Lecture 1
Introduction

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Top ten greatest trades

Rank	Trader	Position	Year
1	John Paulson	Against subprime	2008
2	Jesse Livermore	Against US equity	1929
3	John Templeton	Long Japan	1960s–1990s
4	George Soros	Against UK pound	1992
5	Paul Tudor Jones	Short Black Monday	1987
6	Andrew Hall	Long oil	2003
7	David Tepper	Long financials	2009
8	Jim Chanos	Short Enron	2001
9	Jim Rogers	Long commodities	1990s–
10	Louis Bacon	Long oil, short equity	1990

At least half are derivatives trades

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Paulson's subprime view

- John Paulson is an investment banker, not a macro-investor.
- He runs a hedge fund that specializes in risk arbitrage.
- But in 2007 he was convinced of a US housing bubble.
- How can you bet on this view?

Betting on Paulson's view

- You can't short real estate.
- You can't even short sell mortgages.
- You might be able to short mortgage-backed securities (MBS).
- But is there an easier way to trade on Paulson's view?

Credit default swaps

- Credit default swaps (CDS) pay off when an entity defaults.
- CDS is commonly used to insure against default on bonds.
  - Similar to fire insurance on your own house.
  - If house burns down, insurance contract pays off.
- However, you can still buy CDS without being long a bond.
  - Similar to fire insurance on neighbor's house.

Paulson's profits

- Paulson's hedge fund purchased CDS on subprime MBS.
- They also shorted the ABX index and, later, bank stocks.
- How did these trades turn out?
- Paulson's hedge fund ended up $15 billion in 2007.
  - He took home around $4 billion himself.

Who was on the other side of the trade?

- Goldman Sachs marketed the MBS Paulson bet against.
- Paulson was actually involved in the structuring – i.e., he picked.
- The SEC alleged that Goldman Sachs mislead investors.
- Goldman paid $550 million to settle and Regulation AB was born.

OKAY LET'S KIND OF GET TO WORK

What is a derivative?

- A derivative is a financial instrument whose value is derived from the value of an underlying asset.
- *Example:* credit default swap on subprime MBS.
- *Example:* exchange option on two thoroughbreds:

$$\text{Payoff} = \begin{cases} \text{Horse 1} & \text{if Horse 1 is better than Horse 2} \\ \text{Horse 2} & \text{otherwise} \end{cases}$$

Size of derivatives market is eye-popping

Product	Market size	Year
U.S. equities	$20 trillion	2011
Corporate debt	$10 trillion	2011
U.S. government debt	$18 trillion	2011
Household debt	$9 trillion	2011
U.S. Gross domestic product	$15 trillion	2011
Over-the-counter swaps	**$600 trillion**	**2011**
All derivatives	$>$ **$1 quadrillion**	**2011**

Two main uses of derivatives

1. Speculation and investment:
   - Derivatives can be used to express a specific view.
   - Derivatives provide leverage.
2. Risk-sharing and hedging:
   - Transfer risks to agents most willing to hold it.
   - Sixty percent of non-financial firms use derivatives.

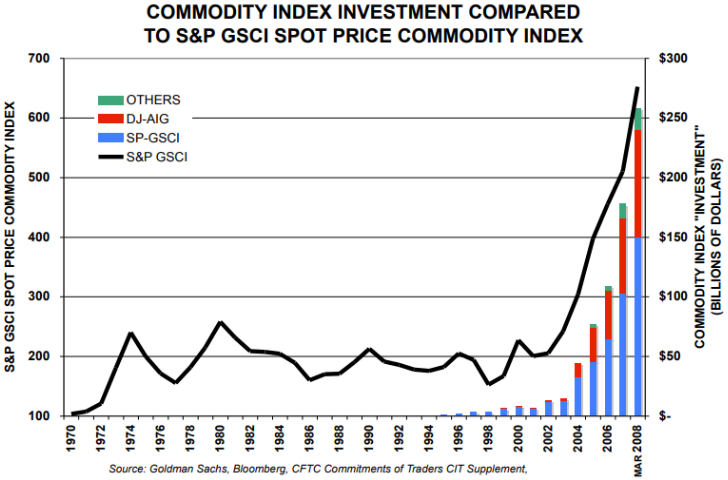
Investing in commodities

- Early 2000s: investing in commodities became a popular idea.
- Idea driven by diversification motives, not speculation.
- Problem is that investing in a physical commodity is difficult.
- Investing in a diversified basket of commodities even worse.

Commodity index investment

- Banks came up with a solution: commodity index funds.
- Idea was to use technique called financial engineering to replicate physical commodities using futures and bonds.
- Markets for bonds and futures were already active and liquid.
- This allowed funds to cheaply replicate baskets of commodities.

Commodity index investment grew from $13 billion in 2003 to $260 billion in 2008



No shame in my game

The Economic Impact of Index Investing

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We study the impact of index investing on firm performance by examining the link between commodity indices and firms that use index commodities. Around 2004, commodity index investing dramatically increased. This event is referred to as the financialization of commodity markets. Following financialization, firms that use index commodities make worse production decisions, earn 40% lower profits, and have 6% higher costs. Consistent with a feedback channel in which market participants learn from prices, our results suggest that index investing distorts the price signal, thereby generating a negative externality that impedes firms' ability to make production decisions. (*JEL* G12, G14, Q02)

A word of caution

- Derivatives can reduce risks when used as insurance.
- This improves overall economic welfare.
- But they can also increase risks and erode financial stability.
- This brings us back to the financial crisis and to AIG...

The AIG CDS machine

- AIG is an insurance company with limited oversight.
- AIG wrote billions in MBS CDS leading up to the financial crisis.
- Data and models suggested these were "free money".
- Customers purchasing CDS were major financial institutions.

CDS collateral requirements

- CDS contracts require collateral from the seller and the buyer.
- If the market moves against you, you must post more collateral.
- As the U.S. housing market deteriorated, MBS values soured.
- AIG took a $100 billion loss in 2008 due to CDS write-downs.

A run on AIG

- AIG's losses sparked a run on the company's assets.
- Losses caused counterparties to demand collateral from AIG.
- Demand for collateral caused AIG to sell assets.
- Lack of assets caused lenders to cut-off credit to AIG.
- And so on until AIG was on the verge of insolvency.

Was AIG a bad actor?

- AIG received a massive bailout from taxpayers:
  - Fed loaned AIG \$85 billion against insurance assets.
  - U.S. government injected \$185 billion equity.
- Public was not happy, but it was necessary to avert disaster.
- Interestingly, taxpayers eventually made money on this deal!

Summary

- A derivative is a financial instrument whose value is derived from the value of an underlying asset.
- Derivatives used for investments and risk management.
- Size of derivatives market is absolutely enormous.
- Be careful with derivatives: even hedges can be risky!

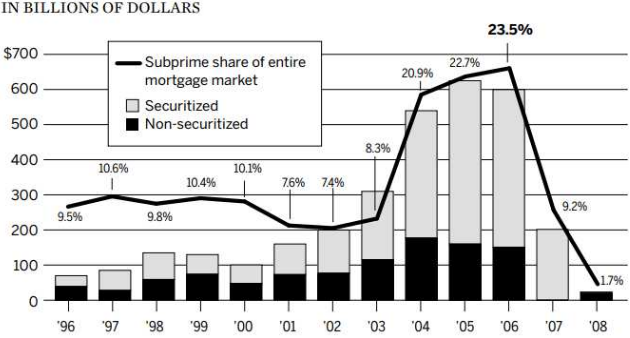
References

- Textbook chapter 1.
- John Paulson article is in the Wall Street Journal.
- My paper is in The Review of Financial Studies.
- Graphs from Bloomberg terminal and US Government.
- Slides are created using code on my Github.

Subprime time

Subprime Mortgage Originations

In 2006, $600 billion of subprime loans were originated, most of which were securitized. That year, subprime lending accounted for 23.5% of all mortgage originations.



NOTE: Percent securitized is defined as subprime securities issued divided by originations in a given year. In 2007, securities issued exceeded originations.

SOURCE: Inside Mortgage Finance

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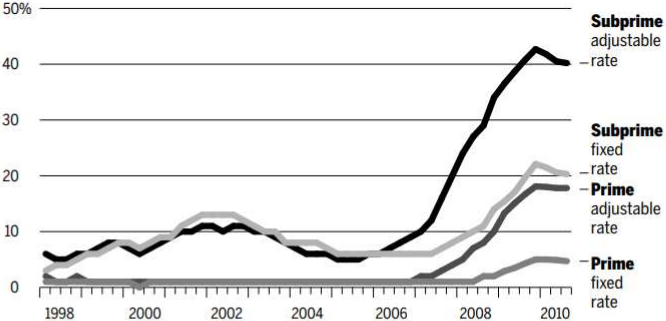
Suprime default rate

Mortgage Delinquencies by Loan Type

Serious delinquencies started earlier and were substantially higher among subprime adjustable-rate loans, compared with other loan types.

IN PERCENT, BY TYPE



NOTE: Serious delinquencies include mortgages 90 days or more past due and those in foreclosure.
SOURCE: Mortgage Bankers Association National Delinquency Survey

Number of new foreclosure filings

KBW bank index performance

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AIG stock price

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