BEHAVIOURAL TECHNICAL ANALYSIS

AN INTRODUCTION TO BEHAVIOURAL FINANCE AND ITS ROLE IN TECHNICAL ANALYSIS

PAUL V. AZZOPARDI
Behavioural Technical Analysis

An introduction to behavioural finance and its role in technical analysis

By Paul V. Azzopardi
To Warren Paul and Marie Claire
Disclaimer

The information, analysis and strategies discussed in this book are provided for informational and education purposes only and should not be considered to be investment advice.

Readers should do their own independent research and seek professional advice before investing.

Readers should understand that there is a high degree of risk involved in trading securities and other financial instruments.

Facts mentioned in this book should be re-checked against official sources before investing.
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The people who have helped with this book, directly or indirectly, are numerous and listing them all would be tedious (and generally meaningless) to the reader. But a few persons, in my life and in this project, stand above all the rest.

To my parents, Joseph and Pauline, and to my grandparents, Paul and Mary Grace Sammut, I owe oceans of gratitude for their love, good example and for always encouraging me to seek knowledge.

To my wife, Jennifer, invariably a source of encouragement and enthusiasm but always with an eye on an even keel.

To my project editor at Harriman House, Stephen Eckett, who has not only been patient and supportive over many months but who also did his best to make sure I wrote the book for others, not myself.

I would like to thank my readers for choosing to read this book. I hope you enjoy reading it as much as I enjoyed writing it.

If you have any comments or suggested improvements please email me at email@paulvazzopardi.com.

I have set up a website at www.behaviouraltechnicalanalysis.com to provide relevant links for this book, supporting material and occasional articles.

Paul V. Azzopardi

Ontario, Canada
Preface

In a sense, investors are be seen as living a life-long struggle against the randomness of market prices. For my part, I tried to make some sense of these utterly capricious but captivating markets by first becoming a certified accountant, in order to learn the language of business, and later immersing myself in as much investment theory as I could.

I therefore started from the trenches of fundamentals and was soon led to the mathematically elegant boulevards of efficient markets, the capital asset pricing model and option pricing theories. I found lots of stimuli but little satisfaction.

For quite a long while I compromised and worked on the assumption that if I did my homework and got the basics of the fundamentals right, I could then join the market with a diversified portfolio, watch over it, and hope for the best. I tried to improve on this basic setup with stop loss levels and, strategically, by trying to guess the next move. It sort of worked, on average, but I was far from happy with the results.

It was when I first read *Reminiscences of a Stock Operator*, Edwin Lefèvre’s masterpiece based on the life of Jesse Livermore, that I realised fundamentals had a role to play – but not the role – and that the market had to be seen as having a life of its own, fuelled by sentiment. I realised that it was sentiment that made the market move and that this movement was evident in the footprints of price. Sentiment, furthermore, was nothing more than the collective psychology of the participants in the market. This potpourri of fundamentals, footprints and sentiment had to somehow show me the way.

At about the same time, in various articles, I came across references to Kahneman and Tversky’s work on prospect theory and how they proposed that people often made use of rules of thumb, so-called heuristics, to make decisions in uncertain conditions. They were writing about such concepts as representativeness, availability, anchoring and adjustment. And what was I, and many other investors, doing if not deciding under uncertainty? Kahneman and Tversky’s behavioural finance approach was using up-to-the-minute research techniques, drawn from psychology, economics, statistics and various other disciplines to try to get to the bottom of Livermore’s market psychology. I felt this work went to the heart of the markets and I was hooked.

Decision making lies at the heart of investing and behavioural finance describes how people decide – it was clear to me that behavioural finance should be a core investment discipline. It also soon became evident to me that while fundamentals dealt with the day after tomorrow (if fed good data), I could only know what was happening now and what was likely to happen tomorrow by looking at price patterns on graphs. This led me to the realisation that sentiment and price patterns
have to be observed most closely, with fundamentals and economic models as background. One other crucial thing is to collect evidence with statistics and quantitative techniques to make sure it is fact, and not myth, which is being studied. This re-focus changed my whole approach to investment.

As the turn of events in 2008 and 2009 showed, the nature of the market is that no one can have perpetual success and that each person involved in the markets is on the way to learning more. I hope, however, that this re-focus helps my readers to improve their performance as it helped me to improve mine.

The rise of behavioural finance

I am very pleased to note that technical analysis associations around the world are increasingly including market sentiment and investor psychology studies in their approved body of knowledge and course curricula as well as giving greater importance to evidence validated by statistical testing. Papers dealing with the behavioural finance aspects of technical analysis now feature in important conferences and awards.

Influential bodies such as the Market Technicians Association (USA), the Society of Technical Analysts (UK), the Canadian Society of Technical Analysts, the Australian Technical Analysts Association and the Technical Analysts Society (Singapore), as well as other similar associations around the world, are proactively including behavioural finance findings in approved research.

The Technical Analyst magazine in the UK, for example, regularly holds conferences, training and other events, and has started a series of behavioural finance seminars for “traders and investment managers looking to exploit market inefficiencies using market psychology.” The 2008 seminar included speakers on prospect theory, over- and under-reaction, herding and using behavioural finance in value investing. These and similar initiatives around the world augur new horizons in finance and securities trading which have the potential to transform the way we approach markets.

Firms providing investor relations services are now analysing shareholders not only by type (institution, mutual fund, individual, etc) but also by style of investment management and whether there are buy-side or sell-side pressures amongst different shareholding classes. Behavioural finance, therefore, is influencing not only investment decision making but also the relationships between corporations and their owners.
The objectives of this book

This book has three main objectives. My first objective is to introduce behavioural finance to investors in a practical, interesting and structured manner. After the introductory Part One, giving some background to behavioural finance, in Part Two I have presented the main concepts of behavioural finance so that the reader is provided with a grounding in the whole subject area.

My second objective, as important as the first, is to try and give some pointers as to how one might attempt to combine the rapidly developing but rather new field of behavioural finance with the insights offered by technical analysis, which has been around ever since markets as we know them began to take shape. This combination I call behavioural technical analysis.

I feel that the mutual pollination of behavioural finance and technical analysis can lead to new and stimulating vistas. I hope that the logic of fusing the two disciplines, and testing the hypotheses generated with objective observation and modern quantitative techniques, will provide impetus to further research in this area and, importantly, create new ways of making money.

My third objective is that this book be of practical value to the investor, helping them to find a way to make money. This book does not contain a secret formula which enables you to acquire great wealth on the market in a few months by dedicating a few minutes a day. Instead, at the end of each chapter in Part Two there is a summary section, discussing how the behavioural finance area just explored can be used by investors. This is extended further in Part Three, where I examine the behavioural finance concepts supporting three strategies which technical analysts have utilised over the years. The three strategies are extreme prices, trend following, and support and resistance. I chose these three strategies because they are well supported by the evidence and offer good prospects for profitable trading in securities.
PART ONE

BACKGROUND
Chapter One
The Behavioural Finance Revolution

“There is nothing so dangerous as the pursuit of a rational investment policy in an irrational world.”

John Maynard Keynes
What this chapter is about

This chapter shows why behavioural finance is important. Classical economics, on which most of our investment knowledge is based, relied on the concept of rational economic man: a calculating, unemotional participant with a perfect understanding of things around him. Behavioural finance challenged this assumption and broke the classical model, developing new, practical ideas that were more realistic.

This chapter introduces six categories which facilitate our approach to behavioural finance, each the subject of a subsequent chapter, and deals briefly with how behavioural finance can be combined with other investment disciplines.

Why is behavioural finance important for your investments?

Investment is a decision-making process based on the analysis of data and a judgement on risk and uncertainty. Our human nature – be it our emotional side, our brain, or even our physiology – plays an important part in this decision-making process. Behavioural finance studies how people make financial decisions and the strength and weaknesses their human nature brings to the table. Behavioural finance, therefore, lies at the centre of the investment process and it has provided investors with new insights into how to invest their money.

The way we look at financial decisions today is very different from how we looked at them even as little as ten years ago. Behavioural finance has taken the old theories of economics and finance and re-examined them in the light of what psychology and other studies of human behaviour have taught us about the way human beings actually act and react – and not how they are supposed to act and react. Most of the pioneers of behavioural finance, therefore, were psychologists and behavioural scientists who applied their knowledge to human beings as economic agents and investors.

One important assumption made by classical economists was that human beings were entirely rational in their economic behaviour. It was assumed that humans analysed everything in a dispassionate and logical manner and only transacted when it was in their interest. Not only this, but it was also assumed that these cold calculations took place against a background of perfect information and, furthermore, were made in such a manner as to optimise the benefit derived by whoever was making the transaction.

Most of classical economics, therefore, was based on the concept of the so-called rational economic man, or REM. The subjects of finance and investment are but specialisations of economics and it is therefore no wonder that financial researchers first built upon the economic theories that were at hand when they did their work. These early finance theories are often referred to by behavioural finance practitioners as standard finance.
The REM

Rational economic man – a calculating, logical, and emotionless being – was the bedrock of many economic models which were built in the early years of economics.

Suppose the REM wants to buy a car. He might go about it in various ways but is likely to go something like this. He realises he needs to buy the best car for the least costs. He first makes a list of the reasons why he needs a car: to travel to work, go to the cinema, go to the big shopping malls in the suburbs, etc. He then calculates the benefits he is likely to derive from having his own car rather than using public transport, hiring a car on a need basis, calling a taxi, or asking for a lift. Once he has calculated the monetary value of the benefit he is likely to derive, he then goes about looking at the costs.

He realises he needs to collect information about the different cars on offer and he makes a list of all the car vendors in the world. He examines this list and decides that the costs of going to another continent to buy a car are likely to prove prohibitive. He then decides on an appropriate radius in which procurement can reasonably take place. He collects information on all the cars: prices, delivery times, likely maintenance costs, taxes and duties payable, fuel consumption, cost of licences, costs of insurance, etc. He then calculates how long he can use each car for and the disposal value of the car at the end of the period. He then compares the benefits he is likely to derive with the bottom line cost of each model of each make. By the time he makes a decision as to which car to choose he would have worked himself up to be a great expert on cars: he would have near perfect information and his choice is a sharp-pencilled one.

Does REM exist?

Mr REM is really a caricature. Hopefully very few people behave in this obsessive way when they come to buy a car. Mr REM’s approach and methods are too time-consuming and, indeed, it is probably a never-ending exercise because by the time Mr REM starts to get somewhere most of his original data is obsolete. If we were to make decisions the REM way, we would probably never arrive at any conclusion.

Yet, we know that there is some truth in my description of the REM. When buying a new car we ask ourselves whether we really need one, or whether we can go by public transport, especially if we live in a big city. We also want to know how much the car would cost us, about fuel efficiency, where best to get the car from and where are we likely to service it. The REM hypothetical model, therefore, is not accurate, but does contain some truth. It does mirror, in certain ways, the way we behave.
In the case under consideration, that of buying a car, we as normal human beings are likely to do two things differently from Mr REM. First, we are unlikely to do as much research, analysis and calculation as Mr REM did. We are likely to keep things much simpler, making fewer mental calculations and comparisons. Otherwise things would get too complex.

Second, we are likely to look at various emotional factors associated with the car. The brand, top speed, the shape of the model, the colours available, and the cachet associated with the vehicle may be important factors to many drivers. To many, a motor car is not simply a machine, but is often nearly a living thing. A car then is more than the sum of its parts and its function is much more than simply taking people and things from point A to point B.

It is no wonder that an economic model which treats cars as simply transportation machines would not reflect all the essential characteristics of the real world and would have, as a consequence, limited utility in describing what is happening and in predicting the future. In a similar fashion, a financial model based on REM does not capture many of the real life and critical aspects of the market it is trying to explain.¹

The beginnings of behavioural finance

In various ways, the car example brings us to the heart of behavioural finance.

Behavioural finance pioneers realised that while REM was a powerful concept, one that allowed the building of various useful economic theories, it did not capture enough of the truth – it did not capture real human beings with all the emotional baggage and personality humans posses.

We all know that our emotions, such as fear and greed, and the emotions of others, especially if we are part of a crowd, creep surreptitiously into our decision-making and nudge us off the logical path. Often it is only with hindsight that we realise how carried away we actually were. “What was I thinking!” we exclaim when it is too late.

Behavioural finance pioneers felt that economics had to be re-examined and refined placing real, often irrational, often emotional, sometimes capricious, men and women at the centre.

So, behavioural finance can be said to be about the replacement of *homo economicus*, or REM, by *homo sapiens*, real man, in economics. This re-examination of the nature of human beings as economic agents led to important critiques of economic theory by Daniel Kahneman, Amos Tversky, Robert Shiller, Richard Thaler and others, which laid the groundwork for the development of behavioural finance.

¹ Please see Appendix 1 for a brief discussion of REM in the market.
Rational within limits

Today, many researchers do not base their work on the superhuman rationality of REM but make use of a more realistic concept, that of *bounded rationality*.

This concept accepts that human beings are essentially rational and given to optimising behaviour but recognises that there are limits to the brain’s ability to assimilate and solve complex problems.

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**Behavioural finance**

Behavioural finance is the application of psychology and other analytical tools to the behaviour of investors.

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One aspect of behavioural finance which makes it so fascinating is the study of unexpected, illogical and counter-intuitive decision making. It is precisely this that gives the implications of behavioural finance such importance.

Researchers are now going beyond the study of manifest decisions to explore the human brain in greater depth by means of Magnetic Resonance Imaging (MRI) and other new tools, seeking to understand the very processes whereby an individual arrives at his or her economic decisions. While brain studies continue to elucidate how people make up their minds it is perhaps sobering to note that, ironically, irrational and unpredictable decision-making is likely to always remain the prerogative of human beings. Without uncertainty there would be little scope for learning how to invest.

Investors, for various psychological and physiological reasons, sometimes act illogically, succumb to emotion, make decisions by primitive rules of thumb, have a variable attitude towards risk, sometimes follow the crowd wherever it leads them, let fear or optimism take hold of them, and generally behave in such a way which shows that, after all, markets are all too human. In the next chapter, we shall examine some aspects of the irrationality of humans.

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The six categories of behavioural finance

Psychology, unlike some of the other science disciplines, is not built around a unified theory. Instead, it is made up of a large number of theories, hypotheses and experimental results which are not tied together neatly in one grand framework and often seem disparate. Behavioural finance, borrowing so much from psychology, inherited its parent’s fragmented nature and this can be somewhat off-putting to investors approaching the subject for the first time.
For this reason, I have classified behavioural finance topics into six main categories. This classification is rather tentative and there are inevitable overlaps but it is the best way I could devise of organising the subject so that an investor taking up this book can form a broad idea of what the main concerns of behavioural finance are. In this way, in his or her further reading, especially when perusing academic papers and the more technical books, the reader will have a rough-and-ready framework on which to hang the different observations and theories.

There may be topics which fall between the six stools, so to speak, and, indeed, as behavioural finance develops, and its ken widens, there may be need for more (or fewer) categories.

The categories

The six main categories are, in turn, divided in two.

First, there are the three categories which deal with our interactions with the world around us:

1. Complexity: coping and dealing with the complexity around us;
2. Perception: the role of perception and how it affects our behaviour;
3. Aversion: our attempt to avoid emotional instability.

Second, there are the three categories dealing with who we are and the influences of those around us:

4. Self: the influence of the self, including status quo;
5. Society: the crowd of which we form part;

I call this the CPA-SSG Framework.

Figure 1.1: the CPA-SSG Framework

![Figure 1.1: the CPA-SSG Framework](image-url)
Aversion is a very powerful concept in behavioural finance and fuses together various observations and important studies, including the work on prospect theory. For this reason, this book deals with aversion after it deals with the forces of the self. The chapters dealing with each category are therefore as follows:

<table>
<thead>
<tr>
<th>The six categories of behavioural finance</th>
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<tbody>
<tr>
<td>1. Coping and dealing with complexity: Chapter Three</td>
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<tr>
<td>2. The role of perception: Chapter Four</td>
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<tr>
<td>3. Aversion: Chapter Six</td>
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<tr>
<td>4. The self: Chapter Five</td>
</tr>
<tr>
<td>5. The crowd: Chapter Seven</td>
</tr>
<tr>
<td>6. Gender issues: Chapter Eight</td>
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After looking at how emotions creep into our decision-making in Chapter Two, we look at the first category (Chapter Three), which groups together studies examining how human beings cope and deal with complexity. The world we live in is a complex place and the human brain has huge, but still limited, capabilities. Faced with the difficulties which the world – and the marketplace – present, the brain does what it can. It therefore tries to simplify, uses rules of thumb, thinks and observes selectively, looks for patterns and creates its own blind spots.

One fascinating way in which the brain tries to cope is by focusing on changes rather than stationary states. As we shall see, the fact that our brain is better at seeing changes rather than constant states places a limit on our rationality – we normally place more importance on what we gain or lose rather than on what we have.

My second category (Chapter Four) deals with the role of perception in behavioural finance. As any painter would tell you, we do not see what is there but what we think is there. Indeed, the most difficult part of becoming a realist painter is learning to see what is actually there – not what is usually there, not what photographs say is there and not what one supposes to be there.

The same is true in most academic training: one is learning how to research, how to measure properly, how to be logical, how to detect and remove subjectivity. The human brain has a tendency to see what it wants to see, bands people and events together in a rough-and-ready manner by prototype, gives undue importance to the
most recent events rather than the truly important events, comes to conclusions based on hindsight and values data depending on how it is framed. Accountants knew this all along. This is the reason why accounting standards place such a lot of importance on how data is classified, how information is presented and what is material or not.

The third category (Chapter Six) groups behaviour which is driven by aversion. We need stability and to “know where we stand”. As a general rule, humans do not want frequent change – stability is desirable. Financially, for example, we try to avoid having frequent changes in the value of our portfolio. Up 25% one day and down 20% the following day spells too much adrenalin in too short a time. That’s the general rule, though, since sometimes we actively go out and seek adventure, and take a punt on life.

The self is the subject of the fourth category (Chapter Five). What we see and what we do depends on who we are. We may be naturally pessimistic, optimistic, conservative, self-critical, or even given to magical thinking: all of these affect the way we perceive the world, and the way we behave.

For example, if an individual is overconfident, the way they see the market and the way they transact will show this. This is one reason why many investors exclaim that their luck turns bad when they stop paper trading and start the real thing. When paper trading and using notional money investors have less emotional involvement than when using real money. They are less anxious and perhaps more logical. Once they start using real money, they become hesitant, emotional rather than logical, and their trading suffers. This is the main reason why one should start real trading on a small scale. A good deal of becoming a successful trader involves training oneself to gain poise, to act dispassionately in a detached manner and to avoid getting emotionally involved.

We are nearly always part of the crowd, part of society. The fifth category, therefore, which is dealt with in Chapter Seven, seeks to draw together how society influences the way we think and the way we feel. As time goes on, more evidence is emerging that our linkages to those around us are wired into our brain. We often observe how people who live for a long time together start to think and speak in similar ways; some say they start to look the same as well.

Chapter Seven also examines how society’s feelings and beliefs feed upon themselves and often spiral out of control. These beliefs are often, of course, backed by money and therefore have an influence on markets. As investors, we should be aware of these beliefs and expectations which have taken hold of a market and seek to profit from them, either by going long as a movement starts to develop or by going short when we think it is past its peak. We often observe that once a movement starts, it tends to last longer than many people expect.
At the end of Part Two the sixth category deals with gender issues (Chapter Eight). Classical economics and finance did not consider the gender of the persons making investment decisions but behavioural finance shows that gender is a critical variable because men and women have different attitudes towards investing. Men, for example, tend to be overconfident while women are generally conservative. This is a very wide area of research, and work has just begun, but it is likely that investor profiling, especially gender, will become a major issue in future. Gender differences highlight the usefulness of technical analysis in providing a more objective approach to investing.

In Part Three we focus more on how behavioural finance can be combined with technical analysis and quantitative finance to forge a new approach to the market. In Chapter Nine a conceptual framework for understanding three tools of technical analysis – extreme prices, trends, and support and resistance – is introduced and the relevant behavioural finance concepts behind each part of this framework are discussed. Chapter Ten, the final chapter, looks briefly at the new horizons which are opening up and how readers can best put this book to practical use.

The fourth approach

For a long time, writers on investments have spoken of two main approaches to investing.

First, there is the fundamental approach. A security – be it a share in a company or bonds issued by the state – is analysed in terms of its economic characteristics and value. If we are analysing a share in a company, for example, we would ask questions such as:

- What are the profits of the company after tax?
- How many shares does this company have in issue?
- What are the profits as a percentage of turnover?
- Are turnover and profits increasing, stable or declining? Why?
- What is the edge of the company in the market?
- What is the market share of the company?
- What are the strengths, weaknesses, opportunities of the company and what threats does it face (so-called SWOT analysis)?
- What debt level does the company have and is this level sustainable?
- What dividend does the company distribute?
Questions such as these help us gain an understanding of the company, and its likely future cash flows, and thus we can arrive at an idea of its value.

The second approach is technical analysis. In technical analysis, it is primarily the price of the share that is examined, often in the context of the market. Analysts look at how the price of the share changed over time and whether the volume of shares transacted was supportive of the trend in price. Specific patterns are considered, for example the head and shoulders formation, as indicative of a change in trend and others – such as flags – are taken to indicate a continuation of the trend. Simple and moving averages, and the difference between moving averages of different time periods, are also used. It is assumed that by studying price and volume patterns it is possible to predict how the price will change.

Eventually, a third approach, or analytical dimension, emerged; quantitative analysis. Economists took a more universal look at the market and in their new models included all the assets in the world and assumed that participants in this market had good information on which to make decisions. They applied various statistical and mathematical tools to these models of the capital market. The quantitative approach gained prominence in the late 1970s and with it came the various influential models we have today, including the capital asset pricing model and the various models used to value options. New tools were developed as mathematics and statistics were more frequently applied to models of the market, as economists analysed the market to gather evidence to confirm or refute hypotheses and as new quantitative techniques, such as GARCH and fractal geometry, evolved.

Some writers include quantitative finance with the fundamental approach but many writers on technical analysis contend that quantitative finance is actually just a development of their work on price movements and markets. Whatever the classification considerations involved, none of the three approaches really placed the individual investor’s psychology at the very centre of its considerations. The individual investor was obviously there but he or she was generally assumed to be behaving as expected; that is rationally. It was behavioural finance which made investors’ psychology and behaviour the focus of its studies. In this sense, therefore, behavioural finance can be seen as the much needed fourth approach to investment.
Key concepts in this chapter

- Rational economic man – too ideal a construct
- Bounded rationality – a better model
- The six categories of behavioural finance, the CPA-SSG Framework:
  - Dealing with Complexity
  - Problems of Perception
  - Aversion of instability
  - The Self
  - Society
  - Gender
- Investing:
  - Fundamental approach
  - Technical analysis
  - Analytical/quantitative approach
  - The fourth dimension – behavioural finance
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Paperback: 9781905641413
eBook: 9780857190680