"The Nation Holds Its Breath"… But The ISEQ Breathes Easy

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Abstract:
This paper contributes to a growing literature that examines the asset pricing impact of mood altering events such as sports results, sunshine levels, daylight hours, public holidays, temperature etc. Much of this literature reports a stock market impact. Specifically, we investigate whether there is a relationship between changes in investor mood arising from wins and losses in international sporting competition and stock market returns. We examine the case of Ireland. Ireland is an interesting case because its people are passionate about sport, the domestic population is relatively homogenous (rather than divided) in terms of support for Irish teams and individuals in international competition and domestic investors comprise the largest proportion of owners of Irish stocks – all factors which suggest that if a mood effect exists it should show up in this case. However, we find no evidence in support of such a mood effect in the case of either sporting wins or losses. This finding suggests that the Irish stock market is rational and efficient in this regard.

Keywords : investor mood, sport, stock returns

JEL Classification: G10, G14.

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1. Introduction

This paper investigates whether there is a relationship between stock market returns and sporting results where the latter are believed to influence investor mood and behaviour. We examine this in the case of Ireland, a country whose people are passionate about sport. This study forms part of a wider literature that examines the asset pricing impact of behavioural biases documented in psychology. In addition to the mood altering effect of sporting results, the possible behavioural impact on the stock market of sunshine, the number of daylight hours, nonsecular holidays, temperature and lunar cycles have also been examined (Kamstra, Kramer and Levi 2000, Frieder and Subrahmanyam 2004, Saunders 1993, Hirshleifer and Shumway 2003 and Cao and Wei 2005). The link between stock market returns and investor mood following sporting results in particular is examined by Edmans, Garcia and Norli (2007) who hypothesise, citing much supporting evidence from psychology literature, that sporting results affect investor optimism and pessimism, self esteem and positive or negative feelings about life in general which in turn impacts investors' views about future stock prices.

More formally, Edmans, Garcia and Norli (2007) argue that in investigating the link between investor mood and stock market returns, the mood variable must satisfy three criteria. First, the variable must influence mood in a significant and unambiguous way, second it must impact a large proportion of the population and third it must be positively correlated across the majority of the (investor) population. In our study, "The nation holds its breath" refers to the by now famous commentary by George Hamilton (a sports commentator on RTE, Ireland's national television broadcaster) just prior to the deciding penalty in the penalty shoot-out between Ireland and Romania in the 1990 soccer world cup – the converted penalty put Ireland through to the quarter finals of the competition causing historic jubilation and euphoria in Ireland. This sporting result, and the many others in our sample, we believe satisfy Edmans et al's three criteria in capturing mood as in general, the small Irish population are homogenous in their reaction to major sporting events, therefore the mood effect has a greater chance of showing up in asset prices.

The sporting events in our sample include 74 Republic of Ireland competitive international soccer wins or losses and 120 international rugby wins or losses. As Irish people's sporting interests are varied we also include a further 21 major Irish sporting achievements and disappointments at international level including in golf, athletics, boxing, snooker, swimming and horse racing. This also allows us to increase our

sample size leading to the improved statistical reliability of findings. We choose (i) international and (ii) competitive fixtures to ensure a stronger homogenous reaction among the domestic population while the 'home-bias' widely documented in the finance literature, e.g. French and Poterba (1991), then suggests that the investment decisions of domestic investors could influence market movements. Between 2001 – 2008, the period for which data are available, approx 30% of ISEQ stocks (by market capitalization) were owned by domestic investors[1] – certainly enough at the margin to determine market movements. Finally, we examine a sample period of over 20 years between January 1989 and June 2009.

Investigating a possible link between investor mood and stock market movements is of interest for a number of reasons. First, if it is found to exist it implies that investors may be forewarned of the timing of a market movement either up or down as the sporting event itself is entirely predictable. Of course, the direction of the stock market move depends on the outcome of the sporting event. Second, an established link would also enable the stock market and sporting betting markets to be used as possible hedging instruments. Third, the study is relevant to researchers investigating anomalies in financial markets as sporting events are not typically captured in the extant models of equilibrium security returns. Fourthly, it serves as a reminder to market practitioners to become self-aware of any biases that may creep into their decision-making process. Finally, the results should be of interest to international investors in the Irish market who may need to concern themselves with studying the sporting form of Irish competitors as part of their short term investment decisions.

Methodologically, the asset price impact of sporting results, or mood altering events generally, is typically examined using either an event study or continuous variable approach. We employ the continuous variable approach as its main advantage is that it allows for a larger number of observations thus leading to improved statistical reliability. Furthermore, using this approach it is also easier to compare the extent of the mood impact on stock markets across different sports *over time* generally rather than comparing individual *once-off* sporting events. The former is likely to be of more interest to investors. For example, a finding that soccer results generally have a greater stock market impact than, say, rugby throughout the sample period is a more useful predictor than knowing, say, that the 1990 soccer world cup had a greater impact than, say, the 1999 rugby world cup.

The remainder of the paper proceeds as follows: the next section briefly outlines some of the key findings from previous studies, section 3 describes the methodology and data set used in this study, section 4 describes our empirical findings while section 5 concludes.

2. Review of Literature

A recent and growing literature has documented a link between mood and stock market returns, where, in turn, mood is hypothesised to be affected by, and is proxied by, factors such as sports results, sunshine, daylight hours (causing a change to sleep patterns), nonsecular holidays, temperature and lunar cycles. For example, Kamstra et al (2000) report a loss effect in the stock market following the daylight saving clock change, which it is hypothesised negatively affects sleep patterns. The paper finds that the average Friday-to-Monday stock return on daylight saving weekends was even more negative than that associated with the 'weekend-effect' anomaly and thereby associated with a one-day loss of US$31 billion on the NYSE, AMEX and NASDAQ markets alone. The weekend effect itself may also be attributable to a mood factor as traders' mood fades between a Friday and Monday[2]. The findings of Kamstra et al (2000) hold not only in the United States and Canada, where the transition to and from daylight saving is broadly similar, but also in the United Kingdom, where patterns differ from that in North America, and to a lesser also extent in Germany. Hirshleifer and Shumway (2003) confirm the intuition that sunny weather is associated with upbeat mood. The authors examine the relation between morning sunshine at a country's leading stock exchange and market index stock returns that day for 26 countries and report and strong positive correlation suggesting it may be possible to trade profitably on the weather. Interestingly, there is an asymmetry – other weather conditions such as rain and snow are found to be unrelated to returns. Frieder and Subrahmanyam (2004) report mixed results for a mood effect associated with religious holidays where abnormal positive returns are found around Yom Kippur and St. Patrick's Day but negative returns around Rosh Hashanah. Hirshleifer (2001), Shiller (2000) and Lucy and Dowling (2005) provide comprehensive reviews of the literature on the asset price impact of behavioural issues in psychology.

Turning in particular to the mood effect associated with sports results, there is much psychological evidence showing that the latter has a significant impact on the former. Wann et al (1994) confirm that fans experience a strong positive (negative)

reaction when their teams perform well (badly). According to the authors, "*such reactions were documented to lead to increased or decreased self-esteem and to positive or negative feelings about life in general.*" (Wann et al 1994, p.347). Schwartz et al (1987) find that the performance of the German football team in the 1982 World Cup significantly changed fans' feelings of well being and opinions on national issues. Sporting results have also been found to be positively associated with the sales of lottery tickets, Arkes et al (1988); with health issues such as heart attacks, Carroll et al (2002); rioting, Wann et al (2001); homicides, White (1989) and suicides, (Trovato (1998). Given the evidence from this literature that sporting results impact on people's feelings of well being, on optimism and pessimism and on their views of their own abilities, it seems reasonable to hypothesise that this 'feel-good' factor could also apply to sentiment on domestic economic and company performance and stock market returns. As noted by Shiller et al (1984): "*Stock prices are likely to be among the prices that are relatively vulnerable to purely social movements because there is no accepted theory by which to understand the worth of stocks and no clearly predictable consequences to changing one's investments. Since investors lack any clear sense of objective evidence regarding prices of speculative assets, the process by which their opinions are derived may be especially social.*" (Shiller et al 1984, p. 465).

A comprehensive international study of the impact on stock market returns of sporting performance and investor mood is that of Edmans et al (2007). This study concentrates for the most part on international soccer results but also looks at results in cricket, rugby, ice hockey and basketball. Edmans et al apply a continuous variable methodology to the sporting events and national stock indices of a cross-section of 39 countries between 1973 and 2004. The authors find, for example, that losses in international soccer matches are associated with significant losses in the losing country's stock market on the next trading day. This finding also extends to rugby, cricket and basketball. However, asymmetrically, no evidence of a positive stock market reaction is found following wins in any of the sports examined. Such asymmetric findings are consistent with prospect theory, central to which is an asymmetry where given the same variation in absolute value there is a bigger utility impact from losses than from gains, i.e. a loss aversion.

Using the alternative event study approach, Ashton, Gerrard and Hudson (2003) investigate if the English national football team's success has any impact on the London Stock Exchange. Football is used because of its historic importance in England and also because the national team is continuously involved in a cycle of qualifying

stages, competitions and friendly matches. Based on daily data between 1984 and 2002, the authors test whether the return on the trading day following a particular game differs from the unconditional mean return on all trading days and conclude that wins are associated with positive returns and losses with negative returns.

Boyle and Walter (2003) examine whether the performances of the New Zealand national rugby team is related to fluctuations in equity pricing on the New Zealand stock exchange. New Zealand is an interesting case - a small country with a single dominant sport whose primary contests are international in nature. It is found that stock return behaviour is independent of the success of the premier national sports team. However, Boyle and Walter use monthly returns which may disguise a short-term influence of investor mood following a contest. Nevertheless, the papers shows that irrational investor responses to sporting contest results would be transitory at best.

We now proceed to outline the methodology and data to be used in this study.

3. Methodology and Data

In order to investigate a possible mood/stock return relationship we employ the continuous variable approach broadly similar to that of Edmans et al (2007). At the heart of this approach is a relatively simple dummy variable specification around sporting events in a model of stock market returns to measure changes in mood. Specifically, the procedure first involves estimating a stock market return model of the form

(1) $$R_t = \gamma_0 + \gamma_1 R_m + \gamma_2 R_{mt-1} + \gamma_3 D_t + \varepsilon_t$$

where R_t is the return on the Irish stock market at time t, R_{mt} is the return on an index of world stocks, R_{mt} is specified here to control for outside events affecting global stock market movements in order to isolate market variation more unique to factors affecting Ireland including, it is hypothesised, mood. We use a 'World' market index from Morgan Stanley Capital International (MSCI) available from Datastream. This is a market capitalization weighted index that is designed to measure the equity market performance of developed and emerging markets. As of June 2009 the index consisted

of 45 country indices. This variable may also be specified in (1) with a lag as the world index is calculated on calendar dates where some countries comprising the index, e.g. the U.S., lag Ireland[3]. However, in testing the robustness of our findings we also employ the returns on the FTSE All Share index in order to control for more local factors closer to Ireland causing stock market fluctuation. D_t is another dummy variable to allow for the Monday effect anomaly observed in many stock market returns. Denoting $\hat{\varepsilon}_t$ as the residuals from regression (1), we examine the effect of the sporting event by estimating

$$(2) \qquad\qquad \hat{\varepsilon}_t = \beta_0 + \beta_1 W_t + \beta_2 L_t + \mu_t$$

where W_t and L_t are dummy variables set equal to one on day t where t is the next trading day following a sporting win or loss respectively and equal to zero otherwise.

Under the null hypothesis, $H_0 : \beta_1 = \beta_2 = 0$, the mood variable surrounding sporting wins and losses involving Irish teams and competitors has no effect on stock returns. Under $H_{A1} : \beta_1 > 0, H_{A2} : \beta_2 < 0$ wins (losses) lead to a positive (negative) reaction in the stock market.

However, a finding that a stock market reacts to sporting successes and failures may instead be picking up the increasing commercial importance around sport. Indeed therefore, it might be argued that a significant finding that a sport related mood variable has an influence on stock market returns is in fact capturing a rational response by an efficient market as expectations are revised surrounding the potential economic benefit to particular industries following national sporting success including effects on merchandise sales, advertising, productivity and wider consumer expenditure and is not in fact related to mood at all. However, it is more likely that the undoubted increasing commercialisation surrounding sport is discounted in the stock market in a far more smoothed and gradual manner. Tests of the mood effect examine the statistical significance of up and down 'spikes' in the stock market immediately following sporting events and therefore significant findings are more likely to be attributable to investor mood as hypothesised. Nevertheless, in an attempt to distinguish between these competing explanations we also investigate the mood effect on returns of a small cap stock index, rather than a broad market index. Since small

stocks are held in higher proportion by domestic investors, they are more likely to be subject to a mood effect.

Data: Descriptions and Sources

The sample period examined in this study is the 5th January 1989 to 15th June 2009. Irish stock returns are calculated from the ISEQ index between these dates. The world stock index is the Morgan Stanley Capital International (MSCI) index. The FTSE All Share Index is also used in some robustness tests. These stock indices are taken from Datastream. We also study an Irish Small Cap Index. This is also taken from MSCI. The small cap returns exists daily from 4th May 1993. In the case of all stock returns, we use daily returns calculated from closing prices.

Our data set includes a total of 215 competitive international sporting events. The sporting events include 74 Republic of Ireland competitive international soccer wins or losses and 120 international rugby wins or losses. Soccer events include qualifier, group and knock-out stages of World Cup and European Championship competitions while Rugby events include similar stages of the Five/Six Nations and World Cup competitions. We also include a further 21 major Irish sporting achievements and disappointments at international level including in golf, athletics, boxing, snooker, swimming and horse racing. Of course these events are not a complete list of wins and losses involving Irish sports men and women over the period. However, this selection is intended to represent a sample of memorable sporting achievements and disappointments with which to increase the sample size and to test the mood/stock returns hypothesis across sport more generally and not just in soccer and rugby. Table 1 below lists the sample of other major sporting successes and disappointments to be included in our study.

[Table 1 Here]

As an initial simple analysis Figure 1 is a collection of graphs which plot the ISEQ daily returns in a time window around a sample of sporting events throughout the sample period. Some graphs present a 15 day event window around a single sporting event as indicated while multiple events are displayed in time windows of varying lengths as relevant such as World Cup competitions. The graphs allow a simple preliminary 'eye-balling' of stock market reaction following sports events. The points

referred to in the notes following each graph relate to the returns on the trading day following the sporting event. The length of the event window relate only to the number of trading days, i.e., excludes weekend days.

[Figure 1 Here]

Overall, the simple graphical examination provides mixed evidence. While there is no obvious consistent relationship between sporting wins (losses) and positive (negative) stock market reaction, there are some examples of the hypothesised link worthy of a more robust statistical examination.

4. Empirical Results

In this section we investigate the possible sporting results/stock market relationship more robustly applying the continuous variable methodology outlined in section 3. We estimate Equations (1) and (2) by OLS and report Newey-West serial correlation and heteroscedasticity adjusted t-statistics to test for statistical significance. Table 2 presents results for the broad measure of Irish stock returns, i.e., daily returns on the benchmark ISEQ index. The upper panel shows the coefficient estimates for alternative forms of (1) as indicated with Newey-West adjusted t-statistics in parentheses. For example, the column denoted 1 is the baseline full specification model with the contemporaneous and lagged returns on the world stock market index and the Monday dummy variable as independent variables. The lower panel (in the same column) reports the corresponding estimates of (2), i.e., where the dependent variable is the estimated residuals from (1). Similarly, Newey-West serial correlation and heteroscedasticity adjusted t-statistics are shown in parentheses. $SW_t, SL_t, RW_t, RL_t, OW_t, OL_t$ are the dummy variables for soccer wins/losses, rugby wins/losses and other sporting event wins/losses respectively. In robustness checks we also employ FTSE All Share returns as an alternative to the world stock market returns as discussed previously. These results are reported in column 3 and column 4. Also shown are the adjusted R^2 and the Schwartz Information Criterion (SIC) for each model estimated. The SIC trades off a reduction in a model's residual sum of squares for a more parsimonious best-fit model, the lowest SIC value indicates the most parsimonious fit.

[Table 2 here]

It is clear from the upper panel of Table 2 that the world stock returns, their lagged values and the Monday dummy variable are consistently statistically significant in explaining daily movements in Irish stock returns at 5% significance across each model. Similarly, in column 3 and column 4, replacing world stock market returns with the FTSE All Share returns in order to control for more local stock market influences yields qualitatively similar results. The SIC indicates that the model with the FTSE All Share returns specified is a more parsimonious fit. We also report the adjusted R^2 which ranges from 0.278 to 0.387 across models. The adjusted R^2 shows that a considerable amount of variation in Irish stock returns remains unexplained by (1) leaving scope for the sports event dummies to explain at least some of this unexplained variation.

However, in the lower panel we find no evidence that sporting event wins and losses have any significant impact on the stock returns – having controlled for the other factors. Indeed, counter-intuitively, the coefficients on the dummy variables for soccer wins and rugby wins are negative across all models, although not significantly so.

Given the relative homogeneity of the Irish population in terms of support for sports teams and competitors as well as the fact that domestic investors comprise the largest proportion of ownership of Irish stocks (approx 30%), one might have expected a mood effect to appear in the stock market. However, the results in Table 2 provide no significant evidence of this. One possible explanation of this finding is that the 30% ownership of stocks by domestic investors, although sizeable, is too small for a mood effect to dominate overall market returns. In order to investigate this possibility further and check the robustness of our findings we repeat the above tests specifically on the returns of Irish *small* stocks using the MSCI small cap index of returns. This is done as small stocks are held in even higher proportion by domestic investors. We report these results in Table 3. Results are presented similarly to those in Table 2 except the dependent variable in Equation (1) is now returns on the Irish small cap index. Newey-West serial correlation and heteroscedasticity adjusted t-statistics are again shown in parentheses. Due to data availability constraints these results relate to the slightly shorter period 4th May 1993 to 15th June 2009.

[Table 3 here]

In the upper panel of Table 3, we find again that the world stock returns (as well as their lagged values) and the FTSE All Share returns are consistently statistically significant in explaining daily movements in Irish small stock returns at 5% significance across each model. Interestingly, however, the Monday dummy is no longer significant. This is an interesting finding and worthy of further investigation – but it is beyond the scope of this study. Again, we report the adjusted R^2 which ranges from 0.156 to 0.182 across models indicating that there is scope for the sports event dummies to explain at least some of this unexplained variation in Irish small stock returns.

However, in the lower panel of Table 3, again we find no evidence that sporting wins and losses have an impact on the returns of even small stocks, where all t-statistics are insignificant at 5%. The coefficient on soccer wins remains perversely negatively signed, though not significantly so, while the coefficient on rugby wins reverts to being intuitively positively signed, though not significantly so.

Overall, our empirical results provide no evidence that a mood effect arising from sporting wins and losses impacts on stock market returns in the Irish case. This finding is symmetric in that neither wins nor losses impact the stock market. This finding is surprising, interesting and important: Ireland is an interesting case because its people are passionate about sport, the domestic population is relatively homogenous (rather than divided) in terms of support for Irish teams and individuals in international competition and domestic investors comprise the largest proportion of owners of Irish stocks – all factors which suggest that if a mood effect exists it should show up in this case. The fact that it does not indicates the Irish stock market remains rational and efficient rather than anomalous in this regard.

5. Conclusion

This paper contributes to a growing literature that examines the asset pricing impact of mood altering events such as sporting results, sunshine levels, daylight hours, holidays, temperature etc. Specifically, we examine whether there is a relationship between sporting wins and losses and stock market returns in the case of Ireland. We apply a continuous variable approach to testing the asset pricing/sports events link and examine soccer, rugby and an 'other' category of sports events which includes boxing, athletics, horse-racing, golf, swimming and snooker. We find no evidence of a mood effect impacting the stock market. This finding is symmetric in that neither wins nor losses yield an effect. Our overall finding is consistent with past studies of similar cases

such as New Zealand. Our symmetry finding differs slightly from some past studies which find that losses do lead to lower stock returns but wins have no impact. We test the robustness of our findings using a number of alternative forms of a stock market return model and using the returns of both a broad market index and a small cap stock index. We conclude that there is no mood anomaly or market inefficiency in the case of the Irish stock market. This finding should be of comfort to international investors who need not concern themselves with studying the sporting form of Irish competitors as part of their investment decisions.

Table 1: Sporting Events in Athletics, Golf, Swimming, Snooker, Boxing and Horse racing*

Athletics	**Aug 23, 1993** – Sonia O Sullivan wins silver in the 1500m World Championships **Aug 11, 1994** – Sonia O' Sullivan wins gold in European Championships in Helsinki **Aug 14, 1995** – Sonia O' Sullivan wins gold at the world championships in Gothenburg **July 29, 1996** – Sonia O' Sullivan disappoints in the 5000m due to an upset stomach **Aug 19 & 23 1998** – Sonia O' Sullivan wins gold in 10000m and 5000m European Championships **Sept 25, 2000** – Sonia O' Sullivan wins silver at the Sydney Olympics
Golf	**July 22, 2007** – Padraig Harrington wins golf's British Open. **July 20, 2008** – Padraig Harrington successfully defends his British Open title. **August 10, 2008** – Padraig Harrington wins the USA PGA Championship
Swimming	**July 21, 1996** – Michelle Smith wins a gold medal in the 400-metre individual medley at the Olympic Games. **July 23, 1996** – Michelle Smith wins a second gold medal in the 400-metre freestyle at the Olympic Games. **August 6, 1998** – Olympic gold Medalist Michelle de Bruin is banned from competition for four years for allegedly tampering with a drug test.
Snooker:	**May 5, 1997** – Ken Doherty becomes the World Snooker Champion
Boxing:	**Aug 8, 1992** – Michael Carruth wins a gold medal and Wayne McCullough takes silver for Ireland at the Olympic Games in Barcelona. It is Ireland's first Olympic gold in 36 years. **March 19, 1995** – Dublin boxer Stephen Collins beats world champion Chris Eubank to win the WBO super middleweight championship title. **Jan 12, 1997** – Wayne McCullough becomes world super bantam weight champion in Las Vegas Aug 25, 2007 - Bernard Dunne is sensationally stopped after just 86 seconds of the first round in his European Super-Bantamweight Championship bout.
Horse Racing	**March 10-13, 2009 –** Ruby Walsh rides a record-breaking 7 winners over the 4 days festival

● Dates shown are the actual dates that the events took place and not the trading days following the event.

- ## Table 2: Relation Between Sporting Results and ISEQ Returns

Table 2 presents results from the OLS estimation of Equations (1) and (2) where the dependent variable in (1) is the ISEQ broad measure of Irish stock returns. The upper panel shows the coefficient estimates for alternative forms of (1) as indicated while the lower panel reports the corresponding estimates of (2). Newey-West serial correlation and heteroscedasticity adjusted t-statistics are shown in parentheses. R_{mt} are the returns on the Morgan Stanley Capital International (MSCI) World Index. In robustness checks we also employ FTSE All Share returns as an alternative as indicated. D_t is a dummy for a possible Monday effect. $SW_t, SL_t, RW_t, RL_t, OW_t, OL_t$ are dummy variables for soccer wins/losses, rugby wins/losses and other wins/losses respectively. Also shown are the adjusted R^2 and the Schwartz Information Criterion (SIC) for each model. The SIC trades off a reduction in a model's residual sum of squares for a parsimonious best-fit model

Model Equation (1) $R_t = \gamma_0 + \gamma_1 R_m + \gamma_2 R_{mt-1} + \gamma_3 D_t + \varepsilon_t$	**1**	**2**	**3**	**4**
Interecept	0.023 (1.478)	0.006 (0.481)	0.020 (1.395)	0.005 (0.420)
R_{mt} (MSCI World Index)	0.600 (18.919)	0.601 (18.873)		
R_{mt-1} (MSCI World Index)	0.254 (8.739)	0.254 (8.727)		
D_t (Monday Dummy)	-0.082 (-2.343)		-0.075 (-2.331)	
R_{mt} (FTSE All Share)			0.723 (30.976)	0.724 (30.885)
Model Selection Criteria				
Adjusted R-square	0.278	0.278	0.387	0.387
Schwartz Information Criterion (SIC)	0.046	0.046	-0.118	-0.119
Equation (2) $\hat{\varepsilon}_t = \beta_0 + \beta_1 W_t + \beta_2 L_t + \mu_t$				
Intercept	0.003 (0.217)	0.004 (0.337)	0.001 (0.100)	0.003 (0.216)
SW_t	-0.019 (-0.141)	-0.027 (-0.201)	-0.045 (-0.371)	-0.052 (-0.432)
SL_t	0.085 (0.495)	0.067 (0.382)	-0.098 (-0.574)	-0.115 (-0.656)
RW_t	-0.257 (-1.409)	-0.321 (-1.759)	-0.164 (-0.989)	-0.223 (-1.341)
RL_t	-0.089 (-0.916)	-0.154 (-1.592)	0.035 (0.409)	-0.024 (-0.278)
OW_t	0.158 (0.522)	0.133 (0.445)	0.218 (0.843)	0.195 (0.760)
OL_t	0.303 (1.400)	0.297 (1.495)	0.305 (1.036)	0.300 (1.062)

## Table 3: Relation Between Sporting Results and Irish Small Cap Returns

Table 3 presents results from the OLS estimation of Equations (1) and (2) where the dependent variable in (1) is the returns on an index of Irish small stocks. The upper panel shows the coefficient estimates for alternative forms of (1) as indicated while the lower panel reports the corresponding estimates of (2). Newey-West serial correlation and heteroscedasticity adjusted t-statistics are shown in parentheses. R_{mt} are the returns on the Morgan Stanley Capital International (MSCI) World Index. In robustness checks we also employ FTSE All Share returns as an alternative as indicated. D_t is a dummy for a possible Monday effect. $SW_t, SL_t, RW_t, RL_t, OW_t, OL_t$ are dummy variables for soccer wins/losses, rugby wins/losses and other wins/losses respectively. Also shown are the adjusted R^2 and the Schwartz Information Criterion (SIC) for each model estimated. The SIC trades off a reduction in a model's residual sum of squares for a parsimonious best-fit model

Model				
Equation (1) $R_t = \gamma_0 + \gamma_1 R_m + \gamma_2 R_{mt-1} + \gamma_3 D_t + \varepsilon_t$	**1**	**2**	**3**	**4**
Interecept	0.043 (2.240)	0.044 (2.617)	0.048 (2.483)	0.048 (2.794)
R_{mt} (MSCI World Index)	0.393 (13.160)	0.393 (13.148)		
R_{mt-1} (MSCI World Index)	0.243 (8.156)	0.243 (8.156)		
D_t (Monday Dummy)	0.007 (0.174)		-0.0003 (-0.008)	
R_{mt} (FTSE All Share)			0.458 (18.939)	0.458 (18.938)
Model Selection Criteria				
Adjusted R-square	0.156	0.156	0.175	0.175
Schwartz Information Criterion (SIC)	0.182	0.180	0.158	0.156
Equation (2) $\hat{\varepsilon}_t = \beta_0 + \beta_1 W_t + \beta_2 L_t + \mu_t$				
Intercept	-0.001 (-0.049)	-0.001 (-0.058)	-0.001 (-0.079)	-0.001 (-0.078)
SW_t	-0.116 (-0.542)	-0.115 (-0.538)	-0.158 (-0.744)	-0.158 (-0.744)
SL_t	-0.002 (-0.011)	-0.001 (-0.005)	-0.135 (-0.642)	-0.135 (-0.642)
RW_t	0.001 (0.010)	0.007 (0.045)	0.036 (0.226)	0.036 (0.224)
RL_t	0.156 (0.821)	0.161 (0.851)	0.243 (1.339)	0.243 (1.338)
OW_t	0.159 (0.538)	0.161 (0.545)	0.218 (0.729)	0.218 (0.728)
OL_t	-0.108 (-0.289)	-0.107 (-0.287)	-0.123 (-0.343)	-0.123 (-0.343)

Figure 1: Visual Inspection of ISEQ Daily Returns Around Sporting Events

Figure 1.1

World Cup 1990

15/06/1990 - 10/07/1990
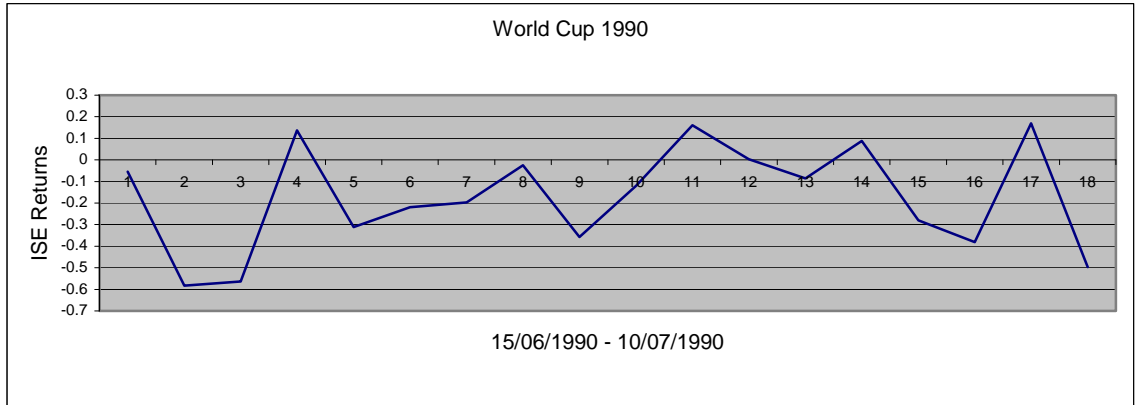
18 day window: Point 8: Ireland beat Romania on penalties. Pt. 12: Ireland lose to Italy. Beating Romania to reach the quarter-finals resulted in national jubilation. The event coincided with neutral ISEQ trading, although better than in previous days. Lower ISEQ returns occurred around the time of the eliminating defeat to Italy.
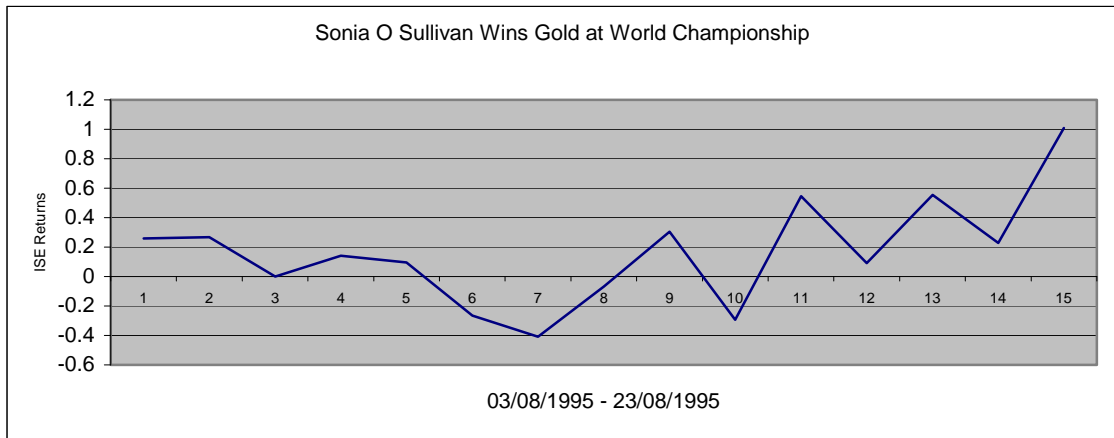
Figure 1.2

Rugby World Cup 1991

30/09/1991 - 28/10/1991
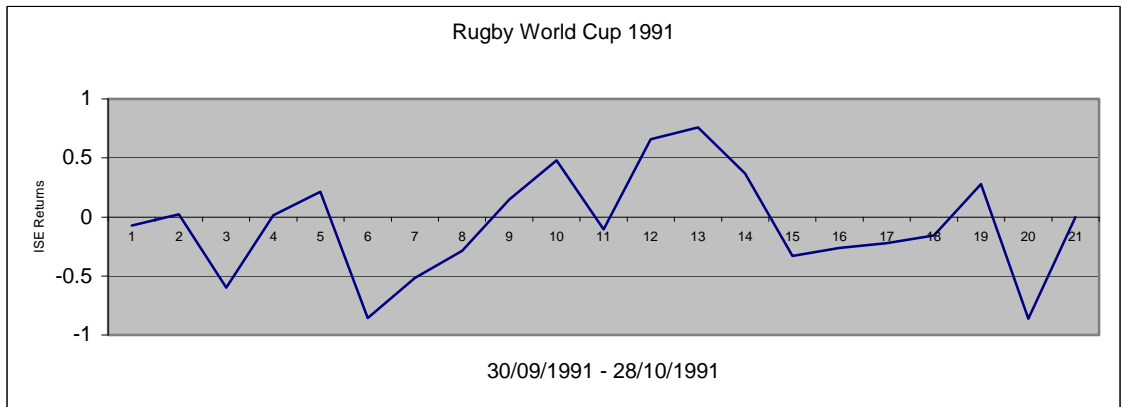
21 day window: Pt. 6 and pt. 9 relate to Irish victories. Pt. 11 Ireland loses to Scotland, Pt. 16 lose to Australia in quarter-final. First victory coincides with sharp ISEQ decline. Elimination from the tournament is not reflected in particularly poor stock market performance, however.

**Figure 1.3**

World Cup 1994

13/06/1994 - 13/07/1994
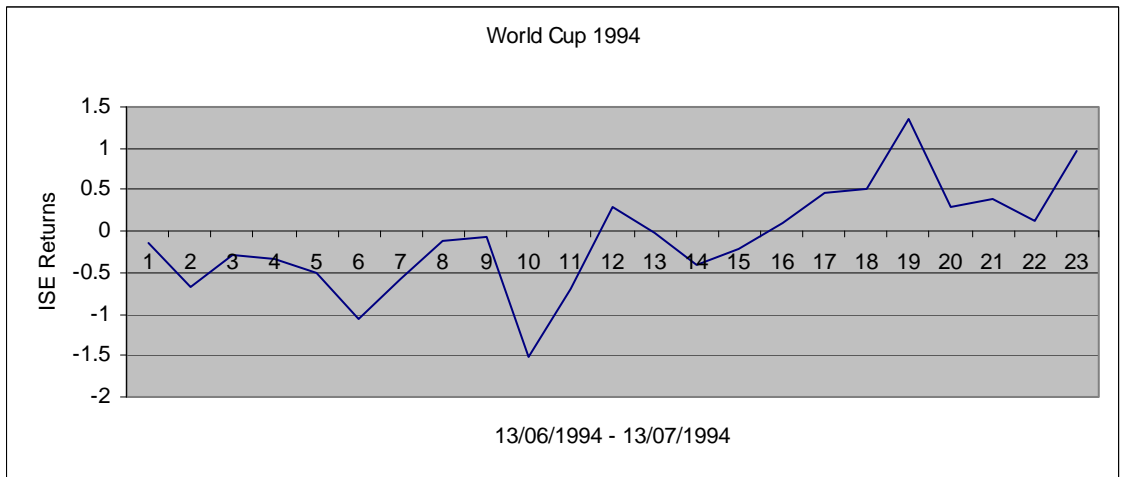
23 day window: First game at pt. 6 where Ireland beat Italy. Pt. 11 Ireland lose to Mexico and Pt. 17 Ireland knocked out by the Netherlands. The surprise win over Italy failed to produce positive ISEQ returns in subsequent days while no sharp declines occurred after the eliminating defeat to the Dutch.
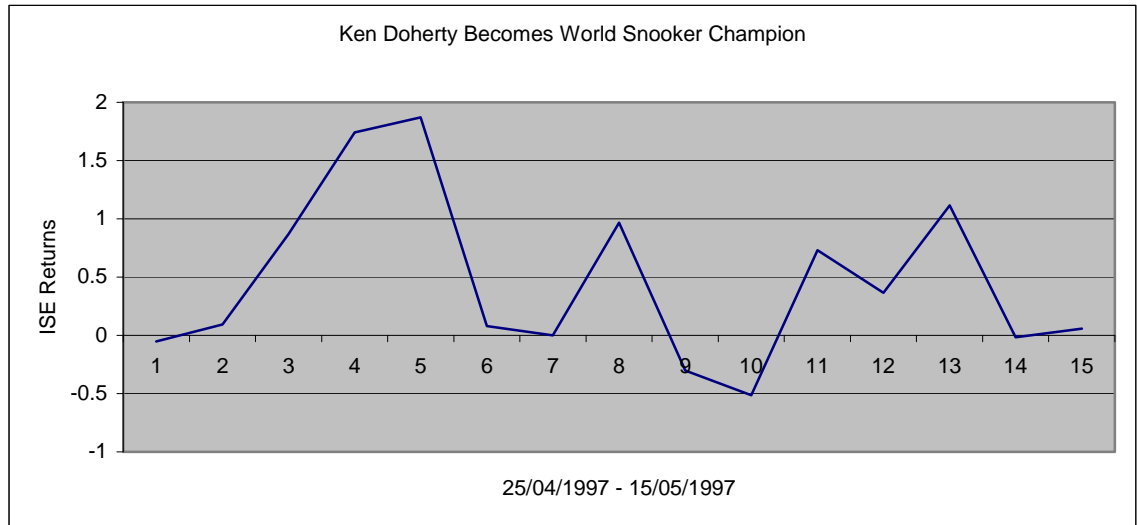
Figure 1.4

Sonia O Sullivan Wins Gold at World Championship

03/08/1995 - 23/08/1995

15 day window. Pt. 8 indicates Sonia O' Sullivan's gold medal. Higher return over previous day.

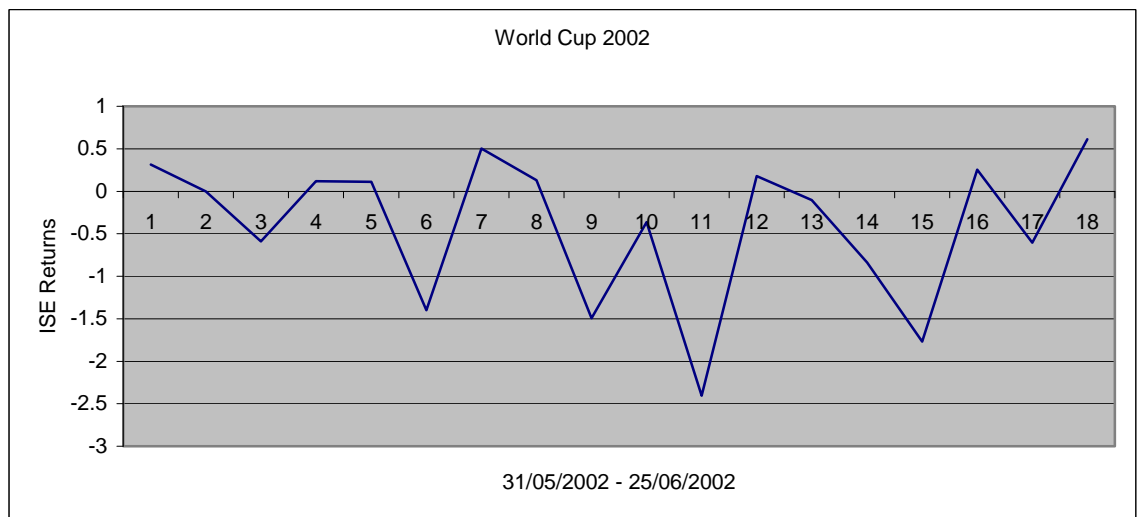**Figure 1.5**

Olympics - Atlanta

15/17/1996 - 06/08/1996
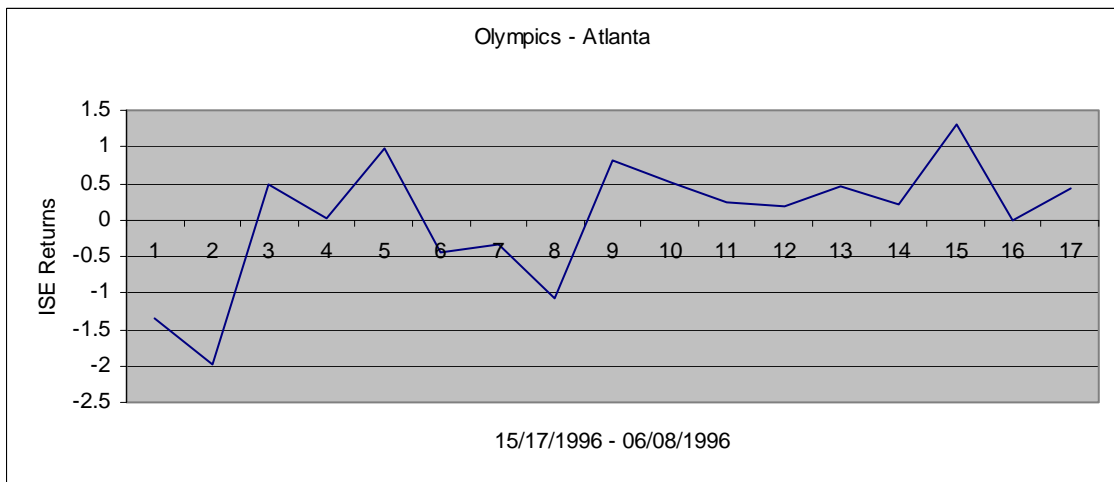
17 day window: Pt. 6 Michelle Smith's first Gold in swimming. Pt 8 her second gold. Pt. 11 Sonia O' Sullivan's disappointing 5000m. Mixed graphical support: unexpected gold medals corresponded with negative ISEQ returns while Sonia O' Sullivan's failure to finish the 5000m coincides with lower (though still positive) return over previous days.
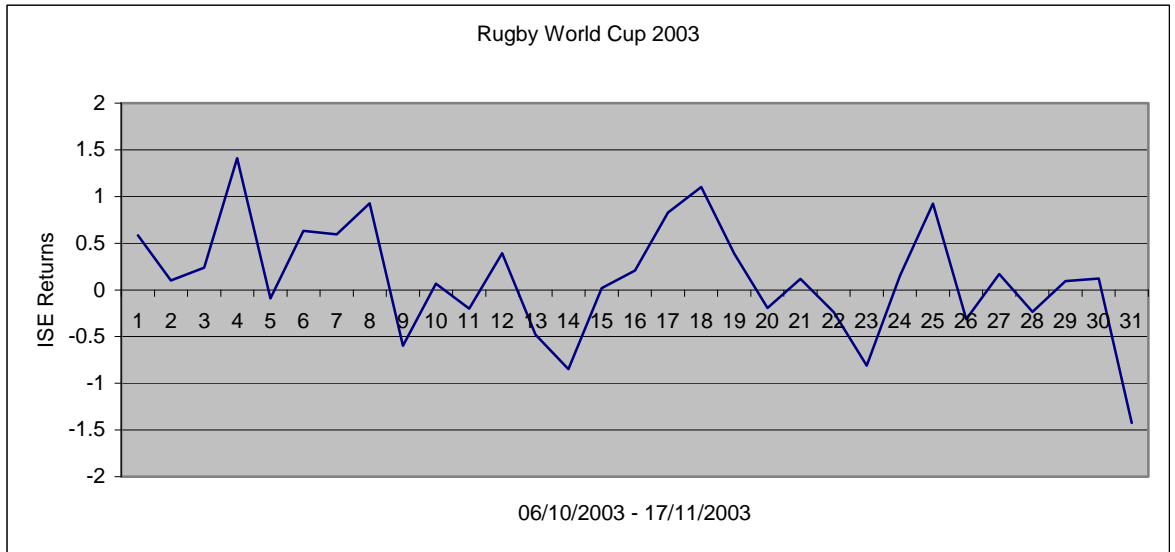
Figure 1.6

Ken Doherty Becomes World Snooker Champion

ISE Returns

25/04/1997 - 15/05/1997

15 day window: Pt. 8 Ken Doherty wins. Positive spike observed in the ISEQ.

Figure 1.7

World Cup 2002

ISE Returns

31/05/2002 - 25/06/2002

18 day window: Pt. 9 Irish victory over Saudi Arabia. Pt 12 Ireland lose to Spain on penalties. No reflection of elimination from the tournament seen in ISEQ returns.

Figure 1.8

Rugby World Cup 2003

06/10/2003 - 17/11/2003

31 day window: Points 6, 11 and 16 correspond with Irish victories while points 21 and 26 correspond with defeats. The graph shows no strong reaction in returns following these wins and losses

Figure 1.9

Ireland V England in the Six Nations at Croke Park

15/02/2007 - 07/03/2003
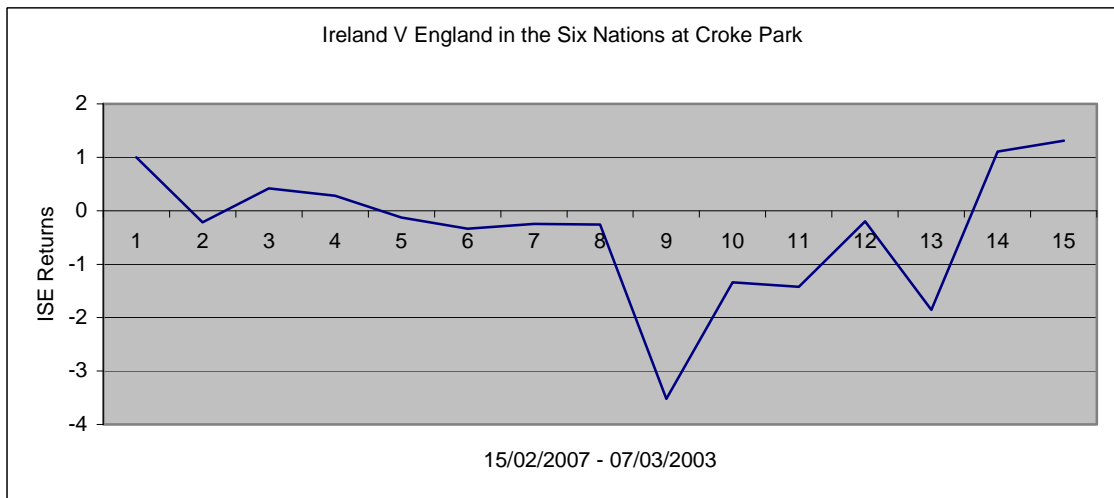
15 day window: Pt. 8: Ireland's emotionally charged win over England on Saturday fails to show in the ISEQ on Monday. (Sharp fall on Tuesday, pt. 9).

Figure 1.10

Padraig Harrington wins British Open Golf 2008

10/07/2008 - 30/07/2008
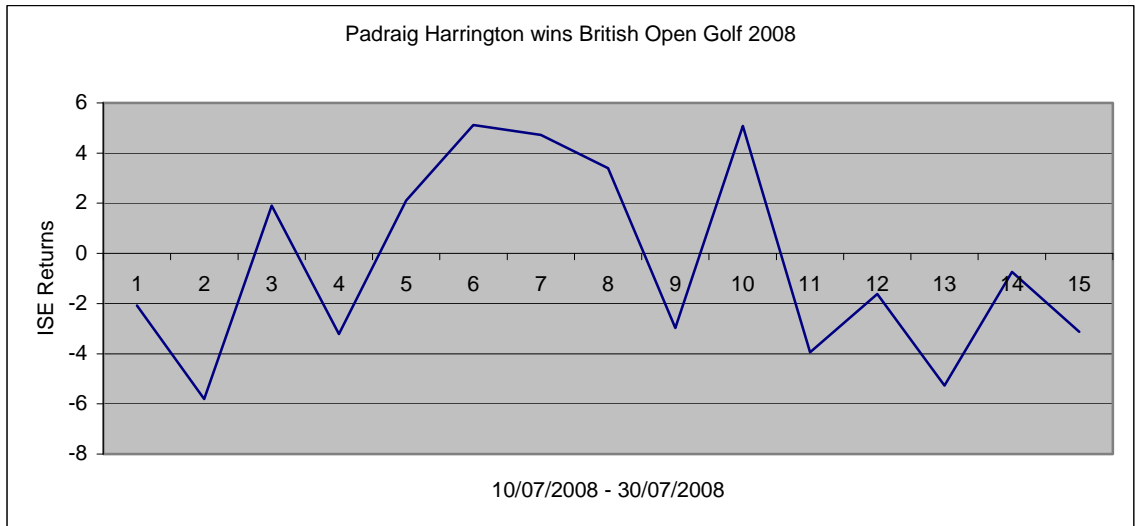
15 day window: Pt. 8. Padraig Harrington defends his British Open crown. The ISEQ observes a 3.4% increase the following day, although lower than the 4.7% return the day before that.

Figure 1.11

Ireland's Six Nations Grand Slam

12/03/2009 - 01/04/2009
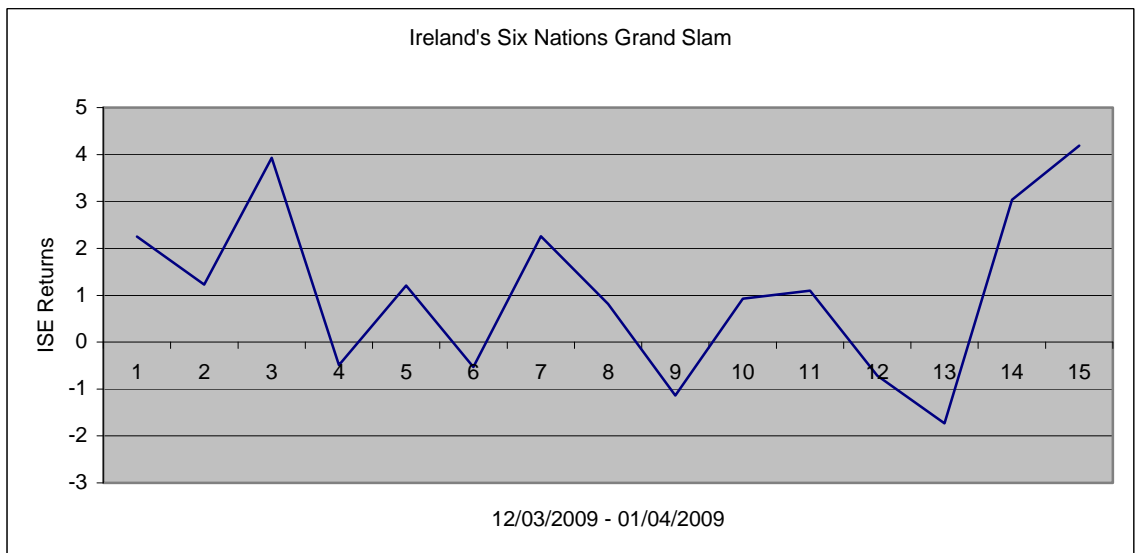
15 day window. Pt 8, Ireland wins the grand slam. Positive, but not 'spectacular', returns seen in ISEQ on the Monday following Saturday victory.

Figure 1.12

Ruby Walsh's 7 Races at Cheltanham 2009

ISE Returns

02/03/2009 to 20/03/2009
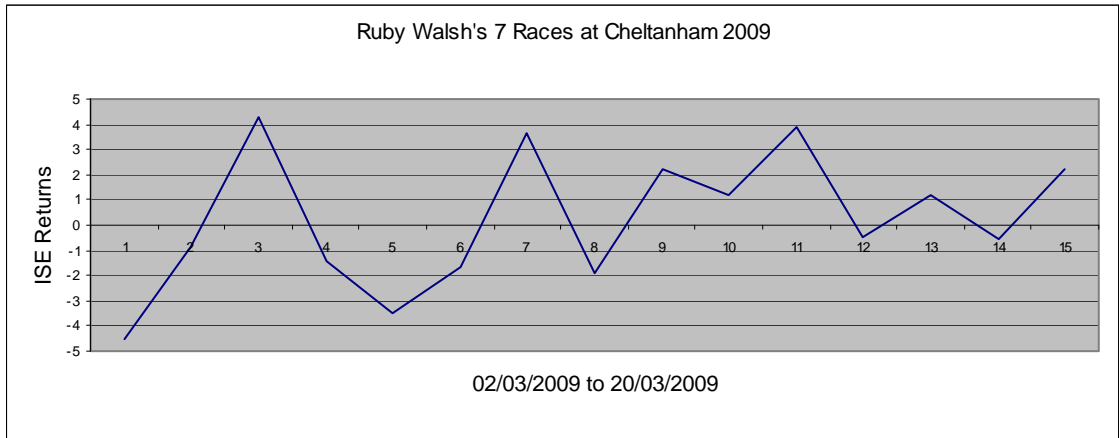
20 day window. Points 10-13 cover Ruby Walsh's record-breaking 7 wins. Positive returns are observed in 3 of the 4 periods. However, the market is particularly volatile over this period complicating any inferences.

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Endnotes

[1] We are grateful to Davy Stockbrokers for providing these data.

[2] Of course, a number of alternative hypotheses have been put forward to explain the weekend-effect anomaly including increased short selling as well as a possible greater tendency for companies to release bad news on Fridays after markets close.

[3] Edmans et al (2007) estimate (1) simultaneously for 39 countries and specify R_{mt} to control for common shocks to stock returns across different countries where return observations on events would not be independent.