

Morgan Stanley

Insurance Seminar

April 2009

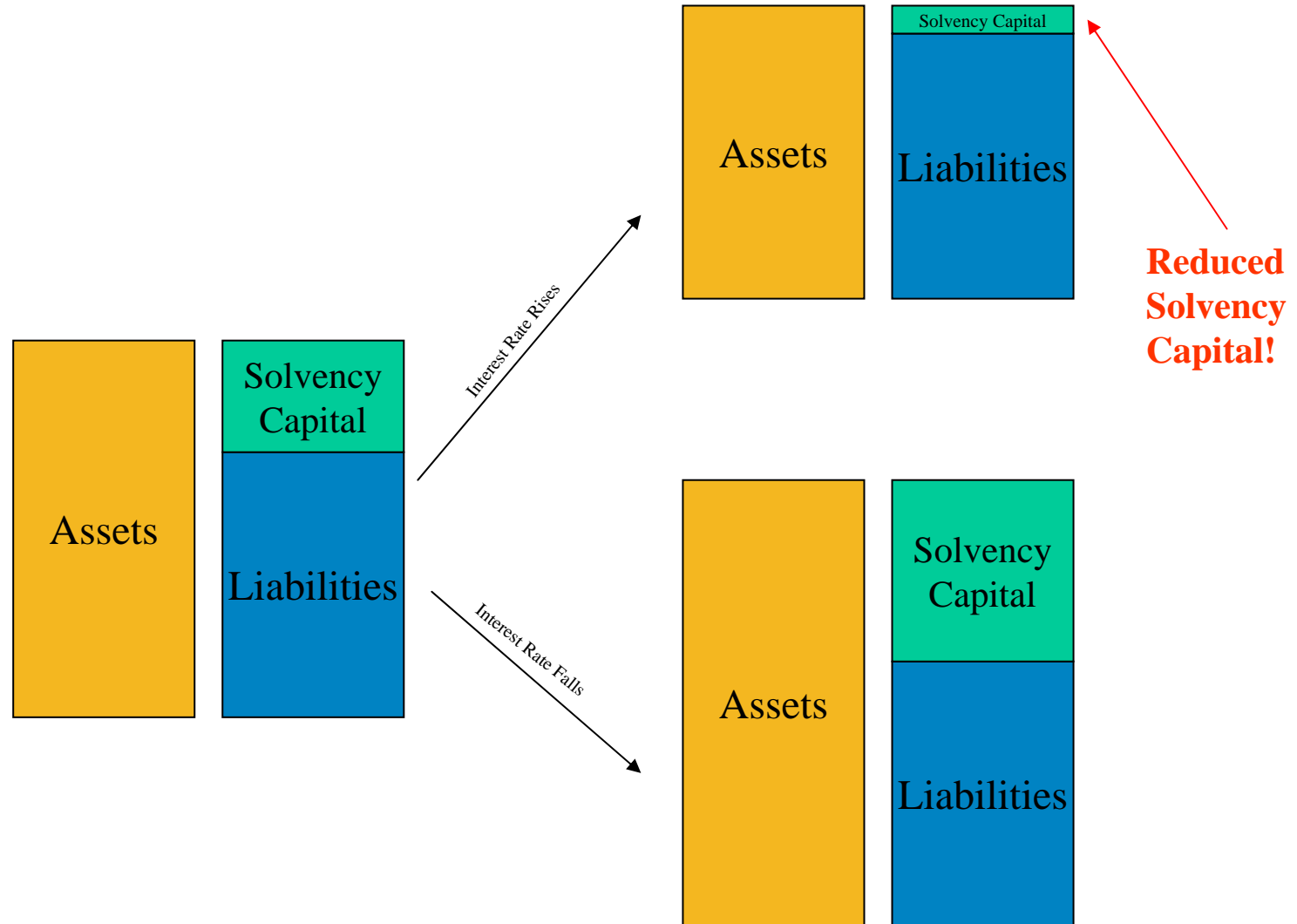
Section 1

Interest Rate Risk Management

Potential Duration Mismatch

Risk of a Worsened Solvency Capital Position on Rising Interest Rate

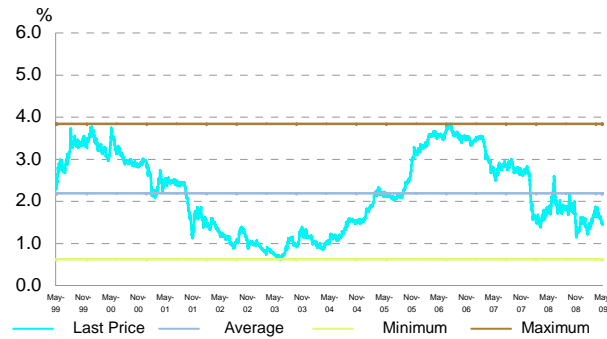
- For some non-life insurers and reinsurers, assets may have longer duration than liabilities
 - This can be caused by certain liabilities not allowed to be discounted (zero duration) and investments in corporate bonds (non-zero duration)
- Solvency position for these companies will be weakened if interest rate rises



Historical SGD interest rate

- Interest rates are at (or near) historical low in many countries

1-Year SGD Swap Rate



Source Bloomberg

2-Year SGD Swap Rate



Source Bloomberg

3-Year SGD Swap Rate



Source Bloomberg

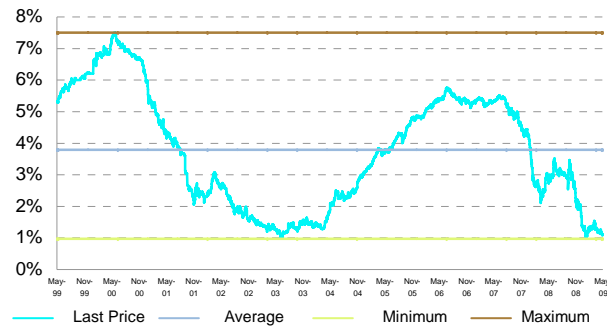
5-Year SGD Swap Rate



Source Bloomberg

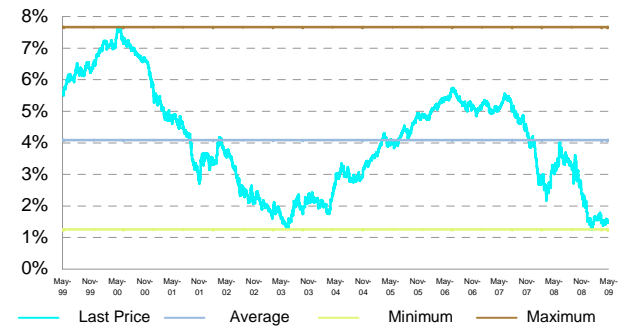
Historical USD interest rate

1-Year USD Swap Rate



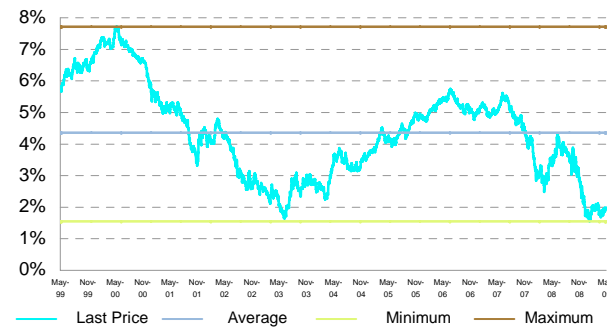
Source Bloomberg

2-Year USD Swap Rate



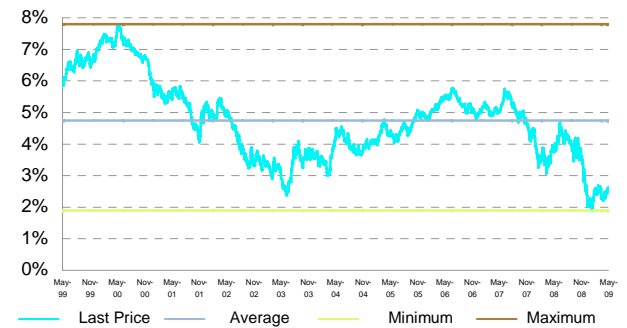
Source Bloomberg

3-Year USD Swap Rate



Source Bloomberg

5-Year USD Swap Rate



Source Bloomberg

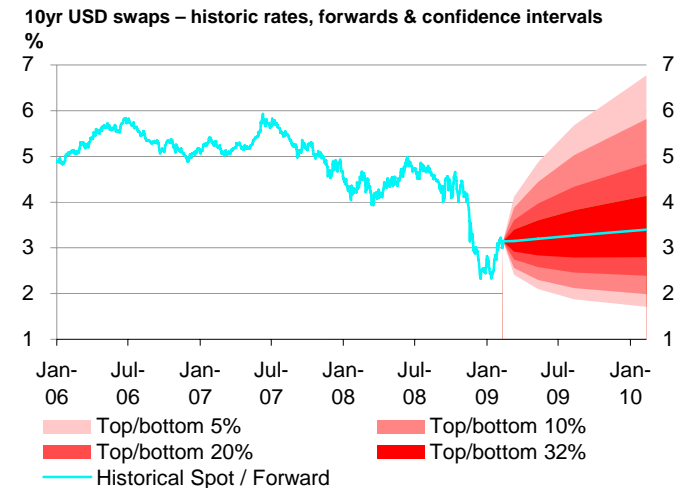
Time to Hedge the Risk of Rising Interest Rate

Good Opportunity to lock in historically low rates

- In the current volatile, low-interest rate environment, the arguments for hedging against risks of interest rate increases are substantial

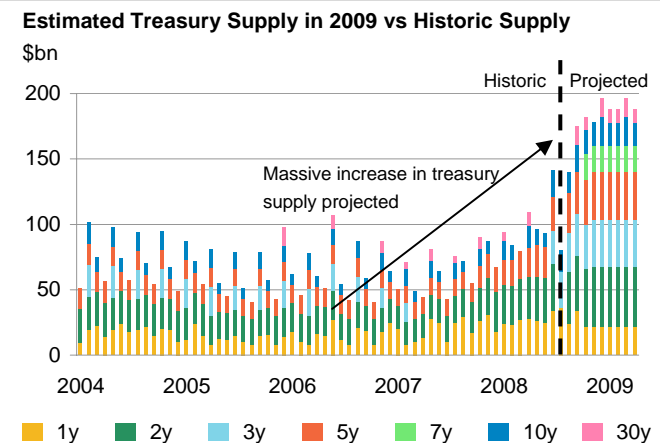
1) Rates are historically low, with the risks skewed towards higher rates in the future

- There is an **asymmetric risk** in the future movements of interest rates. Given the current level of the short term rate, there is limited scope for rates to fall, but substantial room for rates to rise higher



2) External factors may put upward pressure on rates





- Massive Fiscal and Monetary Stimulus:** Over time, aggressive fiscal stimulus, large capital injections, and bank liability guarantees should help stabilize the overall economy, paving the way for the Fed to raise rates
- Quantitative Easing:** Aggressive QE on the part of the Fed should eventually lead to an expansion of bank credit which will go a long way toward addressing deflation risks
- Treasury Supply:** Stimulus programs will be funded by increased Treasury issuance. This could eventually help to put significant upward pressure on Treasury yields once flight to quality flows begin to dissipate



Sources Bloomberg, Morgan Stanley

Not Hedging Is Implicitly Taking a View on Rates

- A common complaint about hedging is that it requires the insurers to take a view on rates – in this case a view that future rates will be higher than current rates
- However, insurers who don't hedge against risk of interest rate rising is by default taking the opposite view – that rates will be lower in the future

Hedge		
		
No Hedge	Interest Rate Rises	Interest Rate Falls

Interest Rate Swap

To hedge against rising interest rate

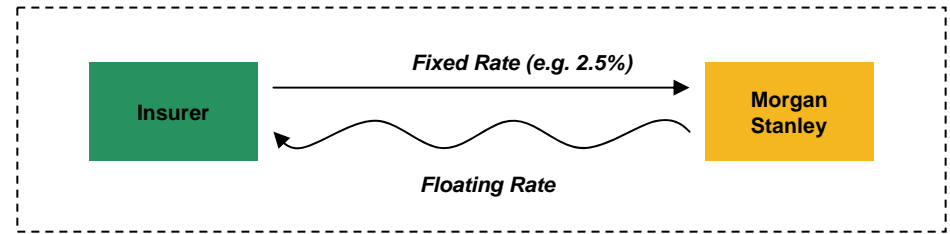
- Entering into a pay fixed interest rate swap is one way to hedge against risk of interest rate increases
 - If interest rate rises/falls, the value of fixed rate bonds will fall/increase, but the value of the swap will increase/fall
- **No** upfront cost is required to enter into an on-market interest rate swap

At Inception

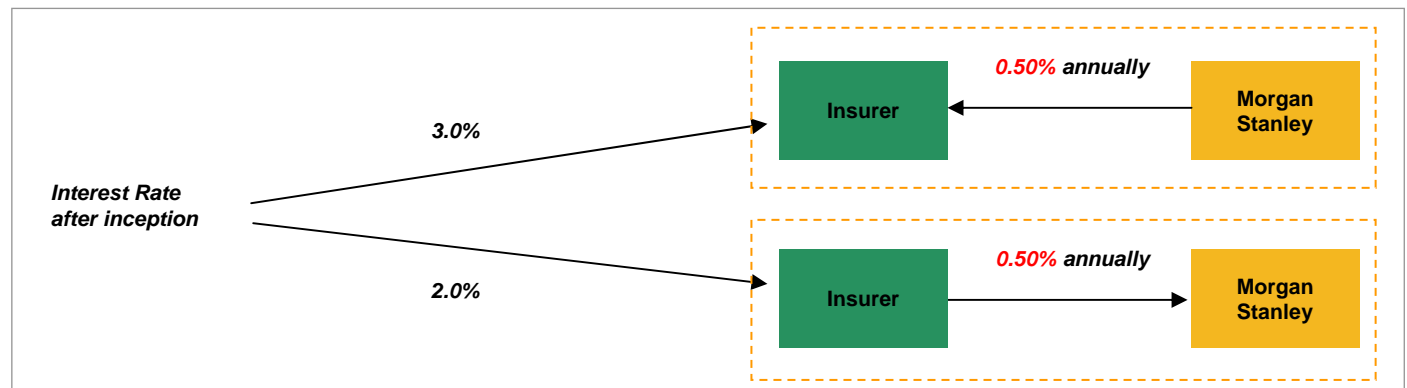
Illustration of Mechanics

Assumption:

- Assets is a 5-year fixed rate bond
- Liabilities have zero duration
- 5 year swap rate is 2.5%



Subsequent to Inception



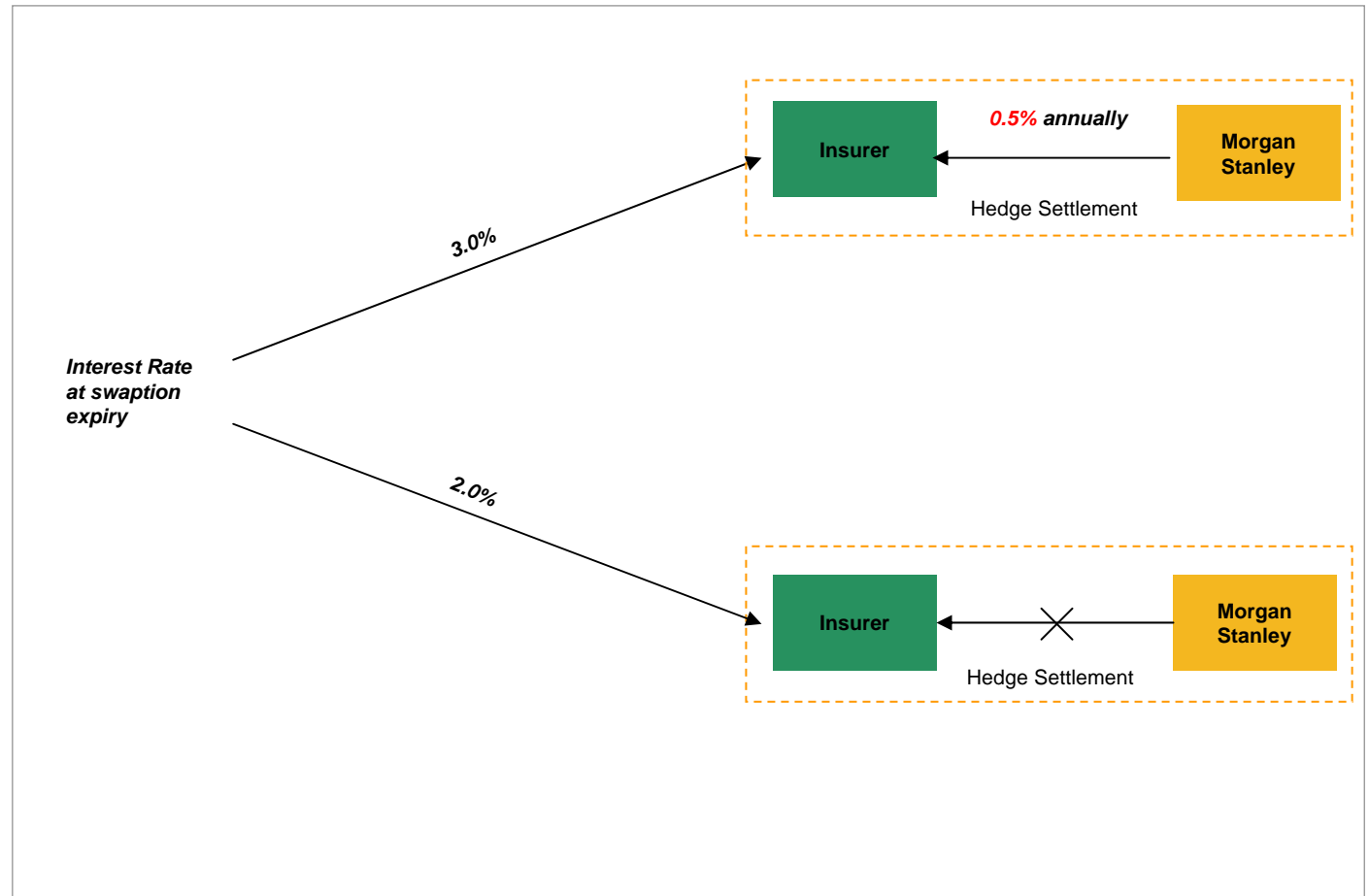
Notes

1. Assuming a flat yield curve for illustration purposes

Hedging Asymmetrical Risk with Payer Swaptions

- An option on pay-fixed interest rate swaps, or a *payer swaption*, can be used to hedge against rising interest rate rises while keeping up upside potential (if interest rate falls)
- Hedge:
 - The option (but not the obligation) to pay a fixed rate of 2.5% and pay floating rate for 5 years after 1
- Result:
 - Risk of interest rate rises is hedged, while keeping upside potential if interest rate falls
- Swaptions will require the payment of a premium

Hedging with a Payer Swaption



Notes

1. For illustration purposes we assume a flat yield curve

Case Study : Allstate's Risk Management Strategy

- In its 2007 annual report, Allstate Insurance Company states that
 - its asset duration is larger than its liability duration; and
 - how it uses interest rate swaptions to protect itself against the risk of upward interest rate move.

risk analysis

- *We manage the interest rate risk in our assets relative to the interest rate risk in our liabilities. One of the measures used to quantify this exposure is duration. Duration measures the price sensitivity of the assets and liabilities to changes in interest rates ...*
- *At December 31, 2007, the difference between our asset and liability duration was approximately 0.39...*
- *A positive duration gap indicates that the fair value of our assets is more sensitive to interest rate movements than the fair value of our liabilities.*
- *... To achieve this objective and limit interest rate risk for Allstate Financial, we adhere to a philosophy of managing the duration of assets and related liabilities within predetermined tolerance levels. This philosophy is executed using interest rate swaps, futures, forwards, caps, floors and swaptions to reduce the interest rate risk resulting from mismatches between existing assets and liabilities, and financial futures and other derivative instruments to hedge the interest rate risk of anticipated purchases and sales of investments and product sales to customers.*
- *Based upon the information and assumptions used in the duration calculation, and interest rates in effect at December 31, 2007, we estimate that a 100 basis point immediate, parallel increase in interest rates ("rate shock") would decrease the net fair value of the assets and liabilities by approximately \$1.51 billion...*

risk management strategy

- *uses interest rate swaptions to manage the risk of a large rate increase. In calculating the impact of a 100 basis point increase on the swaption value, we have assumed interest rate volatility remains constant. Based on the short futures and swaption contracts in place at December 31, 2007, we would recognize realized capital gains totaling \$361 million in the event of a 100 basis point immediate, parallel interest rate increase and \$195 million in realized capital losses in the event of a 100 basis point immediate, parallel interest rate decrease.*

Source Allstate Corporation 2007 Annual Report

Section 2

FX Risk Management

Illustration of Exposure

- FX exposure arises when there's a mismatch between assets and liabilities

Balance Sheet Illustrations

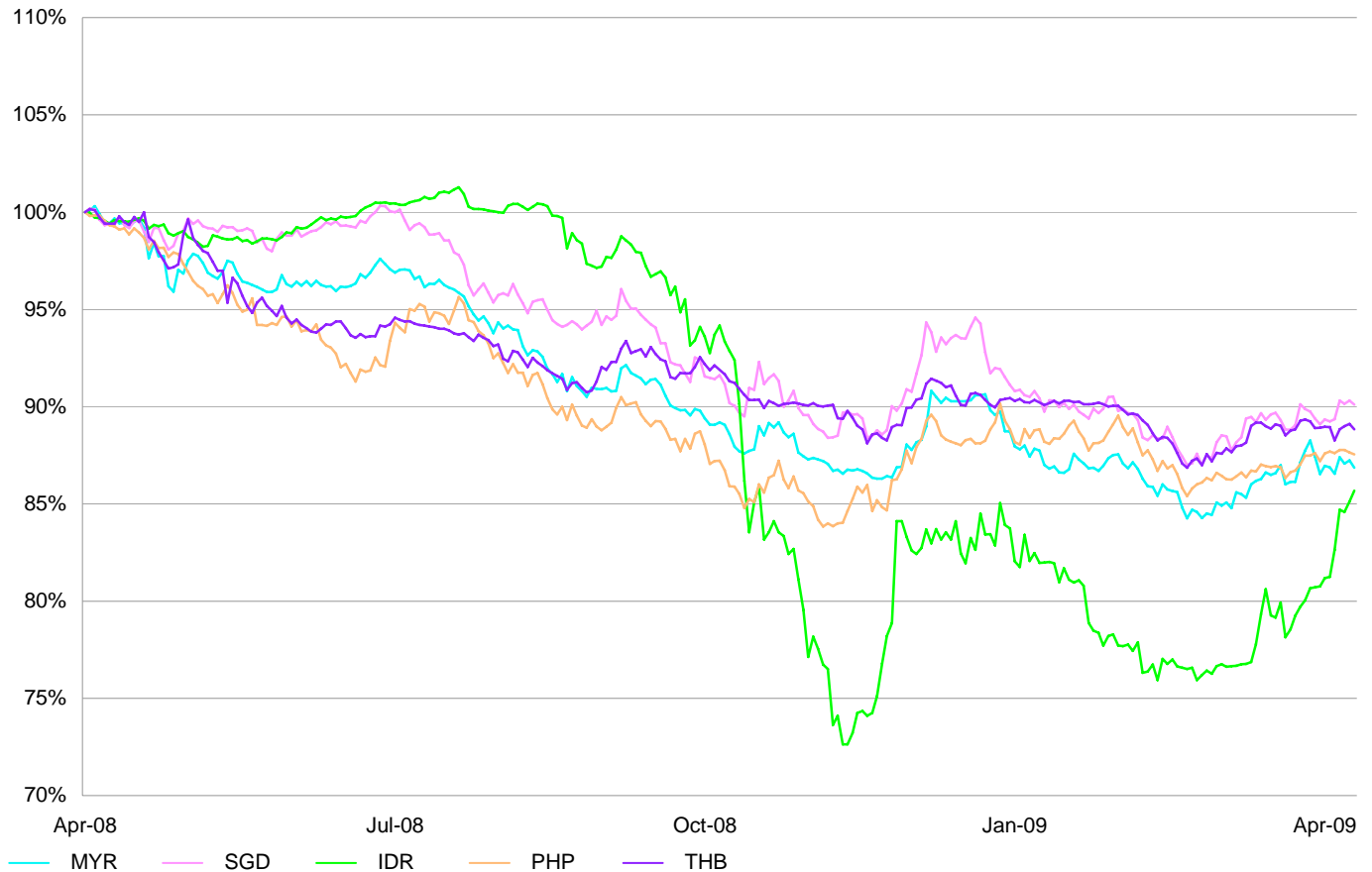


Unprecedented Volatility in the FX Market

- Since the start of the financial crisis, we have witnessed unprecedented volatility in the FX market
- In addition to the absolute movements, we are also seeing an increasing correlation between emerging market currencies
 - Investor sentiment took over country fundamentals and became the key driver for EM currencies
- In the last 12 months, all SEA currencies have weakened against the USD significantly, reflecting a capital outflow from emerging markets

Performance of SEA Currencies

LTM

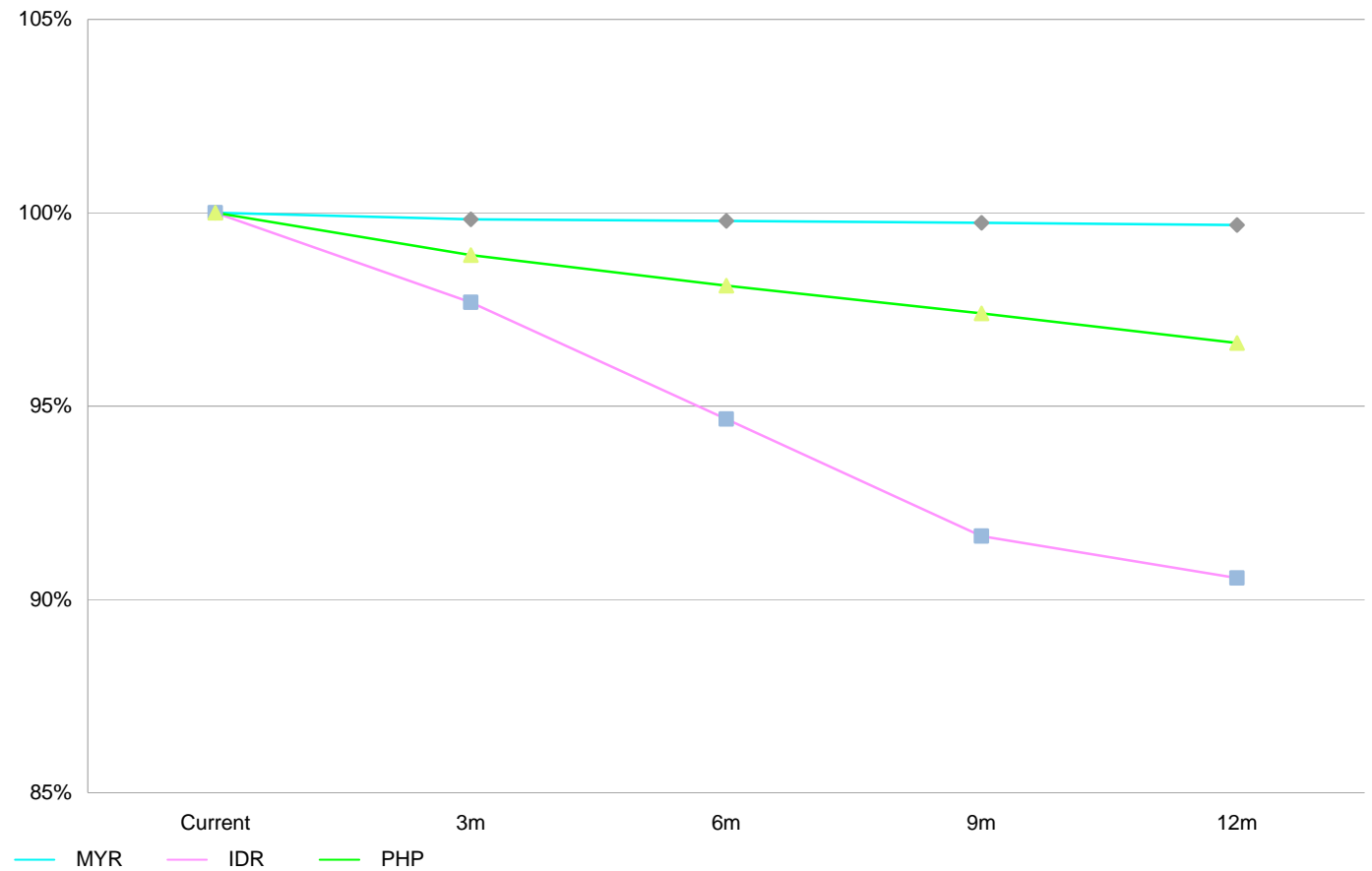


Source Bloomberg

Interest Rate Differential in Favor

- FX forward rates are driven by interest rate differentials in different currencies
- Given that many of the SEA currencies have higher interest rates than USD, the forward rate favors USD sellers

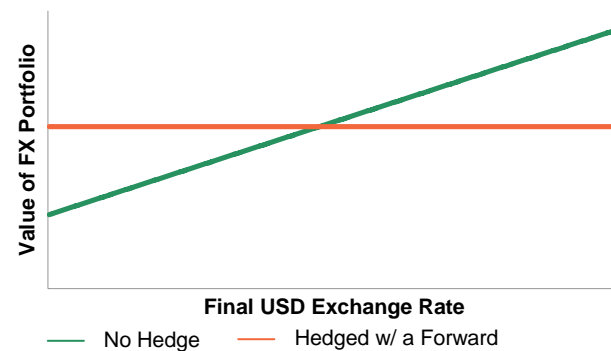
12-Month Forward Curves



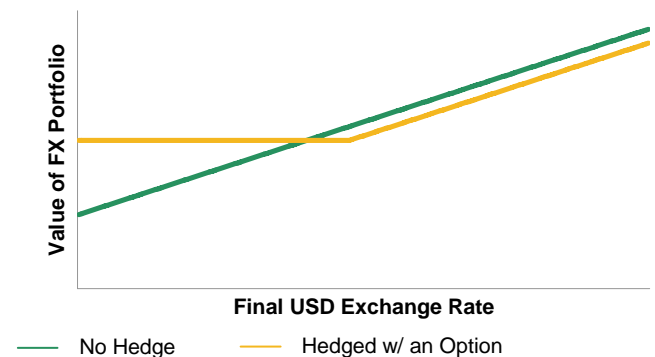
Managing FX Exposures

- Insurers with potential liabilities in SEA countries are exposed to these currencies strengthening against the USD/EUR
 - So far, the weakness of SEA currencies have helped because the USD-value of liabilities have fallen
- When the size of a liability is known, a vanilla forward can be used to eliminate all FX exposures
- An FX option can be used to hedge liabilities whose size is uncertain
 - The option can be struck out-of-the money to cheapen the cost and still protect on large currency movements

Hedging with FX Forwards



Hedging with FX Options



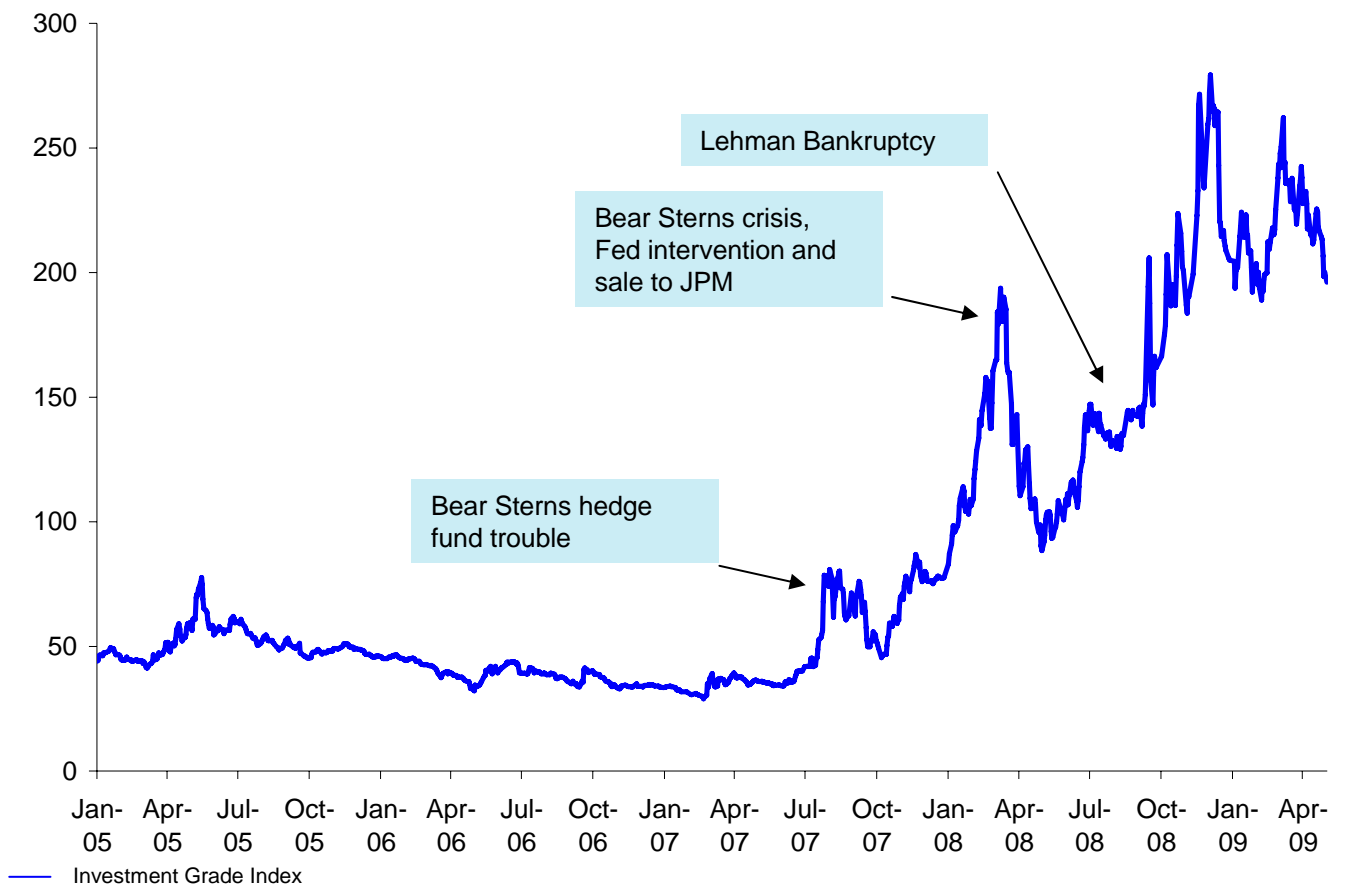
Section 3

Credit Rate Risk Management

Where Credit Spreads are...

20 months into the crisis, credit spreads remain elevated...

(bps)

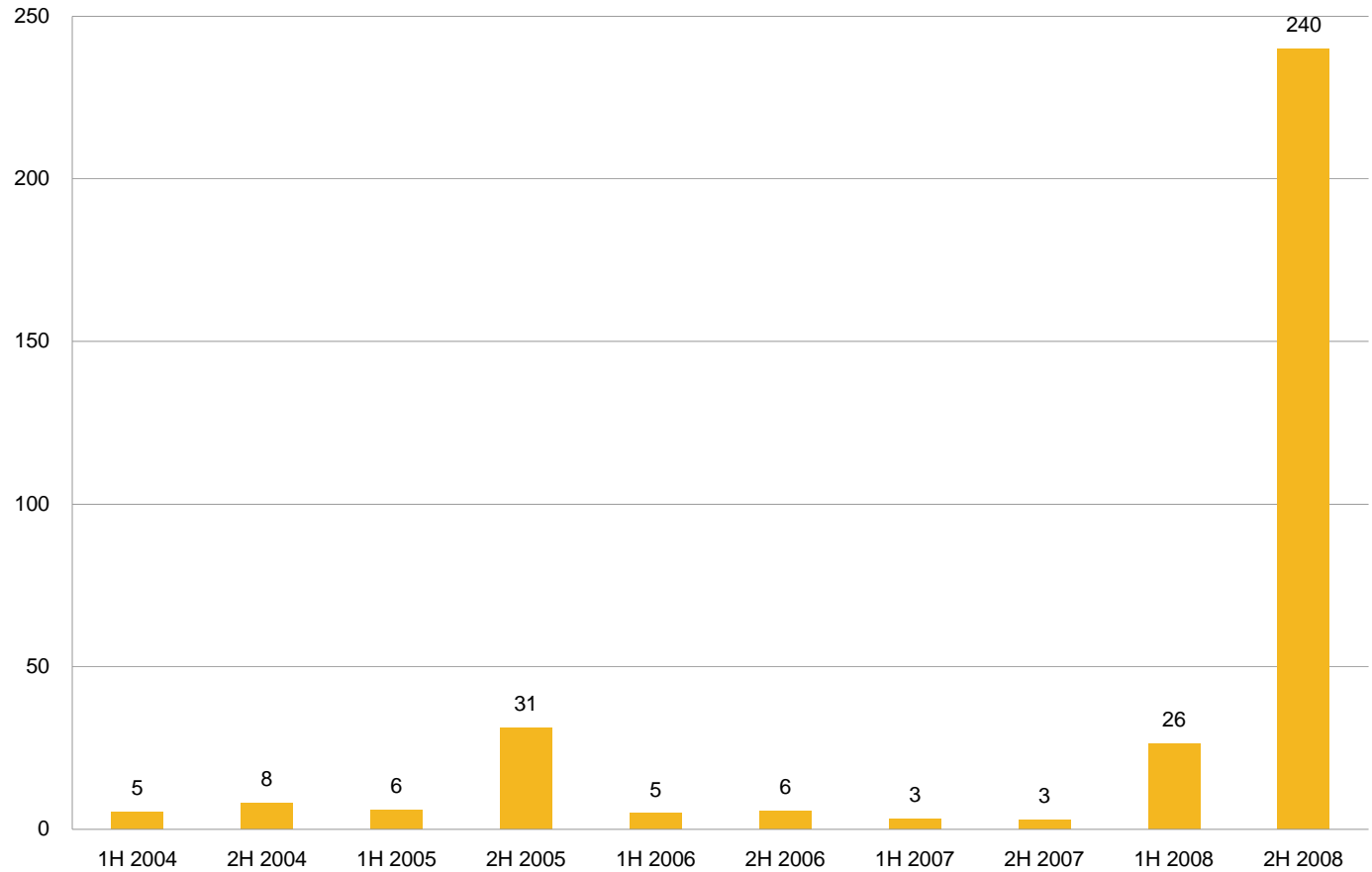


Source Bloomberg

Corporate default rates going up

Historical Corporate Default Volumes⁽¹⁾

Last 5 Years
(Bn USD)



Source Moody's

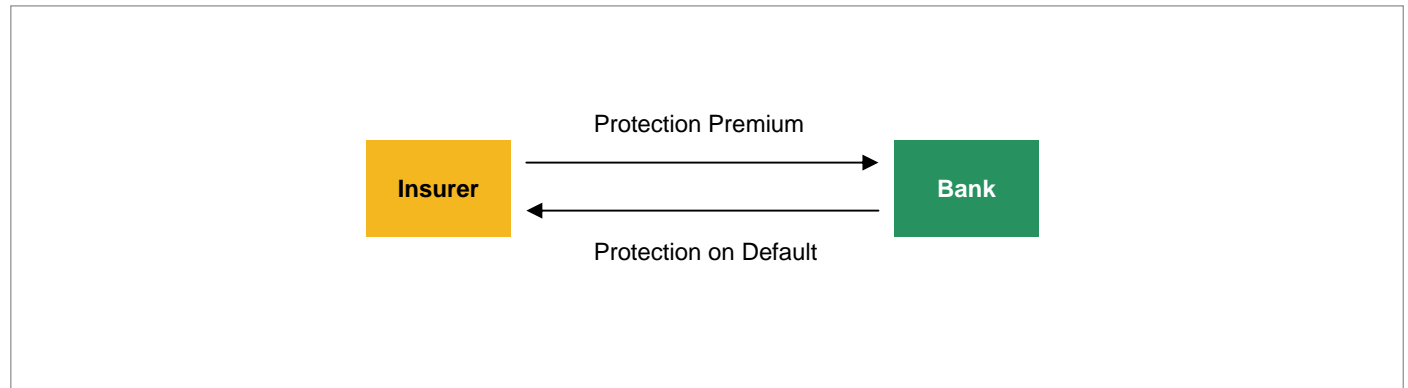
Notes

1. Non-Investment Grade

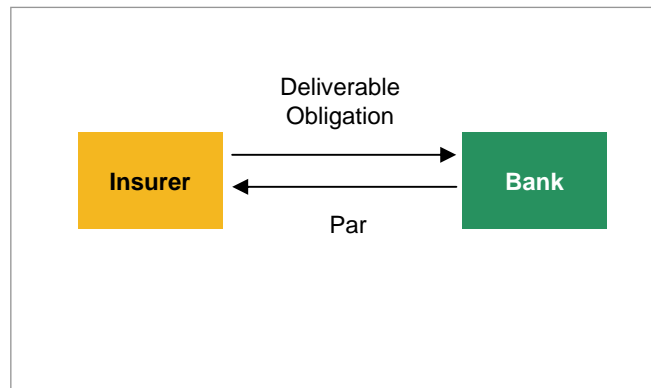
Credit Default Swaps Demystified...

Mechanics

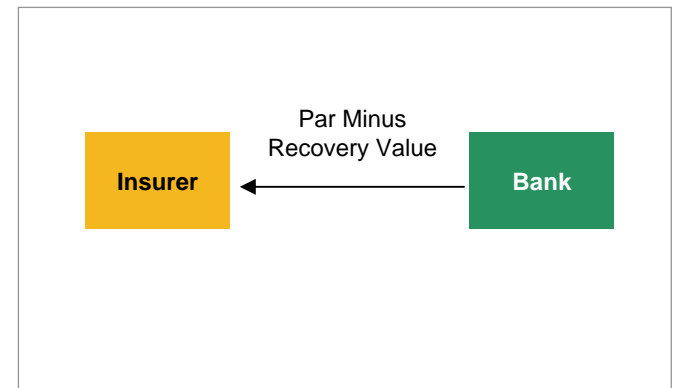
CDS Cashflows Before Maturity/Default



Physical Settlement in the Event of Default



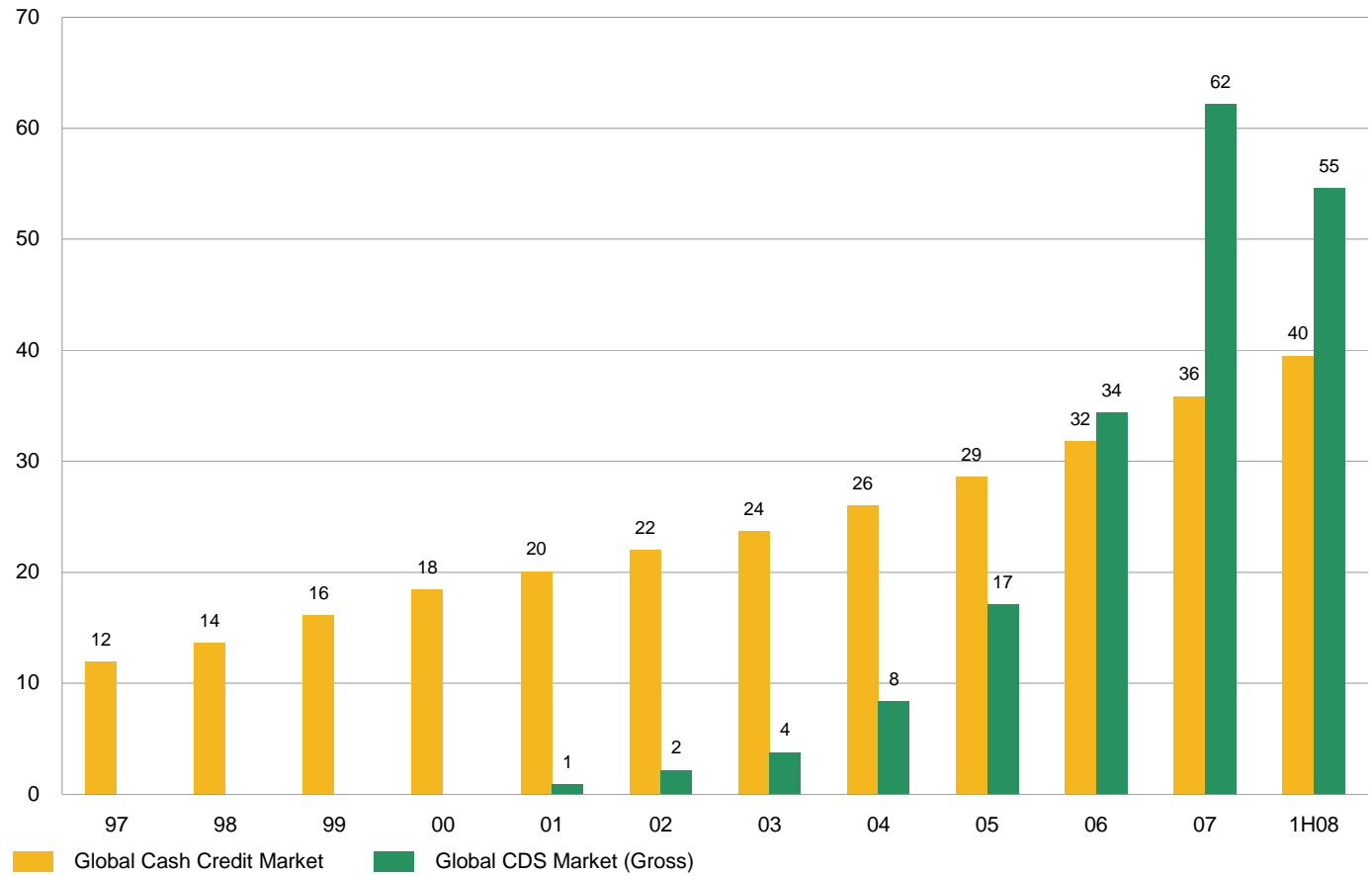
Cash Settlement in the Event of Default



Size of the CDS Market

CDS Notional Outstanding

(\$Tr)



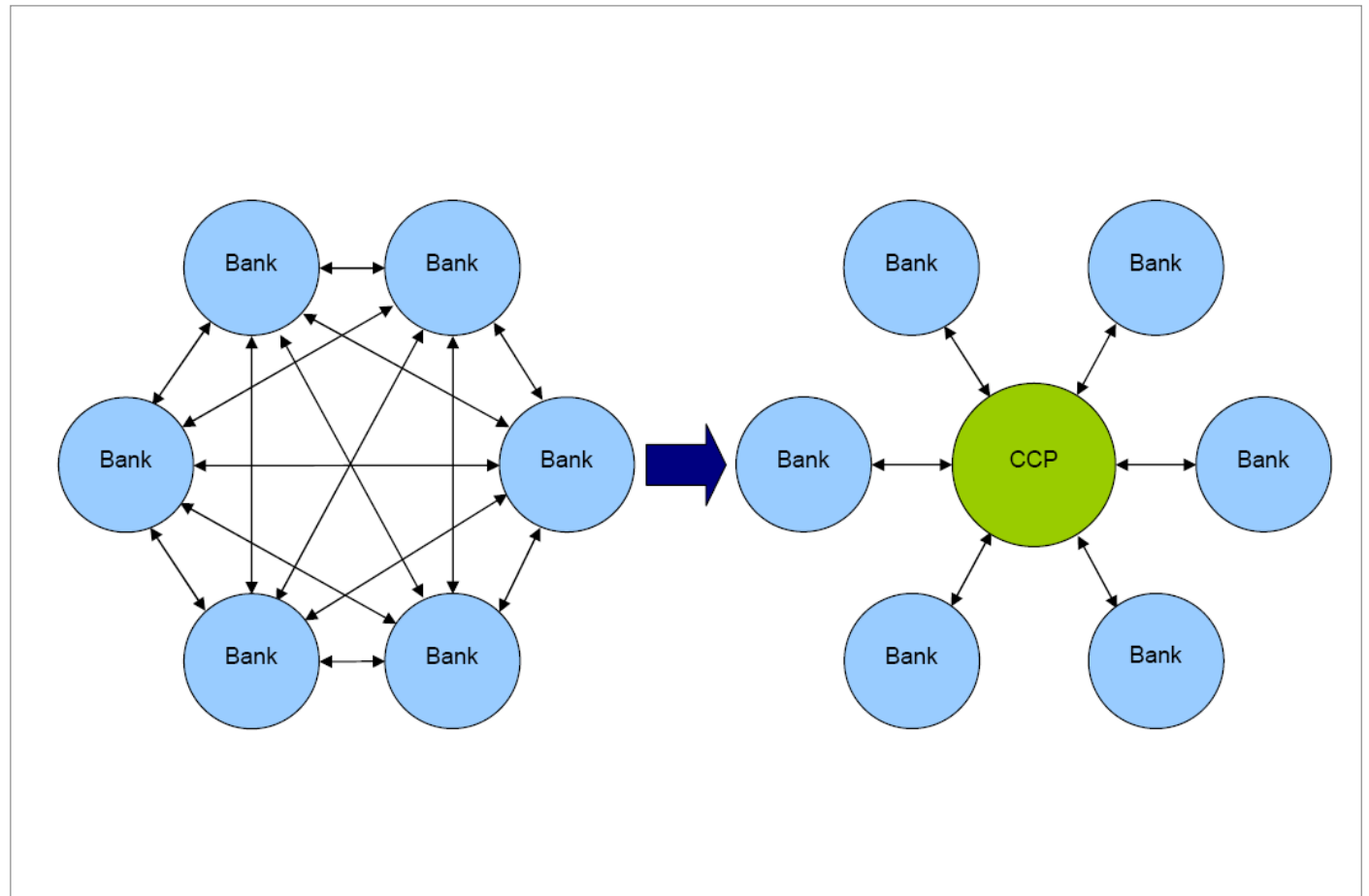
Source ISDA, Thomson Financial

CDS Market Passed the Test of Lehman

- Significant for the CDS market because it is both:
 - A frequently traded name in the CDS market (hence large volume outstanding)
 - A counterparty to many CDS contracts
- Therefore, Lehman's bankruptcy was a big test for the CDS market
- Positive result because:
 - CDS settlement process went orderly, despite large volume
 - Wall Street banks had the most exposure to Lehman through inter-broker trades but did not experience large losses because CDS was used to hedge these exposures

Future of CDS Market

From Over-the-Counter to Centralized Clearing

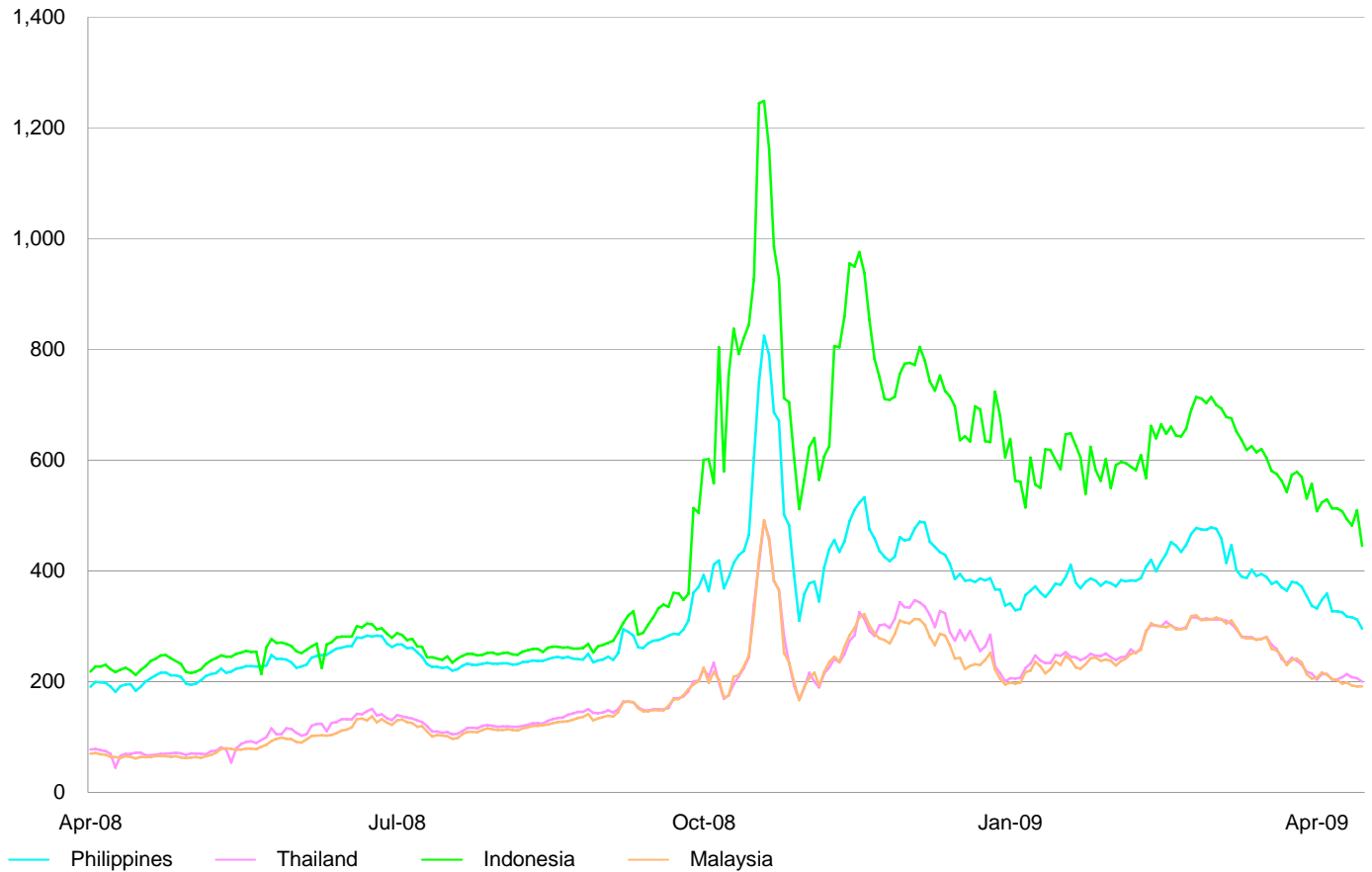


Hedging Political Uncertainties with Sovereign CDS

- Given that a certain level of capital has to be maintained in each jurisdiction, insurers are exposed to political and sovereign credit risks
- Proxy hedges can be put in place using sovereign CDS

Sovereign CDS Levels

(bp)

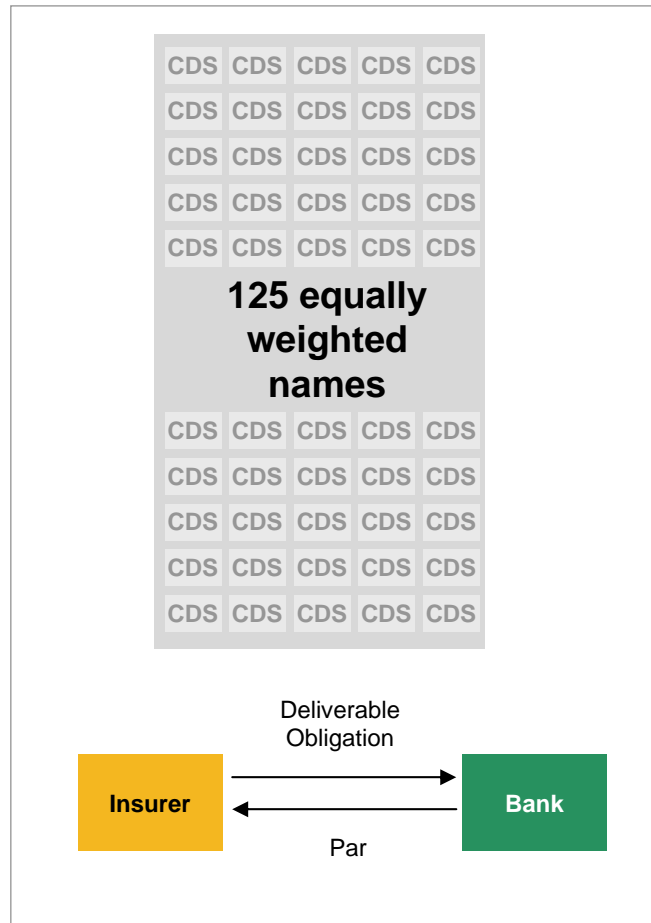


Source Morgan Stanley

Index Products

Portfolio Hedging

Index Product

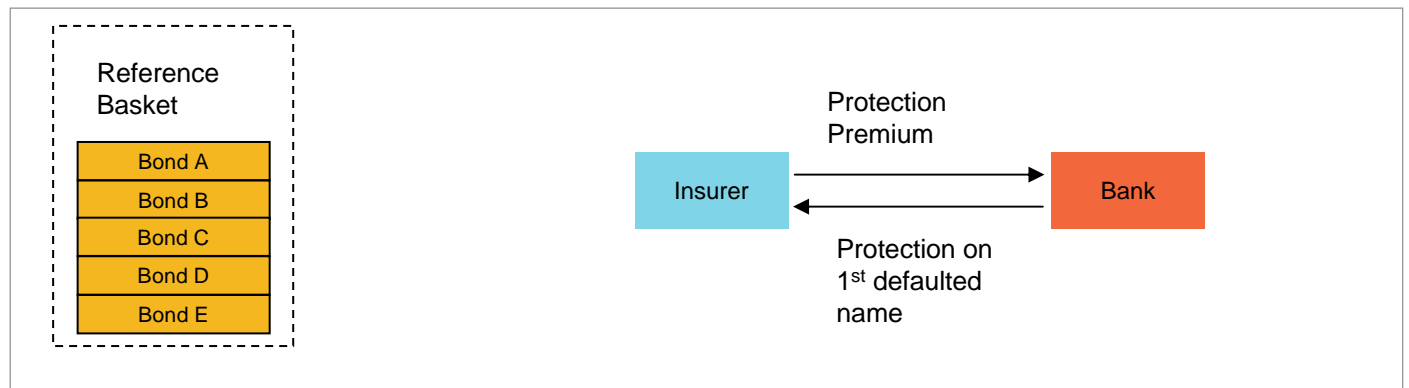


- Standardized and very developed
- Available for regional names
- Highly liquid. Typical size per trade:
 - North American IG index: >500MM USD
 - European IG index: >250MM EUR
 - Asian IG index: >50MM USD

1st to Default Basket (FTD)

Lowering the Cost of Hedging

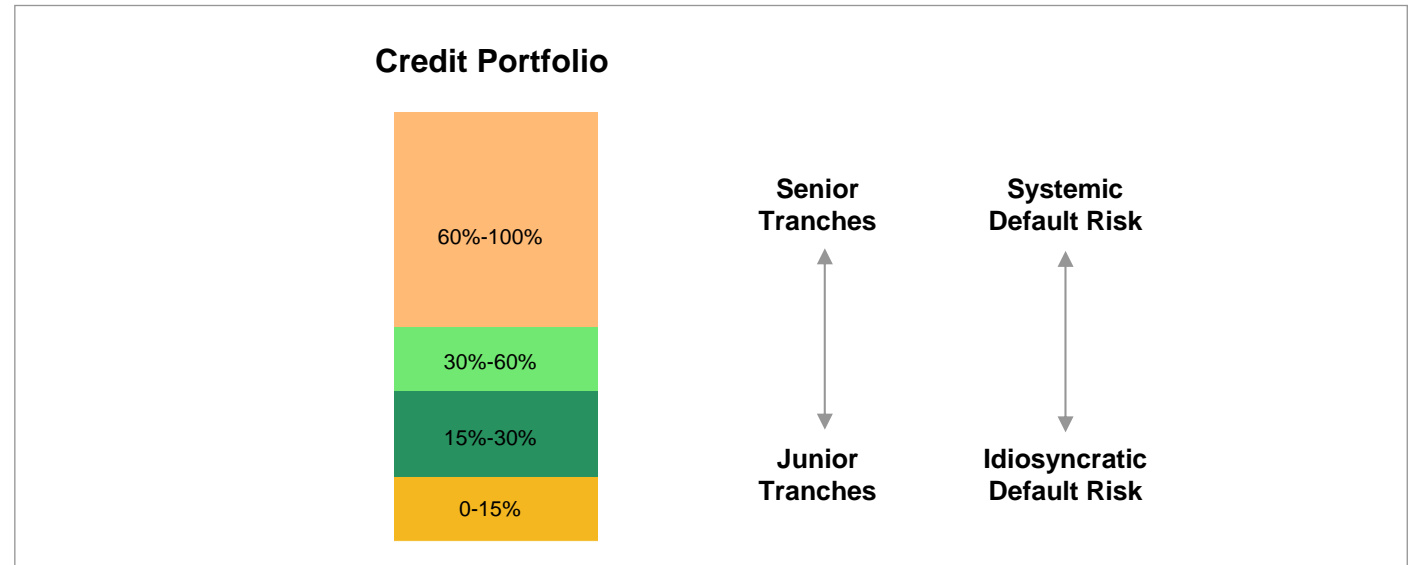
Illustration



- 1st to Default Basket offers protection on the first defaulted name in a basket
- Cheaper than hedging entire basket, but also provides less protection
 - Correlation drives relative cheapness
- Can be altered to Nth to default to increase level of protection

Index Tranches

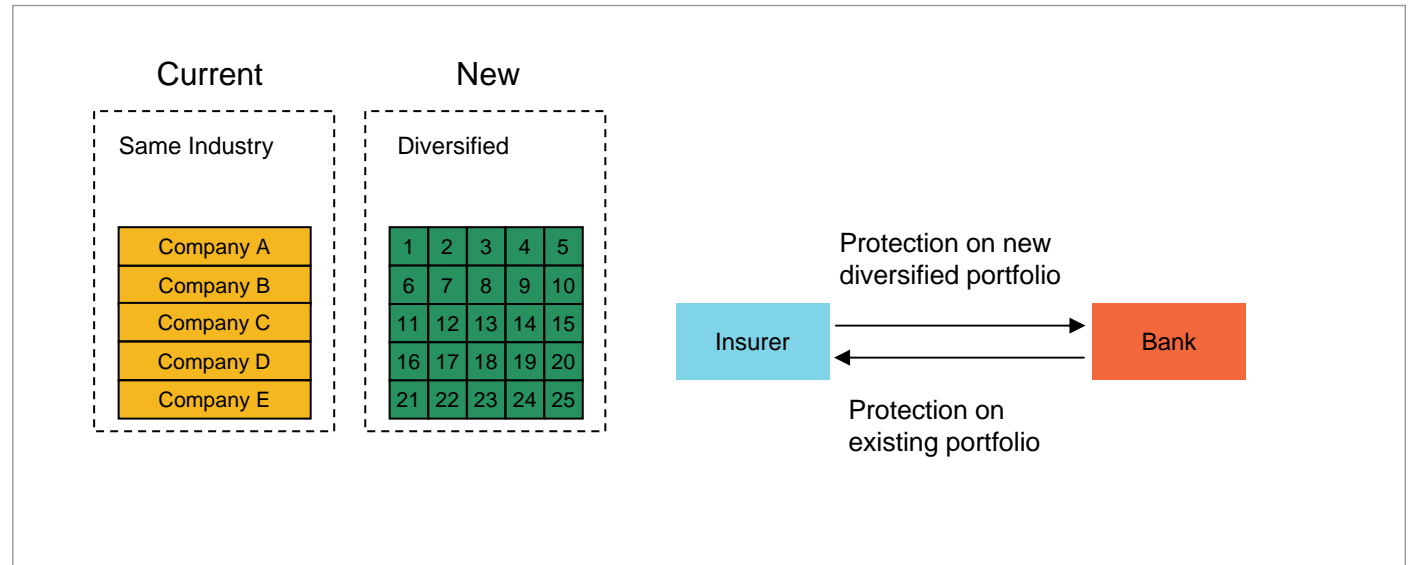
Extending the Nth to Default Basket



- Protections can be bought on any tranche of a portfolio
 - Protection more expensive for lower (more junior) tranches
 - Cheaper for higher (more senior) tranches
- Allows insurers to retain amount of risk proportionate to their available capital
 - More capital means protection on more senior tranches, i.e., cheaper cost

Credit Diversification

Diversifying Credit Exposures on Reinsurers



- Insurer buys protection on existing portfolio and sells protection on new diversified portfolio to offset cost
- Achieves diversification effect without buying and selling bonds
- Quick to execute
- The same idea can be used to diversify credit exposure to reinsurers
 - This allows insurers to pick the reinsurer with the most competitive pricing or the best relationship, and manage credit exposure separately