



SCHOOL OF FINANCE AND ECONOMICS

UTS:BUSINESS

WORKING PAPER NO. 119

AUGUST, 2002

Behavioural Finance and the Decision to Invest in High Tech Stocks

Sian Owen

ISSN: 1036-7373

<http://www.business.uts.edu.au/finance/>

Behavioural Finance and the Decision to Invest in High Tech Stocks

Sian Owen

Working Paper Number 119

School of Finance and Economics,
University of Technology, Sydney¹

Abstract

Recently, investment in high technology companies boomed as people invested large sums of money even when there was little chance of the company being profitable. This is contrary to classical beliefs that investors have rational expectations and maximise their utility. Instead we must consider the idea that people are irrational and make decisions for many reasons, few of which involve a judicious analysis of the available data. Some individuals are over-confident, whilst others copy the actions of previous investors. This paper attempts to explain why people invested in these companies and concludes that few, if any, investors are totally rational.

JEL Classification: D84, G14

¹ Correspondence should be sent to: Sian Owen, School of Finance and Economics, University of Technology, Sydney. PO Box 123, Broadway, NSW 2007, Australia. Tel. +61 2 9415 7776, Fax. +61 2 9514 7711, Email: Sian.Owen@uts.edu.au

Keywords: Behavioural Finance, Overconfidence, Herd behaviour

Introduction

There are several Stock Markets worldwide that actively encourage high technology and speculative companies to float. All of these markets allow companies to list and raise funds through the public sale of shares and allows them to do so at a time when they are still high-risk ventures and some doubt may remain about the probability of these companies surviving. In the last few years these markets have exceptional growth followed by an equally extreme fall. For example, the performance of the NASDAQ, as illustrated in Figure 1, vastly exceeded that of either the AMEX or the New York Stock Exchanges through the same period and the boom, starting in 1999, followed by the fall at the end of 2000 vastly exceeds anything experienced by the other two markets. .

[Insert Figure 1 here]

The exceptional increase in the NASDAQ index was due to the very high levels of growth shown by certain types of companies, such as high technology firms that habitually choose this market to float on. Throughout the late 1990's these firms were incredibly popular with investors leading to a vast increase in the amount of investment funding available, hence the peak in the NASDAQ. This pattern of behaviour was not limited to just the American markets as it was repeated worldwide with markets such as the Alternative Investment Market (AIM) in the UK, the Neuer Markt in Germany, the New Capital Market in New Zealand and the Nouveau Marche in France, which all outperformed the main Stock Exchange boards in their respective countries. At the same time there was an explosion in the number of companies

listing on these Stock Exchanges as many entrepreneurs started up companies of these sorts, presumably to take advantage of the rising market.

More recently, investors seemed to realise that there was little to support these inflated share prices and few, if any, of these firms were likely to make a profit. This realisation was followed by a crash in the share prices of these companies as investors lost confidence and began selling. The crash in the share prices heralded a rash of high technology company failures as many of these companies quickly failed once they were deprived of support from their investors.

Conventional finance theory considers all investors to be rational individuals who are intent on maximising their utility. With rational expectations, most high technology companies would find it virtually impossible to persuade investors to provide funding. The potential investors would realise that the company was not a sensible investment based on an analysis of the firm's expected profitability. A truly rational investor would not purchase shares in this sort of company, as they would realise that the firm was highly unlikely to generate a worthwhile return on their investment. Nevertheless, there are many relatively small high technology companies, venture capitalists are prepared to provide these firms with start-up funds and other investors want to buy the shares when these firms are floated. This is inconsistent with the idea that investors behave rationally and other explanations for these events must be considered. In particular, behavioural finance seems to offer some explanations for the observed activities in this field. Behavioural finance combines the theory of finance with ideas from the fields of psychology and sociology to devise more realistic ideas about the way that people behave when they are making financial

decisions, as it is clear from recent market activity that prices do not always react efficiently.

Theory and Discussion

There is considerable body of research available on the subject of stock market behaviour and specifically concerning the reaction of investors to new information. Whilst the Efficient Markets Hypothesis (EMH) has considerable support in the literature, there is also a substantial amount of work that points out that this theory does not seem to adequately represent the patterns of behaviour that are often observed in financial markets. There are several market anomalies that cast doubt on the efficiency of market reactions, as the existence of these anomalies is inconsistent with the EMH. The Efficient Markets Hypothesis implicitly assumes that all investors are entirely rational and that their interpretation of new information is both immediate and accurate. There are very few people, if any, for whom that statement is entirely accurate. This leads to behaviour in the marketplace that cannot be explained with the conventional theories. A more realistic approach would be to combine conventional financial theories with suitable behavioural hypotheses that more accurately represent the manner in which individuals make decisions.

The overreaction hypothesis is one of the anomalies that does not appear to be adequately explained by the EMH. When news is sometimes released, the market seems to overreact and then, some time later, the overreaction is corrected. Related to this is the notion that stocks that previously demonstrated above average returns then perform badly in the future whilst stocks that were previously doing badly outperform

investor's expectations. Overreaction to new information has been the topic of considerable research. Basu (1978) began the analysis of this phenomenon with his extension of the 1968 paper by Ball and Brown. Basu concluded that markets could erroneously interpret differences in price/earnings ratios, which would result in inaccurate pricing of stocks in the first instance, followed by a price correction. Later papers extended Basu's work to consider a wider range of factors than just the P/E ratio and from this extended analysis came the overreaction hypothesis that states, simply, that investors may react excessively to new information. This means that prices in the market may be inaccurate but, ultimately, there will be a price correction when the initial error becomes apparent. The size of this reversal will depend on the size of the original overreaction, as DeBondt and Thaler (1985) observed. As a result, a large error in pricing will generate a large correction and vice versa. Investors also seem to overweight recent information and assign it more prominence than it deserves, irrespective of the quality or relevance of the newer information.

The problems of overreaction are further exacerbated by the fact that investors seem to react differently depending on the type of news that is released, as DeBondt and Thaler (1985) noted. One possible explanation for the asymmetry in overreaction appeared in Dreman and Berry (1995) who argued that the magnitude of the investor reaction is determined by the disparity between their expectations and the news that is released. If the newly released information merely confirms the investor's prior beliefs about a certain company then this will have little impact on the share price. Conversely, if news is released about a company that contradicts investor's previously held belief then this will have a far greater impact on the company in question. A similar idea appears in Chen and Sauer (1997) who cite previous research in which it

is demonstrated that people overreact to unexpected news, but do not react in the same way to information that conforms to their existing expectations. The occurrence of asymmetry in overreaction is not universally supported, however, with some researchers finding little or no backing for the idea. For example, according to Dissanaike (1996) the suggestion that price reversals are asymmetric is likely to be incorrect owing to the methodology applied in many papers. Dissanaike agrees, however, with the idea that buying loser stocks is likely to be more profitable than buying winners but this does not mean that the magnitude of the overreaction, or the subsequent reversal, is any greater for portfolios constructed of these stocks.

Overreaction in markets may be attributed to overconfidence in individual investors, which leads to erroneous judgements. According to Shiller (1998), this behaviour can cause both overreaction and excessive volatility in market prices. Overconfidence arises from the fact that many individuals are unrealistic about the true limits to their understanding. In surveys, the majority of people will credit themselves with above average abilities and this leads to systematic errors in judgement, as commented on by Barberis and Thaler (2001), as people are unable to correct for their overconfidence. Specifically, many individuals are known to habitually make extreme judgements about probabilities. For example, an event that is likely to take place will be thought of as a certainty, whilst an unlikely event is dismissed as impossible. This means that investors may make errors of judgement when they are called upon to evaluate the probability of a particular outcome occurring. When selecting stocks, overconfidence can lead individuals to overestimate how well good stocks will perform and underestimate poor stocks. This is related to the winner-loser hypothesis, as previously good stocks perform poorly compared to investor expectations. If the

investors are overconfident, then they may have overestimated how the stocks would perform leading, almost inevitably, to disappointment. Dremen and Lufkin (2000) could find no explanation for market overreaction to new information other than the possibility that investors were driven by sentiment in addition to their expectations about the future returns on their shares. Barber and Odean (2001) observed that overconfidence can generate high levels of speculation as overconfident investors believe that their interpretation of the available data is superior to anyone else's and they invest accordingly. These authors also found evidence that overconfident investors trade significantly more often than other people, and expect their portfolios to outperform the market by a significant margin. This follows work by Harris and Raviv (1993) who developed a model in which all the participating traders receive the same information, but each individual is able to interpret the information independently. The resulting differences of opinion encourage individuals to trade shares, as each believes that their interpretation is correct. Overconfidence may also explain why many entrepreneurs founded high technology companies in recent years and then went on to float these firms on the speculative Stock Exchanges. These individuals seemed to be convinced that they could make a profit and were unwilling to consider the possibility that they may be wrong. A related feature is conservatism, which means that people are slow to change their beliefs even when presented with new information that suggests that their initial perspective was wrong. Some individuals will even misinterpret new information so that it seems to confirm their existing belief even if the additional information actually contradicts that standpoint. These behavioural traits mean that people are able to repeat previous mistakes, allowing them to repeatedly overreact, for example.

Another relationship between heterogeneous opinions and trading was developed by Harrison and Kreps (1978), who noted that, since investors will all have individual expectations, this leads to variation in investor behaviour. In particular, speculative investors are prepared to pay more for a certain share than its current market price if they believe that the resale value will be higher at some time in the future. Exactly how far in the future will depend on the individual speculator's investment horizon.

As Shleifer and Summers (1990) argued, many uninformed traders will simply follow any trend that they believe exists in share price behaviour and this "trend chasing" increases the volatility displayed by the markets as these investors are unaware of the fundamental prices of the stocks they are trading and so are unable to stop trading when that value is reached. The strength of the price movements created in this manner cannot be discounted. In the laboratory experiments, involving both informed and uninformed investors, conducted by Caginalp, Porter and Smith (2000) price bubbles were generated by the behaviour of uninformed investors. When the informed investors were encouraged to take advantage of this behaviour, the size of the bubbles was still so large that it exceeded their efforts to arbitrage. As the investors gained more experience, albeit without more information, the bubbles became less frequent but the naïve investors still showed some preference for following the trends exhibited by other investors. This can be linked to another behavioural theory, namely herd behaviour.

When individuals demonstrate herd behaviour, they are inclined to ignore the information that they receive and replicate the previous actions of other people. This behavioural pattern occurs when individuals become convinced that the herd has

better information than they do, irrespective of the quality of their information. The classical theory of rational expectations would suggest that this is not possible but, in truth, it is unrealistic to assume that people are not influenced by the actions of others. Once people start behaving in this fashion, an informational cascade soon develops in which the decisions of the majority overwhelm the signals received by any one individual. In the case of share ownership there are two informational cascades that need to be considered. Firstly, there is the decision whether to buy the stock for the first time or to remain out of the market. In essence the decision to buy is driven by two factors, as given in equation 1.

$$D_{Jt} = E(R_{t+k} | \Omega_{Jt}) + \sum_{i=0}^{t-1} \Delta_i \tag{1}$$

The decision, D_{Jt} , is based on the expectations that the J-th investor has for future returns on the stock, $E(R_{t+k})$, given the signal that the individual receives, Ω_{Jt} , in this period. This part of the decision is the same as it would be under the rational expectations theory but here, in addition to these conventional elements, there is also the fact that the investor can see the previous actions of other investors, $\sum_{i=0}^{t-1} \Delta_i$. For convenience, it is assumed that the investors act sequentially.

In situations of this type an informational cascade can quickly develop. Consider the first investor, A, who receives a signal Ω_{At} but has no information concerning the actions of other investors, since the term $\sum_{i=0}^{t-1} \Delta_i$ has no value for this investor as there are no previous actions for A to view. Having no other information, A will act as the

signal Ω_{A_t} dictates and buy if high returns are likely or remain out of the market if low returns are expected.

A second potential investor, B, receives the signal Ω_{B_t} , and also observes the actions of investor A. B cannot see the signal that A received, only the action that results from that signal. Naturally, B can try to infer A's signal from the outcome it engendered. If A decided to buy, B infers that A received the signal H and vice versa. B ignores the possibility that A may have disregarded the signal Ω_{A_t} and did the opposite, as there is no reason, at this point, for A to act in such a manner.

If B's signal matches the action that A took, then B will do the same as A. On the other hand, B may receive information that suggests a course of action in opposition to A's observed behaviour. In this situation, B will have to decide whether to follow A or follow the signal Ω_{B_t} . B may toss a coin, for example, or decide in some other manner. Whatever method of selection is used, B will follow the course of action it nominates.

Now there is a third investor, C. C receives their own signal, Ω_{C_t} , and observes the actions of both A and B. If A and B both behaved in the same way, then C will replicate their actions irrespective of the signal Ω_{C_t} as the combined influence of A and B will overwhelm C's signal. If this happens, an informational cascade is formed and all the subsequent investors will follow the behaviour of their predecessors even if it is contradicted by their own signal. On the other hand, A and B may have acted in different ways in which case there is no pattern for C to follow and C will have no

choice but to act on the strength of the signal that they have received. This will delay the creation of the cascade temporarily but it will almost certainly develop a little later in the sequence as the actions of A, B and C will combine to suggest one course of action is preferable to the other.

When considering the decision to purchase shares, the only direction that the informational cascade can take will suggest buying the shares. This is because anybody who elects to remain out of the market is unable to indicate that choice to the other potential investors. Their decision not to participate renders them, effectively, invisible to the others, so their actions cannot influence other potential investors. Whilst this may not be the case in laboratory experiments it is obviously the case in reality.

If an individual decides to enter the market and buy shares, they are then presented with a second, slightly more complicated, decision. This concerns the options open to the investor once they have entered the market; to buy more shares, sell the shares they already own or to hold their shares in an unchanged amount. The same relationship, equation 1, represents the decision here, as it did above. The decision will be driven by the investor's expectations for future returns, based on the signal they receive, and their observation of other investor's actions. Here, however, there are three possible outcomes. The investor could purchase more shares, maintain their current holding or sell these shares and exit the market for this particular stock. As in the previous decision, one of these actions, the decision to maintain their shares unchanged, has the impact of rendering anyone takes that option effectively invisible to the later investors. Consequently, the only cascades that can develop will either

encourage investors to increase their holdings or to sell and exit the market. As the sequence progresses, an informational cascade will develop and the prices will either rise yet further or decline very rapidly depending on the direction of the cascade².

Eventually, of course, the informational cascade will come to an end. Cascade behaviour is triggered by relatively little information and, once the cascade forms, any further information entering the market will be ignored, irrespective of its quality. If anyone in the cascade realises what is happening, then they must also be aware that the actions of all the participants are based on very little information. Ending the cascade is normally the result of a shock to the system, such as the release of better quality information. This means that it is relatively easy to stop or reverse a cascade once people realise what is happening. For example, if people are investing in stocks because they believe that the returns will be high and then new information is released that suggests the returns will be low then the cascade will reverse as investors attempt to liquidate their holdings for the best possible price. The cascade could also be stopped by the actions of a single individual. If one of the investors refuses to follow the herd and acts on the strength of their information, then this is sufficient to end the cascade, assuming, of course, that their signal opposes the direction that the cascade is taking. In this situation, the cascade will rapidly come to an end as the investors realise that they have been acting on inaccurate information. This is particularly apposite in the case of buying high technology stocks. If the public imagination is

² At the current time there is insufficient data on high technology investments, and the rationale behind these investments, for any empirical investigation of this phenomenon to be conducted. The majority of existing studies on information cascades use laboratory data to support their suppositions. If suitable data were to become available, this decision process would make a very interesting area for future study.

caught by the notion of buying these shares, as it was in recent times, then an upward cascade quickly develops. The cascade pushes the share prices up until they reach values that are very far removed from the fundamental value, as happened recently with the high technology companies. All that was required to reverse the cascade was for a few investors to realise that many of these companies were incapable of generating sufficient profits to sustain these share prices. A downward cascade developed as investors panicked and tried to liquidate their holdings before the prices dropped too far. The crash in high technology stocks was born.

It is easy to see, in retrospect, how herd behaviour could explain the unrealistic levels to which some high technology stocks were driven recently. Potential investors observed that other investors were already buying stocks in these companies and followed the trend. As demand for the shares grew, so the price was pushed higher and higher. The increase in share prices could be interpreted as indicating that the herd did have superior information and this would encourage other investors to add yet more funds. According to Langer and Roth (1974), many people are inclined to attribute good outcomes to their own skill but blame bad outcomes on luck. Furthermore, early success can raise expectations for future outcomes as individuals become convinced that the good outcomes are generated by their skill. During the period in when high technology stocks boomed in price, this trait would further reinforce the belief that the herd has superior information and that the investor was correct in following this trend to buy the stocks.

An alternative explanation could be the simple desire to gamble. Studies in this area suggest that gamblers do not undertake this activity for any rational reason; they are

not attempting to maximise their utility. Gamblers are interested in the vicarious thrills generated by taking some form of risk. Similar patterns of behaviour have been found in research on investment, as discussed by Shiller (1999). Shiller quoted research in which investors were asked to explain their attitudes to buying and selling shares. Overwhelmingly, investors said that they simply enjoyed buying and selling shares, which is the same reason many people give for gambling. The pleasure that is generated by trading in shares is the same thrill that many gamblers are seeking. When selecting stocks to invest in, a thrill seeking individual would select the riskier companies, such as high technology firms. This explanation may seem overly simplistic but the strength of the urge to gamble cannot be ignored. There is evidence of people gambling extensively throughout history and today a large proportion of the population worldwide gamble in some way³. The very high level of gambling activity, coupled with the fact that a large proportion of the population engage in this activity, means that it cannot be discounted as a contributing factor when considering why people invest in high risk stocks.

These behavioural theories offer an explanation for the elevated share prices exhibited by many high technology stocks in the recent past. To explain the crash, in addition to the herd behaviour discussed above, attention anomalies need to be considered. An attention anomaly arises because public interest moves in waves because most people cannot concentrate on a large number of different events at the same time. There are always practical limits to the amount of time that people have available to evaluate a

³ For example, recent figures from the National Opinion Research Centre (1999) suggest that 68% of Americans gamble in some form and similar figures from the Australian Bureau of Statistics (2000) suggest that 80% of Australians gamble.

certain course of action and this means that public attention is variable. Shiller (1998) claimed that the changeable nature of public attention is responsible for many observed Stock Market anomalies and may be a major contributing factor to the excessive volatility he believes exists in share prices. Levels of investment and the areas in which the investment occurs seem to be driven by waves of investor attention, which change over time and, as new information is released, it concentrates investor attention on one type of stock or another. Shiller also suggested that crashes in stock market prices could be created when investor attention is suddenly concentrated on a particular market or type of stock. If this is the case, it could help explain the sudden decline in high technology share prices that occurred in the year 2000. If public attention was suddenly focused on these firms, investors may have re-evaluated their decisions to invest and realised that many of the companies had no solid fundamentals to support their share prices. Faced with this bad news, the shareholders began to sell and the prices started to drop. Soon, a downward cascade developed and this pattern of behaviour gained momentum as some panic selling also took place and, thus, the recent crash in speculative stocks was created.

Conclusion

The decision to invest in high technology stocks is not one that can be explained simply in terms of rational expectations. The probability of such companies making substantial or sustainable profits is fairly small and so any purely rational analysis of their fundamentals would not encourage investment. It is clear from recent surges in investment in these companies that, despite the concerns that these firms will not

generate a substantial return, considerable amounts of money are invested and this, in turn, implies that investors are not entirely rational.

To explain why people invested in these companies, it is necessary to consider some of the behavioural theories that exist. In particular, the volatility that these high technology stocks demonstrated could be linked to the notion of overconfidence in investors. Overconfidence leads to errors of judgement and to excessive levels of trading and these are both factors that could be responsible for the rapid increase in share price demonstrated by these companies. The desire to take risks and to gamble may encourage some investors to put their money in these higher risk stocks, as they are seeking a vicarious thrill from their investment decisions. Irrespective of which of these reasons prompted people to invest, the high technology shares were increasingly popular through the late 1990's. It seems likely that, once investors become interested in one particular type of company, an element of herd behaviour arises as investors are influenced by the actions of others and an informational cascade develops. In the first instance, this cascade encourages further investment in these companies but, when investors change their perceptions about the stocks, the cascade reverses and a dramatic plunge in the share prices follows.

The upwards cascade ends when there is a shock to the system and, in this instance, the shock was administered when some of the investors realised that they had invested erroneously and that they were unlikely to receive a good return on their investment. This realisation could have been due to a change in investor's interests, which focussed investor's minds on this particular area of the market. Once this happened, they realised that the decision to invest had been erroneous and began selling to exit

the market before prices dropped too far. This new information forced the cascade to reverse direction and created the crash in shares prices.

It is clear that the conventional theories on investment analysis and financial decision making cannot adequately replicate the patterns of behaviour demonstrated by the investors in high technology stocks in the late 1990's. These theories cannot explain why anyone would invest in these shares in the first place, let alone continue to invest as time went on. To adequately understand the investment decisions taken in this field, behavioural finance must be combined with the existing financial theory to explain the recently observed boom and bust in high technology share prices.

References

Australian Bureau of Statistics, 2000, Year Book: Australia 2000 (Australian Bureau of Statistics, Canberra).

Ball, R. and P. Brown, 1968, An Empirical Evaluation of Accounting Income Numbers, *Journal of Accounting Research*, 159-178.

Banerjee, A. V., 1992, A Simple Model of Herd Behaviour, *Quarterly Journal of Economics*, CVII(3), 797-817

Barber, B. M. and T. Odean, 2000, Trading is Hazardous to Your Wealth: The Common Stock Investment Performance of Individual Investors, *Journal of Finance*, LV(2), 773-806

Barber, B. M. and T. Odean, 2001, Boys Will Be Boys: Gender Overconfidence and Common Stock Investment, *Quarterly Journal of Economics*, 116(1), 261-292

Barberis, N. and R. Thaler, 2001, A Survey of Behavioural Finance. University of Chicago, Graduate School of Business Working paper.

Basu, S., 1978, The Effect of Earnings Yield on Assessments of the Association Between Annual Accounting Income Numbers and Security Prices, *The Accounting Review*, LIII(3), 599-625

Caginalp, G., D. Porter and V. L. Smith, 2000, Overreactions, Momentum, Liquidity and Price Bubbles in Laboratory and Field Asset Markets, *Journal of Psychology and Financial Markets*, 1(1), 24-48.

Chen, C. R. and D. A. Sauer, 1997, Is Stock Market Overreaction Persistent Over Time? *Journal of Business Finance and Accounting*, 24(1), 51-66

Daniel, K., D. Hirshleifer and A. Subrahmanyam, 1998, Investor Psychology and Security Market Under- and Overreactions, *Journal of Finance*, LIII(6), 1839-1885.

DeBondt, W. F. and R. Thaler, 1985, Does the Stock Market Overreact? *The Journal of Finance*, XL(3), 793-805.

Dissanaike, G., 1996, Are Stock Price Reversals Really Asymmetric? A Note, *Journal of Banking and Finance*, 20, 189-201.

Dissanaike, G., 1997, Do Stock Market Investors Overreact? *Journal of Business Finance and Accounting*, 24(1), 27-49

Dremen, D. N. and M. A. Berry, 1995, Overreaction, Underreaction and the Low P/E Effect, *Financial Analysts Journal*, 21-30

Dremen, D. N. and E. A. Lufkin, 2000, Investor Overreaction: Evidence that it's Basis is Psychological, *Journal of Psychology and Financial Markets*, 1(1), 61-75.

Gervais, S. and T. Odean, 2001, Learning to be Overconfident, *Review of Financial Studies*, 14(1), 1-27.

Harris, M. and A. Raviv, 1993, Differences of Opinion Make a Horse Race, *The Review of Financial Studies*, 6(3), 473-506

Harrison, J. M. and D. M. Kreps, 1978, Speculative Investor Behaviour in a Stock Market with Heterogeneous Expectations, *Quarterly Journal of Economics*, 323-336

Langer, E. J. and J. Roth, 1974, Heads I Win, Tails it's Chance: The Illusion of Control as a Function of the Sequence of Outcomes in a Purely Chance Task, *Journal of Personality and Social Psychology*, 32(6), 951-954

Mahmood, T., 1992, Does the Hazard Rate for New Plants Vary Between Low- and High-Tech Industries? *Small Business Economics*, 4, 201-209.

McGoun, E. G. and T. Skubic, 2000, Beyond Behavioural Finance, *Journal of Psychology and Financial Markets*, 1(2), 135-144.

Merton, R. C., 1987, On the Current State of the Stock Market Rationality Hypothesis, in R. Dornbusch, S. Fischer and J. Bossons, *Macroeconomics and Finance: Essays in Honour of Franco Modigliani* (MIT Press, Cambridge).

National Opinion Research Centre, 1999, Gambling Impact and Behaviour Study, Report to the National Gambling Impact Study Commission (University of Chicago, Chicago).

Owen, S. A., 2001, The Rise and Fall of the Dot.com: The Impact of Growth Rates and Funding Options on The Mortality of Internet Start-ups, Paper presented at the ICEC 2001 Conference, Vienna, Austria.

Owen, S. A., 2001, Failure in B2C Companies; Two Examples and Lessons for New Players, Working Paper Number 113, (School of Finance and Economics, Sydney).

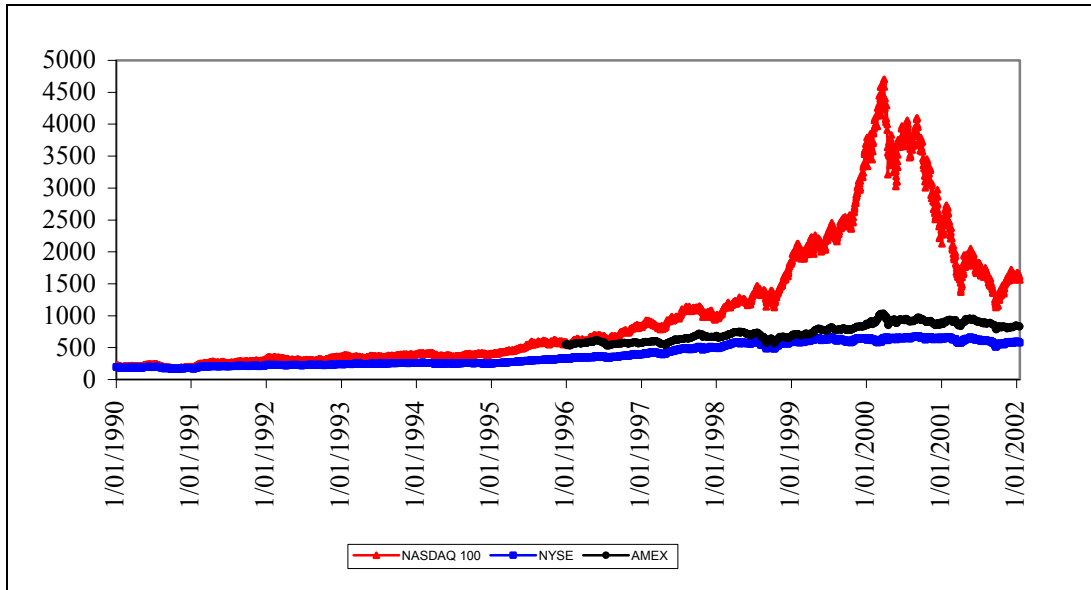
Shefrin, H and M. Statman, 1985, The Disposition to Sell Winners Too Early and Ride Losers Too Long: Theory and Evidence, Journal of Finance, XL(3), 777-792.

Shiller, R., 1998, Human Behaviour and the Efficiency of the Financial System, Working Paper Number 6375 (National Bureau of Economic Research, Cambridge).

Shiller, R., 1999, Market Volatility, (MIT Press, Cambridge).

Shleifer, A and L. Summers, 1990, The Noise Trader Approach to Finance, Journal of Economic Perspectives, 4, 19-33

Figure 1. NASDAQ, NYSE and AMEX Indices



Source: Datastream