Derivatives Disasters

22 – 23 May 2008 (Hong Kong)
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1. Definition Of Derivatives

What Is A Derivative?

- Then
  - Any financial instrument whose value depends on value(s) of the assets underlying the derivative

- Now
  - Any financial instrument whose value depends on value(s) of the assets (transparent and/or latent) underlying the derivative

  - Weapons Of Mass Destruction (WMD) – Bershire's 2002 Annual Report, Page 16

2. History Of Derivatives

Derivatives Before Birth Of Christ

- 1750 BC
  - Clay tablets from Ancient Mesopotamia
- 580 BC
  - Thales (Miletus) a mathematician/philosopher purchased options to rent olive presses in case of good harvest.
- Ancient Romans and Phoneicians have used options on shipping contracts

Derivatives Before Birth Of Christ – cont'd

- Scriptures (Some references):
  - Genesis Chapter 29: Around 1700 BC, Jacob purchases an option whose premium is 7 years of labor that grants him the right to marry Rachel. Laban (Rachels father) reneges and forces Jacob to marry his older daughter Leah.
  - Ramayana: King Dasaratha's wife, Queen Kailkai saves his life/honor on the battlefield. As a token, he gives her a "free option" (i.e. "Ask anything and that will be yours"). She exercises the option many years later to banish her step-son Rama so that her son can ascend the throne

Derivatives Until Now

- In 1600 - 1700's
  - Royal Exchange In London where forward contracting was allowed
  - Forward trading of tulips in Denmark
  - Rice futures trading in Osaka, Japan
- In 1800's
  - Creation of CBOT/CME (actually CME's predecessor Chicago Produce Exchange)
  - Trading of Grain futures
  - Creation of synthetic loans using puts/calls
- In 1900's
  - Regulation of futures market
  - Development of current derivatives market (like what we know now)

See article by Don M Chance in book entitled "Essays In Derivatives (1998)" for a good reference to the history.

3. Examples of Disasters

Examples of 5 Big Disasters

- Societe Generale (2008)
  - Loss: Approximately 7.6 billion USD
  - Instruments traded: Equity Index futures
  - Reason: Fraud/manipulation of systems
  - Lead Cast: Jerome Kerviel
  - Supporting Cast: "Senior management" & other accomplices
  - Plot:
    - **Entered "offsetting" fictitious trades to ensure that real trades put on did not breach trading limits by manipulating systems/passwords**
    - **Late in 2007, had a profit of 55 million Euros on actual trades and was hoping to get a hoping bonus of 600K for 2007**
    - **Start of 2008, was up by about 1.5 billion Euros. For every 1% drop in equity indices, the bank would have lost 500 million Euros**
    - **Got caught when he did not put in a phantom trade as markets were dropping**

Examples of 5 Big Disasters – Cont'd

- Amranath Advisors (2006)
  - Loss: Approximately 7 billion USD
  - Instruments traded: Gas futures
  - Reason: Wrong Bets
  - Lead Cast: Brian Hunter
  - Supporting Cast: NA
  - Plot:
    - **Loss about 50 MM USD in a single week while working for Deutschebank trading gas contracts prior to Amranath**
    - **Was a star of Amranath making a lot of money taking right bets**
    - **Made 100MM USD in 2005**
    - **Amranath wanted higher returns on its fund. Since the other funds were not doing too well, it ploughed a lot of money into his strategy**
    - **Hunter betted in September 2006 that the March/April 2007 spread would widen taking an 8:1 leveraged bet which did not materialize unlike the previous year**
    - **Trying to set up another hedge fund**

Examples of 5 Big Disasters – Cont'd

- Long Term Capital Management (1998)
  - Loss: Approximately 4.6 billion USD
  - Instruments traded: Interest Rate/Equity/currency futures/options
  - Reason: Wrong Bets
  - Lead Cast: John Meriwether
  - Supporting Cast: Myron Scholes, Robert Merton
  - Plot:
    - **Initially made money on good trading ideas based on convergence.**
    - **Undeployed capital, series of bad months due to Asian flu crisis, imitators of strategies all led the fund to look for other trading strategies NOT related to core competence**
    - **Default on russian bonds acted as a catalyst for a chain of events leading to investors NOT being rational and all of them flying to the basic US treasuries - margin calls eventually killed LTCM**
    - **John Meriwether has since run 2 hedge funds all of them losing money**

Examples of 5 Big Disasters – Cont'd

- Sumitomo Corporation (1996)
  - Loss: Approximately 2.6 billion USD
  - Instruments traded: Copper futures
  - Reason: Wrong Bets, fraud
  - Lead Cast: Yasuo Hamanaka
  - Supporting Cast: NA
  - Plot:
    - **Controlled 5% of annual supply of global copper at peak**
    - **Unapproved trades over a 10-year period (when Yasuo started going long futures contract so as to sustain high prices)**
    - **Prices could not be sustained as supply of copper started increasing and prices started dropping**
    - **Funds crediting the company was what gave Yasuo away when no matching records could be found**

Examples of 5 Big Disasters – Cont'd

- Orange County (1994)
  - Loss: Approximately 1.7 billion USD
  - Instruments traded: Interest Rate derivatives
  - Reason: Wrong Bets
  - Lead Cast: Robert Citron
  - Supporting Cast: NA
  - Plot:
    - **Leveraging from 160% - 290% by using Treasuries as collaterals**
    - **Made money betting s/t rates remained lower than longer term rates until 1994 when Feds increased rates by rolling over positions to finance longer dated positions and purchasing notes.**
    - **As a consequence, losses started, margin calls came in – rollover stopped and notes went under the water**
    - **Orange County went bankrupt**
    - **1,000 hours of community service and a fine**

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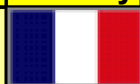
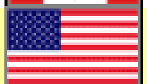
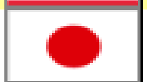
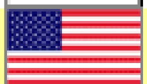
Top 10 Disasters

Number	Year	Amt (USD)	Country	Institution	Key Player	Instruments
1	2008	7.1		Societe Generale	Jerome Kerviel	Equity Index Futures
2	2006	6.5		Amaranth Advisors	Brian Hunter	Gas Futures
3	1998	4.6		Long Term Capital Mgmt	John Meriwether	Interest rate/equity/currency futures
4	1996	2.6		Sumitomo Corporation	Yasuo Hamanaka	Copper Futures
5	1994	1.7		Orange County	Robert Citron	Interest rate derivatives
6	2000	1.9		BAWAG	Wolfgang Flottl Helmut Elsner	Foreign Exchange Trading
7	1993	1.38		Metallgesellschaft	Heinz Schimmelbusch	Oil futures
8	1995	1.32		Barings Bank	Nick Leeson	Equity Index Futures
9	1995	1.1		Daiwa Bank	Toshihide Iguchi	Bonds
10	2007	0.82		West LB	Friedhelm Breuers	Common/Preferred Shares

Source: http://en.wikipedia.org/wiki/List_of_trading_losses

Are There No Insurance Companies?

- Confederation Life (Canada)
- General American (US)
- Cigna Re (US)
- American Skandia (US)
- Equitable Life (UK)

4. Keys To Avoiding Disasters

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Some Observations

- Compensation not reflective of risks taken
- Lack of independent checks
- Getting away on smaller violations undetected/unchecked often tempts traders to violate again
- Know what your models are doing and what drives the value of your trades
- Impact of margins/liquidity
- Too much freedom
- Lack of independent audits (or sophisticated auditors)
- M2M value does not mean much in the real world

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Some Parting Thoughts

- Compensation in line with profitability
- Independent Audits (Internal and External)
- Clear reporting lines
- Independent Validation of trades/risks from back office
- Enforce trading limits even when profitable
- Ensure that traders are rotated from desks
- Avoid key man risks
- Understand what limitations of models are
- Understand the impact of illiquidity/margin requirements