

**U.S. Subprime Crisis –
Causes and Consequences:
*OLD VODKA WITH A TWIST***

Dr Michael Lim Mah Hui

29 January 2008

ESS-ABS Executive Seminar
Singapore

1

Overview

- Section I - Overview of U.S. housing, subprime and related financial instruments
- Section II - Roots of Crisis - economic fundamental - loose monetary policies, global current account imbalance, wealth and income imbalance, financial imbalance. Institutional - financial practices
- Section III - Consequences
- Section IV - Quo Vadis

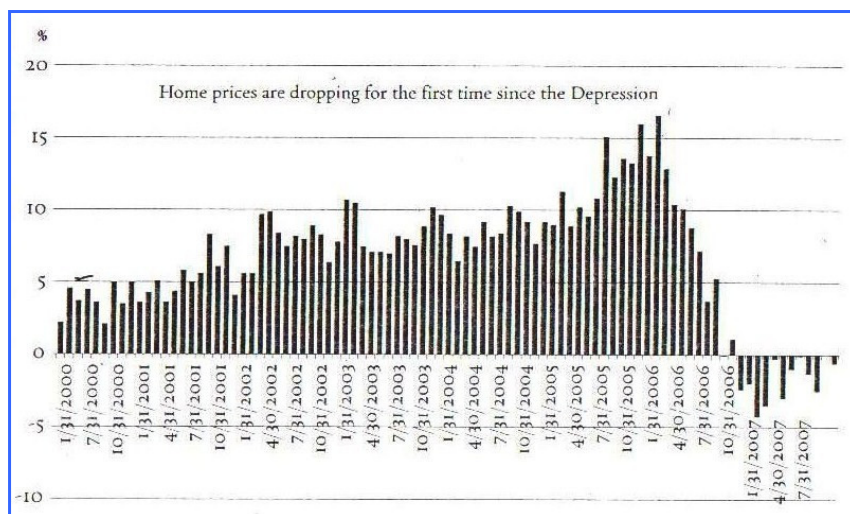
2

I – U.S. Housing Sector

- \$20 trillion industry in a \$13 trillion GDP.
- Household wealth \$45 trillion; MBS \$6.5 trillion.
- Housing mortgages \$10 trillion; Subprime mortgages \$2.5 trillion (25%).
- Median house price rose 40%(2000-06) to \$234,400.
- Ratio of median house price to median household income rose from 3x (1970-2000) to 5x (2006).

3

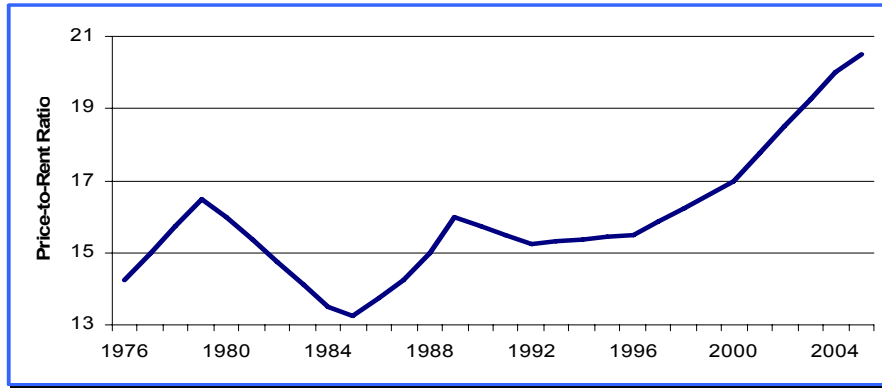
Figure 1
Property Prices



Source: Richard Duncan, Finance Asia, Sept. 2007

4

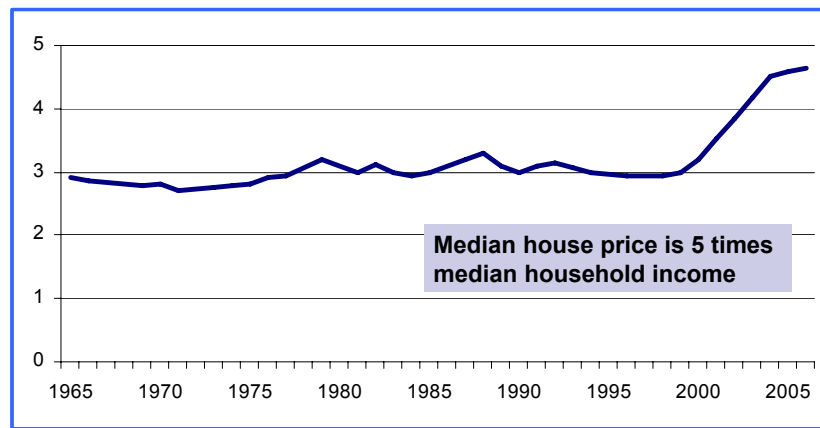
Figure 2
Housing Price-to-Rent Ratio



Source: D. Papadimitrius et. al. Strategic Analysis, Jan. 2006. Levy Economics, Institute of Bard College

5

Figure 3
Ratio of Median House Price to Median Household Income



Source: International Herald Tribune, Sept. 20, 1997

6

Housing Bubble Bursts

- House prices started declining in early 2006. Have fallen 10%-30%. Every 10% fall shaves off \$2 tr. from housing wealth.
- 2006 foreclosures 1.2m houses up 42%.
- 2007 expected foreclosures 2 m houses with losses of over \$100 bn; worse in 2008.
- If no mortgage equity withdrawal in 2005, real GDP growth wd be 0.2% instead of 3.5% (Calculated Risk research).

7

Subprime and MBS

- Subprime - housing loans to weak credit borrowers using teasers like introductory ARMs, low/zero down payment, loose documentation.
- \$1.5 trillion subprimes booked 2004-2006 when housing sector peaked and declined
- Mortgage back securities (MBS) - packing mortgages into a security and selling to investors.
- Originate and Distribution Model allowed:
 - More loans to be made;
 - Banks to transfer risks to other investors.

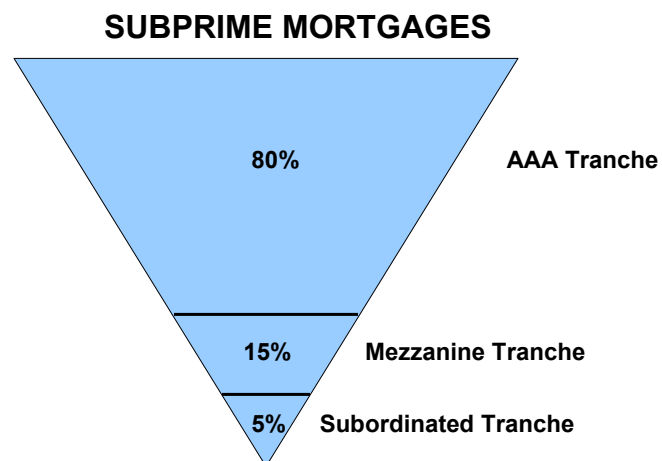
8

CDO Market

- Collateralized Debt Obligations - higher level of complication and leverage.
- CDO consists of package of ABS (asset backed securities) arranged in different tranches with different credit ratings, returns, and payment priority.
- Investors choose which tranche to invest according to risk appetite.
- Often funding mismatch; cross-selling CDOs
- CDO of CDS; CDO squared; CDO cube.

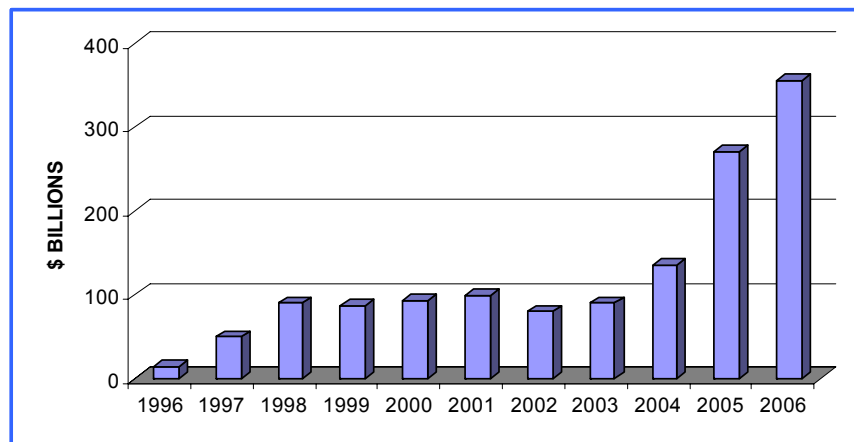
9

Typical CDO



10

Figure 5 Growth in CDO Issuance/Milestones



Source: Presentation on Subprime to ADB by Credit Mortgage Group of TCW Inc., Sept. 2007

11

Crisis Spreads to CDO

- Volume of CDO rose from:
 - 2000 - \$ 90 billion;
 - 2004 - \$125 billion;
 - 2006 - \$350 billion.
- Distributed world-wide - banks in Germany; Bank of China \$9 bn; Australian town councils.
- When lower tranche gets hit, holders of upper tranches panic and head for exit.
- Investors no longer want to fund CDOs.
- Estimated losses fr subprimes >\$200bn vs \$28bn provided by banks initially, \$100bn later.

12

Conduits and SIVs

- Conduits are SPVs set up by banks to hold long term assets (such as CDOs) and funded by short term borrowings like commercial paper - Funding Mismatch.
- Off balance sheet vehicle to avoid capital adequacy requirements.
- Yet banks provide back-up credit lines to conduits.
- Risks exit front door and enter back door.
- Banks forced to put back SIVs on balance sheet.
- Top 21 Eurozone banks E244bn back on B/S.

13

Credit Crunch Spreads to Conduits

- Estimated \$3 trillion of commercial paper world wide with \$1.1 tr back-up credit lines to conduits.
- \$350 billion C.P. due for refinancing.
- C.P. market freezes up; banks scrambling for cash to meet obligations.
- Libor shot up to 5.75% in Sept. despite ECB pumping in Euro 35 billion; Oct. Libor gyrated; in Dec. five central banks coordinated liquidity pumping, calmed the money market.
- Now bond insurers affected. Top 7 monolines guarantee \$ 4 trillion securities. Some downgraded. Banks asked to help recapitalize.

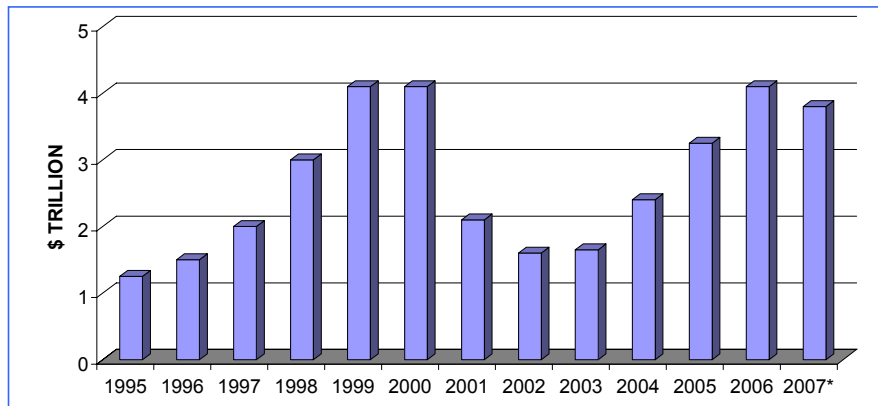
14

LBOs

- Leverage Buy Out - private equity fund often borrow to buy out companies; load them with debt; restructure; pump out cash through dividends.
- Unregulated; no disclosure; set up in tax havens.
- Private equity raised over \$1 trillion (2004-2007).
- LBO deals totaled \$13.5 trillion (2003-07).
- Examples: \$49 bn BCE; \$32 bn TXU; \$26 bn First Data.

15

Figure 6
Global M&A dollar volume,
adjusted for inflation



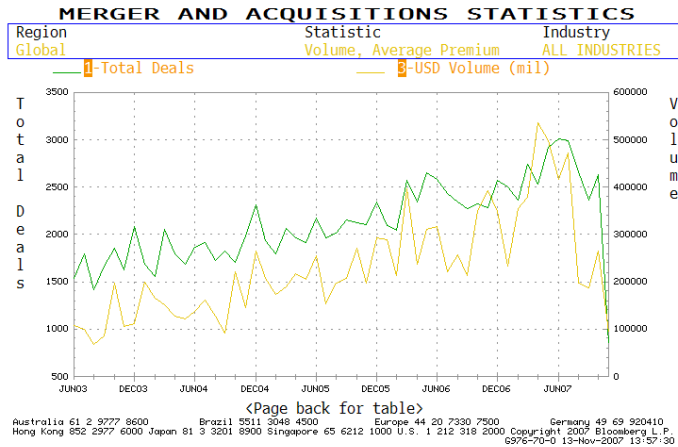
Source: Asia Wall Sheet Journal, Sept. 7-9, 2007

16

Merger & Acquisition Statistics

<HELP> for explanation.

EquityMA



17

LBO – contd.

- Private equity usually puts in 20%-30% equity; rest borrowed – OPM.
- Banks provide bridge loans.
- Lax credit criteria:
 - Covenant-lite loans;
 - Payment in kind;
 - You snooze you loose clause.
- Leverage pushed from 4.8x to 7.0x; some to 15x.
- Debt servicing capacity dropped from 3.4x to 1.8x.

18

LBO – contd.

- LBO market plunged after July 2007:
 - April 2007 - \$695 bn;
 - July 2007 - \$579 bn;
 - August 2007 - \$222 bn;
 - November 2007 - \$100+bn
- Banks stuck with \$300 bn bridge loans; in Sept. some deals sold at 4% discount.
- High possibility of defaults due to high leverage.
- Distressed LBOs of early 2000s recovery rate of 75%.

19

Financial Innovations – Summary

- Securitization “originate and distribute” model:
 - Banks transfer risks to other investors;
 - Increase volume of loans and credit;
 - Higher leverage and risk taking;
 - Closer links between financial products;
 - Often risks enter through back door;
 - Replace personal credit evaluation with statistical evaluation.
- Classic financial strategies to enhance profits:
 - Funding mismatch;
 - High leverage through derivatives.

20

Model of Financial Instability

- Minsky 3 types of financing.
- Hedging - cashflow exceeds principal + interest (P+I) payments.
- Speculative - cashflow meets I, not P.
- Ponzi - cashflow does not meet even I. Payment from further borrowing. P increasing.
- Mixture determines level of financial instability.
- Financial innovation push to Ponzi financing.
- Reduced margin of safety.

21

II – What Caused the Bubble? Fundamental – Structural

- Excess liquidity - result of:
 - Central banks loose monetary policies;
 - Current A/C Imbal - sovereign\$, petro\$;
 - Financial Imbalance - liquidity pyramid.
- Result in financial asset inflation - too much money chasing after too few investment opportunities.

22

Institutional – financial deregulation and innovations

- Hubris
- Financial Innovations - to enhance yields
- O&D model (originate & distribute)
- Funding Mismatch, increased leverage thru derivatives (old vodka with a twist)

23

Hubris – human foible

- “Success breeds a disregard of possibility of failure..As previous financial crisis recedes in time, bankers, regulators, businessmen and even economists believe a new era has arrived” Minsky, 1986.
- “As with current subprime saga, past upheavals are typically preceded by talk of new paradigm, perfect models, fail-safe strategies - a this time its different attitude” (Bus Week, Sept 3, 2007).

24

Hubris

- D. Rubenstein of Carlyle Group: “I don’t think it’s a bubble..what’s happening now is a new investment technique .. Private equity that adds value”.
- J Anderson of Countrywide: “We have a wealth of information we didn’t have before. We understand the data and can price the risk”.
- A. Greenspan extolled new fin innovations said “dispersion of risk to those willing and able to bear..Prevents cascading failures”.

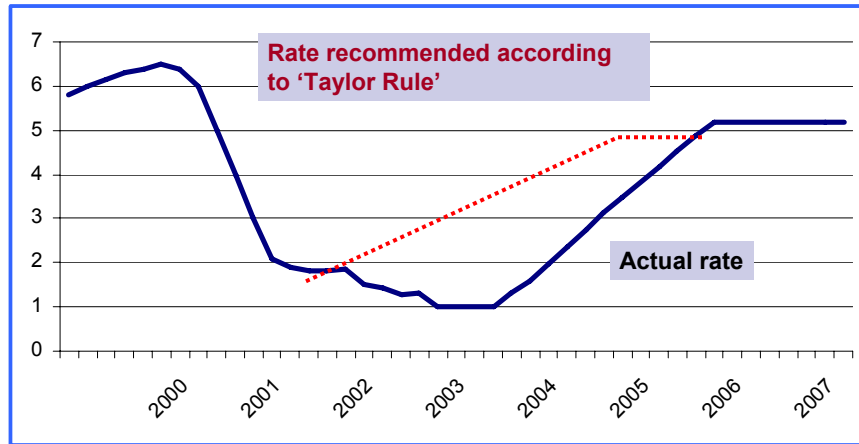
25

Loose Monetary Policies

- World-wide loose monetary policies. Evidenced in historically low risk premium. 2001-2005, junk bond yield dropped fr 9.3% to 4% above 10yTB.
- In U.S. Prof Taylor blamed loose monetary policy of Fed btw 2002-2004. Fed pushed int rate to 1% in 2003 and raised it slowly.
- Similarly in U.K. loose monetary policy egged on housing boom. U.K. consumer debt 166% of gross disposable income vs 127% in U.S. Average home price \$370,000 - 11x avg salary.

26

Figure 7 US Interest Rates



Source: Financial Times, Sept. 12, 2007

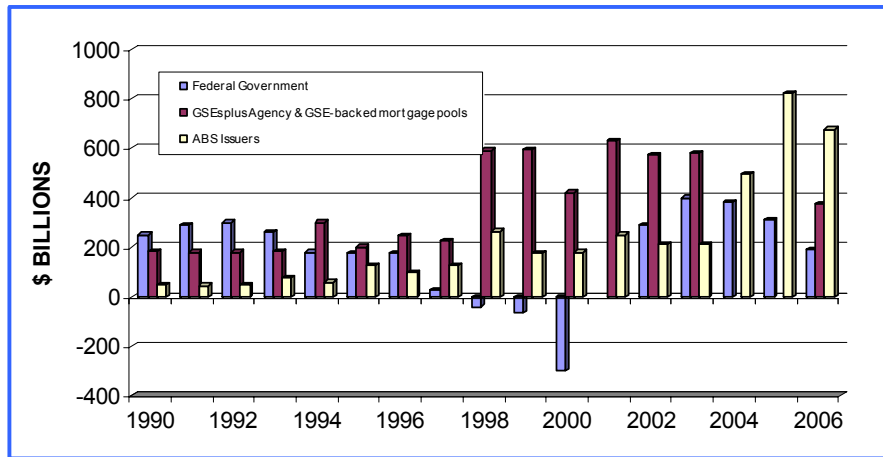
27

Global Current A/C Imbalance

- Sovereign wealth - 10 Asian countries hold \$3.4 trillion (59%) of world's foreign reserves; Petro\$ \$3.4 trillion.
- Foreigners hold \$2.2 trillion (44%) of U.S. \$5 trillion public debt.
- Foreign reserves and other sources of funds funded the property boom.
- Btw 2002-2005, as issuance of federal and fed agencies debt declined, private sector ABS issuance rose 4x fr \$213bn to \$825bn.

28

Figure 8
Who Issued the Debt?



Source: R.Duncan, Finance Asia, Sept. 2007

29

Wealth & Income Imbalance

- Excess savings in EMCs blamed for global imbalance.
- Excess savings and under consumption - two sides of the same coin.
- Present growth pattern accompanied by increasing wealth and income inequality in China, in U.S. and globally.

30

Wealth & Income Imbalance – contd.

- In U.S. 1970-2006, share of GDP to labor down from 60% to 56%; share of GDP to capital up from 27% to 43%.
- In China, 1998-2005, share of GDP to labor fell from 53% to 41%.
- Greenspan puzzled by why labor not getting fair share of growth and worried about political effects.

31

Income Inequality

- Under Bush tax cuts, 400 tax payers with highest income (minimum of \$87m in 2000) paid same percentage of taxes as proportion of income as people earning \$50k - \$75k.
- Avg Wall Street employee \$435,084 per year vs \$40,368 for private sector - 10x.
- Annual compensation of CEOs of top Wall Street banks >\$40mn- 1000x.

32

Income Inequality

- Total earnings of top 25 hedge fund managers in 2006, \$14bn, avg is \$570 m, with top 3 earning >\$1bn. 6 of them produce returns in single digits.
- Inequality a result of political process not a deus ex machina.
- In the U.S. Reagan broke the back of trade unionism and renegotiated national accord between labor and capital. Tax cuts favored the wealthy.
- In China, policies biased against rural sector.

33

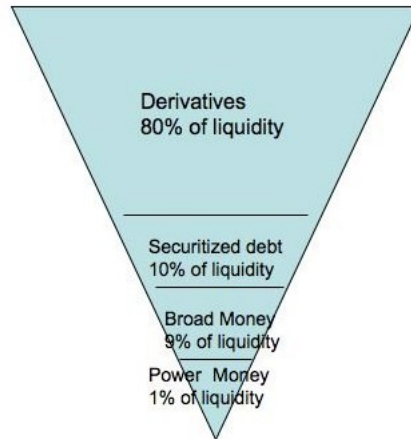
Sectoral Imbalance btw Financial and Real Economy

- Global financial assets = world GDP in 1980. Today it is 316% of world GDP.
- Volume of traditional FX trades and derivatives is \$5 trillion per day vs total world trade of \$12 trillion per year.
- Derivatives and securitized liquidity have overshadowed traditional money supply liquidity.
- New monetarism and inverted liquidity pyramid.

34

Finance – Tail Wagging the Dog

- Inverted Liquidity Pyramid - \$607 trillion - 13 x world GDP



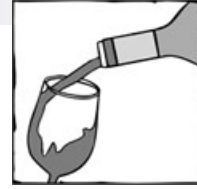
35

Financial Innovations & Strategies – End of Fin History?

- Result in financial asset inflation - too much money chasing after too few investment opportunities ==> technological and financial innovations.
- Deregulation and dismantling of Glass-Steagall Act began with Reagan and culminated under Clinton in 1999.
- Commercial banks also became investment banks take on more risks. NII dropped; non int inc rose.
- Eighties - securitization started - O&D model - ABS, CDO, CDO2, CDS etc.

36

Old Vodka with a Twist



- Despite all financial innovations, still the same strategies of speculative and Ponzi financing.
- Increase leverage through derivatives.
- Funding mismatch are repeated in S&L crisis of 80s, Asian financial crisis of 90s and present financial crisis.
- Hangover is stronger.

37

III – Consequences

- Are Risks Reduced or Heightened?
- Advocates like Greenspan believe financial innovations have transformed risk terrain through dispersion and reduction.
- Warrant Buffet calls them financial weapons of mass destruction.
- Estimated costs from \$200 bn to \$2 trillion.
- Risks heightened thru increased leverage & volatility; lack of transparency; de-leveraging.

38

Risks – contd.

- Risks broadened beyond banks ==> lack of transparency, liquidity/confidence crisis:
 - Risks transfers initially reduce banking risk but what goes out creeps in through back door;
 - Off balance sheet and tax havens to beat regulators;
 - Risk dispersion decreases transparency (don't know who is naked until tide recedes) ==> confidence crisis;
 - Traditional credit evaluation of personal credit history replaced by impersonal mathematical models;
 - If risks dissociated from ownership, credit sense disappears.

39

Risks – contd.

- Market and credit risks unbundled and sold but liquidity risks enhanced.
- Liquidity risks is behavioral, confidence crisis and hardest to measure and price. Prone to irrationality and herd mentality as in the collapse of CDO asset prices.

40

Moral Hazard

- Evidence of repeated intervention by governments to clean up mess caused by private and market failures - S&L, Asian financial crisis, Long Term Capital Mgt. embolden market players.
- Moral hazard - result of asymmetric expectations when market expects central banks to bail out particular institution or whole financial sector during crisis. Costs laid on tax payers.
- Moral hazard - privatization of gains and socialization of risks - a form of externality.

41

IV – Quo Vadis

- Sept 18 2007 - Fed cut interest rate 0.5% Markets initially cheered; then roller coast.
- ADB President said it would stabilize market.
- Others more cautious, warn of rolling bubbles.
- Oct 31 - 0.25%; Dec 11 - 0.25%; Jan 21 - 0.75%; Total - 1.75% to 3.5%. Equity markets even more volatile.
- Credit Crunch and risk repricing starting with money market and rippling out.

42

Quo Vadis – contd.

- Rolling Bubble - Equity; CDS and monolines, Credit and Auto Loans, LBO.
- Every 10% fall in U.S. house price shaves off \$2 trillion household wealth; 70% of GDP powered by consumption.
- Simulation in mid'06- 15% drop in house price imply \$80bn fall in consumption.
- Disinflation ends - wages rise, cheap goods from China and India dry up, oil and food prices climb.
- Yield curve steepens - good for banks, not for borrowers. Lower rates may not benefit debtors.
- Stagflation - stagnant growth + inflation.

43

Conclusions – The Perfect Financial Storm

- Instead of end of financial history, we see repeat of and higher degree financial instability.
- Financial instability quantum leap with derivatives and leveraging.
- Mixture of human foibles - hubris, greed and herd instincts - and structural imbalances and financial innovations have heightened and broaden financial risks.
- Despite financial innovations, we see repeat of same financial strategies - leveraging and funding mismatch that resulted in S&L, Asian financial and now subprime crisis.

44

Lessons Learnt?

- Cutting interest rates postpone pain and repeats the same process down the road.
- Financial innovation one step ahead of regulations.
- Cannot depend on players to self regulate as the imperative is maximize shareholders value. Compensation is tied to that.
- No substitute for prudent lending, credit due diligence. If dissociate risks from ownership, credit standards goes down the tube.

45

Thank You!

46