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
    » Storable (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, 1.21tn /’01 & $1.49tn /’98
  - 23.1bn 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 H1-10 from $673tn in H1-08
  » 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

| Time is Money | Options have value, always |
| Self Interest | Transaction? Market Efficiency |
| Risk Aversion | Diversification Marginal Analysis |
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/bys 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

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