



Detailed Bond Valuation & Bond Portfolio Management

Overview

This course is intended for practitioners in the financial markets who already have an understanding of the Bond Market and would like to learn more about the bond formulae of both vanilla and non-vanilla bonds and want to understand the details of delta, duration and convexity from first principles. The course is very “**hands on**” in that all delegates will learn to use Excel (without VBA) to precisely price vanilla bonds, FRNs, CPI bonds and Repos. Furthermore delegates will use excel to calculate delta and convexity of a bond and a portfolio of bonds. As a result, it is strongly recommended that delegates bring their own laptops. Please note that laptops are encouraged but are not compulsory - delegates who don't bring their own laptops will be able to follow along quite easily as all spreadsheets and data are provided on a DVD. Some of the key details that are discussed are:



What is the duration and delta of an African Buffalo?



Our duration is about 20 years and we love the Okavango Delta!



- Decomposing yield to maturity into its components and credit spreads.
- Traditional bond valuation incorporating broken periods versus the annuity formula.
- Full explanation of the Bond Pricing Formula as per the BESA \ JSE specification.
- International Comparisons of bond formulas for different countries and Accrued interest conventions e.g. 30(E)/360, Act/365 L, Act/ Act, ISMA method etc.
- Implications of the South African Bond pricing formula.
- Deriving yield from price in Excel as well as using a host of techniques such as Newton Raphson etc.
- Understanding approximations and deriving Macaulay's duration, modified duration, delta & convexity from first principles (with reference to the JSE specification.)
- Pricing inflation linked bonds in Excel.
- Pricing FRNs in Excel.
- Pricing vanilla Repos and inflation linked Repos.
- A look at bond portfolios incorporating bullets, barbells and ladders etc.
- Running scenarios and a Monte Carlo simulation on a bond portfolio using Excel.
- Bond Indices
- Duration Matching and some active bond portfolio management techniques.

Please refer to the agenda for more info.

Geometric Progression is accredited as a provider of education and training by BANKSETA. Accreditation number: 557066.

We are a B-BBEE level four contributor. We have a B-BBEE procurement recognition level of 100%. The rating was performed by the Department of Trade and Industry (the DTI).

Contact Sandra at:

Email: sandra@geometricprogression.co.za

Web: www.geometricprogression.co.za

BANKSETA No: 557066

Tel: 021 794 8332

Fax: 011 252 8089

Emergency Cell: 082 872 3812

Reg No: 2005\020493\23





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Cutting thru complexity



Level: Intermediate to Advanced.

Duration:

3 Days. (8h45 - 16h30)

Prerequisites

Please note, this course assumes delegates know the features and characteristics of bonds already. Please refer to the "Comprehensive Introduction to Bonds Course" for more details of the introductory bonds course offered by Geometric Progression.

Furthermore this course assumes you understand:

- The basics of the time value of money (FV, PV) etc.
- Introductory knowledge of Calculus (this is required for delta and convexity only).
- The basics of how to use Excel.

All of the above pre-requisites will be made available in the form of pdf notes or Elearning before the course for those that are a bit rusty on these topics or want some pre-course reading. A CD of these topics will also be provided at the course.

Suitable for

- Business analysts;
- Valuations staff and accountants;
- Investment analysts and Research;
- Investors & Traders;
- Regulators & Compliance Staff;
- Risk Managers;
- Fund Managers & Trustees;
- Graduates and interns;
- Delegates registered to write CFA® exam, FRM® exam, PRM® exam;
- Anyone seeking a greater insight into the Bond Market;

A certificate is available on request



Cost & Details

This course is mostly run on an in-house basis and is occasionally run publicly. Please contact us if you are interested in either running the course internally or would like to attend a public course. Check out the website for more info. A notice will be sent out if you are on the email database.



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Agenda

1. Understanding the Vanilla Bond Pricing formula

Delegates will price bonds in Excel using the PV method and the annuity method balancing back precisely to the JSE valuations. All examples will be performed in Excel and delegates will learn to "program" their own solutions using Excel functions. Topics discussed include:

- A full decomposition of Yield to maturity incorporating credit spreads, real returns, liquidity etc.
- Calculation of the All in Price, Clean Price, Accrued Interest of vanilla bonds and zeroes.
- Broken Periods and books Closed Dates.
- The annuity formula and why it is often displayed in specifications.
- Full explanation of the Bond Pricing Formula as per the BESA \ JSE specification.
- Broken coupons.
- International comparisons of bond formulas for different countries and Accrued interest conventions e.g. 30(E)/360, Act/365 L, Act/ Act, ISMA method etc.

The formal JSE bond specification will be used as a reference.

2. Implications of the South African Bond Pricing Formulae.

- "The saw tooth effect".
- Pull to Par.
- Anomalies of the SA Bond Pricing formula.
- The problem of Accrued Interest.
- YTM vs Spot rates.
- Calculating Bond Returns and a look at historical bond returns.

This section will include video to reinforce the concepts.

3. Deriving Yield to Maturity from the All in Price

- Numerical Techniques
- Bi-section
- Newton-Raphson
- Bailey's method

Excel will be used to demonstrate these processes and delegates will learn to program the process using excel functions (no VBA required).

4. A detailed look at measuring Interest rate Risk

- The truth about Macaulay Duration and how it has been misinterpreted.
- Calculating the first and second derivatives of the Price / Yield function.
- Modified Duration, Delta and PV01.
- Fisher-Weil Duration.
- Derivation, explanation and practical uses of convexity.
- The Taylor series approximation.
- Interpretation and uses of duration and convexity.
- The JSE specification regarding Duration, Convexity, Delta and PV01.

Video and excel will be used to reinforce the concepts. Please note that this section uses calculus quite heavily. Background reading regarding the concepts of calculus will be made available for those who are a bit rusty and want to recap the concepts.



5. Pricing Inflation Linked Bonds

- Understanding and calculating the reference CPI.
- Explanation of how CPI bonds work.
- Pricing Inflation Linked Bonds.

Delegates will perform the calculations in Excel.

6. Pricing FRN's

In order to price FRN's, one needs to understand Yield Curves. As a result, this section includes explanations of the different types of curves and bootstrapping. Delegates will perform a bootstrapping using live data.

- Understanding the Par curve
- Bootstrapping the Spot Curve.
- Deriving the Forward Curve and predicting coupons.
- The FRN pricing formula and its anomalies.
- FRN duration and convexity.

Delegates will price all of the FRNs themselves using Excel. Video be used to reinforce the concepts.

7. Repos

- Understanding Repos and Buy Sell Backs.
- GC, Special and securities Lending.
- Pricing Buy Sell Backs and Repos.
- The consideration method.
- ISMA Repos (now ICMA Repos)
- Pricing Inflation linked Repos and the implications.

Again Excel will be used.

8. Valuing Bond Portfolio's and Bond Portfolio Risk

- Mathematics of Bond Portfolio Management.
- Bond Portfolio duration and convexity.
- Bond Replication.
- Barbell's, Ladders and Bullets.
- Delta neutral portfolios.
- **Yield curve shifts and scenario analysis.**
- **Using Excel to run a monte carlo simulation.**

9. Bond Indices

- Understanding Bond Indices.
- Replicating the ALBI / GOVI. (*Examples in Excel will be used.*)

10. An Introduction to Bond Portfolio management techniques.

- Asset Liability Matching / Duration matching.
- Active Strategies used to outperform the index.
- Bond Spread trading.
 - ◇ *Quote conventions.*
 - ◇ *Matching the Rand per basis point etc.*

Video will be used to reinforce the concepts.

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Tutor: Mark Raffaelli CFA,FRM

Mark graduated with a Bachelor of Commerce from the University of Natal, South Africa in 1990. He is a CFA Charterholder and a member of the CFA Institute. He is also a fellow member of the Global Association of Risk Professionals (GARP) and has the Financial Risk Manager (FRM) qualification. Mark's extensive experience ranges from trading in Spot & Derivative Products and Consulting to the development of Risk Models, Pricing Software and Trading Systems. Those who have been to Mark's courses will know about his passion for the financial markets and ability to cut through jargon, simplify technical issues and provide real life examples. He has been nicknamed the "Steve Irwin of the financial markets".



What makes Geometric Progression different from other providers:

- We don't regurgitate traditional textbooks; instead we share real life experiences.
- We explain all the products as they relate to your own lives in plain English.
- We look at how the products are used by the professionals and how you could use them yourselves to make money.
- We are one of the few providers globally that also runs courses on the more intricate aspects of the financial markets e.g. stochastic mathematics, matrices etc.
- We love multimedia and include video and film in our courses.

We also offer practical training e.g. we teach people how to trade as if they were on the desk so that they get a turn to find out what it is like. Excel and computer examples are used where required.



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Terms and Conditions

Customer Information:

Fees include all the tuition, course file, lunches and refreshments for the duration of the course. Geometric Progression is not responsible for covering airfares or other travel costs incurred by registrants. Delegates will be responsible for their own accommodation and transport.

Disclaimer:

Geometric Progression reserves the right to change or cancel any part of the training courses due to unforeseen circumstances.

Cancellations:

If you cancel more than 10 working days before the course date, there is no cancellation fee. If you cancel between 2 and 10 days before the course date, a cancellation fee of 50% will be charged. Any cancellation less than 2 days before the course date will result in the full fee being charged.

Substitutions:

Registered delegates may be substituted at any time prior to the seminar without incurring any additional fee. Please inform Geometric Progression of the change.

Payments:

Payments must be made prior to the running of the event unless otherwise agreed with Geometric Progression.

Confirmation:

All registrations will be deemed confirmed and subject to these Terms and Conditions. Any disabled individual desiring auxiliary aid for this conference should notify Geometric Progression at least one week prior to the conference in writing, fax or email.

PLEASE NOTE:

Geometric Progression reserves the right to refuse admission where evidence of full payment cannot be shown. Should you require an original VAT INVOICE to requisition payment, please contact us on (0861) 000 615.

Geometric Progression reserves the right to cancel the course. Registered delegates will be notified and a full refund will be made.



Booking Form

Course: _____ Date of Course: _____

DELEGATE 1

First & Last Name: _____

Designation: _____

Company: _____ Department: _____

Tel: _____ Fax: _____ Cell phone: _____

Email: _____ VAT Registration No: _____

Postal Address _____

Special Dietary requirements (pls circle) None Kosher Halaal Vegetarian

DELEGATE 2

First & Last Name: _____

Designation: _____

Company: _____ Department: _____

Tel: _____ Fax: _____ Cell phone: _____

Email: _____ VAT Registration No: _____

Postal Address _____

Special Dietary requirements (pls circle) None Kosher Halaal Vegetarian

DELEGATE 3

First & Last Name: _____

Designation: _____

Company: _____ Department: _____

Tel: _____ Fax: _____ Cell phone: _____

Email: _____ VAT Registration No: _____

Postal Address _____

Special Dietary requirements (pls circle) None Kosher Halaal Vegetarian

Authorised By: Date:.....

Signature: