

## Propectus

1. Fixed income is a fascinating part of finance . . .
2. . . . but it's quantitative
3. . . . and takes time and effort to master
4. Assignments are critical learning experiences
5. Do them in groups (it's easier)
6. We'll emphasize international markets
7. Home page has "overheads" (like these) and "manuscript"
8. Manuscript includes old exams, practice problems, answers
9. Useful references:
  - Garbade, *Fixed Income Analytics*
  - Tuckman, *Fixed Income Securities*
10. Read the syllabus: it's our contract

## Theme 1: Debt Markets are Global

- Bond Markets

(amounts outstanding, billions of US dollars, 1995)

Category	Outstanding
Total	24,110.0
Private	8,776.7
Public	14,197.5
US	10,726.0
Japan	4,958.6
Germany	1,906.4

Source: IMF.

- International capital flows of all kinds are booming

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**Theme 2: Debt Markets are Derivatives Markets  
(and vice versa)**

## Exchange-Traded Derivatives

(annual turnover, millions of contracts traded, 1995)

Category	Turnover (mm)
Interest rate futures	561.0
Interest rate options	225.5
Currency futures	98.3
Currency options	23.2
Stock market index futures	114.8
Stock market index options	187.3
North America	455.0
Europe	353.3
Asia-Pacific	126.5
Other	275.4
Total	1,210.1

Source: BIS.

**Theme 2: Derivatives (continued)**

All Derivatives

(notional outstandings, billions of US dollars, 1995)

Category	Over-the-Counter	Exchanges
Interest rate	26,645	15,669
Currency	13,095	120
Equity and stock indexes	579	442
Commodities	318	142

Tell Figlewski: futures and options = fixed income!

Remark: OTC derivatives tied to global interbank market

**Theme 3: Debt Markets are Emerging**

- Net Capital Flows to Emerging Markets  
(billions of US dollars, 1995)

Total	193.7
Direct Investment	71.7
Portfolio (Debt and Equity)	37.0
Loans	85.1

- Gross Private Issues of Debt and Equity  
(billions of US dollars, 1995)

Debt	
Total amount	501.7
Share of emerging markets (%)	11.6
Equity	
Total amount	44.2
Share of emerging markets (%)	25.3

- Summary of emerging markets:
  - Significant and growing share
  - Increasing use of public markets

**Fixed Income Analytics at Work**

## Example 1: Bell Atlantic

- Stylized balance sheet (typical of nonfinancial corps)  
(year-end 1996, billions of dollars)

Assets	
PP&E	16
Liabilities and Shareholders' Equity	
Debt	6
Shareholders' Equity	8
Stuff	2

- Debt notes:
  - Primarily fixed rate, with maturities through 2033
  - Accounting: coupons charged against income
  - 1.5b callable, and some putable
  - Derivatives: 0.2b interest rate swaps (receive fixed)
- Question: Is long debt less risky than short?
  - Answer 1: Yes, interest expense is predictable
  - Answer 2: No, market value varies more

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**Fixed Income Analytics at Work (continued)**

Example 2: Intel

- Balance sheet summary  
(year-end 1996, billions of dollars)

Assets	
Cash and Securities	7.9
PP&E	8.5
Stuff	1.2
Liabilities and Shareholders' Equity	
Debt	0.7
Shareholders' Equity	16.9

- Securities and debt notes:
  - Everything swapped into dollar-LIBOR (floating rate)
  - Accounting at market value: interest *and changes in market value* included in revenue and expense
- Question: Are floating rate (short) securities less risky?
  - Answer 1: Yes, market value is stable
  - Answer 2: No, interest income/expense unpredictable

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**Fixed Income Analytics at Work (continued)**

Example 3: Banc One

- Stylized balance sheet  
(year-end 1996, billions of dollars)

Assets	
Loans	73
Cash and Securities	29
Liabilities and Shareholders' Equity	
Deposits	72
Debt	21
Shareholders' Equity	8

- Summary and comments:
  - Highly levered (like all commercial banks)
  - Assets shorter than liabilities  
⇒ vulnerable to fall in rates
  - Swaps used to moderate interest sensitivity
  - Accounting: mixture of market value (“available for sale”) and historical cost (“held to maturity”)

**Fixed Income Analytics at Work (continued)**

## Example 4: Emerging Markets

- General characteristics of emerging markets
  - Debt easier to issue than equity
  - Often comes with more stringent disclosure requirements than domestic issues
  - Typically denominated in major currency (dollars, say)
  - Borrowers are sovereigns and firms with strong credit, hard-currency revenues
  - Foreign-currency denomination adds currency risk to to the usual credit risk (economies and currencies often implode together)
- Examples:
  - Par Bonds, Mexico (Bradies)
  - Globals, Mexico (eurobonds)
  - Grupo Carso SA, Mexico, floating rate eurobonds
  - Brazilian “C” Bonds (Bradies)
  - Argentinian FRB’s
  - ICICI, India, eurobonds (144A)
  - Ministry of Finance, Russia (144A)

**Outline**

**Part I: Bonds and Close Relatives**

1. Fixed Income Securities  
assets whose value depends on interest rates
  
2. Bond Arithmetic  
calculating spot rates, yields, etc
  
3. Macrofoundations of Interest Rates  
monetary policy and other factors
  
4. Quantifying Interest Rate Risk  
duration and beyond, activist investment strategies
  
5. Interest Rate Swaps  
also floaters and inverse floaters
  
6. Risk Management, Accounting, and Control  
market and book value, disasters and their sources

**Outline (continued)**

**Part II: Interest Rate Derivatives**

7. State-Contingent Claims  
analytical framework for derivative valuation
  
8. Forwards and Futures  
bond and interest rate futures
  
9. Options  
analytics of options, callable bonds, caps and floors
  
10. Corporate Bonds  
introduction to credit risk
  
11. Emerging Market Debt  
Brady bonds, eurobonds, trends
  
12. Mortgages (probably not)  
Mortgages, mortgage-backed securities, structured notes