CHAPTER 9

Performance Persistence of Unit Funds: Evidence from a Small, Integrated Market

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9.1 INTRODUCTION

A number of researchers, such as Hendricks *et al*. (1993), found evidence of mutual funds performance persistence. Non-US funds, however, have remained the subject of relatively little research. Our study concentrates on all-equity domestic funds for sale in Ireland. The performance of the Irish managed funds industry is of interest because, while the size of the Irish funds under management is relatively small, the Dublin financial centre presents an extraordinarily high concentration of fund management activities and know-how, and it is very well integrated in international financial markets. The interesting question is, then, whether portfolio managers operating in this favourable environment (in terms of ease of access to information and availability of skilled professionals) show persistently superior performance in managing domestic funds.

The Irish funds industry has grown in recent years and there are now well over 100 domestic all-equity unit funds in Ireland. These funds are now an important alternative investment for Irish investors. Our research intends to discover whether past performance is a good predictor of future performance, or in other words, whether performance is persistent. Persistence in fund performance would indicate persistent stock selection skills of fund managers. Where evidence of persistence is found, we examine whether this can

be explained by common factors in stock returns as opposed to the stock selection skills of Irish fund managers. We examine whether an Irish investor could just as easily have earned the same returns by following simple mechanical strategies of portfolio formation, without paying the fees associated with investing through a fund.

Section 9.2 of this chapter reviews the previous literature in this area. Section 9.3 describes our methodology, both for estimating fund performance and testing for persistence. Section 9.4 describes the data. Section 9.5 presents our empirical findings and examines performance to ascertain whether it has been persistent in the sample period. We first examine monthly fund excess returns, then use a 3-factor Fama and French (1993) style performance attribution model based on EMU factors to ascertain the proportion of fund returns that can be replicated using readily available mechanical strategies. We also test for persistence using yearly return intervals. In Section 9.6 we discuss the implications of our findings, and in Section 9.7 we draw our main conclusions.

9.2 LITERATURE REVIEW

Most of the literature on fund performance evaluation is centred on the question of whether the time and skill that goes into the selection of securities by fund managers in fact pays off. Persistent performance in mutual funds was the topic of much empirical research around the early 1990s, and many of these studies, notably Hendricks *et al*. (1993), Goetzmann and Ibbotson (1994), and Brown and Goetzmann (1995), detected a so-called "hot-hands" effect, in that past mutual fund performance appeared to be a good predictor of future returns. This evidence is in contrast to the efficient market hypothesis and is of interest to investors as it implies the possibility of earning abnormal returns by buying previous winner funds. Much of the research prior to this, notably the classic papers by Treynor (1965), Sharpe (1966) and Jensen (1968), had found that mutual funds consistently underperformed the market indices.

Hendricks *et al*. (1993) examined quarterly returns data over the period 1974–88 on a sample of survivorship bias-free equity funds. They found that growth-oriented funds performance persist in the short-run (from one to three years) and the difference between the top and bottom octile of funds is 6–8 percent per year. They also found that by engaging in *ex ante* "hot-hands" investment strategies, an improvement in risk-adjusted returns of 6 percent per year was possible. They could not attribute this "hot-hands" phenomenon to previously known anomalies of firm size, dividend yield and mean reversion in returns.

Studies by Goetzmann and Ibbotson (1994) and Brown and Goetzmann (1995) also found evidence of short-term persistence in mutual fund

performance. Goetzmann and Ibbotson (1994) concluded that performance persistence is present in raw and risk-adjusted returns on equity funds at short-term horizons of one month to three years. Brown and Goetzmann (1995) used contingency table analysis to measure persistence, and suggested that future investigation of this persistence phenomenon should concentrate on a search for common investment strategies.

Performance persistence was also evident in studies by Grinblatt and Titman (1992) and Elton *et al*. (1996). Grinblatt and Titman (1992) found evidence that fund performance is persistent over time, and that this persistence supports the notion of the skilled stock selection ability of fund managers. They argue that their findings cannot be explained by factors related to firm size, dividend yield, past returns, skewness, interest rate sensitivity or the CAPM beta. They also show that differences in fees and transaction costs cannot explain fully the observed persistence in performance. They find evidence of persistence over relatively long horizons and conclude that the past performance of a fund is a good indicator for investors of its future performance. Further evidence of long-term persistence was provided by Elton *et al*. (1996). Like Hendricks *et al*. (1993), they find a short-run persistence in raw returns, but when they use risk-adjusted returns to rank funds they also find evidence of longer-term predictability.

Carhart (1997) examined whether performance persistence boils down to the stock selection ability of fund managers, or it could be explained by common factors in stock returns and differences in transaction costs sustained by the funds. He used as common factors of stock returns a proxy for the market portfolio, and size, book-to-market and momentum factor mimicking portfolios. Carhart (1997) uses these factors as right-hand side variables in a performance attribution model without making any claim for the asset-pricing models that underlie the return data generating process. In other words, it does not matter whether the underlying factors represent true sources of systematic risk. Carhart (1997) employs the models to explain returns and leaves risk interpretations as a side issue. He confirmed the presence of persistence in raw returns, but found that all the funds quantiles have negative alphas when performance is measured relative to the 4-factor model. He concludes that fund persistence is a result of persistence in the underlying stocks and not the persistent stock-picking ability of fund managers. His research does not support the idea of skilled fund managers, and rather suggests that the earlier findings on persistent performance were largely a result of a momentum effect in the underlying stocks. In other words, fund returns persistence could well be attributed to luck rather than skill. The only persistence in performance is that of underperformance. Studies by Malkiel (1995) and Kahn and Rudd (1995) also found persistence to be primarily in poorly performing funds. These studies used contingency table analysis to measure persistence, similar to the methodology of Brown and Goetzmann (1995). Malkiel developed a Z-test for the percentage of repeat

winners each year, whereas Kahn and Rudd (1995) calculated a chi-square statistic and a corresponding *p*-value.

Cortez *et al*. (1999) measured performance persistence in Portuguese mutual funds. They used two-way contingency table methodology of repeat winners and losers. The methodology adopted by Cortez *et al*. (1999) is suitable for small cross-sectional samples. This study is therefore relevant to ours, since Ireland, like Portugal, is a small market and has a relatively small number of funds. They found little evidence in support of performance persistence, but the latter was only measured relative to the market model.

9.3 METHODOLOGY

First, we run OLS regressions of each fund's monthly excess return on the returns of the three factors. These regressions are based on a 3-factor performance attribution model similar to the model used by Carhart (1997), but with no momentum factor mimicking the portfolio

$$R_{it} = \alpha_i + \beta_i RMRF_t + \beta_{i1} SMB_t + \beta_{i2} HML_t + e_{it} \tag{9.1}$$

Here, R_{it} is the excess return on the *i*-th fund; $RMRF_t$ is the excess return on an aggregate market proxy; SMB_t is the excess return on a factor mimicking portfolio for size; HML_t is the return on a factor-mimicking portfolio for book-to-market; and e_{it} is a regression residual. The three factors correspond to the right-hand-side variables of the 3-factor model Fama and French (1993) but, like Carhart (1997), we use this model only to "explain" performance and we ignore risk considerations. Performance is defined in terms of the intercept of these regressions.

The methodology we adopt for testing for persistence in performance draws on a number of the studies discussed in Section 9.2. Carhart (1997) used decile-sorted fund performance to estimate persistence. This methodology is only suitable for large markets. Because the Irish funds market is relatively small, we use instead the two-way contingency table methodology of repeat winners and losers as in Brown and Goetzmann (1995), Kahn and Rudd (1995), Malkiel (1995) and Cortez *et al*. (1999). The methodology involves analyzing the number of repeat winners and losers each month.

We apply this methodology first to see if there is persistence in raw excess returns. Excess returns are defined as a fund's monthly return in excess of the risk-free rate. The risk-free rate proxy is the one-month Euribor. Repeat winner (*WW*) funds are those with a return greater than the median return repeated in the subsequent month. Repeat losers (*LL*) are funds with a return less than the median repeated in the subsequent month. *WL* and *LW* correspond to funds with performance reversals. A chi-square statistic[1] of

repeat winners is then computed and tested for significance. A significant chi-square statistic is evidence of persistence in fund performance. We then repeat the test adjusting the performance estimate for exposure to the factors.

9.4 DATA

We collected monthly price data on Irish unit funds for the sample period January 1999 to January 2004. Unit funds are operated by open-ended investment companies. Investors purchase units in a fund, and the prices quoted are prices per unit. These prices represent the net asset value per unit, which is the fund's total assets less liabilities divided by the number of units. The data was obtained from the MoneyMate database of Irish funds. There are over 300 Irish domestic funds for sale in Ireland in the MoneyMate database. We cleaned this data to include in our study only funds that invest exclusively in equities. We then considered only funds that were in existence in January 1999. This left us with a sample of 117 Irish domestic unit funds investing in equities. As far as we are aware, no funds have been discontinued since 1999 in the MoneyMate database. Thus, to the best of our knowledge, this sample is free of survivor bias. The prices included in the data are net of fees and charges. We calculate returns by first differencing the log of the bid price (that is, the net asset value per unit) of each fund. This gives us 60 months of observations to use in our study.

We use as our market proxy in Equation (9.1) the Datastream total market index for the EMU, and calculate monthly excess returns for this index over the sample period. The risk-free rate we use is the one-month Euribor. Our size factor in Equation (9.1) is the monthly excess return on the MSCI EMU small capitalisation (small cap) index, again for the same period. This size proxy is thus different from the one used by Fama and French (1993) and Carhart (1997). Their size factor is returns on a small cap index minus returns on a large cap index. We think that excess returns on the small cap index, while not being a zero investment portfolio, will suffice as a proxy for size for our purposes. Our justification comes from Instrumental Variable Estimator theory and requires that the instrument be highly correlated with the variable for which it proxies. Since a small cap portfolio and a small minus big portfolio are likely to be highly correlated, we can use a small cap portfolio as our size proxy (in the absence of data for a large cap portfolio we cannot construct the classical size factor-mimicking portfolio). Our HML factor in Equation (9.1) is constructed using the MSCI EMU value and growth indices. We take the difference between the return on the value index and the return on the growth index each month in the sample period. These figures give us the monthly returns on our HML factor-mimicking portfolio. We highlight that our HML portfolio, like our size proxy, is not a zero investment portfolio.

9.5 RESULTS

The factor loadings estimated in Equation (9.1) for some categories of funds in our sample are statistically insignificant. This is the case for funds using only Far Eastern equities and those using only Japanese equities. Thus our model of performance attribution using EMU factors is clearly not appropriate for these categories of funds. Therefore we excluded these categories of funds from our sample. This reduces our sample of funds to 98, which are reported in Table 9.1.

9.5.1 Persistence in excess returns

We first examine persistence in monthly excess returns. We use contingency table analysis in order to test for persistence. Table 9.2 reports the contingency table of repeat winners and losers based on raw excess returns. Under the null of no persistence, we expect the number of *WW* to be equal to one quarter of the sample; similarly for *WL*, *LW* and *LL*.

We compute chi-square statistics in a similar manner to Kahn and Rudd (1995) and replicated by Cortez *et al*. (1999). A chi-square statistic below the critical value indicates that we cannot reject the null hypothesis. Overall, there is no evidence of persistence. The chi-square statistic computed for the whole 60-month period is insignificant at all confidence levels. However, we observe a number of significant chi-square statistics at monthly intervals, with twenty-six of the sixty months examined showing a chi-square statistic significant at the 1 percent level. Two further months have a chi-square statistic significant at the 5 percent level.

Tests based on the chi-square statistic, however, have the drawback of not being able to detect reversals in performance, since its sign is always positive. In other words, while it is the number of *WW* and *LL* that matter for persistence considerations, a high chi-square statistic could also be the result of a relatively high number of *WL* and *LW*. In twelve of the months when we observe significant chi-square statistics, these are the result of a high number of *WL* and *LW*, and thus of reversals in performance rather than repeat winners and losers. This therefore leaves only sixteen months where there is genuine evidence of persistent winners and losers. In other words, only sixteen of the sixty months under examination have a significantly high number of repeat winners and losers (*WW* and *LL*). On balance, these results provide some evidence in favor of short-term month-to-month limited persistence in the performance (measured as raw excess returns) of Irish unit linked funds.

9.5.2 Persistence in performance

Next, we perform a contingency table analysis using our performance estimates from Equation (9.1). The results of this analysis are reported in Table 9.3.

Table 9.1 Average monthly abnormal returns over entire sample period

Fund name	Abnormal return (%)	Fund name	Abnormal return (%)
European equities		Friends First Ord Share 2 N	−0.591
Ark Life Euro Zone N	−0.747	Friends First Ordinary Share N	−0.587
CGU Irl Euro Equity N	−0.478	Friends First Stewardship N	−0.224
Hibernian L&P Euro Equity N	−0.498	GRE Equity N	−0.713
		HibernianLPNU Equity 1 N	−0.486
BOI Life - Unit Funds European N	−0.625	Hibernian L&P (NU) Equity 2 N	−0.913
Canada Life European Equity N	−0.354	Hibernian L&P Equity N	−0.424
		Irish Life Blue Chip 1 N	−0.482
Hibernian L&P Continental Europe N	−0.586	Irish Life Blue Chip 2 N	−0.387
		Irish Life Blue Chip 3 N	−0.387
Irish Life European4N	−0.523	New Irl Equity 1 N	−0.360
Irish Life European5N	−0.586	New Irl Equity 2 N	−0.361
Irish Life European6N	−0.603	New Irl Equity 5 N	−0.360
New Irl European Sec1 N	−0.459	New Irl Equity 6 N	−0.380
New Irl European Sec5 N	−0.459	Progressive Equity 1 N	−0.418
New Irl European Sec6 N	−0.480	Progressive Equity 3 N	−0.458
Progressive European N	−0.593	Progressive Equity 4 N	−0.359
Standard Life Europe 1 N	−0.443	Progressive Grobond Equ N	−0.397
		Standard Life Equity 1 N	−0.537
American equities			
BOI Life – Unit Funds Nth American N	−0.432	**International equities**	
		BOI Life – Unit Funds Intern'l N	−0.398
Hibernian L&P US Equity N	−0.707		
Irish Life Nth American4N	−0.259	Canada Life Inter'l Equity N	−0.246
Irish Life Nth Americanfive	−0.321	CGU Irl International N	−0.721
Irish Life Nth Americansix	−0.341	Hibernian L&P (NU) Global N	−0.393
New Irl Nth AmerSec1N	−0.437	Hibernian L&P (NU) Predator N	−0.464
New Irl Nth AmerSec5N	−0.435		
New Irl Nth AmerSec6 N	−0.457	Hibernian L&P Global Managed N	−0.498
Progressive US Equity N	−0.554		
Standard Life North America 1 N	−0.594	Hibernian L&P International Equity N	−0.498
General equities		Irish Life Inter'l Equ 4 N	−0.344
Ark Life PEP Managed N	−0.490	Irish Life Inter'l Equ 5 N	−0.406
Ark Life Special Inv 2 N	−0.491	Irish Life Inter'l Equ 6 N	−0.424
Ark Life Special Invest N	−0.427	Irish Life Mixed Irish & Inter Equity	−0.829
BOI Life – Unit Funds Equity N	−0.355		
		Merrill Lynch Int. Best of the World N	−0.934
Canada Life Balanced Equity N	−0.357		
Canada Life Hi Growth Man N	−0.363	New Irl Inter'l 1 N	−0.303
Canada Life Leading Co's N	−0.778	New Irl Inter'l 5 N	−0.303
Canada Life Leading Companies B N	−0.618	New Irl Inter'l 6 N	−0.323
		Progressive Inter'l Eq1 N	−0.434

continued

Table 9.1 Continued

Fund name	Abnormal return (%)	Fund name	Abnormal return (%)
Progressive Inter'l Equity 4 N	−0.373	New Irl Irish Equity 6 N	−0.293
Standard Life International Equity 1 N	−0.436	Progressive Irish EquityN	−0.543
Ulster Bank World Equ N	−0.723	Progressive Irish EN	−0.121
Irish equities		Scot Legal ISEQ Tracker N	−0.200
Canada Life Irish Equity N	−0.596	Standard Life Irish Equity 1 N	−0.381
CGU Irl Irish Equity N	−1.241	Ulster Bank ISEQ Tracker N	−0.350
Hibernian L&P (NU) Irish Fund N	−0.087	**UK equities**	
Hibernian L&P (NU) SIF N	−0.106	CGU Irl UK Equity N	−0.603
Hibernian L&P Irish Equity N	−0.158	Hibernian L&P UK Equity N	−0.562
Irish Life Irish Equ SIA N	−0.055	Irish Life UK Equity 4 N	−0.527
Irish Life Irish Equity 4 N	−0.301	Irish Life UK Equity 5 N	−0.589
Irish Life Irish Equity5 N	−0.363	Irish Life UK Equity 6 N	−0.608
Irish Life Irishi Equity 6 N	−0.382	New Irl UK Sec 1 N	−0.674
New Irl Irish Equity1 N	−0.273	New Irl UK Sec 5 N	−0.673
New Irl Irish Equity 2 N	−0.273	New Irl UK Sec 6 N	−0.694
New Irl Irish Equity 5 N	−0.272	Progressive UK Equity N	−0.595
		Standard Life UK Equity 1 N	−0.462

We observe again that, considering the 60-month sample period as a whole, the chi-square statistic is insignificant at all confidence levels. Thus there is no long-term persistence in performance. More interestingly, however, most of the short-term persistence observed in Table 9.3 has disappeared.

In only two months out of the sixty months under observation have chi-square statistics significant at the 1 percent level. A further eight months have significant chi-square statistics at the 5 percent level. Thus in total, just ten out of the sixty months in the observation show significant chi-square statistics. This is in stark contrast to the twenty-eight observed using unadjusted returns. In eight of these ten months, however, the significant chi-square statistics are the result of reversals in performance. Thus only two months out of the sixty in the sample period have significant chi-squares related to persistent winners and losers. These results provide little evidence of persistence in performance.

9.5.3 Persistence in performance over different return intervals

We perform further tests to gauge to what extent persistence in performance depends on the interval of return measurement. Much of the literature has found that persistence is sensitive to the length of the return interval under examination (Carhart, 1997; Cortez *et al*. 1999). We consider five 12-monthly return intervals. We calculate yearly performance as the cumulative total of

Table 9.2 Contingency table of monthly excess returns, end March 1999–end January 2004

	WW	*WL*	*LW*	*LL*	Chi-squared
3/29/99	31	18	18	31	6.898**
4/29/99	34	15	15	34	14.735**
5/29/99	28	21	21	28	2.000
6/29/99	36	13	13	36	21.592**
7/29/99	12	37	37	12	25.510**
8/29/99	12	37	37	12	25.510**
9/29/99	33	16	16	33	11.796**
10/29/99	25	24	24	25	0.041
11/29/99	28	21	21	28	2.000
12/29/99	21	28	28	21	2.000
1/29/00	28	21	21	28	2.000
2/29/00	24	25	25	24	0.041
3/29/00	14	35	35	14	18.000**
4/29/00	31	18	18	31	6.898**
5/29/00	34	15	15	34	14.735**
6/29/00	25	24	24	25	0.041
7/29/00	21	28	28	21	2.000
8/29/00	20	29	29	20	3.306
9/29/00	35	14	14	35	18.000**
10/29/00	30	19	19	30	4.939*
11/29/00	27	22	22	27	1.020
12/29/00	33	16	16	33	11.796**
1/29/01	22	27	27	22	1.020
2/28/01	33	16	16	33	11.796**
3/29/01	17	32	32	17	9.184**
4/29/01	21	28	28	21	2.000
5/29/01	19	30	30	19	4.939*
6/29/01	38	11	11	38	29.755**
7/29/01	26	23	23	26	0.367
8/29/01	21	28	28	21	2.000
9/29/01	21	28	28	21	2.000
10/29/01	16	33	33	16	11.796**

Continued

Table 9.2 Continued

	WW	*WL*	*LW*	*LL*	Chi-squared
11/29/01	32	17	17	32	9.184**
12/29/01	16	33	33	16	11.796**
1/29/02	8	41	41	8	44.449**
2/28/02	29	20	20	29	3.306
3/29/02	22	27	27	22	1.020
4/29/02	29	20	20	29	3.306
5/29/02	31	18	18	31	6.898**
6/29/02	29	20	20	29	3.306
7/29/02	23	26	26	23	0.367
8/29/02	14	35	35	14	18.000**
9/29/02	25	24	24	25	0.041
10/29/02	23	26	26	23	0.367
11/29/02	16	33	33	16	11.796**
12/29/02	8	41	41	8	44.449**
1/29/03	23	26	26	23	0.367
2/28/03	22	27	27	22	1.020
3/29/03	25	24	24	25	0.041
4/29/03	15	34	34	15	14.735**
5/29/03	28	21	21	28	2.000
6/29/03	26	23	23	26	0.367
7/29/03	25	24	24	25	0.041
8/29/03	32	17	17	32	9.184**
9/29/03	17	32	32	17	9.184**
10/29/03	12	37	37	12	25.510**
11/30/03	20	29	29	20	3.306
12/31/03	29	20	20	29	3.306
1/31/04	24	25	25	24	0.041
Total	**1,419**	**1,472**	**1,472**	**1,419**	**1.943**

Notes: ** and * denote significance at the 1% and 5% levels, respectively.

the monthly performance estimates in that year. The contingency table of 12-monthly performance is reported in Table 9.4.

Considering the sample period as a whole, we once again find no evidence of persistence. We observe two individual years where there are significant

Table 9.3 Contingency table of persistence in performance

	WW	*WL*	*LW*	*LL*	Chi-squared
	34	15	15	34	3.684*
3/29/99	34	15	15	34	3.684*
4/29/99	34	15	15	34	3.684*
5/29/99	30	19	19	30	1.235
6/29/99	32	17	17	32	2.296
7/29/99	14	35	35	14	4.500*
8/29/99	14	35	35	14	4.500*
9/29/99	33	16	16	33	2.949
10/29/99	24	25	25	24	0.010
11/29/99	13	36	36	13	5.398*
12/29/99	14	35	35	14	4.500*
1/29/00	26	23	23	26	0.092
2/29/00	28	21	21	28	0.500
3/29/00	12	36	37	13	6.378*
4/29/00	24	25	24	25	0.010
5/29/00	34	15	15	34	3.684
6/29/00	24	25	25	24	0.010
7/29/00	34	15	15	34	3.684
8/29/00	21	28	28	21	0.500
9/29/00	29	20	20	29	0.827
10/29/00	33	16	16	33	2.949
11/29/00	24	25	25	24	0.010
12/29/00	28	21	21	28	0.500
1/29/01	22	27	27	22	0.255
2/28/01	25	24	24	25	0.010
3/29/01	15	34	34	15	3.684
4/29/01	10	39	39	10	8.582**
5/29/01	24	25	25	24	0.010
6/29/01	31	18	18	31	1.724
7/29/01	30	19	19	30	1.235
8/29/01	25	24	24	25	0.010
9/29/01	22	27	27	22	0.255
10/29/01	17	32	32	17	2.296

Continued

Table 9.3 Continued

	WW	*WL*	*LW*	*LL*	Chi-squared
11/29/01	34	15	15	34	3.684
12/29/01	19	30	30	19	1.235
1/29/02	6	43	43	6	13.969**
2/28/02	27	22	22	27	0.255
3/29/02	20	29	29	20	0.827
4/29/02	34	15	15	34	3.684
5/29/02	29	20	20	29	0.827
6/29/02	29	20	20	29	0.827
7/29/02	21	28	28	21	0.500
8/29/02	19	30	30	19	1.235
9/29/02	21	28	28	21	0.500
10/29/02	21	28	28	21	0.500
11/29/02	14	34	35	15	4.500
12/29/02	16	33	32	17	2.949
1/29/03	19	30	30	19	1.235
2/28/03	29	20	20	29	0.827
3/29/03	32	17	17	32	2.296
4/29/03	20	29	29	20	0.827
5/29/03	31	18	18	31	1.724
6/29/03	28	21	21	28	0.500
7/29/03	22	27	27	22	0.255
8/29/03	30	19	19	30	1.235
9/29/03	13	36	36	13	5.398*
10/29/03	23	26	26	23	0.092
11/30/03	26	23	23	26	0.092
12/31/03	18	31	31	18	1.724
1/31/04	23	26	26	23	0.092
Total	**1,404**	**1,485**	**1,485**	**1,408**	**1.191**

Note: ** and * denote significance at the 1% and 5% levels, respectively.

chi-square statistics, both at the 1 percent level. We notice, however, that one of these is caused by a widespread reversal in performance and not by persistent winners and losers. Thus, there is just one year (Yr 5) in the sample period that shows evidence of persistence.

Table 9.4 Contingency table for yearly return intervals

	WW	*WL*	*LW*	*LL*	Chi-squared
Yr 2	20	20	29	29	3.306
Yr 3	16	33	33	16	11.796**
Yr 4	27	22	22	27	1.020
Yr 5	34	15	15	34	14.735**
Total	**97**	**90**	**99**	**106**	**1.327**

Notes: Critical values of chi-square statistic using 1 degree of freedom are 6.635 and 3.841 at the 1% and 5% levels, respectively. The symbols ** and * denote significant chi-square statistics at the 1% and 5% levels, respectively.

9.6 IMPLICATIONS

Our aim was to assess whether persistence in fund performance occurs is as a result of the persistent stock selection ability of fund managers, or whether Irish investors could have just as easily followed mechanical strategies and achieved the same performance. In other words, are the fees paid to fund managers justified? The major implication of our findings is that Irish investors could have done just as well as these funds over the sample period in question by following mechanical stock selection techniques and thus could have avoided the payment of fees to fund managers. We have shown that a 3-factor performance attribution model based on EMU factors can account for almost all of the persistence in monthly excess returns observed. An Irish investor can easily trade EMU stocks with no foreign exchange or other cross-border restrictions. Thus an Irish investor could easily have recombined a portfolio of EMU stocks using three mechanical strategies – namely, high-versus-low beta stocks; size; and value-versus-growth stocks; which could have replicated the performance achieved by the funds in our sample over the period we examined.

9.7 CONCLUSION

We have analyzed a sample of Irish unit funds and assessed their performance persistence. We found evidence of short-term month-to-month persistence in excess returns. We found significant chi-square statistics that suggest persistent winners and losers in sixteen of the sixty months in our sample period. This finding leads us to conclude that there is some evidence of short-term persistence in raw excess returns. We then used a performance attribution model based on EMU factors and repeated the persistence test with the performance estimates from this model. We found that almost all of the previously observed persistence disappeared. Thus

the three strategies underlying the 3-factor model can explain almost all of the persistence in excess returns. Using fairly mechanical stock selection styles based on stock sensitivity to the EMU market, size and book-to-market proxies, an Irish investor could thus have recombined a portfolio of EMU stocks that would have done just as well as these funds over the sample period in question. We also examined yearly returns for persistence, and just one year in the sample period showed evidence of persistence. Thus, once again, the evidence in favor of persistence in performance is weak.

Some may argue that, since our sample contains funds using equities from areas outside the EMU, a model using international factors may be more appropriate. However, we are using the model based on EMU factors as a performance attribution model rather than an asset pricing model, and thus it does not matter whether the factors correspond to true underlying sources of economic risk. Furthermore, an Irish investor would not be able easily to recombine a portfolio using equities from outside the EMU, since there would be foreign exchange issues and other potential barriers. Irish investors can, however, easily trade EMU stocks since there are no restrictions on them. Thus we believe that a model based on EMU factors, when being used for performance attribution purposes, is the most appropriate for the Irish market. Besides, we have shown that an Irish investor would not have needed to invest outside the EMU to achieve the level of performance of the funds in our sample over the period 1999–2004, since it could have achieved it by just investing in EMU stocks and using the three mechanical styles discussed above.

NOTES

1. The chi-square statistic has one degree of freedom and is computed as follows

$$\chi^2 = \sum_{1}^{N} \frac{(WW - N/4)^2}{N/4}$$

for all *WW, WL, LW, LL,* and where *N* is total number of possible repeats. The critical values of the chi-square statistic with one degree of freedom are 6.635 and 3.841 for 1 percent and 5 percent confidence levels, respectively.

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