



**Creating an adaptive asset allocation fund to outperform
inflation in the South African financial market**

Dissertation

Presented to:

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ABSTRACT

In this dissertation, I detail the process I went through to create a new asset allocation product, with the intention of beating inflation over the long term, in the south african financial market space. This process has been a contributor to the creation of my model for new product development in the financial market space. Simulation is at the core of this process. At the outset, I cover a brief history and contextualise absolute return funds, looking at the difference between an absolute return fund, a balanced fund and a hedge fund. The move from defined benefit to defined contribution pension funds and the impact this has had on consulting actuaries risk appetites is visited. My concern in this regard is that capital preservation is being maximised, at the expense of capital growth, without taking into account the devastating effects of inflation.

The context of this study takes the form of three case study papers. The first paper addresses my concern that investment professionals are not totally aware of the factors driving investment performance. The second paper deals with the question of whether it is possible to generate positive returns over time, even if the investment process being used is a random signal, through an effective cash management process. Building on the learnings from the first two papers, in the third paper, I seek to create an investment product which delivers the appropriate risk adjusted returns to investors. I make the case for an absolute return fund in this regard.

I frame the study in the form of a set of research questions, based on the grounded research conducted:

1. Decision criteria trigger levels?
2. Relevant in-sample test period?
3. Achievable return per unit of volatility?
4. Type of derivative overlays to be used?

After running an iterative simulation process, the answer which emerges is an enhanced absolute return fund, with a contrarian component, which reduces volatility of returns, manages the downside risk and generates returns greater than inflation.

For each paper, an appropriate literature review is undertaken, allowing me to understand the existing body of literature and locate my findings within the current thinking and concepts around absolute return funds and new product creation.

Contradicting outcomes lead to further review in behavioural finance. I review a paper by Kahneman and Tversky, titled "Prospect theory: an analysis of decision under risk", which used cognitive psychological techniques to explain a number of documented anomalies in economic decision making. The assumption that individuals seek to maximise utility is flawed, which is key in new product development. In paper 3, I seek to create an investment product which delivers the appropriate risk adjusted

returns to investors. New product development in the financial space constitutes intellectual property, which is closely guarded, so the process is seldom explained in detail. I review a paper on absolute return funds, written by a consulting advisory firm, from which I extract the points of significance for new product development in the south african financial market space.

With respect to research methodology, I cover research in general, moving onto research in financial markets, starting with modern portfolio theory (MPT), covering the capital asset pricing model (CAPM), arbitrage pricing theory (APT), alpha and beta coefficients, the capital market line and the securities market line, finally I elaborate on the methodology I used (grounded theory) and a dynamic simulation process.

Presenting my research results, in case study papers 1 and 2, the research question posed is answered, with the aid of a casual loop diagram, with each factor explained and a subsequent rationale with support from appropriate literature, key learnings are then highlighted. In case study paper 3, the research questions posed are answered using simulation with various iterations, the outcome is justified in the rationale and the key learnings are highlighted. At this point, I propose my theory for new financial product development in the South African financial market space.

I then review my findings, each case study paper is evaluated in terms of relevance, utility, validity and ethics. An appropriate framework for ethical decision making is applied.

I conclude, stating that in order to beat inflation, through an adaptive asset allocation strategy, any new product needs to be able to persist with the strategy selected and stand up to a simulation process, prior to being launched. Simulation highlights any pitfalls that may have been overlooked in the design phase and affords a greater understanding of how a product may react in extreme periods, without the risk of real capital loss. The significance of simulation lies in the fact that it allows others to replicate your assumptions under a multitude of potential structural economic shocks in a cost effective manner.

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This dissertation is broken down into five key chapters:

Chapter 1 establishes the relevance of the dissertation that develops the situation, concern and question. It briefly touches on the answer and the rationale. These sections are covered in great detail later in the paper.

Chapter 2 is a literature review, which deals with understanding the body of literature and locating my findings within the current thinking and concepts around absolute return funds and new product creation in the financial market space.

Chapter 3 deals with the research methodology used in this dissertation. Grounded theory is the broad methodology used. This dissertation involves three different studies, integrated into the whole, which constitutes my model for new product development.

Chapter 4 covers my research results. I describe the results gained from using the methodology described in chapter 3. The key learnings from each study are highlighted, which leads to my key result.

Chapter 5 shows my conclusions and evaluations, using an appropriate ethical framework.

CHAPTER 1

1.1 Situation and overview of the absolute return fund space in the South African financial market

In the early 1990's there were only a hand full of balanced funds available in the South African investment space. These balanced funds had developed post the crash of 1987, during which the market lost over 42% in the six month period between September 1987 and February 1988. This significant destruction of wealth during a relatively short time period highlighted the significance of capital preservation and the risks associated with concentrated investing in one asset class, specifically equities. As a result, the initial balanced funds were created, as a solution to these volatile equity investment return paths.

The crash of 1997, specifically the emerging market crisis, coupled with the crash of 1998 brought about largely due to the Russian debt default, lead to even further realisation that the concept of portfolio construction with a consideration for the correlation between different assets was paramount. In this context, during the seven years post the 1998 crash, more than R 50 billion was invested in South African absolute return funds. This flood of investment shows the extent to which investors had lost faith in traditional balanced funds. It has been argued that there are similarities between balanced funds and absolute return funds, since they essentially invest in similar assets i.e. bonds (inflation linked); equities (domestic and international); property and cash.

The fact that absolute return funds have both a risk and a return target differentiates them from traditional balanced funds which focus only on returns. The focus on risk adjusted returns is important in light of the changes the South African pension fund environment has been through over the last decade. The vast majority of these pension funds have made the paradigm shift from defined benefit to defined contribution funds, transferring the investment risk and the asset liability mismatch risk from the employer to the employee. In this light, absolute return funds, which strive to deliver real returns (returns in excess of inflation), coupled with a low probability of negative returns over a reasonable rolling period, typically three years become an attractive offering.

The magnitude of performance being targeted by South African absolute return funds tends to fall into the CPI (consumer price inflation) + 3% to CPI + 7% range. Although these targets are elevated, they do come with a standard disclaimer that return objectives are not guaranteed and that over a three-year rolling period, these returns should be achieved, while aiming not to lose money over any 12-month rolling period. This needs to be read in the context of market cycles, since during a rampant bull market it tends to be easier to outperform inflation. Consider the period around the August 1998 crash, during August the JSE All Share Index lost 29.71%. In the 12 months post this massive draw down, the JSE All Share Index returned a positive

37.21% and over a three year period returned in excess of 18% per annum on an annualised basis. The same logic may be applied to the period starting in May 2003. In the 11 months preceding this point, JSE All share Index had lost more than 36%. In the 12 months starting from May 2003, the index returned a positive 35.58% and over a three year period an annualised return of 28.50% per annum. At no stage during these periods did inflation get anywhere near these levels. The true test for absolute return funds will be during periods of weak market performance over a sustained period.

The consulting actuaries survey of traditional retirement funds in South Africa (typically managed similar to a balanced fund, with a spread between equity, bonds, cash and property) shows that over the past 25 years, around 70% of funds in the survey beat CPI + 5% on a rolling 5 year basis, however, this number drops to around 60% on a rolling 3 year basis. Increasing the target to CPI + 6% shows that far fewer funds are able to achieve their stated objectives, with just short of 60% of funds delivering over a rolling 5 year basis, and just short of 50% meeting the target on a rolling 3 year basis. In order to raise the target to CPI + 7 or 8%, a much higher risk appetite is required. On this basis an absolute return fund strategy become critical in order to preserve capital in negative market return periods.

The strategies being employed in managing absolute return funds varies widely. Across the spectrum, there are hedging strategies which use derivatives to protect against the loss of capital, "managed floor" strategies which have floor or base levels below which the fund is protected, with the objective being to lock in gains from past performance and various iterations of these approaches. Certain funds tend to focus on generating returns, while others place higher significance on the risk management component. As the levels of complexity increase, the potential for unintended outcomes increases. A common risk is the human element, with fund managers' biases and over confidence weighing on the achievement of targeted returns.

The understanding around what constitutes an absolute return fund is murky. Globally, absolute return investing doesn't refer to an investment style, like value or growth, nor does it refer to a product. It tends to be defined as an investment philosophy, or a set of investment principles beyond the conventional. This approach aims to achieve consistent, positive annual returns irrespective of whether financial markets are rising or falling. In addition the avoidance of significant losses and preservation of capital is evident in these strategies. And finally, the volatility of fund returns is actively managed. A common observation is that these strategies tend to have a low correlation to the traditional stock and bond markets.

A common counter argument to these absolute return funds is that over the long term, markets trend up and therefore, if you remain fully invested, positive returns will be achieved eventually. This argument only holds water if an individual has a very long investment horizon. The majority of people investing in these absolute return strategies are in the 55 to 65 year old range. They have already created their wealth

through many years of hard work and don't want to lose any capital at this stage of their lives. Their return objective is to beat inflation annually, while preserving their capital base. Contrast this to "traditional" asset managers, who operate on a relative performance basis. They deliver the returns in rising markets; however, in bear markets they fall short. Assume that the market is down 35% in a particular year and your retirement fund is only down 33%, most traditional assets managers think that they have provided you with a good service!

In order to understand how these absolute return funds operate in light of the stated objective being positive returns, irrespective of how the share market is doing, consider the origins of absolute return funds, in the form of the first hedge fund. In 1949, Alfred Winslow Jones, a professor of sociology at Columbia University, created the first hedge fund, after interviewing the "smartest" minds on Wall Street. He asked if they could predict the market direction. With nobody claiming to be able to do so, Jones decided that if all the experts couldn't forecast market direction, he needed to create an investment strategy that was less dependent on market direction. Jones took \$100,000 to a brokerage firm, stating that he would like to buy \$100,000 worth of stock. He then said to the broker that he wanted to sell short (selling stock he didn't already own) almost \$100,000 worth of stock. At this point, Jones had a \$100,000 long position and a \$100,000 short position. He then told the brokerage firm that he wanted to borrow some money from them. According to New York Stock Exchange rules, an investor can borrow up to 50 % of their capital. So with \$100,000 in capital, \$50,000 may be borrowed. Jones then had \$250,000 in market exposure (long \$100 000, short \$100 000 and \$50 000 in borrowed cash). Deducting the shorts from the longs, Jones had a \$50,000 net equity exposure. This highlights the concept of true "hedge investing". Jones combined two speculative techniques, short selling and leverage, to lower his portfolio volatility.

Currently, depending on the defined selection criteria there are between 18 to 40 different hedge fund strategies, such as long-short; event driven; merger arbitrage; distressed equities; market neutral and managed futures amongst others. It should be noted that less than half of these are true absolute return strategies. For a hedge fund strategy to be considered as an absolute return strategy it should be non-directional, able to benefit in rising and falling markets and it should have the ability to offset market opportunities.

The idea of constantly creating new products tends to blur the true objective behind why the product was created in the first place. A case in point would be the sub-prime loan market, which has the infamous claim to being the source of the current financial quagmire in which the world finds itself. Initially, credit was only given to credit worthy people; with the means to pay back the interest and capital components of a debt. The rapidly rising residential property market in the USA post the flood of cheap money into the system, courtesy of the US Federal Reserve, led to new product creation. The Fed had aimed to avoid a financial crisis, post the dot com era failures in March 2000. The intention was to provide sufficient liquidity in the system to stimulate

growth. What transpired was the residential property market bubble. With property prices seeming to only rise, banks took the view that they need not be as stringent in the debt provision criteria. The logic being that should they provide a mortgage to a person, secured by the underlying property, and the person defaulted on the debt repayment, they would simply repossess the property in question and sell it at a higher price, recouping the debt repayment shortfall and turning a tidy profit at the same time.

In addition, the thought process was that if a large quantity of these "sub-prime" loans were packaged into a securitisation vehicle, commonly known as a collateralised debt obligation or "CDO", they could be traded with other financial institutions in the secondary market, further reducing the associated risks. This practice spread and in the ever competitive market space, new products had to be created to get ahead of competitors. At this point, the CDO's were being traded in the secondary market and the "expert" credit rating agencies started rating CDO's based on the bank that had issued the securitisation instrument or CDO. By way of a random example, if Lehman brothers pooled ten thousand sub-prime mortgage loans (which at this stage were generally referred to as "ninja's", as the people taking on the debt had no income, no jobs and no assets) and then issued a Lehman brothers CDO, the credit agencies would rate the quality of Lehman brothers as a financial institution and therefore give the product a AAA credit rating, with no regard for what the underlying loans looked like. The practice led to further product development opportunities, as CDO's could then be issued on pooled vehicle loans, credit card debt and all with the knowledge that the quality of the underlying debts was never rated, only the quality of the issuing banks. The final stage was when banks started issuing derivatives on CDO's, giving a payoff profile of two times the underlying CDO's performance; this reached a climax with some banks issuing "quads", which leveraged the return of the underlying CDO four times. When the bubble burst, some respected financial institutions had leverage levels of up to 180 times their capital base. Consider this in the light of the famous LTCM hedge fund blow up during the later part of the last decade. At the peak, LTCM had geared their assets 55 times. At the time of their blow up, a book was written, titled "When Genius Failed", as more than one of the hedge fund partners had won a noble prize in the economics category. The point being that product creation for the sake of profit can have negative unintended consequences.

Coming back to what constitutes an absolute return fund, this time with specific reference to the South African market. Since hedge funds are not yet regulated in South Africa, they fall outside the control of the financial services board (FSB). This means that hedge fund managers may not solicit business directly from the investing public, since they are not licensed as financial service providers. A further complication is the fact that most large asset managers who manage traditional funds which are regulated by the FSB have also created hedge funds. The FSB has said that should asset managers who are regulated by the FSB offer hedge funds to the investing public, they (FSB) may revoke the asset manager's license to manage other funds. Since hedge funds are not regulated yet, the only way pension funds may

invest in them is via the 2.5% allowance under the category "other" in terms of regulation 28 of the pension fund act. Typically, hedge fund managers have created debenture structures to house the hedge fund assets. These debentures are then sold to the pension funds. This means that only a small portion of pension fund assets are invested in hedge funds.

As there are nearly 40 different types of known hedge fund strategies, with more being created all the time, it becomes virtually impossible to create legislation covering the activities for each of these different styles or strategies. For this reason, the FSB has sought to rather regulate hedge fund managers than hedge fund strategies. A point of departure is the defining of what constitutes a hedge fund. The FSB has in conjunction with the alternative investment management association (AIMA) identified two definitive variables that identify any fund as a hedge fund. The first one is the use of gearing. Gearing is having exposure in a fund to a value greater than the capital value of the fund. The second variable is being net short. Net short is the situation where a fund has sold futures contracts or individual shares to a value which exceeds the funds long assets. This definition has led to a peculiar situation in South Africa, whereby funds which are not geared and do not have net short positions, however, do make use of derivatives for hedging have been classified as absolute return funds. This category of absolute return funds is distinctly different to the definition of hedge funds in South Africa and may therefore solicit business from pension funds and solicit business directly from the investing public, without transgressing any of the FSB's legislation.

In the South African absolute return space, there are numerous competitors with sound product offerings. Of the large asset managers, there is an array of approaches. Coronation asset managers has a global absolute mandate, with a performance target of CPI + 7% and a domestic mandate fund with a target of CPI + 5%. This fund has variable equity exposure, with a portion of the equity exposure being hedged via the use of one year forward put options. Old Mutual Investment Group South Africa (OMIGSA) has a fund which focuses more on the risk side than the return side, with a shift in the focus depending on equity market volatility. They make use of a "dynamic floor" approach, with the objective of removing risks intrinsic in human judgement. A dynamic floor approach increases equity exposure in rising equity markets and decreases equity exposure in falling equity markets. In conjunction with this, dynamic floor approaches also have floor value which adjusts upward in rising equity markets. Investec asset management's "absolute opportunity fund" has a target of CPI + 7%. This fund relies on bottom-up share selection and asset allocation, quite similar to a conventional balanced fund. Sanlam Investment Management (SIM) also focuses on asset selection in its absolute return funds. They do not use derivatives and have stated that they believe that for a sustainable CPI + 5% a 30% equity exposure is sufficient. Prescient Investment Management's "Positive Return fund" has a lower target of CPI + 3% coupled with zero-risk tolerance. They use a managed floor approach in conjunction with options. The equity exposure varies, however, it is always 100% capital protected. Their buy line is that

they get all the upside, with zero downside risk. I think they should add that they get all the upside, less the cost of the option protection. Prudential Portfolio Managers has two ARF's, one fund has a target of CPI + 6% and the other has a target of CPI + 7%. Both funds rely solely on asset allocation. A differentiator of their funds is that they use inflation-linked (CPI) bonds as their core holdings. They have a median holding of 50% in CPI linked bonds which can rise to 70%. They believe that this is the only asset class which protect the fund if the market or rand have negative returns.

1.2 Concern

In the defined contribution retirement fund space, the individual now needs to take an active interest and participate in their retirement planning. Actuaries still consult to employers and employees, yet the risk of insufficient funds at retirement needs to be dealt with by the individual. The fact that the actuaries are now responsible for investment returns, since there is no fall back onto the company as in the defined benefit space, has lead to conservatism on their part. They tend to place people in buckets, based on age or life stage. What transpires is a situation whereby in the last five years of a person's working life, their investments are effectively in money market instruments, with a small portion in bonds. This strategy proves to be stable in that the risk of capital loss is substantially reduced.

My concern is around new product design in the financial services industry. In many new products, capital preservation is being maximised, at the expense of capital growth. Furthermore, the effects of inflation get negated in this passive investment approach. Without sufficient capital growth, there may be life left at the end of a retiree's pension annuity stream. This is highlighted by the effects of inflation through time growing faster than an individual's retirement fund investment returns.

Based on this concern, the relevance of my research is twofold:

1. If the returns generated by any investment portfolio are less than inflation (as measured by CPIX) through time, people will have insufficient assets to retire comfortably.
2. Secondly, if the volatility in an investment portfolio is not adequately managed, a situation could transpire whereby all the returns or a large portion of the returns generated during the capital accumulation period in an individual's working life may be forfeited in the last few years prior to retirement.

The next step in my research process was to gain an understanding of what the perception of the market place would be towards an absolute return fund created to address the concerns I have raised. To achieve this end, I conducted a grounded theory research approach. The data I gained from the grounded theory research questions was coded and used in an affinity diagram, which served as the basis for an

interrelationship diagram and ultimately a causal loop diagram, which helped to identify the drivers in the system and hence the key areas of focus.

From the interaction with the grounded research participants, the following key research problems emerged, when developing new products in the financial services industry:

1. The vast majority of absolute return funds in South Africa tend to have the basic principle of constant proportion portfolio insurance (CPPI) as a core component. In order to gain a greater understanding of the concerns around the CPPI problem, I made use of force field analysis, which highlighted the fact that during the 1987 global equity market crash the CPPI methodology failed dismally.
2. A second problem was the issue with regards to what the correct investment returns benchmark should be for an absolute return fund.

1.3 Question

Based on my concern and the associated research problem, the questions I pose are focused on gaining an understanding around new product design in the financial services industry. In order to generate an outcome which serves to address the points which emerged in my concern, a set of research questions were posed:

1. What is the right level to pitch decision criteria "trigger levels" at (client needs, investment professionals views – essentially the investment philosophy that needs to be applied), to maximise returns when developing new financial products?
2. What is a relevant "in-sample" test period? This question seeks to link the theoretical needs of a client to the investment philosophy being proposed.
3. How much return per unit of volatility is achievable through varying asset allocation in an absolute return fund?
4. What type of derivative overlays serve to accomplish this type of strategy? This question will address the risk tolerance and behavioural biases that individuals have when deciding between different investment product offerings.

These questions serve to provide a basis upon which further insight may be gained into investment philosophy and addressing the concern.

1.4 Answer

My answer takes the form of a causal loop diagram (see figure 43), which deals with the components involved in new product design. My model is derived from a synthesis of the first three papers I wrote. Each of these papers should be seen as a small win, serving as an input into the thinking and evolution of my model for new product development in the financial industry. The third paper details the steps applied and simulation process followed in order to develop a new financial product, in

the form of an absolute return fund. Paper three had a direct impact on my thinking and the evolution of my new product development model.

My answer in paper 3 takes the form of an enhancement to traditional absolute return funds. In conjunction with the traditional CPPI methodology, I introduced a strategic asset allocation component (SAA). This SAA component invests contrary to the traditional CPPI methodology in that in an excessive upward movement of the equity component in the fund, the SAA strategy would attempt to capture this excessive volatility. To do this, the fund would have to sell into the strength of the equity market component within the fund, once a certain trigger level was breached on the upside. Conversely, the fund would be required to purchase equities in a market which had fallen excessively, once the trigger level had been breached on the down side. As I ran the data, it emerged that a further refinement could be introduced in the form of a passive buy and hold (BH) strategy.

University of Cape Town

The whole process was an iterative one, with greater levels of efficiency being achieved with each new optimisation. The key concept of the simulation fund was:

- It combined "trend following" (CPPI) strategies with "contrarian" (SAA) strategies and "passive" strategies (BH).
- The strategy selection was dependant on the magnitude of the equity holding component moves within the fund.
- The fund would be rebalanced on a quarterly basis, with the magnitude of movement in the equity component holdings in the fund determining what strategy would be implemented.

The primary focus of this new absolute return fund (ARF) was:

- To create a reduction in the levels of volatility experienced in the fund's returns.
- Manage the downside risk that the fund may suffer.
- Generation of returns in excess of inflation, with volatility levels less than the equity market.

In this paper, I detail the instruments used, and the investment methodology.

The rationale takes the form of empirical data, applying the proposed methodology over a ten year period. In my opinion, a relevant "in-sample" test period was ten years; however, this time period needs to include times of extreme volatility. The justification for this assertion lies in the fact that for any absolute return fund to consistently meet and exceed its stated investment objectives, it would have to weather various "stormy periods". I chose the period from 1995 to 2005, since during this time period, the simulation would encounter:

- Extreme currency volatility during 2001
- Three market crashes 1997 – the emerging markets crisis, 1998 – the Russian debt default and 2000 – the dot com bubble bursting.
- A rampant bull market lasting from 2003 - ?

The results achieved over the test period were positive, in excess of the stated benchmark, with a lower level of volatility. The simulation proved the point that the combination of the CPPI, SAA and BH strategies yielded a greater return than the simple implementation of a pure CPPI strategy.

Based on the success of the simulation, I made a proposal to my company's board, which was favourably received, which lead to the creation of an absolute return fund, making use of this methodology. The performance of this real fund is included in the paper, coupled with thorough risk decomposition. From the investment return statistics, it is evident that the strategy delivers the intended objective, namely, returns in excess of inflation with low levels of risk in the form of volatility.

The concern put forward in this case has been shown to be relevant in the situation at hand. The concern that absolute return funds have been based on the principles of CPPI, which falls short of the investment objectives in times of continued market declines, has been dealt with in the form of an adaptive constant proportion portfolio insurance solution in conjunction with appropriate derivative overlays.

1.5 Thinking around area of study that lead to the outcome

I have always felt that investment products tend to be created firstly to maximise profit for the financial institution that create them, then secondly to serve a potential need that an investor may have. Alternatively, some of the less principled financial institutions set about proving to the public why they actually need the product that they have created.

It is the product creation space that fascinates me in the financial markets. With a specific focus on the South African market, I engaged in writing my first research paper, investigating certain participants in this segment. Given that I wanted my research to remain relevant to my day to day activities, I set about trying to understand the thinking and level of awareness with respect to what was driving financial markets, as viewed by investment professionals in the company I worked for. In my second paper, based on the learning from my first paper, I set about testing whether "cash management" within a fund, or rather capital preservation was a key to outperforming the market. With the knowledge gained from the first two papers, I documented my view of product creation, in the form of highlighting the steps I had gone through to conceptualise, test and implement a new investment product in my third paper.

In considering a common theme which emerges from the papers I wrote, I felt it was best to treat each paper as a case study, striving to observe a common thread, allowing me to extract key learnings which would serve as the basis upon which I could build my theory of new product creation in the South African financial markets. For a brief synopsis and the key learnings I gained from the first three papers I wrote, please see APPENDIX 8.

CHAPTER 2

Literature review

The purpose of this literature review is to establish the current body of knowledge relevant to the research topic and then locate my findings in that body of knowledge.

This takes place at three levels (as I review each paper or article, I classify it according to which of the three levels it falls into):

2.1

The middle level, which considers the key concepts captured in my concern (new product design in the financial services industry) and my question (which centres around a set of questions which provide insight into investment philosophy) and what the literature says around these items. This may be sub classified into a further three levels:

- a. New product development. Followed by a consideration of new product development in financial industry. I also look at the history of new product development in the financial industry, in light of the belief in EMH.
- b. Financial industry challenges.
- c. Changing environment that makes a good new product development process imperative to deal with complexities of the changing environment, or changing economic environment.

2.2

The Upper level, which considers the challenges in the financial services industry in general. There are numerous challenges, a key one is that new product development tends to focus on market capitalisation weighted indices. The role of behavioural finance and inflation needs to be considered in new product development. The question of whether financial markets are efficient needs to be addressed.

2.3

Finally, the lower level is a focus on my findings. Here I look at some of my findings and state what literature says, for example, is it possible to always outperform the market?

2.1 The middle level

New product development

I reviewed a paper titled "Application of grounded theory for concept analysis in new product development process" written by Alper Sen in January 2006.

Abstract:

There is always a gap between analyzing the data and drawing the charts in relation with these data. During the development of new products, there comments on data are having vital importance. The more data collected to be specified, the more success gained to lead to a breakthrough. By stating the correct data, the project of developing new products under appropriate concepts are accomplished. In order to apply the data correctly, these data are driven by some techniques.

In this study, One of these techniques, Grounded Theory is chosen to be examined according to basic examples. By the assistance of these examples, the theory is clarified. In order to be more precise, a case study is established and detailed with the data of developing a new product with a novel concept.

In this paper, the author applies grounded theory to understanding the concept of industrial design and the creation of value through new, innovative products with increased functionality and attractive appearances. The situation is defined and a suitable problem is defined. The author defines grounded theory and provides alternate views on the application of grounded theory. A detailed process explains the different approaches to data gathering and coding. He makes use of causal link diagrams, after defining how the factors in the diagram link to each other. Different levels of abstraction are introduced in the causal link diagram process. The author draws a conclusion based on this method of research. The methodology is then applied to a case study for a industrial designed item, a vegetable peeler. The product is detailed and compared to historic models. The approach to design is highlighted, followed by an elaboration of how the product was marketed. An interesting point is that once a reliable handle was designed, it was used as the basis for creating numerous similar products, highlighting the applicability of the design process across different areas. A logical argument is provided as to why the product was a success and what need it filled for clients. The case study is then approached, from the point of cognition, issues such as aesthetics, product identity and ergonomics are shown to be contributing factors to the success of the product. In the conclusion, the statement is made that the definition of what form success will take, and the impact data collection will have on the research project. The appendix highlights the reviews associated with the product and the table of data representing these reviews. I view the paper as informative, since it clearly shows how new product design doesn't happen in isolation, it is a component of a larger system, involving amongst others, design, consumers attitudes and the path to market.

New product development in the financial industry

In surveying the South African investment space for absolute return fund papers, I came across a survey on Absolute Return Funds. The title of the survey was:

Novare Actuaries and Consultants
South African Absolute Return
Funds Survey
June 2005

Foreword

"Over recent years we have seen an increase in the number of absolute return type of products entering the South African market. We believe this resulted from the "demand driven" needs of investors, as well as the "cost push" by asset managers that created this area for trustees and retail investors to invest in. Due to a run of severe bear markets over the past 10 years, trustees of pension funds and retail investors have become very dissatisfied with the limited returns of traditional balanced funds. As a result, they became more and more conservative and did not want to lose any money. At the same time, trustees of pension funds became (and are becoming) more focused on the specific objectives of their funds in order to meet the liabilities of their pension fund (irrespective of whether it is a defined benefit scheme or a defined contribution scheme). These objectives are normally specified in terms of inflation – to outperform a real return benchmark with a low probability of making losses over any specified rolling period. Absolute return funds address these objectives - either as a building block in the complete solution for a pension fund, or as a single fund satisfying the pension fund's unique objectives. Much has been written about absolute return funds lately. Some articles refer to absolute return funds as disguised balanced funds, while others say that they only provide cash returns with high fees. However, it is our belief that absolute funds do play an important part in the asset management environment and in this document we provide an overview of the South African absolute return industry. We trust that this document adds value to the industry."

The common thread identified in South African absolute return funds is the objective of delivering performance in excess of inflation, with a low probability of delivering a negative return over a specified rolling period. The industry appears to be growing at a rapid rate, in excess of 50% over a one year period. The funds serve as a diversification asset in a pension fund and tend to outperform cash. Most funds seek to perform at a level of CPI + 6% over a rolling 3 year period, with the aim of not losing money over any 12 month rolling period. It is key to understand the type of strategies being employed in the fund, since these differ from manager to manager.

The fee structure appears to be a basic fee in conjunction with a performance fee. I disagree with the charging of a performance fee, since this effectively creates an incentive for the fund manager to take on more equity holdings in the fund, with the intention of achieving more of the equity premium upside. I believe this to be at the expense of the risk management component that is integral in this type of fund. I would rather suggest a higher base fee, with no performance fee, that way the client and the fund manager have an alignment of interests.

There appears to be four approaches involved in running an absolute return fund, with the potential of combinations of the four:

1. Strategic asset allocation
2. Tactical asset allocation
3. Bottom-up stock selection
4. Protecting downside risk via derivatives

The key advantage these funds offer:

- Absolute return funds are assisting in the paradigm shift to move towards a real return objective.
- Performance of these funds is compared against their own objectives, not peers'.
- The general investment philosophy of these funds is to protect capital during bear market periods.
- These funds seek to reduce the volatility of returns.
- These funds tend to have higher levels of diversification than balanced funds.
- These funds have a tendency to provide more positive monthly returns than balanced funds.
- Because of these funds being developed against a fairly new environment, asset managers have designed unique products to address the needs of investors – thus the intellectual capital has also increased. This allows the relevant individuals to be more accountable, rather than only being part of large teams.

Disadvantages

- There is no absolute guarantee provided and therefore, negative returns may be delivered, thus not meeting the objective.
- Inflation volatility makes it difficult to meet the real return objective.
- Long-term returns are expected to be lower than balanced funds during equity bull market periods.
- The diversity of strategies employed by the managers leads to complexity, making it difficult for the man in the street to grasp.
- Capacity constraints do limit the size of capital that these funds may manage.
- Fees charged tend to be higher than those applicable for traditional funds.

Coming back to the issue of fees, I believe that a key question needs to be asked, do fund managers systematically outperform the market?

I came across early research done, highlighting the fact that "net of expenses, managed funds under-performed a buy-the-market-and-hold strategy" (Sharpe 1966 and Jensen 1968). In addition, Lakonishok, Shleifer and Vishny (1992), showed that the equity component of US pension funds during the 1980s underperformed the Standard and Poors 500 Index of US shares on average by 1.5% – 2.5% per annum, before taking into account management fees. Funds would have performed better had they frozen the composition of their portfolios; their active management detracted value.

For this reason, I would suggest the consideration of an exchange traded fund such as the SATRIX products, provided by the JSE. An exchange traded fund seeks to replicate as far as possible the price and yield performance of a chosen index, on a passive management basis. In addition, the fund is managed by the exchange, with minimal fees. The ETF is traded on the exchange and the underlying shares which constitute the ETF are held by the appointed custodian of SATRIX. In order to generate additional income, SATRIX lends out these underlying shares to hedge funds; banks and individuals who wish to sell these particular shares short. This translates into an additional revenue stream for SATRIX, which gets fed back into the management company, and offset against administrative and operational / transactional costs, leading to a reduction in the fee to the end client. The fund is continuously rebalanced and SATRIX creates or redeems ETF units as per their client base demands. A quarterly dividend is distributed to clients and should clients hold more than R1 million rand notional in any of the SATRIX index tracking ETFs, they may elect to swap their SATRIX units for the underlying shares in the ratio that these constitute the representative index. The key benefits with respect to this type of investment are accessibility; liquidity; a transparent investment vehicle; low costs and flexibility. The indices which get tracked, as separate products are the top 40 companies on a market capitalisation basis, the industrial index, the financial index and a dividend index amongst others, including new foreign indices trackers.

The history of financial market product development

The paper I considered was "The Adaptive Markets Hypothesis: Market Efficiency from an Evolutionary Perspective" by Dr. Andrew W. Lo, a professor at MIT's Sloan School of Management.

Abstract

"One of the most influential ideas in the past 30 years of the Journal of Portfolio Management is the Efficient Markets Hypothesis, the idea that market prices incorporate all information rationally and instantaneously. However, the emerging discipline of behavioural economics and finance has challenged this hypothesis, arguing that markets are not rational, but are driven by fear and greed instead. Recent research in the cognitive neurosciences suggests that these two perspectives are opposite sides of the same coin. In this article I propose a new framework that reconciles market efficiency with behavioural alternatives by applying the principles of evolution - competition, adaptation, and natural selection - to financial interactions. By extending Herbert Simon's notion of "satisficing" with evolutionary dynamics, I argue that much of what behavioralists cite as counterexamples to economic rationality - loss aversion, overconfidence, overreaction, mental accounting, and other behavioural biases-are, in fact, consistent with an evolutionary model of individuals adapting to a changing environment via simple heuristics. Despite the qualitative nature of this new paradigm, the Adaptive Markets Hypothesis offers a number of surprisingly concrete implications for the practice of portfolio management."

In the paper, Lo postulates that markets are inefficient and therefore successful active management is possible, with competing groups of investors, with opposite views, closing out clear inefficiencies. Lo views the financial markets as an ecosystem, comparing financial markets and evolutionary forces. In the paper, he integrates some findings from behavioural finance and proposes the concept of competitive, evolutionary markets. Lo argues that investors tend to be self-engrossed. Elaborating, he states that adaptation and innovation in investment strategies is a function of competitive forces between competing groups of investors. In addition, he states that investors make the same mistakes, many of these mistakes are detailed in the behavioural finance research, however, investors do have the ability to adapt and learn. From these mistakes, it is apparent that there is a level of natural selection which shapes the financial market ecology, in the form of successful investors being imitated while unsuccessful investors change their approach or leave the financial markets and seek greener pastures. Thus he argues, evolution determines the financial market system dynamics. The key implications in Lo's hypothesis are risk / reward relationships are unstable and non-linear; risk premia are variable through time; limited arbitrage opportunities do exist from time to time; strategies do fall in and out of favour, for example, growth and value cycles and finally, adaptation and innovation are keys to survival.

Financial industry challenges

I reviewed an article titled "Strategic challenges in financial services industry - targeting small business accounts" by Henson S W, and Wilson J C, published in the Journal of Business & Industrial Marketing (UK), 2002 Vol 17 No 5.

Abstract:

In the first of three articles that look at the market for small business financial services, uses the case of a small, local US bank to provide insight into local market changes in the financial services industry and to illustrate the interaction between strategy and execution. Begins with a brief review of the financial services industry in the USA, explaining how macro-environmental changes have affected competition in the industry, and then describes the local market and Parish National Bank's positioning. Goes on to detail the bank's strategy - focusing on high touch, high technology and targeting small businesses, tailoring products to their needs - and then assesses how successful it has been in implementing this strategy.

This article clearly identifies the challenges facing the financial industry, which is largely driven by external factors, in the form of what is happening in global financial markets. The article details how even if you are focused on clients and have a high level of interaction with them, many of the products available in the financial markets are becoming commoditised, providing the larger players who have economies of scale a competitive advantage. The article argues in favour of high levels of customer contact and the provision of a personalised service. A key point is the focus on what market segment should be pursued. I draw the conclusion that you can't provide everything to everybody, you need to clearly define your competitive niche and play in that space. In addition, financial products tend to be sold on trust. Levels of trust evolve through time, based on numerous interactions, trust can't be bought through an expensive multinational advertising campaign. I would argue that the article highlights the fact that you need to think globally, while operating your business with a local focus. In times of financial crisis, people tend to focus on their immediate environment and expect service providers to be aware of local issues.

Changing environment that makes a good new product development process imperative to deal with complexities of the changing environment, or changing economic environment

I reviewed an article in the financial times, titled "The future of investing: costly cogs, misfiring machine", written by Burgess K on 28 September 2009.

Abstract:

Suggests that the financial crisis has shone the spotlight on the problems associated with the financial investing industry. Reports how many believe that the free market is not working for the good of society but is serving itself; quotes those who have called the efficiency of markets into question, Provides the example of the UK equities market to demonstrate how the complexity of the system has dramatically increased costs and made it difficult for investors to make sound financial investment judgments. Highlights how there is a growing consensus that change is needed; identifies the challenges facing regulators as they attempt to grapple with the need to realign the industry better with the interests of consumers. Records how many believe that a fundamental rethink of investment process is needed and refers to how many remain unconvinced that nationalisation provides a solution to the problem.

This article deals with one of the key issues associated with new product development in the financial market space. The substantial destruction of value experienced during the crash of 2008 has highlighted how vulnerable certain products are to the whims of the market. The fact that consumers end up being the victims and that the banks and asset managers who designed the products move on to design new products, which appeal to a new set of investors, with no recall on the previous products they designed, which failed needs to be addressed. There is a certain paradox in the article, since the argument is made for increased regulation and control of products being offered to the investing public, while the cost of investing needs to be reduced. In order to increase the level of control and regulation, the number of regulators needs to be increased, which serves to increase the cost of investing, as the banks and asset managers that design these products merely pass on the associated increased regulatory costs to the client. For this reason, I believe that the question I raise regarding investment philosophy, needs to get greater recognition in the design phase. Products need to address a specific client need, not merely serve as an additional revenue item for the company that created them.

2.2 The upper level

A focus on market capitalisation weighted indices

A paper I reviewed in this field was seeking to address the drivers of investment performance and was written in 2007 by A. Rabial, an honours student in the actuarial science degree at the University of Cape Town.

Abstract:

"A quantitative study of financial statement drivers of share performance in the banking and property sectors of the South African stock market

This article aims to establish the most significant financial statement drivers of share performance in the banking and property sectors of the Johannesburg Stock Exchange. It makes use of linear regression techniques and fundamental indexation to do so, and is a highly quantitative study as a result. Data from 31/12/1996 till 31/12/2006 was used in our study. The first method determines which financial statement factors are best related to share values in each sector. The second determines which financial statement metric/s one should weight their portfolio constituents by to earn superior risk adjusted returns. The four metrics considered are trading profit, book value, cash flow and dividends. Based on the linear regressions, trading profit is most significant factor in the banking sector, while book value is the most significant in the property sector. Weighting both the banking and property sectors according to cash flows yielded the highest risk adjusted returns over the study period. Market capitalisation weighted portfolios were shown to be suboptimal in the process of our study, in both the sectors over the study period."

My opinion is that this paper applies a sound methodology in the form of linear regression to identify which financial statement factors are related to share values in each sector. The sample period is relevant, since during the time period, an extreme interest rate shock was experienced; a currency meltdown and an exogenous factor took place, in the form of the world trade centre event on September 11 2001. I would however argue that the outcome is a best fit for the sample period and that a certain amount of "curve fitting" is evident in the findings. The finding that market capitalisation weighted portfolios proved to be suboptimal is significant, since it highlights the importance of asset allocation on an active basis, in contrast to passive index based investments, one of the key concerns in my thesis. The factors under consideration in Rabial's paper were of a financial metric nature, in contrast to the factors which I consider such as market confidence levels; sentiment; uncertainty; subjective biases and how these impact upon market cycles and the level of volatility in the market. In attempting to understand how these human factors actually impact financial market performance, I feel that "behavioural finance" needs to be explored.

Behavioural finance and the role of inflation

In this field, Yale University professor Robert Shiller wrote a book titled "Irrational Exuberance", named after Alan Greenspan's "irrational exuberance" quote. The first edition was published in March 2000, at the height of the dot-com boom, highlighting several arguments demonstrating that global stock markets were overvalued at that point in time. Ironically, the NASDAQ peaked during the month of the book's publication, and collapsed shortly thereafter. In 2005, he published the second edition, updating the book to cover the housing bubble, with specific focus on the United States. In the book, Shiller writes that the real estate bubble could soon burst; supporting this claim by showing that median house prices were six to nine times greater than median income in some areas of the United States. He proceeded to show that home prices, in real terms had produced returns of less than 1% per annum.

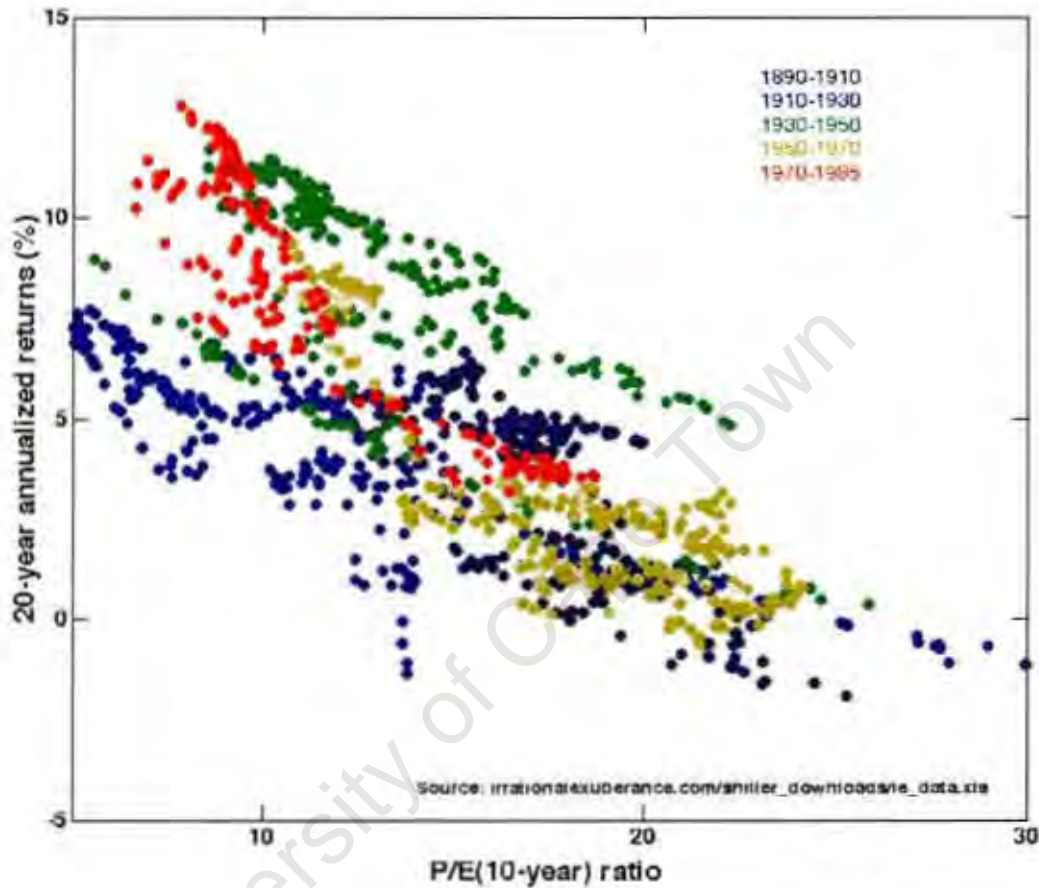
The graph in FIGURE 1, an extract from his second edition of the book, clearly highlights the fact that economic factors, in this case, the appropriate one being the building cost index from 1985 to 2005 had actually declined, coupled with the fact that the population growth rate had not increased at a rate of change in excess of the previously observed 20 year period, however, the home price index had shot through the roof over this 20 year period, with the 10 year treasury bonds maintaining a constant decline in yield, serving as a proxy for the cost of capital. So from a "logical" economic model perspective, this anomaly can't be explained. I would argue that this serves to prove the fact that investors are not aware of the fact that multiple factors working in conjunction could drive the level of sentiment, leading to financial bubbles. Perversely, it could be argued from this data that the investing public sentiment actually drives market cycles, opposing the commonly held perception that the inverse is true. Of course, it could also be argued that a slight decline in the cost of capital could have a marked impact on sentiment, leading to a greater propensity for higher debt levels, creating the right environment for a bubble to develop.

FIGURE 1: SENTIMENT NEGATIVELY CORRELATED?



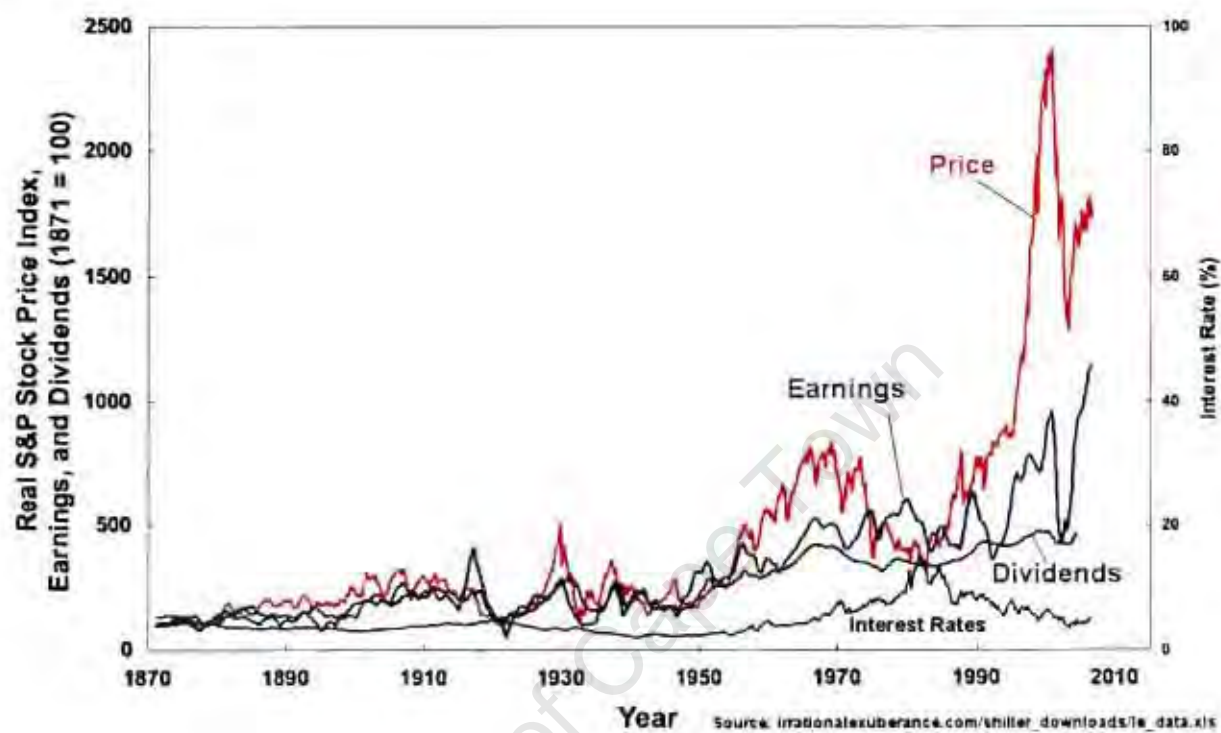
In FIGURE 2, Shiller plots 10 year price/earnings ratios (he uses the real, or inflation adjusted price divided by the previous 10 year mean of real earnings), as a predictor of 20 year annualized returns, assuming reinvestment of dividends and only selling in twenty years time. I perceive this graph to highlight the situation where increasingly positive sentiment reduces uncertainty, leading to a rising market cycle, reinforcing subjective biases with respect to valuations, leading to further price volatility as the market psyche adjusts to new price levels, feeding back into subjective biases, ultimately impacting market confidence levels. The clearest representation of this occurs in the period 1910-1930, with extreme confidence levels, leading up to World War 1, and resultant stratospheric P/E valuations impacting annualized returns, leading to a bubble in 1929 and ultimately a crash, from which excellent annualized returns are achieved in the 1930-1950 period.

FIGURE 2: TEN YEAR P/E RATIOS COUPLED WITH 20 YEAR ANNUALIZED RETURNS



In FIGURE 3, Shiller plots the real S&P stock price index, earnings and dividends. The key in the graph is the level of interest rates. The spike in interest rates during the 1980's was after the stock market had bottomed out. A situation where it could appear that things could not get worse and sentiment must have been at an all time low. The subsequent decline in interest rates, to a level only slightly lower than where they were during the late 1970's sell off, leads to the greatest bull market in a century, peaking in 2000, when the dot-com era caused the party to end abruptly. The key point I take from this is that market confidence levels change differently when presented with the same economic variable level, in this case interest rates, when sentiment appears to be at a turning point. This again highlights the multi-factor nature of financial markets, with booms and busts leading to positive innovations, such as the technological boom.

FIGURE 3: REAL S&P STOCK PRICE INDEX, EARNINGS, DIVIDENDS AND INTEREST RATES.



Are financial markets efficient?

The question being addressed hinged on the concept of markets being efficient, the efficient market hypothesis (EMH) as proposed by Professor Eugene Fama, effectively stating that it is not possible to consistently outperform the market by using information already known by the markets, except through luck.

A paper I considered in the EMH space was "The Efficient Market Hypothesis: A Survey". The paper was written by Meredith Beechey, David Gruen and James Vickery in January 2000.

Abstract

"The efficient market hypothesis states that asset prices in financial markets should reflect all available information; as a consequence, prices should always be consistent with 'fundamentals'. In this paper, we discuss the main ideas behind the efficient market hypothesis, and provide a guide as to which of its predictions seem to be borne out by empirical evidence, and which do not. In examining the empirical evidence, we concentrate on the stock and foreign exchange markets. The efficient market hypothesis is almost certainly the right place to start when thinking about asset price formation. The evidence suggests, however, that it cannot explain some important and worrying features of asset market behaviour. Most importantly for the wider goal of efficient resource allocation, financial market prices appear at times to be subject to substantial misalignments, which can persist for extended periods of time."

Their point of departure is to question the theory of EMH, referencing the fact that Fama updated his, stating that in an efficient market, the asset prices 'fully reflect all available information' (Fama 1991). By implication, prices should always be at levels consistent with fundamental valuation metrics. This is a very broad statement, based on the strong version of EMH, which could only hold if there was no cost associated with attaining "all available information". They contend that if sourcing financial information was costly, it would only be sourced if there was an appropriate financial incentive for doing so. The irony of this statement is highlighted in the statement that there would not be a financial incentive if the information was already 'fully reflected' in asset prices, made by Grossman and Stiglitz in 1980. A financially viable statement is that prices reflect information up to the point where the marginal benefits of acting on the information, with the expected profits to be made do not exceed the marginal costs of collecting it (Jensen 1978). The concept of asset prices moving as randomwalks is addressed, as per the statement; "Asset prices in an efficient market should fluctuate randomly through time in response to the unanticipated component of news" (Samuelson 1965). The reality is that stock returns are partially predictable however; the actual level of predictability is small when compared with the high level of variance

in stock returns. This is corroborated by the findings that there is evidence of mean reversion in returns on stock portfolios with holding periods of three to five years and greater (Poterba and Summers 1988; Fama and French 1988).

Effectively, EMH may be disputed, based on numerous stock market anomalies covered in the paper under review and the findings of various others, such as:

1. Value effects

After controlling returns for company size and the variance of portfolio returns, shares of companies with lower P/E ratios tend to outperform the market (Fama and French 1992).

2. Momentum effects

Given that value shares tend to produce superior returns over long investment horizons, the opposite appears applicable in the shorter term. A paper by Jegadeesh and Titman (1993) finds that portfolios with high returns in the recent past continue to produce above-average returns over a 3–12 month horizon. In addition, Chan, Jegadeesh and Lakonishok (1996) provide evidence that the momentum in share returns can be partially explained by the slow speed with which the market adjusts to profit surprises, either positive or negative.

3. Size anomalies

Small market capitalisation shares provide higher average returns (Banz 1981). It was argued however that this may reflect a distressed firm effect (Chan and Chen 1991). The logic being that since small market cap shares encompass a larger spread of companies in financial distress, the higher expected returns experienced by these small shares may be a form of compensation for exposure to the increased risks associated with investing in distressed firms.

EMH served as a major breakthrough in the 1960's, when initially proposed by Fama, and forms the basis of many subsequent studies. These subsequent studies served to back up EMH, however, they also served to close the opportunities associated with EMH, leaving many glaring questions unanswered, for example, the 1987 crash, which to this day is still not properly attributed to any specific factor or set of factors.

Following EMH, I revisited behavioural finance, since behavioural finance studies show how cognitive or emotional biases, which may be individual or collective, create anomalies in market prices which are inexplicable via EMH alone.

The key issues in behavioural finance include "Why investors and fund managers (both lenders and borrowers) make systematic errors". The area of study considers the impacts on asset prices and the consequential returns due to these errors, ultimately leading to market inefficiencies. The field also attempts to explain what companies and individuals in the financial space do in order to take advantage of these market inefficiencies, commonly referred to as arbitrage trading. There is a consideration of the over or under reaction to new information and how this reaction may result in a trend, which could transpire in a crash or a bubble such as the dot com era in the late part of the last century. Certain commentators have ascribed these reactions to herding instincts; noise trading; overconfidence and a lack of attention to detail. There is also a reference to the lack of asymmetric nature between decisions to acquire or keep assets, often referred to as the "bird in the bush" paradox. This is strongly evident in the loss aversion or regret that an investor attaches to a decision involving an emotionally valued resource such as their house. This loss aversion presents itself in investor behaviour as an unwillingness to sell shares if the sale would result in the trader having to realise a loss (Genesove & Mayer, 2001). It may also help explain why housing market prices do not adjust downwards to market clearing levels during periods of low demand, since people tend to hold onto the asset, "denying" any loss, since it is not realised.

In order to understand these dynamics, researchers have been conducting studies in experimental finance, effectively creating an artificial market with the aid of simulation software to study people's decision making process and resultant behaviour in various financial market states, such as rampant bull markets, crashes and side ways trending markets. This field crosses into the psychology of a trader, attempting to identify whether certain personality types are better suited to making rational decisions in times of extreme stress.

2.3 The lower level

Is it possible to always outperform the market?

I considered the work by Kahneman and Tversky, titled "Prospect theory: An analysis of decision under risk", which used cognitive psychological techniques to explain a number of documented anomalies in economic decision making.

Abstract

"This paper presents a critique of expected utility theory as a descriptive model of decision making under risk, and develops an alternative model, called prospect theory. Choices among risky prospects exhibit several pervasive effects that are inconsistent with the basic tenets of utility theory. In particular, people underweight outcomes that are merely probable in comparison with outcomes that are obtained with certainty. This tendency, called the certainty effect, contributes to risk aversion in choices involving sure gains and to risk seeking in choices involving sure losses. In addition, people generally discard components that are shared by all prospects under consideration. This tendency, called the isolation effect, leads to inconsistent preferences when the same choice is presented in different forms. An alternative theory of choice is developed, in which value is assigned to gains and losses rather than to final assets and in which probabilities are replaced by decision weights. The value function is normally concave for gains, commonly convex for losses, and is generally steeper for losses than for gains. Decision weights are generally lower than the corresponding probabilities, except in the range of low probabilities. Overweighting of low probabilities may contribute to the attractiveness of both insurance and gambling."

The key points I took out of the paper were that people tend to avoid risk, focusing rather on a certain outcome, even if less attractive than an alternative choice which may have a lower probability, however a more desirable outcome. This cuts to the core of most economic theories which assume that individuals aim to maximise utility, when it is actually certainty that individuals appear to desire. By way of example, this may answer why only certain athletes break through barriers that are perceived to be unattainable by the rest of the pack, who rather set "realistic and achievable" goals. This has a direct impact on financial market product development, since the traditional argument has always been that individuals seek to achieve maximum returns. I would argue that this paper highlights the fact that an investment product should at its core, seek to deliver stable, consistent returns rather than merely seeking to generate the highest possible performance, with the associated variance in the return series. The fact that people gamble and in addition, pay high insurance premiums, highlights the fact that decisions tend to be made in the absence of an appreciation for statistical probabilities. This presents an opportunity for the inclusion of risk transferring instruments into an investment portfolio, such as option contracts, since individuals will tend to miss-price these, especially if they are far out the money options with a low

probability of being exercised. Nassim Taleb has built a business around the principle of purchasing extreme event options, to which he refers as "black swan events".

While conventional finance models have been unable to solve the equity premium puzzle, Benartzi and Thaler (1995), claim that they have solved this conundrum via the application of prospect theory. This may suggest that rational / logical economic models may be an oversimplification of the complex financial system, with the desire of achieving maximum utility being irrelevant.

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CHAPTER 3

Research methodology

Since the program for which I am writing this thesis is focused on management practice research, we were required to use the grounded theory research methodology. In 3.1, I discuss research in general. In 3.2, I discuss research in the financial markets and in 3.3 I discuss the research methodology I used in this paper (grounded theory). In 3.4, I highlight some of the advantages and disadvantages associated with grounded theory.

3.1 Research in general

Loosely speaking, research is conducted by everybody, typically to solve a particular problem. For example, a school leaver may be wondering which university would offer courses in a particular field of study that they wish to pursue. Sourcing information on the courses offered by various universities, conducting interviews with current, past students and the faculty members of a university constitutes research in this instance.

The Oxford English dictionary defines research as "the systematic study of materials and sources in order to establish facts and reach new conclusions", as a verb, it is defined as "carry out research into" or "use research to discover or verify information to be presented in (a book, programme, etc.)". Its origin is attributed to obsolete French 'rechercher', from 'cerchier' 'to search'. The definition suggests that it is the application of the mind to investigating a problem / situation. The objective of this research application is typically to understand and explain the problem being dealt with, so as to create a framework, or model upon which further work may be done, leading to an increase in the body of knowledge around a specific area of study. I am suggesting that this research takes a scientific form; however, my studies have led me to the conclusion that this need not be the basis of all research.

In scientific research, specific methods are applied, providing researchers with data or information from which theories may be constructed to explain what is being observed, such as testing the changes in physical form that different substances undergo in zero gravity environments. Scientific research typically expands on existing knowledge by conducting new experiments.

This contrasts with historical research, where historians use primary information sources (written or oral), coupled with other evidence to research and then to write history as they perceive it.

The historical research method is questioned by Gilbert J. Garraghan in his book "A Guide to Historical Method" on various fronts; the criticism takes the form of six inquiries:

1. On what date was the source, written or unwritten, produced?
2. In which place was it produced?
3. Who was the author?
4. Was it based on existing material / what analysis was engaged?
5. What form did the original product take / what is its integrity?
6. Is there evidence to back up the contents / how credible is the research?

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This questioning highlights the importance of how information is gathered, interpreted and presented, if it is to be considered credible.

Taking this notion further, research findings may be rejected by the community in which the research takes place. For this reason, the field of epistemology needs to be considered, when engaging in any form of research. Epistemology focuses on the debate around the nature of knowledge and how it relates to similar notions such as truth, belief, and justification. The field also considers the means of production of knowledge, as well as scepticism about different knowledge claims, key questions in this field take the form of "What is knowledge?," "How is knowledge acquired?," "What do people know?," "How do we know what we know?."

In this paper, I do not address these questions, which tilt towards the philosophical side of research, and the "knowledge", rather, I focus on the results I get from the method of research I conduct and how that may be translated into a value adding component in the creation of new financial products in the South African market place.

A common thread appears in the literature, i.e. the process of research tends to be of a certain structure. Apart from the classification of the research in to scientific / non-scientific, the process tends to start with the formation of a topic, upon which a hypothesis is stated. Theoretical definitions are then presented, coupled with working definitions. Relevant data is then gathered (via numerous different methodologies). The data is then analysed and interpreted. This is then applied to the hypothesis, typically, the objective being to disprove the hypothesis, from a critical perspective, thus eliminating another assumption from the body of knowledge. A positive outcome leads to a statement that the research supports the hypothesis. This tends to form a basis for prediction, which may be verified through further research. This further research could ultimately disprove the hypothesis, leading to a new hypothesis. The process is iterative.

Common to most research is the attempt to add to existing knowledge. I found three broad fields of research in my readings, namely, investigative research dealing with new areas of study; practical research which develops a solution for a specific problem and empirical research which tests the viability of a solution based on observed data.

3.2 Research in financial markets

In the field of finance, research focuses on the variables of time; money; risk and the interrelationship of these variables. Research in the financial markets arena tends to be split between academic research and industry research typically provided by the sell side of the industry i.e. investment banks and stockbrokers to asset managers. In addition, asset managers have their own internal research teams within the business. Over the past couple of years, this divide has tended to become blurred, with some of the greatest brains in the academic world making a move into the realms of the financial market practitioner.

Academic research takes the existing body of knowledge and builds from this base in order to increase the understanding of what is driving financial markets ex-post and what adaptations to current market models need to be made in order to avoid underperforming a given investment return benchmark, be it a market index or an economic index such as inflation.

The point of departure for most current research in financial markets, with specific reference to the fund management component of the financial markets, is modern portfolio theory (MPT). MPT proposes how rational investors will use diversification to optimise their investment portfolios, and how a risky asset should be priced in this context.

The basic concepts of MPT are:

- **Diversification**

Diversification is a risk management technique, related to the hedging of a portfolio, achieved through mixing numerous investments within a single portfolio. Due to the fact that the fluctuation of a single investment has less impact on a diverse portfolio, diversification minimises the risk associated with any single investment in the portfolio. There are three primary strategies used in improving diversification:

1. Spread the portfolio among multiple asset classes, such as individual shares, unit trusts, interest yielding instruments such as government or corporate bonds, and cash.
2. Vary the risk in each asset class. To achieve this, a portfolio can be diversified into different unit trust investment strategies, for example, value funds, growth funds, balanced funds, index tracking funds, small market capitalisation, and large market capitalisation funds. When a portfolio includes investments with varied risk levels, large or extreme losses in one area tend to be offset by investments in other areas.
3. Vary your assets by industry, or by geographic location. This will minimise the impact of industry or country specific risks.

Another practical application of this kind of diversification is mixing investments between domestic and international funds. Through country diversification, the portfolio is less sensitive to extreme events within any single country.

The benefit of diversification is a reduction in portfolio risk. The cost is typically a reduction in returns. Diversification is quantified by the intra-portfolio correlation. This statistically measures the correlation on a range between negative one and positive one, which explains the degree to which the various assets in a portfolio can be expected to perform in a similar or opposite direction. A measure of -1 means that the assets within the portfolio are perfectly negatively correlated. That is, whenever one asset goes up, the other goes down. A measurement of 0 means that the assets in the portfolio move independently, i.e. that the performance of one asset cannot be used to predict the performance of the others. A measurement of 1 means that whenever one asset goes up, so do the others in the portfolio. In order to eliminate diversifiable risk completely, an intra-portfolio correlation of -1 is required.

The formula for calculating intra-portfolio correlation is:

$$Q = \frac{\sum_{i=1}^n \sum_{j=1}^n X_i X_j P_{ij}}{\sum_{i=1}^n \sum_{j=1}^n X_i X_j}$$

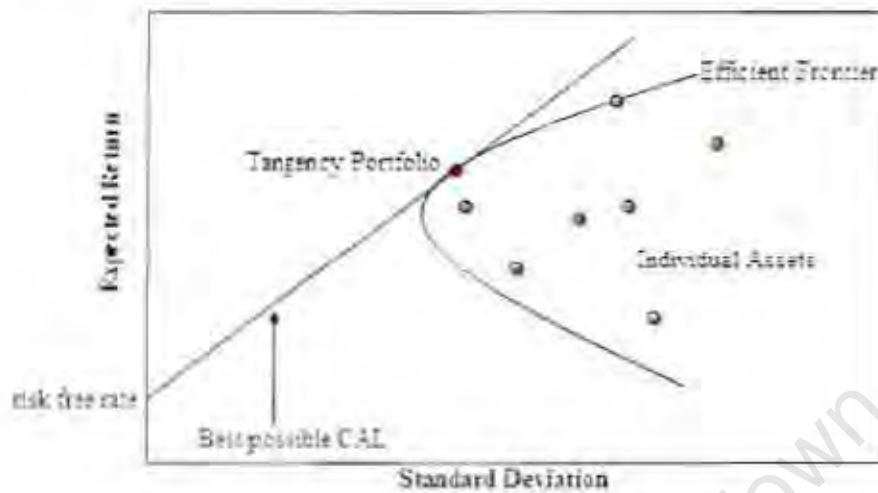
Where:

- Q is the intra-portfolio correlation
- X_i is the fraction invested in asset i
- X_j is the fraction invested in asset j
- P_{ij} is the correlation between assets i and j
- n is the number of different assets

- The efficient frontier

The capital asset pricing model (CAPM) assumes that the risk-return profile of a portfolio can be optimised. In this context, an optimal portfolio displays the lowest possible level of risk for its associated level of return. Furthermore, since each additional asset introduced into a portfolio provides further portfolio diversification, the optimal portfolio must comprise every asset, (assuming no transaction costs) with each asset value weighted to achieve this optimal portfolio. Each of these optimal portfolios, i.e., one for each level of return, constitutes the efficient frontier.

FIGURE 4A: THE EFFICIENT FRONTIER



- The capital asset pricing model (CAPM)

The vast majority of financial research over the past couple of decades has been built on the premise of the capital asset pricing model. The CAPM is used to determine a theoretically appropriate required rate of return for an asset, should you wish to add the asset to an existing, diversified portfolio, while being cognisant of the specific asset's non-diversifiable (instrument or share specific) risk. The model takes into account the asset's sensitivity to non-diversifiable risk (systemic risk or market risk), which is referred to as beta (β) in the financial research industry, as well as the expected return of the market and the expected return of a theoretical risk-free asset. This model was introduced by Jack Treynor, William Sharpe, John Lintner and Jan Mossin independently. They were building on the earlier work of Harry Markowitz around diversification and modern portfolio theory. Sharpe received the Nobel Memorial Prize in Economics (jointly with Markowitz and Merton Miller) for this contribution to the field of financial economics.

The formula for the Capital Asset Pricing Model:

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

Where:

$E(R_i)$	is the expected return on the capital asset
R_f	is the risk-free rate of interest e.g. government bonds
β_i	is the beta coefficient, which is the sensitivity of the asset returns to market returns
$E(R_m)$	is the expected return of the market
$E(R_m) - R_f$	is the market premium (the difference between the expected market rate of return and the risk-free rate of return)

Restated, in terms of risk premium:

$$E(R_i) - R_f = \beta_i(E(R_m) - R_f)$$

Thus, the individual risk premium for a capital asset equals the market premium times the asset's beta to the market return.

- The alpha and beta coefficients

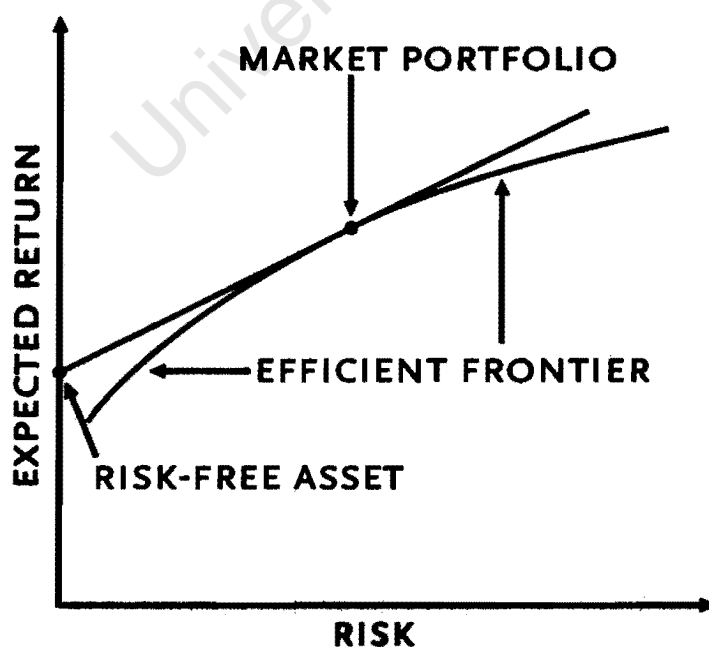
Alpha is a risk-adjusted measure of the active return on an investment portfolio over and above the benchmark against which the portfolio is measured. The active return is that portion of the portfolio which differs from the benchmark against which the portfolio is being measured. This implies that a holding of greater or less amount of a particular share relative to the weight of that share in the index, is the active position in that share. Subtracting the performance of the benchmark from the portfolio's return results in the relative performance of the portfolio. If an efficient market existed, the expected alpha value would equal the return of the risk free asset. This highlights how a portfolio performs, taking into account the risk of that portfolio. Therefore, if the alpha for a portfolio is less than the risk free return, the portfolio earned too little for its risk; if alpha is equal to the risk free rate, the portfolio earned sufficient return for the risk taken; and if a portfolio has an alpha score greater than the risk free rate, the portfolio generated a return in excess of the risk taken.

The beta coefficient of a portfolio shows the extent to which the expected return of a portfolio is correlated to the return of the market or index against which the portfolio is being measured. The beta of a portfolio is estimated through regression analysis against the portfolio's benchmark. A portfolio with a beta score of zero means that its price is uncorrelated with the benchmark against which it is being measured and the portfolio can generate returns independent of the benchmark. A beta score greater than zero implies that the portfolio will tend to trend in the same direction as its benchmark. A negative beta score implies an inverse relationship between the portfolio and its benchmark; therefore, if a portfolio has a negative beta score to its benchmark, and the benchmark decreases in value, the expected return of the portfolio will be positive.

- The capital market line

This capital market line (CML) is achieved by combining the entire market in which the portfolio is able to invest, with the risk-free asset (cash or government bonds). Each point on the CML represents a greater risk-return profile than any portfolio on the efficient frontier. It has been proven that the CML represents the optimal capital allocation line, between risky and risk-free assets, since the addition of cash or leverage with the risk-free asset in combination with the market portfolio are on the Capital Market Line. Each of these portfolios will maximise a portfolio's Sharpe ratio. The Sharpe ratio measures the excess return over the benchmark per unit of risk in a portfolio, highlighting how well an investor is compensated for the risk they take, if two different portfolios are compared to a common benchmark, for example, the risk-free rate.

FIGURE 4B: THE CAPITAL MARKET LINE



- The securities market line.

The CAPM model may be represented graphically in the form of the Security market line (SML). The SML represents the expected rate of return for the whole market or investment universe under consideration, as a function of systematic (non-diversifiable) risk, or 'beta'. The Y axis intercept, where $\beta = 0$ of the SML is equal to the risk free interest rate. The slope of the SML represents investors' degree of risk aversion at a given time, which is the market risk premium. When considering portfolio construction, each asset is plotted against the SML using its own beta and historical rate of return. If the plot of the asset falls above the SML it is considered to have a good rate of return relative to its risk, and vice versa if it falls below.

MPT seeks to model an asset's return as a random variable, and then model a portfolio as a weighted combination of these single assets so that the return of a portfolio is the weighted combination of the assets' returns. Therefore, it can be argued that a portfolio's return is a random variable, and consequently has an expected value and a variance. In this model, risk is the standard deviation of returns.

Any review of the CAPM needs to be read in conjunction with the arbitrage pricing theory model (APT). APT differs from CAPM since its assumptions are less restrictive. Where CAPM is a statistical model of asset returns, APT is more of an explanatory model. The APT model assumes that each investor will hold a unique portfolio with various different betas, in contrast to the market portfolio assumed in the CAPM. Many market participants view CAPM as a unique form of APT, since the securities market line effectively represents a single-factor model of the asset price, where beta is exposed to changes in value of the market.

From an economic perspective, APT is seen as a supply side model, since its beta coefficients reflect the sensitivity of the underlying asset to economic factors. As a consequence, factor shocks may cause structural changes in assets' expected returns, or in the case of a specific share, the company's profitability. In contrast, the capital asset pricing model may be considered a demand side model. Its results, although similar to those of the APT, transpire through an optimisation exercise for each investor's utility function, and the resultant form of market equilibrium, as investors are viewed as asset consumers.

3.3 Research methodology I used in my studies

Research serves the purpose of answering a question through the assimilation of relevant data, or a combination of current research with previous researcher's contributions. The nature of the projects I have undertaken in my studies is the answering of different questions, with the intention of deriving a potential answer or solution for the problem identified. Given that I had an idea of what the potential problem may be, coupled with a potential solution, I wanted to steer clear of a situation where my cognitive biases steer the research towards a preconceived outcome or potential solution which I may view as correct, yet in reality may be sub optimal. In light of this situation, in conjunction with the fact that the potential concerns I had in the area of study were of a subjective nature, the basis of all three papers was grounded theory, as explained by Strauss and Corbin (1990):

A grounded theory is one that is inductively derived from the study of the phenomenon it represents. That is, it is discovered, developed, and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon. Therefore, data collection, analysis, and theory stand in reciprocal relationship with each other. One does not begin with a theory, then prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge. (p. 23).

Typically, grounded theory begins with a research situation. Within that situation, the researcher seeks to understand what is happening and the different role players and their interactions have. This is done through observing, interviews and discussion, with the key issues being noted. Grounded theory involves the constant comparison of data and interview outcomes, from which a theory emerges. From the comparisons, a process of coding is undertaken. From this coding, categories emerge, and from these, sub categories. As the categories and properties emerge, theses and the sub categories provide the theory. These are then "memoed". The depth of the sample may be added to through a process of theoretical sampling, effectively introducing more diversity and possibly different properties or sub categories. Once a category or its sub category may no longer be expanded upon, the results are sorted. This involves the grouping of the memos and arranging them in a manner that provides greater clarity to the theory.

The key differentiator between "traditional" research and grounded theory is that a grounded theory is emergent, a hypothesis is not being tested. Glaser stated that "it is to discover the theory implicit in the data". Grounded theory is rigorous as it responds the situation in which the research is being conducted, coupled with the fact that the researcher is searching for data which may contradict the emerging theory. Glaser states that to evaluate whether an emerging theory is sufficient, it needs to fit the situation and it needs to work, effectively allowing the participants in a situation to understand the situation better and manage the situation more efficiently.

With respect to literature, given that grounded theory is an emergent theory, the researcher may not know at the start of your research, which literature is relevant. As the theory emerges, the researcher is able to read the relevant body of knowledge. In addition, since the theory emerges from the data, a review of the relevant literature may be seen as additional data, not superior to the emergent data. Glaser suggests reading generally, attempting to avoid the literature associated with the current research, so as to avoid constraining coding and memoing.

Methodology used in paper 1

In this paper, I addressed my concern that the investment teams within my company were not aware of the factors actually driving investment performance.

This concern was based on my observation of two key areas:

1. The team's investment performance through time.
2. The teams appeared to have specialist skill with no general awareness of macro economics and the financial markets system.

I created a causal loop diagram APPENDIX1, FIGURE 5 to represent these concerns, from which emerged various practical problems:

1. The investment teams within Futuregrowth appeared to be focusing on their investment thesis in the form of the "story" behind the investment being made and the manner in which decisions have been reached instead of directing their attention towards achieving the desired investment outcome from the client's perspective - performance.
2. If the investment teams are not aware of the factors which may be driving their funds performance, they may have "blind spots".

3. It appears that the investment teams may not be aware of their intense focus.

In order to place the identified practical problems into a meaningful context, I framed these in the form of a practical question, which served as a departure point for further understanding the system under consideration.

The question asked was *"what is the current price level of the financial market variables being presented to you?"*

In order to achieve an actionable outcome or relevant knowledge, the process I applied was:

1. The creation of a sample encompassing general financial market variables which are representative of the broad based market "drivers" in both the global and local financial markets. The variables fell into five broad categories:
 - Currency spot rates
 - Commodity spot rates
 - Indices – global and local
 - Bond yields
 - Interest rates
2. The selection of a group of representative individuals across the company, within the specialist investment areas, to be questioned about the level of the financial variables.
 - The questioning took place without prior warning, hence avoiding people anticipating the questions.
3. I included a few non-investment professionals in both the equity and fixed interest groups as a reference point to allow comparisons with respect to investment professionals and support staff.

APPENDIX 1, FIGURES 6,7,8,9 represents the outcome of the practical questions posed to the sample groups. The findings from this exercise highlighted the fact that the concerns raised were valid and that further investigation was required.

The practical problem being dealt with in paper 1 was subjective in that I was starting with my perceptions of what may be a problem and then attempting to understand the situation by observing data based on a sample test. For this reason, I chose to follow a grounded theory approach.

The point of departure was the creation of a group of questions, which served to initiate conversations with each individual who had formed part of the sample group for the practical question posed, as per APPENDIX 1, FIGURES 6,7,8,9.

The questions posed for the grounded research were:

1. What is the significance of an economic variable, such as the \$/ZAR exchange rate?
2. Is the observation of such a variable significant in the financial markets?
3. Does the actual price or level of an index impact investment decisions?
4. What is the importance of a financial variable?
5. Do these variables represent actual supply and demand in the market place?
6. What is important about observed financial time series?

I intended to interview each individual, starting with the questions and then allowing different themes to emerge, I would collect; code and analyse the data, as per the observation that "The method is circular, allowing the researcher to change focus and pursue leads revealed by the ongoing data analysis" (Hutchinson, 1986, p. 119).

APPENDIX 2 shows the response received from three people. Each had agreed to answer the questions on the basis that they were e-mailed, since they didn't have time for an interview. I adapted the process and e-mailed all the sample group members, requesting their response to the questions being posed. I mentioned that these should not be seen as prescriptive and that any other commentary may be made. Only these three members responded, with the rest failing to engage, following in excess of five requests for either an interview, or the completion of the e-mailed document is a result on its own.

I then coded the results which lead to the creation of an affinity diagram APPENDIX 2 FIGURE 10. From the affinity diagram, an interrelationship diagram APPENDIX 2 FIGURE 11 was constructed, allowing the drivers; outcomes and links in the system to emerge. The next step was the creation of a causal loop diagram APPENDIX 2 FIGURE 12 representing the factors driving investment performance. The CLD allowed me to pose a research question:

What do the factors in the causal loop diagram (APPENDIX 2 FIGURE 12, representing the drivers of investment performance) actually mean, and how do these factors impact each other, either directly or indirectly, via another factor and subsequently, how does this impact on investment performance?

Methodology used in paper 2

In this paper, I contrasted two different schools of thought with respect to the financial markets, those in the efficient market hypothesis camp, who are of the opinion that markets are efficient and that the analysis of public information in the form of corporate annual financial statements is not going to assist in finding an edge to generate additional alpha. The EMH School places no value on the ability of an investor to pick shares; rather they go so far as to ascribe "superior performance" to luck. In contrast, the behavioural-bias school is more concerned about the manner in which an investor thinks and makes decisions under risk, specifically loss aversion, in conjunction with a focus on the various cognitive biases that individuals have.

My concern was that neither group was aware of the fact that their focus is on the investment outcome of returns, without taking into account that the system is wider than returns, achieved through whatever decision making process they choose. I was concerned that the risk component specifically with respect to probability and more specifically cash management was being neglected.

In order to gain further insight into my concern, I represented the situation in a causal loop diagram APPENDIX 3 FIGURE 13. Emerging from this casual loop diagram were various practical problems:

Investors tend to have a confirmation bias in that they search for information in a way that confirms their preconceptions. By way of example, the value crowd will list Warren Buffet as living proof that their approach is the only way to go, proceeded by a list of winning shares that they have picked through time. Should a performance attribution be undertaken in this instance and it confirms that value factors such as book value to price have actually driven the achieved performance, they will agree with the attribution, which reinforces their investment thesis, entrenching their decision making process, leading to a "blind faith" in their investment process. This leads to other biases in the form of the loss aversion bias, since value investors will then tell you that decisions they have made about purchasing a share are correct, even when the share is falling in price, they will assert that it is now even cheaper and that you should invest even more into the share, not willing to realise the loss on the existing investment.

The practical problems raised motivated further investigation into the issues at hand. To frame the problem, I engaged in grounded research, interviewing (telephonically) representatives of the top 10 asset managers in South Africa, based on assets under management as at 31 December 2006 as per APPENDIX 3 FIGURE 14. The question I posed to each of the company representatives in order to get the conversation rolling was:

Do you believe that as an investment company you have the ability to outperform your benchmarks or the market itself, over time?

I mentioned that this question should serve as a start and that they should feel free to elaborate in any direction they desired. Of interest is the fact that every single person then said that they would discuss the issues on the basis that their name was not mentioned and that I don't associate their response with their company. The outcome of the practical question is evident in APPENDIX 4 FIGURE15. This allowed me to create an affinity diagram APPENDIX 4 FIGURE16 dealing with the factors pertaining to the grounded research question, which lead to the creation of an interrelationship diagraph APPENDIX 4 FIGURE17 From the interrelationship diagraph, I was able to construct a CLD, highlighting the factors which impacted on the ability to outperform the market over time, see APPENDIX 4 FIGURE18. The causal loop representation of the research problem highlighted the fact that cash management is a key component of the system, yet investors, specifically professional investors tend to ignore this issue, while placing confidence in their ability to outperform the market over the long run. The question which emerged was:

- Is it possible to generate positive returns over time, even if the investment process being used is a random signal?

Methodology used in paper 3

The last decade has seen an evolution in the South African pension fund landscape, with a move in retirement funds from defined benefit to defined contribution, and the resultant transfer of risk from employer to employee with respect to a potential shortfall at retirement.

The situation highlights the fact that the individual now needs to take an active interest and participate in their retirement planning. Actuaries still consult to employers and employees, yet the risk of insufficient funds at retirement needs to be dealt with by the individual.

The fact that actuaries are now responsible for investment returns, since there is no fall back onto the company as in the defined benefit space, has led to conservatism on their part. They tend to place people in buckets, based on age or life stage. What transpires is a situation whereby in the last five years of a person's working life, their investments are effectively in money market instruments, with a small portion in bonds. This strategy proves to be stable in that the risk of capital loss is substantially reduced.

My concern lies in the fact that during the five years prior to a person's retirement, they typically have low to non-existent debt levels, since their children have grown up and completed their studies, they have paid off a bond they may have had on their house, and they would not have any debt for household durable goods. All this leads me to be concerned that a simple money market and bond allocation investment strategy locks people into a low risk, low potential for capital growth strategy at the time when they actually need to maximise their returns, since at retirement, when they no longer have an income in the form of a salary, they will definitely move into a money market or bond type investment portfolio.

The effects of inflation get negated in this passive investment approach. With the current advances in medical technology, healthier eating patterns and an awareness of the benefits derived from moderate exercise, the probability of outliving the actuarial life expectancy tables is constantly increasing.

I am concerned that there may be life left at the end of a retiree's pension annuity stream. These concerns are best represented in a "behaviour over time graph", highlighting the increasing inflation trend over the past four years. See APPENDIX 5 FIGURE 19 This graph highlights the fact that if investment returns for a pension fund are less than 5% per annum on average, the investor is actually losing money from a purchasing power perspective. Therefore it becomes apparent that a simple money market and bond component portfolio which yields in the region of 9% per annum is basically treading water on a real or returns less inflation basis. The scenario becomes negative if inflation levels move to 6% or greater per annum.

The relevance of this study is two fold. Firstly, if the returns generated by any investment portfolio are less than inflation (as measured by CPI) through time, people will have insufficient assets to retire comfortably. Therefore, this study is relevant to every individual of working age, who is self dependant from an income perspective. Secondly, if the volatility in an investment portfolio is not adequately managed, a situation could transpire whereby all the returns or a large portion of the returns generated during the capital accumulation period in an individual's working life, may be forfeited in the last few years prior to retirement.

In order to understand what the perception of the market place would be towards an absolute return fund created to address the concerns raised, I decided to conduct interviews with representative market participants, namely the actuarial consultants who advise pension funds. To achieve this, I engaged in some grounded theory research.

The research took the form of telephonic interviews with various parties. Interestingly, they were all happy to answer my questions, on the basis of anonymity being maintained.

The questions posed for the grounded research, with respect to an absolute return fund:

1. What is your view on absolute vs. relative performance to a benchmark?
2. Are enhanced returns with lower risk (enlarged opportunity set) achievable through the use of an absolute return fund?
3. Are lower overall risk and volatility (portfolio correlation) important in your decision making process from a portfolio construction perspective?
4. Do you think a fund manager should target positive returns in rising and falling markets, without deferring negative returns to relative performance?

Each conversation started with the questions and allowed for different themes to emerge, I collected, coded and analysed the data, as per the observation that "The method is circular, allowing the researcher to change focus and pursue leads revealed by the ongoing data analysis" (Hutchinson, 1986, p. 119).

Coded data, from the grounded research led to an affinity diagram, which served as the basis for an interrelationship diagram, see APPENDIX 5 FIGURE20. From the interrelationship diagram, I constructed a casual loop diagram, APPENDIX 5 FIGURE21

From the interaction with the grounded research participants, the following key research problems emerged:

The vast majority of absolute return funds in South Africa tend to have the basic principle of constant proportion portfolio insurance (CPPI) as a core principle. The CPPI concept needs further explanation:

- In essence, CPPI may be defined as a fund which holds risky assets (equities) and non risky assets such as cash or money market funds in its portfolio.
- The levels of equity holdings or exposure in the portfolio are increased in a rising equity market and conversely, the level of equity exposure in the portfolio is decreased in a falling equity market.
- This is coupled with the selection of a targeted minimum floor fund value level relative to the starting fund value, below which the fund may not fall. This floor is dynamic and is constantly adjusted at regular intervals, typically on a quarterly basis. Therefore, the constant proportion portfolio insurance name becomes self explanatory.
- A key point to note with CPPI is that this type of strategy doesn't require a finite investment horizon.

In order to gain a greater understanding of the concerns around the CPPI problem, I made use of force field analysis:

The context was the 1987 global equity market crash. In this case, the use of CPPI failed dismally, since as the equity market declined the process required a reduction in equity exposure, effectively selling into a falling market. As the market fell further, the process required even more equity holdings to be reduced in an already depressed equity market. This situation got compounded by the fact that once the equity markets did turn positive again, the investor would be holding a very low portion of equity assets and would therefore fail to capture the equity premium.

The next consideration is that of a buy and hold approach. The problem with this approach is that the investor's time horizon becomes critical, since if they have held their equity assets for many years, in a gradually upward trending market and the market suddenly crashes in the year prior to their retirement, they don't have sufficient time to make up the losses.

Some kind of variable compromise or combination which takes into account past learning's would be needed in order to maximise the potential returns for a fund, while reducing the risk of the fund, as measured by the volatility within the fund.

A second problem was the issue with regards to what the correct investment returns benchmark should be for an absolute return fund.

The causal loop diagram, generated from the grounded research in conjunction with the research problems identified were best framed by a set of questions, which needed to be answered in order to generate an outcome which would serve to address the points which emerged:

1. What is the right level to pitch decision criteria "trigger levels" at, to maximise returns?
2. What is a relevant "in-sample" test period?

3. How much return per unit of volatility is achievable through varying asset allocation in an absolute return fund?
4. What type of derivative overlays serve to accomplish this type of strategy?

Considering that all three research papers followed a related stream, with a focus on investment performance and the construction of portfolios, with the objective function of seeking to determine the driving factor behind these factors and their interrelationship, I had considered making use of meta-analysis. Broadly speaking, meta-analysis seeks to combine the results of different studies which in essence address a set of related research themes. This is normally conducted by identifying a common measure of effect size, which is then modelled using a form of meta-regression. The resultant overall averages while controlling for study characteristics are typically considered to be meta-effect sizes, which tend to be more powerful estimates of the true effect size than those derived during a single study under a given single set of assumptions and conditions.

I chose not to use meta-analysis, since a key weakness of the method is that sources of bias are not controlled by the method and a good meta-analysis of badly designed studies will still result in bad statistics. In addition, this type of research seeks to draw conclusions based on numerous studies. A further weakness of the method is the heavy reliance on published studies, known as the "file-drawer effect", whereby only studies with significant outcomes are published. I feel that the outcomes in my papers have been significant; however, I may be falling into my own bias, intending to prove a point instead of letting the results emerge from the data. For this reason, I chose to focus on the use of grounded research and apply empirical data as support for my answers to the questions posed.

CHAPTER 4

Research results

4.1 Paper 1

The research question posed in paper 1 was:

What do the factors in the causal loop diagram (APPENDIX 2 FIGURE 12, representing the drivers of investment performance) actually mean, and how do these factors impact each other, either directly or indirectly, via another factor and subsequently, how does this impact on investment performance?

ANSWER

In order to answer the question the factors in the causal loop diagram APPENDIX 2 FIGURE 12, first need to be defined:

Subjective biases

To define subjective biases, we need to decompose the term into its two components. Subjective means based on or influenced by personal feelings, tastes, or opinions. Bias means an inclination or prejudice in favour of a particular viewpoint. In this context, we are referring to an individual's subjective opinion of the current financial market and what its future direction may be.

Market confidence levels

This refers the level of optimism or pessimism in financial markets. This may be expanded further, as the intuitive feeling of the greater investment community regarding the expected directional movement of the stock market. For example, if market sentiment is bullish, then most investors expect an upward move in the stock market. Various technical and statistical methods may be used to measure market sentiment such as advancing versus declining stocks; new highs versus new lows.

Sentiment

This refers to feelings and emotions. Feelings convey information about situations, on both conscious and subconscious levels, e.g. fear may be real or perceived. Furthermore, perception of the physical world does not necessarily result in a generalised reaction among a group of people, it varies depending on one's tendency to handle the situation, how the situation relates to one's past experiences, and any number of other factors. Emotion is defined as an intense mental state that arises automatically in the nervous system rather than through conscious effort, this may trigger either a negative or positive psychological response.

Uncertainty

Generally refers to the state of being uncertain. Following on from this explanation; uncertain means not known, reliable, or definite. In this context, I am referring to the situation where market agents are uncertain of the future market direction.

Market cycles

The term market cycles broadly refers to different phases that the financial markets may be in. Typically, two broad phases are differentiated, a bull market and a bear market phase. A bull market is represented by a rising price trend, and a bear market is indicated by a falling price trend. From this basic definition it would appear easy to determine what type of market we're in at any point in time. In reality, it's not quite that simple, because it all depends on what time frame we observe when determining when one kind of market phase ends and another one begins.

Volatility

This is the standard deviation of the change in value of a financial instrument over a specific time horizon. Typically, volatility is used to quantify the risk of the instrument over that time period. This risk may be expressed as either a percentage of the initial value e.g. 10% or an absolute number, such as R 100.

RATIONALE

Now that the factors have been defined, we can explore how they impact each other in a multi factor environment and ultimately how they impact investment performance.

From the evidence presented, it is apparent individuals' perceptions; actions and reactions have a direct impact on financial market performance. This spans the entire spectrum of the CLD presented in APPENDIX 2 FIGURE 12, from subjective biases; market confidence levels; sentiment; uncertainty; market cycles through to volatility. For this reason we need to consider "behavioural finance" as a departure point.

As far back as 1841, when Charles Mackay published his book, *Extraordinary Popular Delusions and the Madness of Crowds*, irrational responses and periods of hypersensitivity have been apparent in financial markets. A more current piece on this subject by Robert J. Shiller, (who coined the phrase "irrational exuberance" as referenced by Alan Greenspan, the previous United States Federal Reserve Governor), draws the conclusion that the magnitude of financial market moves is often far greater than what may be explained by "rational" economic pricing models. Since the start of the current bull market in the 1980's studies have been conducted into the field of behavioural finance in an attempt to shed some light on the psychological reasons behind these periods of "irrational exuberance" and exaggerated "despair".

One of the key issues uncovered in this field is the concept of loss aversion, which highlights the point that investors will pay a premium to avoid a certain loss. This is corroborated by Amos Tversky, who showed that investors tend to hang onto bad investments in order to avoid the actual realisation of a loss, when rationally it makes sense to sell the current under performing holding and enter into another potentially more profitable transaction. Shiller and Summers addressed the issue of overreaction, concluding that market prices frequently vary from "rational" valuations. Another key area is that investors tend to be overconfident in their subjective valuations. Werner DeBondt and Richard Thaler verified this and in addition showed that investors tend to overreact to extraordinary or unforeseen news items. This results in excessive volatility. The positive spin on this volatility is that post disappointments due to excessively positive expectations, prices tend to overreact which transpires in purchasing opportunities for the "rational" investor.

One of the key findings of behavioural finance is that investors make investment decisions based on company specific issues, while omitting to take into account their total portfolio exposures. Consider the purchase of an uncorrelated, yet risky share, which has a high forecast return. Typically an investor would avoid the share and label it as too risky. In reality, this share should be included in the portfolio as a hedge, with the potential to reduce risk, given that it is uncorrelated to the rest of the

portfolio. This ties in with the "agency effect", which touches on the fact that the pay off for fund managers is asymmetric, in that they receive benefits in the form of bonuses and equity in the investment company when their investment decisions prove to be correct, yet they could suffer the loss of their jobs if their investment decisions turn out to be incorrect. This asymmetry can lead to risk-averse behaviour in situations where a greater degree of risk exposure could benefit both the fund and its investors.

In addition, the issue of extrapolation of the recent past has been raised in behavioural finance. In this case, investors place too much emphasis on what has been working in the recent past, while failing to recognise the probability of mean reversion towards the long-term "average". This explains why cycles tend to last longer than expected. A further area of study is the issue of "herding" or consensus thinking, in which investors "blindly" follow each other into specific shares or sectors. To observe these traits, one merely needs to cast your thoughts back to the "dot com" era, when irrationalities such as "clicks per page" superseded observable metrics such as earnings per share.

In addition to behavioural finance, we need to consider the "rational beliefs" hypothesis proposed by Professor Mordecai Kurz of Stanford University. Professor Kurz proposed that a possible explanation for the volatility in asset pricing and a potential solution to certain issues in modern finance is the concept of "endogenous uncertainty." Classical finance presumes that investors have a common model for interpreting how fundamentals affect asset prices. For example, think along the lines of the dividend discount model or a discounted cash flow model. In this world view, when fundamentals (exogenous or external factors) change, all investors have the same interpretation of this event and how it may impact on a shares price. This school of thought is of the opinion that the only advantage an investor can have is a better knowledge or understanding of the fundamentals in comparison to other investors.

Kurz agrees that most investors have a common mental model (endogenous or internal) which maps fundamentals to asset prices. Noteworthy is that his key insight is that these models actually differ across investors, and that every individual has limited and time dependent confidence levels for their model. Kurtz proves that if this is actually true, then there are really two drivers of asset prices. Changes in fundamentals, and in addition, changes in the models investors use to interpret these fundamentals and subsequently map them to their subjective perception of "fair value". Kurtz refers to this effect as "endogenous uncertainty".

A further area of study which bears mentioning is the concept of "Adaptive Markets Theory" developed by Dr. Andrew W. Lo, a professor at MIT's Sloan School of Management. In a 2004 paper, Lo postulates that markets are inefficient and therefore successful active management is possible, yet competing groups of investors over time tend to squeeze out apparently obvious inefficiencies from the financial markets. He makes a comparison between the financial markets and

evolutionary forces, proceeding to present the financial market as an ecosystem. In Lo's "adaptive markets hypothesis", he integrates some findings from behavioural finance and proposes the concept of competitive, evolutionary markets.

The key beliefs behind Lo's adaptive markets theory are:

- Investors are self-engrossed.
- Adaptation and innovation in investment strategies is a function of competition between investors.
- Investors make mistakes, many of these mistakes are detailed in the behavioural finance research, however, investors do have the ability to adapt and learn.
- There is a level of natural selection which shapes the financial market ecology, in the form of successful investors being imitated while unsuccessful investors change their approach or leave the financial markets.
- Evolution determines the financial market dynamics.

The key implications of Lo's hypothesis include:

- Risk / reward relationships are not stable and are non-linear.
- Risk premia are variable through time.
- Limited arbitrage does exist from time to time.
- Strategies do go in and out of favour, consider growth and value cycles.
- Adaptation and innovation are keys to survival.

I have shown that investors appear to have different perceptions of what drives share prices. There are pros and cons to these different schools of thought, with apparent cycles during which they fall in and out of favour. There is a natural evolution to the market, with successful managers enduring (even if this success is merely a stroke of luck, in that their approach is suitable for the current market phase) and less successful managers either adapting or seeking greener pastures in different industries.

A key point to note is that when the market environment starts changing, too many investors hold on to the approaches that have made them successful in the past for too long, believing that the recent past will endure. I liken this to driving down a straight road, navigating solely by the rear view mirror. It works perfectly until the first corner is experienced. Therefore, I would suggest an adaptive investment process, flexible enough to cope with changing market phases.

Markets are inefficient as highlighted by behavioural finance research amongst others, which demonstrates that individuals do not always act rationally, either on their own or in the collective. Investors' mental models of how share prices are discovered change in reaction to fundamental factors at play, and to "endogenous" variables. I

believe that further study is required into the type of individual that should be employed as a fund manager.

Key learnings / values extracted from paper 1

1. Investment returns may be volatile through time, even when investment professionals with specialist focus areas apply themselves to the objective of maximising returns.
2. Specialist investment professionals may be highly qualified and experienced, however, at times; it appears that they are disconnected from reality, seemingly unaware of the interconnectivity of the various factors in the financial markets and how these actually drive share prices.
3. Investment professionals tend to focus on their investment thesis, wanting to prove the validity of their "way" of investing, be it style, theme, analysis or thematic, when the actual focus should be on maximising risk adjusted investment returns for clients.
4. Behavioural biases tend to drive the way in which fund managers tend to invest and as such, the field of behavioural finance requires further study in conjunction with traditional investment theories.
5. Financial markets are not as efficient as the investment public think.

PAPER 2

The research question posed in paper 2 was:

Is it possible to generate positive returns over time, even if the investment process being used is a random signal?

ANSWER

The answer to the research question is a resounding yes!

The process followed to generate the scenario in the research question was run in Matlab, utilising actual price data, to allow for a representative empirical study. The code for the process is available in APPENDIX 7.

The system at hand (the CLD representative of the research problem APPENDIX 4 FIGURE 18), shows that current thinking favours the significance of the investment process and places a premium on the overconfidence effect, with investors attempting to search out the "star fund manager", assuming that individuals are able to outperform the market. Of the key drivers in the system, the overconfidence effect is believed to drive out performance over time. This is typically cited in conjunction with the particular investment process selected by the investor to explain returns.

The key nature of the concern raised was that cash management is being neglected in favour of the investment process. I believe that cash management is a key component in any investment process as proven by the fact that positive returns may be generated, even when the investment process in question is sub-standard. The results from my cash management scenario prove that positive returns are actually a function of protecting capital and implementing stop-losses in a disciplined manner, while allowing positive winning trades to run, and adding to these winning trades, irrespective of whether the current position held is a long or short position. To prove this point, I went to the extreme of a random coin toss, which over a large enough sample will produce equal probability of being long or short. This effectively strips out the "investment process" from the scenario resulting into specific focus on cash management.

This solution should address the needs of all stakeholders in the financial market system, since the primary objective is the generation of wealth, while preserving capital.

RATIONALE

The logic behind my answer is that a disciplined approach to cash management in the investment world will provide positive returns over the long run. In order to prove the point, I have devised a scenario where the investment signal, which is effectively a proxy for the investment process alluded to by the largest ten investment companies in South Africa is stripped out of the scenario, allowing a specific focus on the answer being provided in the form of cash management.

To understand how I have come to the conclusion, we need to unpack the method I have used:

In running my scenario, I aimed to eliminate as many biases as possible. The key bias I wished to remove was the overconfidence bias in which we believe that we have greater abilities than we actually have. This came through in the grounded research interviews conducted in APPENDIX 4 FIGURE 15. Every single company in the sample group said that they could outperform the market over time. From a statistical perspective we know that this is impossible, since every single one in the sample group would be above the mean. The median would be at the 100th percentile! To prove that this statement on behalf of the sample group participants (that they could all outperform), is over ambitious, we need only look at APPENDIX 6 FIGURE 22, which is an extract from the Alexander Forbes asset consultants fund managers survey. I have highlighted the fund managers in red, and the returns have been highlighted in red, for the times when they have not beaten their respective benchmarks. Of interest is the fact that there appears to be no common benchmark.

The objective of my theory is to demonstrate that cash management can generate positive returns even if the "investment process" being used is a random signal such as the toss of a coin. The hit rate means that the suggested trade should over a large enough number of observations only be correct 50% of the time. This means that if the investment process was blindly followed on an equal weighting basis for each suggested transaction, the process could either generate negative or positive returns over time, since 50% of the time the intended trade would be wrong! This effectively strips out any "investment signal" and allows the validity of the suggested cash management thesis to be viewed in isolation.

The conditions used for the cash management scenario:

1. The trade decisions are based on randomly flipping a coin to determine either a buy or a sell transaction.
2. The instrument to be traded in the simulation is the ALSI 40 near expiry futures contract which gets traded on the South African futures exchange (SAFEX).

3. The trigger action, which is the determinant to institute an additional trade if the strategy already has one in place, or to initiate a stop loss strategy if the existing position is in a loss is dependent on the ALSI 40 index future level.
4. The stop-loss and stop-profit rules are a function of the index futures level.
5. Profitable trades have a built in pyramiding addition scheme, once a trade is in a profit scenario which is greater than 5%, then a second trade in the same direction (either long or short, depending on what the initial trade direction was) is added.
6. The stop-loss applicable to this second trade will be 2.5% below the entry level for the transaction in question.
7. The stop-profit is a floating one, with it rising in 2.5% increments, as the 5% profit level for a trade is breached. Essentially, over time, the trend gets captured while minimising potential losses – effective cash management.
8. Stop Loss Logic:
 - a. If profit > 5%, stop-profit at 5% (profit will be taken if the trade profit falls back to a level of 5%.
 - b. If loss > 2.5%, then exit the trade (stop-loss), this action is implemented immediately and is the crux of the process, since this is the action which preserves capital and allows the fund to "live another day". The significance of this point is key, since if we start at 100 and the fund goes down to 90 (a 10% fund value drop), it will take an 11,1% fund value gain to get back to the initial starting point (from 90 back to 100).

As the old adage goes, a picture is worth a thousand words; hence the results from the scenario are best displayed graphically in APPENDIX 6 FIGURE 22 AND FIGURE 23.

Key positive results from the scenario:

- The strategy generated a 60% success rate, which is phenomenal in terms of investment process systems.
- This was achieved with a bet hit rate of 51% at the individual transaction level (the likelihood of a transaction being correct turned out to be correct 51% of the time, based on the random "coin toss", and achieved through random number generation).
- The strategy accumulated cash through time, hence showing the ability to generate positive returns.
- The distribution of returns had a positive skew, with a median greater than zero.

Key learnings / values extracted from paper 2

1. The asset allocation component in fund management does not receive sufficient focus in the investment process. It appears that investment professionals want to rather focus on picking the winning share, or a "ten bagger" share which increases in value more than tenfold from the initial purchase price for the share rather than building a sound portfolio.
2. Efficient market hypothesis as proposed by Professor Fama cannot hold true, otherwise it would not be possible to outperform the market index over time. This is in contrast to the data which suggests that some fund managers do "beat" the market over time, while others under perform. If all information is known and represented in shares prices at all time, would all fund managers merely achieve the market return?
3. The perception of risk, real or subjective tends to impact the decision making process followed by fund managers. There tends to be an aversion to realising a loss, even if it is the logical thing to do and take the remaining proceeds and place them into a better performing investment. It appears that people don't "feel" the pain of a loss while it is only a revaluation loss on paper, with the potential to recover.
4. Cash management, which is the preservation of funds in a portfolio, through effective mechanisms such as stop losses, or varying the portion of the portfolio which is exposed to the risky asset (typically equities), based in the appreciation or depreciation of the component investments serves to protect the capital in the fund and allow for compound growth over the longer term. I found that this alone allows for an out performance of the market, on a simulated back tested basis.
5. There appears to be vast amounts of time spent on looking for "investment signal", that is where to invest, when in reality, the timing component and asset allocation to different sectors appears to have a greater significance on the returns generated.

4.2 PAPER 3

The key research questions posed in paper 3 were:

1. What is the right level to pitch decision criteria "trigger levels" at, to maximise returns?
2. What is a relevant "in-sample" test period?
3. How much return per unit of volatility is achievable through varying asset allocation in an absolute return fund?
4. What type of derivative overlays serve to accomplish this type of strategy?

ANSWER

In order to create an absolute return fund that addressed the key research questions, I decided that a twist to the traditional CPPI type absolute return fund strategies was required. I needed to deal with the major short comings of this concept. The key one being that the process works for gently trending markets, yet it is when extreme moves occur, which are usually followed by a reversion back to the long term mean that the process fell short.

My answer takes the form of an enhancement to traditional absolute return funds. In conjunction with the traditional CPPI methodology, I introduced a strategic asset allocation component (SAA). This SAA component invests contrary to the traditional CPPI methodology in that in an excessive upward movement of the equity component in the fund, the SAA strategy would attempt to capture this excessive volatility. To do this, the fund would have to sell into the strength, once a certain trigger level was breached on the upside. Conversely, the fund would be required to purchase equities in a market which had fallen excessively, once the trigger level had been breached on the down side. As I ran the data, it emerged that a further refinement could be introduced in the form of a passive buy and hold (BH) strategy.

The whole process was an iterative one, with greater levels of efficiency being achieved with each new optimisation. The key concept of the simulation fund was:

- It combined "trend following" (CPPI) strategies with "contrarian" (SAA) strategies and passive strategies (BH).
- The strategy selection was dependant on the magnitude of the equity component holding moves within the fund.
- The fund would be rebalanced on a quarterly basis, with the magnitude of movement in the equity component holdings in the fund determining what strategy would be implemented for the ensuing quarter.

The primary focus of the absolute return fund (ARF) would be:

- To create a reduction in the levels of volatility experienced in the funds returns through time.
- Manage the downside risk (as measured by the volatility of returns less than zero) that the fund may suffer.
- Generation of returns in excess of inflation, with the absolute return fund experiencing volatility levels less than the general equity market volatility levels.

For the purpose of the simulation, the instruments used; rebalance frequency; simulation period and trigger levels used were:

Equity assets	The JSE ALSI40 index (The top forty shares on the JSE, based on a market capitalisation basis. This index gets rebalanced on a quarterly basis).
Non-equity assets	Three month NCD's (Negotiable certificates of deposit).
Rebalance frequency	Quarterly, as a function of equity component move within the portfolio for the previous observed quarter.
Simulation period	In excess of 10 years (June 1995 – March 2006).
Trigger levels	These must emerge from the iterative process.

RATIONALE

"The proof is in the pudding"!

The back-testing over the ten year period yielded the following results with respect to the stated research questions:

1. The right level to pitch the decision criteria "trigger levels" at, to maximise returns were:

The optimal asset allocation trigger levels between CPPI, SAA and BH from an asset allocation perspective turned out to be 0% - 1% for the BH strategy, from 1% - 7% for CPPI in its pure form, greater than 7% for SAA. Note that these levels inverted apply the same logic in reverse.

This may be represented in a set of fund asset allocation rules:

- CPPI asset allocation changes in the equity component of the fund < 1%
Treated as a buy and hold
- CPPI asset allocation changes in the equity component of the fund > 7%
Treated as SAA
- CPPI asset allocation changes the equity component of the fund > 1% and < 7%
"Traditional" CPPI implemented

The graphical representation of these rules is observable in FIGURE 25. The asset allocation between cash and equity is evident in FIGURE 26.

The justification for the 1% and 7% bands emerged from the 10 year back-testing, which highlighted the fact that these levels increased the probability of maximising performance in the long term.

FIGURE 25: ASSET ALLOCATION RULES

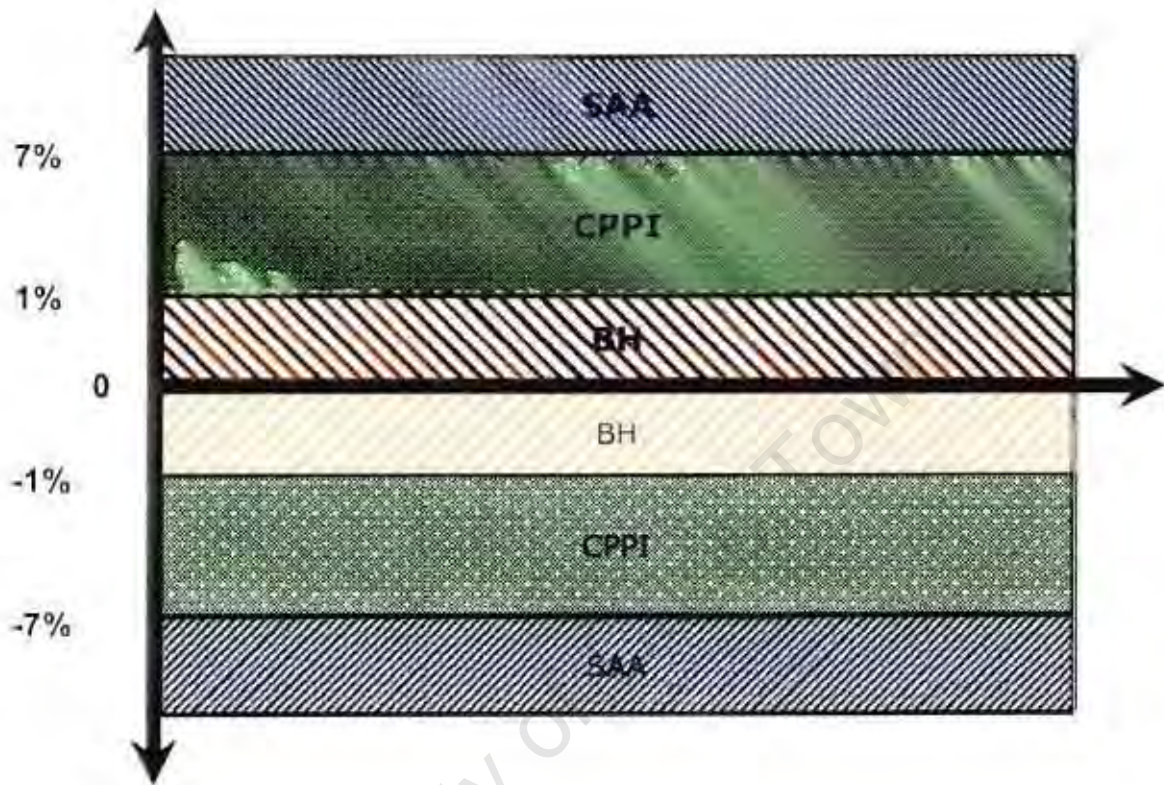
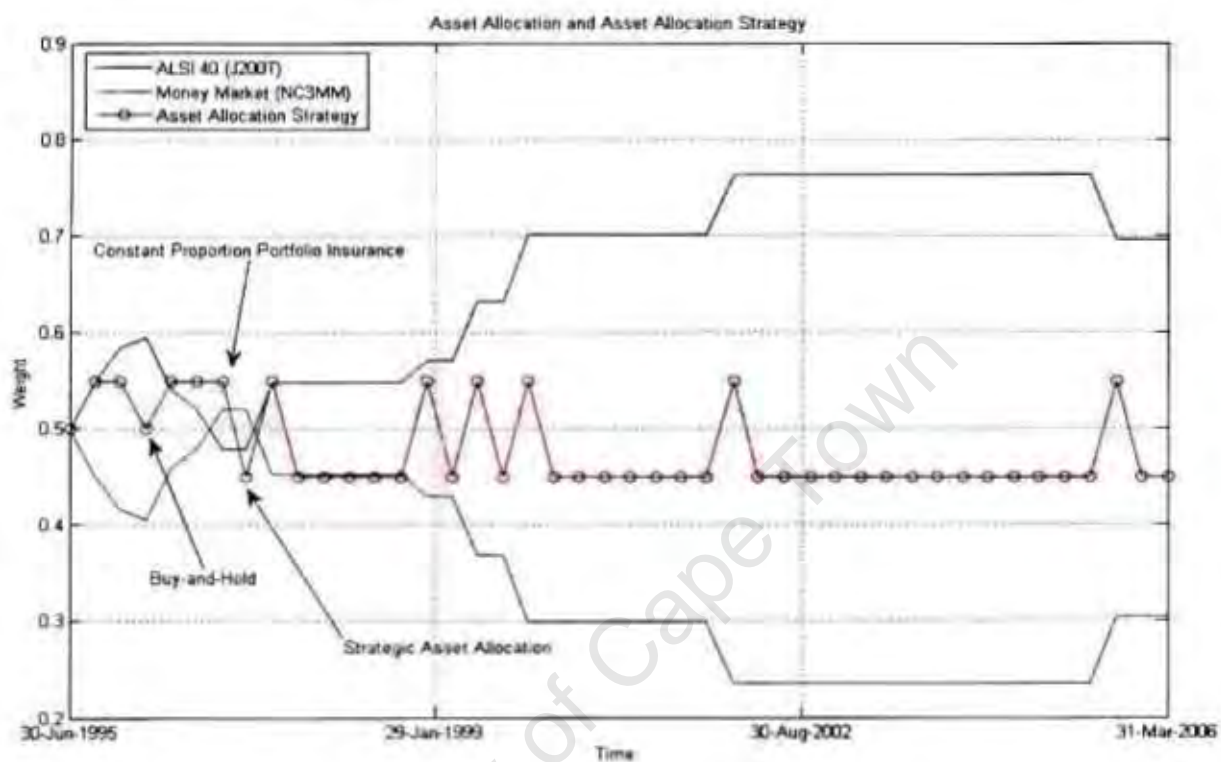


FIGURE 26: ASSET ALLOCATION FOR SIMULATION PERIOD



2. In my opinion, a relevant "in-sample" test period was ten years; however, this time period needs to include times of extreme volatility.

The justification for this assertion lies in the fact that for any absolute return fund to consistently meet and exceed its stated investment objectives, it would have to weather various "stormy periods".

I chose the period from 1995 to 2005, since during this time period, the simulation would encounter:

- Extreme currency volatility during 2001, as seen in FIGURE 27.

FIGURE 27: RAND VOLATILITY DURING 2001.



- Three market crashes 1997 – the emerging markets crisis, 1998 – the Russian debt default and 2000 – the dot com bubble bursting, as seen in FIGURE 28.
- A rampant bull market lasting from 2003 - ?, as seen in FIGURE 28.

FIGURE 28: ALSI 40 INDEX MARKET VOLATILITY FOR 1995 TO 2007



3. The return per unit of volatility which is achievable through varying the asset allocation in the absolute return fund:

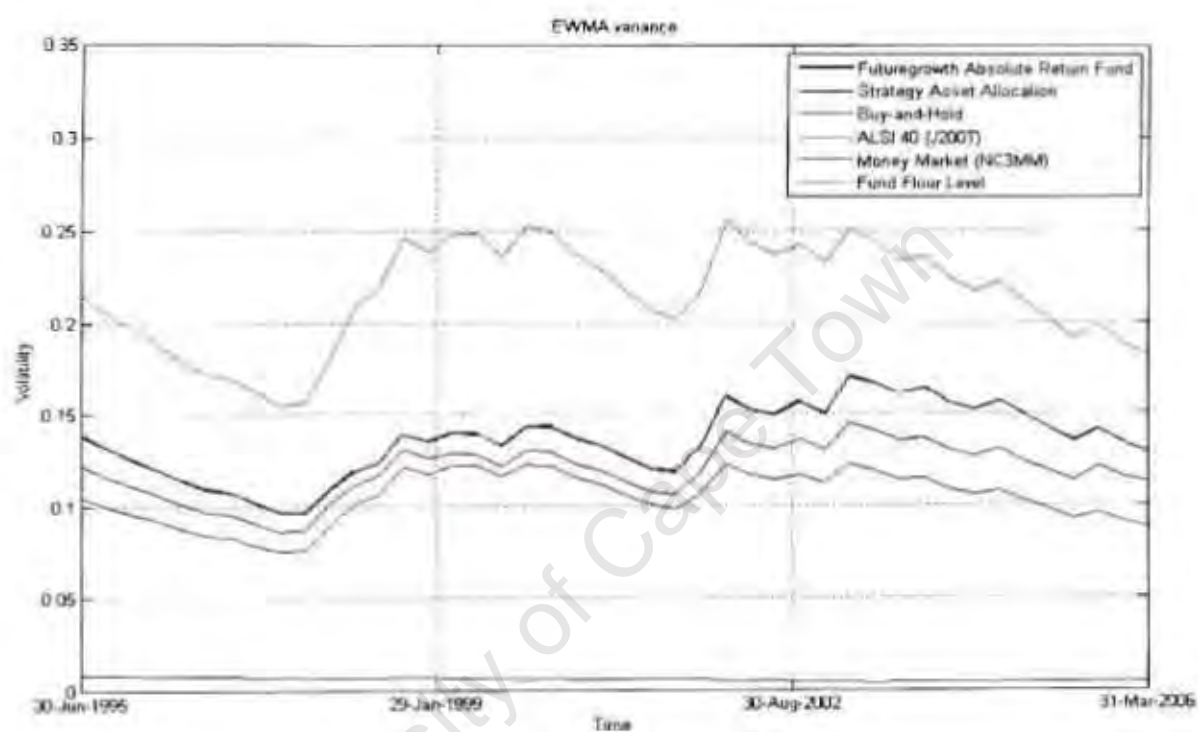
FIGURE 29: RETURN PER UNIT OF VOLATILITY USING STRATEGY RULES FOR SIMULATION PERIOD

Dates	Volatilities			Returns			Return / Vol	
	ARF	J2001	NC3MM	ARF	J2001	NC3MM	ARF	J2001
1996/12/31	10.66%	17.02%	0.74%	8.90%	11.31%	5.24%	0.83	0.66
1997/12/31	10.31%	18.24%	0.64%	-2.39%	-8.39%	5.21%	-0.23	-0.45
1998/12/31	13.49%	22.94%	0.67%	-1.65%	-4.98%	6.02%	-0.12	-0.20
1999/12/29	14.31%	25.25%	0.66%	38.20%	61.22%	4.15%	2.57	3.43
2000/12/29	12.55%	21.89%	0.57%	5.06%	6.70%	4.42%	0.40	0.29
2001/12/31	15.02%	25.57%	0.52%	20.41%	21.69%	3.28%	1.28	1.24
2002/12/31	14.98%	23.25%	0.42%	-6.47%	-9.97%	4.10%	-0.43	-0.39
2003/12/31	16.41%	23.60%	0.42%	10.43%	15.49%	3.47%	0.64	0.66
2004/12/31	14.87%	21.15%	0.44%	17.92%	24.09%	2.59%	1.21	1.14
2005/12/30	13.35%	18.29%	0.43%	10.82%	42.36%	2.39%	2.21	2.24
							0.83	0.75

It should be noted that the mechanical implementation of the absolute return fund strategy, ARF in FIGURE 25, as per the format in the answer, yielded a greater return per unit of volatility than the ALSI 40 total return index, J2001 in FIGURE 29, on average for the ten year observation period.

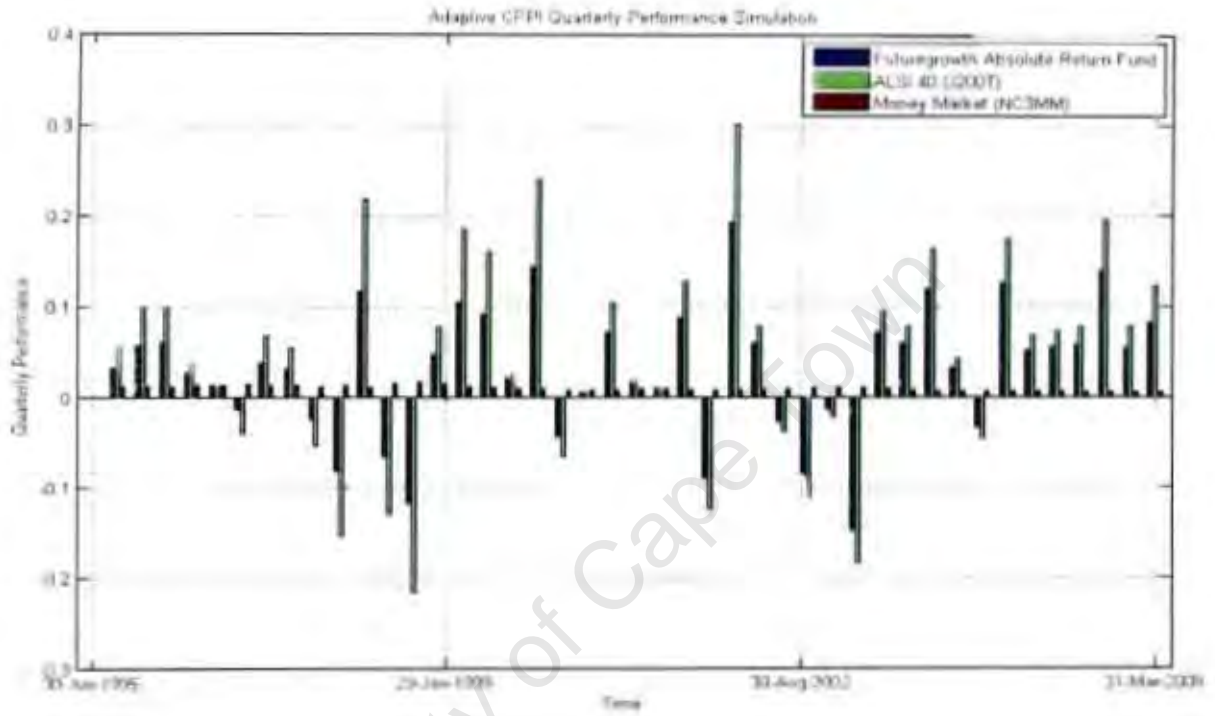
Considering the volatility relative to the component building blocks proved that the fund simulation had lower levels of volatility than the ALSI 40 total return index:

FIGURE 30: STRATEGY VOLATILITY DURING OBSERVATION PERIOD



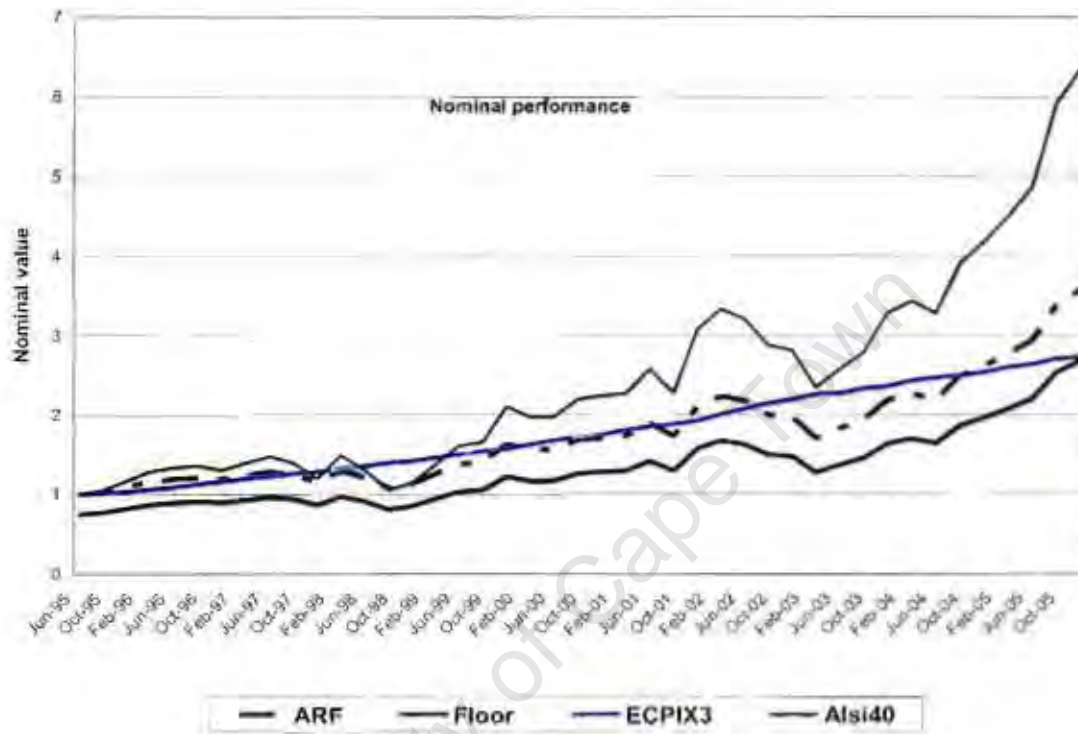
The next consideration was how the absolute return fund would behave on a quarterly basis. The simulation yielded results:

FIGURE 31: STRATEGY QUARTERLY RETURNS DURING OBSERVATION PERIOD



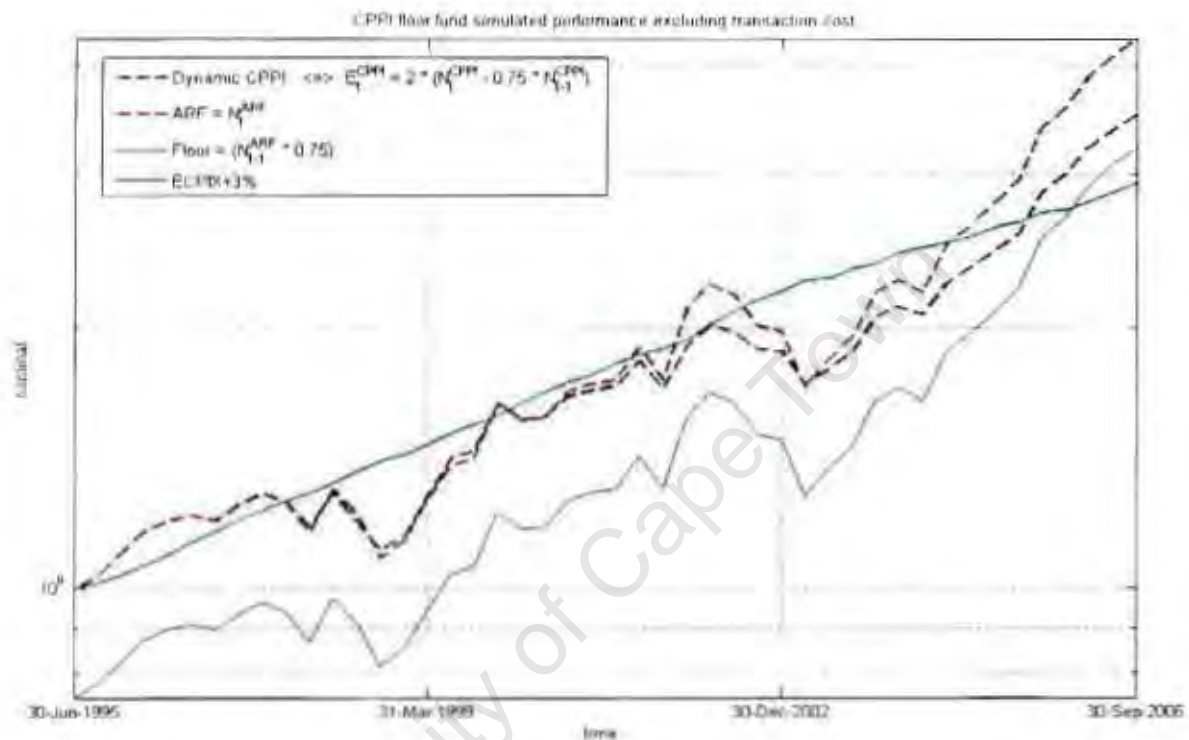
The returns that were generated from the simulation:

FIGURE 32: LOG SCALE CUMULATIVE RETURNS FOR STRATEGY SIMULATION PERIOD



The simulation proved the point that the combination of the CPPI, SAA and BH strategies yielded a greater return than the simple implementation of a pure CPPI strategy:

FIGURE 33: CPIX (CONSUMER PRICE INDEX EXCLUDING MORTGAGES) OVER TIME.



Based on the probability of success, suggested from the simulation period, I decided to get approval from my board to invest Futuregrowth seed capital into a fund based on the methodologies tested in the simulation period. The Futuregrowth absolute return fund was initiated.

Actual Futuregrowth Absolute Return Fund Performance:

The Futuregrowth Absolute Return Fund is based on the investment strategy explained in the answer above. FIGURE 34 is the cumulative performance of the fund relative to targeted benchmark of CPIX+3% and the FTSE/JSE All share index (merely for reference purposes) on a monthly performance basis. FIGURE 35 highlights the actual absolute return funds performance on a monthly basis.

FIGURE 34: ACTUAL INVESTMENT FUND CUMULATIVE RETURNS

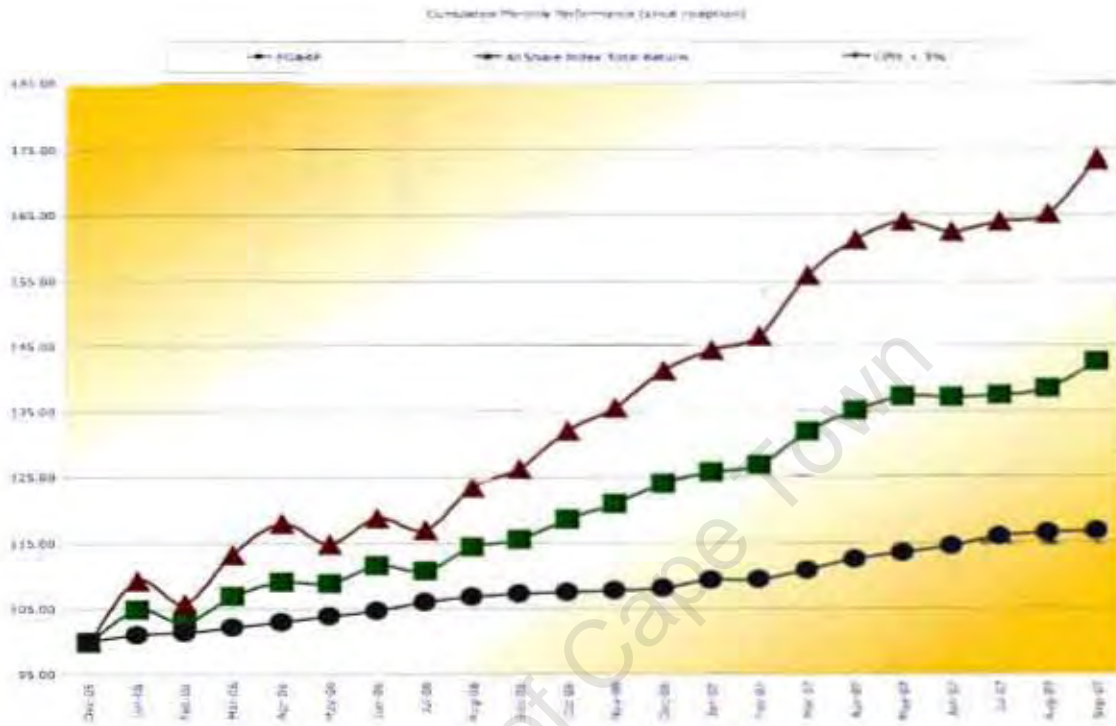


FIGURE 35: ACTUAL INVESTMENT FUND MONTHLY RETURNS



Descriptive statistics for the actual fund performance: January 2006 to 30 September 2007

FIGURE 36: ACTUAL INVESTMENT FUND SUMMARY DESCRIPTIVE STATISTICS

	Annualised Return	Annualised Volatility	Sharpe Ratio	Information Ratio	1 Month	3 Month	6 Month	12 month
Fund	22.5%	5.7%	2.3	3.2	2.9%	3.9%	6.1%	23.4%
CPIX +3%	9.3%	1.5%			0.3%	2.0%	6.5%	8.9%
All Share Index (TR)	37.1%	10.7%	2.6	3.0	5.0%	6.7%	11.3%	37.4%

Risk Decomposition of the Futuregrowth Absolute Return Fund

FIGURE 37: ACTUAL INVESTMENT FUND RISK DECOMPOSITION

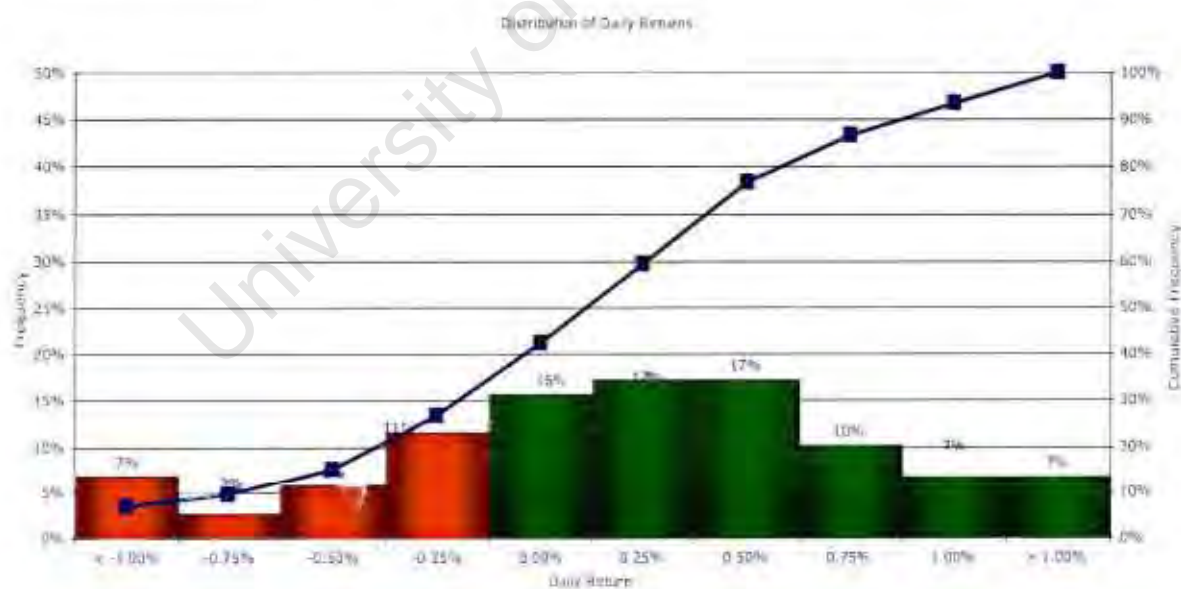
Risk Decomposition as @ Fri 28-09-2007			
Descriptive Statistics (30 trading days)			
Total Return	8.79%	Alpha	7.70%
Annualised Return	104.51%	Annualised Alpha	94.83%
Volatility (ann)	14.38%	Active Risk (ann)	14.38%
Downside Dev (ann)	7.76%	Information Ratio	6.6
Skewness	-0.1	Sharpe Ratio	6.6
Excess Kurtosis	0.9	Sortino Ratio	12.2
Correlation	0.9	Beta	0.5
ALSI Volatility	23.95%	Volatility Ratio	0.60
Descriptive Stats (since inception)		- 436 trading days	
Total Return	42.57%	Alpha	27.99%
Annualised Return	22.54%	Annualised Alpha	14.42%
Volatility (ann)	11.33%	Active Risk (ann)	11.33%
Downside Dev (ann)	7.07%	Information Ratio	1.3
Skewness	-0.4	Sharpe Ratio	1.3
Excess Kurtosis	2.2	Sortino Ratio	2.0
Correlation	0.9	Beta	0.5
ALSI Volatility	20.85%	Volatility Ratio	0.54
Notes:			
1	Volatility, Downside Deviation, and Active Risk are annualised figures.		
2	Volatility Ratio is the ratio of Fund Volatility to ALSI Volatility.		

FIGURE 38: ACTUAL INVESTMENT FUND RELATIVE TO ALL SHARE TOTAL RETURN INDEX

Comparison: FGARF vs ALSH-TR		
Fri 28/09/2007	FGARF	ALSH-TR
Mean Daily Return	0.08%	0.13%
Daily Standard Deviation	0.72%	1.32%
Volatility (annualised)	11.33%	20.85%
Worst Daily Move	-3.20%	-6.70%
Best Daily Move	2.22%	4.92%
# of Negative Days	184	185
% of Days Negative	42%	43%
# of Positive Days	252	250
% of Days Positive	58%	57%
Total Return	42.57%	73.49%
Annualised Return	22.54%	37.12%

Distribution of Daily Returns

FIGURE 39: ACTUAL INVESTMENT DISTRIBUTION OF DAILY RETURNS



From the descriptive return statistics in FIGURE 36, it is evident that the strategy delivers the intended objective, namely, returns in excess of inflation with low levels of risk in the form of volatility.

Futuregrowth Absolute Return Fund Relative to Peers

FIGURE 40: ACTUAL INVESTMENT FUND RETURNS RELATIVE TO PEERS – 3 MONTHS

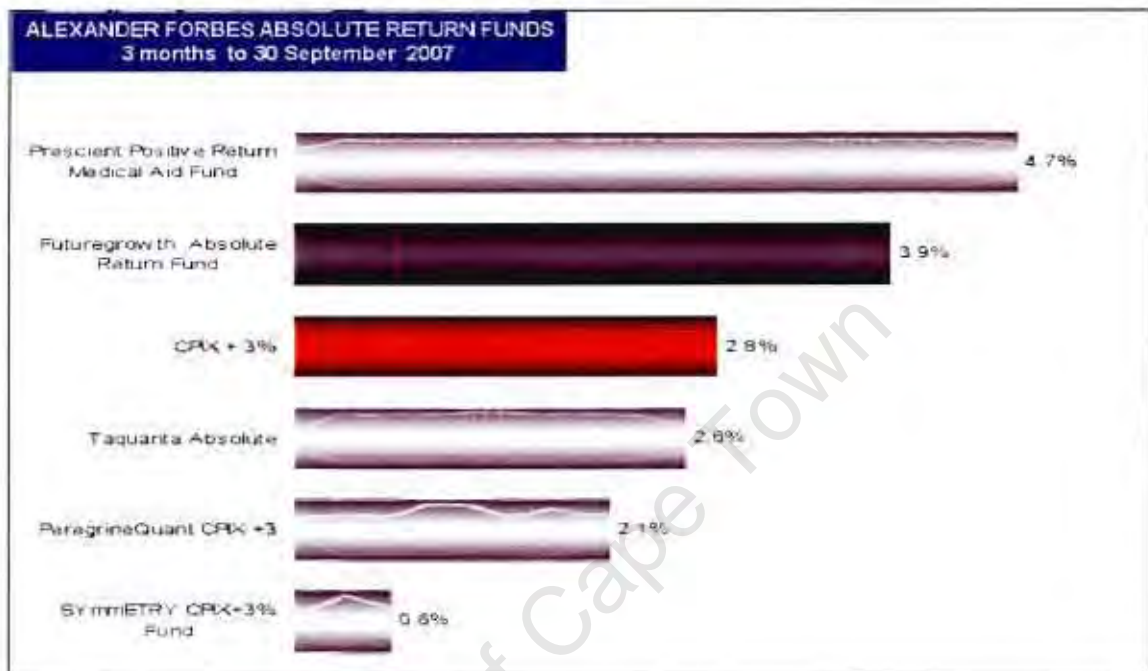
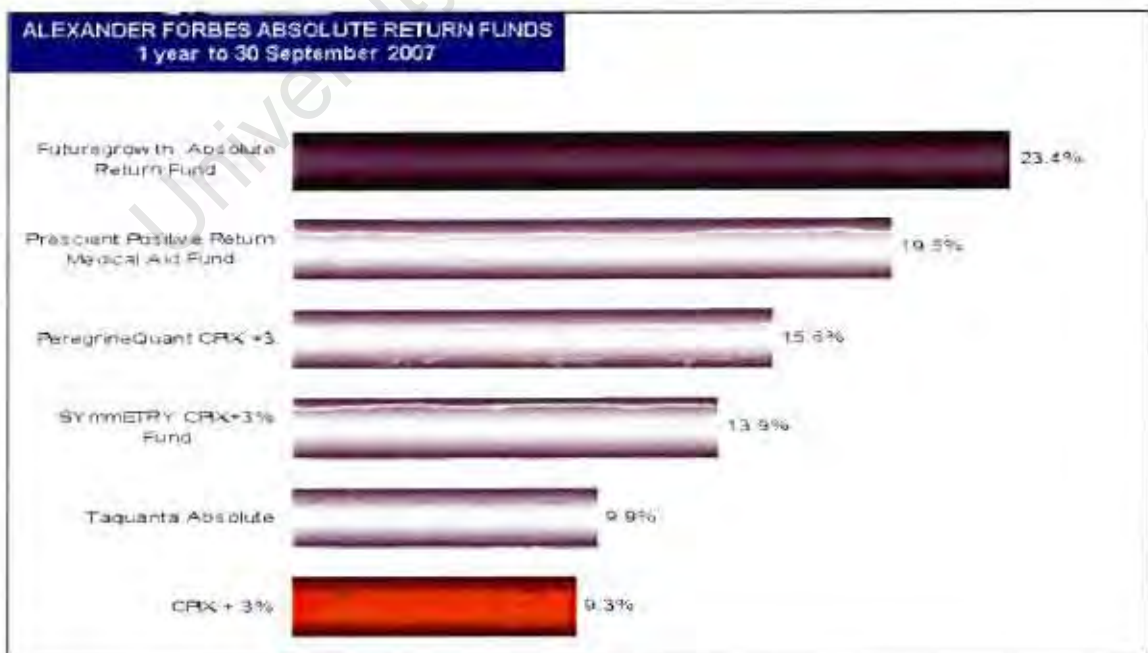


FIGURE 41: ACTUAL INVESTMENT FUND RETURNS RELATIVE TO PEERS – 12 MONTHS



4. The type of derivative overlays which serve to accomplish the objective of the absolute return fund strategy:

During the calendar year of 2006, at a time when actual funds were invested in the strategy, I chose to implement a "short fence". It should be noted that during the simulation period, the back-testing would have been meaningless, since the benefit of "perfect hindsight / foresight" would have negated the simulation validity.

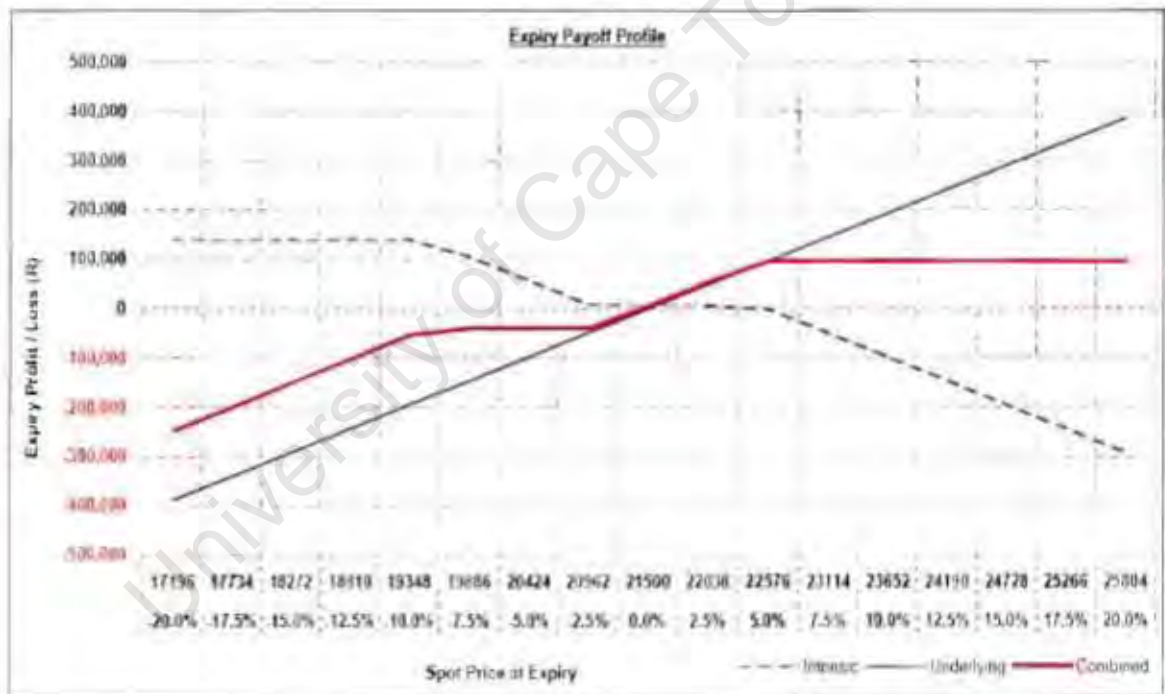
A short fence is achieved through the sale of a call option at the level above which you are happy to forgo upside, coupled with the purchase of a put option at a strike level where you want the downside protection to start, and the sale of a put option at a level lower than the purchased put option at which point you are happy to experience un-hedged market participation again.

A call option is defined as a financial contract between two parties, the buyer and the seller of this type of option contract. It is the option to buy the shares of a company at a specified time in the future. The buyer of the call option has the right, but not the obligation to buy an agreed quantity of the share in question (the underlying instrument) from the seller of the option at a certain time (the expiration date) for a certain price (the strike price). The seller (or "writer") is obligated to sell the share or underlying instrument should the buyer decide to exercise the call option. The buyer pays a fee known as the option premium for this right. The buyer of a call option wants the price of the underlying instrument to rise in the future; the seller either expects that it will not, or is willing to give up some of the upside profit from a price rise in return for the premium received immediately and retaining the opportunity to make a gain up to the strike price of the option.

A put option is defined as a financial contract between two parties, the seller (writer) and the buyer of the option. The buyer of the put option acquires a long position offering the right, but not the obligation, to sell the underlying instrument at an agreed-upon price (the strike price). If the buyer exercises the right granted by the option, the writer has the obligation to purchase the underlying at the contracted strike price. In exchange for having this option, the buyer pays the writer a fee (the option premium). The put buyer either believes it's likely the price of the underlying asset will fall by the exercise date, or hopes to protect a long position in the underlying asset. The advantage of buying a put over short selling the asset is that the risk of potential loss is limited to the premium paid for the option. The put writer does not believe the price of the underlying share is likely to fall. The writer sells the put to collect the option contract premium.

The intention is to create a self funding protective strategy, since the sold call and put should pay for the purchased put. In this instance, I sold a call at 105% of the point where the index was, bought a put at 97% of the current index point and sold a put at 92% of the point where the index was. Effectively this meant that I was hedged, in that if the market fell by more than 3%, I would only suffer the 3% loss, down to a market fall of 8%, beyond which I would be outside the "short fence" and would experience losses equal to the market fall beyond that point. To enjoy this benefit, I had to write a call option 5% above the current market level which meant that for the duration of the option (3 months in this instance); I could not have gained more than 5% on the upside. In this instance, I actually generated a positive cash flow for the absolute return fund, from the protective derivative strategy.

FIGURE 42: ACTUAL INVESTMENT FUND DERIVATIVE STRATEGY IMPLEMENTED IN OCTOBER 2006



Key learnings / values extracted from paper 3

1. Defined contribution pension funds appear to provide greater benefit for employees, since they are able to determine contribution levels and in certain instances have a hand in determining in which asset classes their pension gets invested into. However, in reality, the move from defined benefit to defined contribution has shifted the responsibility for a potential pension shortfall upon retirement from the employer to the employee. This has happened without appropriate training and education being provided to pension fund beneficiaries. From a purely capitalistic perspective it could be argued that company balance sheets will now be in a better position, since they will not have to provide for a potential liability in the form of a pension short fall, however, a far greater concern should be the fact that now an even larger portion of the retired population is not going to be self sufficient and in turn dependent on the state.
2. It makes sense to protect capital in the years leading up to a person's retirement; however, total risk aversion means that any potential upside to be experienced through exposure to equity markets is negated. A controlled exposure, through a suitable asset allocation diversifying strategy will add value.
3. Inflation is the enemy of all pension funds. The actual return on an investment portfolio is irrelevant if it is not producing returns in excess of inflation over the long term.
4. A slight adaptation to philosophy that appears to be fatally flawed can result in a new strategy that actually provides the desired result. I took traditional constant proportion portfolio insurance (CPPI) principles, which tend not to work and adapted them to create a solution which delivers appropriate risk and return levels.
5. Choosing the right benchmark against which to manage an absolute return fund is paramount. This comes through in the level of risk incurred as a result of the returns being targeted.

4.3 My theory on new product development in the South African financial market

Financial market product development tends to be of a subjective nature, since different world views shape investors perceptions about what is attainable in terms of investment returns and what level of risk is appropriate. A key assumption is that investors wish to maximise their utility i.e. they wish to receive the highest possible return for the amount of risk they are willing to take. Based on the information available to investors, they make a decision with regards to which asset manager meets their decision criteria. This is largely driven by behavioural biases, fuelled by the media.

In light of this situation, I elected to use a grounded theory research process, in order to remove a certain amount of subjectivity and potentially derive an answer from the data. Grounded theory as explained by Strauss and Corbin (1990):

A grounded theory is one that is inductively derived from the study of the phenomenon it represents. That is, it is discovered, developed, and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon. Therefore, data collection, analysis, and theory stand in reciprocal relationship with each other. One does not begin with a theory, then prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge. (p. 23).

In order to expand upon my theory, the learnings from each of my three case study papers need to be considered:

Key learnings / values extracted from paper 1

1. Investment returns may be volatile through time, even when investment professionals with specialist focus areas apply themselves to the objective of maximising returns.
2. Specialist investment professionals may be highly qualified and experienced, however, at times; it appears that they are disconnected from reality, seemingly unaware of the interconnectivity of the various factors in the financial markets and how these actually drive share prices.
3. Investment professionals tend to focus on their investment thesis, wanting to prove the validity of their "way" of investing, be it style, theme, analysis or thematic, when the actual focus should be on maximising risk adjusted investment returns for clients.
4. Behavioural biases tend to drive the way in which fund managers tend to invest and as such, the field of behavioural finance requires further study in conjunction with traditional investment theories.
5. Financial markets are not as efficient as the investment public think.

Key learnings / values extracted from paper 2

1. The asset allocation component in fund management does not receive sufficient focus in the investment process. It appears that investment professionals want to rather focus on picking the winning share, or a "ten bagger" share which increases in value more than tenfold from the initial purchase price for the share rather than building a sound portfolio.
2. Efficient market hypothesis as proposed by Professor Fama cannot hold true, otherwise it would not be possible to outperform the market index over time. This is in contrast to the data which suggests that some fund managers do "beat" the market over time, while others under perform. If all information is known and represented in shares prices at all time, would all fund managers merely achieve the market return?
3. The perception of risk, real or subjective tends to impact the decision making process followed by fund managers. There tends to be an aversion to realising a loss, even if it is the logical thing to do and take the remaining proceeds and place them into a better performing investment. It appears that people don't "feel" the pain of a loss while it is only a revaluation loss on paper, with the potential to recover.
4. Cash management, which is the preservation of funds in a portfolio, through effective mechanisms such as stop losses, or varying the portion of the portfolio which is exposed to the risky asset (typically equities), based in the appreciation or depreciation of the component investments serves to protect the capital in the fund and allow for compound growth over the longer term. I found that this alone allows for an out performance of the market, on a simulated back tested basis.
5. There appears to be vast amounts of time spent on looking for "investment signal", that is where to invest, when in reality, the timing component and asset allocation to different sectors appears to have a greater significance on the returns generated.

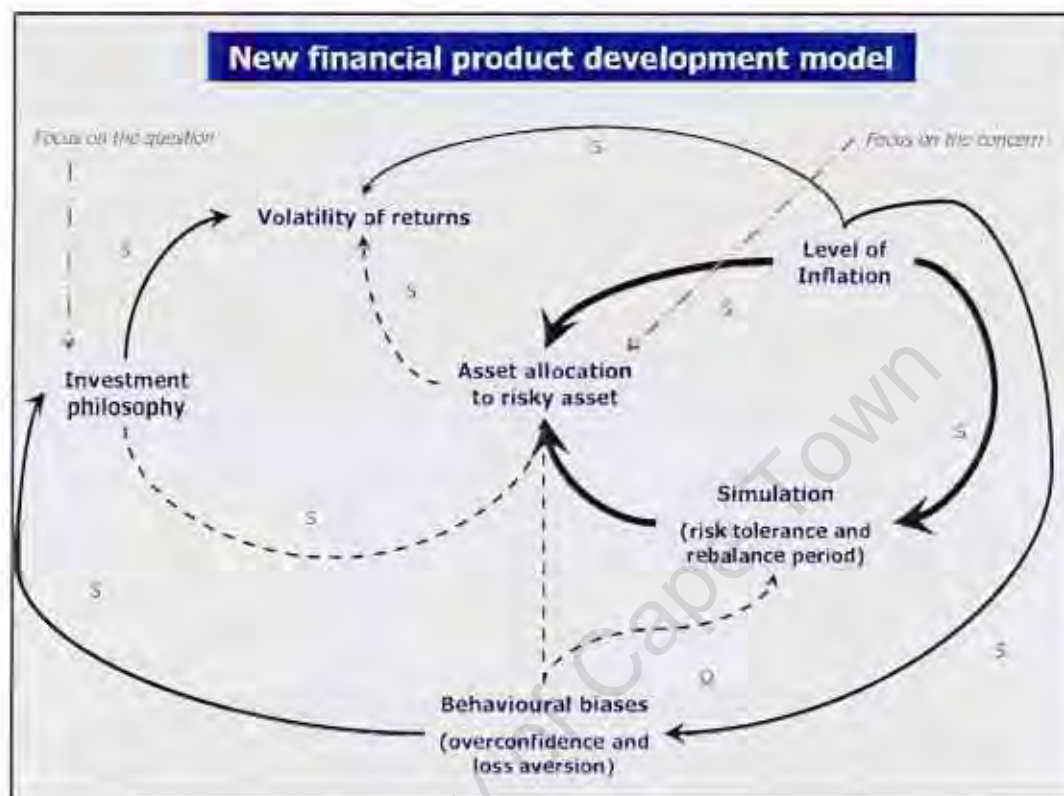
Key learnings / values extracted from paper 3

1. Defined contribution pension funds appear to provide greater benefit for employees, since they are able to determine contribution levels and in certain instances have a hand in determining in which asset classes their pension gets invested into. However, in reality, the move from defined benefit to defined contribution has shifted the responsibility for a potential pension shortfall upon retirement from the employer to the employee. This has happened without appropriate training and education being provided to pension fund beneficiaries. From a purely capitalistic perspective it could be argued that company balance sheets will now be in a better position, since they will not have to provide for a potential liability in the form of a pension short fall, however, a far greater concern should be the fact that now an even larger portion of the retired population is not going to be self sufficient and in turn dependent on the state.

2. It makes sense to protect capital in the years leading up to a person's retirement; however, total risk aversion means that any potential upside to be experienced through exposure to equity markets is negated. A controlled exposure, through a suitable asset allocation diversifying strategy will add value.
3. Inflation is the enemy of all pension funds. The actual return on an investment portfolio is irrelevant if it is not producing returns in excess of inflation over the long term.
4. A slight adaptation to philosophy that appears to be fatally flawed can result in a new strategy that actually provides the desired result. I took traditional constant proportion portfolio insurance (CPPI) principles, which tend not to work and adapted them to create a solution which delivers appropriate risk and return levels.
5. Choosing the right benchmark against which to manage an absolute return fund is paramount. This comes through in the level of risk incurred as a result of the returns being targeted.

From these fifteen key learnings, I made use of an affinity diagram in order to identify what factors are driving the system in question. From the affinity diagram, I constructed an interrelationship diagram, which allowed me to construct a causal loop diagram, which shows the six key factors (drivers, outcomes and links) that need consideration in any new financial product development process in South Africa. See my model, figure 43.

FIGURE 4.5: NEW FINANCIAL PRODUCT DEVELOPMENT MODEL



Explanation of the middle loop (level of inflation, simulation and asset allocation to the risky asset)

Level of inflation

The level of inflation is the key driver in developing any financial market product. There are various risk measures, which seek to identify deviation from a chosen benchmark, or the level of expected return per unit of risk, however, any investment product which is unable to beat inflation in the long term is actually costing the investor on a real investment return basis (return less inflation), since the value of money invested today, will have a lower purchasing power in the future, as inflation erodes it.

Simulation

Simulation may get influenced by behavioural biases, since this will impact the starting level of risk or allocation to the risky asset class that an investor is prepared to accept. The benefit of simulation lies in the fact that irrespective of which starting point is

selected, from an asset allocation basis, the only variables which will impact the outcome are the level of inflation and the asset allocation to the risky asset. Each of these variables may be adjusted on an iterative basis, or alternatively a monte carlo simulation may be run, generating thousands of potential returns paths and asset allocation solutions, devoid of human emotion. Ultimately allowing for an objective decision to be made, based on the outcome of the data.

Asset allocation to the risky asset

This part of my new product development model addresses the concern around new product development in the financial markets. The level of inflation will impact upon the asset allocation to the risky asset in a portfolio, since as the level of inflation increases, so will the required allocation to the "risky asset", in the form of equity exposure, since equity's have more volatile returns, they have the ability to deliver returns in excess of inflation, when compared to less volatile assets, such as cash. This payoff for equity has an asymmetric profile, since the deviation in these returns may lead to a large negative return. Simulation assists in selecting the right level of allocation to the risky asset, since numerous potential outcomes may be simulated for different market phases or variables. A focus on asset allocation, in relation to a client or group of clients needs, allows for the product to be targeted at their exact need, instead of being merely designed with the objective of maximising profit for the company creating the new product.

Explanation of the outer loop (level of inflation, behavioural biases, investment philosophy and volatility of returns).

Level of inflation

The level of inflation drives investors and investment professionals behavioural biases. In a high inflation environment, all assets rise in price, leading to overconfidence in ones abilities, since individuals tend to attribute positive performance to their own genius, with negative performance being attributed to external factors, "beyond their control". Conversely, in a low inflation environment, all assets tend fall in price on a relative basis. This leads to the bias where investors tend to hang onto poor performing investments, believing that if an investment has decreased in value, it is only realised, once the asset is sold, up to that point, they tend to view it as a "paper loss".

Behavioural biases

These tend to get influenced by the level of inflation, since in a high inflation environment, investors tend to pursue growth strategies, as they wish to generate higher returns. Growth strategies tend to benefit from higher levels of inflation, as individual companies have a greater chance of passing on higher costs for their goods

and services, as all companies need to do this in a high inflation environment, as their inputs costs tend to rapidly rise. In lower inflation environments, value strategies tend to be in vogue, as companies have lower pricing power and investors tend to seek out companies trading at discounts to their theoretical fair value.

Investment philosophy

This component of my new product development model deals with the question being posed, it takes the thinking process to a higher level of abstraction and deals with manner in which investors think as well as investment professionals who create new financial products. It attempts to introduce a level of objectivity into an environment which is largely subjectively driven and therefore highly variable. As investors behavioural biases influence their thinking, they tend to adjust their investment philosophy, with classical biases such as over confidence and loss aversion leading to decisions being made on an emotional basis, instead of a sound, logical, objective investment rationale.

Volatility of returns

The volatility of returns experienced in a portfolio, simulated or actual is a function of the level of equity present in the portfolio. The higher the equity component in a portfolio, the higher the realised volatility of returns will be. This is applicable for both positive and negative returns. This volatility may be mitigated to a certain extent, through the use of derivative structures, which seek to limit the downside risk for a fund, in exchange for a premium payment. This may effectively be seen as an insurance premium. This does however, introduce an additional level of complexity into a fund, since the return profile for a derivative instrument is non-linear. This means that returns will move in a straight line up to a certain point, then may accelerate or decelerate faster than the underlying market, based on the type of strategy implemented.

Connecting the outer loop to the inner loop

Behavioural biases to asset allocation to the risky asset

Investors with high levels of overconfidence will tend to allocate much higher levels of their portfolio to the risky asset. In contrast, those with a risk aversion will be more conservative and allocate higher amounts to the less risky asset (cash), even if this means a lower potential return.

Behavioural biases to simulation

The same effect as the impact on asset allocation, as investors initial starting points will be biased. For this reason, I would suggest a random selection, such as a monte

carlo simulation, with thousands of potential return paths, thus eliminating subjectivity and allowing a greater focus on the resultant data from the simulation.

Investment philosophy to asset allocation

Value investors will be biased towards investments which appear cheap, based on their subjective decision criteria or set of metrics upon which decisions are made. Growth investors will tend to adapt asset allocation, based on the momentum of the current market phase.

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Connecting the inner loop to the outer loop

Asset allocation to the risky asset to volatility of returns

As the level of equity in a fund is increased, so is the volatility of returns, both on the upside and downside, since the realised volatility of equity returns historically has always been greater than the realised volatility of cash returns.

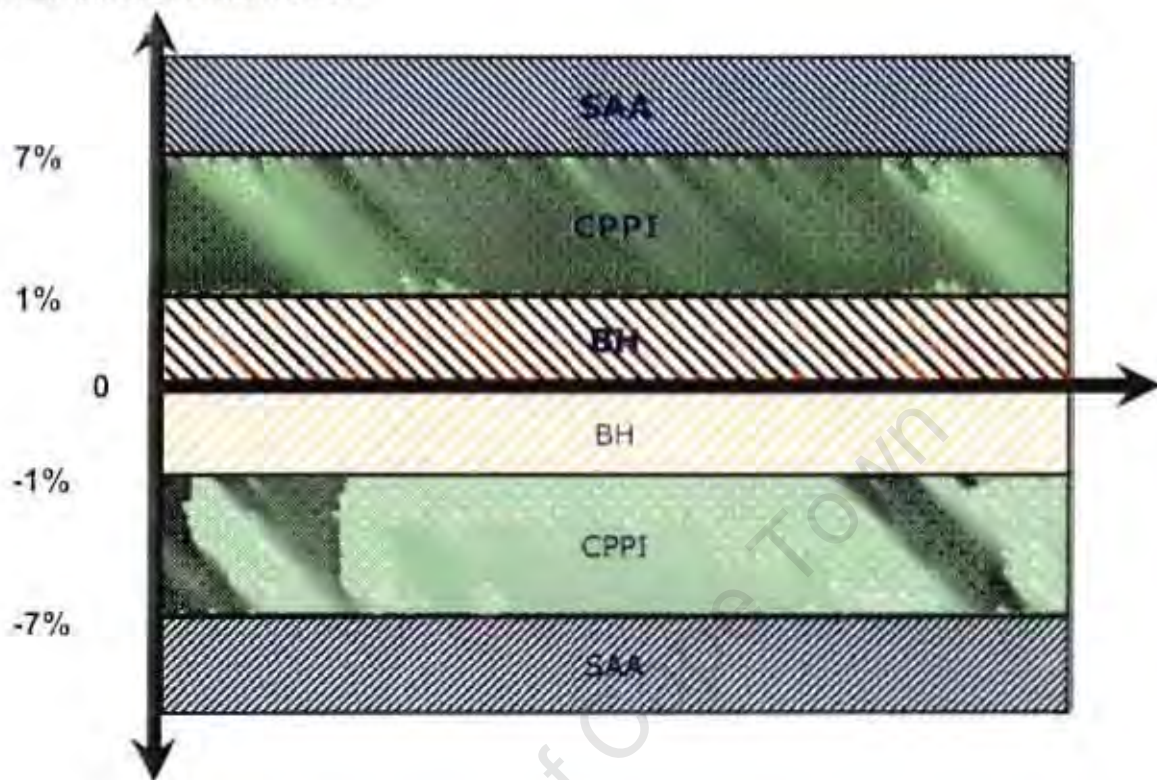
What really helps in new product development is simulation. The strength of simulation lies in the fact that subjective biases may be disproved, since numerous potential outcomes or scenarios may be tested, at a very low cost, prior to actually launching the product and then discovering the flaws. The weakness in simulation lies in the fact that tests tend to make some broad based assumptions with respect to potential entry and exit points and the level of liquidity available in the market at any point in time. This weakness needs to be tempered by applying realistic decision criteria and avoidign the practice of curve fitting, based on perfect hindsight.

Behavioural biases need to be recognised and potentially documented, prior to the launch of a simulation, allowing for the replication of the simulation at any point in time, with the application of a reasonable set of decision criteria and assumptions with respect to the viability of a simulated outcome.

In addition, the investment philosophy of the client or investment firm need to be considered, to determine wheether the expectations of both parties are aligned and the levels of risk and return are considered reasonable and attainable to both parties.

I believe that the key decision in any investment product is the asset allocation level. This will determine a successful product and outcome. I offer that in order to make a good investment decision, with respect to asset allocation in the context of an absolute return fund, my decision criteria in the model I propose in figure 25 should be applied. These decision criteria are a function of the simulation performed, as serves as the basis upon which the product was launched and successfully run with real assets. This model allows for the decision between strategic asset allocation, constant proportion portfolio insurance and a buy and hold strategy to be made on a quantitative basis, devoid of subjective biases, based on the observed equity component return within a fund, for the past quareter. This implies that investment rebalancing should take piace on a quarterly basis. The decision criteria rule for this asset allocation model have been reshown here for ease of reference.

FIGURE 25: ASSET ALLOCATION RULES



4.4 Evolution of my thinking post this research finding / how I would now develop a new financial market product.

Now that I have been through the process of doing this research, I feel that I have a process that may be followed when developing new products. The value of my model lies in the fact that it starts with the concern, which is what the exposure to the risky asset (equity) will need to be in order to address the needs of different investors. This is directly related to the question, which deals with what investment philosophy is appropriate / acceptable for the situation at hand. The balance of the factors in the model constitute the answer and are related to the starting point. I find that if the concern is not clear for the product or individual purchasing the product, the question will definitely shed some light on which path the thinking needs to go along. From this point, the answer, in the form of how the new product that is being developed needs to be designed, evolves. The model provides a relatively objective framework in which to make decisions for a concern and question that is largely subjective.

CHAPTER 5

5.1 SIGNIFICANCE OF RESULTS

At the start of my research papers, I followed an interest, namely the awareness of what is actually driving financial markets, from the perspective of investment professionals within my organisation. This inquiry was driven by a hunch that their focus had become too specific, without an appreciation of the true multi dimensional system the markets operate in. The outcome surprised me and lead to further study in the psychology behind investors, which branched out further to a consideration of the world according to two distinct schools of thought. The first group was of the opinion that they could explain all shares prices away and that there is no room for "beating the market", the EMH school of thought. The converse is behavioural finance, where the thinking of investors and their subjective biases have an impact on the market itself and their individual investment returns.

These biases lead me to my second paper, where I proposed that the market could be beaten merely by applying stringent capital preservation methodologies to a simple trading strategy, devoid of investment signal or unique insights. To my amazement, the process was able to "beat the market", which begs the question of what is the purpose of traditional fundamental research in the financial markets. Definitely an area I would like to further explore.

The learnings from these two papers lead to an area I am truly motivated by, namely absolute return funds. I have always had the opinion that if an investment strategy is unable to outperform inflation, it is worthless. I strongly suggest that any person considering their retirement planning should use inflation as their benchmark and ignore the wild gyrations of the financial markets. I proved on an empirical basis that with the use of an adaptive asset allocation strategy, effectively making a few change to a process that was previously thought to be worthless, constant proportion portfolio insurance (CPPI), I was able to generate the required returns in excess of inflation. The exciting part is that this was before the use of derivative overlays, which serve to offer a further form of protection. I feel that the key value add comes through the passive equity component in the form of an exchange traded fund, coupled with the contrarian strategic asset allocation approach that I overlaid on top of the "tired" CPPI methodology. I think the biggest learning for me throughout the entire process is that we should not prejudge a potential solution before due attention has been given to it and that this outcome is only achievable by following a process that allows for a large amount of objectivity in the research process, namely simulation, eliminating subjective biases around what should actually be done, based on a limited world view.

The future lies in an exchange traded absolute return fund! It hasn't been done anywhere in the world yet, however, I believe that the creation of this "commoditised" asset allocation type strategy which is able to deliver risk adjusted returns in excess of

the market index, could revolutionise the way the pension fund world operates and potentially provide a means for governments to stem the tide in the pensioner space where people are retiring on hopelessly inadequate capital savings.

The objective in designing an investment product should be to outperform inflation over the period of time for which the investment is made. It is possible to achieve this result, with lower volatility than the market through the effective application of asset allocation.

This involves numerous components which need to be controlled and exploited in unison in order to achieve this objective:

1. The optimal rebalance period at which the weightings to each of these asset classes are adapted.
2. The expected inflation level, which impact on the level of equity in a fund.
3. The current and expected interest rate level, which impacts on the returns achievable from money market investments.
4. The individual's investment horizon, which impacts upon the level of risk that may be taken in the fund.
5. The investment objectives for the specific fund.

5.2 GENERAL CONCLUSIONS

I think that further research needs to be conducted with respect to how many simulations need to be run to achieve a valid outcome, with a high level of certainty that the simulated assumptions actually transpire in an actual portfolio.

I have applied my proposed methodology in the creation of an adaptive asset allocation absolute return fund, which did perform as simulated, when real money was invested in the fund. In addition, the objective of beating inflation was achieved, as displayed in my research results in chapter 4.

My final conclusion with respect to investing:

Build an appropriate portfolio; matching risk adjusted expected returns with your investment objectives, mindful of individual investment horizons, cash flow requirements and risk appetite. These parameters determine your allocation between different asset classes. Persist with your strategy. Avoid investing in the "flavour of the month"!

5.3 Evaluation

Paper 1

Relevance

I have shown that investment performance is directly impacted by the subjective responses of individuals who constitute investment teams. Following this train of logic, I have demonstrated that individuals' subjective biases impact market confidence levels, via collective thinking such as the herding phenomenon and attaching too much weight to the recent past. This has a powerful influence on sentiment and the frame of mind with which investment professionals approach the valuation of a company and hence the determination of which companies to invest in. This feeds into the "irrational behaviour of crowds", with uncertainty running amok, in the form of exaggerated despair and conversely excessive confidence in one's investment abilities. From this we observe the emergence of "market cycles". Central to the whole cycle is the individual and their awareness of the multitude of factors which impact both themselves and the greater investment community, transpiring in a market price.

The concern raised is that individuals are not aware of the multiplicity of variables which actually cause financial markets to adapt to different conditions, coupled with "tunnel vision", focusing on the micro issues of company specifics. The situation deals with the returns generated by investment professionals, within a specialist investment manager, hence there is a clear link between the concerns being raised and the situation under consideration.

The situation adequately explains the concern, since it identifies the importance of the task at hand and what impacts individuals thoughts, perceptions, emotions and actions actually have on the investment process.

Utility

Is the answer useful? Yes, it shows the factors which are driving investment markets and how the emotions of individuals impact upon and are actually a function of the system. The entire process is that of a dynamic feedback loop, with numerous levels of interconnectivity. The concern raised was that individuals were unaware of this feedback system coupled with intensive focus on details at the expense of the big picture. The answer adequately addresses these concerns, since it shows how these factors impact on the system and what the potential outcomes may be. In addition, the answer considers the area of behavioural finance which spans the vast majority of the variables raised in the concern.

There is a use for the answer, however, to be of true value, the subject requires further study. A possible area that needs further inquiry is what type of individual or more specifically, what personality types should be recruited as investment professionals. If we gain a greater insight into the thought process and reactions of the key decision makers in the system, we may gain a greater understanding of how to use the drivers in the system to our advantage, through the minimisation of recurrent errors due to consistent behavioural biases.

To add true value, a model should be simple enough to grasp at first consideration, yet comprehensive enough to include all the relevant components. I am also of the opinion that the model should be of a visual form that is simple to recognise and commit to memory. Given that my representation of the system complies with this requirement, I believe my model to be concise, explanatory, effective and useful in understanding the factors at play in the financial market arena.

Validity

In my answer, I have shown that the individuals in the system actually have a direct impact on how the system operates. This relationship happens whether they are aware of the process or ignorant of it. Should they be aware of the process (this would require a high degree of emotional intelligence, to acknowledge that we overestimate our abilities), they would be able to make "better" decisions. This is backed up with reference to different theories on how individuals interpret and react to the financial markets. On this basis, the rationale provides a valid basis for the answer proposed in the form of a dynamic system with a thorough justification of how the variables actually impact the concerns raised, via reference to the literature.

Ethics

Is my answer ethical? Ethics form the basis upon which a sound system operates, with internal self checks and balances. They provide purpose and meaning to our lives and help us attain desired objectives in a moral manner. Ethics assist in showing us what is right and wrong. I believe that if we act in an "ethical" manner we develop solid value systems. I am of the opinion that any action or process which has the intention of achieving a positive outcome that is not at the expense of another individual is an ethical system. The system that I have proposed is my interpretation of a complex system and how the system might impact on the individuals involved in it and how they might have a direct impact on the system. From this perspective it may be argued that I have approached the situation with a valid concern and provided a viable, objective manner in which to make sense of the system. Is this ethical?

The Markkula Centre for Applied Ethics at the Santa Clara University in California outlines a framework for ethical decision making. They state that there are a few steps that need to be taken in the process. These steps include:

1. Firstly recognise the ethical issue at hand. Is there something wrong and could it be damaging to the people or environment that it impacts.

Yes, clearly there is an ethical issue at hand, people's investments or pension funds are impacted, based on the actions and thoughts of the individuals who manage this money on their behalf.

2. Attempt to gather all facts pertaining to the issue. Who is involved? Who is affected? Who needs to be consulted? What are the options that we have in order to solve the issue?

I believe that I have been thorough enough with respect to this point.

3. Evaluate the different options we have and decide how this will impact on solving the issue using the means of doing the most good and the least harm.

This mindset resonates through the answer being proposed, since it seeks to provide a framework to understand how we might perform at our optimal in making investment decisions.

4. Choose an approach to solve the problem. Options include using a utilitarian approach, fairness approach, common good approach or a virtue approach.

This point is not applicable to my current area of study.

5. Make a decision and test it.

I have made a decision to represent a solution in the form of systems thinking methodologies. This system still needs to be tested in reality, currently it is my theoretical understanding of what is actually happening.

6. Implement the decision and then reflect on its outcomes.

The model will be implemented in due course and copious quantities of written reflection will take place to understand what factors are at play.

Paper 2

Relevance

The situation deals with different schools of thought with respect to approaching investments. The one believes that all information is in the current price of a share (EMH), while the other school of thought, the behavioural finance group is aware of the biases that exist, with particular reference to overconfidence in our abilities as investors. The common theme between these two apparently opposing world views is that there is a belief that positive investment performance or the ability to outperform the market is a function of being able to pick shares that will outperform.

The concern raised deals with the fact that neither group is taking into account that the simple issue of cash management could actually be all that is required to generate positive returns through time.

Therefore, I believe that the concern is relevant in the situation under consideration.

Following this train of thought, the situation does adequately explain the concern. I am of the opinion that the behavioural finance school is going down the right path, in that they have identified investors' shortcomings, however, their focus tends to be on meta-cognition, dealing with the biases and psychological profiles of investors, instead of dealing with the issue of how to protect capital and generate positive returns through time.

Reflecting on the argument I have put forward, I feel that further study is required to actually correlate the returns that may be generated via the cash management scenario I have proposed, with the actual returns of the market. I have shown that positive returns may be generated, yet I haven't contextualised these within the market returns space. I think that I steered clear of this, given the diverse range of benchmarks against which returns are measured. Further study into the risk reduction, capital preservation and attainment of returns in excess of inflation (the benchmark that I think is most relevant over the long term), achievable through cash management needs to be undertaken. I also think that the personality profiles of fund managers, needs further investigation, since biases tend to overshadow logic in many instances.

Utility

Is the answer useful? Definitely, it squarely addresses the concern, since it goes about proving that cash management alone, with random investment signal can generate positive returns, even taking into account transaction costs. This should serve as a point of departure for all investment process. I think of it as getting the basics correct,

setting yourself up to profit through effective cash management through time, will generate the positive returns, then on top of that, excess alpha may be added, irrespective of what methodology is applied.

The answer may be used as a basis to formulate hybrid investment strategies which ignore the ability to make stock calls; rather an exchange traded fund could be used as the underlying risky asset in a portfolio construction environment. The next step would then be to apply the cash management methodology to enhance entry and exit points. The level of gearing desired could be achieved through using derivative instruments. Another benefit of using an exchange traded fund such as the SATRIX 40, which tracks the top 40 shares, based on market capitalisation on the JSE, is that each quarter there is a rebalance which takes place by SATRIX; hence investors are not exposed to this timing risk, should they be attempting to replicate the top 40 index. Yet they receive the full benefit of the underlying dividends. The use of an exchange traded fund would also reduce basis risk, since there is a perfect correlation between the futures on the top 40 and the SATRIX 40, since both are based on the same underlying instrument – the top 40 index.

Validity

The rationale provides a valid argument for the answer, since it spells out the methodology applied in the scenario. It then proceeds to show the outcome of the scenario, which justifies the claim made that cash management can generate positive returns through time, even with a random investment process. The logical extension to assessing whether there is validity in the claim would be to test whether the process may be replicated. For this purpose, I have included the code required to run the scenario in the Matlab software package. The code for the scenario appears in Appendix 2. Added credibility would come in the form of reference to literature dealing with the topic. The absence of such reference is based on the fact that no publicly available research exists on the subject matter. I am of the opinion that studies have been undertaken in this field, yet the results have been retained for profit generation purposes.

Ethics

The question needs to be posed as to the ethical side of my answer. It is my opinion that ethics should underpin any system, be it financial; political; medical; social or other. A set of ethics serves as a method for us to benchmark whether we are achieving our objectives and goal, while maintaining a sense of harmony. I refer here to the fact that if we are not destroying the system, or creating an imbalance, while striving to achieve our objectives, we are living with purpose and ethics. In terms of first principles, ethics serve as a differentiator between positive and negative actions (this is a subjective statement at best). I have offered systems representation of what is occurring in the investment decision making space. I believe that to gauge whether my suggestions are ethical, they should be tested against an ethical "standard".

For this purpose, I have chosen the framework developed by The Markkula Centre for Applied Ethics at the Santa Clara University in California. The framework forms a basis for ethical decision making. The steps that need to be taken into account in the process:

1. *Firstly recognise the ethical issue at hand. Is there something wrong and could it be damaging to the people or environment that it impacts.*

No, there isn't an ethical issue at hand. I am studying the potential to enhance investment returns. These returns may already be good, I am merely suggesting that there could be room for improvement.

2. *Attempt to gather all facts pertaining to the issue. Who is involved? Who is affected? Who needs to be consulted? What are the options that we have in order to solve the issue?*

This is a tough one, every person who has an investment; pension fund or financial need for capital preservation could be involved. I believe that in my study of a specific area, I have gathered sufficient information.

3. *Evaluate the different options we have and decide how this will impact on solving the issue using the means of doing the most good and the least harm.*

The proposal suggests a potential solution to enhance returns. The objective is to only do good, no harm is intended.

4. *Choose an approach to solve the problem. Options include using a utilitarian approach, fairness approach, common good approach or a virtue approach.*

This point is not applicable to my current area of study.

5. *Make a decision and test it.*

I have made a decision to generate a scenario to prove my claim. The scenario has been tested and the results presented.

6. *Implement the decision and then reflect on its outcomes.*

I intend to implement the model to enhance my current investment process. Reflection will take place in due course.

Paper 3

Relevance

The situation focuses on the pension fund environment in South Africa, and the manner in which it has changed over the last decade from defined benefit to defined contribution. While this change may be beneficial from the perspective of the employer, since they have removed the burden of providing for guaranteed retirement benefits for employees, post retirement, the situation is totally different for the employee. The employee now has to provide for the potential that their retirement savings prove to be insufficient. In this situation, the actuarial consultants have provided conservative solutions which effectively move people from equity investments into money market investments in the last 3 -5 years of employment. My concern lies in that this "one size fits all" approach of placing people into buckets, based purely on age is not appropriate. I have suggested that an absolute return fund would prove more appropriate in these final years of an employee's income generating stage. I therefore believe that concern put forward in this case has been shown to be relevant in the situation at hand. The concern that absolute return funds have been based on the principals of CPPI, which falls short of the investment objectives in times of continued market declines, has been dealt with in the form of an adaptive constant proportion portfolio insurance solution in conjunction with appropriate derivative overlays.

Upon reflection on the argument I have put forward, I feel that vested interests within the asset management space may be hindering the provision of adequate solutions from the individual's perspective. I believe that this type of absolute return fund should form part of the building blocks of all investors' portfolios; with the percentage allocated to this type of strategy increasing as the individual tends towards retirement. This would provide a more stable, annuity type payoff profile right through the individuals working life, while not subjecting them to prejudicial investment practices in their golden years.

Utility

The answer serves the purpose for which the concern came about. I believe that the fact that I have created a fund, based on the answer serves to prove that the solution has utility. The actual fund takes the answer to a new level, since it is no longer a theoretical exercise, rather a practical demonstration of the fact that the absolute return fund does actually provide the objectives in the form of reduced volatility; management of the downside risk and generation of returns in excess of inflation, with lower levels of volatility than the equity market. I therefore believe that the answer is useful.

A key differentiating factor between the type of absolute return fund that I am proposing and a traditional balance fund is:

These "balanced funds" don't engage in the active use of derivatives, when they use derivatives, it tends to be post the event of a decline.

- In contrast, Futuregrowth's absolute return fund proposal proactively manages risk and asset allocation and uses derivative structures to lock in gains.

Validity

The rationale provides a valid argument for the answer, since it spells out the methodology applied in the scenario. It also shows the actual performance of the answer over the simulated ten year period and the actual investment of seed capital in the period since January 2006 up to the present day. From the outcome in the form of returns generated, it becomes apparent that the answer is valid. In attempting to further enhance the validity of my findings, I wanted to provide references to similar studies in other markets around the world. It appears however, that there are similar solutions on the global front; however, these are the preserve of selected private banks that closely guard their funds, as the competitive advantage that they offer their select clients. Surely this type of solution should be made available to everybody? It would have the impact of reducing the dependency of individuals on governments for retirement benefits.

The credibility of the answer lies in the fact that the theory I have provided has been tested in the actual world, with real funds, outside the sterile world of custom fitting solutions perfectly to past learnings. I believe this is therefore a valid solution, beyond the realms of data mining.

Ethics

On the ethical front of my answer, I believe that it is ethical. The basis upon which I live my life is that ethics should be the platform upon which all decisions are taken. I know this appears idealistic; however, we need to set the standards high, if we want a viable, sustainable environment. Ethics should serve as a regulation tool by which we interact with our environment and as such, the financial world needs to be approached from this perspective, since the financial markets are effectively a complex, adaptive, ecological system with multiple levels of feedback.

In order to test the solution that I have provided, a suitable ethical framework needs to be applied. I have chosen the framework developed by The Markkula Centre for Applied Ethics at the Santa Clara University in California. The framework forms a basis for ethical decision making. The steps that need to be taken into account in the process:

1. *Firstly recognise the ethical issue at hand. Is there something wrong and could it be damaging to the people or environment that it impacts.*

Yes, there is something wrong, since if people retire with insufficient funds they could find themselves in a situation whereby they are unable to afford basic essentials such as food and medical care. Should this situation occur on a large scale, the very basis upon which societies are built could be brought into disarray. The right to a dignified retirement should be a constitutional non-negotiable.

2. *Attempt to gather all facts pertaining to the issue. Who is involved? Who is affected? Who needs to be consulted? What are the options that we have in order to solve the issue?*

Every economically active individual, either past or present (working or retired) is involved. There haven't been adequate solutions up to this point, and I believe that this answer is merely scratching the surface. The field of study could be expanded in consultation with government, regulators and financial institutions.

3. *Evaluate the different options we have and decide how this will impact on solving the issue using the means of doing the most good and the least harm.*

My answer serves to preserve capital while providing exposure to upside. The answer serves to benefit individuals. On the fact of it, I don't see how the solution could harm anybody. It could reduce the profitability of financial companies with less than sound practices.

4. *Choose an approach to solve the problem. Options include using a utilitarian approach, fairness approach, common good approach or a virtue approach.*

I don't believe there is relevance to my area of study from this ethical standpoint.

5. *Make a decision and test it.*

A decision has been taken in the form of creating an absolute return fund which deals with asset allocation from a different perspective. The theory has been tested and taken one step further, in the form of an actual fund, based on the theories proposed.

6. Implement the decision and then reflect on its outcomes.

The decision has been implemented and constant reflection is part of the ongoing process. The practice of reflection is essential when determining what derivative strategies may be appropriate. We need to learn from past scenarios, while adapting the knowledge to the current scenarios we encounter.

I find the results generated from this study positive, however, I do believe that in order for the model I propose to gain acceptance, a longer time period may need to be simulated. This would allow for more business cycles to be captured and a greater degree of variability in the financial markets to be modelled. In addition, I have based this test purely on the South African financial market and the factors which drive this specific environment. In order for greater insight into my model, I believe that the same methodology needs to be applied to different global markets, with their respective inflation and growth variables. As a point of departure, a reasonable global sample would be the S&P 500 index, the FTSE100 index, the EUROSTOXX50 index and the NIKKEI225 index, allowing a geographic spread across USA, Europe, UK and ASIA. A further area that needs investigation is the maximum fund size that could be invested on this asset allocation basis, without impacting the factor driving the markets.

New financial product development model

Relevance

The situation deals with the environment in which new products are created in the financial market space in South Africa. The approach followed by many product providers has been to create a product and then convince the investing public that they need the product. Sometimes this takes the form of scare tactics, highlighting the fact that less than five percent of retirees will have sufficient capital to retire and maintain their current living standards until the time of their death. Compounding the situation is the fact that with the move from defined benefit to defined contribution pension funds, the risk of a person retiring with insufficient capital is not the responsibility of the company employing them, rather the individual. The employer "contributes" by providing the individuals access to a consulting actuary, or firm of consulting actuaries. The actuaries don't want to take on excessive risk in the form of volatile returns, so they tend to suggest to high a level of investment into cash or bond instruments in the last five years of a persons life prior to retirement. Without sufficient capital growth, at the end of the retiree's working life, their pension annuity stream will not be able to meet their living costs and potentially increased medical care costs associated with old age. This is highlighted by the effects of inflation through time growing faster than an individual's retirement fund investment returns.

Based on this concern, the relevance of my proposed new product development model is twofold:

1. If the returns generated by any investment portfolio are less than inflation (as measured by CPIX) through time, people will have insufficient assets to retire comfortably.
2. Secondly, if the volatility in an investment portfolio is not adequately managed, a situation could transpire whereby all the returns or a large portion of the returns generated during the capital accumulation period in an individual's working life may be forfeited in the last few years prior to retirement.

In this situation, most actuarial consultants suggest that people move into extremely low risk investment vehicles in the last 3 -5 years of employment. This classification based on age is not appropriate, since individuals may have different needs and different levels of capital built up over their working life. Therefore, an adaptive process needs to be considered, with the flexibility to vary asset allocation to the risky asset, based on the investors favoured investment philosophy. I therefore believe that concern put forward in this case has been shown to be relevant in the situation at hand. My model addresses these concerns and provides an appropriate "thinking environment" which seeks to base decision making on objective variables as opposed to subjective, emotionally driven biases.

Utility

The answer proposed, which takes the form of a model to be used when considering new product development in the financial market space has utility, since it may be adapted to various different scenarios. The model proposed is not dependant on any one asset class or investment objective, rather it is flexible and seeks to start with an understanding of what risk appetite and return expectations an individual may have, effectively the concern in my paper. Given that this decision is going to be different for every individual, no prescriptive approach may be adopted. Once this component of the model is understood, we are able to address the investment philosophy that resonates with an individual, addressing the question in my paper, once again, letting the answer emerge, rather than predefining what an investor needs and then attempting to match them with the product that has already been designed, as is the case in current new product development processes. The remaining components in the model constitute the answer. I find utility in the model, since it is not based on any assumptions, rather it seeks to derive an answer, based on numerous simulations of potential outcomes. Therefore one of the key fears most people have with respect to the level of inflation, tends to get contextualised, since it is merely a component of the environment to which the new product development model is able to adapt.

The effectiveness may also be evidenced in the fact that I am currently designing a new financial market product, which seeks to deliver investment returns independent of the direction of the financial market indices. I attribute the development of this product to the fact that I made use of my new product development model when designing and proposing the product to my board. The model allowed us to discuss the various options, based on the simulated data instead of what the potential target market may be prepared to invest and what the associated fees need to be.

A potential lack of utility lies in the fact that I have developed this model largely with the South African investor and retirement space in mind. For this reason, I believe that further research needs to be conducted before the model may be used in foreign markets. In addition, the sample group used in the various simulations fall into the "sophisticated investor" category, with a sound grasp of the variables under consideration. In theory, the model should be applicable across the entire spectrum of investors, however, I think that specific cultural biases may impact upon the behavioural biases component of the model. For this reason, I believe that another level of abstraction may need to be introduced, particularly with respect to investment philosophy. Upon reflection on this point, I feel that I may need to create a sub set causal loop diagram which deals with the investment philosophy component in the larger model for new product development.

Validity

I feel that the rationale provides a valid argument for the answer being proposed in the form of my new product development model. I have explained the middle loop of my model and how the various components interact with each other. After this, I have defined and explained the outer loop in the model. I have then provided an explanation for the logic behind how the outer loop connects to the inner loop and conversely how the inner loop connects to the outer loop.

I have also highlighted on the model which factor addresses the concern and which factor addresses the question. The balance of the factors constitute the answer. However, it should be noted that the factors are variable and the dynamic between them may change over time. I do believe that we get phase changes in the financial markets, particularly with the advent of entirely new asset classes, assuming that these are significantly different from current product offerings. A case in point would be the creation of the sub prime lending market. This changed investors expectations with respect to risk appetite in the property market and how they viewed leverage and debt levels. In defence of the model, it does work for the current asset classes, and I would argue that the sub prime market was effectively a fictitious market, created through financial engineering, devoid of investment logic.

I would have liked to include the current new product that I am developing, however, due to sensitivities around intellectual property, my company would not allow me to discuss the mechanics of the product, or the thinking that lead to the products creation, even though it was based on my new product development model, and the variables I chose to include could largely be argued to be a function of my thought process.

The credibility of the answer will emerge, should I get the go ahead to launch this new product, since this would show a link between the application of the model in the theoretical space and the practical application in the market place.

Ethics

I believe that the answer being proposed is ethical. The new product development model seeks to bring a certain level of objectivity into the product creation space, based rather on the needs and risk appetite of an individual investor, instead of where investment managers feel they may generate the largest profit. I do feel that ethics are observable and that the application of the process should be viewed as the basis upon which a decision is made regarding the ethics of the proposed model, instead of a subjective commentary on my behalf, since I clearly have a vested interest. Ethics should serve as a regulation tool by which we interact with our environment and as such, the financial world needs to be approached from this perspective, since the financial markets are effectively a complex, adaptive, ecological system with multiple levels of feedback. The ethics of the financial market place are currently under question, given the plethora of financial products that were created, by profit driven financial institutions, with a total disregard for the impact of their products, should they fail. Look no further than the current global financial crisis brought about largely by the arrogant belief by investment banks that they were far too large to fail. The irony of this situation lies in the fact that the US federal reserve has bailed out many of these institutions, on the grounds that should they be allowed to fail, the entire financial world may cease to exist in its current form. Would this be such a bad outcome, if we reduced debt dependency and introduced a conscious saving attitude?

In seeking to address the ethical question and in order to test the solution that I have provided, a suitable ethical framework needs to be applied. I have chosen the framework developed by The Markkula Centre for Applied Ethics at the Santa Clara University in California. The framework forms a basis for ethical decision making. The six steps that need to be taken into account in the process:

1. *Firstly recognise the ethical issue at hand. Is there something wrong and could it be damaging to the people or environment that it impacts.*

I could argue this point both ways. Firstly on the positive, I would say that the environment (financial product development) has been driven by greed and financial incentives for product creators, instead of focusing on generating inflation beating returns for the investor. Conversely, I would argue that many of the investment products created have provided huge amounts of wealth creation and had positive knock on effects, like the education of a child, through the funds generated by an investment into capital protected investments over the long term. I think on balance, the model I am proposing seeks to remove the ambiguity in why a product is designed and rather, strives to focus on the intersection of the clients needs and the capabilities of the investment product provider to address that need at a reasonable cost.

2. *Attempt to gather all facts pertaining to the issue. Who is involved? Who is affected? Who needs to be consulted? What are the options that we have in order to solve the issue?*

I believe that this step is partially met, since the investor and the investment company are involved and clearly consulted, however, the environment is seen as an input into the system, and a decision criteria trigger, instead of the model looking outwards and considering variables such as what happens if we create a tax effective product, which leads to the client paying less tax, the investment company generating greater profits, however, the government may receive less taxation income and therefore have to engage in budget cuts. Leading to a reduction in spending on key social areas such as health and education. That said, I don't believe that every single product that gets created needs to address the wider system. As long as it seeks to provide a positive outcome for the individual investing in the product and the product itself operates within legal boundaries, this step is addressed.

3. *Evaluate the different options we have and decide how this will impact on solving the issue using the means of doing the most good and the least harm.*

My answer seeks to match the investment objectives of an individual with their respective risk appetite and investment philosophy in order to generate positive returns. For this reason, I believe that the only good is being done, there is no intention of inflicting harm to the client or the investment company seeking to develop new products.

4. *Choose an approach to solve the problem. Options include using a utilitarian approach, fairness approach, common good approach or a virtue approach.*

The model being proposed seeks to remove a portion of the subjectivity associated with making investment decisions and rather focus on addressing the need of the client. The client benefits, the investment product developer benefits, since there will be a lower incidence of investors pulling out of the product, which I view as fair and utilitarian. With respect to virtue, this component is addressed in the investment philosophy variable. For example, should an investor seek to only invest in socially responsible funds, this serves as a constraint on the allowable investment universe, which interestingly has shown to produce better results in the long term, while addressing the client's moral values, or set of decision criteria.

5. *Make a decision and test it.*

A decision has been taken since I have produced a model which serves as a framework in which decision may be made. On the testing side, simulation forms a component of the model and therefore, in theory, each decision regarding ne

product creation may be tested, identifying if the needs of all stakeholders are being addressed

6. Implement the decision and then reflect on its outcomes.

I am in the process of implementing the decision, as mentioned, I am near to the launch of a new product, which has been developed using the model I propose. Once the product has been launched, I will be able to reflect upon the outcome and make any required adjustments to the model. I believe that once a theory is placed into practice, we gain further insights, which may change our initial thinking and lead to positive changes in the suggestions being made, or the variables which are included in the model. Time will tell!

University of Cape Town

Glossary

Asset allocation decision

The decision regarding how an institution's funds should be distributed among the major classes of assets in which it may invest.

Asset classes

Categories of assets, such as stocks, bonds, real estate, and foreign securities.

Capital market line (CML)

The line defined by every combination of the risk-free asset and the market portfolio. The line represents the risk premium you earn for taking on extra risk. Defined by the capital asset pricing model.

Capital growth

The increase in an asset's market price. Also called capital appreciation.

Efficient frontier

The combinations of securities portfolios that maximize expected return for any level of expected risk, or that minimize expected risk for any level of expected return. Pioneered by Harry Markowitz.

Efficient Market Hypothesis

States that all relevant information is fully and immediately reflected in a security's market price, thereby assuming that an investor will obtain an equilibrium rate of return. In other words, an investor should not expect to earn an abnormal return (above the market return) through either technical analysis or fundamental analysis. Three forms of efficient market hypothesis exist: weak form (stock prices reflect all past information in prices), semistrong form (stock prices reflect all past and current publicly available information), and strong form (stock prices reflect all relevant information, including information not yet disclosed to the general public, such as insider information).

Efficient markets theory (EMT)

Principle that all assets are correctly priced by the market, and that there are no bargains.

Inflation

The rate at which the general level of prices for goods and services is rising.

Value investing

In the context of asset management, mutual funds, and hedge funds, the a style of investment that focuses on securities with low price to earnings ratios or low price to book ratios. Some of these securities are deemed cheap and are viewed by manager as having a lot of profit potential

Volatility

A measure of risk based on the standard deviation of the asset return. Volatility is a variable that appears in option pricing formulas, where it denotes the volatility of the underlying asset return from now to the expiration of the option. There are volatility indexes. Such as a scale of 1-9; a higher rating means higher risk.

List of References

Abarbanell, Jeffery S., and Victor L. Bernard. 1992. *Tests of Analyst's Overreaction / under reaction to Earnings Information as an Explanation for Anomalous Stock Price Behaviour*. Journal of Finance. 47:1181-1207.

Amenc, N., L. Martellini, and M. Vaissié, (2003), *Benefits and Risks of Alternative Investment Strategies*, Journal of Asset Management, Vol. 4, No. 2.

Anson, Mark (2005). *Handbook of Alternative Assets*. John Wiley and Sons, Ltd.

Asness, C., R. Krail, and J. Liew, (2000), *Do Hedge Funds Hedge?*, Journal of Portfolio Management, Vol. 28, No. 1.

Bernard, Victor L., and J.K. Thomas. 1990. *Evidence that Stock Prices Do Not Fully Reflect the Implications of Current Earnings for Future Earnings*. Journal of Accounting and Economics. 13:305-340.

Checkland, P. (1999), *Systems Thinking, Systems Practice*. First edition. West Sussex: John Wiley & Sons, Ltd.

DeBondt, Werner F.M. *Investor Psychology and the Dynamics of Security Prices*. Behavioural Finance and Decision Theory in Investment Management, Arnold S. Wood (ed.), Charlottesville, VA: The Institute of Chartered Financial Analysts, 1995.

DeBondt, Werner F.M., and Richard H. Thaler. July 1986. *Does the Stock Market Overreact?* Journal of Finance.

Fama, Eugene F. 1965. *The Behaviour of Stock Market Prices*. Journal of Business 38:34-105.

<http://www.edhec-risk.com/>

<http://www.hedgefund.net/>

Kahneman, Daniel, and Amos Tversky. *On the Psychology of Prediction*. Scientific American, 246 (1982).

Kurz, Mordecai, 1997, *Asset Prices with Rational Beliefs*. Endogenous Economic Fluctuations: Studies in the Theory of Rational Belief, Mordecai Kurz (ed.) Springer Series in Economic Theory, No.6.

Lo, Andy, 2004. *The Adaptive Markets Hypothesis: Market Efficiency from an Evolutionary Perspective*. Journal of Portfolio Management 30, 15-29.

Martellini, L. and V. Ziemann, (2005), *The Benefits of Hedge Funds in Asset Liability Management*, EDHEC Risk and Asset Management Research Center, Position Paper.

Shefrin, H. (2002). *Beyond Greed and Fear: Understanding Behavioural Finance and the Psychology of Investing*. Oxford University Press.

Shiller, Robert J. *Do Stock Prices Move Too Much to be Explained by Subsequent Changes in Dividends?* American Economic Review, June 1981. Reprinted in *Advances in Behavioural Finance*, edited by Richard H. Thaler, New York: Russell Sage Foundation, 1993.

Shleifer, Andre. 1999. *Inefficient Markets: An Introduction to Behavioural Finance*. Oxford University Press.

Thaler, Richard H. 1999. *The End of Behavioural Finance*. Financial Analysts Journal. 55:12-17.

Tversky, Amos and Daniel Kahneman. *Judgments of and by Representativeness*. In *Judgment under Uncertainty: Heuristics and Biases*, edited by Daniel Kahneman, Paul Slovic and Amos Tversky. Cambridge, U.K.: Cambridge University Press, 1982.

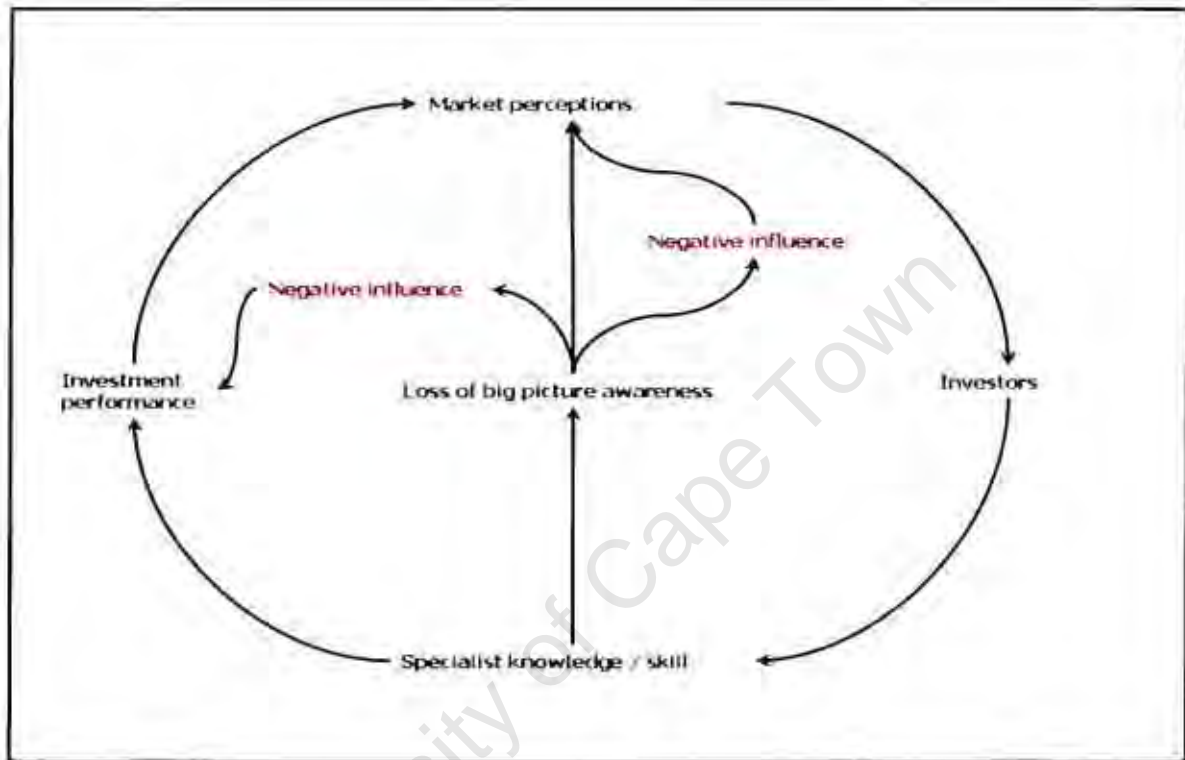
Tversky, Amos and Daniel Kahneman. *Rational Choice and the Framing of Decisions*. Journal of Business, October 1986.

Tversky, Amos. *The Psychology of Decision Making*. Behavioural Finance and Decision Theory in Investment Management, Arnold S. Wood (ed.), Charlottesville, VA: The Institute of Chartered Financial Analysts, 1995.

Velasquez M., Moberg D., Meyer M.J., Shanks T., McLean M.R., DeCosse D., André C., and Hanson K.O. (2005) - *The framework for thinking ethically is the product of dialogue and debate at the Markkula Centre for Applied Ethics at Santa Clara University*. [Online] <http://www.scu.edu/ethics/practicing/decision/framework.html>

APPENDIX 1

FIGURE 5: INVESTMENT PERFORMANCE; SPECIALIST SKILL AND LACK OF BIG PICTURE AWARENESS IMPACT ON THE TARGET MARKET.



Outcome from practical question posed (what is the current price level of the financial market variables being presented to you?)

The sample group for both the equity team and the fixed interest team included ten team members. Each team comprises a total of twelve team members, hence a greater than 80% team representation level.

In FIGURE 6, EQ avg. deviation represents the average for the equities team and FI avg. deviation represents the averages of the fixed interest team.

FIGURE 6: SUMMARY OF THE DATA REPRESENTING INDIVIDUAL TEAM MEMBERS RESPONSES TO THE QUESTION.

	Actual	Avg deviation	EQ avg deviation	FI avg deviation
<i>30 January 2007</i>				
Gold spot	643.00	-10%	0%	-22%
EUR / ZAR spot	9.46	-8%	0%	-19%
USD / ZAR spot	7.30	-1%	-3%	-1%
EUR / USD spot	1.30	-16%	-2%	-21%
Brent spot	53.68	-11%	-7%	-19%
Platinum spot	1166.00	-25%	-10%	-41%
Dow Jones Index level	12490	-67%	-61%	-70%
S & P 500 Index level	1420	-6%	-71%	68%
JSE All Share Index level	25341	-42%	-23%	-65%
JSE Top 40 Index level	22842	-55%	-25%	-90%
R 157 bond	7.86	-15%	-11%	-20%
RSA Repo rate	9.00	-1%	5%	2%
RSA Prime rate	12.50	-3%	-1%	-5%
Average deviation		21%	24%	39%

FIGURE 7: SUMMARY OF THE DATA REPRESENTING THE EQUITY TEAM MEMBERS RESPONSES TO THE QUESTION.

	ME	DM	EM	GM	TC	GM	CMdev	AM	AA	HM	SS									
<i>30 January 2007</i>																				
Gold spot	643	0%	645	0%	645	0%	700	9%	628	-2%	640	0%	643	0%	625	-3%	650	1%	630	-2%
EUR / ZAR spot	9.3	2%	9.45	0%	9.45	0%	9	3%	10	6%	9.5	1%	9.45	0%	9.41	-1%	9.37	1%	9.3	-2%
USD / ZAR spot	7.2	1%	7.29	0%	8.37	13%	7	4%	7	4%	7.2	-1%	7.3	0%	7.3	0%	7.35	1%	7.1	-3%
EUR / USD spot	1.29	1%	1.295	0%	1.3	0%	1.1	15%	1.34	2%	1.26	-7%	1.28	1%	1.29	0%	1.29	0%	1.29	0%
Brent spot	53.4	1%	56	4%	55	-2%	60	12%	60	12%	0	-100%	53	-1%	54.25	1%	55	2%	54	1%
Platinum spot	1140	-2%	1160	1%	1150	-1%	990	-13%	1290	3%	0	-100%	1180	1%	1167	2%	1190	1%	1300	11%
Dow Jones Index level	0	-100%	12400	-1%	0	-100%	0	-100%	0	-100%	0	-100%	12500	0%	12900	-4%	12300	-2%	0	-100%
S & P 500 Index level	0	-100%	1430	2%	0	-100%	0	-100%	0	-100%	0	-100%	1370	-4%	0	-100%	1250	12%	0	-100%
JSE All Share Index level	22450	-11%	25490	1%	25000	-1%	24000	-5%	26000	5%	0	-100%	23100	-5%	23100	1%	23700	-1%	0	-100%
JSE Top 40 Index level	21200	-7%	22900	0%	22000	-4%	21000	-8%	26000	12%	0	-100%	22300	-2%	22400	2%	20000	12%	0	-100%
R 157 bond	7.4	0%	8.22	3%	7.17	-9%	7.5	5%	7.84	0%	0	-100%	7.8	1%	7.9	1%	7.85	0%	8.01	2%
RSA Repo rate	10.3	12%	9	0%	10.3	12%	7	-22%	10	13%	9.9	10%	11.3	28%	9	0%	9	0%	8.3	-6%
RSA Prime rate	11.3	-8%	12.3	0%	12.3	0%	12	4%	12.5	0%	12	-4%	12	-4%	12.5	0%	12.5	0%	11.5	-8%
Average deviation		-7%	1%		-15%		-22%		-14%		-54%		1%		0%		-2%		-31%	

FIGURE 8: SUMMARY OF THE DATA REPRESENTING THE FIXED INTEREST TEAM MEMBERS RESPONSES TO THE QUESTION.

30 January 2007	AL	Diff	MCL	Diff	B	Diff	TLB	Diff	LC	Diff	TH	Diff	SW	Diff	SB	Diff	DB	Diff	SM	Diff
Gold spot	643	0%	645	0%	520	-19%	645	0%	500	-22%	800	24%	0	-100%	0	-100%	642	0%	639	-1%
EUR / ZAR spot	9.82	4%	9.31	-1%	9.95	3%	0	-100%	9.5	0%	9.83	4%	9.5	0%	0	-100%	9.4	-1%	9.35	-1%
USD / ZAR spot	7.31	0%	7.27	0%	7.2	-1%	7.28	0%	7.3	0%	7.27	0%	7.2	-1%	7.2	-1%	7.3	0%	7.28	0%
EUR / USD spot	1.2875	-1%	1.29	0%	1.28	-1%	1.29	0%	1.3	0%	1.22	-6%	0	-100%	0	-100%	1.295	0%	1.2966	0%
Brent spot	55.5	2%	55	-1%	52	-6%	56	4%	54	-1%	54	1%	0	-100%	0	-100%	55	0%	55	0%
Platinum spot	1329	14%	1257	-5%	985	-18%	1380	4%	0	-100%	0	-100%	0	-100%	0	-100%	1142	-2%	1129	-1%
Dow Jones Index level	12380	2%	0	-100%	25000	100%	0	-100%	0	-100%	0	-100%	0	-100%	0	-100%	0	-100%	0	-100%
S & P 500 Index level	1385	-2%	1368	-1%	4000	223%	0	-100%	0	-100%	0	-100%	0	-100%	0	-100%	0	-100%	1460	5%
JSE All Share Index level	24298	-5%	13052	-48%	16500	-35%	0	-100%	0	-100%	24000	-5%	0	-100%	0	-100%	9400	-61%	1230	-95%
JSE Top 40 Index level	0	-100%	8000	-65%	0	-100%	0	-100%	0	-100%	15000	-34%	0	-100%	0	-100%	0	-100%	0	-100%
R 157 bond	7.84	0%	7.83	0%	7.85	0%	7.83	0%	7.85	0%	7.825	0%	0	-100%	0	-100%	7.82	-1%	7.83	0%
RSA Repo rate	0	0%	9	0%	9.5	5%	0	0%	8.5	-6%	9.5	6%	10	11%	0	0%	0	0%	0	0%
RSA Prime rate	12.5	0%	12.5	0%	12.5	0%	11	-12%	12	-4%	11.5	-8%	11	-12%	11	-12%	12.5	0%	12.5	0%
Average deviation		-7%		57%		20%		-40%		-41%		25%		-69%		-79%		-28%		-23%

FIGURE 9: DATA REPRESENTING THE NON-INVESTMENT PROFESSIONAL RESPONSES TO THE QUESTION.

30 January 2007	FR	Diff
Gold spot	644	0%
EUR / ZAR spot	10.8	14%
USD / ZAR spot	7.3	0%
EUR / USD spot	0	-100%
Brent spot	64	19%
Platinum spot	1044	-10%
Dow Jones Index level	0	-100%
S & P 500 Index level	0	-100%
JSE All Share Index level	24000	-5%
JSE Top 40 Index level	21000	-8%
R 157 bond	8.56	9%
RSA Repo rate	0	-100%
RSA Prime rate	12.5	0%
Average deviation		-29%

APPENDIX 2

Feedback and coding from the questions posed to the sample groups

Respondent 1 – AC head of fixed income (investment professional) and a director of the company

1. What is the significance of an economic variable, such as the \$/ZAR exchange rate?

Represents the balance of trade, productivity, inflation, stability and growth between countries.

2. Is the observation of such a variable significant in the financial markets?

Of course.

3. Does the actual price or level of an index impact investment decisions?

Probably, but it shouldn't.

4. What is the importance of a financial variable?

This represents the state of play, and changes thereto. Level is less important than change... much like its easier to spot an impala in the bush when he's walking, not standing still.

5. Do these variables represent actual supply and demand in the market place?

As a very broad rule of thumb, and over time, yes.

6. What is important about observed financial time series?

Gives a sense of ranges and history, and assists in formulating "Connections" between factors.

Respondent 2 – PR Managing director of the company (not an investment professional)

1. What is the significance of an economic variable, such as the \$/ZAR exchange rate?

Very significant:

- Impact on rand hedge stocks
- Balance of payments
- Ability to export
- Inflation
- Oil prices and its knock on effect
- Competitiveness of factories exporting
- Competitiveness of resource companies
- Pricing of companies
- Pricing of dual listed stocks
- Volatility

2. Is the observation of such a variable significant in the financial markets?

Yes.

3. Does the actual price or level of an index impact investment decisions?

Yes.

4. What is the importance of a financial variable?

Creates price anomalies, opportunities for arbitrage, competitive advantages or disadvantages, volatility.

5. Do these variables represent actual supply and demand in the market place?

Yes and no, can also represent sentiment.

6. What is important about observed financial time series?

Trends pick out times of volatility, help to predict future prices?

Respondent 3 – TG Head of quantitative research - equities team (investment professional)

1. What is the significance of an economic variable, such as the \$/ZAR exchange rate?

The difference between primary and secondary markets is not fully understood by agents (financial analysts).

The secondary market is about trading on perceptions of value and information, whereas the primary market is all about raising capital for projects in the medium to long term environment.

Primary markets should be grounded in economic reality, whereas secondary markets are grounded in speculation.

If there were no secondary markets, we would only be doing fundamental analysis and econometric analysis, and it would work. Yet we operate in the secondary market and the reason they are important, is that without bubbles, people can't take excessive risk, hence there is no innovation and you end up with accountants running the economy.

2. Is the observation of such a variable significant in the financial markets?

The heart of the debate lies in the difference between phenomenology which originates in the sciences such as physics, biology and applied mathematics compared to empirical analysis of data in the context of normative models.

From a phenomenology perspective, we want to observe as many variables that uncover key phenomena associated with price behaviour.

From the empirical approach, one is trying to statistically analyse the data in specifically posed relationships. This is an ill posed problem. I would argue that it comes to the point that it is still an open question as to what drives prices in a financial market.

3. Does the actual price or level of an index impact investment decisions?

It does, there is significant evidence that news does not drive prices in a linear way. We can observe big changes in prices when no relevant news exists, for example about earnings of companies, yet we observe situations where there are no moves in prices, while new information about earnings has been distributed. "There appears to be little synchronicity about when news arrives and changes in the price, similarly changes in price are almost ten times larger than changes in the news on liquid stocks".

4. What is the importance of a financial variable?

It is an important indicator on herd sentiment, in terms of short term movements. The intermediate movements (3-6 months) are a good measure of actual corporate activity e.g. companies importing or exporting goods, while in the longer term, it is a good indicator of interest rate differentials, since it is taught in main stream economics that interest rate differentials should drive the carry trades, however, certain important counter examples exist, like Japan, which has low interest rates, yet low investment in their stock market.

5. Do these variables represent actual supply and demand in the market place?

It may occur at times, yet it is somewhat unlikely, once again, the example of the yen carry trade is cited. We would expect investment into Japan, given the low interest rate environment, if you were dealing with real goods and services. The supply and demand arguments would insinuate that the yen should strengthen over time given low interest rates and hence, we would expect the Japanese stock market to do well, this is not what happened. The reality is that the secondary market is far more important, here we borrow cash by selling yen, knowing that we can make delivery in the future by investing the borrowed money into higher yielding instruments or currencies in the secondary market and earning the difference.

6. What is important about observed financial time series?

The stylised facts, which are time series have autocorrelations which die out very quickly, volatilities are clustered, volumes traded are correlated in the same way as volatilities, the price yesterday is negatively correlated with the volatility. There is no model which satisfies all the stylised facts all the time yet. There is evidence that simple agent models, such as one which has only a technical investor and a fundamental investor, allows one to reproduce time series which satisfy most of the stylised facts most of the time. Value investors introduce negative auto correlations, while technical investors introduce positive auto correlations. These typically cancel out on the short term, yet lead to bursts of volatility and long-term cycles in the prices themselves.

Questions to initiate debate	AC
<p>1 What is the significance of an economic variable, such as the \$/ZAR exchange rate?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Represents the balance of trade, productivity, inflation, stability and growth between countries.</p> <p>balance of trade, inflation, growth between countries balance of trade, inflation Need for positive economic growth</p>
<p>2 Is the observation of such a variable significant in the financial markets?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Of course.</p> <p>Of course, open question as to what drives prices in a financial market. Uncertain about price driver's</p>
<p>3 Does the actual price or level of an index impact investment decisions?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Probably, but it shouldn't</p> <p>Probably, but it shouldn't</p> <p>news does not drive prices in a linear way Subjectivity regarding news flow</p>
<p>4 What is the importance of a financial variable?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Represents the state of play, and changes thereto. Level is less important than change. much like its easier to spot an impulse in the bush when he's walking, not standing still</p> <p>Represents the state of play, and changes thereto. Level is less important than change. Level is less important than change. Price volatility is key</p>
<p>5 Do these variables represent actual supply and demand in the market place?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>As a very broad rule of thumb, and over time, yes.</p> <p>yes. May represent sentiment Markets driven by sentiment</p>
<p>6 What is important about observed financial time series?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Gives a sense of ranges and history, and assists in formulating "Connections" between factors.</p> <p>Gives a sense of ranges and history, and assists in formulating "Connections" between factors. volatility and cycles financial markets have recurring cycles</p>

Questions to initiate debate	PR
<p>1 What is the significance of an economic variable, such as the S/ZAR exchange rate?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Very significant: Impact on rand hedge stocks Balance of payments Ability to export Inflation Oil prices and its knock on effect Competitiveness of factories exporting Competitiveness of resource companies Pricing of companies Pricing of dual listed stocks Volatility</p> <p>Balance of payments, inflation, competitiveness of factories exporting balance of trade, inflation Need for positive economic growth</p>
<p>2 Is the observation of such a variable significant in the financial markets?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Yes</p> <p>Yes open question as to what drives prices in a financial market. Uncertain about price drivers</p>
<p>3 Does the actual price or level of an index impact investment decisions?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Yes</p> <p>Yes</p> <p>news does not drive prices in a linear way. Subjectivity regarding news flow</p>
<p>4 What is the importance of a financial variable?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Creates price anomalies, opportunities for arbitrage, competitive advantages or disadvantages, volatility</p> <p>Creates price anomalies volatility Level is less important than change. Price volatility is key</p>
<p>5 Do these variables represent actual supply and demand in the market place?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Yes and no, can also represent sentiment.</p> <p>Yes and no, can also represent sentiment. May represent sentiment Markets driven by sentiment</p>
<p>6 What is important about observed financial time series?</p> <p>Level 1 coding Level 2 coding Level 3 coding</p>	<p>Trends pick out times of volatility, help to predict future prices?</p> <p>Trends Pick out times of volatility, help to predict future prices?</p> <p>volatility and cycles financial markets have recurring cycles</p>

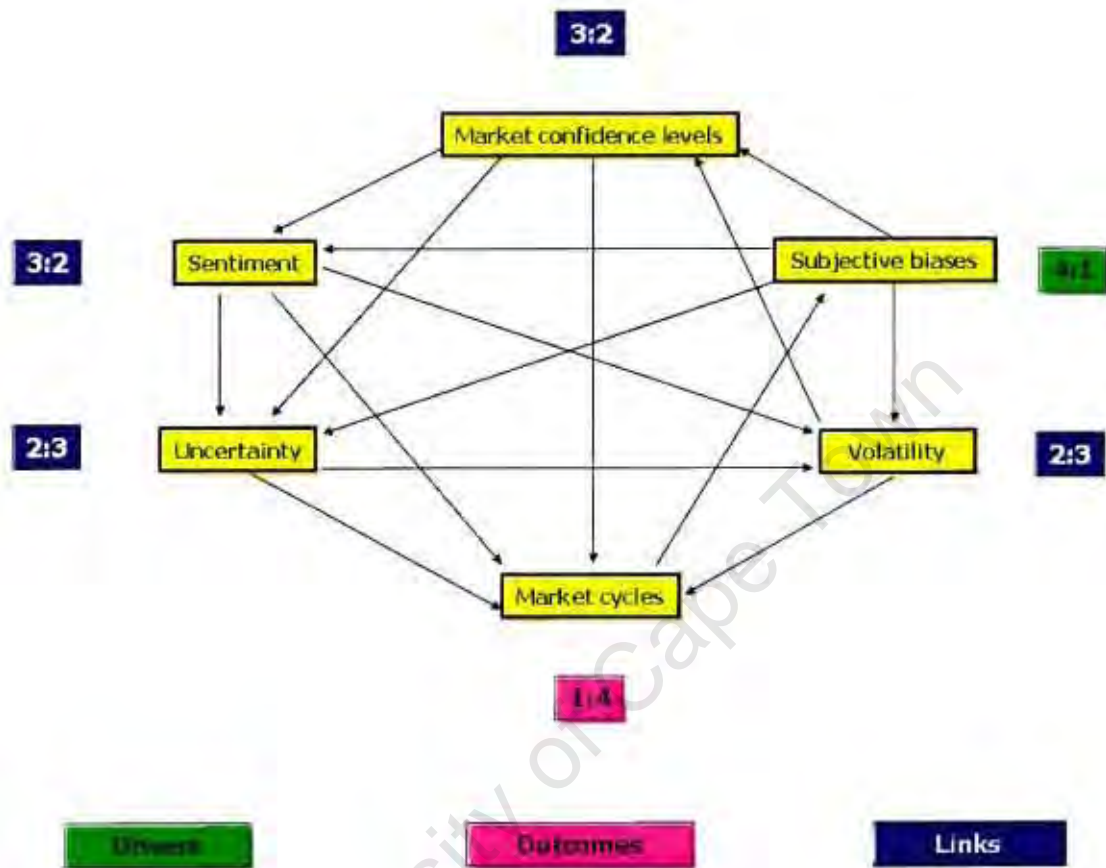
Questions to initiate debate	16
<p>1. What is the significance of an economic variable, such as the SZAR exchange rate?</p> <p>Level 1 (coding) Level 2 (coding) Level 3 (coding)</p>	<p>The difference between primary and secondary markets is not fully understood by agents (Financial Analysts). The secondary market is about trading on perceptions of value and information, whereas the primary market is all about raising capital for projects in the medium to long term environment. Primary markets should be grounded in statistics, reality, whereas secondary markets are grounded in speculation. If there were no secondary markets, we would only be doing fundamental analysis and economic analysis, and it would work.</p> <p>Yet we operate in the secondary market and the reason they are important, is that without bubbles, people can't take excessive risk, hence there is no innovation and you end up with stagnation causing the economy to collapse.</p> <p>Innovation Balance of trade, inflation Factor for economic growth</p>
<p>2. Is the introduction of such a variable significant in the financial markets?</p> <p>Level 1 (coding) Level 2 (coding) Level 3 (coding)</p>	<p>The heart of the debate lies in the difference between phenomenology which originates in the sciences such as physics, biology and applied mathematics compared to empirical analysis of data in the context of narrative models. From a phenomenology perspective, we want to observe as many variables that uncover key phenomena associated with price behaviour. From the empirical approach, one is trying to statistically analyse the data in specifically posed relationships. This is an ill posed problem. I would argue that it comes to the point that it is not an open question as to what drives prices in a financial market.</p> <p>It is still an open question as to what other prices in a financial market, open question as to what drives prices in a financial market. Uncertain about price changes</p>
<p>3. Does the actual price or level of an index impact investment decisions?</p> <p>Level 1 (coding) Level 2 (coding) Level 3 (coding)</p>	<p>If there is significant evidence that news does not drive prices in a financial market, we can observe big changes in prices when no relevant news events, for example about earnings of companies, yet we observe situations where there are no moves in prices, while new information about earnings has been distributed. There appears to be little synchronicity about when news arrives and changes in the price, primarily changes in price are around low news events, that changes in the news or liquid assets, news does not drive prices in a linear way.</p> <p>It does, there is significant evidence that news does not drive prices in a linear way. One can observe big changes in prices when no relevant news events. There appears to be little synchronicity about when news arrives and changes in the price, primarily changes in price are around low news events, that changes in the news or liquid assets, news does not drive prices in a linear way. Investing depends on news flow</p>
<p>4. What is the importance of a financial variable?</p> <p>Level 1 (coding) Level 2 (coding) Level 3 (coding)</p>	<p>It is an important indicator of how it performs in terms of short term movements. The intermediate movements (3-6 months) are a good measure of actual corporate activity e.g. companies reporting an expanding growth, while in the longer term, it is a good indicator of interest rate differentials, since it is taught in most stream economics that interest rate differentials should drive the carry trade, however, certain important counter examples exist, like Japan, which has low interest rates, yet low investment in their stock market. It is an important indicator of how it performs in terms of short term movements. Short term movements Level 1, less important than change. Short volatility is key</p>
<p>5. Do these variables represent actual supply and demand in the market place?</p> <p>Level 1 (coding) Level 2 (coding) Level 3 (coding)</p>	<p>It does occur at times, yet it is somewhat tricky, once again, the example of the yen carry trade is cited. The small equity investment into Japan, given the low interest rate environment, if you were dealing with real goods and services, the supply and demand arguments would indicate that the yen should strengthen over time give low interest rates and hence, one would expect the Japanese stock market to do well, this is not what happened. The reality is that the secondary market is far more important, here we borrow cash by selling yen, knowing that we can make delivery in the future by investing the borrowed money into higher yielding instruments or currencies in the secondary market and earning the difference.</p> <p>It may occur at times, yet it is somewhat tricky. They are not real world Markets don't go to equilibrium</p>
<p>6. What is important about correlated financial time series?</p> <p>Level 1 (coding) Level 2 (coding) Level 3 (coding)</p>	<p>The stylized facts, which are time series have autocorrelations which die out very quickly, volatilities are clustered, volumes traded are correlated in the same way as volatilities, the price yesterday is negatively correlated with the volatility. There is no model which satisfies all the stylized facts all the time yet. There is evidence that arises against models, such as one which has only a technical investor and a fundamental investor, allows one to reproduce time series which satisfy most of the stylized facts in use of the time. Value investors introduce negative auto correlations, while technical investor introduce positive auto correlations. These typically cancel out on the short term, yet lead to bursts of volatility and long term cycles in the series themselves.</p> <p>volatilities are clustered long term cycles in the series volatility and price Volatility is not always leading price</p>

FIGURE 10: AFFINITY DIAGRAM DEALING WITH THE FACTORS PERTAINING TO THE GROUNDED RESEARCH QUESTIONS

Subject matter (Factor)	Measure of performance
Need for positive economic growth	Market confidence levels
Uncertain about price drivers	Uncertainty
Subjectivity regarding news flow	Subjective biases
Price volatility is key	Volatility
Markets driven by sentiment	Sentiment
Financial markets have recurring cycles	Market cycles

University of Cape Town

FIGURE 11: INTERRELATIONSHIP DIAGRAM BASED ON THE GROUNDED RESEARCH FACTORS (LEVEL III CODING).



APPENDIX 3

FIGURE 13: INVESTMENT PROCESS WITHOUT CONSIDERING CASH MANAGEMENT.

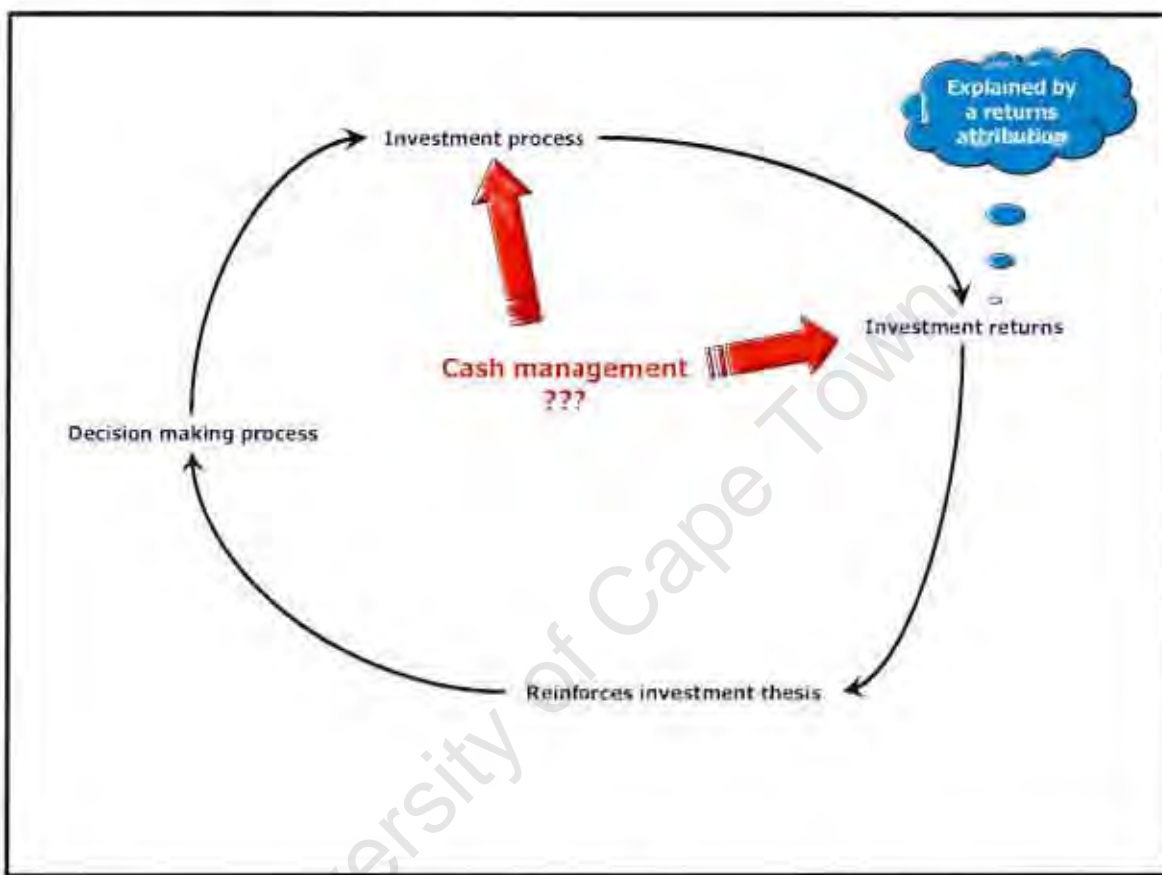


FIGURE 14: TOP TEN ASSET MANAGERS BASED ON ASSETS UNDER MANAGEMENT AS AT 31 DECEMBER 2006

Asset Manager	AUM R(M)
OMIGSA	347,411.0
Sanlam Investment Management	272,244.6
STANLIB Asset Management	236,303.7
Investec	215,831.5
Allan Gray	201,447.0
RMBAM	179,663.0
Investment Solutions	127,587.8
Coronation	113,980.4
Sanlam Multi Managers	96,758.1
ABSA Asset Management	57,811.0

Appendix 4

FIGURE 15: OUTCOME FROM THE PRACTICAL QUESTION POSED.

Do you believe that as an investment company you have the ability to outperform your benchmarks or the market itself, over time?	Company representatives response Level 1 coding Level II coding Level III coding
Company # (randomly selected, with no correlation to AUM)	
1	Yes, we definitely are able to outperform the market. We have dedicated research analysts with unique insights into company valuations.
2	Absolutely, we outperform over time, just look at our track record . Why would anybody invest with another investment company?
3	Yes, I think so, because we have bedded down our investment process through time.
4	Definitely, we are great stock pickers , with the ability to identify companies with superior growth prospects, before the rest of the market.
5	Of course yes, we have talented individuals with diverse skill sets which allow us to switch between growth and value market cycles without missing opportunities.
6	Yes, as a multi manager we gain access to the best of breed across every market niche irrespective of what phase the market is in.
7	Yes, we believe that consistent and significant excess returns can be generated over the long term by using a well chosen blend of skilful investment managers who, in their own distinct ways exploit market inefficiencies.
8	Certainly, based on the depth of resources , our teams experience and our risk management capabilities
9	Yes, we pride ourselves on our focused, nimble investment boutiques, backed by extensive infrastructure and a global brand.
10	Sure, we are an aspirational brand with quality individuals , who are able to deliver sustained competitive investment results.

Affinity Diagram

FIGURE 16: AFFINITY DIAGRAM DEALING WITH THE FACTORS PERTAINING TO THE GROUNDED RESEARCH QUESTIONS

Subject matter (Factor)	Measure of performance
Overconfidence effect	Overconfidence effect
Market cycles	Market cycles
Investment process	Investment process
Stock pickers	Stock pickers
Talented individuals	Talented individuals
Outperform over time	Outperform over time

University of Cape Town

FIGURE 17: INTERRELATIONSHIP DIAGRAM BASED ON THE GROUNDED RESEARCH FACTORS (LEVEL I, II & III CODING).

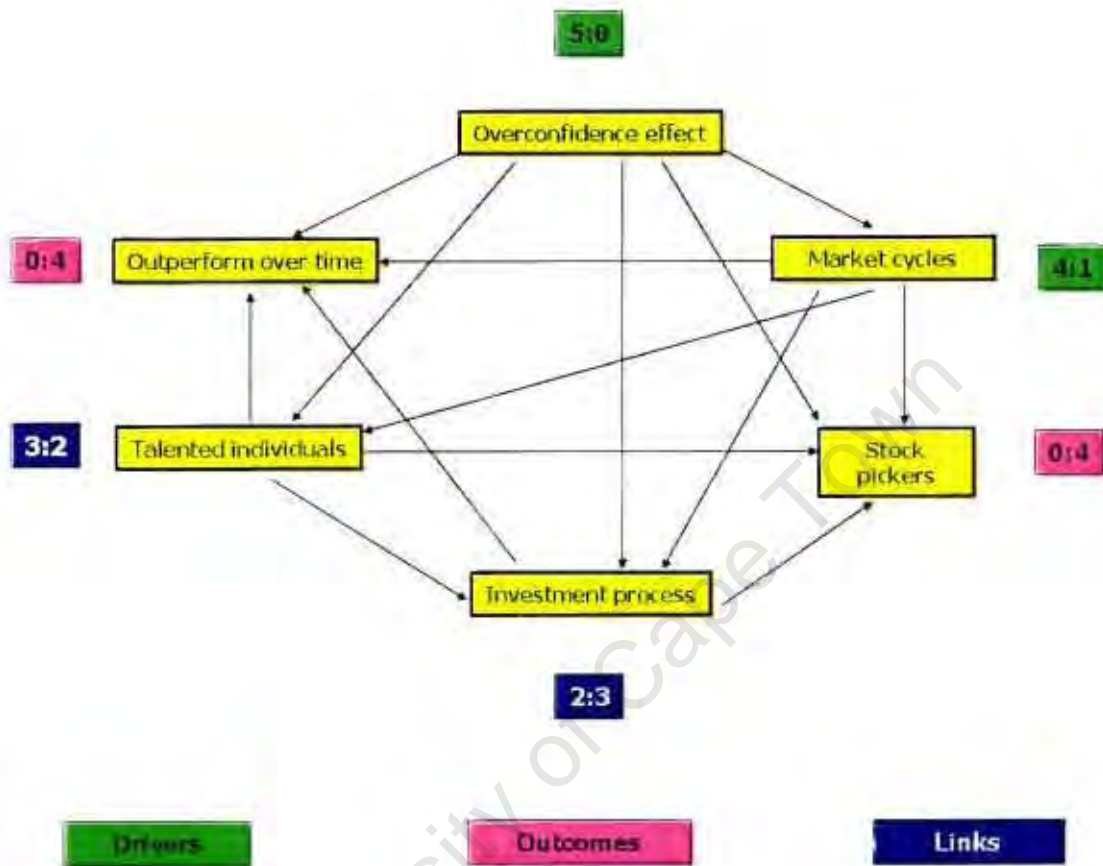
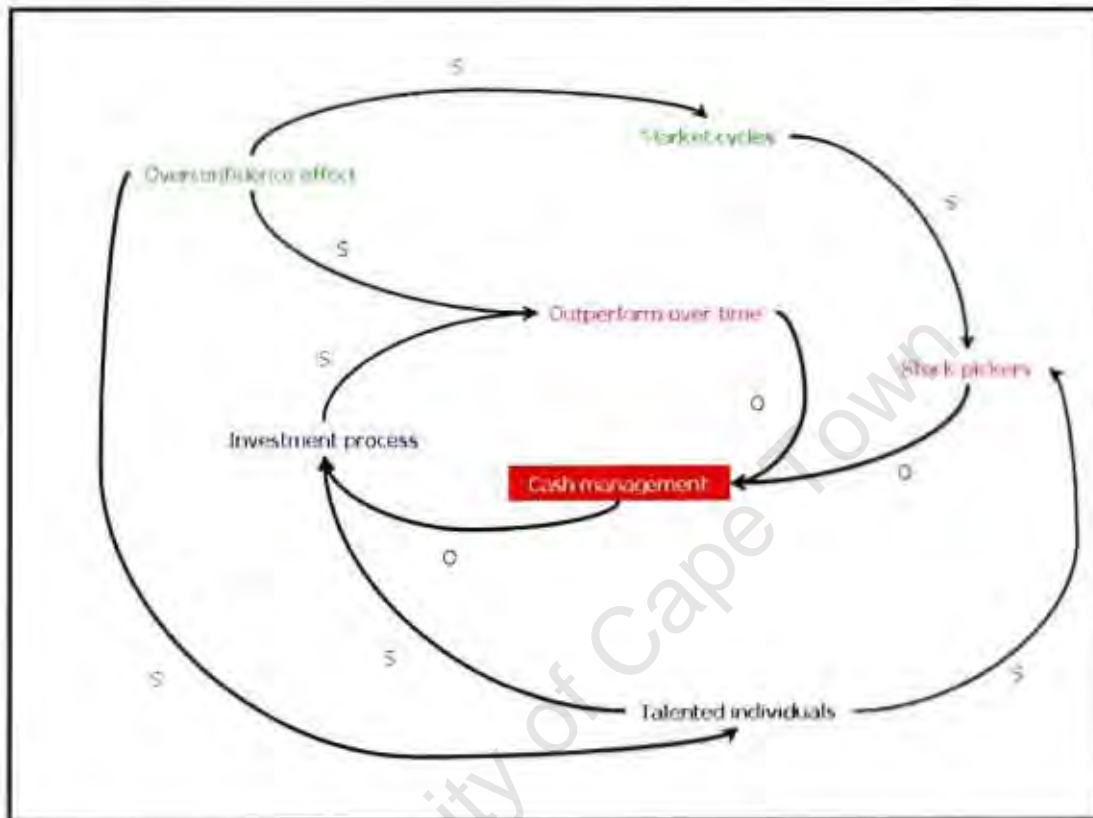


FIGURE 18: CAUSAL LOOP DIAGRAM REPRESENTING THE FACTORS DRIVING THE ABILITY TO OUTPERFORM THE MARKET OVER TIME.



APPENDIX 5

FIGURE 19: CPIX (CONSUMER PRICE INDEX EXCLUDING MORTGAGES) OVER TIME.

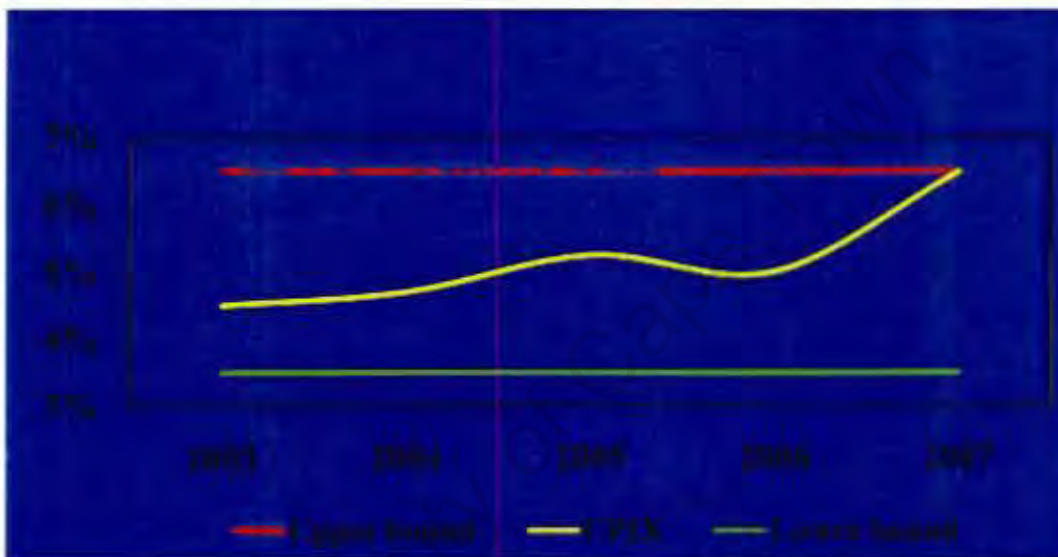


FIGURE 20: INTERRELATIONSHIP DIAGRAM BASED ON THE GROUNDED RESEARCH FACTORS (LEVEL I, II & III CODING).

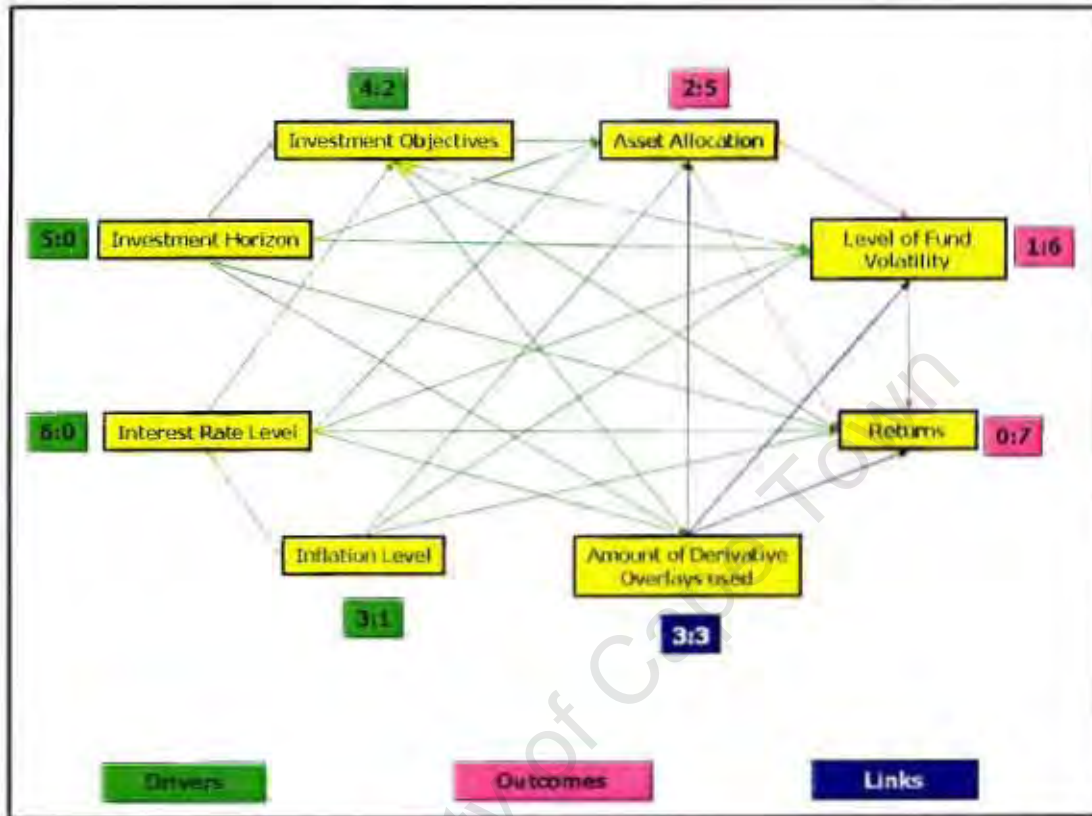
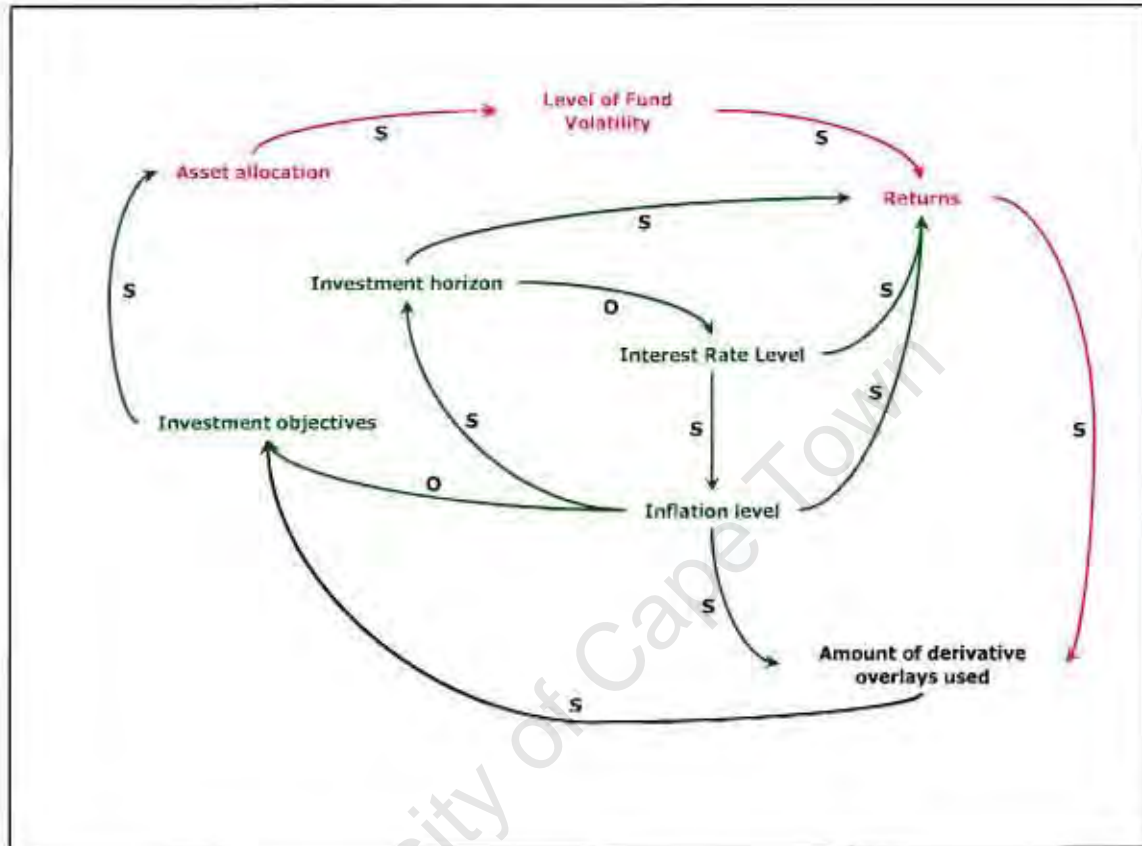


FIGURE 21: CAUSAL LOOP DIAGRAM BASED ON THE INTERRELATIONSHIP DIAGRAM IN FIGURE 20.



Appendix 6

FIGURE 22: EXTRACT FROM THE ALEXANDER FORBES ASSET CONSULTANTS FUND MANAGERS SURVEY.



GLOBAL MANAGER WATCH™

INVESTMENT DATA TO THE END OF MAY 2007									
	Year to Date			1 Year			3 Year (p.a.)		
	Fund Rank	Deviation		Fund Rank	Deviation		Fund Rank	Deviation	
INVESTMENT MANAGERS									
Atlas Corp.	11.74%	8	10.36%	37.96%	1	34.96%	36.15%	1	34.55%
Cadiz African Harvest	10.98%	11	12.97%	32.29%	11	34.85%	34.23%	7	34.66%
Cooperation	12.24%	6	12.97%	34.27%	7	34.85%	35.21%	4	34.66%
Investic Asset Management	16.41%	1	10.73%	30.37%	3	29.60%	34.94%	5	29.73%
Metropolitan	11.20%	9	11.17%	33.35%	10	30.96%	33.05%	11	31.61%
Qans	13.76%	4	12.74%	37.34%	2	34.35%	34.72%	6	34.00%
QMGSA Macro Strategy	13.90%	3	12.63%	36.16%	4	34.37%	36.12%	2	34.41%
Prudential	13.52%	5	12.74%	33.87%	5	34.03%	35.78%	3	33.94%
RAMM	12.22%	7	10.63%	34.97%	5	28.34%	35.42%	9	29.34%
Ramlin Investment Management Global Equity	10.93%	10	12.97%	34.43%	6	34.85%	33.73%	5	34.66%
Standix	14.46%	2	12.74%	33.49%	8	34.05%	33.37%	10	33.94%
STATISTICS									
Highest	16.41%			37.96%			36.15%		
Upper Quartile	13.83%			36.26%			35.49%		
Median (compounded)**	12.97%			34.85%			34.66%		
Average	12.86%			34.96%			34.38%		
Lower Quartile	11.32%			33.63%			33.27%		
Lowest	10.38%			32.29%			33.08%		
Number of participants	11			11			11		

APPENDIX 7

Based on my findings during the grounded research, I came to the conclusion that cash management was totally neglected by investment professionals. This is to their detriment in my opinion. I therefore came up with a scenario to test whether it was possible to generate positive returns, even with a "poor" investment process which only had a hit rate of 40%. The scenario was run in Matlab. I enlisted the assistance of a colleague, Dr Tim Gebbie to assist with coding my specifications into Matlab. The code for the scenario which may be replicated is:

Money Management Scenario Project

file:///C:/MATLAB/R2006a/work/html/money_management_scenario.html

1 of 3 2007/06/08 08:54 AM

Money Management Scenario Project

Authors: Grant Watson, Tim Gebbie

Contents

Load ALSI data
Load the data
Money Market
Equity Index Data
Starting portfolio value
Trading Strategy
Plot output

Load ALSI data

```
ALSI = all;
ALSI = 10^7;
```

Load the data

```
load('data.mat');
data = load('data.mat');
save('money_management_scenario_data.mat');
data = convertToTable(data);
```

Money Market

```
check this NACQ (90-day NCD)
if (data.NACQ > 100 - (data.NACQ * data.NCD) / 100)
    % check value
    data.NACQ = 0;
```

Equity Index Data

Money Management Scenario Project

file:///C:/MATLAB/R2006a/work/html/money_management_scenario.html

1 of 3 2007/06/08 08:54 AM

```
J200 = fixmat(isat.F,AL5IN);
```

Starting portfolio value

```
book.cash = 1000000;
book.number = 0;
book.open = false;
% times the index value 1 contract is 10* underlying
multiplier = 10;
% margin level
margin = 11000; % can be set to 28000 per contract
% trading costs
costs = 10; % RIC per contract
```

Trading Strategy

```
for i=2:length(dat2.dates)
% Compute the Bet hits
if ((book.number(i-1)>0) && J200(i)>J200(i-1)),
book.bethit(i-1) = 1;
elseif (book.number(i-1)<0 && J200(i)<J200(i-1)),
book.bethit(i-1) = -1;
else
book.bethit(i-1) = 0;
end;
% Money Management
% update the cash by rolling it over
book.cash(i) = book.cash(i-1);
% initialize the profit and loss
book.profitloss(i) = 0;
% loop over all open contracts
for j=1:i-1,
if(book.open(j)),
% the profit/loss for a position
profitloss = book.number(j) * ((J200(i) ./ J200(j))-1);
% settle the margin accounts
index_profitloss = multiplier * (J200(i)-J200(j));
% cash management decision based on profit and loss
if profitloss == 0,
% do nothing and roll over the contracts
elseif profitloss > 0.05,
% close the position and add back to cash
book.open(j) = false;
book.profitloss(i) = book.profitloss(i) + index_profitloss * margin;
book.mmhit(j) = 1; % for hit-rate
elseif profitloss < 0.025,
% close the position and subtract from cash
book.open(j) = false;
book.profitloss(i) = book.profitloss(i) + index_profitloss * margin;
book.mmhit(j) = 0; % for hit-rate
end; % try to close open positions
end;
end;
% update the cash
book.cash(i) = book.cash(i) + book.profitloss(i);
% random buy/sell signal
% can only trade if at least 80% of the cash account is available
if book.cash(i) > 0;
```

```

if rand() >= 0.5,
    % buy 1 contract
    book.number(i) = 1;
    book.cash(i) = book.cash(i) - margin - costs;
    book.open(i) = true;
Money Management Scenario Project file://C:/MATLAB/R2006a/work/html/money_management_scenario.html
3 of 3 2007/06/08 08:54 AM
else
    % sell 1 contract
    book.number(i) = -1;
    book.cash(i) = book.cash(i) + margin - costs;
    book.open(i) = true;
end;
end;
end % end trading loop

```

Plot output

```

bookfts = fints(dat2.dates, book.cash(:) book.profitLoss(:)); % 'Cash', 'PL');
% plot the strategy/cash and P&L
plot(bookfts);
% the strategy hit-rate
mm_hitrate = sum(book.mmhit)/length(book.mmhit);
% the bet hit-rate
bet_hitrate = sum(book.bethit)/length(book.bethit);
% write the information to the graph
text(731950, 1e7, sprintf('Strategy Hit-rate : %f', mm_hitrate));
text(731950, 1.2e7, sprintf('Bet Hit-rate : %f', bet_hitrate));

```

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APPENDIX 8

Extracts from my first three papers

Paper 1
March 2007

Are investment professionals at Futuregrowth asset management aware of the factors which drive investment performance?

In this paper, I consider whether the investment professionals at Futuregrowth Asset Management are aware of the factors which drive investment performance.

The paper begins by contextualising the company as a specialist asset manager. The concept of a specialist asset manager is defined and expanded upon, with reference to the areas of speciality in which each of the investment teams focus their attention.

Since the investment world is dynamic, with multiple factors impacting on performance and risk simultaneously, the isolation and exploitation of one specific factor is near impossible. For that reason, the concern arises that the investment teams are not aware that various factors need to be considered simultaneously in order to make sense of the investment world and that focus on one area could have a negative impact on investment returns. I state the basis for this observation in the form of various statements, some objective and others subjective. This concern is then presented in the form of a causal loop diagram.

Emerging from the concerns in the casual loop diagram, various practical problems are identified, which are then posed as a practical question in order to better understand the system under consideration. The practical question asks the group of participants in the survey to provide the current price level of various financial market variables. The group of individuals selected to take part in the survey is drawn from across the different specialist investment teams within the company. The questioning took place without prior warning, avoiding anticipation and preparation for the questions that may be asked. In addition, a few non-investment professionals were included in the study as a reference point to allow comparisons with respect to investment professionals and support staff.

The outcome from the practical questions posed was that the concerns raised were valid and that further investigation was required.

The practical problem being dealt with was subjective in that I started with my perceptions of what may be a problem and then attempted to understand the situation by observing data based on a sample test. For this reason, I used grounded theory, as explained by Strauss and Corbin (1990):

A grounded theory is one that is inductively derived from the study of the phenomenon it represents. That is, it is discovered, developed, and provisionally

verified through systematic data collection and analysis of data pertaining to that phenomenon. Therefore, data collection, analysis, and theory stand in reciprocal relationship with each other. One does not begin with a theory, then prove it. Rather, one begins with an area of study and what is relevant to that area is allowed to emerge. (p. 23).

The point of departure was the creation of a group of questions, which served to initiate conversations with each individual who had formed part of the sample group for the practical question posed. The responses from the group were tabled and analysed. From this study, a casual loop diagram was constructed, highlighting the research problem, through which a research question emerged:

"What do the factors in the causal loop diagram (representing the drivers of investment performance) actually mean, and how do these factors impact each other, either directly or indirectly, via another factor and subsequently, how does this impact on investment performance?"

In order to understand each of the factors, they were defined in the context of the study.

In the rationale, I explore how each of the factors impact upon each other in a multi factor environment and ultimately how they impact investment performance, with a specific focus on the field of "behavioural finance", considering the work of Charles Mackay and Robert Shiller amongst others. One of the key findings of behavioural finance is that investors make investment decisions based on company specific issues, while omitting to take into account their total portfolio exposures.

In addition to behavioural finance, I consider the "rational beliefs" hypothesis proposed by Professor Mordecai Kurz of Stanford University. Professor Kurz proposed that a possible explanation for the volatility in asset pricing and a potential solution to certain issues in modern finance is the concept of "endogenous uncertainty."

I go on to consider the concept of "Adaptive Markets Theory" developed by Dr. Andrew W. Lo, a professor at MIT's Sloan School of Management. In Lo's "adaptive markets hypothesis", he integrates some findings from behavioural finance and proposes the concept of competitive, evolutionary markets.

In the paper, I show that investors appear to have different perceptions of what drives share prices. There are pros and cons to these different schools of thought, with apparent cycles during which they fall in and out of favour. There is a natural evolution to the market, with successful managers enduring (even if this success is merely a stroke of luck, in that their approach is suitable for the current market phase) and less successful managers either adapting or seeking greener pastures in different industries.

A key point to note is that when the market environment starts changing, too many investors hold on to the approaches that have made them successful in the past for too long, believing that the recent past will endure. I liken this to driving down a straight road, navigating solely by the rear view mirror. It works perfectly until the first corner is experienced. Therefore, I would suggest an adaptive investment process, flexible enough to cope with changing market phases.

The final part of the paper is an evaluation of the paper, considering the relevance of the proposals, the utility of the answer, followed by a statement on the validity of the answer and finally, a consideration of the ethics of the proposed answer.

Key learnings / values extracted from paper 1

1. Investment returns may be volatile through time, even when investment professionals with specialist focus areas apply themselves to the objective of maximising returns.
2. Specialist investment professionals may be highly qualified and experienced, however, at times; it appears that they are disconnected from reality, seemingly unaware of the interconnectivity of the various factors in the financial markets and how these actually drive share prices.
3. Investment professionals tend to focus on their investment thesis, wanting to prove the validity of their "way" of investing, be it style, theme, analysis or thematic, when the actual focus should be on maximising risk adjusted investment returns for clients.
4. Behavioural biases tend to drive the way in which fund managers tend to invest and as such, the field of behavioural finance requires further study in conjunction with traditional investment theories.
5. Financial markets are not as efficient as the investment public think.

Paper 2
June 2007

Is effective cash management the key to outperforming "the market"?

In my first paper, I had a specific focus in considering whether the investment teams in my company were aware of what was driving investment markets and following on from this, the investment returns of the portfolios we manage for clients. This led to a consideration of behavioural finance and how the participants in the financial markets were actually making decisions, based on the feedback they were receiving from the financial system of which they were a part.

The insights gained from my first paper led me to revisit a topic which I have done previous work on and have been interested in for many years, namely, the investigation of whether there is real skill in the fund management space, or if it is possible to outperform the market through effective cash management. This "cash management" refers to the act of managing the cash or non-risky asset in a portfolio relative to the equity or risky component of a portfolio.

The point of departure for paper two was a look at the efficient market hypothesis (EMH) as developed by Professor Eugene Fama. A key concept of EMH is the statement that it is not possible to consistently outperform the market by using information that the market already knows, except through luck. EMH defines information or news as anything that may affect share prices, which is currently unknown, yet may appear randomly in the future.

Following EMH, I revisited behavioural finance, since behavioural finance studies show how cognitive or emotional biases, which may be individual or collective, create anomalies in market prices which are inexplicable via EMH alone.

I then considered the work by Kahneman and Tversky, titled "Prospect theory: Decision making under risk", which used cognitive psychological techniques to explain a number of documented anomalies in economic decision making.

The brief synopsis of the financial market system from two different perspectives highlighted the fact that we are dealing with a complex system with multiple feedback loops and high levels of abstraction. The key objective irrespective of world view, within financial markets, should be to maximise risk adjusted investment returns.

My concern is that neither group is aware of the fact that their focus is on the investment outcome of returns, without taking into account that the system is wider than returns, achieved through whatever decision making process they choose. I am concerned that the risk component specifically with respect to probability and more specifically cash management is being neglected.

This concern gets highlighted in a causal loop diagram, which helps to identify the practical problems at hand, such as investor's confirmation bias.

The next step was the creation of a practical question to frame the problem. For this purpose, grounded research was used to interview the top 10 asset managers in South Africa. The question I posed to each of the company representatives in order to get the conversation rolling was: *"Do you believe that as an investment company you have the ability to outperform your benchmarks or the market itself, over time?"*

Based on the outcome of the grounded research, I constructed a causal loop diagram (CLD), highlighting the factors which impact upon the ability to outperform the market over time.

The CLD highlighted the fact that cash management was a key component of the system, yet investors, specifically professional investors tended to ignore this issue.

From this observation, a research question was derived: *"Is it possible to generate positive returns over time, even if the investment process being used is a random signal?"*

In order to prove the concept, I made use of a synthetic "coin toss" to determine purchase or sales, coupled with reasonable capital preservation or cash management strategies.

The answer to the research question was a resounding yes! The process followed to achieve this answer, is detailed in the paper in Appendix 2.

The rationale in this paper explains the scenario developed and tested, with real life constraints to justify the answer proposed, with a few unexpected discoveries along the way.

The evaluation of the paper deals with the relevance of the concern in the situation under consideration. The situation deals with different schools of thought with respect to approaching investments. The one believes that all information is in the current price of a share (EMH), while the other school of thought, the behavioural finance group is aware of the biases that exist, with particular reference to overconfidence in our abilities as investors. The common theme between these two apparently opposing world views is that there is a belief that positive investment performance or the ability to outperform the market is a function of being able to pick shares that will outperform the greater market.

The utility considers whether the answer is useful. It is argued to be useful, since the answer addresses the concern, since it goes about proving that cash management alone, with random investment signal can generate positive returns, even taking into account transaction costs.

The rationale provides a valid argument for the answer, since it spells out the methodology applied in the scenario. It then proceeds to show the outcome of the scenario, which justifies the claim made that cash management can generate positive returns through time, even with a random investment process.

Finally, the question is posed as to the ethical side of my answer. I offer a systems thinking representation of what is occurring in the investment decision making space. I believe that to gauge whether my suggestions are ethical, they should be tested against an ethical "standard". For this purpose, I have chosen the framework developed by The Markkula Centre for Applied Ethics at the Santa Clara University in California. The framework forms a basis for ethical decision making.

Key learnings / values extracted from paper 2

1. The asset allocation component in fund management does not receive sufficient focus in the investment process. It appears that investment professionals want to rather focus on picking the winning share, or a "ten bagger" share which increases in value more than ten fold from the initial purchase price for the share rather than building a sound portfolio.
2. Efficient market hypothesis as proposed by Professor Fama can not hold true, otherwise it would not be possible to outperform the market index over time. This is in contrast to the data which suggests that some fund managers do "beat" the market over time, while others under perform. If all information is known and represented in shares prices at all time, would all fund managers merely achieve the market return?
3. The perception of risk, real or subjective tends to impact the decision making process followed by fund managers. There tends to be an aversion to realising a loss, even if it is the logical thing to do and take the remaining proceeds and place them into a better performing investment. It appears that people don't "feel" the pain of a loss while it is only a revaluation loss on paper, with the potential to recover.
4. Cash management, which is the preservation of funds in a portfolio, through effective mechanisms such as stop losses, or varying the portion of the portfolio which is exposed to the risky asset (typically equities), based in the appreciation or depreciation of the component investments serves to protect the capital in the fund and allow for compound growth over the longer term. I found that this alone allows for an out performance of the market, on a simulated back tested basis.
5. There appears to be vast amounts of time spent on looking for "investment signal", that is where to invest, when in reality, the timing component and asset allocation to different sectors appears to have a greater significance on the returns generated.

Paper 3
November 2007

Managing the creation of an absolute return fund

Following on from the learning of the first two papers, the next and final step in the process was to create an investment product. This product would aim to maximise on the learnings from the research I had conducted over the years 2005, 2006, coupled with the knowledge gained during the writing of the first two papers I have just commented on, during 2007.

As a point of departure, the evolution in the South African pension fund landscape over the last decade is considered. South African retirement funds have moved from defined benefit to defined contribution pension funds, with a transfer of risk from the employer to the employee.

The paper highlights the fact that the individual now needs to take an active interest and participate in their retirement planning. Actuaries still consult to employers and employees, yet the risk of insufficient funds at retirement needs to be dealt with by the individual. The fact that the actuaries are now responsible for investment returns, since there is no fall back onto the company as in the defined benefit space, has led to conservatism on their part. They tend to place people in buckets, based on age or life stage. What transpires is a situation whereby in the last five years of a person's working life, their investments are effectively in money market instruments, with a small portion in bonds. This strategy proves to be stable in that the risk of capital loss is substantially reduced.

My concern lies in the fact that capital preservation is being maximised, at the expense of capital growth. Furthermore, the effects of inflation get negated in this passive investment approach. I am concerned that there may be life left at the end of a retiree's pension annuity stream. This gets highlighted with the aid of a behaviour over time graph, showing the effects of inflation through time.

The relevance of this study is twofold:

If the returns generated by any investment portfolio are less than inflation (as measured by CPI-X) through time, people will have insufficient assets to retire comfortably.

Secondly, if the volatility in an investment portfolio is not adequately managed, a situation could transpire whereby all the returns or a large portion of the returns generated during the capital accumulation period in an individual's working life, may be forfeited in the last few years prior to retirement.

The next step in the process is to gain an understanding of what the perception of the market place would be towards an absolute return fund created to address the concerns raised. To achieve this end, grounded theory research was conducted.

The data gained from the grounded theory research questions was coded and used in an affinity diagram, which served as the basis for an interrelationship diagram and ultimately a causal loop diagram, which helped to identify the drivers in the system and hence the key areas of focus.

From the interaction with the grounded research participants, the following key research problems emerged:

The vast majority of absolute return funds in South Africa tend to have the basic principle of constant proportion portfolio insurance (CPPI) as a core principle.

In order to gain a greater understanding of the concerns around the CPPI problem, I made use of force field analysis, which highlighted the fact that during the 1987 global equity market crash, CPPI failed dismally.

A second problem was the issue with regards to what the correct investment returns benchmark should be for an absolute return fund.

In order to generate an outcome which serves to address the points which emerged, a set of research questions were posed:

1. What is the right level to pitch decision criteria "trigger levels" at, to maximise returns?
2. What is a relevant "in-sample" test period?
3. How much return per unit of volatility is achievable through varying asset allocation in an absolute return fund?
4. What type of derivative overlays serve to accomplish this type of strategy?

My answer takes the form of an enhancement to traditional absolute return funds. In conjunction with the traditional CPPI methodology, I introduced a strategic asset allocation component (SAA). This SAA component invests contrary to the traditional CPPI methodology in that in an excessive upward movement of the equity component in the fund, the SAA strategy would attempt to capture this excessive volatility. To do this, the fund would have to sell into the strength of the equity market component within the fund, once a certain trigger level was breached on the upside. Conversely, the fund would be required to purchase equities in a market which had fallen excessively, once the trigger level had been breached on the down side. As I ran the data, it emerged that a further refinement could be introduced in the form of a passive buy and hold (BH) strategy.

The whole process was an iterative one, with greater levels of efficiency being achieved with each new optimisation. The key concept of the simulation fund was:

- It combined "trend following" (CPPI) strategies with "contrarian" (SAA) strategies and passive strategies (BH).
- The strategy selection was dependant on the magnitude of the equity holding component moves within the fund.
- The fund would be rebalanced on a quarterly basis, with the magnitude of movement in the equity component holdings in the fund determining what strategy would be implemented.

The primary focus of this new absolute return fund (ARF) was:

- To create a reduction in the levels of volatility experienced in the funds returns.
- Manage the downside risk that the fund may suffer.
- Generation of returns in excess of inflation, with volatility levels less than the equity market.

In the paper, I detail the instruments used, and the investment methodology.

The rationale takes the form of empirical data, applying the proposed methodology over a ten year period.

In my opinion, a relevant "in-sample" test period was ten years; however, this time period needs to include times of extreme volatility.

The justification for this assertion lies in the fact that for any absolute return fund to consistently meet and exceed its stated investment objectives, it would have to weather various "stormy periods".

I chose the period from 1995 to 2005, since during this time period, the simulation would encounter:

- Extreme currency volatility during 2001
- Three market crashes 1997 – the emerging markets crisis, 1998 – the Russian debt default and 2000 – the dot com bubble bursting.
- A rampant bull market lasting from 2003 - ?

The results achieved over the test period were positive, in excess of the stated benchmark, with a lower level of volatility. The simulation proved the point that the combination of the CPPI, SAA and BH strategies yielded a greater return than the simple implementation of a pure CPPI strategy.

Based on the success of the simulation, I made a proposal to my company's board, which was favourably received, which lead to the creation of an absolute return fund,

making use of this methodology. The performance of this real fund is included in the paper, coupled with thorough risk decomposition.

From the investment return statistics, it is evident that the strategy delivers the intended objective, namely, returns in excess of inflation with low levels of risk in the form of volatility.

The concern put forward in this case has been shown to be relevant in the situation at hand. The concern that absolute return funds have been based on the principals of CPPI, which falls short of the investment objectives in times of continued market declines, has been dealt with in the form of an adaptive constant proportion portfolio insurance solution in conjunction with appropriate derivative overlays.

From a utility perspective, the answer serves the purpose for which the concern came about. I believe that the fact that I have created a fund, based on the answer serves to prove that the solution has utility.

The rationale provides a valid argument for the answer, since it spells out the methodology applied in the scenario. It also shows the actual performance of the answer over the simulated ten year period and the actual investment of seed capital in the period since January 2006 up to the present day. The credibility of the answer lies in the fact that the theory I have provided has been tested in the actual world, with real funds, outside the sterile world of custom fitting solutions perfectly to past learnings. I believe this is therefore a valid solution, beyond the realms of data mining.

On the ethical front of my answer, I believe that it is ethical. The basis upon which I live my life is that ethics should be the platform upon which all decisions are taken. I know this appears idealistic; however, we need to set the standards high, if we want a viable, sustainable environment. Ethics should serve as a regulation tool by which we interact with our environment and as such, the financial world needs to be approached from this perspective, since the financial markets are effectively a complex, adaptive, ecological system with multiple levels of feedback.

Key learnings / values extracted from paper 3

1. Defined contribution pension funds appear to provide greater benefit for employees, since they are able to determine contribution levels and in certain instances have a hand in determining in which asset classes their pension gets invested into. However, in reality, the move from defined benefit to defined contribution has shifted the responsibility for a potential pension shortfall upon retirement from the employer to the employee. This has happened without appropriate training and education being provided to pension fund beneficiaries. From a purely capitalistic perspective it could be argued that company balance sheets will now be in a better position, since they will not have to provide for a potential liability in the form of a pension short fall, however, a far greater concern should be the fact that now an even larger portion of the retired population is not going to be self sufficient and in turn dependent on the state.
2. It makes sense to protect capital in the years leading up to a person's retirement; however, total risk aversion means that any potential upside to be experienced through exposure to equity markets is negated. A controlled exposure, through a suitable asset allocation diversifying strategy will add value.
3. Inflation is the enemy of all pension funds. The actual return on an investment portfolio is irrelevant if it is not producing returns in excess of inflation over the long term.
4. A slight adaptation to philosophy that appears to be fatally flawed can result in a new strategy that actually provides the desired result. I took traditional constant proportion portfolio insurance (CPPI) principles, which tend not to work and adapted them to create a solution which delivers appropriate risk and return levels.
5. Choosing the right benchmark against which to manage an absolute return fund is paramount. This comes through in the level of risk incurred as a result of the returns being targeted.