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 trn (2013 triennial BIS survey)
      » 4trn ('10), 3.2trn ('07), 1.9trn ('04), 1.21trn ('01) & $1.49trn ('98)
    – 23.1bn futures & option contracts exchange-traded annually (2015; FIA)
    – notional on all OTC derivatives = $493 trn in (H2-2015; BIS)
      » After Lehman, fell to $582 trn in 1H-10 from $673trn in 1H-08
      » Back up to $710trn 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 Money</th>
<th>Options have value, always</th>
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</thead>
<tbody>
<tr>
<td>Self Interest Transaction? Market Efficiency</td>
<td></td>
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<tr>
<td>2 parties</td>
<td></td>
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<tr>
<td>Risk Aversion Diversification Marginal Analysis</td>
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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*

*right*  OTC option  exchange-traded option

*obligation*  forward  futures

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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
      - the *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