Derivatives & Risk Management

Who we are

Who you are: name sheet

This week

– First half
  • syllabus and course outline
  • why we should be here
  • basic finance principles – reminder
– Second half: Part I – Forwards

Who I am

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• Web site vs. Blackboard
• Disclaimer: CFTC and DoE and USDA and JPM Center for Commodities

Syllabus

• Prerequisites
• Course Objectives
• Materials
• Grading
  • 25% MT + 25% Final + 2*22.5% (Cases) + 5% (CP)
  • Groups
  • Honor Code

This Course within Finance

• Finance
  • Corporate finance
  • Investments analysis & portfolio management
  • Market microstructure
• This course’s main themes
  • Pricing (microstructure & investments)
  • Hedging (corporate, banking & investments)
  • All-in cost of capital (corporate)

Markets and Instruments

• Types of Markets
  • direct search vs. broker vs. dealer vs. auction
• Our focus – Derivatives on
  • FX
  • Interest Rates
    • Money Market vs. Fixed-income capital markets (bonds)
• Equities (single-stock vs. stock-index futures)
• Commodities
  • Storables (oil, gas, “ags”, metals) vs. Not (weather, electricity)

Why Should We Be Here?

• Trading in financial assets is huge
  • stock market vs. derivatives market
    • daily global FX turnover = $5.3 tn (2013 triennial BIS survey)
    • 4tn/’10, 3.2tn/’07, 1.9tn/’04, 1.2tn/’01 & $1.4tn/’98
    • 23.1tn futures & option contracts exchange-traded annually (2015; FIA)
    • notional on all OTC derivatives = $493 tn in (H2-2015; BIS)
      • After Lehman, fell to $582 tn in 1H-10 from $673tn in 1H-08
      • Back up to $710tn in Dec.13, now down – clearing, compression!
  • 94% of large corporations use derivatives (ISDA April ’09)
• Importance of theory
  • Computerization – experience vs. new situations (reference points)
  • know the theory to know its limits
Course Outline

• 3 Parts
• Reading Packet
• Cases

Introduction

Basic Finance Principles

<table>
<thead>
<tr>
<th>Time is</th>
<th>Money</th>
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<tbody>
<tr>
<td>Options have value, always</td>
<td></td>
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<table>
<thead>
<tr>
<th>Self Interest</th>
<th>Transaction?</th>
<th>Market Efficiency</th>
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<tbody>
<tr>
<td>2 parties</td>
<td>Efficiency</td>
<td></td>
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<table>
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<tr>
<th>Risk Aversion</th>
<th>Diversification</th>
<th>Marginal Analysis</th>
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Derivative Securities

• Definition
  • A derivative security or derivative is a financial instrument whose value depends on the values of other more basic underlying variables

• In this course
  • Forward & Futures
  • Swaps
  • Options

Forward / Futures /Swap Fundamentals

• Definition: Forward
  • contract calling for delivery of a given asset at a given future date, at a price agreed-upon today no money changes hands today (caveat)

• Market microstructure
  • OTC market

• Approximate definitions – Futures & Swaps:
  • Futures = Exchange-traded Forward
  • Swap = Bundle of forwards or of futures

Options Fundamentals

• A call is an option to BUY a certain asset at/by a certain date for a certain price that is fixed today

• A put is an option to SELL a certain asset at/by a certain date for a certain price that is fixed today
Options vs. Forwards & Swaps

*Customized*  *Standardized*

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<tr>
<th>Right</th>
<th>OTC option</th>
<th>exchange-traded option</th>
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</thead>
<tbody>
<tr>
<td>Obligation</td>
<td>forward</td>
<td>futures</td>
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**Terminology**

- **Number of parties**
  - 2 (buyer & seller) + intermediaries (sometimes)
- **The party that has agreed to:**
  - **BUY**
    - has what is termed a *LONG* position
    - *long position gains* when the price of the underlying increases
  - **SELL**
    - has what is termed a *SHORT* position
    - *short gains* when the price of the underlying falls

**Terminology 2**

- **Types of Traders**
  - Speculators
    - are willing to take risk based on their forecasts
    - try to exploit price movements
    - “Investors”?
      - use derivatives to gain LT (as opposed to ST) exposure
  - Hedgers
    - want to reduce risk of existing assets or liabilities
  - Arbitrageurs
    - use risk-free trading strategies
    - to exploit asset mis-pricings

**Ways Derivatives are Used**

- To invest or speculate
- To hedge risks
- To infer views
  - about the future direction of the market or about risk
- To lock in arbitrage profits
- To change the nature
  - of a liability
  - of an investment

**Forwards & Futures**

- **Forward contracts**
  - basic idea & market participants
  - links between spot and futures prices
    - forward as predictor of future spot prices
    - spot-futures parity theorem
- **Futures contracts**
  - market microstructure
    - participants, major contracts, exchanges
  - differences with forwards (purpose, contracts & prices)

**Forward Fundamentals**

- **Definition**
  - contract calling for delivery of a given asset
  - at a given future date, at a price agreed-upon today
  - no money changes hands today (*caveat*)
- **Market participants** (*Who and Why?*)
  - hedgers-traders-arbitrageurs
  - speculators
- **Market microstructure** (*Where and How?*)
  - OTC market
Forward Fundamentals 2

- Market participants
  - traders-arbitrageurs
  - hedgers
    - try to avoid impact of price movements
    - short hedgers: have long position, go short
    - long hedgers: have short position, go long
  - speculators
    - try to profit from price movements

Forward Fundamentals 3

- Taxation
  - hedging vs. speculation
    - ordinary income vs. capital income
- Risks borne by parties
  - volatility of underlying asset price
  - default
    - why?
- Solution
  - currencies: forwards
  - most other assets: futures

Futures

- Fundamentals
  - participants, major contracts, exchanges
- Differences w/ forward contracts (main ones)
  - trade in the risk (contract), not in the asset (commodity)
  - standardized and exchange-traded (not OTC)
  - marking-to-market / risk control
- Differences b/ forward & futures prices
  - in theory
  - in practice / arbitrage