

RESEARCH REPORT

ADVANCES IN BEHAVIOURAL FINANCE

by

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EXECUTIVE SUMMARY

A key question in behavioural finance is why prices in financial markets change. The field of behavioural finance evolved in an attempt to understand better and explain how cognitive errors and emotions influence investors' decision-making processes. Behavioural finance is the study of the psychological effects of market events on investors that affect finance decisions. It is not a new field of study, but more emphasis has been placed on this field of finance in the past two decades. Behavioural finance explores the irrational nature of investors' decisions.

The primary objective of the research was to provide an understanding of the psychological impact of people on prices in financial markets. The secondary objectives are

- to provide a brief history of behavioural finance;
- to show that there are alternatives to the efficient markets theory; and
- to demonstrate the impact of popular models on prices.

The report was compiled based on a literature study on the topic of behavioural finance. The purpose of the literature study was to provide sufficient information to meet the objectives of the study as set out above. The following sources were used:

- published articles;
- textbooks; and
- the Internet.

The efficient market hypothesis and the CAPM are challenged by behavioural finance. Prices of speculative assets do not always reflect fundamental values. The perceptions of investors play an important role in the determination of prices. Hence, when there are market crashes on the equities markets, the contagion effect amongst investors should not be underestimated. It is shown in this report that portfolio insurance is an important contributing factor to the magnitude of any crash on equities markets.

Dividends are an important determinant for the fundamental value of shares. This contrasts with the revenue model that is used to value new economy shares, such as Internet companies. It is also clear that investors expect to receive a dividend. In this report, various theories strongly suggest investors' preference for dividends. These include the self-control and prospect theories, regret-aversion and the clientèle effect.

Changes in dividends affect share prices. A decrease in the dividend of a company is a clear signal to investors that the share price is overvalued. Movements in share prices are therefore at least partially the result of changes in dividends.

Investment strategies that can be followed by investors include the following:

- It may help to acquire closed-end fund shares at the listing of a new fund. The research shows that initially closed-end funds trade at a premium of up to ten per cent, but within 180 days, the premium evaporates and the fund starts to trade at a discount.
- The optimal strategy for sophisticated investors is a strategy that involves market timing with increased exposures to shares that have fallen, and decreased exposure to shares after they have risen in price.
- Individual investors should follow a buy-and-hold strategy, as opposed to a trading strategy, as the cost of trading is excessive.
- Arbitrageurs (professional investors) can earn higher than normal returns on markets that are excessively volatile. However, they need to be cautious, as they can also lose significant amounts of money when markets are volatile.

Careful consideration should be given to what shares to trade, as the cost of trading is expensive, as much as six per cent. Furthermore, it is important to have stop-loss limits in place and to sell shares once they breach the lower limit that has been set. The notion that losing shares in a portfolio will somehow turn into winning shares is, in most cases, incorrect.

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CHAPTER 1

INTRODUCTION

1.1 Introduction and problem statement

A key question in behavioural finance is why prices in financial markets change. Prices in financial markets change due to both fundamental economic shifts and human psychological beliefs (perceptions). Investors' attitudes are of great importance in determining price trends with regard to speculative assets such as equities, bonds, commodities, property etc. It is very difficult to quantify perception and therefore it is virtually impossible to predict prices in the financial markets.

1.2 Background and history

The fathers of behavioural finance are Daniel Kahneman of Princeton University and the late Amos Tversky of Stanford University. The field of behavioural finance evolved in an attempt to understand better and explain how cognitive errors and emotions influence investors' decision-making processes.

In 1979, Kahneman and Tversky proposed their now famous "Prospect Theory". Their research found that, contrary to the expectations of the prevailing utility theory, people weight gains and losses differently and rate ranges of probability differently. They found that individuals are more distressed about potential losses than excited by potential gains. In cases where there is a sure gain, investors usually become risk-averse, but, faced with a sure loss, investors may become risk-takers.

Behavioural finance is the study of the psychological effects of market events on investors that affect finance decisions. It is not a new field of study, but more emphasis has been placed on this field of finance in the past two decades. Behavioural finance explores the irrational nature of investors' decisions. The publication in 1985 of De Bondt and Thaler's paper "Does the Stock Market Overreact" created much controversy, as it was one of the first to directly challenge the efficient market hypothesis.

Thaler (1993:xv) raises interesting questions, based on his observations of the financial markets, that pertain to behavioural finance, namely: Are markets any different because of the involvement of humans? Why has financial economics largely ignored people? The answer to the latter question is that there are better data on prices than on people. Thaler (1993:xvii) defines behavioural finance simply as “open minded finance”. He explains that “it is necessary to entertain the possibility that some of the agents in the economy behave less than fully rational some of the time. Any financial economist willing to consider this possibility seriously is ready to take a try at behavioral finance.”

Economic and financial theory is based upon the assumption that investors act rationally and consider all publicly available information in their decision-making processes. However, the involvement of people in the financial markets causes markets to react differently to what is expected in terms of financial theory. Participants (humans) in financial markets are far from rational. Prices are affected by the opinions of these participants in the financial markets.

According to Shiller (1997), in his paper on “Human Behavior and the Efficiency of the Financial System”, theories of human behaviour from Psychology, Sociology, and Anthropology have provided a rationale for much of the recent research on the behaviour of financial markets.

1.3 Aim of the research

1.3.1 Primary objective

The primary objective for this study is to provide an understanding of the psychological impact of people on prices in financial markets.

1.3.2 Secondary objectives

The secondary objectives are

- to provide a brief history of behavioural finance;
- to show that there are alternatives to the efficient markets theory; and
- to demonstrate the impact of popular models on prices.

1.4 Methodology

The report was compiled based on a literature study on the topic of behavioural finance. The purpose of the literature study was to provide sufficient information to meet the objectives of the study as set out above. The following sources were used:

- published articles;
- textbooks; and
- the Internet.

1.5 Outline of the study

To examine the question as to why prices change in financial markets, it is necessary to investigate the following aspects of behavioural finance:

- noise and noise trader risk;
- volatility, excess volatility and the impact on the efficient market hypothesis;
- overreaction and abnormal performance;
- corporate finance and investors' preference for cash dividends; and
- individual behaviour and popular non-scientific models.

The study is arranged according to the above topics.

CHAPTER 2

NOISE AND NOISE TRADER RISK

2.1 Introduction

The purpose of this chapter is to explain the concept of noise and the impact of noise traders on Finance, Econometrics and Macroeconomics. The impact of noise traders on the behaviour of asset prices is examined, and, finally, the so-called “closed-end fund puzzle” is discussed.

2.2 What is noise?

Noise is a term popularised by Fisher Black’s presidential address “Noise”. Thaler (1993:xvii) indicates that one way to think about noise is that it is the opposite of news. Whilst rational traders make decisions based on information or facts, noise traders make decisions based on anything else. Black (1986:7) defines noise trading as trading on noise as if it were information.

Black’s (1986:3) basic model of financial markets contrasts noise with information. Sometimes people trade on information in the normal way and they are justified in assuming that they can make a profit from these trades. On the other hand, some people trade on noise as if it were information. In this case, these people would be incorrect to assume that a profit can be made from these trades. In Black’s model of the way we observe the world, noise is what makes observations less than perfect. Black’s model of business cycles and unemployment indicates that noise is information that has not yet crystallised. Black states that he thinks of all these models as equilibrium models, but not as rational models, because of the influence of noise.

The models that Black describes in his paper on noise apply to different fields, namely

- Finance;
- Econometrics; and
- Macroeconomics.

Black also states that other researchers may find his work on this topic controversial, due to its being untested and not supported by evidence at present. However, he

predicted that in future his conclusions would be widely accepted. He declared that if his conclusions were not to be accepted, he would blame it on noise!

2.2.1 Finance

According to Black (1986:4), noise makes financial markets liquid; however, it also makes them less than perfect. If there were no noise traders (traders that trade on noise as opposed to rational traders that trade on information and facts), there would be very little trade in individual assets. People would trade mainly in unit trusts or portfolios or indexed financial instruments to change their exposure to perceived market risks. There would be no need to trade in the shares of individual firms.

In the absence of noise traders, a dealer with information about an individual company might like to trade, but this person would soon realise that only another dealer with similar insights about the company would be willing to trade. If an outsider knew what both traders knew, one of the traders would surely have to be making an error. If the trader who is making the error declines to trade, there is no trading on information. Black believes that it makes no sense to develop a model that is based only on information trading, but includes no noise trading. Under those circumstances, a trader who had special knowledge about a company would be in no rush to trade as he or she would know that other traders have their own special pieces of information. However, if very little trade takes place in individual shares there can be no trading in unit trusts, portfolios or indexed financial instruments, because there is no easy way to price the market. A market depends on the liquidity of individual company shares. Noise trading provides the catalyst for this.

Black indicated in his paper that where there are significant numbers of noise traders participating in the market, it is worthwhile for those traders with information on individual companies to trade. Information traders may even be willing to pay for costly information in order to trade on this information. As a group, most of the time, noise traders tend to incur losses by trading, while information traders collectively make profits. Markets become more liquid as more noise traders participate in them. However, noise trading results in a situation where noise itself is reflected in prices. Both noise and information are then included in the price of a share.

According to Black (1986:6), the more noise trading takes place, the more attractive it is for information traders to trade, because more noise is reflected in the prices of

individual shares. However, an increase in information traders does not make prices more efficient. This is due to the fact that the noise trading needed for a liquid market, causes prices to be less efficient. In this case, information traders are not in a position to take larger positions to eliminate noise. Their information gives them a competitive advantage, but it is no guarantee of profits. Taking a larger position naturally results in more risk. Also, information traders cannot be sure that they are trading on information and not noise. If the information they trade on is already reflected in the price of a share, it is as though they are trading on noise.

Information traders also tend to become more aggressive the further the price of a stock gets from its perceived value. As a result, the price of a share tends to move back to its fundamental value over time. Black defined an efficient market as one in which the price is within a factor of 2. He also stated in his paper that almost all markets are efficient almost all the time (where “almost all” means at least 90 per cent).

Black (1986:9) concluded that the price of a share would be a noisy estimate of its value. The sustainable earnings per share of a company, multiplied by a suitable price earnings ratio, gives another value for the company, but this estimate is also noisy. Portfolios cannot be managed using price earnings ratios, because the earnings themselves contain so much noise. While noise creates an opportunity to trade profitably, at the same time, it is difficult to ensure profits from trading activities.

2.2.2 Econometrics

Black (1986:9) speculates that people trade on noise because they either like to do it or there is so much noise that they are not aware that they are trading on noise and that they think they are trading on information. He indicated that neither of these reasons fits in with the utility theory, where the best possible use is made of available information. Black cautioned against tampering with the utility function. However, he believes there is a compelling case for letting trading into the utility function.

As a result of the quantity of noise in the world, certain aspects cannot be observed. Black gives the example that one cannot know what the expected return of the market will be – there is ample evidence to suggest that it changes over time and that there is no reason to believe that changes will occur evenly. One can use the average return achieved previously as a predictor of an expected return, but this is a very noisy estimate.

Another example is that wealth is often an important variable in estimating any demand curve. However, wealth is unobservable because the value of non-traded assets such as human capital is part of wealth. Black believes that if it were possible to observe the value of human capital, there would be a strong correlation with the level at which the stock market fluctuates. However, he is of the opinion that the extent of fluctuations in the value of human capital is probably less than the magnitude of fluctuations in the level of stock markets.

Economic variables are generally less observable than financial variables. These variables include

- interest rates;
- share prices;
- returns on shares;
- the past volatility of a share's return; and
- the correlation of returns on different shares.

Black (1986:12) in his paper uses the example of goods and services, where prices and quantities are difficult to observe because it depends on the location, terms of the trade, what is traded and when it is traded. Econometric studies using economic variables are hard to explain due to the following reasons:

- the variables are subject to many measurement errors; and
- the coefficients of regressions do not explain the causal relationships.

As a result empirical studies in finance are easier to do than empirical studies in economics. However, there are several stumbling blocks to analysing the results of securities studies. It is common for empirical studies in finance to take the form of "event studies" which observe share price. These prices react to public announcements that affect a company, for example, via the JSE's news service (SENS). If shares had contained no noise, this would have been a very trustworthy way to determine how certain events affect companies, but, because there is noise, the impact of these events on companies are difficult to observe.

Black (1986:13) concludes that correlations between financial and economic variables have some value and that experimental studies in economics and finance do add value. However, according to him, theory is accepted because researchers persuade

each other that the theory is correct and relevant and not because it is confirmed by empirical tests.

2.2.3 Macroeconomics

Noise or uncertainty has an impact on economic markets because there are costs associated with moving physical and human resources from one economic sector to another, according to Black (1986:15). In an ideal world, where skills and capital can be shifted between sectors without cost, mismatches between what we can do and what we want to do will not occur. However, because the costs associated with re-allocating resources are so high, it is probable that these costs do influence business cycles.

Black assumes that governments do not have superior information about future supply and demand conditions within and between economic sectors to the information held by people active in these sectors. As a result there is little that the government can do to help the economy to steer clear of a recession. These uncertainties are noise to the people involved in these sectors, just as they are noise to government employees, according to Black.

The government's monetary policy is almost completely passive in countries such as the United States, according to the Black. Interest rates go up when prices go up, or when income goes up as a result of an increase in the demand for money. Black claims that he had no trouble (and nor do many other well-known economists) constructing an equilibrium model in which changes in prices cause changes in interest rates. Furthermore, the inflation rate and price levels are indeterminate – they are what people believe they are and are the result of expectations based upon no rational model. In addition, he indicates that, within a given sector, the prices of inputs and outputs are regarded as given.

Decisions on how much and what to produce are based upon given prices. Therefore each sector in the economy assumes that the inflation rate of input and output prices is given and includes the government sector as a provider of money. If the economy is in equilibrium, based upon the expected inflation rate, and everyone forecasts a lower inflation rate, there will be a new equilibrium. Black concludes that noise causes changes in the rate of inflation.

Black is of the view that there is a real international equilibrium that is not influenced by monetary policy, except in developing countries with volatile markets or with a national debt that is totally out of line with the taxable wealth of the country. As a result of this, there are world and national business cycles driven largely by tastes and technology. This real equilibrium also leads to relative prices for all goods or services, irrespective of location. Because information and transportation are costly, there are no arbitrage opportunities that force the prices of similar goods and services in different locations to be the same.

Black (1986:18) defines purchase power parity as an equilibrium in the economy that is largely independent of price levels and exchange rates. He adds that purchase parity does not hold, because there are relative price changes, changes in the level of economic activity, changes in exchange rates and interest rates. We therefore think that exchange rates and interest rates cause relative price changes and fluctuations in the economic cycle, but this is only due to the noise in the data that clouds the issue.

2.3 Noise trading and the behaviour of asset prices

Shefrin and Statman (1994:323) have shown that noise traders interact with information traders in the market. They define noise traders as traders who commit cognitive errors, while information traders are defined as free of cognitive errors. They indicate that there is no need for behavioural theory in a market in which only information traders participate and that this would be a market where price efficiency and the capital asset pricing model ("CAPM") would hold. In this scenario, beta and the distributions of returns on the market portfolio determine risk premiums. Option prices follow the Black-Scholes formula. According to Shefrin and Statman, the theories of price efficiency and the CAPM are constantly challenged because they do not incorporate the actions of noise traders.

They quote studies by respected authors in this field such as Banz, De Bondt, Thaler, Shiller, Stein, Mehra, Prescott, Lee, Sheffler, Fama and Fench, to back up their statement:

- Abnormal returns are associated with size;
- Past winners tend to be future winners and past losers tend to remain losers;
- Volatility might be excessive;
- Overreaction is reflected in option prices;

- The closed-end fund puzzle; and
- The failure of beta to reflect risk.

According to Shefrin and Statman the key difference between markets in which prices are efficient and markets in which prices are inefficient is what they call the “single driver property”. In markets where prices are efficient, there is a single specific variable that drives the return distribution of the market portfolio, the mean-variance efficient frontier, the premium for risk and the prices of options. They define the single driver as the minimum amount of new information that is required to cause a change to the return distribution of the market portfolio. Noise traders introduce a second driver into the market and drive prices away from efficiency. The behaviour of noise traders includes the following:

- They affect the mean-variance efficient frontier. As a result, abnormal returns are created for particular securities. There is thus a link between the market beta and abnormal returns.
- The risk premium on the market portfolio and long-term interest rates is affected by excess volatility caused by noise traders. There is a link between the slope of the yield curve and the risk premium on the market portfolio.

Shefrin and Statman (1994:324) argue that the actions of noise traders are the result of the failure of the single driver property. The focus of Shefrin and Statman was specific cognitive errors committed by noise traders. They argue that the reaction of the market is strongly dependent on this type of error. They show that price efficiency protects noise traders. When prices are efficient, noise traders as a group are on a par with information traders and the impact of noise traders is restricted to an increase in volumes traded.

Shefrin and Statman also define noise traders as any traders who are not information traders and who do not process information rationally. In their model, noise traders are assumed to commit certain cognitive errors in the way they act on information and learn. One such error is probability mismapping. They explain probability mismapping using the following example: imagine tossing a coin five times. Suppose that the first four tosses result in heads. Someone who is of the opinion that the probability of tails is higher, because tails is due according to the law of averages, commits a gambler’s fallacy.

According to Shefrin and Statman (1994:333), not all noise traders commit the same error. An important attribute for noise traders who want to survive is patience. They suggest that information traders in a price efficient market do not exploit noise traders and that this is another reason for the survival of noise traders. Some noise traders are protected by efficient prices.

Shefrin and Statman (1994:340) state that if prices are efficient, the market price of a share is determined by the beta of that share and the return on the market portfolio. Therefore, security prices and volatility are determined through a single driver. Consequently, the volatility of long-term interest rates is zero. If prices are inefficient, a second driver such as noise can influence prices. Shefrin and Statman have shown that a noise trader bubble is created where prices are not efficient. For example, in the case where there is a noise trader bubble, index call options are often over-valued, while index put options may be undervalued.

Shefrin and Statman (1994) also indicate that trading volumes depend on the amount of dispersion in expectations. It is the change in investors' different expectations over time that is fundamental in determining trading volumes.

De Long, Shleifer, Summers and Waldmann (1990:23) state that despite overwhelming evidence of the participation of noise traders in the market, economists feel they can safely ignore them in most discussions and studies on asset price formation. Irrational investors or noise traders are confronted in the market by rational arbitrageurs who trade against them and in the process drive prices back to fundamental values. (The argument that speculation destabilises markets is more or less equivalent to saying that speculators lose money, since speculation can be destabilising only if speculators buy high and sell low.) Therefore, noise trading cannot affect prices very much, and even if they could, they would not be able to sustain their effect for a long period.

De Long *et al.* (1990:24) examine the arguments set out above and focus on the "limits of arbitrage dedicated to exploiting noise traders' misperceptions". They recognise that arbitrageurs are likely to have short time horizons and tend to be risk-averse. As a result arbitrageurs' willingness to take positions against noise traders are limited. So, for example, if noise traders are pessimistic about an asset today and have driven down its price, an arbitrageur buying the asset has to recognise that in the foreseeable future noise traders may become even more pessimistic and drive the price down even further. In these circumstances, if the arbitrageur has to liquidate his/her position

before the price recovers, he/she will suffer a loss. Fear of this loss would limit the original arbitrage position.

Similarly, if noise traders are bullish on an asset and an arbitrageur is selling this asset short, the arbitrageur has to remember that noise traders may become even more bullish. The arbitrageur has to factor in the risk of taking a position when the price of the asset may rise further, and when he/she may have to buy back the asset.

Noise trader risk is defined by De Long *et al.* (1990:24) as the risk of a further change of noise traders' opinion away from the mean. Noise trader risk is a risk that any arbitrageur has to bear (with a short time horizon) and will limit their willingness as a group to bet against noise traders. De Long *et al.* (1990:25) comment that from their observations arbitrage does not eliminate the effects of noise, because noise itself creates risk.

Noise traders can earn higher than expected returns by taking more risk that they themselves have created. In addition, noise traders can earn higher than expected returns from their own destabilising influence, and this is neither by bearing fundamental risk nor by performing a useful social function.

A further development is the implications of De Long *et al.*'s (1990:25) model on asset price behaviour. As a result of the fact that noise trader risk limits the effectiveness of arbitrage, prices can become excessively volatile. The model also shows that assets subjected to noise trader risk can be underpriced, relative to fundamental values. Finally, their model has several implications for the optimal investment strategy of sophisticated investors and for the possible role of long-term investors in stabilising asset prices.

Noise traders incorrectly believe that they have special information about the future price of a risky asset – noise traders' select their portfolios based upon these beliefs. In response to noise trader's actions, sophisticated traders (or arbitrageurs) buy when noise traders depress prices and sell when noise traders push prices up. The result of all of this is that prices are pushed towards a fundamental value, but not all the way.

De Long *et al.* (1990:31) show that sophisticated investors will not hold a risky asset unless they are compensated for bearing the risk that noise traders will become bearish and drive the price of the asset down. Both sophisticated investors and noise

traders believe that the asset is mispriced, but because of the misperceptions of noise traders in a future time, neither group is prepared to rely too much on this mispricing. Noise traders “create their own space” due to the uncertainty over what the noise traders in a future time will believe, resulting in a riskless asset becoming risky, driving its return up and its price down. Both noise traders and sophisticated investors hold portfolios that have the same amount of fundamental risk – zero. One might argue that investors in a risky asset should receive higher than expected returns, because they perform a valuable social function. This view, however, ignores the fact that noise trader speculation is the only source of risk. For the economy as a whole, there is no risk.

Noise traders can affect prices even though there is no uncertainty surrounding fundamental values. If a noise trader portfolio is invested in assets that are predominantly subject to noise trader risk, it is possible for noise traders to earn a higher average rate of return than sophisticated investors.

Noise traders’ beliefs or misperceptions are stochastic, resulting in them having the worst possible market-timing, according to De Long *et al.* (1990:34). They buy most of a risky asset just when other noise traders are buying it, which is when they are most likely to suffer a capital loss. As the variability of noise traders’ beliefs increases, the price risk increases as well. Sophisticated investors must bear this greater risk if they have to take advantage of noise traders’ misperceptions.

Sophisticated investors tend to wait to reduce the extent to which they bet against noise traders, since they are risk-averse. When noise traders are on average bearish or on average bullish, they do not earn higher than average returns. De Long *et al.*’s (1990:34) model indicates that for different levels of average bullishness, noise traders earn higher than expected returns.

De Long *et al.* (1990:45) argue that if a large number of investors constantly allocate a portion of their wealth to shares, a small number of noise traders can have a large impact on prices. Only a few sophisticated investors would be willing to hold extra shares when noise traders try to sell, and consequently prices have to fall significantly for them to do so. The fewer sophisticated investors there are (relative to noise traders), the larger the impact of noise. Asset prices tend to revert back to mean if prices respond to noise, and if noise trader errors are of a temporary nature.

The model shows that even when sophisticated investors accurately predict the behaviour of noise traders, and when misperceptions are significantly correlated, sophisticated investors will not be willing to bet against noise traders to a large degree. This is as a result of the risk of capital losses, which is balanced by a smaller than expected return, since the next period price is not expected to move all the way back to its fundamental value. There is, however, significant evidence in the financial literature that share prices exhibit mean-reverting behaviour.

De Long *et al.* (1990) indicate that in a world with mean-reverting noise traders' misperceptions, the optimal investment strategy is very different from the buy and hold strategy of the standard investment model. The optimal strategy for sophisticated investors involves market-timing with increased exposure to shares that have fallen and decreased exposure to shares after they have risen in price. The strategy of betting against noise traders is a contrarian investment strategy. The evidence on the mean-reverting behaviour of stock returns indicates that over a long time horizon, such a contrarian strategy can be feasible. An alternative investment strategy would be to investigate and predict future noise trader demand shifts and to trade in anticipation of these shifts. The information to be considered in this regard includes trading volumes, price patterns, buy/sell ratios, etc. For sophisticated traders with a short time horizon, this alternative strategy would be optimal. De Long *et al.* (1990:55) use the example of an entrepreneur who builds casinos to exploit gamblers compared to the rational investor who spends vast amounts of money to exploit noise traders.

For noise traders to earn higher expected returns than sophisticated investors, De Long *et al.*'s (1990:50) model shows that the average price of an asset must be below its fundamental value. This is due to the fact that the dividends on the asset held by a noise trader (an unsafe asset) produce a higher rate of return on average than the same dividend on a safe asset. By implication, the price of the unsafe asset must be below its fundamental value.

2.4 The closed-end fund puzzle

A closed-end fund, like the more popular open-ended fund or unit trust, is an entity that typically holds other listed companies' shares. Unlike an open-ended fund, a closed-end fund issues a fixed number of shares that are traded on the stock exchange. To sell a holding in a closed-end fund, investors have to sell their shares to other

investors, rather than redeem them with the fund itself for the net asset value (as they would do for an open-ended fund like a unit trust).

The efficient market hypothesis states that assets should sell for their fundamental value. In most cases, fundamental values are difficult to measure and are different for each investor. The fundamental value of a closed-end fund is more easily determined:

- the fund pays dividends equal to the sum of the dividends paid by shares in its portfolio; and
- the fund's value should be the sum of the market value of the shares of its underlying portfolio.

Lee, Shleifer and Thaler (1991:59) state that the closed-end fund puzzle is the empirical finding that closed-end fund shares typically sell at values that are not equal to the value of the underlying investments. In recent years, discounts of between 10 and 20 per cent of net asset value have been the norm in the United States.

De Long *et al.* (1990:47) indicate that explanations in this regard are not completely satisfying. They offer two historical explanations:

- the agency cost of fund management; and
- the miscalculation of the net asset value as a result of a failure to deduct the fund's capital gains tax liability.

Lee *et al.* (1991:59) concur with the explanations above and add a third one, namely the illiquidity of certain closed-end funds' holdings. However, they point out that, even collectively, these factors fail to account for much of the existing evidence.

Lee *et al.* (1991:60) explain four important pieces to the puzzle covering the life cycle of the fund:

- Closed-end funds start with a premium of nearly ten per cent at the inception of the fund. Why investors would pay a premium when existing funds are selling at a discount is the first part of the puzzle.
- When the closed-end fund is listed, it starts off at a premium, but within 120 days, it trades at a discount of approximately 10 per cent.
- Discounts on closed-end funds are subject to large fluctuations in the levels of discount to net asset value.

- When closed-end funds are terminated, either by the liquidation of the fund or making it an open-ended fund, share prices increase and discounts become smaller.

According to Lee *et al.* (1991:62), the standard historical explanations for the discount mentioned above are not satisfactory for the following reasons:

- Neither the current nor the future agency costs can account for the large fluctuations in the discount levels. Also, the agency cost theory cannot explain why rational investors initially buy into the fund at a premium, since they should expect to sell their share at a discount.
- Unlisted investments are generally illiquid and can overstate the net asset value of the fund. This statement is rejected by Lee *et al.* (1991:63), as they indicate that some of the largest funds in the United States only have listed securities in their portfolios.
- The illiquidity argument is also used to explain that, for a thinly traded share, the market price will not be a realised or obtained if a large block of these shares is sold. However, there is some evidence to suggest that large abnormal returns are realised when closed-end funds are changed to open-ended funds.
- The same holds true for the capital gains tax liability, which is supposedly not reflected in the net asset value of the fund. On open-ending, closed-end fund prices move up to the underlying net asset value, rather than the net asset values' decreasing to the funds' share price.

Lee *et al.* (1991:65) state that the standard explanations have only been marginally successful in explaining the existence of discounts (the second part of the puzzle).

There is a vast amount of evidence that closed-end funds are owned primarily by individual investors. This evidence has led Lee *et al.* (1991:68) to conclude that the sentiments that affect closed-end funds should also affect other securities that are predominantly traded by individuals, like certain "small cap" shares.

The obvious question asked by Lee *et al.* (1991:68) is why a rational arbitrageur cannot buy the fund selling at a discount and sell the underlying portfolio short. This strategy appears to make logical sense. However, there are several problems with this strategy. Firstly, if the fund changes its portfolio, the short seller has to take cognisance of this and change his/her portfolio. This may be difficult to achieve in the short-term. Secondly, investors do not get the full proceeds of a short sale. Thirdly, the hedge is not a pure arbitrage opportunity unless arbitrageurs have an infinite time

horizon or never have to liquidate their positions. If an arbitrageur has to liquidate his/her position, the discount might have widened since the time the arbitrage trade was put in place and this will result in a loss. Arbitrageurs would not have to liquidate their positions if they received the full proceeds on a short sale, but this is never the case. Therefore arbitrageurs have to accept noise trader risk, resulting in additional risk if the discount increases. Arbitrageurs can, as a consequence, only take limited positions.

An alternative to the buy and hold arbitrage described above by Lee *et al.* (1991:69) is to take over the closed-end fund followed by the sale of its underlying portfolio to realise the net asset value. However, shareholders of the closed-end fund will not tender their shares to the bidder unless they receive full net asset value. Making a bid is a costly process and any bidder who pays the full net asset value cannot profit from this transaction, and therefore no such bids will take place.

According to Lee *et al.* (1991:69), investor sentiment theory states that holding the fund is riskier than holding its portfolio directly. Because the risk is systematic, the required rate of return held on fund shares must, on average, be higher than the required rate of return of the underlying investments purchased directly. As a result, the fund must, on average, sell at a discount to its net asset value to encourage investors to hold the fund's shares. To be able to explain why anyone will buy a fund at inception when the expected return over the next few months is negative, it is necessary to introduce some type of irrational investor or noise traders. In their theory, there is no real economic reason for the existence of closed-end funds. Closed-end funds are a device by which entrepreneurs take advantage of less sophisticated investors, as casinos exploit gamblers.

The investor sentiment theory of Lee *et al.* (1991) as set out above implies that discounts on closed-end funds fluctuate with changes in investor sentiments regarding future returns. Their theory requires discounts to fluctuate – if discounts were constant, then the arbitrage trade of buying the fund and selling short its portfolio would be riskless (even for short horizon investors) and therefore the discount will disappear. Their theory also explains why the fund's share price increases with the announcement of open-ending, and why discounts are reduced and eliminated on actual open-ending. When it is known or there is a reasonable expectation of open-ending, noise trader risk is eliminated (or reduced), and so is the discount. The investor sentiment theory thus

predicts that after the announcement of open-ending of a fund, the discount to net asset value at which the fund is trading, is largely eliminated over a period of time.

Lee *et al.* (1991:93) interpret the discount on closed-end funds as an individual investor sentiment index. Their research has shown that there is a strong correlation between the discount on closed-end funds and the fluctuations of small cap stocks. In periods when discounts have narrowed, the share prices of small caps have increased.

According to Lee *et al.* (1991:101), changing investor sentiment makes closed-end funds more risky than their individual portfolios they hold, and as a result causes underpricing of funds, relative to fundamentals. Since the same investor sentiment affects smaller stocks and so makes them more risky, smaller stocks must also be underpriced relative to their fundamentals.

De Long *et al.* (1990:48) also discuss the discounts on closed-end funds. They indicate that the concept of noise trader risk can explain the reason for the discount as well as the fluctuating levels of discounts. Noise trader misperception about the return on a closed-end fund becomes a source of risk for any short horizon arbitrageur who is trying to arbitrage the fund and its underlying portfolio. This observation is consistent with the observations made by Lee *et al.* (1991:68).

The model of De Long *et al.* (1990:49) explains the discounts on closed-end funds and assists with a number of predictions:

- Closed-end funds get started when noise traders are unusually optimistic about the returns on them. Although they do not test their argument, De Long *et al.* (1990) suggest that new closed-end funds are formed in times when existing closed-end funds are trading at a premium or a small discount. They have investigated the timing of the launch of new closed-end funds. Their results lend some support to the notion that new funds get started when discounts on existing funds are lower.
- The fluctuations in noise trader opinion on the expected return of a closed-end fund also explain why discounts fluctuate.

2.5 Summary

Rational traders make decisions based on information and facts. Noise traders, on the other hand, make decisions based upon anything else. Noise traders are important, as

their trading results in much-needed liquidity for individual shares. Without liquidity, the financial markets cannot function properly. The price of a share reflects both noise and information. However, the mere participation of information traders in the market does not in itself result in prices' being efficient. Noise creates the opportunity to trade profitably, but at the same time, it is difficult to ensure profits from trading activities. In addition, noise causes changes in the rate of inflation which affect the economy as a whole.

The price efficiency and the CAPM paradigms are constantly challenged because they do not incorporate the actions of noise traders. Arbitrage cannot eliminate the effects of noise, because noise itself creates risk. As a result of the fact that noise trader risk limits the effectiveness of arbitrage, prices can be excessively volatile. Assets that are subject to noise trader risk can be underpriced relative to fundamental values. The model proposed by De Long *et al.* (1990:25) has several implications for the optimal investment strategy of sophisticated investors and for the potential role of long-term investors in stabilising asset prices.

The fewer sophisticated investors there are, relative to noise traders, the larger the impact of noise. In a world with mean-reverting noise traders' misperceptions, the optimal investment strategy is very different from the buy and hold strategy of the standard investment model. The optimal strategy for sophisticated investors is a strategy that involves market-timing with increased exposure to shares that have fallen, and decreased exposure to shares after they have risen in price. The strategy of betting against noise traders is a contrarian investment strategy.

There is no real economic reason for the existence of closed-end funds. Closed-end funds are a device by which entrepreneurs take advantage of less sophisticated investors. The discount on closed-end funds is an indicator or index of individual investor sentiment.

CHAPTER 3

VOLATILITY

3.1 Introduction

In this chapter, volatility and excess volatility are defined. The importance of psychological factors that affect the prices of speculative investments is highlighted. The impact on share prices of changes in dividends is examined and the conclusion is drawn that, over time, movements in share prices are attributed to changes in dividends. The reaction of share prices to announcements that affect regulatory policy, corporate control and macroeconomic data is considered, as well as the underlying fundamental values of shares. An alternative hypothesis to the efficient market hypothesis, which is influenced by social psychology in financial markets, is examined later on in this chapter.

3.2 Definition of volatility and excess volatility

Volatility is the measure of price fluctuations over time. One often hears that markets are quite volatile, meaning that prices fluctuate more than expected. Volatility is one of the factors that cause prices to fluctuate from day to day. The question that has to be answered is what causes volatility. This is where psychological factors come into play and where perception plays an important role. Prices are not always a reflection of all available market information. Other psychological factors may also influence prices.

In option price theory, volatility is one of the variables that give rise to the time value of an option. The intrinsic value of an option is a function of the spot price and the strike price. The time value and the intrinsic value combined are equal to the value of an option. It is clear that option price theory considers volatility to be one of the variables that has an impact on the pricing of options. Therefore, I would argue that prices (for example, the prices of equities or bonds) could not be based only on economic fundamentals.

According to Shiller (1989:2), excess volatility is a variability in price movements that is too large to be justified in terms of the efficient market model. Another way of putting it is that excess volatility means that if price movements were adjusted downwards, so as

to be less variable, then the price would have been a better predictor of fundamental value. Shiller (1989:4) indicates that popular models are being studied to help us to interpret the apparent excess volatility in speculative markets.

3.3 The impact of changes in dividends on share prices

Shiller (1989:105) refers to a simple model that is commonly used to interpret movements in share prices. It is based on the notion that share prices are determined as the present value of rationally expected or optimally forecasted future dividends, discounted by a constant real discount rate. This valuation model is often used by economists and market analysts to describe the behaviour of share prices. It is regarded as a plausible explanation if someone asks what accounts for the sudden movement in share prices. New information about future dividends is then offered as a reason for the sudden movement in share prices. Shiller refers to this model as the "efficient market model".

Shiller (1989) indicates that it is often claimed that share price indices are too "volatile", meaning that movement in share price indices cannot realistically be attributed to any objective new information, since the movements in share indices seem too large, relative to the subsequent event or actual dividend.

Shiller (1989:106) compared the real Standard and Poor's Composite Stock Price Index to the present discounted value of actual real subsequent dividends from 1870 to 1979 in a graph. What is interesting from the graph is the smoothness and stability of the ex-post rational price or p^* (present discounted value of actual real subsequent dividends), compared to the huge fluctuations in the Standard and Poor's Composite Price Index or p . Real dividends varied over the sample period. However, they did not vary for long enough to cause large movements in p^* . Shiller (1989:107) observes that the efficient market theory does not say that p should be equal to p^* . Also, the stock market decline on Wall Street from 1929 to 1932 cannot be rationalised in terms of subsequent dividends. The question that one has to ask is whether this stock market crash was a rational mistake, or a forecast error made by rational people. According to him, the answer to these questions is no, as a result of the volatility of p (S&P Index).

According to Shiller (1989:26), aggregate real dividends are fairly highly correlated with real share prices. He has shown that the correlation between the Standard and Poor's

composite index and the corresponding annual real dividend series between 1926 and 1983 is 0.91. The correlation coefficient between the real stock price index and a linear time trend over the same sample is 0.60. Shiller (1989:26) indicates that the price of the aggregate share market is therefore significantly linked to dividends and that the movement in share prices is the result of changes in dividends.

Shiller (1989:27) states that if the efficient market model is true, the price-dividend ratio should be low when real dividends are high and vice versa (i.e. the price-dividend ratio is high when real dividends are low). Therefore, short-run movements in the real dividend would correspond to short-run movements in the opposite direction of the price-dividend ratio. This behaviour of the price-dividend ratio is the result of an overreaction of share prices to dividends if the dividend payout ratio is maintained over time. He concludes that the behaviour of share prices may be consistent with certain psychological models.

The standard deviation of the change in price is the highest when information about dividends is released evenly. Occasionally, information may be communicated to the market in "big lumps" and as a consequence the price series may have fatter tails, but a lower variance, according to Shiller (1989:108).

A great deal of literature on efficient markets is concerned with the study of "nominal profit" opportunities. Shiller (1989) indicates that if real share prices are too volatile, then there may well be a real profit opportunity. This is a consequence of the fact that the expected real returns for equities markets are constant over time.

Shiller (1989:117) observes that earnings may be relevant to the pricing of shares, but only in so far as they are an indication of future dividends. Earnings are no different to any other indicator of future dividends. The only time when earnings can be used as an indicator of the present value of a share price is, when companies do not declare any dividends. The most important factors that determine the present value of share prices, according to the efficient market model, are

- the terminal price; and
- intervening dividends.

Shiller (1989:124) has shown that share price volatility is between five and 13 times too high to be attributed to new information about future real dividends. As a result, he concludes that the failure of the efficient market model is so dramatic that it is

impossible to attribute the failure to data errors, price index problems or changes in tax laws.

Movements in share prices may be attributed to changes in expected real interest rates. However, Shiller (1989) has shown that the movements in expected real interest rates that would justify the variability in share prices have to be very large – in fact much larger than the movement in nominal interest rates over the time period explained in his paper.

The uncertainty surrounding future dividends (which is indicated by the sample standard deviation of the movements of real dividends around their long run exponential growth path) understates the true uncertainty about future dividends. Shiller (1989:125) indicates that the markets in the period under review may very well have been fearful of much larger movements than have actually occurred. This is not the case, as after almost a century of observations, nothing has happened that could remotely justify the share price movements.

3.4 What news affects share prices?

The standard approach in the financial literature holds that fluctuations in asset prices are attributable to changes in fundamental values, according to Cutler, Poterba and Summers (1989:133). There is abundant evidence that stock prices react to announcements on regulatory policy, corporate control and macro-economic conditions that affect fundamental value. However, the claim that only information affects asset prices is much more difficult to prove. There was an absence of fundamental economic news at the time of the 1987 stock crash on Wall Street, which is particularly difficult to reconcile with the standard view. According to Cutler *et al.* (1989), several recent studies have challenged the view that stock price movements are wholly attributable to new information or the arrival of news. The purpose of their paper is to estimate the fraction of the variation in aggregate share price returns that can be attributed to various kinds of economic news.

To determine the importance of unexpected macro-economic developments, Cutler *et al.* (1989:134) analysed monthly-expected stock returns for the 1926-1985 period, as well as annual returns for the period from 1871 to 1986. The conclusions reached by them are as follows:

- Macro-economic news only explain approximately one-fifth of the movement in share prices
- Most of the macro-economic variables affect returns with their predicted signs and statistically significant coefficients. For the sample period an unexpected one per cent increase in real dividends only resulted in a one-tenth of a per cent increase in share prices, while a one per cent increase in production output resulted in a four-tenths of a per cent increase in share prices.
- Both inflation and market volatility have negative and statistically significant effects on market returns. An unanticipated doubling of volatility would lower prices by 2.5 per cent or a one per cent rise in volatility would lower share prices by 0.025 per cent.

In addition, Cutler *et al.* (1989) indicate that the results for both periods mentioned above are very similar.

Cutler *et al.* (1989:142) suggest that political developments that affect future policy expectations, and international events such as wars, affect the risk premiums. They should then also be important in asset pricing. Cutler *et al.* (1989) proceeded to analyse stock market reactions to non-economic events. The events that were included in the analysis were those that the *New York Times* carried as a lead story and that the Business Section reported as having had an impact on share prices. Some 49 events were identified. These included certain events with substantial movements in the aggregate market:

- President Eisenhower's heart attack in 1955 caused a 6.62 per cent decline in the share market.
- After the Japanese attacked Pearl Harbour, the market declined by 4.37 per cent.
- When President Kennedy was assassinated, share values dropped by nearly three per cent. The orderly presidential transition resulted in a nearly four per cent increase in the equity market.

The average absolute market movement was 1.46 per cent based on the events that they analysed, as opposed to 0.56 per cent over the entire 1941-1987 period. These findings suggest a surprisingly small impact by non-financial news.

The 50 largest one-day movements were analysed as an alternative strategy for identifying the importance of news. According to Cutler *et al.* (1989:143), it is difficult to link market movements to the release of economic or other information. On several days, the *New York Times* reported that there was no specific reason for the changes that were analysed. On other days, the changes clearly marked important information

releases, such as the 1948-election outcome, President Eisenhower's heart attack and the assassination of President Kennedy. On days with the most sizeable movements, the information that the press cites as the cause of the market movements was not particularly important.

Cutler *et al.* (1989:143) conclude that their results suggest difficulty in explaining as much as half the variance in aggregate shares prices on the basis of new information that affects fundamental values. The view that movements in share prices reflect something other than news about fundamental values is consistent with evidence on the correlation of *ex post* returns, according to Cutler *et al.* (1989:148). For example, if prices were periodically driven away from fundamental values by something other than news or new information, but ultimately returned to fundamental values, one would expect a tendency for returns to be low when markets are high (relative to some indicator of fundamental value) and high when the market is low (relative to fundamental value). These patterns emerge from studies of *ex post* returns that use historic levels of earnings, prices and dividends as indicators of fundamental values. Volatility may reflect changes that take place in the average re-rating, given sets of information regarding fundamental value, as investors re-examine existing data or present new arguments.

The possibility that many investors do not determine their own estimates of fundamental value is evidenced by the 1987 crash. Despite Wall Street's dramatic drop, the vast majority of shares were not traded. According to Cutler *et al.* (1989:149), this can only be explained if investors rely on market price as an indication of value, or if they receive information that consequently resulted in a downward revision of their fundamental value. However, it would be difficult to identify what information would support the second explanation.

3.5 Does the equity market reflect underlying fundamental values?

According to Summers (1986:153), the proposition that stock markets are efficient forms the basis for most of the research in financial economics. Apparent anomalies, such as the closed-end fund puzzle, are treated as indications of the failure of models predicting equilibrium returns, rather as evidence against the efficient market hypothesis. Research in this field has typically assumed that asset prices are in some sense rationally related to economic realities. A number of authors, including

Modigliani, Cohn, Summers, Shiller, Tversky and Kahneman, have suggested that certain asset prices are not rationally related to economic realities. However, these claims are frequently dismissed as they imply the presence of exploitable excess profit opportunities.

Summers (1986:154) argues that existing evidence does not suggest that financial markets are efficient in the sense that they rationally reflect fundamental values. The same considerations that make deviations from efficiency difficult to isolate statistically make it unlikely that inefficiencies will be arbitrated away or eliminated by speculative trading.

According to Summers (1986:156), the body of evidence supporting the efficient market hypothesis is based on two different conclusions. The first is the fact that failures to reject the hypothesis have been taken as evidence that portfolio managers cannot outperform the market to a great extent (by trading using publicly available information). Secondly, evidence of market efficiency is often viewed as an indication that market prices reflect the rational assessment of fundamental values. A failure to reject a hypothesis is not evidence enough to support the validity of the hypothesis.

Summers (1986) states that numerous studies have demonstrated that share prices respond almost immediately to new information, and that no excess returns can be earned after the news has been released.

According to Summers (1986:161), one of the factors supporting the efficient market hypothesis is the finding that professional portfolio managers cannot consistently outperform the market. Convincing evidence that individuals can outperform the market on an ongoing basis has yet to be presented. His model suggest that even if some individuals can outperform the market and have the ability to identify periods of market over- or undervaluations, they would not be able to prove it during the relatively short time horizons over which performance valuations are normally undertaken.

Summers (1986:162) states that the weakness of the empirical evidence verifying the hypothesis that securities markets are efficient in assessing fundamental values would not have been problematic if (a) the hypothesis was based upon firm theoretical foundations and (b) if there were no contrary empirical evidence. Unfortunately, neither *of these conditions is satisfied in practice.*

Summers (1986:162) indicates that the standard argument for market efficiency is that unless stocks are priced rationally or efficiently, there will be opportunities to earn excess returns. Speculators take advantage of these opportunities by arbitraging away inefficiencies. However, this argument does not explain how speculators become aware of these arbitrage opportunities. Summers (1986) also points out that risk-averse speculators are only willing to take limited positions when they perceive that there may be valuation errors. As a result, errors are not eliminated unless they are widely noticed.

Even when valuation errors are detectable, they are not completely eliminated. For example, when stock market index futures are held to maturity, they yield a return that is perfectly matched with the return from the market portfolio. Yet these futures have frequently been priced so that the return from holding them exceeds the return from holding the underlying market portfolio by several basis points.

Summers (1986:163) points out that both theoretical and empirical considerations suggest that market valuations often differ significantly from fundamental values. He argues that it is unlikely that market forces eliminate irrational traders. To the extent that risk is rewarded, irrational investors who invest in certain securities may even come to dominate the market. There are many traders that pursue strategies that are not closely related to fundamental values. However, these traders are not necessarily eliminated. Nor can it be assumed that they cannot move market prices.

The difficulty economists have in explaining the large variation in speculative prices on the basis of new information about fundamental values also suggests that valuation errors are continuously made. Summers (1986) cautions against treating stock prices or their changes as rational reflections of fundamental values. He points out that this observation is important for both corporate finance policy and for event study research. It is even more important for macroeconomic theories that presume that asset prices can be used to reflect the present value of the returns that the asset generates over time.

Summers (1986:164) concludes that a more holistic approach should be adopted for evaluating the behaviour of speculative prices. It may be possible to model the process by which errors are incorporated into asset prices – numerous studies on individual choice under uncertainty may provide guidance here. Such a process is

preferable to relying on market valuations, as the evidence suggests that these valuations are not always rational.

Shiller (1989:49) states that “for hundreds of years it has been commonly accepted that prices in speculative markets are influenced by capricious changes in investor sentiments, changing fashions, fads or bubbles.” In contrast with this statement, there is the hypothesis of market efficiency. Academics in Economics and Finance have indicated that they support the hypothesis. Shiller (1989) argues that the concept of market efficiency is not correct, and that, in fact, there is evidence which suggests that fashions, fads and bubbles do influence the price of speculative assets. According to him, people are sometimes overly optimistic regarding certain speculative assets and, as a consequence, they do not exercise prudent judgement.

If fashions or fads influence the price of a speculative asset, then there should be profit opportunities for information traders or arbitrageurs. Arbitrageurs see these opportunities and eliminate all the profit opportunities through arbitrage trades. On the other hand, fashions or fads may not create significant profit opportunities if the future direction of the fashion or fad is not known and as a consequence there are only limited profit opportunities for arbitrageurs.

Shiller (1989:52) indicates that there is a large amount of statistical literature that deals with market efficiency. He identifies several problems with the research:

- There is no consensus on how to define investment value or true economic value.
- There are no definitions of abnormal return resulting from prices deviating from fundamental values.
- The null hypothesis of market efficiency is not well defined.
- There is no specific indication in the literature that fashions or fads were considered.
- The alternative hypothesis is also not well defined.

According to Shiller (1986:55), various studies have been conducted that indicate that, on aggregate, real-stock price indices have changed much more than the present value of real dividends for the same time series. If the data had shown that the movement in real aggregate stock prices was due to predicting fundamentals, there would have been evidence for the efficient market hypothesis.

Shiller (1989:56) states that

a fad is a bubble if the contagion of the fad occurs through price; people are attracted by observed price increases. Observing past price increases means observing other people becoming wealthy who invested heavily in the asset, and this observation might interest or excite other potential investors. In the simplest bubble model, price increases themselves thus cause greater subsequent price increases until price reaches some barrier; then the bubble bursts and price drops precipitously, since there are then no further price increases to sustain the high demand.

He also indicates that it will be easier to determine whether fashions or fads exist than bubbles, as fashions and fads are more general terms.

Shiller also points out that investing in speculative assets overlaps with certain motives for gambling. In a survey of 2 500 individual investors, it was found that these investors overwhelmingly enjoyed investing and that they looked forward to increasing their activity in this regard. In another survey people who invested in mutual funds (unit trusts in South Africa) indicated that this type of investment reduced their personal satisfaction from making their own investments. As a consequence of people's seeing investment activity as a kind of play, one would expect judgement errors from investors similar to judgement errors made by gamblers. Not investing and therefore not playing may result in some psychological letdown. A clear example of such behaviour may be speculative bubbles. Shiller uses the example where a friend has invested in a share that has increased in value and the investor is drawn to that share. One may come to realise that it is not known whether or not the share price will increase or decline further. However, the "game" may have captured one's attention and involves one's ego so that one is surely tempted to play. If an investor decides to play, then it is likely that his/her friends will be informed that the investment has got good prospects. A front is therefore created to conceal the gambling element of the decision.

3.6 Share prices and social dynamics

Shiller (1989:7) states that investing in speculative assets is a social activity. Investors spend a significant amount of time discussing investments, reading about investments and talking about successes and failures in investing. It is thus not unreasonable to believe that the behaviour of investors may be influenced by social dynamics. Attitudes or fashions seem to fluctuate in many other topics of the day such as food, clothing,

health or politics. These fluctuations appear widely in society and often appear without any logical explanation. It is conceivable that attitudes or fashions regarding investments would also change without any apparent reason or in arbitrary social reaction to some widely noted event. Shiller (1989) points out that most people who buy and sell in speculative markets seem to take it for granted that social movements significantly influence the behaviour of prices.

Shiller uses the example of running that has become very popular as a “fashion”. He states that 20 years ago, boy scouts and watching western movies were the “in” things. Some countries favoured becoming more conservative, but there were others that moved in a different direction towards socialism. He asks whether there is any reason to think that social movement affects investments any less strongly than they do for the other activities described above. There are probably people who would argue that that investing is less likely to be influenced by fashions than other activities, because investment decisions are taken in private and investors are not concerned about what other people will think. He points out those perceptions of return themselves represent changing fashions.

According to Shiller (1989:8), it is hard to find in literature on the efficient market hypothesis any discussion of any alternative hypotheses that are influenced by social psychology in financial markets. He highlights the notion that it is nearly impossible to forecast returns on speculative assets. This fact is the most important argument against the role of psychology in speculative markets. As the real returns are nearly unforecastable, the real price of a stock should be close to its intrinsic or fundamental value, that is, the present value with a constant discount rate of optimally forecasted future real dividends. Shiller (1989) points out that this argument for the efficient market hypothesis represents one of the most remarkable errors in the history of economic thought. He also indicates that mass psychology may well be the dominant force in movements in the price of the aggregate stock market.

Shiller indicates that it is important to clarify the identity of investors in listed companies. He said that it is widely but mistakenly believed that

- institutional investors hold most of the shares;
- most wealthy investors delegate authority to manage their investments; and
- smart money investors dominate the market.

These misconceptions strengthen the argument that markets are efficient, but he indicates that individuals held nearly 65 per cent of all shares listed on the New York

Stock Exchange in 1980. Studies have shown that only about ten per cent of individuals delegated some or all authority for the management of their investments. Only two per cent of the high-income group indicated that they have delegated all authority for the management of their investments (full discretionary mandates). About 75 per cent of high-income respondents who managed their own investments indicated that they got advice from other people. According to Shiller, the important factor is not the extent to which institutional investors and wealthy individuals dominate the market, but rather the extent to which smart money investors dominate the market. He makes the point that smart money investors represented by individuals will eventually die. Their heirs will in all likelihood not be smart money investors.

According to Shiller (1989:12), normal investors have no model to predict the behaviour of prices, earnings and dividends of speculative assets. He poses a series of questions, namely:

- Does an expectation of a large deficit in the federal budget imply that the price of long-term bonds will increase or decrease?
- Does the election of a liberal president imply that the earning per share of General Motors will increase or decrease?
- Does a rise in the price of fuel cause the share price of IBM to increase or decrease?

He concludes that normal investors do not have an objective way of knowing the answers.

Another important factor is the impact of group pressure on individuals, according to Shiller (1989:14). There is some evidence that individuals make decision errors under social pressure. This could possibly explain swings in public opinion. Investor opinions regarding speculative assets may very well be derived from social influences.

Shiller (1989:41) indicates that a great deal of evidence has been presented that suggests that social movements and fashions are likely to be a dominant source of speculative asset price movements. He studied the United States stock market history after the Second World War and suggests that there is evidence that various social movements were under way during this period that may have had a large impact on the demand for shares.

Shiller (1989:41) presents two reasons for why the random-walk theory of share prices is still applicable.

- The aggregate demand of individual investors may itself be a random walk.
- Fashions are difficult to predict and, as a result, ordinary shareholders overreact to news on earnings and dividends.

There is a limited amount of smart money in the economy and this results in returns' becoming nearly impossible to predict. Moreover, the smart money may not be able to prevent ordinary investors from causing major fluctuations in the market and being the source of volatility in the market.

3.7 Summary

The price of the aggregate share market is linked to dividends and thus movements in share prices are the result of changes in dividends. Over time, non-financial significant news events do not affect equity markets to a large extent.

The stock market decline on Wall Street from 1929 to 1932 cannot be rationalised in terms of subsequent dividends. One should caution against treating share prices or their changes as rational reflections of fundamental values.

As real returns are nearly unforecastable, the real price of a share should be close to its intrinsic or fundamental value, that is, the present value with a constant discount rate of optimally forecasted future real dividends. This argument for the efficient market hypothesis represents one of the most remarkable errors in the history of economic thought.

Where real share prices are too volatile, there may well be profit opportunities.

CHAPTER 4

OVERREACTION AND ABNORMAL PERFORMANCE

4.1 Introduction

The purpose of this chapter is to analyse whether equity markets overreact. In order to study this issue De Bondt and Thaler (1985) examined the prices of shares that were listed on the NYSE from 1926 to 1982. Secondly, the impact of profit announcements on share prices was considered. To test whether profit announcements affect share prices, different portfolios were constructed and analysed for pre-and post earnings announcements price movements by Bernard (1993).

4.2 Do equity markets overreact?

De Bondt and Thaler (1985:249) indicate that the term “overreaction”, by definition, has to refer to a reaction that is considered to be inappropriate. They ask: “What is an appropriate reaction?” Studies have shown that investors put more emphasis on recent information and less emphasis on prior data. The goal of their study was to test whether the overreaction hypothesis was predictive. Two hypotheses are tested:

- Subsequent movements in the opposite direction will follow significant movements in share prices.
- The more severe the initial price movement, the greater the correction or subsequent adjustment will be.

Their study focuses on shares that have either experienced very significant capital gains or extreme losses over periods up to five years. Winner and loser portfolios were formed over a three year period in this study, based on market-adjusted excess returns. The study covered shares listed on the NYSE for the period between January 1926 and December 1982.

The results of the test were consistent with the overreaction hypothesis. For a period of 36 months after portfolio formation, loser portfolios consisting of 35 different shares outperformed the market by an average of 19.6 per cent. On the other hand, the return on winning portfolios was five per cent less than the market, resulting in a difference of 24.6 per cent between the extreme portfolios. The study confirmed previous research,

in that most of the excess returns on the loser portfolios were realised in January. In January, the next January and then the next January, the excess returns were 8.1 per cent, 5.6 per cent and four percent respectively.

One possible explanation for the January effect is tax loss selling. However, De Bondt and Thaler (1985) point out that this explanation is not wholly satisfactory, as it does not explain why share prices increased again in the following January, and in fact up to five Januaries forward. They suggest that a possible explanation may be that investors wait for years before they realise their losses.

The results of the study conducted by De Bondt and Thaler (1985:262) support the hypothesis that high P/E shares are "overvalued" and that low P/E shares are "undervalued". They are quick to point out that P/E ratios are also affected by the January effect described above. In general, most people overreact to dramatic and unexpected new information, which is in conflict with Bayes' rule which prescribes the "correct" reaction to new information.

Odean (1999:1279) tested the hypothesis that investors trade too much. The reason why investors may trade too much is overconfidence. He used a discount brokerage house, as opposed to retail brokerage accounts, because retail brokers experience a conflict of interest in that they may work accounts to earn commissions. He adds that psychological studies have shown that people are generally overconfident about their capabilities. He observes that the more overconfident an investor is, the more that person trades resulting in smaller expected utility. Rational investors do not trade when trading is costly and where the expected returns are lower or marginally higher than the costs. By contrast, overconfident investors have false beliefs about expected returns and, as a result, may engage in costly trading.

The data used by Odean for this study consisted of 10 000 brokerage accounts of a nationwide discount brokerage firm in the United States. These accounts were randomly selected from the active master-file of accounts in 1987. "Active" was defined as having at least one transaction in a year. The study covered the history in the accounts from 1987 to 1993. From the data set it was established that the average commission for a purchase was 2.23 per cent and for a sale 2.76 per cent. Average monthly turnover on these accounts came to 6.5 per cent.

Odean (1999:1282) tested the simple hypothesis that the securities in the data set which was purchased by investors outperformed those that were sold by a sufficient margin to at least cover the costs of trading. If one security is sold and another security was purchased in its place, the average commission for both trades was about five per cent. The average bid-ask spread was found to be 0.094 per cent, based upon the data set, and as a consequence, the average total cost of a buy and sell trade was about 5.9 per cent. Therefore, an investor had to believe that the return on the share that had been purchased would amount to at least six per cent in order to cover the costs of trading.

On analysing the data set, Odean (1999) observed that securities purchased by investors underperformed the ones that were sold. On top of this investors had to pay transaction costs. He found that for his entire sample over a one-year time period, the average return of a share purchased was 3.3 per cent lower than for a share that was sold. Another observation made by Odean (1999) is that, on average, investors purchased or sold shares that had appreciated in value prior to the transaction.

Investors that invest through a discount broking house are more likely to buy shares that have a history of larger price increases over the previous two years than the shares investors sell. Also, they buy the same number of losing shares as winning shares. For both winners and losers, investors sell shares that have risen sharply in the weeks just before the sale. Investors faced with the dilemma of which shares to purchase are more likely to invest in shares that were in the news recently. Investors that use a discount broking house are unlikely to do short sales, as these are very expensive. This is clear from the data set, where this type of transaction constituted less than one per cent of sales.

The decision of which security to sell is not as onerous as the decision which security to purchase, as the investor only has to consider the securities in his/her portfolio. The average number of securities per account, which includes bonds, unit trusts and options, is only 3.6. When making the decision to sell a security, investors are more influenced by past performance as opposed to what the security's likely future performance will be.

Odean (1999:1295) considers the possibility that the return profile of previous winners is the result of investors who buy at the top of the "hype" cycle. In subsequent years, those securities that performed well previously tend to continue to do so. However,

after one year, these trends are reversed to some degree. These reversals are mainly reflected in securities that have high percentages of individual ownership. Individual investors who follow momentum strategies may be part of the last investors to buy securities where momentum traders have pushed the prices beyond the fundamental values. The prices of these securities are likely to decrease when new information becomes available causing the above mentioned investors to be amongst the first to suffer losses when trends are reversed.

Chopra, Lakonishok and Ritter (1992:265) note that the predictability of share returns is one of the most controversial topics in the financial literature. They indicate that the main reason why returns on extreme winners and extreme losers vary so much is a result of changes in leverage. The beta of a share is a function of both risk and leverage. Therefore a trend of negative abnormal returns increases the beta of a share and also increases the expected return for that share. The same logic can be applied to shares which exhibit positive abnormal returns, resulting in a decline in beta. The betas of extreme losers exceed the betas of extreme winners after the formation period of the portfolios by a full 0.79. It is obvious that such large differences in beta can account for substantial differences in realised returns.

Another reason for the variance in returns between extreme losers and winners could be ascribed to the size of the loser companies. Losers tend to be small or medium-sized companies. Various studies have found a relation between size and future returns. Typically, a portfolio of losers is made up with smaller market capitalisation size shares, compared to a portfolio consisting of winners.

The data used in Chopra *et al.*'s (1992:269) study was the Centre for Research in Security Prices' ("CRSP") monthly tape of security prices from 1926 to 1986. Twenty portfolios were formed by ranking companies according to their prior five-year returns. Chopra *et al.* (1992) noted that one of the most interesting results from their study was the inverse relationship between past and subsequent returns. The portfolio of the extreme prior period losers had a post formation period return of 27.3 per cent, while the portfolio of extreme winners only had a 13.3 per cent return, resulting in a difference between the two of 14 per cent. As discussed earlier, the difference in betas between the two extreme portfolios is 0.79, and, based upon an average market risk premium of between 14 per cent and 15 per cent, the CAPM predicts a difference of 11 per cent, leaving some three per cent unaccounted for.

Twenty portfolios were also formed based upon the ranking of betas for 60 months. Post-ranking period betas were then calculated for these different portfolios. Interestingly, the difference in betas between the extreme portfolios was 0.86, compared to the difference in returns of only 7.3 per cent. Extreme winner portfolios underperformed a portfolio with the same beta by 3.4 per cent, while extreme loser portfolios outperformed a portfolio with the same beta by 3.1 per cent. Therefore, the difference in abnormal returns was 6.5 per cent, substantially higher than the 2.5 per cent abnormal return where portfolios were constructed using prior period returns (as opposed to prior period betas).

Prior period monthly returns were also used to construct twenty portfolios. The difference in betas between the extreme portfolios was marginally smaller at 0.71, while the difference in abnormal returns was 0.5 per cent per month or six per cent per year. The difference in returns between the two extreme portfolios amounted to 1.35 per cent per month or a 16.2 per cent annual return.

Chopra *et al.* (1992:276) recognise that winners and losers also differ in respect of the size of a company. They therefore constructed twenty portfolios from the data set defined above, based upon the market capitalisation of companies in order to take into account the impact of size. Based upon this portfolio construction, the difference in excess returns between the extreme portfolios was 6.6 per cent during the five post-ranking years. Excess returns were also computed using size-controlled portfolios. These portfolios were constructed based on the prior returns of the five biggest losing portfolios and the five biggest winning portfolios. The difference in the post-ranking period returns between the extreme loser and extreme winner portfolios was 9.7 per cent. Therefore there was an economically significant overreaction effect, over and above any size effect.

Their study also found that, in terms of seasonality, the overreaction effect was disproportionately concentrated in January, which is consistent with other studies. They found that for size-adjusted returns, in the first post-ranking year, prior five year losers outperformed winners by 11 per cent whilst prior one year losers underperformed prior one year winners by 8.6 per cent. Interestingly, the entire underperformance takes place between February and December (15.2 per cent). Chopra *et al.* (1992) conclude that where winners and losers were chosen on the basis of one-year returns, losers continued to lose the next year and winners continued to win in the next year.

In addition to the above, Chopra *et al.* (1992:284) also present multiple regression evidence that captures size, beta and post-ranking period returns simultaneously. In this analysis, 400 portfolios were used, formed on the basis of prior returns and the size of the company. Extreme losers on average outperformed extreme winners by 4.8 per cent per year for the five post-ranking years. They also noted that the quantum of the overreaction effect is very similar to the size effect. Another conclusion drawn by Chopra *et al.* (1992) is that the overreaction effect is strongest amongst smaller companies. They found that the overreaction effect for smaller companies was approximately ten per cent per year (50 per cent for five years before compounding) and that no overreaction effect was observable for the 20 per cent of largest companies listed on the NYSE. As a rule, institutional investors are generally holders of large capitalisation shares, whilst individuals normally invest in small companies. Thus the results confirm the hypothesis that individuals overreact and institutions do not.

Finally, Chopra *et al.* (1992) pose the question why the return anomalies discussed above are not eliminated by arbitrageurs. Are these anomalies purely a compensation for taking risk? The answer may lie in the fact that information or smart money traders may be exposed to opportunity costs. Furthermore, there is no certainty that a mispricing will be corrected in a timely manner. As a consequence of this, investors tend to look at short-horizon arbitrage opportunities as opposed to long-term arbitrage strategies.

In addition, Shefrin and Statman (1994:343) have shown that the expected abnormal return of an equity-based security is a function of

- an increase in its mean-efficient variance beta; and
- a decrease in its market beta.

They point out that securities that have high abnormal returns should also have high betas. Their theory, however, indicates that not all high beta securities have high abnormal returns.

4.3 The impact of profit announcements on equity prices

Bernard (1993:305) states that it is a well-documented fact that there is unusual share price activity pertaining to earnings announcements. According to Bernard, no company-specific information is more scrutinised and analysed than accounting

earnings. He presents evidence that the initial response to earnings announcements is an underreaction. On the other hand, extreme share price movements may indicate overreactions to earnings announcements. Several studies have focused on “post earnings drift” where cumulative abnormal returns drift upwards after an increase in earnings has been announced and drift downwards after a decrease in earnings. A reason why post earnings drift arises may be that share prices do not reflect fully what current earnings imply in respect of earnings for forthcoming quarters. A consequence of this is that when subsequent earnings are announced, the market is taken by surprise with regard to changes in earnings that really should have been expected in advance.

Companies were allocated to one of ten portfolios on the basis of their standardised unexpected earnings (“SUE”) by Bernard (1993:306). Over a period of 60 trading days’ post-earnings announcements, companies who reported good news earnings experienced an abnormal return of two per cent, while companies which announced bad news earnings experienced negative abnormal returns of about two per cent as well. The difference between the two (SUE 1 portfolio and SUE 10 portfolio) generated a 60-day abnormal return of some 4.2 per cent or about 18 per cent on an annual basis.

Another observation made by Bernard (1993:308) is that the post-earnings drift is bigger for small companies than for large companies. Also, the drift continues well beyond the 60 trading day interval used above to calculate abnormal returns. For 180 days, the abnormal returns between the extreme portfolios amounted to ten per cent for small companies and 4.5 per cent for large companies. The evidence presented suggests market inefficiencies in respect of earnings announcements. This inefficiency may be caused by a failure to fully appreciate risk, where as good news companies may be riskier and bad news companies may be less risky than the benchmark portfolio that they are compared with.

Estimated abnormal returns in a zero investment portfolio (consisting of long positions in good news shares and short positions in bad news shares) were consistently positive over a 13-year period from 1974 to 1986. Therefore, a SUE strategy is risky only if

- the risk contained in a SUE strategy gives rise to unlikely but severe or catastrophic losses; or

- the infrequency of losses in the 13-year period covered by the study is different to the norm.

Therefore, there should be no problem for a trader to implement a SUE strategy and to generate abnormal returns, at least before costs and short trading restrictions are taken into account. The costs of purchasing and selling or round tripping amounts to some 1.2 per cent for individuals, while it is estimated to be around 0.75 per cent for institutional investors. These costs are much lower than the abnormal returns of ten per cent for small companies and 4.5 per cent for large companies mentioned above.

Bernard (1993:315) notes that share prices appear to incorporate a “naïve” earnings expectation, where this expectation is simply based on the earnings from the corresponding quarter in the previous year. He investigated the likelihood that prices can be attributed to these naïve expectations and that, as a result, the behaviour of prices to future earnings are forecastable, in a similar way that the forecastable errors of a naïve expectation model are predictable. The following trading strategies can be considered:

- Hold positions in a zero investment portfolio for three quarters and then revers this position in the fourth quarter. The abnormal returns are about 11.5 per cent, ten per cent and five per cent respectively for small, medium and large companies.
- Take positions 15 days prior to earnings announcements. Long (short) positions are taken in shares that have a high (low) SUE for the last three quarters or a significantly low (high) SUE for the corresponding quarter in the previous year. The abnormal return amounts to approximately 4.2 per cent for a holding period of 15 days.

Bernard (1993:324) also considers overreaction to earnings announcements. He cites that previous studies have shown that prior extreme loser portfolios outperform prior extreme winner portfolios. This could have been caused by the fact that the prior share prices represented a deviation from the fundamental values of the shares. Loser portfolios outperformed winner portfolios by 37 per cent. Initially, loser portfolios suffered decreased earnings during the formation period, however, earnings increased in subsequent periods. For winners who experienced increased earnings during the formation period, earnings decreased in subsequent periods. This evidence suggests that share prices do not reflect earnings that follow a random walk. Bernard (1993) points out that if overreaction does exist, it appears to be too complex to be attributed purely to recent changes in earnings.

Bernard (1993:335) notes that certain studies have found that underreaction occurred whilst other studies have found that overreaction occurred. He attempts to reconcile the two different sets of results:

- As pointed out earlier, even if overreactions do occur in the stock market they cannot be attributable to earnings only.
- A second possibility is that both under- and overreaction to earnings can occur. Studies that focus on prior earnings changes suggest underreaction, whilst studies that focus on prior returns lean towards overreaction.
- The market response to earnings announcements may ignore the attribute of either under- or overreaction.

The above comments constitute a strong challenge to the efficient market hypothesis. It is difficult to explain how the strategies documented above can result in such relatively large abnormal returns. Prices do, however, deviate from fundamental values in competitive markets.

Chopra *et al.* (1992:290) present evidence of overreaction around press releases relating to quarterly earnings announcements. They focused on three-day windows surrounding an earnings announcement. Their study looked at companies for the period from 1970 to 1981. They found 227,522 earnings announcements for this period. Small loser companies had average returns of 0.958 per cent for the three day window, while large company winners had average returns of 0.001 per cent. For the portfolio of extreme losers, the average return was 0.63 per cent, while for the extreme winner portfolio, the average return was zero. It would seem that the market was surprised by earnings announcements, which is consistent with the overreaction hypothesis. A reason for this overreaction could be that more information is available around the time earnings announcements take place.

Chopra *et al.* (1992:292) also constructed 400 portfolios formed on the basis of post-period ranking returns and independent rankings of company size. They found that post earnings announcements returns were more positive for prior losers than for prior winners. In short, the effect was 0.27 per cent per quarter or 1.08 per cent annually, based upon only 12 trading days – clearly supporting the overreaction hypothesis.

4.4 Summary

There is evidence that stock markets do overreact. Most of the excess return is realised in January, confirming the so-called “January effect”. Evidence was presented in this chapter that the average cost of swapping shares (i.e. sell one and buy another) amounts to six per cent and, as a consequence, the expected return on the new share purchased has to exceed six per cent to make the trade viable.

The overreaction effect of equity markets is strongest amongst smaller companies, as a result of the overreaction of individual investors. There is an economically important overreaction effect in the stock market in smaller companies. Betas on extreme loser portfolios exceed the betas of extreme winner portfolios, and thus have a substantial impact on the realised return.

The initial response to earnings announcements is one of underreaction. Post-earnings drift causes abnormal returns when good news or bad news earnings are announced. Smaller companies are affected by post earnings drift to a larger extent than big companies.

Where an investment strategy is followed to construct a portfolio of long positions in good news shares and short positions in bad news shares (with zero actual investment), it is expected that the portfolio will realise positive returns. This is based on the assumption that does not take costs and short trading restrictions into account.

CHAPTER 5

CORPORATE FINANCE

5.1 Introduction

The impact of dividends on share prices is assessed in this chapter. It is shown that dividends and capital gains are not perfect substitutes for each other in the eyes of investors. Various theories are discussed as to why dividends and capital gains are not substitutes for each other. These include self-control, the prospect theory (which involves segregation and integration), the regret-aversion theory and the clientèle effect. In the second part of this chapter, the motives behind mergers and acquisitions are discussed. The hubris hypothesis (overconfidence), which aims to explain that take-over gains are often over-estimated by the bidding entity, is introduced.

5.2 Investors prefer cash dividends

Shefrin and Statman (1984:393) state that it is generally accepted that where transaction costs and taxes are ignored, dividends and capital gains should be perfect substitutes for each other. The reasoning behind this is quite simple. If a dividend of 100 cents is paid, the share price should reduce by 100 cents. An investor can achieve the same result by selling 100 cents worth of the stock, and thus the investor should be indifferent to the option chosen. However, in the United States the tax on cash dividends generally exceeds capital gains tax for most investors, and thus it is to be expected that investors will not demand any cash dividends as long as the re-investment opportunity yields returns that are equal to or higher than the cost of capital.

Yet it is a well-known fact that investors prefer cash dividends. It has been shown that investors ignore dividend yields in making decisions about their portfolio and instead concentrate on portfolio diversification. The only good evidence supporting the preference for cash dividends is the value of information. This stems from the fact that by increasing or decreasing the dividend of a company, information is provided to investors which is not available elsewhere. Shefrin and Statman (1984:395) state: "It is worth mentioning that the motives for dividend preference that we discuss will often interact with the signalling function of dividends."

Shefrin and Statman (1984:395) suggest that an understanding of the so-called “principal-agent” framework provides a significant explanation for various aspects of corporate behaviour. What the framework predicts is not always achieved, due to self-control difficulties. Conflict exists in that there is a need for self-denial with a principal and the urge for timeous recompense with an agent. For example, an individual’s investment adviser may indicate a preference for long-run sustainable returns. As a result of a lack of self-control and the urge for immediate gratification, the investor may rather consume his/her money and not invest it in shares that deliver long-term sustainable returns.

Following on from this, an investor who wants to protect long-term wealth may implement a rule that does not allow spending from capital, in contrast with consumption of capital for immediate gratification. Such an investor will prefer dividends to cater for current consumption. The rule this investor is following is to protect the capital of the investment and only to consume dividends. The reason why such a rule is followed is to prevent the investor from consuming capital (immediate gratification). Implementing this rule enhances self-control. However, in a self-control framework, the sale of shares is not a perfect substitute for increased dividends.

The prospect theory is offered as a second reason by Shefrin and Statman (1984:398) as to why investors prefer cash dividends. Investors do differentiate between the issues of form and the issues of substance, according to Shefrin and Statman (1984). As discussed above whether wealth is presented by a cash dividend or included in the share price should be of no relevance, as they should be perfect substitutes for each other. However, various studies have found evidence to suggest that form does matter. Individuals generally display risk-averse behaviour to gambles which involve only gains, and risk-acceptance behaviour in gambles that only involve losses. Where the likelihood of a loss is equal to the likelihood of a gain, investors are more concerned about the potential loss.

Research has shown that investors either segregate or integrate payoffs based on the outcome. The following is a quote from a manual for stockbrokers to support this theory: “By purchasing shares that pay good dividends, most investors persuade themselves of their prudence, based upon expected income. They feel the gain potential is a super-added benefit. Should the stock fall in value from their purchase level, they console themselves that the dividend provides a return on their cost.” This is an example of where investors segregate outcomes. A sizeable capital loss (due to

the decrease in the share price) is segregated from the dividend, which is seen as a “silver lining” and assists in consoling the investor in respect of the capital loss suffered. Where there is a sizeable capital gain, the investor also separates the gain from the dividend, as the gain is seen as the “super added benefit”. Lastly, in the case of a relatively small capital loss, investors apply integration to offset part or all of the capital loss against the dividend.

Suppose an investor purchases a stock for \$40 and the dividend is expected to be \$2. Now assume that the closing share price is either \$50 or \$54. The outcome here is made up of a dividend of \$2 and a capital gain of either \$10 or \$14. The investor ordinarily segregates the dividend from the capital gain in order to enjoy the two separately.

Secondly, suppose the purchase price of the share was \$70 and the rest of the details remain the same. In this case, the capital loss is either \$16 or \$20, but a dividend of \$2 is also earned. Here again the investor tends to prefer to segregate, as the dividend is seen as a “silver lining”. In simple language, segregation assists the investor to focus on the positive aspects of his/her net loss.

Finally, suppose the purchase price of the share was \$51 with all the other assumptions remaining the same. With the \$2 dividend, there is either a capital gain of \$3 ($\$54 - \51) or a capital loss of \$1 ($\$50 - \51). In this case, the investor would apply integration, as it eliminates any possibility of a loss.

An announcement about a decrease in the dividend of a company has a significantly greater impact on the share price, compared to an announcement of a dividend increase. This is consistent with the prospect theory, which states that losses loom larger than gains. Shefrin and Statman (1984:408) point out that a substantial increase in the dividend for a company tends to be separated into a regular increase and the additional unexpected component, so that the reference point of investors is not affected by the increased dividend. So, for example, a gold mining company can have an exceptional year as the result of a high unsustainable gold price. If the dividend for the year is announced, the extraordinary dividend should be separated from the regular dividend. This separation is performed in order not to send the wrong message to investors, and also to ensure that investors do not change their reference points.

The next theory that is discussed as a reason for the preference for dividends is regret-aversion. Shefrin and Statman (1984:408) compare the following two cases:

- (a) An investor takes \$600 received as a dividend and buys a television set.
- (b) An investor sells \$600 worth of shares and uses it to buy a television set.

Subsequently the price of the share increases sharply. Dividends and receipts from the sale of shares are perfect substitutes for each other (on the assumption that taxes do not play a role), as discussed above, and thus for both cases the amount of regret should be equal. However, research has proved that in this example, it is likely that the investor will regret Case (b) more than Case (a). Shefrin and Statman (1984) point out that consumption from dividends may be preferred to consumption from capital for investors who are regret-averse.

Suppose that Paul owes shares in Company A. He has considered switching his shares for shares in Company B, but has decided against it. At the end of the year, he realises he could have increased the value of his portfolio by \$1,200 if he had switched to Company B. George, on the other hand, does switch his shares in Company B for Company A and, at the end of the year, he realises he could have increased the value of his portfolio by \$1,200 if he had kept the shares in Company B. It is generally agreed that George will be the more upset of the two, despite the fact that both of them take a conscious decision to invest in the shares of Company A. In short, it is likely that investors would feel more regret (for example due to a switch from Company B to Company A) where they have initiated a transaction, as opposed to not taking action (they consider switching, but do nothing).

Shefrin and Statman (1984:410) provide another example to prove the regret theory as it pertains to dividends. Suppose Paul normally spends cash dividends, whilst George rarely sells shares for consumption. George in this case does sell \$1 worth of shares and spends the proceeds. Subsequently the price of the share increases. George will feel more regret than Paul will, because he feels responsible for his actions. On the other hand, Paul may be in an identical financial position as George and not feel any regret, because, for him, consuming dividends is standard practice. Even if Paul followed a rule for re-investing dividends, this theory will hold. The one time he deviates from this rule and consumes the \$1 dividend, he will feel regret for breaking the rule. Therefore, very importantly, the argument that dividends and capital are perfect substitutes in the absence of any taxation considerations may not hold due to regret-aversion.

Shefrin and Statman (1984:412) indicate that saving for retirement may be difficult for younger people who see retirement as a distant event. In consequence, a young investor may impose the following rules to him/herself to ensure self-control:

- encourage savings; and
- avoid consuming already accumulated wealth.

These authors argue that dividends play an important role in rules that discourage dissaving.

Suppose that to limit dissaving, the following rules are adhered to:

- do not consume from capital; and
- choose a portfolio with a relatively low dividend yield.

This policy is effective, since it serves to discourage dissaving and the low dividend yield prevents high consumption from the portfolio.

Now consider a somewhat older investor who is still working with most of this person's wealth locked up in his/her house and with no dependent children. This investor may follow a policy of dissaving from the investment portfolio, but may still not want to dissave too quickly. It is likely that this investor will adhere to the rules above with the exception of changing the portfolio to yield high dividends for consumption and greater dissavings.

In the final case a retired employee with a significantly reduced salary income is considered. This investor depends heavily on the investment portfolio to fund consumption. Here, once again, the self-control problem exists, as this person has to ensure that wealth is allocated over the whole retirement phase. To curtail consumption of capital, the same rules as above will be employed, except that the portfolio will now consist of even higher yielding dividend shares.

Shefrin and Staman (1984:413) conclude that there is a clientèle effect. They state that "the self-control portion of our theory predicts that dividend yield will be positively correlated with the planned rate of dissaving for individual investors. Therefore, we could observe that whenever the rate of dissaving is positively correlated with age and negatively correlated with income, we should find that:

- portfolio dividend yield is positively correlated with age; and
- portfolio dividend yield is negatively correlated with income (from human wealth)."

Shefrin and Statman (1984:413) also consider the interdependent implications of self-control, regret-aversion and segregation. An investor who is concerned about his/her self-control will design a portfolio where consumption is financed out of dividends and not the sale of shares. This policy will also limit regret when a policy becomes “standard procedure”, as discussed above. However, the above will be in conflict with the need to segregate for an investor in the savings stage of his/her life cycle. Self-control theory implies that the portfolio this investor chooses will be one containing little or no dividend-paying shares. The absence of dividends eliminates the application of segregation. As a result, Shefrin and Statman indicate that they expect an investor to choose a portfolio that balances the self-control and segregation theories and, as a consequence, the allocation of the portfolio which invests in dividend-paying shares will be a compromise.

Transaction costs are another factor which favours dividends as opposed to the sale of shares to finance consumption, as the sale of shares increases brokerage commissions and, in South Africa, marketable securities tax (MST). Shefrin and Statman point out that there is no conclusive evidence to suggest that transaction costs play an important role in the preference for dividends – but it certainly does play a small role.

In 1974 the Consolidated Edison Company of New York (“Con Ed”) omitted to pay a dividend, due to the quadrupling of oil prices, after 89 years of consistent dividend payments. What is interesting from the annual general shareholders’ meeting is that none of the shareholders ever commented on the fact that they will now have to sell their shares in order to finance their consumption. Therefore it is clear that most shareholders used self-control as a measure and as a consequence had a rule that consumption can only be financed from dividends. Shefrin and Statman (1984:419) make two points in terms of prospect theory:

- If an investor breaks the rule and creates a “home-made dividend” by selling shares, this sale will probably be at a price less than the original purchase price, taking into account market conditions at the time. The reference point will be above the current price and investors will therefore have to accept a capital loss.
- The omission of the dividend also prevents segregation. If segregation was possible (a dividend was paid), that would have reduced the psychological effect of the decrease in the share price of Con Ed.

Shefrin and Statman indicate that a scrip dividend could have resolved some of the issues discussed above. In terms of normal financial theory, the issue of a scrip dividend is irrelevant, in that it does not make most shareholders better off. However, a scrip dividend is labelled a dividend and, as a result, investors do not have to break rules such as “do not consume out of capital” by selling the shares obtained from the scrip dividend. Also, the reference point for the shares obtained from the scrip dividend is different from the reference point of the original purchase of the shares. As a consequence, the sale of shares obtained from the scrip dividend entails no perceived loss on the sale. Finally, the scrip dividend does present some “silver lining” which can assist with segregation. Therefore, it would appear that in times of hardship, the declaration of a scrip dividend needs to be seriously considered as opposed to no dividend being paid at all.

It is suggested that an investor can improve on the rule of not dipping into capital, by financing consumption from dividends, and by letting a professional investment manager manage his/her portfolio. The investment manager can be instructed to sell shares at regular intervals and to submit funds to the investor, part of which will be a capital gain. Such a strategy could result in a higher after tax return than the pure “consume from dividends” rule and could also address the self-control issue. In the United States both dividends and capital gains are taxed. To avoid double taxation, a portfolio may be constructed using a combination of bonds and shares with no dividend payments. Consumption can then be financed from the interest coupons on the bonds only. Strategies such as the two described above can lead to increased wealth for the investor, but this is by no means guaranteed.

5.3 Motives behind mergers and acquisitions

Roll (1986:437) argues that take-over gains are overstated, if they exist at all. A take-over process includes the following steps:

- The acquiring firm identifies a potential target.
- The valuation of the equity of the potential target is investigated. This may include, in certain cases, non-public information and an assessment of synergies and management.
- Lastly, the value computed above is compared to the current market value of the share. If it is below the current market value, the bid is abandoned. If this value exceeds the current market, an offer is made and it becomes public knowledge.

As a consequence, the take-over premium may overstate the increase in economic value of the proposed combined entity.

Taking over a listed company is different to other acquisitions, such as oil-drilling rights, where trade is infrequent and there is no observable price. In the case of a listed company, the lower bound of the offer (the current market price) is known.

Roll (1986:441) states that “if there are no gains available for corporate take-overs, the hubris hypothesis implies that the average increase in the target firm’s market value should then be more than offset by the average decrease in the value of the bidding firm. Take-over expenses would constitute the aggregate net loss”. Therefore the share price of the target firm should increase when a bid is announced, and it should decline to its previous levels when the offer is not accepted, or when no other offers are received.

Roll indicates that the share price reaction of the acquiring firm is not very clear. On the assumption that the offer was not expected and that the bid conveys no information about the acquiring company, the hubris hypothesis will predict the following:

- a price decline in the shares of the acquiring firm on announcement of the offer;
- a price increase in the share price of the acquiring firm on losing the bid or abandoning the bid; and
- a further price decline in the share price on actually winning the bid.

Roll (1986:442) points out that on announcement of a bid, the target company’s share price increases (on average) by seven per cent and this trend is almost entirely reversed within 60 days. By the time the last offer is abandoned, the target company’s share price has declined by some 8.1 per cent, on average.

The main prediction of the hubris hypothesis is that the combined take-over gain to both companies’ shareholders is not favourable. Roll (1986:445) reviews several previous studies on this topic in his paper and concludes that the evidence about total gains in take-overs is inconclusive. He also indicates that during the period between the initial offer and a successful outcome, the average movements in the share prices of the acquiring entity are small and it is thus not possible to make much of them. This is consistent with the hubris hypothesis, which predicts a decrease in the value of the share price of an acquiring company. Where there is a rival bid, he suggests that a price decline in the shares of the first take-over company on the announcement of a rival bid can be explained by the hubris hypothesis. This is because the rival bid may

set off a bidding war and the market expects a significant loss for the winning bid company. Roll also highlights the fact that the price change of the acquiring company's share price after a successful bid is almost always negative and relatively large in magnitude.

Roll (1986:453) also suggests that the hubris hypothesis can serve as the null hypothesis of corporate take-overs, as it assumes that all markets display the strong form of market efficiency. As discussed earlier, the hubris hypothesis predicts that at the time of a take-over,

- the combined value of the target company and the prospective acquiring company should decrease slightly;
- the value of the share price of the prospective acquiring company should decline; and
- the value of the target should increase.

5.4 Summary

In the absence of taxation and transaction costs, dividends and capital gains should be perfect substitutes for each other. However, as this chapter shows, investors prefer cash dividends. Various theories including self-control, prospect theory, regret-aversion and clientèle impact are discussed as possible reasons for investors' preference for cash dividends.

An investor who wants to protect long-term wealth may implement a rule that does not allow spending from capital, in contrast with the consumption of capital for immediate gratification. Such an investor prefers dividends to cater for current consumption. The rule this investor is following is protecting the capital of the investment by only consuming the dividends. In times of hardship, the declaration of a scrip dividend needs to be seriously considered as opposed to no dividend being paid at all.

Target companies' share prices increase when a bid is announced, while the bidding companies' share prices decline in most cases. The hubris hypothesis predicts the following:

- a price decline in the shares of the acquiring firm on the announcement of the offer;
- a price increase in the share price of the acquiring firm on losing the bid or abandoning the bid; and

- a further price decline in the share price on actually winning the bid.

Therefore the hubris hypothesis indicates that the combined take-over gain to both companies' shareholders is not favourable.

CHAPTER 6

INDIVIDUAL BEHAVIOUR

6.1 Introduction

Popular models that affect share prices are investigated in this chapter. The market crash in October 1987 is analysed in detail to try to establish the cause of the crash. The second part of this chapter discusses the behaviour of investors who hold onto their losing shares too long and not sell their winning shares timeously. This theory is known in Finance as the “disposition effect”.

6.2 Popular models

Shiller (1989:371) states that there is not just one popular model, but that there is a range of these models. The life expectancy of a model in the available pool of models changes over time. The available pool of popular models at any given time can be obtained through surveys and questionnaires (the research tools used by academics).

Stock market crashes are national events that lead to significant public reaction. They normally follow a boom period where share prices have been overvalued and where prices have reached unusual heights. The initial price decreases in shares are the most important news that triggers a crash. The timing of a crash cannot be attributed to a specific news event at the time. A theme such as “shares are overpriced” is in the minds of most investors shortly before a crash takes place. Other themes include program trading (which make markets fundamentally different) and the overall indebtedness in the economy. Popular models of crashes claim that investor psychology is one source of such a crash. The timing of a crash is therefore a function of the themes in the minds of investors, which cause them to become unusually reactive to price movements.

In the market crash of 1987, stop-loss selling due to portfolio insurance was an important factor. However, it is important to note that portfolio selling did not cause the crash, but was rather executed in line with price declines. The behaviour of market participants, both individuals and institutions, should be considered in seeking the cause of any market crash.

One shortcoming of surveys is that they take place after the crash, and investors' memories tend to be short. Often, questions such as: "Was the stock market overvalued prior to the crash?" are answered affirmatively. Of the institutional investors who were surveyed in September 1987, 47.9 per cent indicated that the market would be a "bull market" in three months time. Only 24.5 per cent thought that the market would be a "bear market" in three months time. Not surprisingly, in November 1987, only 19.9 per cent of institutional investors thought that in three months time the market will be a "bull market", as opposed to 42.4 per cent who indicated a "bear market".

Shiller (1989:373) is of the opinion that a bullish attitude as reported in the surveys that he has conducted is consistent with the sentiment that the market is overpriced. The evidence of surveys suggests that simple feedback models, in which price is dependent on delayed price changes, amplifying price changes in a snowball scenario, does play a role in price dynamics. As a consequence, price is determined in part from its own lagged values – increases (decreases) in price tend to foster further increases (decreases). Shiller points out that feedback models do not necessarily imply positive serial correlation or price changes. Feedback from past price changes can greatly increase price variances in which there is very little correlation or even a negative correlation to future price changes.

Another form of feedback, which is different to price changes, is the demand for shares fuelled by direct interpersonal communication. One such model is a contagion model similar to what is found in the field of medicine. This model can be accessed to model the time pattern of rumours, attitudes or fads. Contagion models are powerful, since research in the field of social psychology has found that direct interpersonal communication among peers is very important in promoting changes to attitudes. Surveys conducted by Shiller suggest that interpersonal communication appeared to have influenced both individual and institutional investors, and others. In short, investors tend to acquire the same shares that friends have bought.

One should perhaps beware of attributing everything to feedback models, as one of the substantial components of prices in a speculative market is fundamentals. In general, share prices correlate with earnings.

Shiller (1989:381) did four surveys on the October 1987 crash. Two pilot surveys were done. The first covered the drop in the market from 14 October to 16 October. This

survey was mailed on the morning of 19 October 1987. Due to the magnitude of the drop in the Dow on 19 October 1987, another pilot survey was sent out later that day and pertains to the drop in the Dow for that day. Two further full surveys were sent out over the next few days, one covering individual investors and the other covering institutional investors.

What the survey found was that, on 19 October 1987, the number of net buyers equalled the number of net sellers for both the institutional investors and the individual investors. For the month before the crash (covering the period 12 September 1987 to 12 October 1987), institutional investors reported that they were net sellers, whilst individual investors reported they were net buyers of shares. For 19 October and 20 October 1987, this trend reversed itself. Individual investors were net sellers whilst institutional investors were net buyers.

Based upon questions in the surveys of what influence news events had had on investors, Shiller concluded that there was no clear-cut reaction to news. The surveys also found that both institutional and individual investors were concerned about the drop in the market. The average time at which investors became aware of the above-average drop in the market was approximately 14:00. Only 18.9 per cent of individual investors were not aware of the crash at 17:00. The surveys also found that many people were emotionally involved in the market and felt symptoms of anxiety. Roughly 29 per cent of individual investors and 28 per cent of institutional investors reported that on 19 October 1987 they expected a rebound to occur.

In excess of 71 per cent of individual investors and about 84 per cent of institutional investors reported that they thought the market was overvalued relative to fundamentals round about 12 October 1987. It is interesting that individuals were net buyers for the month before, yet they believed that the market was overvalued. There may be many reasons why they bought shares under these circumstances:

- Investors think that they can time the market and buy while it is still going up.
- Investors may follow the “trend is your friend” philosophy.
- There was an expectation that lower prices would develop over the next three to six months.
- The dollar cost average buying model is popular.

Both the 1929 and the 1987 crash occurred on a Monday. The surveys confirmed that the weekend does have an impact on investor behaviour. With regard to the question

of which theory describes the declines (investor psychology or a theory of fundamentals such as profits or interest rates), the majority of respondents, namely 67 per cent of individual investors and 64 per cent of institutional investors, indicated the investor psychology theory as a reason for the decline.

About a third of both individual investors and institutional investors indicated that they were influenced by the fact that the price dropped through the 200 day moving average or some other long-term trend line. We can thus be fairly confident that technical analysis does play a role in the market.

It was quite striking in the surveys conducted by Shiller (1989:395) that only 5.5 per cent of institutional investors indicated that they followed a portfolio insurance strategy. Portfolio insurance is a strategy used by investors to limit their losses. The strategy involves the continuous selling of index futures whilst share prices are declining, thereby hedging portfolios against any further declines. Various other studies have concluded that portfolio insurance was not the only reason for the crash on 19 October 1987.

Another aspect covered by Shiller's surveys was whether investors were more reactive at the time of the crash than at any other times. Of the investors who had a policy of holding losses to a certain point, 46 per cent of individual investors and 50 per cent of institutional investors adopted such a policy within one month of the crash.

Shiller concludes that something must have been very different on 19 October 1987 to cause the market to behave differently to any other day. It could not have been portfolio insurance, nor could it have been a big news event on that day that affected the market (for example, the announcement of hostile activity such as the declaration of a war). Investors were concerned that the market was overpriced, were worried about the impact of program trading and were aware of the level of national debt and the impact of taxation. These concerns and worries certainly had an impact on the *behaviour of investors on 19 October 1987, but they still fail to explain the events of that day.*

The efficient market theory is also called into question – it cannot explain the drop on the basis of interpretable information about economic fundamentals, as there was no identifiable cause for the drop in prices on 19 October 1987. There is increasing

evidence that prices sometimes behave in a manner unrelated to economic fundamentals.

Due to the fact that there was no recognisable event that caused the crash, Shiller (1989:398) explored investor dynamics and thinking as the cause for the crash. He identifies two channels by which price declines could feed back to further declines:

- the price-to-price channel (investors were reacting to price changes); and
- the social-psychological channel (investors were reacting directly to each other).

The surveys provide adequate evidence that the feedback loops were working on 19 October 1987, since most investors were aware of the movement in the markets at least on an hourly basis. Furthermore, investors certainly had expectations, before the 1987 crash, that something like the 1929 crash was a possibility. It may be that many people were behaving in a way that suggests that they had experience based on historical comparisons.

Shiller (1989:431) contends that speculative prices are a combination of popular models and fundamental values. The movement in prices can be caused by opinion changes as a result of a popular model that leads people to overreact to certain economic data or indicators. Large variances in earnings and dividends cause large movements in share prices. Alternatively, price changes can be the result of the investors' own behaviour, due to opinion changes amongst them. Lastly, price changes can be the result of genuine information about future earnings and dividends. If share prices were purely a function of the efficient market model, they would be fairly volatile, but not as volatile as we actually observe.

Shiller draws an analogy between ancient sailors and investors. People interact with each other and so do winds, causing a storm that surprised ancient sailors, similar to a stock market crash. Complicated dynamics are created when people interact with each other. One can learn more about the dynamics of speculative markets than the ultimate causes for price movements. The great risk, according to Shiller (1989:432), is "overinterpreting the existing evidence of market efficiency". The efficient market theory may have too much importance in many people's minds, due to the fact that there are no alternatives. Price movements occur due to information about future earnings and dividends, as well as information about the future demands of ordinary investors. Therefore price changes reflect both future cash flows and anticipated opinion changes.

Both simple feedback models (in which prices change in response to past price changes), and contagion models (in which people interact with each other), support the random walk behaviour of speculative prices. Price changes in the short term are not very predictable. People willingly admit that they are anxious and are influenced by the excitement of others in periods of great uncertainty in the stock market. Shiller points out that popular models are not taken into account by researchers, who only look at data on prices and other objective factors. Shiller (1990:434) states that “the risk social scientists incur in ignoring these models is of interpreting observed behaviour as reflecting generalisable patterns of basic human behaviour”.

Shiller (1990:497) indicates that between mid-1987 and mid-1988, house prices in California increased, on average, by 20 per cent. Questionnaires were sent out to recent homebuyers in two Californian cities, namely Anaheim and San Francisco, as well as to home-owners in Boston, Massachusetts, where house prices declined after a previous boom. In addition, questionnaires were also sent out to home-owners in Milwaukee, Wisconsin, where real house prices had remained stable for five years. Homebuyers were asked for their theories as to what explained recent changes of home prices in their cities, as well as about any trends that may have had an impact on house prices.

The study found that there was no specific event that caused house prices to change. Interest rates were offered as a reason for changes in house prices for all four cities. However, as interest rates are the same for all four cities, this could not explain the vastly different behaviour in house prices. The surveys suggested that psychology plays a less important role for home-owners, compared to investors in the stock market – less than 25 per cent of the respondents in each city selected this as a reason for changes in house prices. The study revealed that speculative considerations were a main reason for buying homes in a “boom city”, as 75 per cent of the respondents indicated this as the reason for purchasing a house. On the other hand, only 28 per cent of homebuyers in Milwaukee offered this as an explanation for purchasing a house.

Surveys were sent out by Shiller (1990:500) to try to understand why the Initial Public Offering (“IPO”) market shows very high initial returns and why the market is sometimes “hot”. The behaviour of the IPO market is just as difficult to explain as the stock market and housing price bubbles. Previous studies have shown that the increase on the offering price at the end of the listing day is about 20 per cent. It is

sometimes difficult to participate in an IPO, because typically one is dependent on a broker to allocate shares in an offer. The willingness of the broker to assist in this regard is a function of how much business is given to that broker. It is difficult to explain why companies deal with underwriters that substantially underprice new issues and what the reasons are for the high initial returns. One factor that may cause underwriters to underprice IPO's is the potential litigation claims of investors. Underpricing reduces the chances that investors will sue underwriters. Another view is that the high initial return is a payment by the underwriters to induce investors not to sell their shares in an IPO.

Yet another theory of Shiller (1990:502) as to why IPO's are underpriced is the so-called impresario hypothesis. Just as it is important for musicians to play to packed audiences, so it is also important for IPO's to be fully or over-subscribed. It is therefore not appropriate to price tickets or an IPO just to maximise profits for a single event. If an excess demand for tickets is created and people stand in long queues to purchase tickets, it may cause people in the queue to start trading amongst themselves in tickets at higher prices than the official price. Similarly, underpricing IPO's causes high initial returns that create a sense that the broker or underwriter is giving good investment advice.

6.3 The disposition theory

Shefrin and Statman (1985:777) refer to the behaviour of investors who hold on to losing shares too long and sell winners too soon as the "disposition effect".

Odean (1998:1775) has tested this disposition theory by obtaining the trading records for 10 000 broking accounts from a large discount securities dealer. The reason why the records from a discount brokerage house were examined was to rule out the influence of retail broking. Retail brokers may be biased to advise clients to trade in order for these brokers to earn commissions.

According to Odean (1998), investors may rationally (or irrationally) be of the opinion that their losing investments will outperform their current winning investments in future. Another interesting observation is that in the event that investors do sell winners, these winners tend to outperform the losing investments they hold on to. What is also revealed from his study is that if an investor holds two different shares and that investor

is faced with a liquidity crisis, he/she is more likely to sell the share that is up. The original purchase price is assumed to be the reference point that is used by investors in their decision-making.

Investors believe that the current losing investments may outperform the current winners and for this reason they might follow a strategy to keep their losers and sell their winning investments. Investors tend to be irrational in their beliefs if future expected returns for holding on to their losers proves to be less than those of their winners. Furthermore, investors incorrectly believe that their losers and winners will be mean-reverting.

There is enough evidence to suggest that the only time that investors in the United States are willing to sell their losing investments is December, which is at the end of their tax year. The reason for this is to capture tax losses so as to reduce their taxable income, although they may still be reluctant to sell their losers.

Odean's (1998:1781) study examined whether investors hold on to their losers for too long and sell their winners too soon and whether tax-motivated trading takes place in December. He investigated the frequency with which investors sell winners and losers relative to the conditions of the market. The inclusion or exclusion of commissions or dividends did not affect his findings.

The study found that a share that is up in value from its original purchase price is more than 50 per cent likely to be sold, compared to a share that is down in value. Odean's study also found that in December more losses are realised, compared to the period between January and November, proving that investors are conscious of taxation and therefore trying to minimise their capital gains by selling losers in December.

Another argument Odean investigated is the notion that investors may sell their winners to rebalance their portfolios and therefore make new purchases. However, his research found that, eliminating the desire of investors to sell winners in order to rebalance their portfolios, investors continue to prefer to sell winners. He also tested the excess returns after investments were sold and the performance of the remaining losers in the portfolio. He found that for winners that were sold, the average excess return over the next year is 3.4 per cent more than for the losers not sold. Investors who do believe that their losers will outperform their winners in future do not take count of reality.

Odean (1998:1795) argues that by affecting supply, the disposition effect may assist market stability close to prices at which large amounts of trading have taken place. If a share is sold at a specific price and many investors buy this share, this price may become their reference point. If the price of a share falls below this reference point, these investors are not likely to sell their shares at a loss. This reduces the supply of potential sellers, resulting in a slowdown of further price decreases due to the reduced supply of potential sellers. The opposite also holds true where the price of a share rises above the reference point. Under this scenario, investors are more willing to sell and thereby increase the supply of potential sellers, which in turn leads to a possible slowdown in further price increases.

Odean (1998) also assesses the impact of the economic cost of loss aversion. He uses a hypothetical investor who chooses to sell one of two shares. Of the two shares, the one is characteristic to an average realised winner in the data set of 10 000 discount broking accounts, while the other share behaves like the average paper loser. As expected, due to the fact that the average investor is averse to realising losses, the winner is sold. The data set shows that one year later the losing share will, on average, have a return of one per cent below the market, whilst the winning share will have, on average, a return of 2.4 per cent above the market. The difference in return between the two options amount to 3.4 per cent.

Odean (1999:1279) argues that, due to overconfidence, investors are likely to trade too much. Barber and Odean (2000:773) also claim that overconfidence results in high trading levels and consequently lead to the poor performance achieved by individual investors. In 1996, roughly 47 per cent of equity investments in the United States were held directly by households, 23 per cent by pension funds and 14 per cent by mutual funds. These authors point out that a substantial amount of research has been done on the performance of pension funds and mutual funds. However, only limited research has been done on the performance of equities held directly by households.

The data set used by Barber and Odean (2000) for their research consisted of 78 000 households' investments at a large discount broking house for the period from January 1991 to December 1996. These accounts were stratified as follows:

- If at any point in time an account had equity in excess of \$100 000, it was classified as affluent, accounting for 12 000 accounts.

- Accounts which had more than 48 trades in a year were classified as active trader households, accounting for 6 000 households.
- The balance were classified as general and consisted of 60 000 accounts.

The average round-trip trade based upon the data set had a bid-ask spread of about one per cent and carried a commission charge of roughly three per cent. On average, households purchased 6.49 per cent of their share portfolio and sold 6.23 per cent of their share portfolio per month. Therefore, the average household turned over more than 75 per cent of its equity portfolio each year.

Based upon the full sample, the annualised geometric mean return earned by individual investors, the average household and the value weighted market index are respectively 18.2 per cent, 18.7 per cent and 17.9 per cent. Thus there is very little difference between the return earned by the average household and that earned by an investment in a value weighted market index of NYSE, AMEX and NASDAQ stocks. However, the net average return per household underperforms the value weighted market index by some 100 basis points annually.

The results of the Barber and Odean (2000) study indicate that investors would have realised higher returns if they had followed a buy and hold strategy, compared to a trading strategy. In other words, their choice of strategy hurt their gross performance. It is also worth noting that individual investors prefer small companies with high risks. The betas for shares held by individual investors are significantly higher than the market portfolio. One of the more important findings from this study is that net of transaction costs investors performed poorly, in that the underperformance per month was between 15 to 31 basis points (which translates into 1.8 per cent to 3.7 per cent underperformance per year). As a consequence, individual investors could have increased their annual return by some two per cent by merely holding onto their beginning-of-year portfolios.

6.4 Summary

Stop-loss selling (instituted as a process of portfolio insurance) was an important factor contributing to the stock market crash in the United States in 1987. Price movements occur due to information about future earnings and dividends, as well as information

about the future demands of ordinary investors. Therefore price changes reflect both future cash flows and anticipated opinion changes.

Interpersonal communication influences the behaviour of both individual and institutional investors. These investors tend to acquire the same shares that their friends have purchased. Both simple feedback models (price changes in respect of past price changes) and contagion models (where people interact with each other) support the random walk behaviour of speculative prices.

Investors believe that current losing investments may outperform the current winners in their portfolio, and for this reason they might follow a strategy to keep their losers and sell their winning investments. Investors tend to be irrational in their beliefs, even if the future expected returns for holding on to their losers proves to be less than those of their winning shares. Furthermore, investors incorrectly believe that losers and winners will be mean-reverting.

It has been shown in this chapter that individual investors are better off selling their losing investments and holding onto their winning investments. As a result of overconfidence, investors trade too much. Individual investors could realise a higher return if they followed a buy-and-hold strategy, compared to a trading strategy.

CHAPTER 7

SUMMARY

7.1 Summary of research results

Prices in financial markets change due to both economic fundamental shifts and human psychological aspects. Investors' attitudes are of great importance in determining shifts in the prices of speculative assets.

Rational traders make decisions based on information and facts. Noise traders make decisions based upon anything else. Noise traders are important, as their trading results in much needed liquidity for individual shares. Without liquidity, financial markets cannot function properly. The price of a share reflects both noise and information. However, the mere participation of information traders in the market does not in itself result in prices' being efficient. Noise creates the opportunity to trade profitably, but at the same time, it is difficult to realise consistent profits from trading activities in a noisy market.

The paradigms of market efficiency and the CAPM are often criticised because they do not incorporate the actions of noise traders. Arbitrage does not eliminate the effects of noise, because noise itself creates risk. Because noise trader risk limits the effectiveness of arbitrage, price movements are volatile. Assets that are subjected to noise trader risk can be underpriced relative to fundamental values.

The fewer sophisticated investors there are relative to noise traders, the larger the impact of noise. In a world with mean-reverting noise traders' misperceptions, the optimal investment strategy is very different from a buy-and-hold strategy. The optimal strategy for sophisticated investors is a strategy that involves market timing with increased exposure to shares that have fallen, and decreased exposure to shares after they have risen in price.

There is no real economic reason for the existence of closed-end funds. Closed-end funds are a device by which entrepreneurs take advantage of less sophisticated investors (like casinos exploit gamblers). The discount on closed-end funds is an indicator or index of individual investor sentiment.

The level of the aggregate share market is linked to dividends and therefore the movement in share prices is the result of changes in dividends. In the absence of taxation and transaction costs, dividends and capital gains should be perfect substitutes for each other. However, as is shown in this report, investors prefer cash dividends. Various theories, including self-control, the prospect theory, regret-aversion and the clientèle impact have been suggested to explain investors' preference for cash dividends.

An investor who wants to protect long-term wealth may implement a rule that does not allow spending from capital, in contrast with consumption of capital for immediate gratification. Such an investor would prefer dividends to satisfy current consumption. The rule this investor is following is to protect the capital value of his/her portfolio and to consume only the dividends.

When companies experience difficult times in terms of profitability and cash flow, the declaration of a scrip dividend needs to be seriously considered by the board of directors, compared to no dividend being paid at all.

In contrast with normal expectations, significant non-financial news events do not affect equity markets very much. The stock market decline on Wall Street from 1929 to 1932 cannot be rationalised in terms of subsequent dividends. In times of market crashes, stop-loss selling instituted as a process of portfolio insurance is an important factor contributing to the magnitude of the crash. One should caution against treating stock prices or their changes as rational reflections of fundamental values.

This report shows that the real return of a share is difficult to forecast. However, the real price of a share should be close to its intrinsic or fundamental value, that is, the present value with a constant discount rate of optimally forecasted future real dividends. Where real share prices are excessively volatile, there may be profit opportunities for arbitrageurs.

There is evidence that the stock markets do overreact. Most of the excess return is realised in January, confirming the so-called "January effect". Evidence has been presented that the average cost of a sale and a buy from an individual investor's portfolio who trades through a discount broking house amounts to six per cent. Hence, the expected return on the new share purchased will have to exceed six per cent to

make the trade viable. The overreaction effect in equity markets is strongest amongst smaller companies, as a result of the overreaction of individual investors.

The initial response to earnings announcements is one of underreaction. Post-earnings drift causes abnormal returns when good news or bad news earnings are announced. Smaller companies are affected by post-earnings drift to a greater extent than large companies.

Where an investment strategy is followed to construct a portfolio of long positions in good news shares and short positions in bad news shares (with zero actual investment), this portfolio is expected to yield positive returns. This does not take into account the cost of trading and the short trading restrictions associated with short sales.

In a take-over scenario, the target company's share price is likely to increase on announcement of a bid, whilst the bidding company's share price is likely to decline in most cases. The hubris hypothesis predicts the following:

- a price decline in the shares of the acquiring firm on the announcement of the offer;
- a price increase in the share price of the acquiring firm on losing the bid or abandoning the bid; and
- a further price decline in the share price on actually winning the bid.

Therefore the hubris hypothesis indicates that the combined take-over gain to both companies' shareholders is not favourable.

Price movements occur due to information about future earnings and dividends, as well as information about the future demands of ordinary investors. Therefore price changes reflect both future cash flows and anticipated opinion changes.

Interpersonal communication influences the behaviour of both individual and institutional investors. Unsophisticated investors tend to acquire the same shares that their friends have purchased. Both simple feedback models (price changes in respect of past price changes) and contagion models (where people interact with each other) support the random walk behaviour of speculative prices.

Investors tend to believe that current losing investments will outperform the current winners in their portfolio and for this reason they may choose to follow a strategy of keeping their losers and selling their winning investments. Investors are irrational in

their beliefs that the future expected returns for holding on to their losers would be more than those of the winners in their portfolios. Furthermore, investors incorrectly believe that their losers and winners will be mean-reverting.

This report shows that individual investors are better off selling their losing investments and holding onto the winning investments in their portfolios. As a result of overconfidence, investors trade too much. Individual investors may realise a higher return if they follow a buy-and-hold strategy as opposed to a trading strategy.

7.2 Discussion

The efficient market hypothesis and the CAPM are challenged by behavioural finance. Prices of speculative assets do not always reflect fundamental values. The perceptions of investors play an important role in the determination of prices. Hence, when there are market crashes on the equities markets, the contagion effect amongst investors should not be underestimated. Also, it was shown in this report that portfolio insurance (or stop-loss limits) is an important contributing factor to the magnitude of any crash on equities markets.

Dividends have been highlighted as an important determinant for the fundamental value of shares. This contrasts with the revenue model that is used to value new economy shares, such as Internet companies. It is also clear that investors expect to receive a dividend. Amazon.com is a good example – pressure was exerted on this company to declare a dividend. As was shown in this report, various theories strongly suggest investors' preference for dividends. These include the self-control and prospect theories, regret-aversion and the clientèle effect.

Changes in dividends affect share prices. A decrease in the dividend of a company is a clear signal to investors that the share price is overvalued. Movements in share prices are therefore at least partially the result of changes in dividends.

7.3 Recommendations

Investment strategies that can be followed, based upon the research done for this report, include the following:

- It may help to acquire closed-end fund shares at the listing of a new fund. The research indicates that initially closed-end funds trade at a premium of up to ten per cent, but within 180 days, the premium evaporates and the fund starts to trade at a discount.
- The optimal strategy for sophisticated investors is a strategy that involves market timing with increased exposures to shares that have fallen, and decreased exposure to shares after they have risen in price.
- Individual investors should follow a buy-and-hold strategy, as opposed to a trading strategy, as the cost of trading is excessive.
- Arbitrageurs (professional investors) can earn higher than normal returns on markets that are excessively volatile. However, they need to be cautious, as they can also lose significant amounts of money when markets are volatile.

Careful consideration should be given to what shares to trade, as the cost of trading is expensive. It was shown that to do a simple switch can cost as much as six per cent. Furthermore, it is important to have stop-loss limits in place and to sell shares once they breach the lower limit that was set originally (on acquisition) by an investor. The notion that losing shares in a portfolio will somehow turn into winning shares is, in most cases, incorrect.

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