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THE TIMING AND SELECTION ABILITY OF IRISH FUND MANAGERS: PARAMETRIC AND NON-PARAMETRIC TESTS

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ABSTRACT

This study examines the market timing and selection ability of portfolio managers. It uses both the parametric and non-parametric models proposed by Henriksson and Merton (1981) to analyse Irish funds over the period 1992 to 1997. The results show that Irish fund managers exhibit positive selection ability, however, as with most of the existing empirical evidence, the results for timing ability are less conclusive. The parametric model provides inconclusive evidence, however the non-parametric model does provide some evidence to the contrary. Generally the results are in line with findings in other markets.

INTRODUCTION

The examination of the performance evaluation of portfolio managers has received considerable attention in the finance literature. The primary aim of this literature has been to examine whether portfolio managers are able to consistently outperform the market, thereby violating the principles of the efficient markets hypothesis. This study extends previous work by examining the market timing and stock selection ability of Irish fund managers using the parametric and non-parametric models proposed by Henriksson and Merton (1981). Meta analysis tests are also used to examine whether the observed variation in timing and selection ability across the funds is real or artificial. The market timing ability of fund managers refers to where managers forecast price movements of the market in general, while selectivity refers to when forecasts are made of individual securities. Whilst numerous studies have examined mutual funds in the United States, relatively few studies have been undertaken using European data, in particular outside of the United Kingdom. This study examines a total of 24 funds on a monthly basis over the period 1992 to 1997.

The examination of the Irish market is of particular interest due to the small and illiquid nature of the Dublin exchange. The use of this market may allow an examination of whether there are any differences between the performance of fund managers based in smaller capital markets, such as Dublin, in comparison to larger and more liquid markets. The small nature of the Irish market means that fund managers have a limited universe of domestic investment opportunities, in particular due to the limited number of large actively traded stocks. In addition, while it may be expected that they would have more details about the stocks traded on the exchange, the small scale of the market means that all fund managers would also have such information.

The paper is organised as follows. The next section briefly reviews a number of key articles in the field of performance evaluation, while the following two sections will discuss the data requirements for the study and describe the models used. This is followed by a section which contains the main empirical results and the final section presents a summary of the main findings.

EXISTING EMPIRICAL EVIDENCE

Existing studies examining timing and selection ability have generally found inconclusive results. Kon (1983) examined 37 mutual funds between 1960 and 1976, finding that individual funds exhibited positive timing ability and performance. However, the study did conclude that the results were not inconsistent with the efficient markets null hypothesis. This would indicate that managers as a group have no special information regarding unanticipated market returns. Henriksson (1984) used both the parametric and non-parametric tests developed in Henriksson and Merton (1981) to examine 116 funds over the period 1968 to 1980. The results did not support the hypothesis that managers are successful at market timing, with only three funds having significant results in the parametric tests and only one in the non-parametric tests. Chang and Lewellen (1984) also used the original parametric model, examining 67 mutual funds between 1971 and 1979, finding that there was little evidence of successful market timing or selection ability and that mutual funds have generally been unable to outperform a passive strategy.

Fletcher (1995) used the parametric model and the model proposed by Chen and Stockum (1986) to analyse UK unit trusts over the period January 1980 to December 1989. The results are also generally in line with previous studies, with on average positive selection ability, while timing performance is on average negative. Koh, Phoon and Tan (1993) empirically tested both the parametric and non-parametric models of Henriksson and Merton (1981) on funds quoted on the Singapore Stock Exchange between January 1980 and December 1987. The initial results show that using the non-parametric model the null hypothesis that managers have no timing ability is rejected at the one per cent significance level for both up and down market forecasts. These results are consistent over the whole time period and the four sub-periods used. The parametric results contradict the above findings, with no evidence of market timing ability. No material changes occur in the results when the model is adjusted for heteroscedasticity, using both weighted least squares and the Hansen-White method. Due to the contradicting evidence, the authors apply the methodology of Jagannathan and Korajczyk (1986). Koh et al. subsequently conclude that bias can be present in the parametric model, whereby the true level of market timing is suppressed due to the selection of equities with low systematic risk.

In terms of studies in Ireland, work examining the equity fund sector is limited to the study by Kenneally and Gallagher (1992). This paper examined the performance of the unit fund sector using a variety of performance measures to rank Irish unit linked funds over the period 1983 to 1990. The measures used included the conventional Sharpe, Treynor and Jensen measures as well as the period weighting measure developed by Grinblatt and Titman (1989a). Overall the results are fairly conclusive in that the funds underperformed the benchmark portfolio. Stevenson, Kinsella and O'Healai (1997) analysed Irish property funds, using both the Henriksson and Merton model, and the Chen and Stockum (1986) model. The results do provide some intuitively appealing findings, which differ quite substantially from empirical results of equity markets. While property portfolio managers show no signs of having superior selection ability, there is evidence of superior market timing ability. While it would not be expected that fund managers will be able to select individual properties, due to factors such as illiquidity and the heterogeneous nature of the asset, the smoothed nature of the real estate market would perhaps lead to superior timing performance.

Recent papers have used a multiple portfolio benchmark framework, taking into account that the benchmark generally used in single portfolio studies is unlikely to be mean variance efficient. Lehman and Modest (1987) compared a variety of benchmarks. They found that while the results produced within the multiple portfolio framework were broadly similar, those found from the equally weighted and value weighted indices not only differed from the factor analysis benchmarks, but also from each other. Other studies to have examined this issue include Grinblatt and Titman (1989b), Connor and Korajczk (1991) and Elton, Gruber, Das and Hlavka (1995). While the use of a multiple benchmark framework is theoretically appealing there remain question marks over the appropriateness of their use[1].

DATA REQUIREMENTS

The data set used in this paper consists of 24 Irish based equity funds, and is analysed on a monthly basis over the period January 1992 to May 1997. There are a number of problems that specifically apply to the market in Ireland and lead to a reduction in the initial sample size. Firstly the number of funds is reduced due to the use of differing management charges, leading to situations whereby two funds issued by the same company may be based on the same asset base and therefore provide virtually identical returns. In order to overcome this problem, the returns of funds issued by the same company and the broad asset allocations were analysed and where a common asset base was apparent, only one of the funds was incorporated in the data set.

A further problem that was encountered was due to the regulatory framework in place in the Irish Republic. While in the UK fund managers are required to hold a minimum of 80 per cent of the fund's assets in the appropriate classes, this is not the case in Ireland. Irish regulation merely requires managers to meet the stated requirements of the fund, however no strict guidelines are laid down concerning allocations. All the fund allocations were therefore examined in order to ensure that the majority of the fund is allocated in Irish equities. As asset allocations are also required for the non-parametric model used, these two factors determined the starting date of January 1992, as prior to this date insufficient funds had allocation information available.

A total of 24 funds complied with the requirements detailed above. All of the funds used were from the aggressively managed, managed growth, general equity and Irish equity sectors. The funds have an average asset size of IR£44.26m and a total value of IR£929.5m. Due to insufficient numbers in some of the categories it is however impossible to examine whether there are any significant differences in the results of funds in different categories. It should be noted that survivorship is not a problem in this data set due to the nature of the fund industry in Ireland, with the majority of funds offered by institutions. Therefore the problems generated by survival bias, as noted by articles such as Brown, Goeztmann, Ibbotson and Ross (1992) and Brown, Goeztmann and Ross (1995) are not an issue in the data set used.

MARKET TIMING AND SELECTIVITY MODELS

This section will briefly discuss the methodological framework in which the analysis takes place. Initially the parametric model, which is based on the mean variance framework of the CAPM (capital asset pricing model) is outlined, and then the non-parametric model.

Parametric Model

The CAPM, as developed by Sharpe (1964) and Mossin (1966), can be expressed as follows:

$$R_{it} - R_{ft} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + \varepsilon_{it} \tag{1}$$

where R_{it} equals the one period return of the asset, R_{mt} is the excess return on the market portfolio and β_i represents the systematic risk of the asset in relation to the market portfolio. As the expected value of the error term in equation (1) is equal to zero, the intercept can be taken to be a measure of the portfolio managers selection ability, with successful selection policies indicated by a significantly positive intercept term.

The CAPM framework will, however, produce biased results as the intercept term will be downwardly biased due to market timing effects. This means that the effects of market timing and selectivity cannot be examined separately[2]. Henriksson and Merton (1981) proposed a parametric model which complies with the assumptions of the CAPM and multi-factor models, such as those of Merton (1973) and Ross (1976), and which overcomes the problems of the biased intercept term. Merton (1981) provided theoretical support for this model, with the concept that investment managers will either forecast that the market will outperform the riskless asset, or that the riskless asset will outperform the market. The parametric model proposed by Henriksson and Merton (1981) can be expressed as follows:

$$R_{it} - R_{ft} = \alpha_i + \beta_{1i}(R_{mt} - R_{ft}) + \beta_{2i}[D_t(R_{mt} - R_{ft})] + \varepsilon_{it} \quad (2)$$

The dummy variable contained in the model takes the value of zero when the market return is greater than that of the risk free asset, and -1 when the risk free assets return exceeds that of the market. There are, however, a number of problems with this model. Henriksson (1984) notes the problems concerned with the specified return generating process and the fact that empirical studies have found that the security market line (SML) does not hold for individual securities[3]. Therefore, if this is due to a second factor, which is uncorrelated with the market return, it will bias the results of the intercept, but not the beta coefficient.

Henriksson also refers to Roll (1977) and his critique of the CAPM, and specifically the proxy chosen as the market portfolio. Henriksson finds that there is a negative correlation between α and β, implying that those funds that earn superior returns from selectivity have negative market timing ability. One possible source of this problem is the use of a proxy for the market portfolio. Another potential source is the possible omission of factors that may be of importance to the return generating process. To counter this problem, Henriksson adds a second factor to the model. This is based on the excess returns of an equally weighted portfolio of the funds used, taking account of the market. The amended model can therefore be expressed as follows:

$$
\begin{aligned}
&R_{it} - R_{ft} = \alpha_i + \beta_{1i}(R_{mt} - R_{ft}) + \beta_{2i}[D_{1t}(R_{mt} - R_{ft})] + \\
&\beta_{3i}(R_{EWt} - R_{ft} - \beta_{EW}(R_{mt} - R_{ft})) + \\
&\beta_{4i}[D_{2t}(R_{EWt} - R_{ft} - \beta_{EW}(R_{mt} - R_{ft})] + \varepsilon_{it}
\end{aligned} \tag{3}
$$

The fourth expression in the model takes on the value of $Max[0, w(t)]$, where $w(t)$ equals the third expression. The dummy variable takes on the value of 0 when the return of the equally weighted portfolio exceeds that of the risk free asset and -1 if the reverse occurs. The model requires correction for heteroscedasticity as the standard deviation of the error term is an increasing function of R_{mt}. The model is therefore estimated using OLS (ordinary least squares) and then adjusted using the methods of Hansen (1982) and White (1980)[4].

Meta Analysis

A number of recent papers examining the timing and selection ability of fund managers have utilised meta analysis[5]. Meta analysis is a parametric technique for the cumulation of results across studies, providing estimations of the mean and standard deviation of the population values. In terms of this paper, each fund manager can be viewed as a study. Meta analysis provides a means of examining whether the observed variation in timing and selection ability across funds is real or artificial. In addition, it provides information on the proportion of the observed variation that can be explained by sampling error variation. The tests require only the regression coefficients, the standard errors and the number of observations. For each study the observed regression values, including the intercept term, are denoted as b, the observed values as β, and e represents the sampling error. This is shown in the following equation:

$$e = b - \beta \text{ or } b = \beta + e \tag{4}$$

The average observed value is:

$$\bar{b} = \bar{\beta} + \bar{e} \qquad (5)$$

As the average error will be zero across a large number of studies the above equation can be re-written as:

$$\bar{b} = \bar{\beta} \qquad (6)$$

In the case of this study we are comparing regression results across individual funds, denoted by *i*, we can therefore re-write equation (5) as:

$$b_i = \beta_i + e_i \qquad (7)$$

As β and e will be uncorrelated across funds, the variances of the observed values (σ_b^2) will be larger than the variance of the population values (σ_β^2) by the amount of the sampling error (σ_e^2).

$$\sigma_b^2 = \sigma_\beta^2 + \sigma_e^2 \text{ therefore}: \sigma_\beta^2 = \sigma_b^2 - \sigma_e^2 \qquad (8)$$

As the variance of the sampling error can be computed, we can directly estimate the population variance. Whilst the above work assumes that the sample size is large, alterations to the methodology have to be undertaken when this is not the case. Therefore, the best estimate for the population value is the frequency weighted average can be represented as:

$$\bar{b} = \frac{\sum [N_i b_i]}{\sum N_i} \qquad (9)$$

where b is the observed value in the study, N is the number of observations in the study. The variance used is therefore the frequency weighted average squared deviation, and can be represented as in equation (10), as follows:

$$s_b^2 = \frac{\sum \left[N_i (b_i - \bar{b})^2 \right]}{\sum N_i} \tag{10}$$

The sampling error variance can be represented as shown in equation (11), while the population variance can be estimated as in equation (12).

$$s_e^2 = \frac{\sum \left[N_i (standard\ error\ b_i)^2 \right]}{\sum N_i} \tag{11}$$

$$s_\beta^2 = s_b^2 - s_e^2 \tag{12}$$

A chi-square test is used to examine whether there is any real variation in observed values. The ratio of the observed variance to the sampling error has a chi-squared distribution with *k-1* degrees of freedom, as follows:

$$\chi^2 = \frac{k s_b^2}{s_e^2} \tag{13}$$

where *k* is the number of studies.

One potential problem is that if the number of studies is large, there is the risk that the null hypothesis may be rejected even if there is a small amount of real variation. The tests therefore have to be adjusted due to the issue of independence. As Coggin and Hunter (1993) note, this problem arises due to the potential presence of the same individual stocks in different fund portfolios, thereby having an influence on the returns on the funds. This situation leads to the sampling errors for the coefficients being non-independent and positively correlated. This issue is of particular importance in this study due to the small-scale nature of the Irish market and the limited number of investment opportunities that are available, in particular due to the small number of large and actively traded firms on the Irish market. It can therefore be taken that the sampling error variance can be written as $[(1-r)s_e^2]$ rather than s_e^2. The adjusted meta-analysis formulas can therefore be re-written as follows:

$$s_b^2 = s_\beta^2 + (1-r)s_e^2 \quad (14)$$

$$s_\beta^2 = s_b^2 - (1-r)s_e^2 \quad (15)$$

$$s_\beta^2 = (s_b^2 - s_e^2) + rs_e^2 \quad (16)$$

$$\chi^2 = \frac{ks_b^2}{(1-r)s_e^2} \quad (17)$$

$$\chi^2 = [1/(1-r)]\left(\frac{ks_b^2}{s_e^2}\right) \quad (18)$$

As it is assumed that the studies are not independent then the standard error can be represented as follows:

$$SE = \sqrt{(s_b^2 / k) + rs_e^2} \quad (19)$$

Non-parametric Model

The non-parametric model developed by Henriksson and Merton (1981) allows the investigation of selectivity and market timing without the need to assume a CAPM framework. The model allows for the fact that while the conditional probabilities of a correct forecast can measure forecasting ability, they are not reliant on the return distributions. If $R_m(t)$ is the return on the benchmark portfolio over a period starting at point *t*, and $R_f(t)$ is the return on the appropriate risk-free rate over the same holding period, then if a portfolio manager forecasts that $R_m(t) \leq R_f(t)$, the probability of success is $p_1(t)$. Correspondingly, the probability of failure is $1-p_2(t)$, where $p_1(t)$ is the probability of the prediction conditional on the actual outcome of $R_m(t) \leq R_f(t)$. Therefore, the forecast can only be of positive value if the probability of success is greater than the probability of failure.

Following on from this it can therefore be stated that the null hypothesis of no market timing ability can be formulated as follows:

$$p_1(t) + p_2(t) = 1 \tag{20}$$

Under the null hypothesis n_1, the number of correct forecasts that $R_m(t) \leq R_f(t)$, follows a hypergeometric distribution. The non-parametric model does, however, require a proxy for the forecasts. Koh et al. (1993) approached this problem by using changes in the allocation of the fund between the risk-free asset and local equities. A similar approach is used in this paper.

EMPIRICAL FINDINGS

This section presents the empirical results from the tests on the market timing and selection ability of portfolio managers. Initially the summary statistics of the 24 funds are examined, then the results from the parametric model and the meta analysis are discussed. The next section expands the analysis by utilising the non-parametric model.

Table 1 provides details of the mean monthly return of the 24 funds and the corresponding standard deviations. For comparative purposes the corresponding results for the ISEQ index, the average fund performance and that from an equally weighted portfolio of the 24 funds are also shown. The average monthly return of the ISEQ over the period examined was 1.3061 per cent and it can be shown that 13 of the 24 funds produced corresponding returns in excess of that figure. In addition, both the average fund return and that from the equally weighted portfolio were higher than the market. The Jensen performance measure was also calculated, with the results displayed in **Table 2**. Only six funds provided positive measures, however none of the six was significant. The positive period weighting measure developed by Grinblatt and Titman (1989a) was also calculated, however no difference was observed between this and the Jensen measure. The performance measurement results support the findings of Kenneally and Gallagher (1992) in finding that Irish funds underperform the benchmark portfolio[6].

Table 1: Summary Statistics of Funds

	Mean Monthly Return (per cent)	Standard Deviation
Fund 1	1.1510	4.6033
Fund 2	1.1839	4.0941
Fund 3	1.1874	4.3553
Fund 4	1.0892	3.0446
Fund 5	1.0896	2.4250
Fund 6	1.4926	3.6678
Fund 7	1.4973	3.1332
Fund 8	1.3808	3.6776
Fund 9	1.2145	4.1148
Fund 10	1.2585	3.1657
Fund 11	1.2865	3.1276
Fund 12	1.2437	3.1271
Fund 13	1.4106	3.4478
Fund 14	1.3495	3.4332
Fund 15	1.3480	3.4328
Fund 16	1.4882	3.8682
Fund 17	1.1358	3.2559
Fund 18	1.4650	3.9454
Fund 19	1.3141	3.2957
Fund 20	1.3113	3.5591
Fund 21	1.2807	3.5727
Fund 22	1.4880	4.0453
Fund 23	1.4585	4.0368
Fund 24	1.3693	3.9374
Portfolio	1.3122	3.2889
Average	1.3122	3.5986
ISEQ	1.3061	4.2056

Table 2: Jensen Performance Measure

	Jensen's Alpha
Fund 1	-0.0013617
Fund 2	-0.0030517
Fund 3	-0.0026733
Fund 4	-0.004623*
Fund 5	-0.0058533**
Fund 6	0.00084507
Fund 7	-0.00081254
Fund 8	-0.00020339
Fund 9	-0.0012538
Fund 10	-0.0029512
Fund 11	-0.0027129
Fund 12	-0.0031437
Fund 13	-0.00075726
Fund 14	-0.0013142
Fund 15	-0.0013209
Fund 16	0.00073706
Fund 17	-0.0035437*
Fund 18	0.00050439
Fund 19	-0.0017734
Fund 20	-0.001387
Fund 21	-0.00167532
Fund 22	0.0012771
Fund 23	0.00097994
Fund 24	0.000047686

* Indicates significance at a 10 per cent level, ** at 5 per cent and *** at 1 per cent.

The results from the parametric model proposed by Henriksson and Merton (1981) model and as adapted by Henriksson (1984) are contained in **Tables 3** and **4**. **Table 3** details the results for all 24 funds, while **Table 4** provides the summary statistics for the tests. Note that all of the results provided in these tables are those after correcting for heteroscedasticity. To briefly re-cap, the intercept can be interpreted as a measure of the stock selection ability of the fund, the second coefficient measures the market timing ability of the manager, the third coefficient is the fund factor and the fourth coefficient measures market timing ability against the other funds.

Table 3: Parametric Model Results for Individual Funds

	α	β_1	β_2	β_3	β_4
Fund 1	0.002977	1.0219***	0.025274	0.1184	-0.18511
Fund 2	0.011712**	1.1937***	0.48786*	1.2828*	0.19915
Fund 3	0.015774**	1.1879***	0.2849	1.6762***	0.74456
Fund 4	0.010044**	0.67019***	-0.068516	0.7218**	0.080327
Fund 5	0.011566***	0.59433***	0.023097	1.1048***	0.38021*
Fund 6	0.011566***	0.77227***	-0.15621	0.1553	-0.31496*
Fund 7	0.015364***	0.74208***	0.072469	0.86201***	0.003634
Fund 8	0.005638**	1.0257***	0.15871	0.54628**	0.17516
Fund 9	0.007115***	0.93102***	-0.085307	0.214	-0.17942
Fund 10	0.014578***	0.7980***	0.080271	0.93356***	0.001141
Fund 11	0.014541***	0.77898***	0.071025	0.88828***	-0.032752
Fund 12	0.014102***	0.78011***	0.073219	0.89015***	-0.032173
Fund 13	0.007397	0.73206***	-0.02531	0.21406	-0.2366

Fund 14	0.007982	0.75464***	-0.018593	0.27777	-0.23427
Fund 15	0.008001*	0.75901***	-0.01618	0.28839	-0.22439
Fund 16	0.006391*	1.0540***	0.27019	0.43419	-0.10533
Fund 17	0.003488	0.83646***	0.129996	0.34203	-0.16352
Fund 18	0.012121***	0.84901***	-0.025918	0.21723	-0.473393
Fund 19	0.007305**	0.77245***	0.049366	0.23929	-0.355558
Fund 20	0.006809**	1.1206***	0.31582*	1.0799***	0.57847*
Fund 21	0.006545*	1.1211***	0.31113	1.0825***	0.5862*
Fund 22	0.007267**	1.3011***	0.39651-	1.0114***	0.53849
Fund 23	0.007247**	1.2849***	0.37284*	0.99798***	0.52585
Fund 24	0.007042***	0.89004***	-0.050588	0.067961	-0.333236

The results displayed are those after correction for heteroscedasticity. * Indicates significance at a 10 per cent level, ** at 5 per cent and *** 1 per cent.

Table 4: Summary Parametric Model Results

	α	β_1	β_2	β_3	β_4
Average	0.009239	0.915897	0.111501	0.651928	0.039397
Minimum	0.002977	0.59433	-0.15621	0.067961	-0.47393
Maximum	0.015774	1.3011	0.48786	1.6762	0.74456
No. Positive	24 (20)	24 (24)	16 (5)	24 (13)	11 (3)
No. Negative	0	0	8	0	13 (1)

The figures in parenthesis indicate the number of significant positive and negative coefficients at a 10 per cent level.

It can be seen that all 24 funds produced positive intercepts, indicating superior stock selection ability, with 20 of the intercepts also being statistically significant at a 10 per cent level or lower. If these results are compared to the raw Jensen measures the problem of bias can be clearly seen. With the Jensen measure only six funds produced positive intercepts, and none of these was statistically significant. As noted by Grant (1977) and others, the intercept will be downwardly biased if market timing is not examined. The results for the market timing ability of fund managers indicate that Irish fund managers have some degree of superior timing ability, with 16 of the 24 funds having positive coefficients (β_2). However, the number of significant positive coefficients is low, with only five funds having coefficients significant at 10 per cent or less. Due to high variations between the funds with regard to total asset value and the average allocation in Irish equities, the tests were re-calculated with two sub-groups. According to each criteria the 24 funds were separated into two groups, however no discernible differences between the high and low Irish equity allocation groups and the large and small funds were observed[7].

As noted earlier, a number of existing studies (such as Henriksson, 1984 and Jagannathan and Korzjcyzk, 1986) have found that there is a negative correlation between the measure of market and stock selection. The coefficient was calculated, and even though both average figures were positive, the correlation coefficient was -0.058989 (not significant).

Table 5: Meta Analysis Results

	Selectivity	**Timing**
$\bar{b}$	0.009238775	0.1115007917
s_b^2	0.0000132135	0.028967272
s_β^2	0.0000026744	0.0260956746
s_e^2	0.0000129869	0.0450088853
χ^2	31.44238478	19.88894369
$(1-r)s_e^2 / s_b^2$	0.763300881	1.206700585

Table 5 details the results of the meta analysis tests. The first row of the table gives the frequency weighted mean of the observed values, the second row gives the variance of the observed values, the third the population variance, the fourth row gives estimates of the sampling error variance, the fifth row provides the chi-square statistic for the ratio of the observed variance to the sampling error variance, while row six provides an estimate of the proportion of the observed variance that can be attributed to the sampling error. The chi-square statistic tests examines whether there is any real variation in observed values.

The results confirm the findings from the parametric model, however it would appear that the small sample size does lead to problems. While the average figure for selection ability and that for market timing are positive, in none of the cases shown is the χ^2 statistic significant at 10 per cent or less. Basing the analysis on these results would indicate that there is no real variation around the mean values. In addition, these results are supported by the high figures for proportion of the observed variance attributable to the sampling error. This is particularly the case of market timing where the statistic is greater than unity.

Table 6: Non-Parametric Model Results

	$R_m > R_f$	$R_f > R_m$
N_1	455	503
N_2	503	455
N	958	958
n_1	213	285
n_2	219	241
n	432	526
Prob $1 > x$	0.028988	0.0247

The non-parametric model results are reported in **Table 6**. The terminology used in the tests is explained as follows. The number of actual outcomes where $R_m(t) \leq R_f(t)$ is denoted by N_1, N_2 can be defined as the number of outcomes where $R_m(t) > R_f(t)$, n_1 is the number of correct forecasts that $R_m(t) \leq R_f(t)$, n_2 is the number of correct forecasts that $R_m(t) > R_f(t)$, and n is the total number of forecasts that $R_m(t) \leq R_f(t)$. The results support the parametric tests and provide some degree of evidence that Irish portfolio managers possess market timing ability. **Table 6** shows that the null hypothesis that portfolio managers have no timing ability is rejected at the 5 per cent level for both up and down market forecasts.

CONCLUSION

This study has examined the selection and market timing ability of 24 Irish based funds using both the parametric and non-parametric models of Henriksson and Merton (1981). The empirical findings support previous studies such as Henriksson (1984), Koh et al. (1993) and Fletcher (1995) in finding stronger evidence in support of the stock selection ability of fund managers. Of the funds examined, all 24 had positive measures of selectivity, with 20 of the intercepts being statistically significant. With regard to the market timing ability of portfolio managers, the results were more mixed. While the non-parametric model rejected the null hypothesis of no timing ability at a

5 per cent level, the parametric model was less clear. While 16 of the 24 funds produced positive coefficients, only five of the 16 were significant. This also supports the existing literature, in particular the findings of Koh et al. (1993) in their examination of Singaporean funds.

As with previous studies, evidence was found regarding a negative correlation between the timing and selection ability of managers, however it should be noted that the coefficient was not significantly different from zero. Meta analysis tests were also conducted, in order to examine whether there is evidence of any real variation in the regression coefficients.

The data set used in this study does suffer from a number of limitations that may well help to explain the results obtained. Firstly, the sample size does naturally present problems, and in particular with regard to the meta analysis tests. A further issue is the question of whether the benchmark portfolio used, the ISEQ, is efficient. As Kenneally and Gallagher (1992) note, given the small scale of the Irish equity market it is unlikely that the ISEQ is efficient. In addition to the general small size of the market, the limited number of actively traded stocks is another issue that should be considered, and may be an important factor in the differences between the selection ability results contained in this paper and those reported from larger and more actively traded markets. A third factor is the lack of regulation concerning the allocations of the funds, with no strict minimum allocation required in the Irish market. While the use of actual fund allocations has limited this potential problem, only monthly figures were available and the variation in the Irish-based allocation was substantial over the whole of the five-year period. This was true even in the case of funds specifically designed to invest in the Irish equity market.

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NOTES

[1] The author is currently extending this study to explicitly examine the use of an APT framework in the evaluation of fund managers.

[2] See Fama (1972), Jensen (1972), Grant (1977), Admati and Ross (1985) and Dybvig and Ross (1985).

[3] See for example Black, Jensen and Scholes (1972).

[4] It should also be noted that due to the behavioural assumptions used in the model the contribution of fund managers' timing and selection abilities will be estimated with some degree of bias. In addition, the model used requires that the return of the fund is not co-skewed with that of the market. If this is the case the results will be mis-classified.

[5] See for example Coggin and Hunter (1993) and Fletcher (1995).

[6] The Sharpe and Treynor performance measures were also calculated by the author. All of the funds produced negative figures, indicating underperformance. These results are available from the author on request.

[7] Detailed results are available on request from the author.

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