-0.024	-0.047	-0.021	-0.039
			(-0.51)	(-1.06)	(-0.45)	(-0.76)
Winners	0.125	0.118	0.127	0.166	0.124	0.143
			(1.41)	(1.75)*	(1.26)	(1.61)
WL	0.149		0.151	0.213	0.146	0.182
	(1.32)		(1.35)	(1.92)*	(1.22)	(1.61)

* Significant at 10%
** Significant at 5%

The table reports the out-of-sample performance of trading strategies of portfolios of international unit trusts group-adjusted excess returns between January 1990 and December 2000 formed on the basis of different past performance measures. Each month, an equal weighted winners (top 20%) and losers (bottom 20%) portfolio is formed on the basis of past performance during the previous 60 months. The past performance of the trusts is estimated using the unconditional (unc) Jensen(1968) measure for the CAPM and Carhart models, and the conditional (con) time-varying measure of Christopherson, et al.(1998) for the CAPM and Carhart models. WL is a zero-cost portfolio that is long in the winners portfolio and short in the losers portfolio. The out-of-sample performance of the trading strategies is estimated using the mean excess returns (%), the Sharpe(1966) performance measure, the Jensen measure using the CAPM and Carhart models, and the Ferson and Schadt(1996) FS measure using the CAPM and Carhart models. The *t*-statistics in parentheses examines if the performance of the portfolio equals zero and is corrected for the effect of heteroskedasticity using the method of White(1980). All of the performance numbers except the Sharpe measure are monthly %.

Table 7 Predictive Tests of International Trusts Group-Adjusted Excess Returns: International, Europe, and Far East Sectors

Panel A	Average	Unconditional CAPM	Unconditional Carhart	Conditional CAPM	Conditional Carhart
1	0.274	0.257	0.139	0.038	0.023
	(2.24)**	(2.57)**	(1.29)	(1.16)	(0.83)
3	0.936	0.879	0.658	0.155	0.041
	(3.04)***	(3.31)***	(2.30)**	(2.12)**	(0.66)
6	1.960	1.862	1.578	0.326	0.071
	(3.78)***	(3.92)***	(2.79)***	(2.20)**	(0.66)
12	2.123	1.994	1.696	0.343	0.075
	(3.96)***	(3.98)***	(2.72)***	(2.16)**	(0.66)
18	4.728	4.719	3.069	0.954	-0.193
	(4.02)***	(3.58)***	(3.16)***	(4.20)***	(-0.73)
24	6.712	6.379	4.047	1.329	-0.190
	(4.85)***	(3.89)***	(2.82)***	(5.45)***	(-0.68)
36	12.490	11.513	9.440	3.223	0.756
	(6.52)***	(5.65)***	(3.25)***	(4.53)***	(2.13)**
Bonf	0	0	0.007	0	0.232

* Significant at 10%
** Significant at 5%
*** Significant at 1%

The table reports the Fama and MacBeth(1973) average time-series slope coefficients (and *t*-statistics) in parentheses from the monthly cross-sectional regressions in equation (3) between January 1990 and December 2000. The tests only include trusts within the International, Europe, and Far East investment sectors. The past performance of the trusts is estimated using the average excess returns during the past 60 months, the Jensen(1968) measure for the unconditional CAPM and Carhart models, and the time-varying measure of Christopherson, et al(1998) for the conditional CAPM and Carhart models. The future compounded group-adjusted excess returns of the trusts is estimated over monthly horizons of 1, 3, 6, 12, 18, 24, and 36 months. The cross-sectional regressions are estimated using Weighted Least Squares where the weights are the inverse of the standard deviation of the residuals from the estimation of past performance. The *t*-statistics are corrected for the effects of heteroskedasticity and serial correlation of (N-1) lags using the method of Newey and West(1987) where N is the number of months over which future compounded group-adjusted excess returns are calculated. Bonf is the Bonferroni p value of the null hypothesis that the slope coefficients across the seven return horizons are jointly equal to zero.

Table 8 Predictive Tests of International Trusts Group-Adjusted Excess Returns: International, Europe, and Far East Sectors

Panel A Negative	Unconditional CAPM	Unconditional Carhart	Conditional CAPM	Conditional Carhart
1	0.186	-0.020	-1.946	0.024
	(0.95)	(-0.15)	(-1.16)	(0.42)
3	0.829	0.254	-4.875	0.051
	(1.48)	(0.72)	(-0.89)	(0.39)
6	1.898	0.836	-6.498	-0.081
	(1.93)*	(1.12)	(-0.96)	(-0.28)
12	2.031	0.901	-6.820	-0.085
	(1.94)*	(1.02)	(-0.98)	(-0.29)
18	6.585	1.455	3.350	-0.626
	(1.92)*	(0.81)	(1.32)	(-1.57)
24	8.342	2.039	3.974	-0.722
	(1.75)*	(0.99)	(1.34)	(-1.82)*
36	14.761	5.452	12.381	-1.878
	(2.15)**	(1.98)**	(1.29)	(-1.77)*
Bonf	0.218	0.326	1	0.476

Panel B Positive	Unconditional CAPM	Unconditional Carhart	Conditional CAPM	Conditional Carhart
1	0.749	0.727	0.123	0.031
	(2.82)***	(1.85)*	(1.10)	(0.40)
3	2.317	2.294	0.379	0.069
	(2.79)***	(2.15)**	(1.97)**	(0.58)
6	4.954	4.709	0.777	0.205
	(2.82)***	(2.51)**	(2.27)**	(0.88)
12	5.385	5.107	0.816	0.215
	(2.52)**	(2.29)**	(2.11)**	(0.81)
18	11.001	10.787	3.143	0.558
	(3.31)***	(2.64)**	(3.23)***	(0.91)
24	12.126	13.109	4.860	0.838
	(4.82)***	(4.43)***	(3.33)***	(1.44)
36	18.313	20.863	10.333	2.735
	(5.19)***	(2.67)***	(2.28)**	(3.47)***
Bonf	0	0	0.006	0.004

* Significant at 10%
** Significant at 5%
*** Significant at 1%

The table reports the Fama and MacBeth(1973) average time-series slope coefficients (and *t*-statistics) in parentheses from the monthly cross-sectional regressions in equation (3) between January 1990 and December 2000. The tests only include trusts within the International, Europe, and Far East investment sectors. Panel A (B) reports the results where the sample only includes trusts with negative (positive) past performance. The past performance of the trusts is estimated using the average excess returns during the past 60 months, the Jensen(1968) measure for the unconditional CAPM and Carhart models, and the time-varying measure of Christopherson, et al(1998) for the conditional CAPM and Carhart models. The future compounded group-adjusted excess returns of the trusts is estimated over monthly horizons of 1, 3, 6, 12, 18, 24, and 36 months. The cross-sectional regressions are estimated using Weighted Least Squares where the weights are the inverse of the standard deviation of the residuals from the estimation of past performance. The *t*-statistics are corrected for the effects of heteroskedasticity and serial correlation of (N-1) lags using the method of Newey and West(1987) where N is the number of months over which future compounded group-adjusted excess returns are calculated. Bonf is the Bonferroni p value of the null hypothesis that the slope coefficients across the seven return horizons are jointly equal to zero.

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