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Trading the fixed income, inflation and credit markets

A Relative Value Guide

NEIL C. SCHOFIELD
TROY BOWLER

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Trading the Fixed Income, Inflation and Credit Markets

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Dedicated to RBS
To Bren, Robert and Gillian
To Nicki

NCS

To my family and my friends;
who always support me

TB

Preface

If you have ever tried to read a finance textbook and bemoaned the fact that your brain starts to wander (or even wonder) after the first paragraph, then we think this book is for you. If you have ever been suckered into paying the best part of £100 for a finance textbook that you have opened only once, then again, we think this book is for you – clearly though for the right reason! If you have ever opened a finance textbook to be told "obviously" when it is patently far from it, then we also think this book is for you.

On the other hand, if you are looking for a heavy-duty academic text, then this book is definitely not for you. There are plenty of those available. Try, for example, *An Introduction to the Mathematics of Financial Derivatives* by Salih N. Neftci or the classic *Options, Futures and Other Derivatives* by John C. Hull. A slightly less academic but highly worthwhile read is *The Mathematics of Financial Derivatives: A Student Introduction* by Jeff Dewynne. Likewise, if you are looking for a cheaper version of one of the popular product handbooks that proliferate the market, put our book back on the shelf right now. It is not for you. We are not planning on discussing mortgage-backed bonds, Munis, REITs or 401Ks.

That is not to say that our book is not rigorous in its descriptions and its workings. It most certainly is. It is just that we want readers to come away from this book with a clear understanding of the intuition behind the theory, some practical examples to aid the understanding of that theory, some shortcuts that can be used to cut to the chase and some jargon-lite explanations of concepts such as PCA and Monte Carlo. As such, this book will be useful for students about to embark on a university course in finance and who want a book that is not dedicated to "squiggly d's" and stochastic calculus. It will also be useful for those people about to embark on a career in finance, whether on a well-structured graduate training course or not.

We have adopted a relative value approach to analysing the fixed income, credit and inflation market. The phrase "relative value" is perhaps most commonly interpreted in a literal sense; the value of one asset relative to another. From this notion the argument extends towards the definition of "value", which is often expressed as some notion that an asset can be considered cheap or expensive ("rich" in the market jargon). As any regular shopper will no doubt frequently report when they consider something to be a bargain, this notion is expressed with respect to some given benchmark or accepted norm.

This definition of relative value is a valid one, although we will argue that it is also somewhat limiting. Our definition of relative value is therefore "*what is the optimal way in which a particular view of the market can be expressed*". To grasp the significance of this

definition, consider the following simple example. Let us assume that we are an investor who is looking to earn a return in euros with a minimum degree of credit risk (i.e., the risk that the issuer of a security will be unable to repay its debts). If the investor chose to invest in AAA-rated EUR-denominated sovereign bonds, they would be able to pick between a variety of different countries. In theory, since the currency and the credit risk are identical, all of these bonds should return the same amount for a given yield. The investor may be able to identify one bond that they consider cheap relative to the universe of other assets and so purchase that asset. This type of transaction would conform to the traditional definition of relative value. Using the wider definition of relative value the investor would look at alternative structures that may afford the same exposure but offer a greater degree of return. So, for example, an investor may choose to purchase a bond future *or enter* into an interest rate swap transaction where they receive fixed or execute an option transaction that will show a profit if market rates move as expected. We will use this framework of spot–forward–swap–optionality as the basis of our trade design as we progress through the different asset classes.

Chapter 1 presents an overview of the different products that will be analysed in later chapters. It is not imperative to go through this chapter slavishly if you are confident of your product knowledge, but we include the chapter for the sake of completeness. *Chapter 2* introduces our relative value framework and considers the pricing relationships that exist between the spot, forward, swap and volatility markets. *Chapter 3* is essentially an extension of the pricing relationships developed in the previous chapter as it considers the market risk of the different instruments. *Chapter 4* considers how the relative value framework can be applied to express trading opinions within a fixed income context. *Chapter 5* takes a traditional "cheap/rich" approach to relative value within a sovereign bond context. *Chapter 6* looks at different ways to express views on expected yield curve movements. *Chapters 7 and 8* apply the relative value framework within a credit and inflation context, respectively. *Chapter 9* concludes the text on a slightly light-hearted note by considering some of our favourite trading axioms.

Finally, by the time that you have finished reading this book you will understand why, amongst other things, forward prices are not expected prices (Troy's pet hate!) and why most financial commentators need a little more humility. This book is the result of more than 50 years' combined working in various roles at the coal face of the capital markets rather than in the comfort of academia. We hope that it is worth the journey.

Acknowledgements

It's scary to think that Troy and I first met at Loughborough University many years ago; more than we care to remember. We went our separate ways and it wasn't until about 2002 that we bumped into each other at Barclays Capital. It was at Troy's instigation that we decided to embark on the project and I am personally grateful to him for his intellectual input into the text over the two to three years it took us to compile the material. His insight into all of these markets is remarkable and I am lucky to have been the scribe who documented his thoughts.

Troy has always been a big supporter of graduate education within Barclays Capital and the text was written with this audience in mind. The book is designed to both complement and supplement the existing classroom training that such a "bootcamp" course would deliver. However, we have tried to make the text accessible to any reader wishing to deepen their understanding of these complex financial markets.

I must also take the opportunity to extend a very big "thank you" to Stuart Urquhart of Barclays Capital. I first met Stuart at Barclays in about 2002, and ever since day one he has proved to be one of life's true gentlemen. Not only did he arrange for access to Barclays Capital Live for all of the data in the text, but he added value to some of the chapters with insightful suggestions and constructive observations. His professionalism and kindness are truly an example to us all. Thanks also to Dr Andy Bevan for help in shaping my thoughts on certain aspects of the yield curve.

I would also like to thank the late Paul Roth, who shaped my understanding on many aspects of derivatives. Sadly my late father, Professor Reg Schofield, passed away during the writing of the book and all his family and friends still miss him. He perhaps didn't realize it at the time, but his explanation in 2007 of yield curve modelling was a useful addition to the text – not bad for a Civil Engineer! As ever, Nicki never complained about me writing, even during (at least) two holidays.

Many thanks go to the team at John Wiley (Caitlin, Aimee and Pete in particular), who came to know me as Neil "*can I have another extension for delivery of the manuscript*" Schofield.

Although many people helped to shape the book, any mistakes are entirely our responsibility. I would always be interested to hear any comments about the text and so please feel free to contact me at neil@fmtuk.com or via my website (www.fmtuk.com).

P.S. Alan and Roger – two slices of white toast and a cuppa for me!

About the Authors

TROY BOWLER

Troy Bowler joined Barclays Capital in London in 2002 and is currently a Managing Director within Distribution, based in Singapore. Before joining Barclays Capital, he held positions at Deutsche Bank in London, where he was part of their highly-regarded global fixed income and relative-value research team, at PaineWebber and Bank of Tokyo Capital Markets (UK), where he was Chief Economist, and Charterhouse Investment Management Limited, where he managed money-market funds, including the #1 ranked GBP unit trust according to Micropal (acquired by McGraw-Hill Companies in 1997).

Although Troy's membership of the Institute of Investment Management and Research (IIMR), now known as CFA UK, has lapsed, he was a member of the Examination Committee in the mid-1990s, helping to revamp the IIMR's examinations. Previously, the examinations had focused almost exclusively on equity markets and the IIMR looked to widen the remit to encompass fixed income professionals. Those of you who went through the IIMR examinations prior to 2002, especially the "Economics & Applied Statistical Analysis" paper, may wish to thank or curse Troy in equal measure. He happily admits that he passed his examinations well before this.

Troy holds a BSc in Economics from Loughborough University and an MSc in Economics from London University.

NEIL C. SCHOFIELD

Neil Schofield is the principal of FMT Ltd, a UK-based company offering training services in the areas of treasury, derivatives, capital markets and risk management to financial institutions, Central Banks and corporations worldwide.

Neil was global head of Financial Markets training at Barclays Capital from 2001 to 2008. He teaches primarily on the rates business, covering all of the major asset classes and their respective derivative products from foreign exchange through to commodities.

Before joining Barclays Capital, he was a director at Chisholm-Roth Training for 4 years, where he was responsible for provision of training services for a number of blue-chip global investment banks. Clients included Citigroup, Deutsche Bank, Goldman Sachs and JP Morgan Chase.

He started his training career at Chase Manhattan Bank, where he was originally employed as an internal auditor. Over a period of 9 years, he conducted numerous internal and external

training seminars including the Bank of England and the Federal Reserve System in the USA. He has also held positions with Security Pacific Hoare Govett (now trading as Bank of America) and Lloyds TSB.

Neil holds a BSc in Economics from Loughborough University and an MBA from Manchester Business School. He was elected as a Fellow of the IFS School of Finance (formerly the Chartered Institute of Bankers) in 1999.

Neil was appointed as a Visiting Fellow at the University of Reading ICMA centre in April 2007.

He is author of the book *Commodity Derivatives: Markets and Applications* published by John Wiley in October 2007.

Contents

1 Product Fundamentals

1.1 CHAPTER OVERVIEW

In this chapter we consider the features of a number of instruments that will be the focus of subsequent sections. The coverage is not intended to be comprehensive; the aim is to make sure that the reader is armed with sufficient terminology to be able to understand the more detailed concepts that will follow. Pricing and risk management will be the subject of Chapters 2 and 3, respectively.

This chapter starts with a discussion of the main "cash" (i.e., non-derivative) markets of fixed income, inflation and credit. The coverage then widens to incorporate the derivative building blocks, namely futures, forwards, swaps and options. Within this section the material occasionally leans towards the detail of specific products in certain asset classes that are considered key. However, the discussion relating to options is asset class neutral to keep the chapter size manageable.

Readers with a good knowledge of these subjects can skip this chapter but we would suggest a quick skim of the pages just in case a review is needed!

1.2 BOND FUNDAMENTALS

A key building block for the first part of the text will be bonds. A bond is an IOU that evidences the indebtedness of a borrower. Borrowers comprise mainly sovereign and corporate entities, although there have been issues made by individuals such as the pop star David Bowie.

1.2.1 Fixed income structures

Although bonds have many different forms we will initially focus on standard ("vanilla") structures. In return for borrowing a given sum of money, the issuer of the bond will pay a series of contractual interest payments to the owner of the instrument. When bonds were issued in physical form, the owner would detach a small coupon and present this to a bank appointed on behalf of the borrower as their eligibility to receive interest. As a result of this practice, interest payments on bonds have become termed coupons. At the maturity of the instrument the investor will be repaid the value stated on the face of the bond, but this may not be the sum that was originally paid to acquire the asset. This is because bonds are traded on a price basis, which is quoted as a percentage of the face value. Bonds are priced by present valuing all of the future cash flows, but this concept will be considered in Chapter 2. Suffice to say that with a limited amount of any bond in issue, the relative attractiveness of the fixed coupon will be the key determinant of how much an investor will pay to acquire the bond. If a bond has a fixed coupon of 5% but investors could earn a greater return on an equivalent investment (equivalent in terms of maturity and the risk of default), the