Protection Strategies: Analysis of their impacts on market stability

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Protection Strategies

- Types of Protection
- Analysis
- Commentary

Types of Protection - OBPI

- **Option Based Portfolio Insurance (OBPI)**
  - Protection through (put) options
  - Options can be traded on index or replicated dynamically
  - Fixed-term
  - Based on Black-Scholes option theory (replicating portfolio)

Types of Protection - CPPI

- **Constant Proportion Portfolio Insurance (CPPI)**
  - Time-invariant (perpetual)
  - Equity component is given by: Multiplier × (Asset Value – Floor)
  - Convert equities into cash as the “floor” is approached
  - Can be aggressively geared depending on the “multiplier” employed

Analysis - Considerations

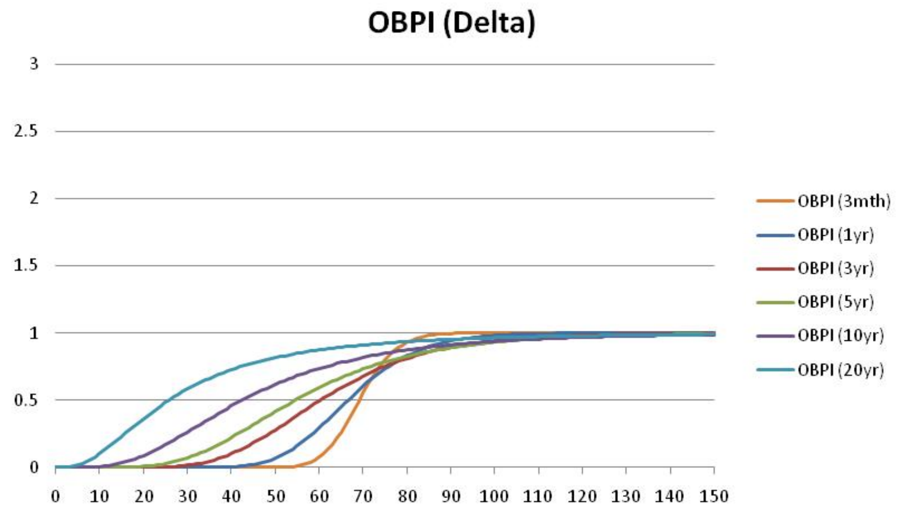
- Questions to consider:
  - What characteristics influence the behaviour of the strategy?
  - What is the equity exposure as the market moves (Delta)?
  - How quickly does the equity exposure change as the market moves (Gamma)?

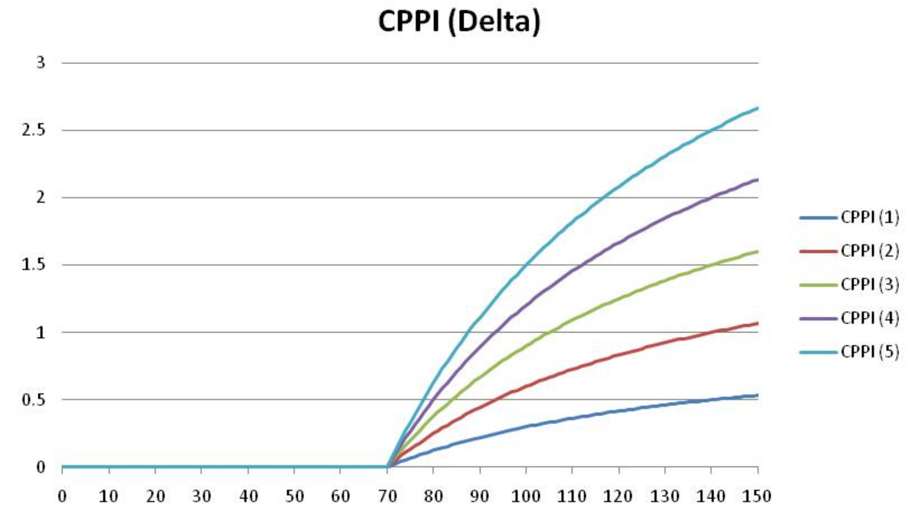
Analysis - Parameters

	Key Characteristic
OBPI	Tenor
CPPI	Multiplier

- Analysis parameters
  - Protection Floor of 70%
  - OBPI tenors ranging from 3mth to 20yr
  - CPPI multipliers ranging from 1 to 5

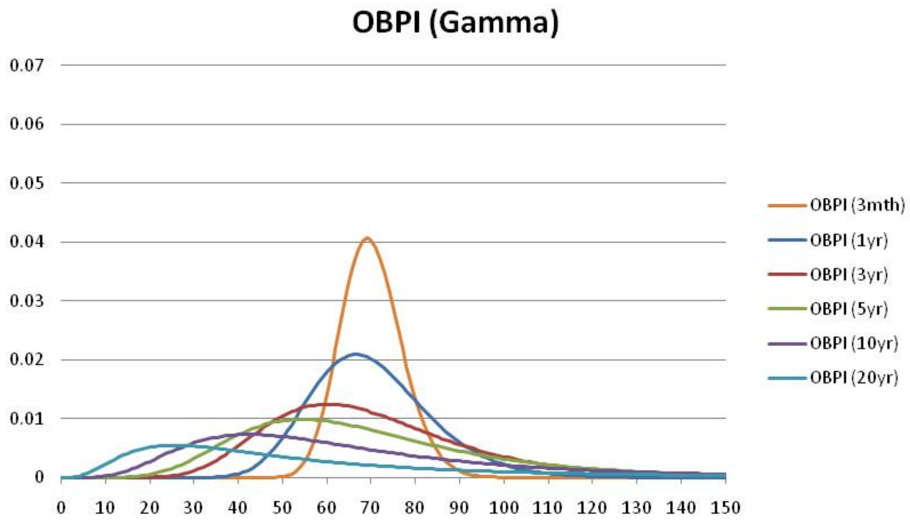
Portfolio Delta

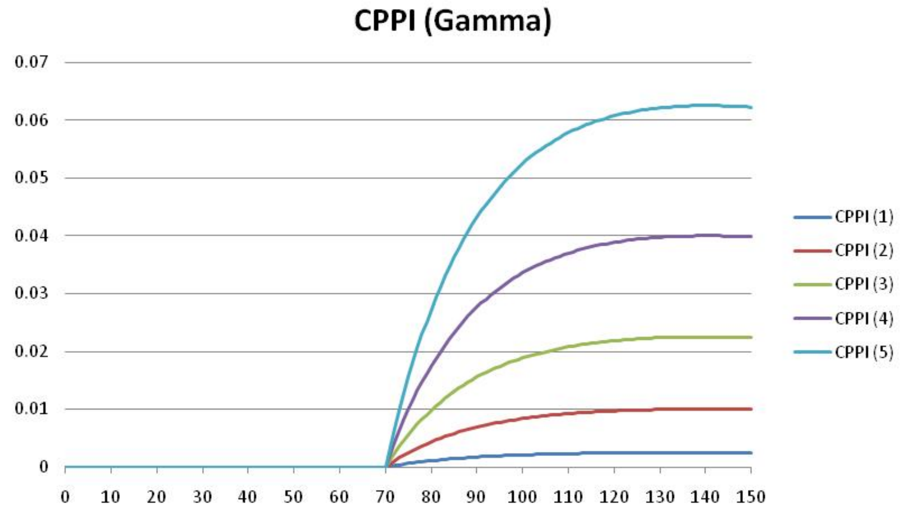




The leverage generated under CPPI as the multiplier increases is apparent

Portfolio Gamma





Under CPPI (5), if the initial equity investment drops by 10%, you would sell 50% of the equity position.

Commentary

- These structures (and many more) all exist in various guises in the market, e.g.
  - 10yr & 20yr OBPI is sold by life insurers as variable annuities
  - 1yr OBPI is offered with protected margin loans by retail banks
  - 3mth OBPI is implemented with option budgets by fund managers
  - Various CPPI strategies are offered by investment banks and/or fund managers

Key Observations

- Irrespective of how OBPI is implemented it is inevitably hedged in the market
- CPPI generates more selling pressure in a falling market due to the leverage
- It is debatable whether any of this selling pressure can have a significant effect on market behaviour and systemic risk

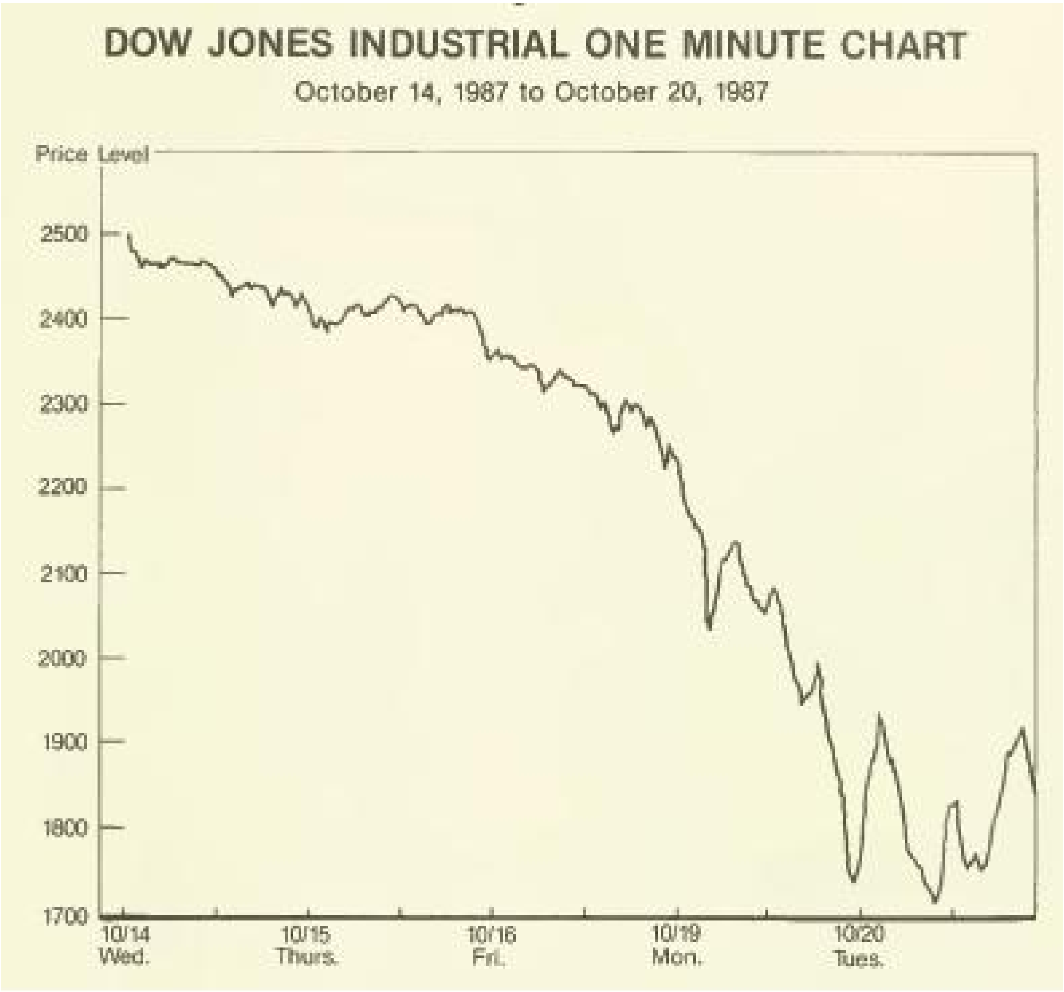
Impacts on the financial system

- Black Monday
- Global Financial Crisis
- 6th May 2010

Black Monday

- October 19th 1987
- Market fell for four straight days from the previous Wednesday
- Black Monday is remembered for the large intraday decline
- In fact it was Tuesday when the market bottomed and nearly failed

Black Monday



Source: Brady Report

Black Monday

1973	1976	1981	1982	1984-6	1987	1988
Black-Scholes model	L&R develop PI theory	LOR launch OBPI	SPI futures launch	OBPI moves to index futures	Market Crash	Brady Report
				LOR move towards CPPI		

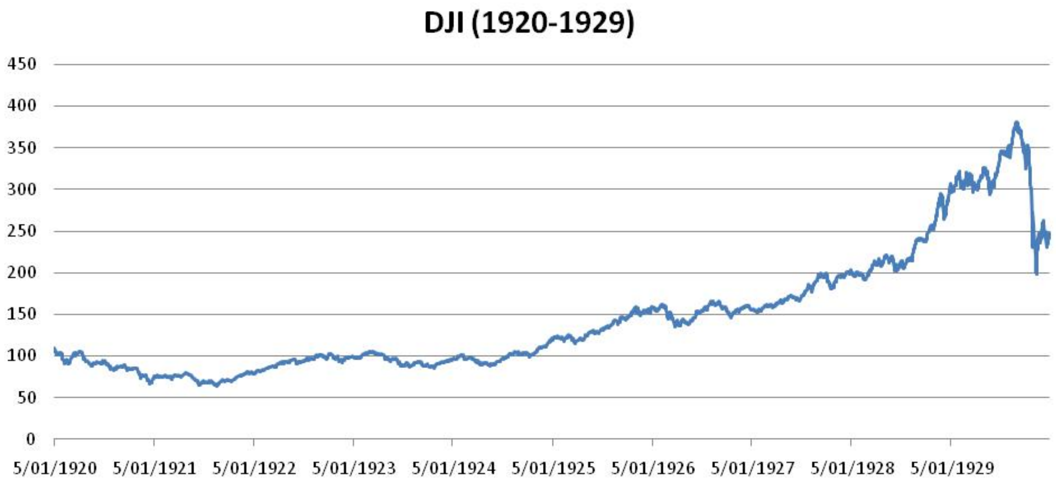
Black Monday

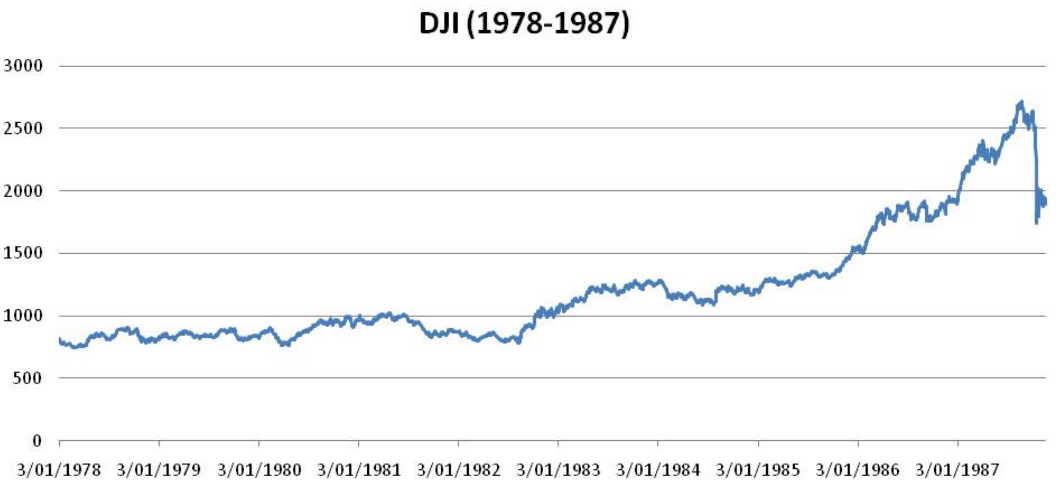
- Brady Report
  - Delivered to the US govt in Jan ’88
  - Findings
    a) Crash came on the back of a string of bad economic data
    b) PI accounted for approx 15%-30% of the futures volume traded intraday peaking at 80% at times
    c) Massive dislocation of stock and futures markets
    d) The fall in prices was stopped by the market! Eventually listed companies bought back their own stock at the deep discounts on offer

Black Monday

- Alternate analysis
  - Not surprisingly, L&R present a different story
    a) Markets worldwide crashed while PI was only implemented in the US
    b) Critical question is did those implementing PI sell more than they otherwise would have?
    c) If the market knew that selling was for PI, investors would buy the undervalued stock.
    d) PI volume did spike at times but prices were generally rising at those times

Black Monday

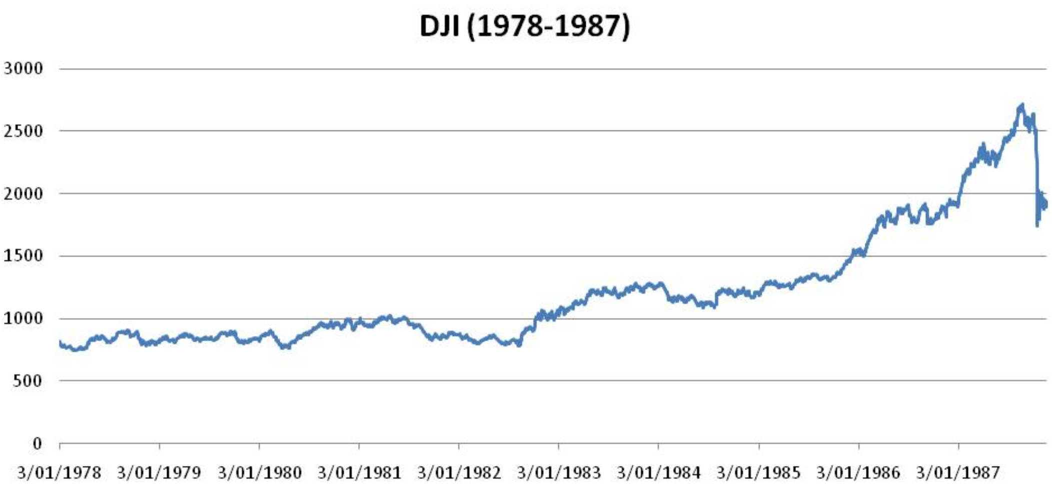




GFC

- Another market downturn
- Sustained negative daily returns did not trigger market failures
- Liquidity was maintained in equity markets throughout the crisis

GFC


DJI (1978-1987)
3000
2500
2000
1500
1000
500
0
3/01/1978
3/01/1979
3/01/1980
3/01/1981
3/01/1982
3/01/1983
3/01/1984
3/01/1985
3/01/1986
3/01/1987


DJI (2000-2009)
16000
14000
12000
10000
8000
6000
4000
2000
0
3/01/2000
3/01/2001
3/01/2002
3/01/2003
3/01/2004
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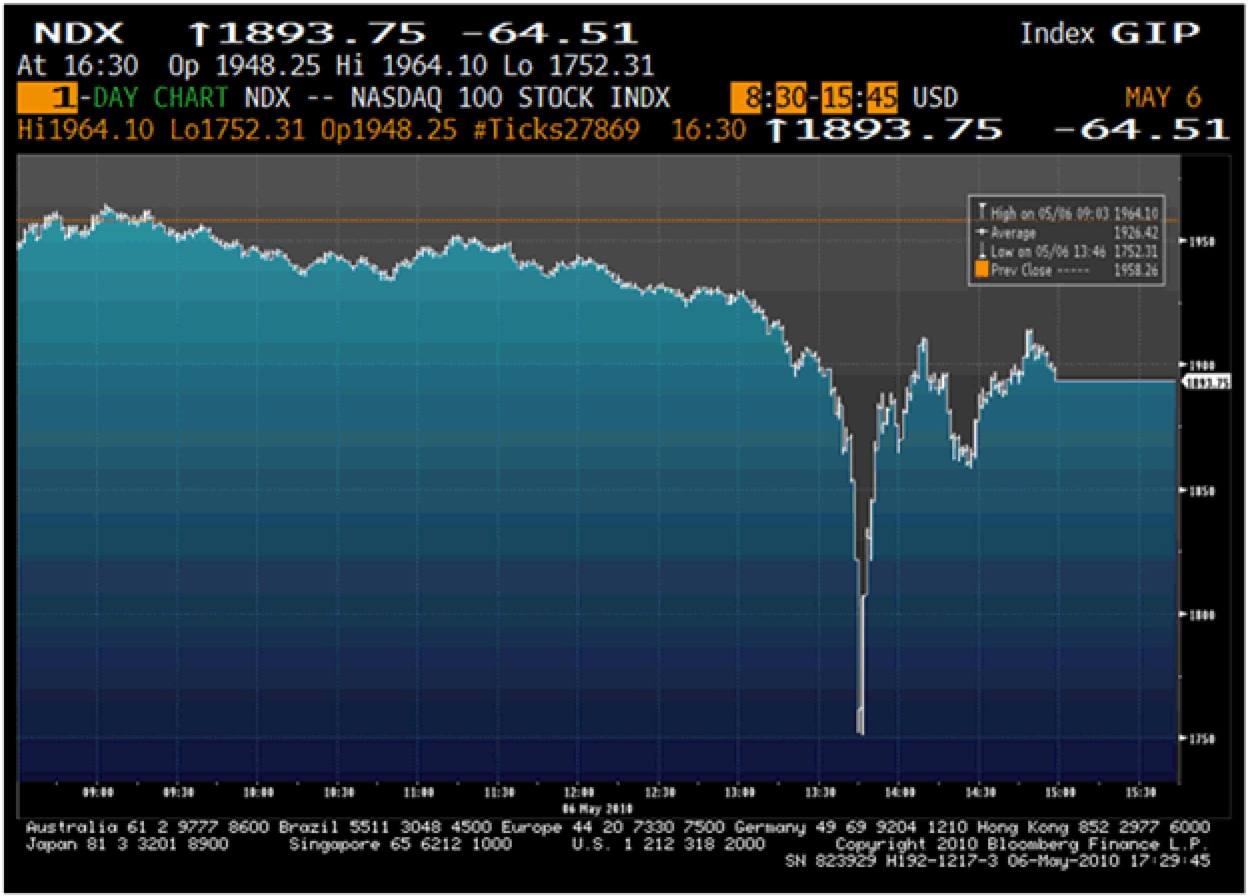
Last week's crash



Nasdaq Intra-day (6th May 2010) [*Source: Bloomberg*]

Rise of the machines?

- Theories abound as to the cause of the crash
  - Did algorithmic trading set the market off following trader error?
  - Was it caused by inconsistent circuit breakers (on P&G and 3M) between exchanges?
  - Was it market manipulation?
- Unlike 1987 the market almost instantly recovered…

Closing Thoughts…

- Equity is a risky investment
- Selling in a falling market is a common response and it is not the sole domain of protection strategies
- Behavioural finance supports momentum as a driver of market pricing
- Value investors proven their ability to outperform by seeking out oversold stocks and profiting from that research

Thank You

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