

# The Contrarian Investment strategy is it another anomaly to the EMH? An investigation with respect to the FTSE100 & ISEQ Stock Exchanges during the period 1997-2011

This dissertation is submitted in partial fulfilment of the requirements for the Degree of Masters in Business Studies (E&F), at Waterford Institute of Technology



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## **ABSTRACT**

This study was designed to investigate the contrarian investment strategy in the ISEQ and FTSE 100 stock exchanges. This study also looks at the January effect which is said to be a major cause of the abnormal returns generated using the contrarian strategy.

This strategy is tested over the time period 1997-2011. The data consists of a portfolio of the top twenty companies for both stock markets by market capitalisation. This is chosen as not to have size effect bias in the data. The portfolios are broken up into the top ten winners and bottom ten losers. This is done by calculating the company's returns over a three year period using the adjusted market model by De Bondt and Thaler (1985). This investment strategy involves buying past losers and short selling past winners in the hope that there will be price reversal in the stock market. These winner and loser portfolios are then held for another three year period where abnormal returns are calculated.

This study also tests the data using another model the CAPM. This was used to test the risk factor that is associated with this investment strategy. Some authors suggest that the abnormal returns generated are from the extra risk associated with buying a portfolio of past losers. For this reason it was important to also test the data using the CAPM model.

The results from the adjusted market model indicate that the contrarian investment strategy is very successful in both markets. However using the CAPM model the abnormal returns disappear in the FTSE 100 when risk has been taken into account. In the ISEQ the strategy was still successful however due to the financial crisis that occurred in the Irish banking system the level of risk was not adequate to the levels of risk associated with the banks in Ireland. The results of the January effect have shown that the abnormal returns generated in the FTSE 100 were not due to this effect, however there is some evidence of higher abnormal returns in January in the ISEQ which indicated some presence of this effect in the ISEQ.

Overall this study has added to the existing literature in this area with a perspective from the Irish and English stock markets where there was little evidence of the anomaly.

## **ACKNOWLEDGEMENTS**

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## **ETHICAL DECLARATION**

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# *List of Abbreviations*

## **LIST OF ABBREVIATIONS**

- ISEQ (Irish Stock Exchange)
- FTSE 100 (Financial Times Stock Exchange Top 100 Companies)
- FTSE 500 (Financial Times Stock Exchange Top 500 companies)
- CIS (Contrarian Investment Strategy)
- CAR (Cumulative Abnormal Returns)
- ACAR (Average Cumulative Abnormal Returns)
- CAPM (Capital Asset Pricing Model)
- EMH (Efficient Market Hypothesis)
- RWT (Random Walk Theory)
- NYSE (New York Stock Exchange)
- LSE (London Stock Exchange)
- DJIA (Dow Jones Industrial Average)
- US (United States)
- UK (United Kingdom)

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# *Chapter 1*

## *Introduction*

## **Chapter 1**

### **INTRODUCTION**

#### **1.1 Chapter Overview**

This chapter will introduce the topics that will be discussed throughout this dissertation. This chapter will firstly provide an overview of some of the key areas that are crucial to the understanding of this study such as Efficient Market Hypothesis (EMH), Contrarian Theory and Overreaction in the market place. In addition the rationale for the study and finally the outline of the dissertation structure will be discussed.

#### **1.2 Background**

The EMH is the first theory that is essential to this study. It is considered one of the most important theories to abide your dealings by in the financial markets. The theory was developed in the 1950's but came to the fore of economic and financial literature when it was introduced to the world by Eugene Fama (1965, 1970). The EMH states that stock markets are efficient and all relevant information whether it be past, present or future is immediately taken into account by the market and as a result no abnormal profits can be earned by investors. Fama developed three forms of efficiency the weak form, semi-strong form and strong form. Theoretically the concept of an efficient market is easily understood. However numerous research studies have had mixed results in attempting to prove the validity of this theory in practice, leading to much debate surrounding the theory. Due to the uncertainty of the validity of the theory a number of anomalies have been created to demonstrate that the market is not efficient and that abnormal returns can be achieved. These anomalies are based on the premises that past prices can be used to estimate future stock prices. Some of the most prominent anomalies are the Momentum effect, January effect, Size effect and the Day of the Week effect. An additional anomaly discussed in the literature is the contrarian (winner-loser effect), on which this study will focus. If these anomalies can

highlight patterns in past stock prices that can be used to generate abnormal returns, then they violate the EMH.

### **1.3 The Contrarian Investment Strategy**

This contrarian investment strategy (CIS) can also be known as the winner-loser effect. This anomaly was brought to the fore front of academic literature by De Bondt and Thaler (1985). This investment strategy involves going against what is considered good judgement in the market by buying past loser stocks and selling past winner stocks. This portfolio of stocks in theory can generate abnormal returns for an investor and therefore contradict the EMH if it can be proven to generate abnormal returns. This anomaly also contradicts Bayes Rule which states that people react appropriately to dramatic or unexpected news. This anomaly believes that people overreact in stock markets. With this overreaction investors can make money.

The leading study on CIS was completed by De Bondt and Thaler (1985). They carried out their research on stocks from the NYSE over the time period 1926-1982. They conducted their study on 35 winners and 35 losers which created winner and loser portfolios based on their stocks returns in the three year formation period. From their results they highlighted that this strategy could be extremely profitable as they earned 19.6% above the market return. With their findings they created a lot of discussion on this anomaly which has resulted in numerous other studies that both contradict and agree with De Bondt and Thaler's initial study. The main studies will be highlighted in the next chapter from this the readers should gain an insight into the debate that surrounds the contrarian anomaly.

### **1.4 Behavioural Finance**

Behavioural finance is a relatively new idea in theory which tries to explain the movements in the stock market. It deals with the influence of psychology on the market. There are two main parts to this theory, arbitrage and cognitive psychology. Unlike the EMH it agrees that there is both irrational and rational investor in the stock market. The irrational investors are the key to this theory as it is them that deviates the stock price from its proper value. Psychological factors like overconfidence or

overreaction can have a huge impact on the stock markets and can even make rational investors irrational.

Cognitive psychology means that human minds are not built like computers and that there is a possibility of human error when dealing with information. Human error can lead to stocks being mispriced which could prompt an overreaction in the marketplace. Arbitrage states that rational investors should arbitrage any excess prices and return the stocks to their proper value. This is not the case however as irrational investors are also present which could result in price reversals taking longer than expected if the market had just rational investors. This theory will be examined in more detail in the coming chapters together with the role it has in stock markets and how it is linked to the contrarian philosophy of investing.

### **1.5 Research Rational**

Where to invest? The age old question, that everyone seems to have a different answer too. In attempting to answer this, an understanding of the way the markets operate is extremely important. Obviously, it is known that prediction of stock market movements is impossible, but what if there are trends or an anomaly to the market. It is a unique challenge to find an investment strategy that regularly beats the market. There are many different strategies available today and so many anomalies that try to contradict the theory of the EMH by implying that they do beat the market. One of the strategies is the CIS which requires an investment in under-performing stocks that are under-priced due to market overreaction and subsequently can beat the market when they return to true value when the market returns to normal.

In today's economic climate, there is a lot of stock market overreaction. If this means that stocks are overvalued, the author considers an investigation into the CIS an important step in testing the validity of this strategy in practice. There is very little research from an Irish or English perspective. Results from a proposed study could yield interesting result for both the author and the reader.

## **1.6 Dissertation Structure**

The remainder of the dissertation is set out in the following sequence. Chapter two will explore the relevant literature associated with the EMH and describe the three forms of market efficiency.

Chapter three will introduce Contrarian theory it will discuss both sides of the argument relating to this theory, it will also discuss the Size Effect and the January effect as they are needed for an overall understanding of this topic.

Chapter four will discuss another theory associated with anomalies in the stock market. The area of behavioural finance will be explained along with its' two main components cognitive psychology and arbitrage.

Chapter five will outline the main objectives of the study, the methodologies that will be used to carry out the study such as the adjusted market model and CAPM model. It will then discuss some limitations that were encountered while researching the topic.

Chapter six will outlines the findings from the research after it has been carried out. The results will be presented with the use of tables and graphs so that the reader can see the results clearly.

Chapter seven will analyse the findings and considers if they fall in line with previous studies or not.

Finally chapter eight will conclude this study and highlight the main research findings.

# *Chapter 2*

## *Literature Review*

## **Chapter 2**

### **LITERATURE REVIEW**

#### **2.1 Chapter Overview**

This chapter focuses on the Efficient Market Hypothesis in more detail, including its origins and the three forms of market efficiency that have been developed. In addition I will introduce another theory of efficiency the Random Walk Theory. I will examine the relevant academic evidence supporting and criticising the level of efficiency in the market. The results of a number of principal academic papers will be evaluated.

#### **2.2 Efficient Market Hypothesis**

It is imperative that one must first understand the economic theory known as the Efficient Market Hypothesis (EMH). It is probably one of the most debated topics among economic analysts and stock market analysts. Malkiel (2003) states that “The intellectual dominance of the efficient-market revolution has more been challenged by economists who stress psychological and behavioural elements of stock-price determination and by econometricians who argue that stock returns are, to a considerable extent, predictable”.

Bachelier (1900) originally introduced the concept of EMH claiming that prices act randomly to public information in his thesis “The theory of Speculation”. The EMH in plain English says that you cannot make abnormal profits from movements in prices in the stock market. However Fama (1965) is considered the first to have developed a framework about the EMH in his paper “The Behaviour of Stock Market Prices”. This paper is famous for the concept that stock prices react like a “random walk”. He came to the conclusion that it was impossible for investors to outperform the market and gain abnormal returns due to the random stream of information in a market. This states that the prices will consist of all available information in the



market. All information will be shown in the market prices and because of this there should be no opportunity for investors to make abnormal returns.

Fama (1965 P.2) stated that *“the theory of random walks says that the future path of the price level of a security is no more predictable than the path of a series of cumulated random numbers”*.

In a subsequent paper Fama (1970) came up with three versions of EMH which highlight the amount of information that has influence on prices in the market.

### **2.2.1 Weak form efficiency**

The weak form of efficiency implies that current stock prices include all information from the history of these prices only because of this it is very hard for investors to make abnormal returns from past information on stock prices which is available to everyone. Past price history is readily available along with trading volumes etc., some investors attempt to use technical analysis on this past price history with the aim of detecting missed priced stocks. Regardless of this, once transaction costs are taken into consideration it is impossible to make excess profits. Therefore this asserts that investors can't detect miss-priced stocks from past prices and as a result from this information cannot beat the market.

### **2.2.2 Semi strong form of efficiency**

The second form of efficiency is the most commonly accepted theory. It implies that stock prices fully integrate all information that is publicly available. This form of efficiency also includes the weak form of efficiency; past prices and other financial statements released by companies. A number of statements, not limited to financial information can affect stock prices e.g. BP share price suffered dramatically after the news of its oil spill in the Gulf of Mexico. This version assumes that all information is known publicly so therefore no can beat the market and make abnormal returns.

### **2.2.3 Strong form of efficiency**

The final version asserts that prices reflect upon and contain past, present and private information. This form of efficiency incorporates the previous two forms of efficiency

and builds on them. It is perceived no investor can generate abnormal returns, not even investors with insider information. It is illegal for people with information relating to mergers or company performance to invest in the stock relating to this information. Nonetheless there have been many cases of insider information one of the most famous cases for example is of Denis Levine and Ivan Boesky who made millions from insider information relating to a takeover of Nabisco. For this reason this form of efficiency is the most rejected because of a number of cases that showed insider trading exists and can be profitable. Rozeff and Zaman (1988) conducted a study to test this hypothesis and has found that it does fall in line with the EMH hypothesis.

### **2.3 Debate around the EMH**

The EMH was deemed indisputable and was supported by the majority of the market when it first originated. The reason for the unquestionable support however was mainly due to the fact that there was a lack of studies providing negative results against the EMH. In recent decades however with the use of fundamental and technical analysis they have shown that they can identify miss priced stocks in the market. Malkiel (2003) Technical analysis is the study of past stock prices in an attempt to predict future prices, fundamental analysis is the analysis of financial information such as company earnings, asset values, etc., to help investors select “undervalued” stocks. This in theory would enable an investor to achieve returns greater than those that could be obtained by holding a randomly selected portfolio of individual stocks with comparable risk. In today’s academic literature there are numerous studies that have examined the theory and have come up with results contradicting the EMH.

Lo and MacKinlay (1990) state that “the notion that historical prices may not reflect future prices surprises many people because a major component of the random walk model is the uncorrelated ness of its increments and deviations from this theory imply that price changes are to some degree forecast-able”. Lo and MacKinlay (1990) discover that short run serial correlations do not equal zero and that too many consecutive moves in one direction allows them to reject the EMH as they conclude that stock prices do not move on a random basis as the random walk theory suggests.

Malkiel (2003) debates this point however and suggests that these successive moves are not enough to beat the market on a regular basis. In the short run this idea might challenge the EMH but in the long run it holds. Malkiel identifies the January effect as an example of how in the long run the market will be efficient even though some profit might be made in the short run. Once everyone knew about the January effect, its ability to beat the market was gone.

Many predictable patterns seem to disappear after they are published in financial literature. As Schwert (2001) points out, there are two possible explanations for such a pattern. One explanation may be that researchers are always sifting through mountains of financial data to unearth new ways of beating the market. Their normal tendency is to focus on results that challenge perceived wisdom, and sometimes do happen to come upon one. A combination of a certain sample and a certain technique will produce a statistically significant result that seems to challenge the EMH. Alternatively, perhaps practitioners learn quickly about any true predictable pattern and exploit it to the extent that it becomes no longer profitable. Malkiel's (2003) view is that such apparent patterns were never sufficiently large or stable to guarantee consistently superior investment results and certainly such patterns will never be useful for investors after they have received considerable publicity. The so-called January effect, for example, seems to have disappeared soon after it was discovered.

The biggest and most common rejection of the EMH is related to the idea of anomalies that exist in the market that contradict the EMH hypothesis. These anomalies state there is some predictability in the markets that can be utilised to beat the market; prices are not random and can be tracked. This can create an opportunity to generate abnormal returns from these anomalies of the EMH. The theory of some of these anomalies has been around for a number of years now; De Bondt and Thaler (1985) "The Winner/Loser" effect, Basu (1977) "P/E ratio", Banz (1981) the "size effect", Jegadeesh and Titman (1993) "momentum theory". Some investors still use these strategies in today's markets. If these anomalies still persist today surely they violate the EMH and therefore it doesn't hold.

Roll and Shiller (1992) argue in their paper after Shiller stressed the importance of inefficiencies in the pricing of stocks, Roll responded as follows:

*“I have personally tried to invest money, my client’s money and my own, in every single anomaly and predictive device that academics have dreamed up. ... I have attempted to exploit the so-called year-end anomalies and a whole variety of strategies supposedly documented by academic research. And I have yet to make a nickel on any of these supposed market inefficiencies ... a true market inefficiency ought to be an exploitable opportunity. If there’s nothing investors can exploit in a systematic way, time in and time out, then it’s very hard to say that information is not being properly incorporated into stock prices”.*

To sum up this debate about the EMH, the market cannot always be perfectly efficient or there would be no incentive for professionals to uncover the information that gets so quickly reflected in market prices. This fact was highlighted by Grossman and Stiglitz (1980). Malkiel (2003) states that the anomalies mentioned above in the market are expectations too rather than a definite rule against EMH. Fama (1998) also reinforces this point expressing that even though there is literature highlighting the weaknesses of the EMH, market efficiency should not be abandoned. He suggests that in the long run, anomalies will not exist like the January effect as mentioned earlier. These factors highlight that there is a future for the EMH.

## **2.4 Random Walk Theory**

The Random Walk Theory (RWT) suggests that abnormal returns cannot be made from the markets Malkiel (1999) states that the RWT suggests that the erratic movement of stock prices prevents investors from following stock price patterns in the long run so therefore contrarians as well as security analysts is incapable of beating the market. Malkiel (1999) said, “The history of stock price movements contains no useful information that will enable an investor consistently to outperform a buy and hold strategy in managing a portfolio”. This idea is strongly contradicted by some investors who consistently search previous stock market prices for patterns in the prices in order to beat the market. Cootner (1962; 1964), Fama (1963; 1965a), Fama and Blume (1966), and Osborne (1959) perform related tests of the RWT and, all of these articles indicate support for the RWT using historical stock price data. For holding periods much longer than one week – for example, three to five years –Fama

and French (1988) and Poterba and Summers (1988) find negative serial correlation in US stock returns indexes using data from 1926 to 1986. Although their estimates of serial correlation coefficients seem large in magnitude, there is insufficient data to reject the RWT at the usual levels of significance. Moreover, a number of statistical artefacts are documented by Kim, Nelson and Startz (1991) and Richardson (1993) cast serious doubt on the reliability of these longer-horizon inferences.

## **2.5 Conclusion**

This chapter has explored the background to the EMH and the forms of efficiency in the market. It has examined the debate that exists in the literature relating to the validity of the EMH today. Finally this chapter highlighted some of the anomalies in the stock market. From the literature surrounding the EMH, you can clearly see there is no concrete answer regarding whether a fund manager can outperform the market or not using previous information. There are a number of people who believe strongly in favour of the EMH but on the other hand there are all the results of numerous studies conducted using anomalies that beat the EMH. In the next chapter I will investigate these anomalies further paying special attention to the contrarian investment method. I will review the literature surrounding this anomaly and whether or not it has made abnormal returns thus opposing the EMH. I intend to offer some more insight into this area of controversy.

# *Chapter 3*

## *Literature Review 2*

## **Chapter 3**

### **LITERATURE REVIEW 2**

#### **3.1 Chapter Overview**

This chapter aims to provide a detailed discussion of previous studies on the contrarian investment strategy. I will focus on the relevant academic evidence supporting and criticising the effectiveness of this investment strategy. This chapter will highlight some possible explanations for the success of the contrarian strategy such as the size effect and the January effect. I will examine the performance of the strategy on a number of different stock markets and over several different time frames.

#### **3.2 Contrarian theory**

A contrarian strategy may have its roots in the workings of Graham and Dodd (1940) who stated that at any time, some stocks are undervalued and some may be overvalued. Dreman (1998) brought it to the fore by suggesting that contrarian investors can outperform the market with an investment strategy that rises above a statistical anomaly.

Contrarian theory is linked to the psychology of the markets and how investors overreact or under react to news in the market resulting in securities being mis-priced. Khaneman and Tversky (1982) determined that people tend to overreact to unexpected and dramatic events. Their findings are in direct opposition to Bayes' rule which stipulates that individuals react in an appropriate fashion to unexpected and dramatic events.

The efficient markets view claims that stock prices include all information quickly and reflect all public information, therefore stock prices would follow a stochastic process like a random walk. The overreaction hypothesis implies that there are temporary disparities between prices and fundamentals. Prices misbehave because

many “Noise traders” violate ‘Bayes theorem’ and overreact to new information De Bondt (1991).

A CIS is one that goes against the market by buying undervalued stocks. This might be due to under or overreaction in the market by investors. However the returns that can be gained from this strategy can outweigh the risk. De Bondt and Thaler (1985) found that portfolios that experience negative returns tend to outperform portfolios that experience positive returns for the same period during the subsequent period by about 25%. Their study comprised of an analysis of stocks which have experienced either extreme capital gains or losses over the previous 36 months. They computed the cumulative excess returns of all stocks in the portfolio which meet requirements from the NYSE over a three year formation period. The stocks were then ranked based on their performance and assigned either to the winner or loser portfolio. The cumulative excess returns were then calculated over the next three years. These steps were conducted 16 times from January 1930 to December 1977. Their study signalled extreme changes in stock prices in the opposite direction after the original extreme change in stock price. From their findings a lot of the overall return was realised in the month of January. The January effect will be discussed later.

Dreman (1998) stated that in order to beat the market safely, investors should seek to invest in downtrodden stocks that are out of favour with the market. Because the stocks are out of favour in the market the theory suggests they might be under-priced and therefore generate higher than expected returns. Gallea and Patalon (1998) stated that “contrarian investments can be lonely, but they are profitable to those who are willing to take the risk”. For this to happen Investors must buy stocks when doing poorly in the market and sell them when they are performing well in the market.

Gallea and Patalon (1998) also stated for this strategy to work the investor must buy and hold the stocks for 2-3 years and refrain from continually changing portfolios as this will result in high transaction costs. If this is done according to Gallea’s and Patalon’s findings it will result in a successful investment that contradicts the EMH. This is in stark contrast to the EMH that states that wrongly priced prices will not last for a prolonged period of time giving the chance for investors to make abnormal returns.



De Bondt and Thaler (1985) were one of the first who found that stock prices behaved as if individual investors overreacted to given information. They found “that in the stock market a contrarian strategy which buys losers and sells winners based on their returns over a 3- to 5-year horizon performs well in subsequent holding periods of 3–5 years”.

They showed evidence of contrarian investment by investing in a “portfolio of past losers and selling a portfolio of past winners”. This illustrates that abnormal returns can be achieved using past information thereby undermining the EMH. De Bondt and Thaler (1985) state that “as stock prices overshoot then the reversal in this overshoot should be gauged using past return data”. Using their hypothesis it can be assumed a violation of EMH. Their results were that using this strategy, the losers outperformed the market by 19.6%, whereas the winners were outperformed by the market by 5%.

De Bondt and Thaler (1985) state that “contrary to market efficiency, prior stock market ‘losers’ are much better investments than prior ‘winners’”. Jegadeesh (1990) and Lehmann (1990) provide evidence of shorter term return reversals. These papers prove that contrarian strategies who have selected stocks based on their returns from the previous week or month generate significant abnormal returns. Jegadeesh and Titman (1995) also discovered that US stock using a contrarian strategy is also profitable in short term. De Bondt and Thaler (1985) also recognised that “loser portfolios experience exceptionally large January returns as late as five years after portfolio formation. They argue that equity prices systematically overshoot due to excessive investor optimism and pessimism”.

A study by Chang, McLeavey, and Rhee (1995) examines short-term abnormal returns of the contrarian investment strategy in the Japanese stock market. Empirical evidence is provided that: 1) the short-run contrarian strategy remains profitable after systematic risk and firm size are taken into account, 2) the seasonality effect does not explain the contrarian profits, 3) abnormal profits are reported regardless of whether losers are smaller or greater than winners and the magnitude of the profits does not differ after an adjustment for firm size, and 4) contrary to empirical evidence documented for the US market, a strong asymmetry exists between the performance of the two extreme portfolios.

The roots of the CIS fall in line with the ideas of the over-reaction hypothesis by De Bondt and Thaler (1985). They learned that stocks that had bad performance in the previous year bounced back to previous prices. They deduced that the stocks have a price reversal. Mun et al (2001) did a similar study to De Bondt and Thaler and also agreed that some stocks did exceed their true market value and that stocks would eventually return to previous prices after many years of bad performance. This suggests that the CIS can be successful.

Chopra et al (1992) found that the overreaction effect was economically significant for portfolios based on five year prior returns. The oldest of the contrarian strategies according to Dreman is P/E ratio which has been proving to outperform the market. Basu (1977) stated that low P/E return securities provided superior returns relative to securities with high P/E ratios and they were less risky.

De Bondt (1993) finds that individual investors expect a continuation of upward price trends in bullish markets and a continuation of downward trends in bearish markets. In contrast, “experts” behave as contrarians, i.e., they expect price-reversals in both bullish and bearish markets (De Bondt 1991)

Lo and MacKinlay (1990) imply that “by selling winners and buying losers can earn positive expected returns in the presence of negative serial correlation because current losers are likely to become future winners and current winners are likely to become future losers”. They believe that overreaction in the stock market account for less than “50% of the returns generated from this investment strategy”.

Dissanaike (1997) investigated the winner-loser effect in the English stock market specifically the FTSE500 companies. He constructed two portfolios (Winner and loser portfolio) from January 1975-1991. He used one thousand large very well-known companies. His results back up the existence of the contrarian anomaly with results consistent with price reversals.

Clare and Thomas (1995) also examined contrarian strategy using a sample of 1000 UK stocks to test the potential for profit from implementing a contrarian investment strategy from 1955 to 1990. They support the overreaction hypothesis, but attribute their findings to a size effect. Antoniou et al. (2006) use weekly data of 1645 LSE

stocks and find that contrarian performance exists in the UK market where large capitalization stocks are the main driving force for contrarian performance.

Even though there is a lot of empirical evidence suggesting that a CIS is profitable, there is considerable disagreement surrounding the source of these profits. Some of the explanations for these profits are the Size Effect and the January Effect. This will now be explained.

### **3.2.1 Size Effect**

The size effect generally indicates that small firms outperform large firms Banz (1981). Subsequent studies have suggested that the small firm's effect occurs mainly in January. Zarowin (1990) also agreed with Banz and suggested that the reason why losers outperformed winners in the market had to do with the size. He also argued that the overreaction by investors is a materialization of size, as winners tend to be smaller sized firms. Moreover some critics have argued that overreaction is not a novel anomaly but merely the size effect in disguise. Fama and French (1992) examined data from 1963 to 1990 and divided companies into deciles according to their size measured by total capitalization, decile one contained the smallest ten per cent of stocks while decile ten contained the largest stocks. Their results also backed up the work of Banz and contended that deciles containing the small size firms did generate higher average monthly returns than the larger firms. Chan et al (1991) reaffirmed earlier studies that the size effect is important. However they suggested that the size effect might be due to the model used by the researcher.

Reinganum (1983) findings indicate that the average annual returns on the smallest capitalized portfolio had a 32.77% return on stocks while the heaviest or largest capitalized portfolio had a return of 9.47%. The results further confirmed that the mean return on the small size firms suggested that they experienced returns of more than three times those of the largest portfolio with the greater capitalization. De Bondt and Thaler (1987) contradict these statements and dismiss the size effect as an explanation for abnormal returns as they found losers to be larger than the smallest sized firms in the sample. They discovered that the smallest quintile to be thirty times smaller than the market value of the loser quintile. From this they conclude overreaction to be a better characteristic of the loser rather than size.

Malkiel (2003) stated that the dependability of the size phenomenon is also open to question. From the mid-1980s throughout the 1990s, there has been no gain from holding smaller stocks. Indeed, in most world markets, larger capitalization stocks produced larger rates of return. It may be that the growing institutionalization of the market led portfolio managers to prefer larger companies with more liquidity to smaller companies where it would be difficult to liquidate significant blocks of stock. Finally, it is possible that some studies of the small-firm effect have been affected by survivorship bias. Today's computerized databases of companies include only small firms that have survived, not those that later went bankrupt.

### **3.2.2The January effect**

The ability of the January effect to explain contrarian performance has also been investigated. The January effect states that there is an abnormal increase in the price of stocks during the month of January after a drop in price in December. Zarowin (1990) documents that "return reversals can be attributed to the superior positive performance of small firms in January", whereas Grinblatt and Moskowitz (2004) find "that consistent losers experience significantly positive returns in January which they attribute to tax-loss selling at the tax year end". George and Hwang (2007) provide a "unified tax explanation for both loser and winner reversals. They show that winner reversals are driven by investor's incentive to delay capital-gain tax payments, while loser reversals are caused by tax-loss selling at the tax year end". These papers support the view that strategic tax planning can help explain contrarian performance.

### **3.3 Conclusion**

This chapter has highlighted the major research that has been carried out in this area already. From the origins of the anomaly with Graham and Dodd, to Dremen who brought the idea to the fore with his paper. From the literature it can be seen there are contrasting views on the validity of the anomaly in the market from a wide variety of stock markets perspectives in which it has been tested in. There are also questions on whether or not other anomalies might be the actual cause of the abnormal returns that are generated by the CIS such as the Size Effect and the January Effect. The author endeavours to add to the existing literature on the topic and to try and answer some of the questions relating to the cause of abnormal returns generated from the CIS.

# *Chapter 4*

## *Literature Review 3*

## **Chapter 4**

### **LITERATURE REVIEW 3**

#### **4.1 Chapter Overview**

This chapter will discuss another theory that has emerged for the effect of overreaction and price movements in the stock market called Behavioural finance. The theory will firstly be introduced, described and the two building blocks of behavioural finance will be discussed, cognitive psychology and arbitrage. The relevant academic evidence supporting and criticising behavioural finance in the market will be debated. Some of the key academic papers will be analysed along with their results.

#### **4.2 Behavioural Finance**

Ritter (2003) defines behavioural finance as the study of the influence of psychology on the behaviour of financial practitioners and the subsequent effect on markets. It removes the assumption of rational investors in the market. It is a relatively new concept to finance and a new reasoning for the behaviour of the market yet it is becoming increasingly acknowledged by market participants and academics.

The concept of behavioural finance has popped up in the academic literature being critical of the EMH. This notes how investors can be influenced by certain psychological biases. Behavioural finance can be broken down into two areas, arbitrage and cognitive psychology. Ritter (2003) stated that the two building blocks of behavioural finance are cognitive psychology and limits to arbitrage. The theory primarily investigates overconfidence by investors and irrationality and overreaction. As stated earlier the EMH states that all investors in the market act rationally. This is challenged by behavioural finance which suggests that there are both rational and irrational investors in the marketplace. Irrational investors in the market will lead to market inefficiency and hence lead to the rejection of the EMH.

Buffet (1999) “behavioural psychology suggests that investors do not possess rational expectations”. This notion is supported by La Porta et al (1997) who found evidence of overreaction in glamour stocks and growth stocks upon announcement of future earnings. La Porta (1996) also found evidence that managers as well as prices overreacted and there was a psychological element in choosing stocks.

Saunders (1993) shows how the market is influenced by psychological factors as simple as cloud cover in New York City. Saunders asserted that the cloud covers in New York City influence stock prices. He maintained that when cloud coverage was between 0% -20%, return on the DJIA were 12.3 %; when there was 100% cloud coverage, the return was 2.03%. Saunders further noted that Monday’s returns were much less when it was a sunny day relative to an overcast day. He rejected the notion that stock prices were not systematically confined to purely economic variables and that investors’ psychology influenced stock prices. The study points out that there is a general correlation between investors’ decisions and the weather pattern. Saunders (1993) asserts that the “security markets are not entirely rational” as it was predictable how investments would occur on any given day based on the amount of cloud coverage.

Behavioural finance models have been developed to test investor over and under reaction by Daniel et al (1998) and Barbaris et al (1998). Fama (1965) the creator of the EMH has criticised these models. He states that the explanatory power of these models do not explain market efficiency better than his original market efficiency model.

### **4.3 Arbitrage**

Arbitrage can be defined as “the simultaneous purchase and sale of the same, or essentially similar, security in different markets for advantageously different prices” (Sharpe and Alexander (1990)).

De Long et al (1990) state that, the randomness of noise trader principles create risks in the stock price that deters arbitrageurs from gambling against them. De Long et al (1990) also dispute that in order to be a rational investor a lot of time needs to be put



in to investigating how irrational investors are performing and how they will respond to market information.

Findings from research carried out by De Long et al (1990) show that noise traders finish up earning superior returns than experienced rational investors because they bear most of the risk that they were the cause of.

Examining the notion of behavioural finance in relation to arbitrage situations, it is clear how it contradicts the EMH. In this context traders will detect differences in stock prices in relation to their fundamental value. They will utilize this information to short a stock or buy a stock long in order to make a profit on the belief that the stocks will return to their fundamental value, although this is based on the condition that there is only rational investors in the market but according to behavioural finance there is also irrational investors in the market. These irrational investors will have to be considered by the rational investors as these groups of investors could affect the reversion of the underlying value and make the longer than expected to return to fundamental value.

#### **4.4 Cognitive Psychology**

Psychological factors can occasionally cause otherwise rational investors to sometimes act irrationally. This theory also examines and compares the processing abilities of computers and humans. The primary distinction is how humans have a tendency to make assumptions when processing information. There are a number of psychological factors that affect investor's performance but overconfidence, preferences and overreaction are some of the most prevalent factors.

Fischhoff et al (1977) believe that people overestimate what they think is going to happen. Their results show that things people expect to happen only occur 80% of the time whereas things they thought impossible occur 20% of the time. These results show overconfidence can be a major factor in people's expectations.

Griffin and Tversky (1992) indicate that overconfidence stems from people's biased interpretation of the information given to them. Griffin and Tversky (1992) also found that overconfident people focused on the strength of the information and interpreted it incorrectly to its weight which has previously been stated to lead to overreaction.

## **4.5 Conclusion**

This chapter has presented a new field of literature that has emerged recently seeking to understand the behaviour of the market and professional investors. This area of literature can help to try and contradict the concept of the EMH as it can now be shown that there are irrational investors in the marketplace and therefore do not make rational decisions. This literature can be used to explain why some anomalies have been successful in the market. One of the reasons might be these irrational investors.

## **4.6 Literature review Conclusion**

The theory of a contrarian investments strategy has been studied for many years, yet there are still no definite conclusion established. This investment strategy is based on overreaction in the stock markets and questions the efficient market hypothesis proposed by Fama, (1965) (1970). For this investment strategy to work the investor must believe that the EMH doesn't hold up in today's markets. There are contrasting opinions in the literature about the validity of the strategy. Is the contrarian profits purely accounted for by the "size effect" or higher returns in January because of the "January effect"? The results in the literature are conflicting, but Jegadeesh and Titman (1995) and Chopra et al (1991) are just two who have supported the idea that contrarian profits are primarily a result of overreaction in the stock markets by investors. Therefore, is there an opportunity for contrarian investors to make abnormal returns from the market, by going against the market selling a portfolio of past winners and buying a portfolio of past losers? All these opportunities are based on stock market overreaction that exists because of investors herding together and inflating and decreasing the prices of some stock by overreacting to news or information released in the stock markets. Does the stock market reflect all available information that exists in the markets or is there opportunities for investors to make abnormal returns? The author aims to answer these questions with this research, the author will be able to offer some insight into the contrarian strategy from an Irish and English perspective and make comparisons between the two stock markets.

# *Chapter 5*

## *Research Methodology*

## **Chapter 5**

### **RESEARCH METHODOLOGY**

#### **5.1 Chapter Overview**

This chapter will describe the data that has been used for this research project and the methodology used to carry out this study. Firstly there will be a brief discussion about the research problem and then the research objectives will be stated. The different types of methodologies that were used for the analysis of the data will be presented; also the calculation of returns method will be discussed. The data will be presented including selection criteria and justification for sample size. Finally some limitations to the research carried out in relation to the methodology used and data will be considered.

#### **5.2 Introduction**

Stock market anomalies have been researched and debated in academic literature for a long time, it is an area of finance that is always contemplated and is a source of controversy. This study is driven by the constant debate about the practicality of contrarian investment and whether such a strategy is more psychologically driven due to overreaction in the markets or if it is in reality a financially profitable investment strategy. Furthermore, the current global market presents a great opportunity to re-evaluate the long-existing efficient market theory, developed by Fama (1970). Additionally, the current theory of stock movement is that stock trends will continue to rise and maintain their current direction notwithstanding the economic downturn of certain economic factors. This practice differs from that of contrarian investors, who practice the very opposite of momentum investors. They buy stocks that are downtrodden and decreasing and sell stocks that are hotly pursued with stock prices on the increase. Both strategies cannot be right, and this contention provides the rationale to further investigate the contrarian strategy.

Most investors fall into two categories, those that believe in the EMH proclaimed by Fama (1970) or those that believe the stock market is not efficient and opportunities to make abnormal returns using anomalies as investment strategies are available.

The purpose of this study is to determine if contrarian investors can make excess returns in the Irish and English stock market that outperform the average returns from both funds. This study's aim is to contribute to the existing literature, specifically, studies that have investigated with holding periods of 3- 5 years.

This research dissertation will hope to build on numerous studies that have been carried out in the area of testing the EMH and testing CIS. Most of the research in the area has been carried out from an US stock market perspective including studies by De Bondt and Thaler (1985), Jegadeesh and Titman (1995). There has been some from an English stock market perspective namely Clare and Thomas (1995).

The ISEQ and FTSE100 will be examined in this context of the following hypothesis:

$H_0$ : The null hypothesis suggests that a contrarian investment strategy will not yield significant abnormal returns.

$H_a$ : The alternative hypothesis suggests that the contrarian investment strategy will generate significant abnormal returns.

### **5.3 Research Objectives**

The primary objectives for this study are to test a CIS from an Irish and English perspective in conjunction with the hypothesis outlined in the previous section.

The objectives for this study are:

1. To find evidence in the market to prove if a CIS is still successful in the Irish and English stock markets or if the anomaly is disappearing.
2. To discuss the viability of the CIS and if it more successful in one market in comparison to the other. Is there a better opportunity for this investment strategy in the UK market, or is there a better opportunity in the smaller Irish market.
3. What amount of the abnormal profits in the CIS can be attributed to the January effect

4. To investigate whether the financial crisis has caused a change in Behavioural Finance, in particular, anomalies- and if so has the contrarian anomaly prospered due to the crisis or not.

#### **5.4 Quantitative vs. Qualitative Data**

Researchers have had prolonged debates of the relative value of qualitative and quantitative inquiry. According to Miles and Huberman (1994) both research methods often work in coincidence with each other. However, as qualitative normally involves words and quantitative is related to numbers, some researchers feel that one is better than the other. In qualitative research, a research question is not needed for research to begin however; all quantitative research cannot begin without a hypothesis.

It is important to decide how to analyse the data, research can either be quantitative or qualitative. Qualitative examines subjects, experiences without the use of numerical measures to express a theme from the sample whereas quantitative research deals with numbers that are used to express an opinion or theme to back up the literature. Quantitative analysis is usually carried out using statistical analysis on Excel or SPSS. A major difference between qualitative and quantitative research is the role the researcher plays. In quantitative research, the researcher is ideally an observer that neither participates in nor influences what is being studied in any way (Saunders et al, 2003). In qualitative research, the researcher can learn from participating or being immersed in the study.

In most research papers one method of analysis is used however both methods can be combined. For this research paper the quantitative method will be used due to the nature of the hypothesis and the objectives of the paper. Hard numbers need to be used and statistically analysed. The qualitative method would not have been appropriate for this research.

#### **5.5 Data**

The data for this study will be gathered from Thomson One banker. This online Database is widely used by financial investors to conduct investment portfolio

analysis and has also been used extensively in other academic research such as Chin et al (2002).

Important factor when carrying out research is to consider the length of the timeframe the study inspects. The longer and more robust the time period and data the more accurate the results will be. This is evident through the studies in the literature De Bondt and Thaler (1985) used a sample period of 56 years while Jegadeesh and Titman (1995) used a sample period of 27 years. Studies that carry out research with these timeframes would be perceived as being the benchmark.

The time period for this study will be from the 1<sup>st</sup> of January 1997 to the 31<sup>st</sup> of December 2011. The timeframe was chosen to try and maximise the size of the study as much as possible. Due to time constraints it would be impossible to carry out a sample period as long as the above mentioned authors. With this time period we can see the viability of this anomaly with the most contemporary information. This should help with the literature on the topic as new data will be used and it should help improve existing research. This time period will also help discover if there are differences between the returns of the CIS due to the economic conditions that have been experienced during these time periods especially in the Irish market with the Celtic tiger boom and then the subsequent recession. The data used will be weekly data as daily data would be too time consuming and volatile.

The data will consist of the top twenty companies by market capitalisation at the beginning of the test period. The largest companies are chosen to ensure that the results of the study will not be clouded by the size effect as was the case in other studies. Once the data is collected it will be divided up into four formation periods:

January 1 <sup>st</sup>	December 31 <sup>st</sup>
1997	1999
2000	2002
2003	2005
2006	2008

These formation periods will be used to produce a portfolio of ten winners and ten losers for each index based on the returns earned during the formation period. At the end of each formation period a holding period is created for the following three years. The two portfolios created consist of short selling the ten winners and buying the ten losers. The holding periods are as follows:

January 1 <sup>st</sup>	December 31 <sup>st</sup>
2000	2002
2003	2005
2006	2008
2009	2011

## 5.6 Data Models

The stocks of the winner and loser portfolios will be selected by the stock's performance in each formation period. The abnormal returns will be calculated by following the same methodology as De Bondt and Thaler (1987). Their market model can still be used by researchers today the model is as follows:

$$R_{it} = \alpha_i + \beta (R_{mt}) + \varepsilon_{it}$$

De Bondt and Thaler (1987) stated in their adjusted market model that  $\alpha$  is equal to zero and  $\beta$  is equal to one. Using this adjusted market model we can calculate abnormal returns for the formation period by using the following formulas:

$$R_{it} - R_{mt} = \varepsilon_{it}$$

$$\text{OR } R_{it} - R_{mt} = \mu_{it}$$

$$\text{OR } AR_{it} = R_{it} - R_{mt}$$



$R_{it}$  is the rate of return on security  $I$  at time  $t$ .

$R_{mt}$  is the rate of return on the market at time  $t$ .

$E$  is the random error.

This adjusted market model will organise the stocks into the winner and loser portfolios. The returns for stocks will be calculated using the above formula. This calculation will be carried out during each formation period. The top ten stocks will go into the winner portfolio and will be short sold and the bottom ten stocks will go into the loser portfolio and will be bought for the holding period. These steps will be repeated for each formation and holding period.

### 5.7 Cumulated Abnormal Return (CAR)

CAR is calculated by aggregating single weekly abnormal returns over each period and has been widely used in the literature (De Bondt and Thaler, 1987).

$$CAR_{it} = \sum_{t=1}^t AR_{it}$$

$$ACAR_{pt} = \frac{\sum_{i=1}^n CAR_{it}}{n}$$

This formula is used to calculate cumulative abnormal return and to calculate the average cumulative abnormal return (ACAR). To do this cumulative average residual returns will be computed of all the stocks in the portfolios for each time period. To attain the residuals for each company in the portfolio they are regressed on their respective stock exchange. Once the individual regressions are run, the cumulative

average residual return of all stocks can be calculated. The CAR's are found by totalling up all the weekly abnormal returns. These are then used to calculate ACAR for the winner and loser portfolio. The difference between both portfolios can then be calculated if the winner portfolio displays price reversals. The author can then say the contrarian effect is present.

There are some criticism of the CAR approach as highlighted by Conrad and Kaul (1993). With the CAR approach portfolios are continuously rebalanced. This can lead to increased transaction costs which would diminish returns. The authors state that this rebalancing sets in motion an upward bias in the results that are obtained. They put forward an alternative approach to calculating returns; the buy and hold method which will be discussed next.

It is important to examine the risk profile of the two portfolios this will help with the robustness of the study. To do this the author will use two models the CAPM.

## 5.8 CAPM

An important procedure is to adjust for risk as it helps to take account for risk differentials between the portfolios; the most common model used for this is the CAPM. This model will help to see if the abnormal returns are a result of risk within the portfolios as suggested by Chan (1988) or a result of overreaction. Simply it answers the question, are losers more risky than winners. Chan (1988) suggests that a large company's share price will impact on the leverage of the company. So it is essential to look at the betas for the test period. Regression analysis will be carried out for both markets.

$$\text{LNR}_{pt} - \text{LNR}_{ft} = \alpha_p + \beta_p (\text{LNR}_{mt} - \text{LNR}_{ft}) + \varepsilon_t$$

$$\text{LNR}_{Lt} - \text{LNR}_{Wt} = \alpha_{L-W} + \beta_{L-W} (\text{LNR}_{mt} - \text{LNR}_{ft}) + \varepsilon_t$$

$\text{LNR}_{mt}$  = continuously compounded return on the market portfolio in month t.

$\text{LNR}_{pt}$  = continuously compounded return on the relevant portfolio.

$LNR_{ft}$  = continuously compounded risk free rate in month  $t$  and  $\alpha$  is the continuously compounded average monthly excess return. (Dissanaïke (1997))

If the EMH and the CAPM hold then  $\alpha_p$  should equal zero. However the overreaction hypothesis states that  $\alpha_l > 0$ ,  $\alpha_w < 0$ ,  $\alpha_l - w > 0$ . The second equation above is very important as it shows if the loser stocks are riskier than winner stocks by using the term  $\beta_l - w$ .

## **5.9 Limitations**

The study only looked at returns for twenty companies in each market compared to De Bondt and Thaler who looked at seventy. This was not possible due to the size of the ISEQ which has a much smaller number of companies listed compared to American stock exchanges. Also this study only investigated over a fifteen year period this is considerably a smaller time frame than 56 years by De Bondt and Thaler. This would have taken a considerable length of time to process the data and due to the time constraints and limitations involved in completing this research it was impossible to carry out such long sample periods.

## **5.10 Chapter Summary**

This section has presented the methodology that will be used for both collection and analysis of data used in this primary research. Also the hypotheses that will be tested have been outlined. The method of calculating return CAR was also highlighted. Finally some limitations to the study were outlined.

# *Chapter 6*

## *Findings*

## Chapter 6

### FINDINGS

#### 6.1 Chapter Overview

This chapter will present the findings of the primary research questions as highlighted in the last chapter. The results of the CIS in the ISEQ and FTSE 100 from 1997- 2011 will be presented for the two models used, the CAPM model and the adjusted market model. The results of the January effect on the data will also be shown.

#### 6.2 Adjusted Market Model

##### Objective one

Using the adjusted market model the author hopes to find evidence in the market to prove whether a contrarian investment strategy is still successful in the Irish and English stock markets or whether the anomaly is disappearing.

**Table 6.1 FTSE 100- Formation Period**

Formation	Winners	Losers
<i>Period 1 (97-99)</i>	5.820790932	-0.45412969
<i>Period 2 (00-02)</i>	6.936275	-1.04378
<i>Period 3 (03-05)</i>	2.905206	-2.40105
<i>Period 4 (06-08)</i>	4.472801	-1.47027
<b>Average</b>	<b>5.033768</b>	<b>-1.342307</b>
<b>Difference</b>	<b>6.3760757</b>	

**Table 6.2 FTSE 100- Holding Period**

Holding	Winners	Losers
<i>Period 1 (00-02)</i>	-0.2286438	6.121139
<i>Period 2 (03-05)</i>	0.51114459	-0.10168
<i>Period 3 (06-08)</i>	1.89965711	1.102876
<i>Period 4 (09-11)</i>	0.53422436	2.549568
<b>Average</b>	<b>0.67909556</b>	<b>2.417976</b>
<b>Difference</b>		<b>1.73888</b>

Table 6.1 and 6.2 show the returns from the adjusted market model from the FTSE100. Table 6.1 illustrates the returns from the formation period and table 6.2 illustrates the returns from the consequent holding period. The above results indicate that the CIS is profitable when used in the FTSE100. From 1997-2011 this investment strategy generated 173% higher returns than the market itself. Even though the winner portfolio only returned negative returns in one out of the four periods. It was the loser portfolios who had a vast turnaround from an average -134% less than the market to a return of on average of 241% greater than the market in the holding period. This shows that the contrarian strategy has worked. Stocks that were significantly underperforming against the market in the formation period turned around to outperform the market. In three out of the four holding periods the loser portfolio made a profit. This shows that the strategy worked over a consistent time period and that it was not just one time period which swayed the portfolio to a positive return in the loser portfolios.

The winner portfolios did exhibit a dramatic drop in performance comparing to the formation and holding periods. On average in the formation period the winner portfolio outperformed the market by 503%, however in the holding period the portfolio's performance did drop to an average of 67% above the market. From this one can see that there is some momentum in the market as the winners continued to outperform the market, but it is visible that there is some contrarian evidence in this, as the stocks did not continue to beat the market at such a high level. They did return to somewhere near their normal price level.

Observing the individual time periods you discern some interesting points, you can see in the first time period that the loser portfolio went from a loss of 45% to a gain of 612% which shows an extreme price reversal, a clear sign of the CIS. The winner portfolio also showed clear signs of the CIS as the winners went from a gain of 582% to a loss of 22% in a three year period which demonstrates an extreme price reversal. In period two the strategy did not make any profit as the winner portfolio went from a gain of 693% above the market to a 51% gain and the loser portfolio went from -104% less than the market to a -10% return less than the market. Hence the investment would have lost money on both sides of the strategy. In period three the strategy again would have made a loss overall as the winners did outperform the

losers by 79%. In period four however the strategy was very successful as the losers outperformed the winners by 174%.

**Table 6.3 ISEQ-Formation Period**

Formation	Winners	Losers
<i>Period 1 (97-99)</i>	2.98106761	-3.8203981
<i>Period 2 (00-02)</i>	11.1631986	-2.1692908
<i>Period 3 (03-05)</i>	12.5490102	-0.6368583
<i>Period 4 (06-08)</i>	7.63104643	-3.7337251
<b>Average</b>	<b>8.5810807</b>	<b>-2.5900681</b>
<b>Difference</b>	<b>11.17115</b>	

**Table 6.4 ISEQ-Holding Period**

Holding	Winners	Losers
<i>Period 1 (00-02)</i>	1.20269839	7.79120938
<i>Period 2 (03-05)</i>	6.10823419	5.80391773
<i>Period 3 (06-08)</i>	1.64154882	2.25577254
<i>Period 4 (09-11)</i>	4.49756529	1.3755117
<b>Average</b>	<b>3.36251167</b>	<b>4.30660284</b>
<b>Difference</b>		<b>0.9440912</b>

The returns from the adjusted market model can be seen above for the ISEQ. Table 6.3 displays the returns from the formation period while table 6.4 displays the returns from the resulting holding period. Overall the CIS is profitable in the ISEQ stock exchange as the strategy made a return of 94% above the market during the time period 1997-2011. The loser's portfolios over the four periods showed clear signs of extreme price reversals. All four periods moved from dramatically underperforming the market to outperforming the market dramatically. On average the loser portfolios went from making a loss of 259% against the market to a gain of 430% against the market in the holding period.

The winner's portfolios however in the ISEQ did not show any signs of price reversal instead the winner's portfolios showed momentum in the market. The winner's

portfolio still outperformed the market by 336% in the holding period from a high of 858% in the formation period. This displays strong price momentum in the market even though it is a large decrease on the formation periods figure which reveals that the prices had a modest decrease in relation to the market.

### **6.3 Adjusted Market Model: FTSE 100 vs. ISEQ**

#### **Objective two**

To discuss the viability of this anomaly is it more successful in one market in comparison to the other. Is there a better opportunity for this investment strategy in the UK market, or is there a better opportunity in the smaller Irish market.

After completing the adjusted market model for both exchanges you can see the results and compare the differences in the success of the strategy in both markets. The most noticeable point is that the CIS is successful in both the FTSE 100 and ISEQ during the period 1997-2011. In the FTSE 100 it was most successful, generating 173% more returns than the market compared to a 94% return against in the market in the ISEQ. Both markets showed momentum in the winner's portfolios with a positive return of 67% against the market in the FTSE 100 and a positive return of 336% against the market in the ISEQ. The CIS however was successful because of the major price reversal of the loser portfolios. In the FTSE 100 the loser portfolio went from having a negative return of -134% against the market in the formation period to a positive return of 241% against the market in the holding period. Similar results were seen in the ISEQ where the losers went from a negative return of -259% in the formation period against the market to a positive return of 430% in the holding period. The biggest price reversals seen in both markets were in period one where the losers went from -382% to 779% from formation to holding period in the ISEQ and -45% to 612% from formation to holding period in the FTSE 100.

Evidence from the adjusted market model reveals that both markets generate abnormal returns using the CIS and as a consequence the results show a clear violation of the EMH. It has been shown that historical prices can be used to select future price movements over the period 1997-2011.



## 6.4 CAPM

It is important when testing to see if the CIS is evident in the FTSE100 and the ISEQ to include a second model. As previously highlighted in the methodology chapter the CAPM will be used to justify the results of the adjusted market model which have exposed that the CIS to be successful. However these results of the adjusted market model may be due to the increased risk of buying a portfolio consisting of losers. To back up the findings of the adjusted market model we need to review the results of the CAPM for both stock exchanges. If the results of the CAPM still present abnormal profits after taking the increased risk into consideration we can verify the previous results with an increased level of certainty the CIS is evident and that the EMH does not hold.

**Table 6.5 CAPM-FTSE 100 Formation Period**

Formation	Winners	Losers
<i>Period 1 (97-99)</i>	9.6326	-2.5181
<i>Period 2 (00-02)</i>	8.426	-4.6644
<i>Period 3 (03-05)</i>	2.751	-2.1412
<i>Period 4 (06-08)</i>	6.3295	-1.742
<b>Average</b>	<b>6.784775</b>	<b>-2.76643</b>
<b>Difference</b>	<b>9.5512</b>	

**Table 6.6 CAPM- FTSE 100 Holding Period**

Holding	Winners	Losers
<i>Period 1 (00-02)</i>	1.5156	2.246
<i>Period 2 (03-05)</i>	1.084	-0.4742
<i>Period 3 (06-08)</i>	6.033	-1.4455
<i>Period 4 (09-11)</i>	-7.4004	-0.4412
<b>Average</b>	<b>0.30805</b>	<b>-0.02873</b>
<b>Difference</b>		<b>-0.33678</b>

Looking at the above results for the CAPM we can see that when the stocks have been accounted for risk the CIS does not seem to be effective in the FTSE 100. The results do not support the previous results of the adjusted market model, it went from making a 173% gain against the market to making a 33% loss against the market. The winner portfolios did show some sign of price reversals as there was large return percentage drops in three out of the four periods. Again the loser portfolios did display some signs of price reversal, in period one it went from a loss of 251% in the formation period to a gain of 224% in the holding period. Overall however the results have shown that strategy is no longer profitable.

**Table 6.7 CAPM-ISEQ Formation Period**

Formation	Winners	Losers
<i>Period 1 (97-99)</i>	0.57847	-10.6666
<i>Period 2 (00-02)</i>	2.6905	-9.01369
<i>Period 3 (03-05)</i>	8.479566	-0.93397
<i>Period 4 (06-08)</i>	4.37	-10.0376
<b>Average</b>	<b>4.029634</b>	<b>-7.66297</b>
<b>Difference</b>	<b>11.6926008</b>	

**Table 6.8 CAPM- ISEQ Holding Period**

Holding	Winners	Losers
<i>Period 1 (00-02)</i>	-1.18691	-5.13628
<i>Period 2 (03-05)</i>	3.177388	4.368218
<i>Period 3 (06-08)</i>	-2.4832	-3.18437
<i>Period 4 (09-11)</i>	-16.77243	7.41266
<b>Average</b>	<b>-4.316288</b>	<b>0.865057</b>
<b>Difference</b>		<b>5.181345</b>

**Table 6.9 CAPM-ISEQ Holding Period without AIB, BOI**

Holding	Winners	Losers
<i>Period 1 (00-02)</i>	-3.02591	-4.42458
<i>Period 2 (03-05)</i>	4.992216	3.057618
<i>Period 3 (06-08)</i>	-2.5212	-3.84837
<i>Period 4 (09-11)</i>	0.99324	5.95502
<b>Average</b>	<b>0.1095865</b>	<b>0.184922</b>
<b>Difference</b>		<b>0.0753355</b>

In complete contrast to the FTSE 100 results, the CAPM returns for the ISEQ illustrate that the strategy is successful after risk has been taken into account thereby justifying the results of the adjusted market model. It generates returns of 518% greater than the market. However after consideration of these results, the author believes some bias especially during period four was evident. There was a reversal in the winner's portfolio of 437% in the formation period to negative 1670% in the holding period. The author assumes this was because of the banking collapse in Ireland. For this reason AIB and Bank of Ireland were removed from the data and carried out again. You can see that the returns have dropped significantly to a return of 7% higher than the market.

**Table 6.10 Beta Values- FTSE 100 & ISEQ**

BETA VALUES	FTSE 100	Portfolios	ISEQ	Portfolios
	Winners	Losers	Winners	Losers
<i>Period 1 (00-02)</i>	1.216	0.783	1.096	0.493
<i>Period 2 (03-05)</i>	0.968	1.135	0.619	1.131
<i>Period 3 (06-08)</i>	1.235	0.922	0.767	0.87
<i>Period 4 (09-11)</i>	0.766	1.526	0.577	1.462
<b>Average</b>	<b>1.04625</b>	<b>1.0915</b>	<b>0.76475</b>	<b>0.989</b>

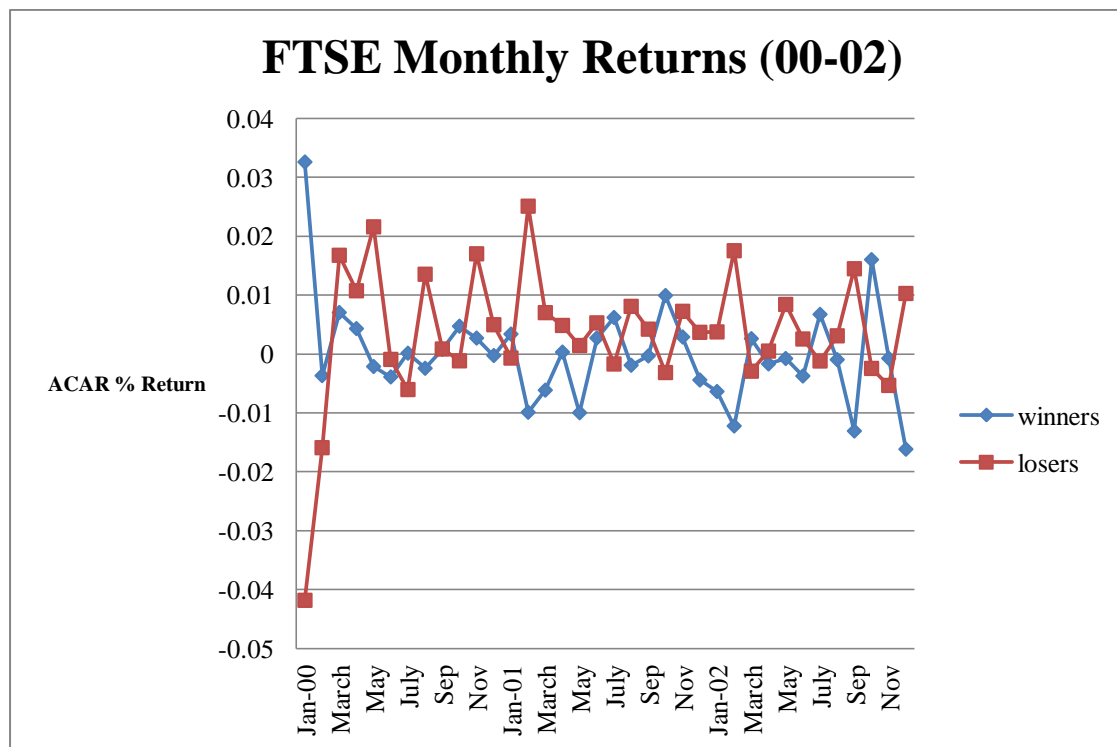
By examining the average beta values for both markets we can see that loser's portfolios are more risky than the winner portfolios in both markets but only slightly. In the ISEQ both portfolios betas are less than one which indicate that both portfolios are not as risky as the market which is deemed to have a beta of one. This result is not surprising as the author designed the research by only selecting the biggest companies by market capitalization as to eliminate any possibility of the size effect hindering any of the results obtained. In the FTSE 100 both the winner and loser portfolios are slightly above one at 1.04 and 1.09 respectively. The difference between them does not seem to justify the increased levels of risk which is deemed to be undertaken by the investor when purchasing previous losers.

## 6.5 Results for the January effect

### Objective three

What amount of the abnormal profits in the contrarian investment strategy can be attributed to the January effect?

**Graph 6.1 FTSE 100-Averages Monthly Portfolio Returns (2000-2002)**

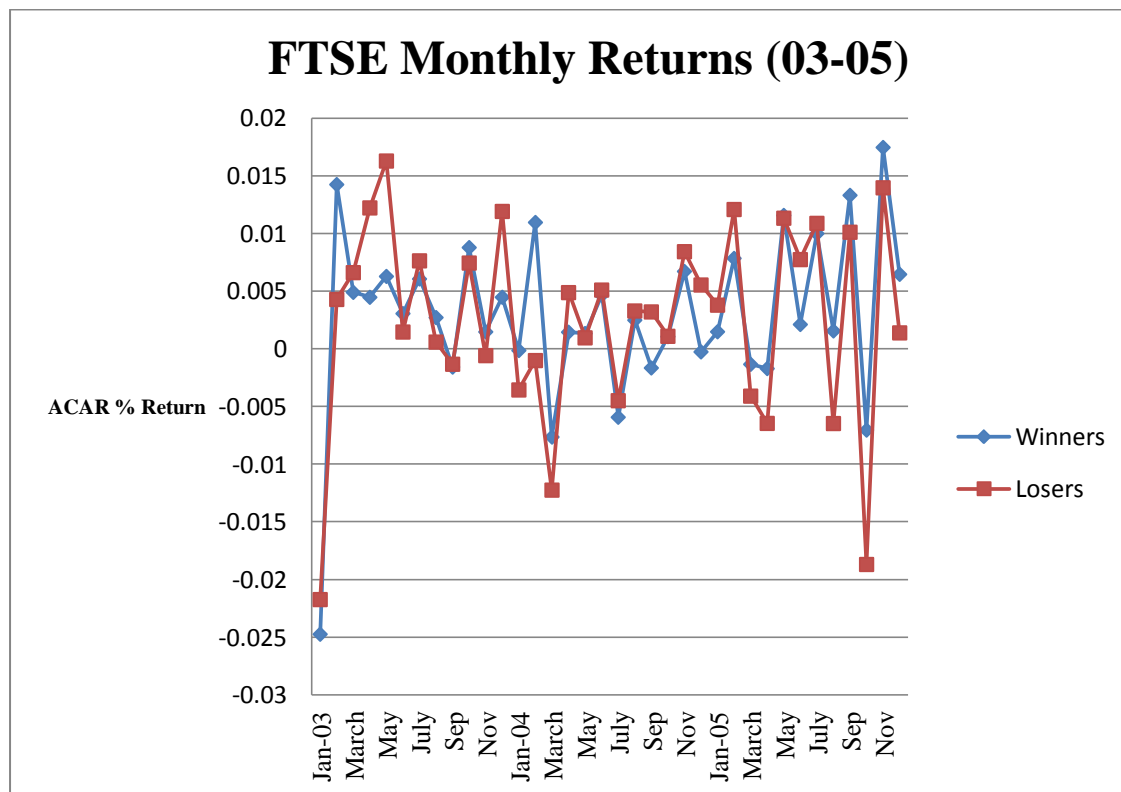


Graph 6.1 illustrates the average cumulative abnormal returns for January 2000-December 2002. The month that we are interested in is the January returns. This will show us if the January effect is the cause of the abnormal returns that have been generated using the CIS. During the three year period the January returns were not excessively high and even made negative returns in 2000. From this we can say that the January effect has not caused the abnormal returns in this time period. This is confirmed by the findings in table 6.11 as the average January returns for the time period was negative and below the average returns of 1.1%

**Table 6.11 Average monthly returns FTSE 100 (2000-2002)**

2000-2002	Winners	Losers
January	0.02959282	-0.0387808
February	-0.025815	0.0267034
March	0.00349342	0.0208448
April	0.00293331	0.0160543
May	-0.012886	0.0314197
June	-0.0049305	0.0068968
July	0.01303958	-0.0089386
August	-0.0053176	0.0246959
Sep	-0.0126332	0.0195214
October	0.03065366	-0.0067779
November	0.00483904	0.018901
December	-0.0208638	0.0189131
<b>Average returns</b>	<b>0.00017548</b>	<b>0.0107877</b>
<b>Total Returns</b>	<b>0.00210572</b>	<b>0.1294529</b>

**Graph 6.2 FTSE 100-Averages Monthly Portfolio Returns (2003-2005)**



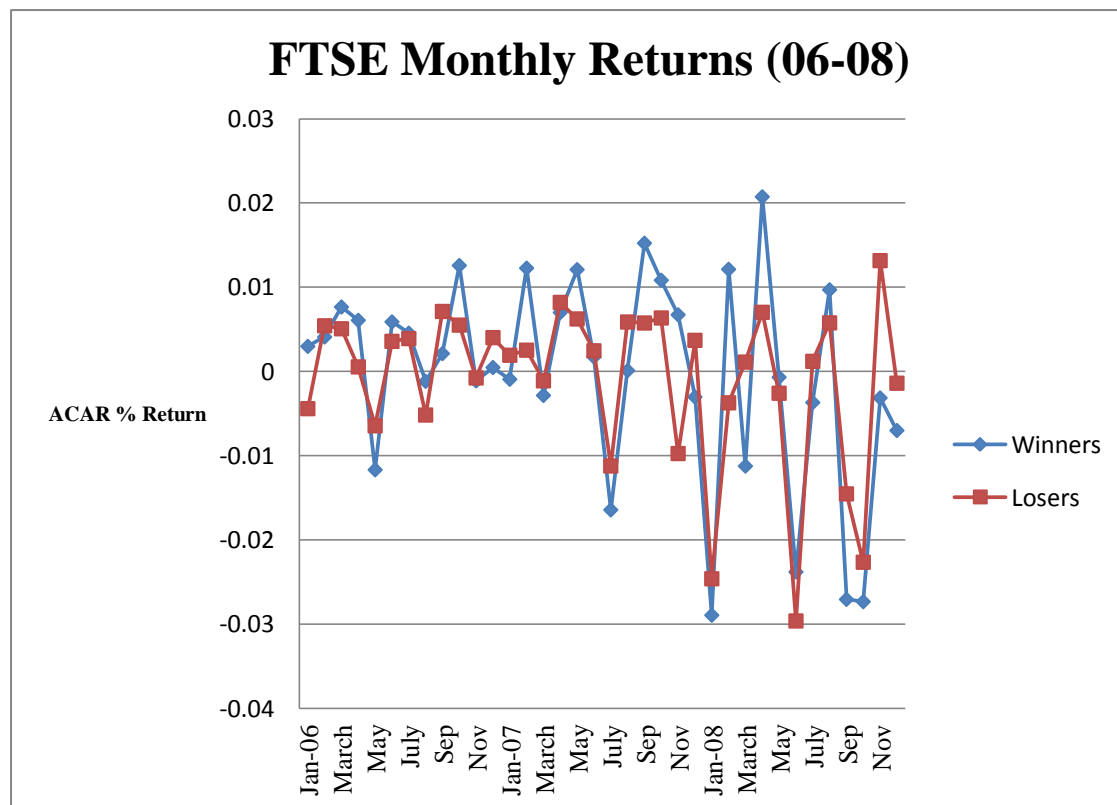
Graph 6.2 highlights the monthly ACAR returns during the period January 2003-December 2005. From the graph you can see the January effect had little effect on the time period as other months during the period had more substantial returns than January. Again the average returns for January over the time period were negative

which was lower than the average returns which you can see in table 6.12. From this the author can say that the January effect is not present.

**Table 6.12 Average monthly returns FTSE 100 (2003-2005)**

2003-2005	Winners	Losers
January	-0.02338007	-0.021486
February	0.03307496	0.0153743
March	-0.00406564	-0.009715
April	0.00422844	0.010658
May	0.01920812	0.0285933
June	0.00984704	0.0143187
July	0.01014606	0.0140403
August	0.00677899	-0.00258
Sep	0.01009908	0.0120048
October	0.00282145	-0.01014
November	0.02567004	0.0218252
December	0.0106988	0.0188615
<b>Average returns</b>	<b>0.00876061</b>	<b>0.0076464</b>
<b>Total Returns</b>	<b>0.10512728</b>	<b>0.0917562</b>

**Graph 6.3 FTSE 100-Averages Monthly Portfolio Returns (2006-2008)**

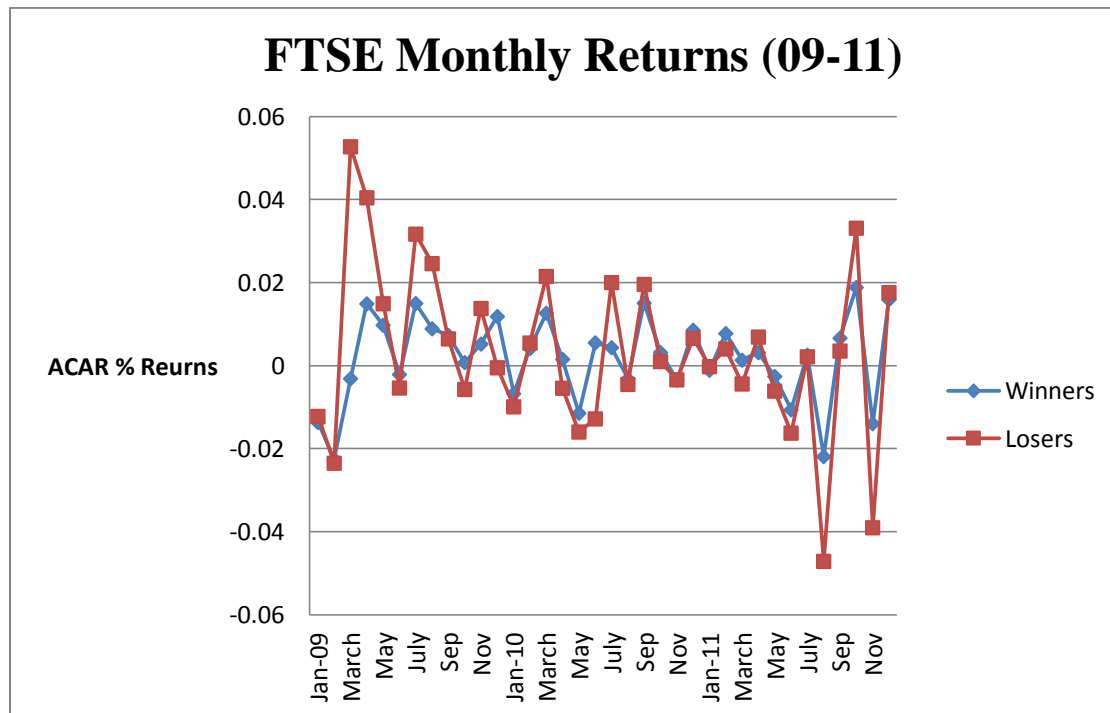


Graph 6.3 highlights the ACAR returns during the period January 2006-December 2008. In January 2008 for the first time you can see that the figures for January returns were one of the highest of the 36 month period. However the other two January returns again were insignificant so overall again the result seems to not have had a major impact on the returns generated. As is visible from the average returns in table 6.13 January returns were again negative so abnormal returns were not generated from the January effect.

**Table 6.13 Average monthly returns FTSE 100 (2006-2008)**

2006-2008	Winners	Losers
January	-0.0268942	-0.02711
February	0.02850546	0.004235
March	-0.0064246	0.005085
April	0.03382196	0.015776
May	-0.0002694	-0.0028
June	-0.0161911	-0.02359
July	-0.015569	-0.00611
August	0.00864095	0.006476
Sep	-0.0097105	-0.00165
October	-0.0039206	-0.01079
November	0.00247097	0.00265
December	-0.0095719	0.006328
<b>Average returns</b>	<b>-0.0012593</b>	<b>-0.00262</b>
<b>Total Returns</b>	<b>-0.0151119</b>	<b>-0.03149</b>

**Graph 6.4 FTSE 100-Averages Monthly Portfolio Returns (2009-2011)**



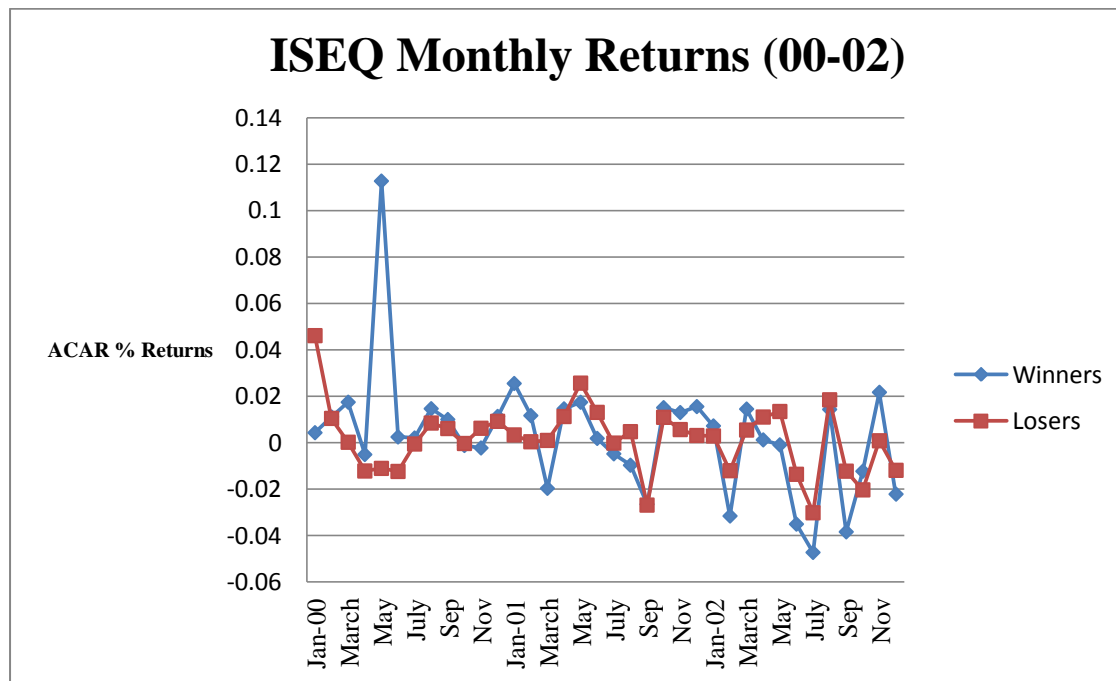
The final time period tested January 2009-December 201 is seen in Graph 6.4. It additionally fails to confirm that the January effect has had a major impact on the data or has been a cause of the abnormal returns generated in this time period. Table 6.14 shows that January has negative returns which are below the average returns. During the four different time periods it is clear that the overall result indicates that the January effect has not being the major cause of the abnormal returns generated using the CIS.

**Table 6.14 Average monthly returns FTSE 100 (2009-2011)**

2009-2011	Winners	Losers
January	-0.0214351	-0.02223
February	-0.0105545	-0.01389
March	0.01090816	0.069912
April	0.01965249	0.042007
May	-0.0042197	-0.00708
June	-0.0071573	-0.03432
July	0.02195338	0.05393
August	-0.0161212	-0.02694
Sep	0.02906173	0.02965
October	0.02285029	0.028485
November	-0.0121641	-0.02854
December	0.03633221	0.023794
Average returns	0.00575885	0.009564
Total Returns	0.0691062	0.114772



**Graph 6.5 ISEQ-Averages Monthly Portfolio Returns (2000-2002)**

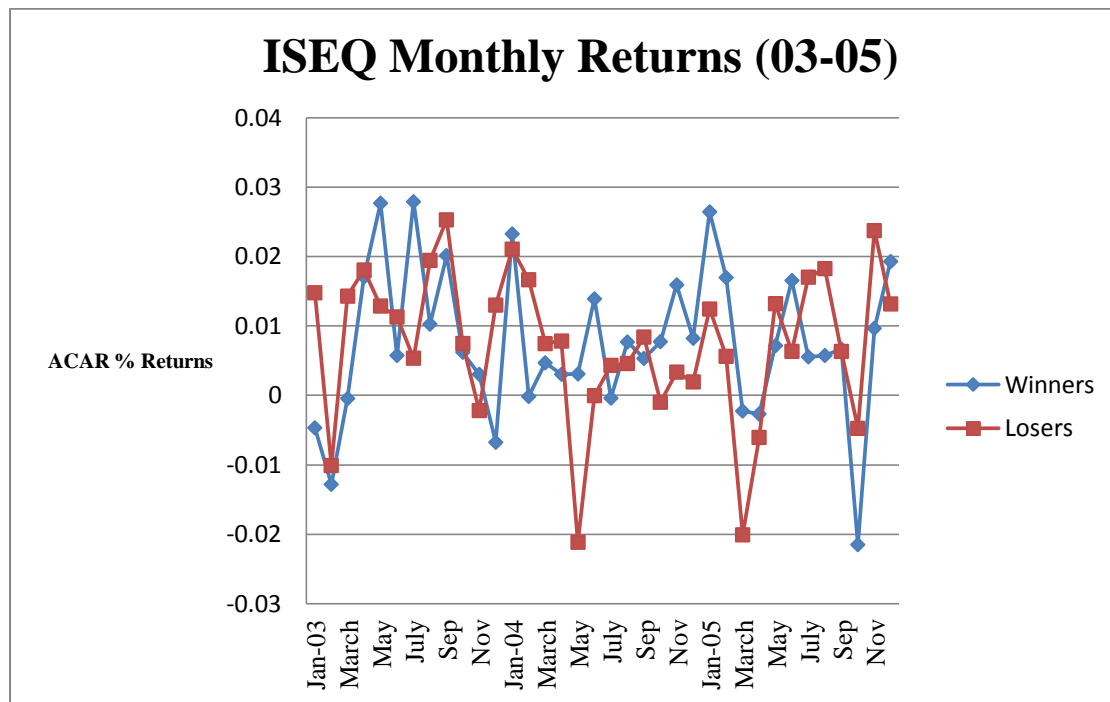


Graph6.5 highlights the ACAR results for the ISEQ during the period January 2000-December 2002. January 2000 contained the highest price reversal of the loser portfolio of the 36 month period. This would suggest strong evidence of the January effect in the year 2000. You can see in table 6.15 overall that average January returns for the period are well above the average monthly returns of 1.8%. So in this time period the January effect has made an impact during this time period.

**Table 6.15 Average Monthly returns ISEQ (2000-2002)**

2000-2002	Winners	Losers
January	0.12986851	0.09671
February	0.01714309	-0.08442
March	0.02680487	0.135269
April	0.10924208	0.143472
May	0.0966639	-0.00741
June	-0.0184732	-0.06255
July	-0.0194782	-0.01446
August	0.04647685	0.096902
Sep	-0.0411873	0.01091
October	-0.0149115	-0.04792
November	-0.0507025	-0.1418
December	0.05617472	0.099785
<b>Average returns</b>	<b>0.02813511</b>	<b>0.018706</b>
<b>Total Returns</b>	<b>0.33762129</b>	<b>0.224475</b>

**Graph 6.6 ISEQ-Averages Monthly Portfolio Returns (2003-2005)**

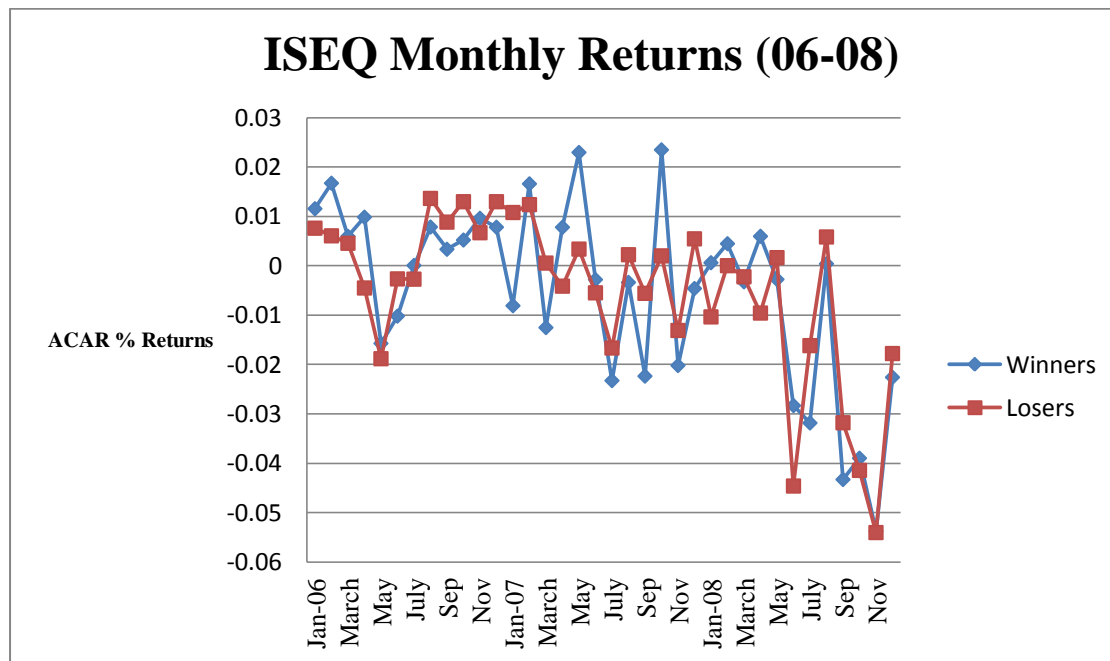


For the first time the author has seen signs of the January effect during the period January 2003-December 2005 in graph 6.6. There are the strongest signs of the January effect as over the three years the returns were positive for January in each year. Looking at table 6.16 it is clear that average January returns are 4.8% which is much higher than the average of 2.2 indicating again in the ISEQ that the January effect is having an impact on the abnormal returns.

**Table 6.16 Average monthly returns ISEQ (2003-2005)**

2003-2005	Winners	Losers
January	0.044999	0.04826
February	0.0039913	0.012162
March	0.0019793	0.001656
April	0.0174071	0.019812
May	0.0379173	0.004915
June	0.0361881	0.017584
July	0.0330261	0.026698
August	0.0236733	0.042272
Sep	0.0321266	0.039993
October	-0.0075594	0.001722
November	0.0285881	0.024877
December	0.0207232	0.028102
<b>Average returns</b>	<b>0.022755</b>	<b>0.022338</b>
<b>Total Returns</b>	<b>0.2730602</b>	<b>0.268053</b>

**Graph 6.7 ISEQ-Averages Monthly Portfolio Returns (2006-2008)**

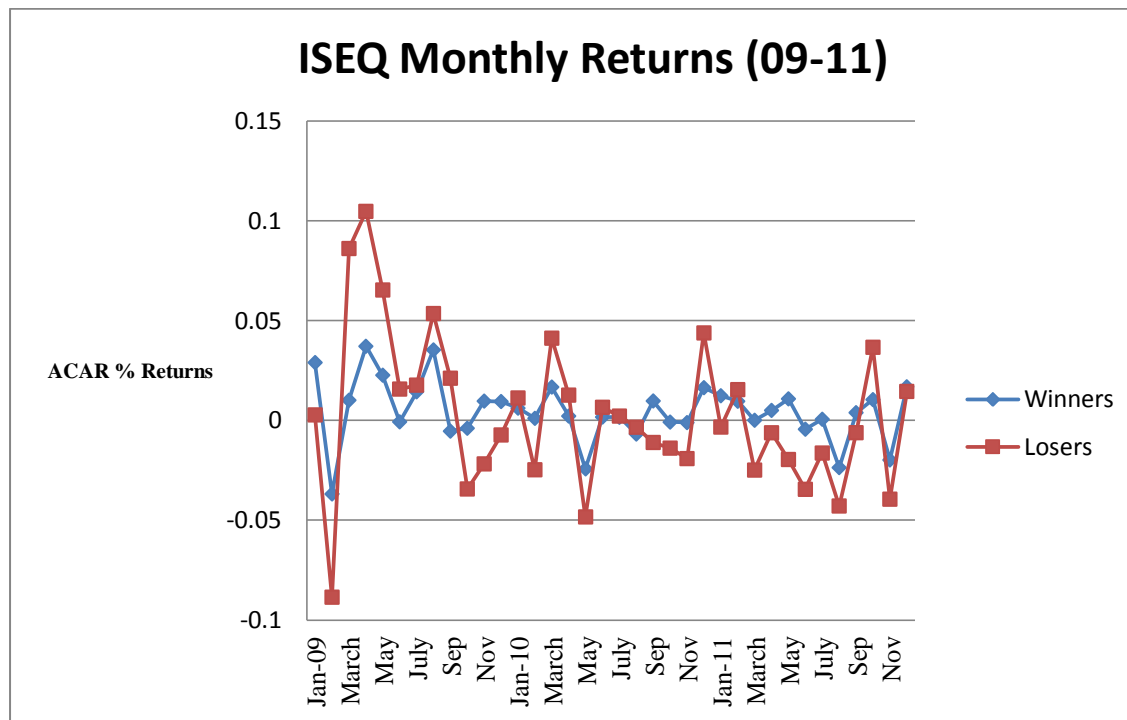


Again graph 6.7 for the period January 2006- December 2008 shows some signs of the January effect. As you can see from table 6.17 the average January returns are above the average monthly returns for the period, however overall the returns are not significantly higher. Overall in this period the January effect does not seem to have had as big an impact as in the previous time periods.

**Table 6.17 Average monthly returns ISEQ (2006-2008)**

2006-2008	Winners	Losers
January	0.0040483	0.008016
February	0.0377467	0.018427
March	-0.0098347	0.002842
April	0.023579	-0.01823
May	0.0044435	-0.01382
June	-0.0413302	-0.05276
July	-0.0550473	-0.03555
August	0.0048442	0.021678
Sep	-0.0623129	-0.02855
October	-0.0103107	-0.02649
November	-0.064361	-0.06045
December	-0.0194016	0.000632
<b>Average returns</b>	<b>-0.0156614</b>	<b>-0.01536</b>
<b>Total Returns</b>	<b>-0.1879368</b>	<b>-0.18427</b>

**Graph 6.8 ISEQ-Averages Monthly Portfolio Returns (2009-2011)**



The final testing period for the ISEQ can be viewed above in graph 6.8 from January 2009- December 2011. There is little evidence from the above graph to prove that the January effect was the main cause of the success of the CIS in the ISEQ. From table 6.18 you can see that the average January returns were just above the average monthly returns for the time period. From these results it cannot be said that the January effect has had a major cause of the abnormal returns.

**Table 6.18 Average monthly returns ISEQ (2009-2011)**

2009-2011	Winners	Losers
January	0.0474534	0.010637
February	-0.0262457	-0.09788
March	0.0268541	0.102404
April	0.0442829	0.11118
May	0.0091502	-0.00262
June	-0.0034708	-0.01226
July	0.0164569	0.003479
August	0.0048225	0.007244
Sep	0.0082338	0.003909
October	0.0056339	-0.01162
November	-0.0112612	-0.08039
December	0.0426891	0.051027
<b>Average returns</b>	<b>0.0137166</b>	<b>0.007093</b>
<b>Total Returns</b>	<b>0.1645991</b>	<b>0.085118</b>

Overall in the two markets it seems that the January effect has had more of an impact in the ISEQ than in the FTSE 100. All the individual times periods for the FTSE 100 January returns, were negative so there was no evidence of the January effect. In the ISEQ there was strong evidence off the January effect in two out four the four time periods which could have an impact on the returns for the CIS. These results indicate that the overreaction in the FTSE 100 market is down to other circumstances and as a result not of the January effect. In the ISEQ however some of the overreaction in the market might be due to the January effect.

## 6.6 Before and after financial crisis

### Objective four

The final objective is if the financial crisis has caused a change in behavioural finance, in particular, anomalies- and if so has the contrarian anomaly prospered due to the crisis or not.

**Table 6.19 FTSE 100 Returns before and after financial crisis**

FTSE	Winners	Losers	Returns
<i>Period 3 (06-08)</i>	1.89965711	1.10287611	<b>-0.796781</b>
<i>Period 4 (09-11)</i>	0.53422436	2.549568	<b>2.0153436</b>

**Table 6.20 ISEQ Returns before and after financial crisis**

ISEQ	Winners	Losers	Returns
<i>Period 3 (06-08)</i>	1.64154882	2.25577254	<b>0.6142237</b>
<i>Period 4 (09-11)</i>	4.49756529	1.3755117	<b>-3.122054</b>

From table 6.19 and 6.20 it is clear that the financial crisis had two contrasting effects on the two stock exchanges in the ISEQ. Before the financial crisis the CIS was successful generating returns of 61% higher than the market however after the financial crisis hit Ireland the returns made a huge reversal resulting in 312% loss greater than the market using the CIS. The FTSE 100 was the polar opposite with the strategy making a loss of 79% before the crisis to a gain of 201% after the financial

crisis. Of course, the financial crisis did have a bigger impact on Ireland than England because of the banking collapse so this might be one of the reasons there are such opposing results for the two markets.

## **6.7 Chapter Summary**

This chapter has analysed the results according to the primary research questions within this thesis. Is the CIS effective in the FTSE100 or ISEQ during the period 1997-2011? From the results of the adjusted market model, the author has revealed that this investment strategy is effective in both markets. It is more effective in the larger English stock exchange which is not surprising as the stocks would be traded more frequently than the ISEQ. The results of the January effect show that this has had little impact on the data and that the price reversal is not due to this factor. Finally the results of the CAPM highlighted that when risk was taken into account the strategy was not successful in the FTSE 100. It was successful however in the ISEQ mainly due to the banking crisis in the country which had a strong impact on the results. When these were taken out of the data sample, the returns were still positive but not to the same heights as before. Overall you can discern that the abnormal returns generated are mainly due to the increased level of risk of having a portfolio of losers stocks.

# *Chapter 7*

## *Discussion of Findings*

## **Chapter Seven**

### **DISCUSSION OF FINDINGS**

#### **7.1 Chapter Overview**

The goal of this chapter is to discuss the findings that were presented in the previous chapter in relation to some of the key studies found in comparison to this study. Are they similar or has this study uncovered different results than previously found? Finally there will be a conclusion and viewpoint on the results achieved and the implications of these results on the research area.

#### **7.2 Does the Efficient Market Hypothesis Still Hold?**

The creator of the EMH Fama (1965) came to the conclusion that it was impossible for investors to outperform the market and gain abnormal returns due to the random stream of information in a market. This states that the prices will consist of all available information in the market. All information will be shown in the market prices and because of this there should be no opportunity for investors to make abnormal returns. This point has already been disputed in the literature for numerous years.

The existence of a number of anomalies in the market has not ended the belief that the EMH holds true. By using past prices it should not be possible to predict future price movements otherwise EMH would not hold. The results from this research have indicated that by using the adjusted market model in the ISEQ and FTSE 100, past price information can be used to generate abnormal returns. The CIS generated 173% higher than the market average. Table 5.2 has shown that the CIS has been successful in three out of the four time periods. These results express that the FTSE 100 is not efficient from 1997-2011.

The results of the smaller ISEQ also display no sign of supporting the EMH while using the adjusted market model the CIS returned 94% above the market. Table 5.4



indicates that each individual time period revealed price reversals and those past prices could be used to predict future price movements, violating the EMH. When the author adjusted the data for risk using the CAPM model, there is not such a strong support for violating the EMH. The results in table 5.5 and 5.6 show that for the FTSE 100 winners remained winners and that losers remained losers. This does not back up the CIS but these results display some signals of momentum in the stock market and because of this there is a violation of the EMH. If an investor was using the momentum investment strategy they could have generated abnormal returns using past price information. The results of the ISEQ can be seen in table 5.8 and 5.9, they demonstrate the CIS had been successful even after adjustments for risk and showing that past prices could be used to predict future prices and as a result violating the EMH.

### **7.3 The Contrarian Investment Strategy**

The results from this study have shown that using the adjusted market model created by De Bondt and Thaler (1987) in the FTSE 100 and ISEQ that there are clear signs of overreaction in the market and price reversals. From these results it is possible to say that Contrarian approach is deemed a successful investment technique during the period 1997-2011. These results fall in line with those of Dreman and Lufkin's (1997) who stated that contrarian strategies earn higher returns than the market over time. From this it is clear that investor's treatment of past winners and losers is not efficient.

These results support those of Antoniou et al (2006) who found that contrarian strategies produce statistically and economically significant profits. Clare & Thomas (1995) also found that overreaction was present in the English market as their results showed that previous losers outperformed winners in the holding period. Their results they believed were a result of a manifestation of the size effect, Fama & French (1986), Zarowin (1989) (1990) also confirms this reasoning for the abnormal profits, however the results in this project have not been effected by the size effect as the author has only selected the largest companies by market capitalization.

Antoniou et al. (2006) contradict the idea that smaller companies are the main source of contrarian results. In their study for the UK market the main source of Contrarian

performance came from larger capitalization stocks, this study backs their results as only larger capitalization stocks were used in this study and contrarian profits were also found in the UK market. Gallea and Patalon (1998) stated that for the contrarian strategy to work, the investor must buy and hold the stocks for two to three years. According to Gallea and Patalon this will result in a successful investment. This study followed their method of having a three year formation and holding period which was first introduced by De Bondt and Thaler (1985).

De Bondt and Thaler (1985) study is considered the central study on the CIS and the main study to gauge new findings against. Their test results showed that losers outperformed the market by 19.6%. In comparison, the findings of this study showed that losers outperformed the market by 241% in the FTSE100 and by 430% in the ISEQ see table 5.2 and 5.4. The winners in De Bondt and Thaler's findings underperformed the market by 5%. However in this study the winners showed some momentum in the market and still outperformed the market by 67% in the FTSE 100 and by 336% in the ISEQ. The losers outperformed the winners, so it is important to note that the study has been successful in providing significant evidence on this effect. There are obvious discrepancies between the two studies findings but these can be explained by a number of reasons. The data samples differ between the two studies as does the time periods with De Bondt and Thaler's study. The timeframe in this study is quite unique as it included a number of extreme events such as the dot.com bubble burst at the beginning of 21<sup>st</sup> century, also the stock market crash of 2007, 2008 which effected the remaining years in this study. These could be some of the reasoning for the large returns generated compared to the pivotal study by De Bondt and Thaler. Kryzanowski and Zhang (1992) suggested that the success of De Bondt and Thaler's (1985) contrarian strategy is limited to the US stock market. However the primary research of this study indicate that both markets the ISEQ and FTSE 100 show high levels of contrarian profits and price reversals.

Authors such as Conrad and Kaul (1998) and Jones (1993) proposed that contrarian investment strategies gained significant profits pre-World War two only. The findings of this study suggest that excess returns can be achieved using the adjusted market model from 1997-2011. An interesting addition to this study would be to extend the time period as far back as possible to see if contrarian profits were higher pre-war compared to today.

#### **7.4 Comparing results of before and after financial crisis**

One of the objectives was to compare the CIS returns for the period before and after the financial crisis. The findings were interesting as the CIS was successful in the FTSE 100 but not in the ISEQ. The foundations of the CIS are built on how investors overreact or underreact to news. This overreaction results in stocks being mis-priced, as highlighted earlier in the literature people tend to overreact to unexpected and dramatic events as stated by Kahneman and Tversky (1982). Surely for these reasons, after the financial crisis then it would have been perfectly suited for the CIS to generate abnormal returns. Looking at the results of the holding period in table 6.2 and 6.4 compared to the formation period in table 6.1 and 6.3 the previous winners did underperform. This would have resulted in abnormal returns for the investor if they had just short sold the winners. However the loser portfolios did not have such a big price reversal. This resulted in the CIS not being successful in the ISEQ. From these results, from an Irish perspective at least the CIS does not work after a dramatic event e.g. financial crisis. People did overreact to a dramatic event in the market, which according to De Bondt and Thaler's (1985) over-reaction hypothesis which is the root of CIS the contrarian investor should have generated abnormal returns. The author believes that even though there was an overreaction in the market it was impossible for the contrarian investor to make abnormal profits in the post financial crisis time period as no stocks made massive price surges. For this reason it was impossible for the loser portfolio to turn around and make profits for the investor as the whole market was suffering.

#### **7.5 The January effect**

Numerous studies have found evidence of the January effect when analysing the returns of the CIS. Roll (1983) and Keim (1984) state that the January effect is related to the size effect. Conrad and Kaul (1993) identify substantial evidence of the January effect in their study which included small firms; from this the excess January returns can be attributed to the Size effect. This study eliminated the possibility of the Size effect limiting the study to the biggest companies in each stock market. So any abnormal returns can only be attributed to the January effect.

De Bondt and Thaler (1985) found strong evidence of the January effect with 84% of the loser's portfolio's returns coming from the three January months over the three year period. Comparing their results to the findings in this study there are contrasting findings with no evidence of the January effect in the FTSE 100 with January averaging negative returns of -10% compared to a monthly average return of 2%. However there is strong evidence of the January effect in the ISEQ with average returns for January of 9% compared to a monthly average return of 2%. In the ISEQ January made up on average 43% of returns of the loser portfolio over the period 2000-2011. This indicates strong evidence to back up the January effect in the ISEQ. Jegadeesh & Titman (1993) were other noted writers to document that winners outperform losers in every month of the year, except January and those losers significantly outperform winners in January. Overall the results indicate there is evidence of the January effect in the ISEQ but not in the FTSE 100.

## **7.6 Taking Risk into Account: CAPM Model**

Using the adjusted market model demonstrates strong evidence to support the CIS. By using this model it allowed this study to compare its findings to some key studies. There are some criticisms of this model as it implies that all stocks have an equal beta value of one, which is unlikely as some stocks would be much more risky than others as highlighted by Zarowin (1990). For this reason it was very important to compare the results with a second model that would take into account risk. De Bondt and Thaler (1985) findings after using the CAPM were similar to those of the adjusted market model, from their findings they concluded that the abnormal returns were not generated from the increased level of risk. There are critics of this method however such as Fama and French (1996) who argue that beta values are not adequate at explaining cross sectional dispersion of returns. They instead created a three factor model to replace CAPM. However the CAPM model was chosen so that the study could be compared against De Bondt and Thaler findings.

The results after using the CAPM model show large reversals in the success of the Contrarian Investment strategy. In the FTSE 100 the results went from returns of 173% before risk was taken into account to a -33% return below the market. This displays a massive price reversal when adjusted for risk and shows that the abnormal

returns were caused by the increased risk of buying loser stocks. However in the ISEQ the returns went from 94% above the market before risk was taken into account to a surprising 518% above the market. This massive increase however was due to the collapse of the Irish Banking industry. The beta values of these stocks didn't take into account what was happening in the industry. For this reason if future research could be carried out it would be interesting to see if Fama and French's three factor model would give different results. After the banking stocks were taken out of the portfolio the CAPM returns were reduced to 7% above the market. So overall the results show that when the returns are adjusted for risk the abnormal returns disappear, but it is interesting to see the returns of the ISEQ when risk is only taken into account using beta values.

## **7.7Chapter Summary**

This chapter has discussed the findings of this study in relation to the existing literature on the topic that had been discussed earlier in the literature review. The success of the CIS has been shown using De Bondt and Thaler (1987) adjusted market model. Some causes of the abnormal returns have been discussed such as the January effect and the size effect and if they had impacted on the data. The results of the CIS were discussed in relation to before and after the financial crisis and how the overreaction hypothesis did not hold up after a dramatic event at least from an Irish perspective. The successful results of the Contrarian approach were then examined using a different model the CAPM.

# *Chapter 8*

## *Conclusions*

## **Chapter Eight**

### **CONCLUSIONS**

#### **8.1 Chapter Overview**

This final chapter offers a conclusion to this research study. The main conclusions on the research objectives are presented. Some consequences that arose from the study will be addressed and finally the author will sum up with a final comment.

#### **8.2 Research objectives**

The main aim of this study was to determine if ‘The Contrarian Investment strategy is another anomaly to the EMH? An investigation with respect to the FTSE 100 & ISEQ stock exchanges’. To provide the answer to this the author divided the study into four main objectives. The four key objectives for this research study where:

- To find evidence in the market to prove whether a CIS is still successful in the Irish and English stock markets or whether the anomaly is disappearing.
- To discuss the viability of this anomaly and if it is more successful in one market in comparison to the other. Is there a better opportunity for this investment strategy in the UK market, or is there a better opportunity in the smaller Irish market.
- What amount of the abnormal profits in the CIS can be attributed to the January effect
- Also to investigate whether the financial crisis has caused a change in behavioural finance, in particular, anomalies- and if so has the contrarian anomaly prospered due to the crisis or not.

The study was carried out on the FTSE 100 and the ISEQ during the time period 1997-2011. The top twenty stocks by market capitalization where selected for both markets, this was to remove the risk of the Size Effect from the data. The twenty

stocks were then put into winner and loser portfolios based on their returns over the three year formation period. These returns were calculated using the cumulative abnormal returns method. Over the next three years these stocks were held with the winners being short sold and the losers being bought long. The results of the CIS do reveal that it is an effective investment strategy in the FTSE 100 and the ISEQ before the portfolios were adjusted for risk. These results are similar to those of some of the pivotal studies in the area such as De Bondt and Thaler (1985) and Dissanaike (1997).

These results begin to answer the research objectives but in order to fully justify the findings it was important to take risk into account. A lot of researches suggest that the abnormal returns generated using the CIS is a result of the increased risk associated with buying a portfolio of loser stocks. In order to test for returns after risk was taken into account the CAPM model was chosen. The results found using this model prompts reservation about the results found using the adjusted market model. The abnormal returns generated using CIS seem to disappear once risk is taken into account in the FTSE 100, however because of the banking crisis in Ireland the abnormal returns continued and even increased after risk was taken into account.

Another one of the main objectives was to test what proportion if any of the abnormal returns were generated because of the January effect. The result indicates that there is no evidence of the January effect in the FTSE 100 however there is evidence from the ISEQ to suggest that a vast majority of the abnormal returns were generated during January. The author can conclude from this that there is evidence in the ISEQ of the January effect but not in the FTSE 100.

There were also some interesting outcomes after getting the results of the contrarian strategy before and after the financial crisis. The results show that it was more successful in the FTSE 100 after the financial crisis compared to the holding period before. However in the ISEQ, the roles reversed as it was successful before the financial crisis and not successful after the crisis.



### **8.3 Recommendations for Future Research**

This research study has revealed mixed results on questioning if the Contrarian Investment Strategy is successful in the ISEQ and FTSE 100. The results varied when different models were used. Future research could be carried out using other models such as the three factor model created by Fama and French. If a study could carry out this investment strategy using all models available for testing, there could then be a definitive answer on this investment strategy and offer a clear model to use when testing for Contrarian approach in the stock market.

The time frame in this study followed in line with De Bondt and Thaler (1987) a three year formation and holding period. It would be interesting to see the results of a number of different time frames in the same study. You could then see difference in the results and whether they were attributed to the extra time involved.

This study only covered a 15 year period, due to time constraints numerous studies have carried out much longer studies such as De Bondt and Thaler (1985) who conducted a study over a 56 year period. A study from an Irish and English perspective with this time length would be interesting to compare.

### **8.4 Final Comments**

This study has added to the extensive existing literature in this field of study. It has filled some of the gaps in the literature with respect to testing the contrarian strategy from an Irish perspective. This objective has been achieved by having a foundation of results that can be built upon with future research in this area. Much deeper analysis can be undertaken such as using different methodologies as from the literature, results seem to vary when different methodologies are used. A study encompassing all available methodologies in the literature would once and for all put a definitive answer forward to whether or not the CIS is profitable.

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# *Appendices*

## APPENDIX A

### PERSONAL REFLECTION

#### **A summary of the key learning that you have derived from each stage completing the dissertation commencing with topic selection**

The process began by selecting a topic to do a research proposal for research methods. In September and October nobody was talking about their research proposals, it seemed to be in the back of everyone's mind. The research for a topic began in November; I knew straight away that it would be on a Finance topic and not an Economic topic. I had previously done a research project on investment strategies in stock markets and had really found it interesting. So I decided to choose a stock market anomaly for my research proposal.

Doing this research proposal made me realise the amount of work that it would take to complete a 15 thousand word thesis. The editing involved in the research proposal was bad enough I could only imagine trying to edit a one hundred page document. In February I had my first meeting with my supervisor, I found this meeting very useful as he explained what was required and told me the importance of reading the dissertation guidelines. I had scanned through it before but after the meeting I said I better have a proper look through it. After doing so I knew what was ahead of me and I felt a bit more at ease. Throughout the end of the second semester the thesis was kind of put on the back of the mind again as exams and projects had to be completed. From February to May I had a draft of my literature review and methodology chapter. I was happy with the progress that I had made through these months as I knew the literature review was the biggest piece. The tests were now over and summer was here, a few weeks drifted by and I soon realised it was up to me to get things done during the summer, not being around the college or the library made it more difficult to focus. During the following months though I put the head down and got the work done. I was relieved to have it finished in the end. I was happy with the document I had completed and that I could now say that I had wrote a thesis.

**What would you do differently?**

Probably the first thing I would of told myself last September was to try and do more during the college months as you would have had more people you could of gone and asked for help if you were stuck on a problem. Also I believe that just been around the college makes you more proactive, it's great to be at home and say you'll do a certain thing tomorrow and then something comes up at home and you get distracted and forget about the work to do. From this point I can now see how important planning and time management are to completing a thesis. It's not just a matter of doing a bit here and there and hoping you will finish it on time.

If I was doing this study again I probably would select larger stock markets to carry out the study on. I wanted to carry it out on Ireland for obvious reasons but soon realised that it was more difficult to get information on, as well as the number of companies listed on the market was not high. Getting historical data was not as easy as it would have been in some of the bigger stock markets in the World.

**How will you use the learning and skills in the future?**

I will be the first to admit that my level of writing and grammar isn't the best; this thesis has helped my writing skills I believe. Rewriting work over and over again you quickly come to see mistakes you were making previously. This thesis has also made me very proficient in using Excel at this stage I can pretty much do anything on it. Obviously in my future career in Finance using Excel will be an integral part of my job as well as writing documents. So I believe the thesis has really helped me to improve my skill set that I will be using for the rest of my life.

Time management and planning was a key part to finishing this thesis. Setting deadlines for myself and actually meeting them was essential. In work in the future I will be set deadlines and they will have to be met and the standard of work will have to be high, so these skills I have learned during this process will be utilized every day in the working world.

## Appendix B: List of Companies

<b>Top 20 FTSE 100 Companies By Market Capitalization</b>	<b>Top 20 ISEQ Companies By Market Capitalization</b>
Anglo American	Abbey PLC
Astra Zeneca	Allied Irish Banks
Barclays	Aminex
BG Group	Bank of Ireland
BP PLC	CRH
British American Tobacco	DCC PLC
British Sky Broadcasting Group PLC	Dragon Oil
BT Group PLC	Elan Corporation
Cable & Wireless PLC	FBD Holdings PLC
Diageo PLC	FYFFES PLC
GlaxoSmithKline PLC	Glanbia
HSBC Holdings PLC	Grafton Group PLC
Lloyds	IFG Group
M&S	Independent N&M PLC
Prudential	Irish Continental Group PLC
Rio Tinto	Kenmare Resources
Royal Dutch Shell	Kerry Group PLC
Standard Chartered	Kingspan PLC
Unilever	Permanent TSB Group Holdings PLC
Vodafone	United Drug PLC

## Appendix C: Adjusted Market Model returns FTSE 100

Adjusted Market Model Returns Period 1			Adjusted Market Model Returns Period 2		
Winners	Formation	Holding	Winners	Formation	Holding
Vodafone	1.5655252	-0.1568	British American Tobacco	1.277322	0.3629
BT Group PLC	1.0049296	-0.7139	Diageo PLC	0.761929	-0.176
BG Group	0.5708608	0.63252	Unilever	0.761801	-0.3895
Prudential	0.5484298	-0.2098	M&S	0.673712	0.1623
Cable & Wireless PLC	0.5457356	-1.8646	Barclays	0.657091	0.09349
HSBC Holdings PLC	0.4272466	0.48223	BG Group	0.632516	0.44448
British Sky Broadcasting Group PLC	0.3370064	0.60301	British Sky Broadcasting Group PLC	0.603015	-0.6154
Barclays	0.286947	0.65709	Anglo American	0.552936	0.4419
GlaxoSmithKline PLC	0.276345	0.15189	Astra Zeneca	0.527517	-0.055
Lloyds	0.257765	0.18971	Standard Chartered	0.488437	0.24198
<b>Total Returns</b>	<b>5.8207909</b>	<b>-0.2286</b>	<b>Total Returns</b>	<b>6.936275</b>	<b>0.51114</b>
Losers	Formation	Holding	Losers	Formation	Holding
BP PLC	0.2207522	0.22763	Rio Tinto	0.485037	0.44259
Standard Chartered	0.191543	0.48844	HSBC Holdings PLC	0.482234	-0.105
Rio Tinto	0.1546926	0.48504	Royal Dutch Shell	0.36482	-0.0903
Royal Dutch Shell	0.0932368	0.36482	BP PLC	0.227628	0.01511
Anglo American	0.0678659	0.55294	Lloyds	0.18971	-0.2422
Astra Zeneca	0.0648712	0.52752	GlaxoSmithKline PLC	0.151886	-0.2422
British American Tobacco	-0.049919	1.27732	Vodafone	-0.156805	-0.2911
Unilever	-0.082369	0.7618	Prudential	-0.209815	-0.0599
Diageo PLC	-0.295025	0.76193	BT Group PLC	-0.713883	-0.2841
M&S	-0.819778	0.67371	Cable & Wireless PLC	-1.864592	0.75549
<b>Total Returns</b>	<b>-0.45413</b>	<b>6.12114</b>	<b>Total Returns</b>	<b>-1.04378</b>	<b>-0.1017</b>
Adjusted Market Model Returns Period 3			Adjusted Market Model Returns Period 4		
Winners	Formation	Holding	Winners	Formation	Holding
Cable & Wireless PLC	0.7554888	0.5592	BG Group PLC	0.889089	0.17806
BG Group	0.4444801	0.88909	British American Tobacco	0.654093	0.25493
Rio Tinto	0.442585	0.12727	Cable & Wireless PLC	0.559203	-0.6327
Anglo American	0.4419038	0.25432	Unilever PLC	0.532248	0.06265
British American Tobacco	0.362897	0.65409	Diageo PLC	0.409095	0.13045
Standard Chartered	0.2419763	0.15678	Vodafone	0.36267	0.03151
M&S	0.1622989	-0.3647	Astra Zeneca	0.3082	-0.1642
Barclays	0.093489	-0.7803	British Sky Broadcasting Group PLC	0.273503	0.23921
BP PLC	0.0151142	0.09574	Anglo American	0.254322	0.32998
Astra Zeneca	-0.055028	0.3082	Royal Dutch Shell	0.230379	0.10427
<b>Total Returns</b>	<b>2.9052055</b>	<b>1.89966</b>	<b>Total Returns</b>	<b>4.472801</b>	<b>0.53422</b>
Losers	Formation	Holding	Losers	Formation	Holding
Prudential	-0.059907	0.16426	Prudential	0.164263	0.4876
Royal Dutch Shell	-0.090317	0.23038	Standard Chartered	0.156779	0.45077
HSBC Holdings PLC	-0.105048	-0.0777	GlaxoSmithKline PLC	0.151956	-0.0842
GlaxoSmithKline PLC	-0.147514	0.15196	Rio Tinto	0.12727	0.83665
Diageo PLC	-0.175964	0.4091	BP PLC	0.095738	-0.3252
Lloyds	-0.242204	-0.7921	HSBC Holdings PLC	-0.077734	-0.2786
BT Group PLC	-0.284135	-0.1514	BT Group PLC	-0.151367	0.19593
Vodafone	-0.291054	0.36267	M&S	-0.364731	0.19137
Unilever	-0.389484	0.53225	Barclays	-0.780306	1.16764
British Sky Broadcasting Group PLC	-0.615425	0.2735	Lloyds	-0.792135	-0.0924
<b>Total Returns</b>	<b>-2.401051</b>	<b>1.10288</b>	<b>Total Returns</b>	<b>-1.470268</b>	<b>2.54957</b>

## Appendix D: Adjusted Market Model Returns ISEQ

Adjusted Market Model Returns Period 1			Adjusted Market Model Returns Period 2		
Winners	Formation	Holding	Winners	Formation	Holding
CRH	0.521969	-0.2918	Fyffes PLC	5.511685	-0.0064
Elan Corporation	0.471601	0.23749	Kingspan PLC	1.193	1.30893
Kingspan PLC	0.348627	1.193	Grafton Group PLC	0.777284	0.58159
Grafton Group PLC	0.318902	0.77728	Independent N&M PLC	0.750673	0.07037
Allied Irish Banks	0.311321	0.47225	Abbey PLC	0.663405	0.24437
DCC PLC	0.310908	0.55155	Dragon Oil	0.621857	2.8404
Bank of Ireland	0.296281	-0.1365	DCC PLC	0.551549	0.06502
IFG Group	0.280378	-0.2989	Allied Irish Banks	0.472249	-0.2577
Irish Continental Group PLC	0.082055	-0.3439	United Drug PLC	0.366385	0.08504
FBD Holdings PLC	0.039024	-0.9577	Kenmare Resources	0.255111	1.17658
<b>Total Returns</b>	<b>2.981068</b>	<b>1.2027</b>	<b>Total Returns</b>	<b>11.1632</b>	<b>6.10823</b>
Losers	Formation	Holding	Losers	Formation	Holding
Independent N&M PLC	0.027513	0.75067	Elan Corporation	0.237485	2.68458
United Drug PLC	-0.08273	0.36639	Glanbia	0.219098	0.01596
Permanent TSB Group Holdings PLC	-0.13413	-0.1468	Kerry Group PLC	-0.0552	-0.1922
FYFFES PLC	-0.1607	5.51169	Bank of Ireland	-0.13651	-0.2828
Kerry Group PLC	-0.18711	-0.0552	Permanent TSB Group Holdings PLC	-0.14676	-0.0692
Abbey PLC	-0.20648	0.66341	CRH	-0.29183	0.20667
Aminex	-0.20652	-0.395	IFG	-0.29895	1.035
Dragon Oil	-0.30697	0.62186	Irish Continental Group PLC	-0.34386	-0.0649
Glanbia	-1.11434	0.2191	Aminex PLC	-0.39504	1.08747
Kenmare Resources	-1.44893	0.25511	FBD Holdings PLC	-0.95772	1.38342
<b>Total Returns</b>	<b>-3.8204</b>	<b>7.79121</b>	<b>Total Returns</b>	<b>-2.16929</b>	<b>5.80392</b>
Adjusted Market Model Returns Period 3			Adjusted Market Model Returns Period 4		
Winners	Formation	Holding	Winners	Formation	Holding
Dragon Oil	2.840404	0.97266	Irish Continental Group PLC	1.705019	-0.3553
Elan Corporation	2.684583	0.85493	Glanbia	0.997677	0.81972
FBD Holdings PLC	1.383422	-0.3929	Dragon Oil	0.972656	1.12608
Kingspan PLC	1.30893	-0.0429	CRH	0.872743	-0.2697
Kenmare Resources	1.176577	-0.4425	Elan Corporation	0.854926	1.02845
Aminex	1.08747	-0.3014	Kerry Group PLC	0.796487	0.56909
IFG group	1.034997	0.16923	DCC PLC	0.595591	0.38288
Grafton Group PLC	0.581587	-0.0518	United Drug PLC	0.583475	-0.2088
Abbey PLC	0.244368	0.00354	IFG group	0.169227	1.11897
CRH	0.206672	0.87274	Fyffes PLC	0.083244	0.28617
<b>Total Returns</b>	<b>12.54901</b>	<b>1.64155</b>	<b>Total Returns</b>	<b>7.631046</b>	<b>4.49757</b>
Losers	Formation	Holding	Losers	Formation	Holding
United Drug PLC	0.08504	0.58348	Abbey PLC	0.003544	0.30144
Independent N&M PLC	0.070375	-0.3412	Kingspan PLC	-0.04293	0.73769
DCC PLC	0.065017	0.59559	Grafton Group PLC	-0.05179	0.15708
Glanbia	0.015961	0.99768	Aminex	-0.30135	0.68735
Fyffes PLC	-0.0064	0.08324	Independent N&M PLC	-0.34116	-1.3801
Irish Continental Group PLC	-0.06494	1.70502	FBD Holdings PLC	-0.39294	-0.3053
Permanent TSB Group Holdings PLC	-0.06921	-0.4566	Kenmare Resources	-0.44254	2.77001
Kerry Group PLC	-0.19222	0.79649	Permanent TSB Group Holdings PLC	-0.45655	-0.9745
Allied Irish Banks	-0.25767	-0.7646	Allied Irish Banks	-0.76464	-0.7951
Bank of Ireland	-0.28282	-0.9434	Bank of Ireland	-0.94337	0.17697
<b>Total Returns</b>	<b>-0.63686</b>	<b>2.25577</b>	<b>Total Returns</b>	<b>-3.73373</b>	<b>1.37551</b>

## Appendix E: CAPM Returns FTSE 100

CAPM Returns Period 1	Formation	Holding		CAPM Returns Period 2	Formation	Holding
<b>WINNERS</b>				<b>WINNERS</b>		
Vodafone	1.8832	0.0736		British Sky Broadcasting Group PLC	1.7644	0.677
HSBC Holdings PLC	1.2782	0.6796		Diageo PLC	1.2448	-0.2556
Standard Chartered	1.2361	1.0212		Standard Chartered	1.0212	0.2288
BT Group PLC	1.1325	-1.17		Anglo American	0.982	0.1054
Barclays	0.9393	0.9052		Barclays	0.9052	0.1086
Lloyds	0.9293	-0.1756		HSBC Holdings PLC	0.6796	-0.156
Prudential	0.8115	0.5404		Rio Tinto	0.5624	0.4418
Cable & Wireless PLC	0.7442	-0.8436		Prudential	0.5404	0.0184
Anglo American	0.343	0.982		Royal Dutch Shell	0.3652	-0.131
GlaxoSmithKline PLC	0.3353	-0.4972		M&S	0.3608	0.0466
<b>Total Returns</b>	<b>9.6326</b>	<b>1.5156</b>		<b>Total Returns</b>	<b>8.426</b>	<b>1.084</b>
<b>LOSERS</b>				<b>LOSERS</b>		
BG Group	0.1094	-0.6124		Vodafone	0.0736	-0.3252
Rio Tinto	0.0663	0.5624		BP PLC	-0.0524	-0.0174
BP PLC	0.0546	-0.0524		Lloyds	-0.1756	-0.2336
Royal Dutch Shell	0.0254	0.3652		Unilever	-0.3508	-0.4494
British Sky Broadcasting Group PLC	0.0201	1.7644		Astra Zeneca	-0.398	-0.1566
Unilever	-0.2209	-0.3508		GlaxoSmithKline PLC	-0.4972	-0.1492
Astra Zeneca	-0.2362	-0.398		BG Group	-0.6124	0.3864
British American Tobacco	-0.5543	-0.638		British American Tobacco	-0.638	0.2256
Diageo PLC	-0.6281	1.2448		Cable & Wireless PLC	-0.8436	0.5124
M&S	-1.1544	0.3608		BT Group PLC	-1.17	-0.2672
<b>Total Returns</b>	<b>-2.5181</b>	<b>2.246</b>		<b>Total Returns</b>	<b>-4.6644</b>	<b>-0.4742</b>
CAPM Returns Period 3	Formation	Holding		CAPM Returns Period 4	Formation	Holding
<b>WINNERS</b>				<b>WINNERS</b>		
British Sky Broadcasting Group PLC	0.677	-0.0545		BG Group	0.9825	-0.2768
Cable & Wireless PLC	0.5124	0.3805		M&S	0.962	0.7
Rio Tinto	0.4418	0.57		Anglo American	0.932	-1.4664
BG Group	0.3864	0.9825		Standard Chartered	0.789	-0.4336
Standard Chartered	0.2288	0.789		Prudential	0.612	-1.6152
British American Tobacco	0.2256	0.3575		Rio Tinto	0.57	-1.1252
Barclays	0.1086	0.502		Barclays	0.502	-4.7724
Anglo American	0.1054	0.932		Cable & Wireless PLC	0.3805	-0.0208
M&S	0.0466	0.962		British American Tobacco	0.3575	1.4108
Prudential	0.0184	0.612		Royal Dutch Shell	0.242	0.1992
<b>Total Returns</b>	<b>2.751</b>	<b>6.033</b>		<b>Total Returns</b>	<b>6.3295</b>	<b>-7.4004</b>
<b>Losers</b>				<b>LOSERS</b>		
BP PLC	-0.0174	0.018		Vodafone	0.0975	1.1212
Royal Dutch Shell	-0.131	0.242		BP PLC	0.018	-0.37
GlaxoSmithKline PLC	-0.1492	-0.438		Astra Zeneca	0.013	1.0848
HSBC Holdings PLC	-0.156	-0.441		Unilever	0.0095	1.4436
Astra Zeneca	-0.1566	0.013		British Sky Broadcasting Group PLC	-0.0545	1.1916
Lloyds	-0.2336	-0.0625		Lloyds	-0.0625	-5.3512
Diageo PLC	-0.2556	-0.1115		Diageo PLC	-0.1115	1.226
BT Group PLC	-0.2672	-0.7725		GlaxoSmithKline PLC	-0.438	1.1052
Vodafone	-0.3252	0.0975		HSBC Holdings PLC	-0.441	-1.4168
Unilever	-0.4494	0.0095		BT Group PLC	-0.7725	-0.4756
<b>Total Returns</b>	<b>-2.1412</b>	<b>-1.4455</b>		<b>Total Returns</b>	<b>-1.742</b>	<b>-0.4412</b>



## Appendix F: CAPM Returns ISEQ

CAPM Returns Period 1	Formation	Holding		CAPM Returns Period 2	Formation	Holding
<b>WINNERS</b>				<b>WINNERS</b>		
Elan Corporation	0.57977	1.3442		Elan Corporation	1.3442	1.1959
Allied Irish Banks	0.5689	0.4606		FBD Holdings PLC	1.16703	1.2865
Bank of Ireland	0.4622	0.6667		Bank of Ireland	0.6667	-0.24514
CRH	0.25717	-0.7987		Allied Irish Banks	0.4606	-0.259095
DCC PLC	0.19354	-0.3779		Grafton Group PLC	0.18319	0.425425
Kingspan PLC	-0.0801	-0.5208		Glanbia	0.03295	-0.09362
Permanent TSB Group Holdings PLC	-0.1997	-0.1481		Permanent TSB Group Holdings PLC	-0.1481	-0.068
Independent N&M PLC	-0.3939	-0.8889		Kenmare Resources	-0.20647	0.74147
Grafton Group PLC	-0.40428	0.18319		DCC PLC	-0.3779	0.00152
Irish Continental Group PLC	-0.40513	-1.1072		Abbey PLC	-0.4317	0.192421
<b>Total Returns</b>	<b>0.57847</b>	<b>-1.18691</b>		<b>Total Returns</b>	<b>2.6905</b>	<b>3.177381</b>
<b>LOSERS</b>				<b>LOSERS</b>		
Kerry Group PLC	-0.5974	-0.7117		Kingspan PLC	-0.5208	1.3106
IFG Group	-0.6742	-1.0483		United Drug PLC	-0.5588	0.0327
Abbey PLC	-0.67942	-0.4317		Dragon Oil	-0.5622	2.2712
FBD Holdings PLC	-0.73161	1.16703		Kerry Group PLC	-0.7117	-0.207
FYFFES PLC	-0.78279	-0.71809		FYFFES PLC	-0.71809	-0.02418
United Drug PLC	-0.7878	-0.5588		CRH	-0.7987	0.18096
Dragon Oil	-0.88	-0.5622		Independent N&M PLC	-0.8889	0.062148
Aminex	-1.3565	-2.099		IFG Group	-1.0483	0.62187
Glanbia	-1.5227	0.03295		Irish Continental Group PLC	-1.1072	-0.1333
Kenmare Resources	-2.65422	-0.20647		Aminex	-2.099	0.25322
<b>Total Returns</b>	<b>-10.66664</b>	<b>-5.13628</b>		<b>Total Returns</b>	<b>-9.01369</b>	<b>4.368218</b>
CAPM Returns Period 3	Formation	Holding		CAPM Returns Period 4	Formation	Holding
<b>WINNERS</b>				<b>WINNERS</b>		
Dragon Oil	2.2712	-0.114		Elan Corporation	1.944	0.8469
Kingspan PLC	1.3106	-0.268		FBD Holdings PLC	1.93	0.796
FBD Holdings PLC	1.2865	1.93		Permanent TSB Group Holdings PLC	0.93	-6.4117
Elan Corporation	1.1959	1.944		Allied Irish Banks	0.466	-8.82353
Kenmare Resources	0.74147	-0.7012		Bank of Ireland	0.236	-7.4845
IFG Group	0.62187	-1.472		CRH	0.038	-0.6326
Grafton Group PLC	0.425425	-0.612		Dragon Oil	-0.114	1.6799
Aminex	0.25322	-1.554		Kingspan PLC	-0.268	0.2528
Abbey PLC	0.192421	-1.674		Irish Continental Group PLC	-0.35	1.9364
CRH	0.18096	0.038		DCC PLC	-0.442	1.0679
<b>Total Returns</b>	<b>8.479566</b>	<b>-2.4832</b>		<b>Total Returns</b>	<b>4.37</b>	<b>-16.77243</b>
<b>LOSERS</b>				<b>LOSERS</b>		
Independent N&M PLC	0.062148	-1.65914		Glanbia	-0.522	1.45764
United Drug PLC	0.0327	-0.627		Kerry Group PLC	-0.596	2.118
DCC PLC	0.00152	-0.442		Grafton Group PLC	-0.612	-0.20518
FYFFES PLC	-0.02418	-0.62023		FYFFES PLC	-0.62023	1.7965
Permanent TSB Group Holdings PLC	-0.068	0.93		United Drug PLC	-0.627	0.7399
Glanbia	-0.09362	-0.522		Kenmare Resources	-0.7012	1.5997
Irish Continental Group PLC	-0.1333	-0.35		IFG Group	-1.472	2.11
Kerry Group PLC	-0.207	-0.596		Aminex	-1.554	-0.02
Bank of Ireland	-0.24514	0.236		Independent N&M PLC	-1.65914	-3.9539
Allied Irish Banks	-0.259095	0.466		Abbey PLC	-1.674	1.77
<b>Total Returns</b>	<b>-0.933967</b>	<b>-3.18437</b>		<b>Total Returns</b>	<b>-10.03757</b>	<b>7.41266</b>