GARP Webcast

Monitoring and Analyzing Credit and Counterparty Risk

Presented by:

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On24 Tech Tips

- *Make sure your speakers are on*
- *Hit F5 any time your console freezes*
- *For a LIVE event you should be hearing music now*
- *Use the "Ask a Question" feature to report issues*
- *Webcast starts at the top of the hour*

GARP | Global Association of Risk Professionals

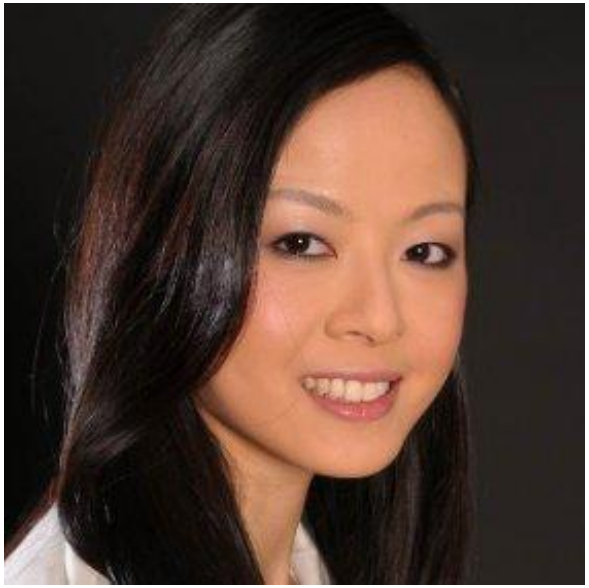
Luca Jellinek, Crédit Agricole

Luca Jellinek is the Head of European Rates Strategy at Crédit Agricole.

Over the past two decades, Luca has researched almost every aspect of interest rate strategy, from inflation-linked products to sovereign spreads, from yield curve dynamics to basis spreads.

His experience is mostly in the Euro and constituent markets but always in the context of global trends, while working for institutions like BNP Paribas, ABN Amro, RBS and ANZ.

Fiona Lui, Bloomberg



Fiona Lui is a Credit Derivatives Specialist at Bloomberg.

Based in London, Fiona has more than 10 years of market experience prior to joining Bloomberg. She worked as a Derivatives Structurer at Societe Generale and Structured Credit salesperson at Lloyds Banking group. She started her career as a Debt Capital Market Originator at Standard Chartered Bank in Hong Kong.

Elliot Noma, Garrett Asset Management

Elliot Noma is the founder of Garrett Asset Management, a systematic trading firm that uses technical systems to invest in futures, ETFs, and currencies. Dr. Noma is also a Senior Risk Consultant with Asset alliance. He consults on a variety of financial issues involving portfolio management, hedge fund due diligence, trading systems, risk management, fund of hedge funds, and operational due diligence. Dr. Noma is a member of the Financial Risk Manager (FRM) examination committee within the Global Association of Risk Professionals (GARP).

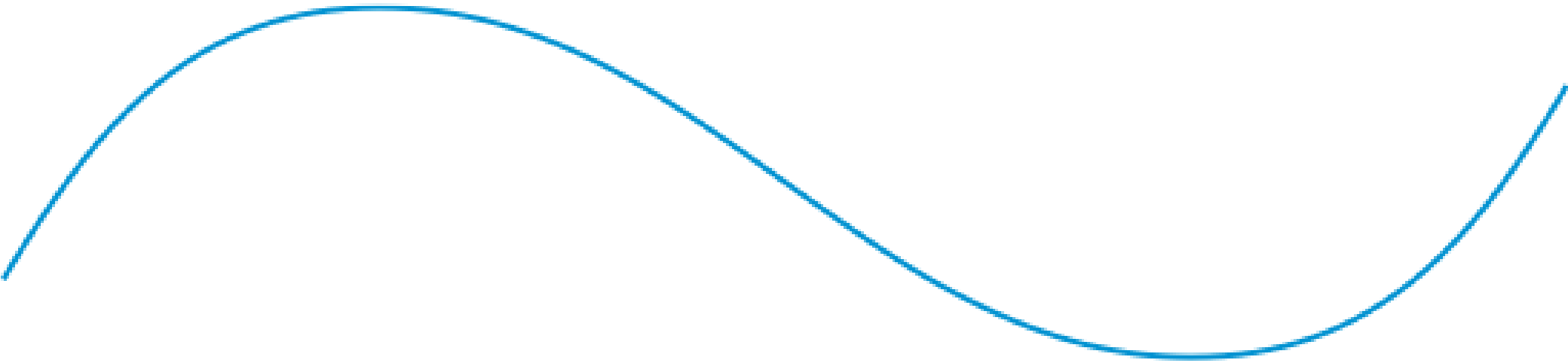
Prior to founding Garrett Asset Management, Dr. Noma was the portfolio manager for the BTOP50 fund, a diversified portfolio of global macro, commodity, and managed futures programs. He was a member of the Asset Alliance Investment Committee that oversees all fund of funds investments for Asset Alliance. Dr. Noma was also the Chief Risk Officer at Asset Alliance. In that role he was responsible for the risk oversight of Asset Alliance's single- and multi-manager product offerings.

Dr. Noma graduated from Dartmouth College in 1972 with a BA in Mathematics. He received M.A's in Mathematics and Psychology in 1979 and a Ph.D in Mathematical Psychology in 1982 from The University of Michigan. In 1990, Dr. Noma received an Advanced Professional Certificate in Finance from New York University. Dr. Noma also spent four years in the psychology faculty at Rutgers University (1983 – 1986) and his research has been published in numerous industry journals and scholarly periodicals.

Yedau Ogoundele, Bloomberg

Yedau Ogoundele has been a Credit Derivatives Specialist at Bloomberg since May 2010. Her previous industry experience includes being a Senior Credit Structurer at Credit Agricole CIB and Natixis, through 2002 - 2010, with previous roles as a Trader and Fixed Income Sales person at Credit Lyonnais from 1993 -2002.

EMU Sovereign Spreads: Liquidity Still on the Brink



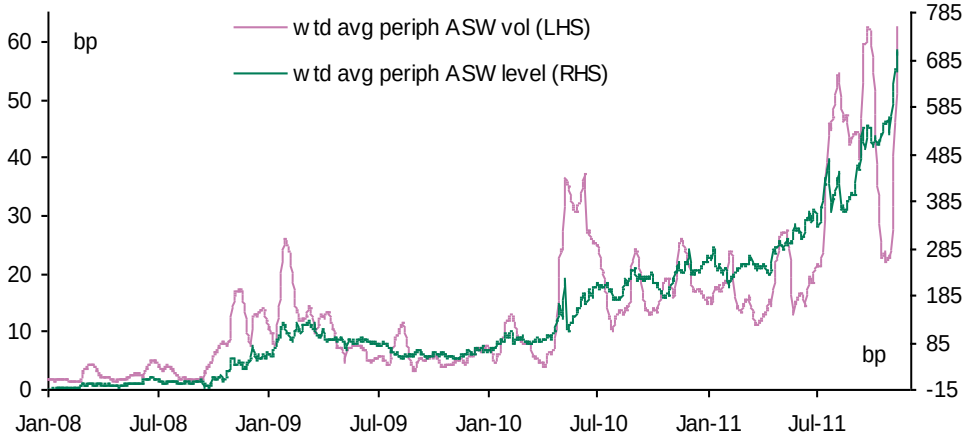
Luca Jellinek, Head of European Rates Strategy, Credit Agricole

Stubborn Sovereign Solvency Skepticism

- **Sovereign credit crisis main element shaping EGB market for a year and a half**

- **A very fragile equilibrium in periphery sovereigns**
  - Greece restructuring/default only a matter of extent and manner
  - Concern over sovereign creditworthiness remains elevated
  - SMP remains the only immediate defense against runaway yields

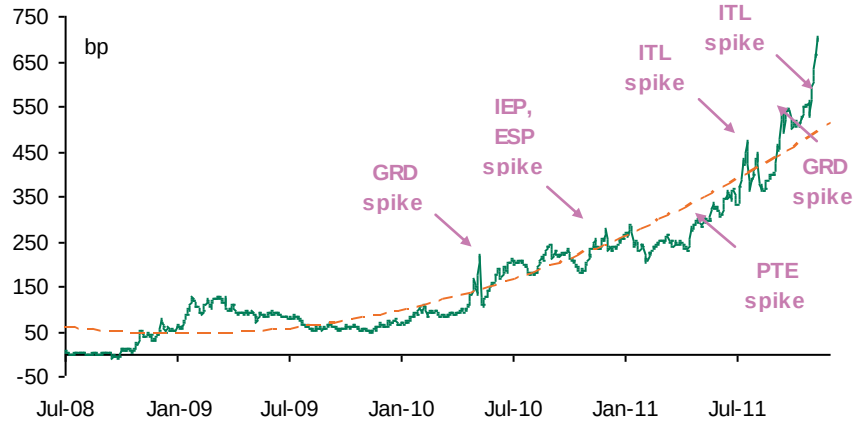
Periphery* ASW risk sets new heights



Source: Bloomberg, Crédit Agricole CIB

(*): Weighted by debt size – includes GRD, IEP, PTE, SPG, ITL and BEF10Y ASW

Italy, France in market's sights; Greece still a top stressor



Source: Bloomberg, Crédit Agricole CIB

2011 Budget Progress Remains Mixed

- **Greece (again), Belgium and Ireland are not looking like they are hitting targets**
- **France, Spain and Portugal need to improve more quickly**
- **The "hard" core and Italy are looking much better**

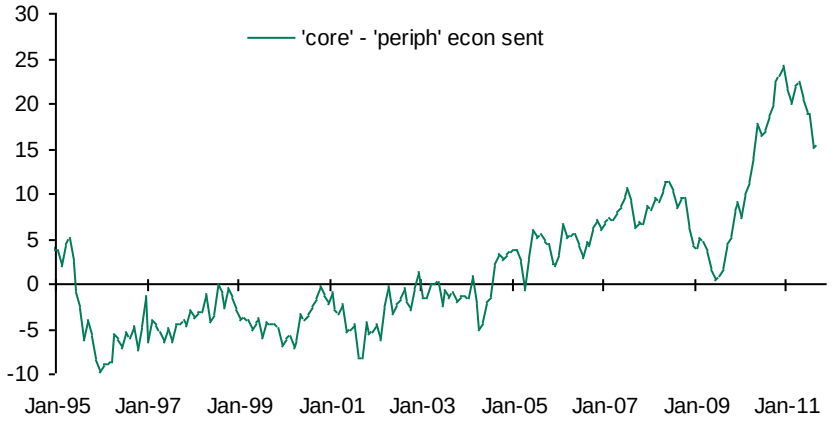
	Data available to…	2010 deficit/GDP	YTD budget deficit 2011 (EUR bn)	equivalent deficit 2010 (EUR bn)	% improvement	linearly extrapolated 2011 deficit ‡	2011 deficit/GDP target	Assessment based on performance and target
Germany	Sep	3.3%	-34.5	-49.4	30%	2.3%	1.9%	
France	Sep	7.0%	-92.7	-124.2	25%	5.2%	5.7%	
Italy	Oct	4.6%	-59.8	-72.7	18%	3.8%	3.9%	
Spain	Sep	9.2%	-37.0	-44.5	17%	7.6%	6.0%	
Netherlands	Sep	5.2%	-17.1	-25.6	33%	3.5%	4.2%	
Austria	Sep	4.6%	-6.0	-8.8	32%	3.1%	3.9%	
Belgium	Sep	4.1%	-15.6	-12.5	-25%	5.1%	3.6%	
Greece	Sep	10.5%	-24.5	-16.5	-48%	15.6%	7.6%	
Portugal	Sep	8.6%	-6.6	-9.3	29%	6.1%	4.6%	
Finland	Sep	2.5%	-3.3	-6.3	48%	1.3%	80.0%	
Ireland	Oct	32.0%	-22.2	-14.4	-54%			
Ireland *	Oct	12.0%	-13.2	-13.4	1%	11.8%	9.4%	

on track to sub-5% deficit ***and*** making progress making progress or below 5% deficit not making progress

*** = net of one-off bank transfers** **‡ = this is just a metric we provide, it is *not* our forcast for year-end deficits, due to many non-linear efffects**

Objective Problems, Subjective Behavior, Toxic Politics

- **Real underlying causes to sovereign crisis**
  - Rapid rise and increasing dispersion in General Government imbalances and debt/GDP
  - Poor and divergent demographics; old-age entitlements calibrated for 1950s population
  - Very little cross-state fiscal balancing
  - ‘Austerity’ is a very, very relative concept
- **Markets seem rudderless**
  - Ratings agencies and margining (LCH-C, etc.) are pro-cyclical
  - Very high correlations (‘contagion’) overstate inevitability of domino effects
  - Sovereign – banks/domestic finance vicious cycle
- **Politicians keep sending mixed messages**
  - German (& co.) opposition to monetization (only effective liquidity support)
  - Politically-motivated “PSI” focus since the Deauville summit was a key detrimental factor

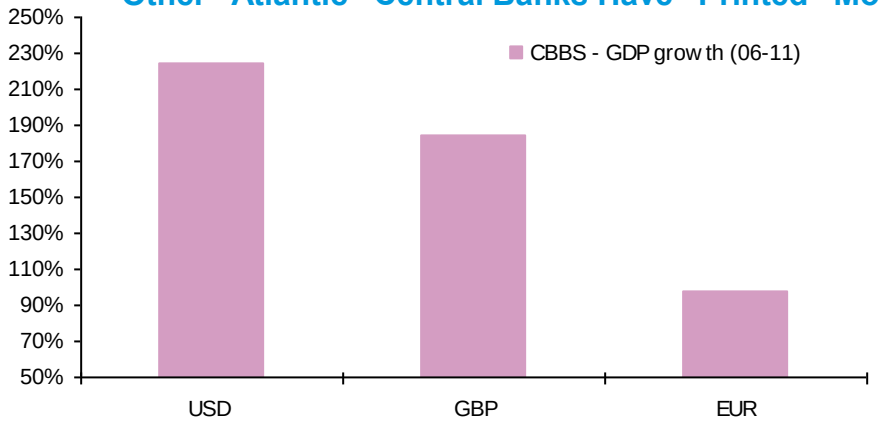


Source: Bloomberg, Crédit Agricole CIB

Poor Policy Response Is a Major Determinant

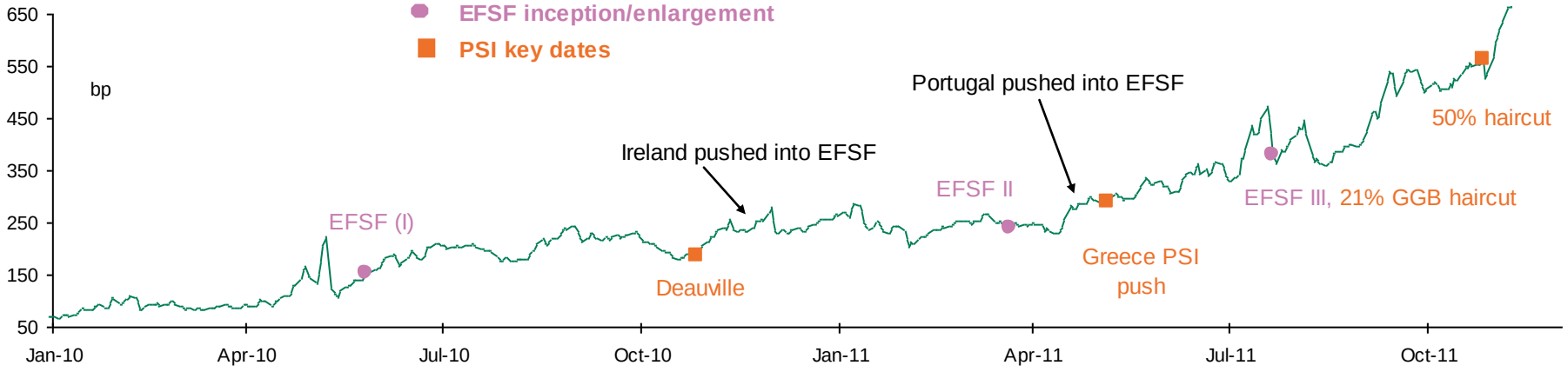
- **ECB "exceptionalism" is a big difference between EMU and other bond markets**
- **The obsession with PSI has been very detrimental**

Other "Atlantic" Central Banks Have "Printed" More



Source: Bloomberg, Crédit Agricole CIB

Periphery ASW and Policy "Un-Fixes"



Source: Bloomberg, Crédit Agricole CIB

ESFS "Bank" Was an Elegant Solution

If the EFSF Became a "Bank," It Could Buy as Much Periphery Paper as Necessary, Using the ECB as a Source of Liquidity

- **Pros**
  - No need to place every penny of financing in primary bond market
  - Much quicker response; can act (almost) as fast as SMP
  - Credit risk of bond market intervention shifts to EFSF guarantors; as ECB prefers
  - *It is a form of monetization if the ECB gets involved*

- **Cons**
  - Capital, on top of guarantees, might be required; not so simple
  - German government and ECB oppose this
  - It makes virtuous coercion of periphery spenders less likely
  - Not clear how it fits in with actual sovereign loan role
  - *It is a form of monetization if the ECB gets involved*

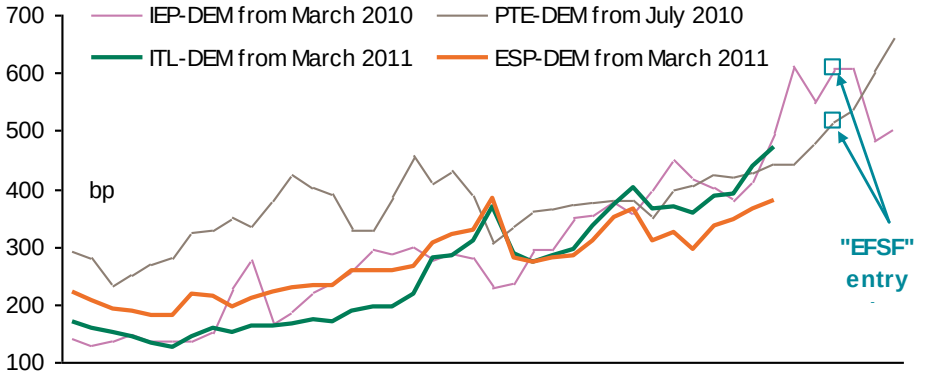
EFSF "First-Loss Insurance" Is Not

- Current proposal is to cover first 20-30% of any loss on new issues
- In theory, any credit enhancement should be welcome. But in reality this doesn't work on many levels
- Arguably, Spain and Italy face a liquidity issue, more than a credit issue
- 'First-loss' or junior tranche might make sense for a CDO or ABS with many small credits with a historical default distribution. Government bonds have a binary default outcome and hard to gauge LGB
- Without ECB liquidity backing, EFSF is just another credit risk (albeit at or near AAA)
- It would create a two-tier market in (Italian and/or Spanish) bonds
- Unlikely to reverse contagion
- Negative pledge issues

Italy Liquidity Still Under Pressure

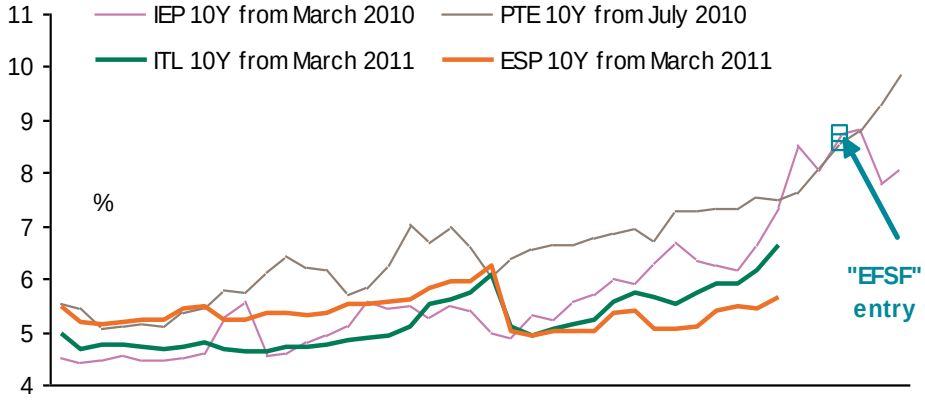
- From July, institutional investors started reducing Italy exposure
- Delivery of full reforms package undermined by political divisiveness
- Italian yields at post-EMU highs ➔ ratings and margining risk (LCH-Clearnet)
- More recently, G20 mention of IMF "monitoring" very badly delivered
- The excess yield cost argument

Why Markets Equate Wide Spreads With Primary Market Exit



Source: Bloomberg, Crédit Agricole CIB

But Yields for "Outs" Were Higher …

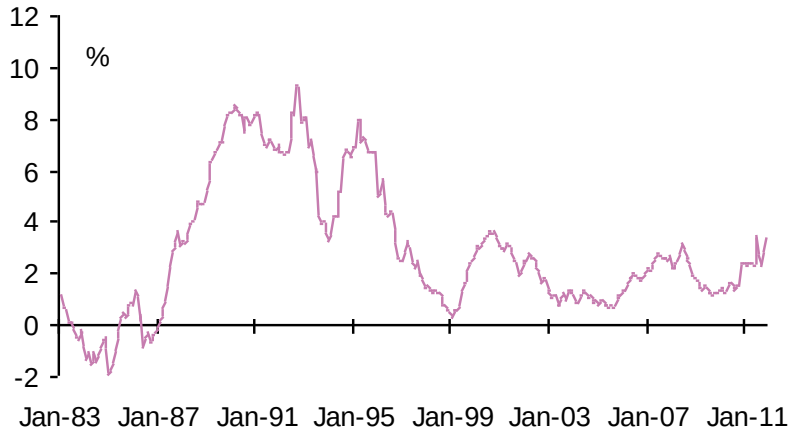


Source: Bloomberg, Crédit Agricole CIB

Italy Liquidity Still Under Pressure

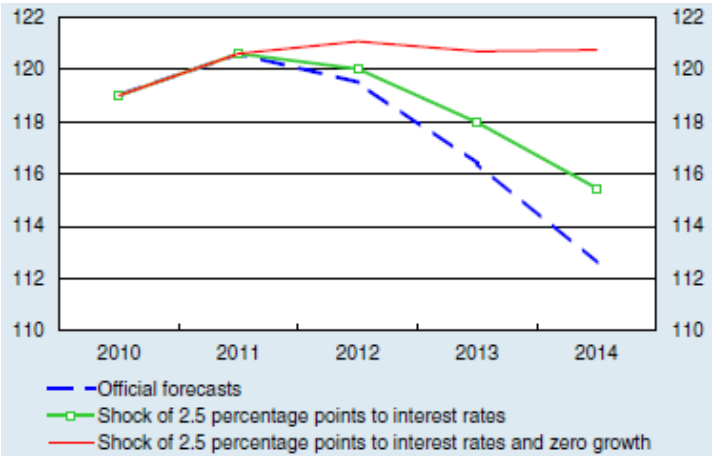
- **The yield cost is high, but not inherently disastrous or historically unprecedented**
- **Even at high levels, Italy can stabilize debt, though more slowly**
- **The real issue is liquidity**
  - Italy needs to raise 18 bn/month to end 2012, not counting BOT rolls
  - Aug –Nov 1, the ECB bought 60-80 bn Italian debt vs. government sales of under 50 bn but yields exploded (i.e., serious selling)

Italian Average Yield Deflated by Inflation 5YMA



Source: Bloomberg, Crédit Agricole CIB

Italian Debt/GDP Based on Different Scenarios

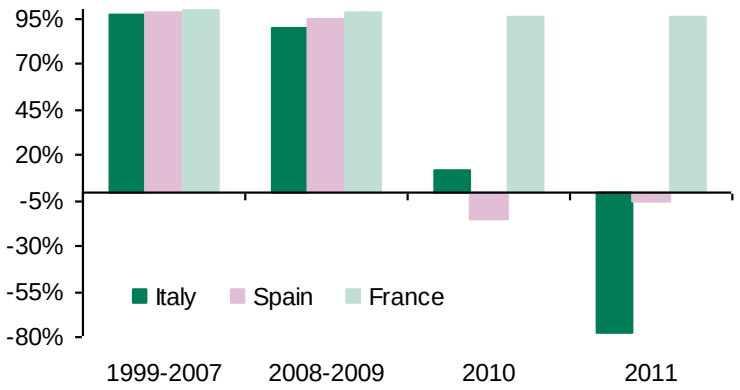


Source: Bloomberg, Crédit Agricole CIB

France: Pressure Continues

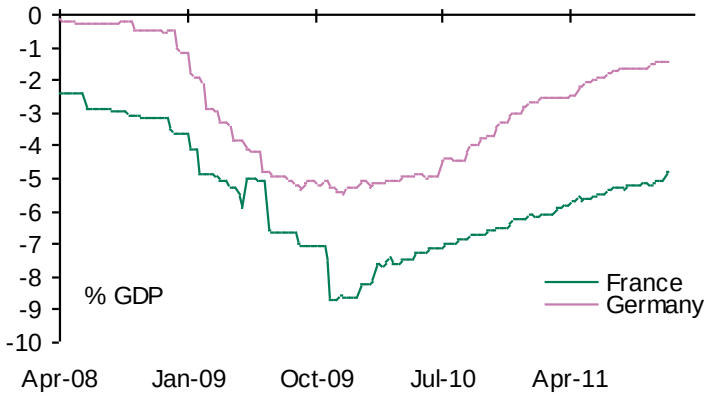
- **Fiscal, growth, political and ratings agency pressure all bearing down on France**
- **So far, correlations not suggesting it's in the "risk" bucket, yet**
- **Fiscal issues**
  - In 2012, France will sell bonds for 9.9% of GDP vs. 6.7% for Germany
  - One of the highest, faster growing old-age expenditure ratios in the EU
  - TFP decelerated more rapidly than in competing economies
- **Strength too: demographics, similar debt profile to Germany, banks much less dependent on foreign deposits; no more exposed to periphery**

Selected 5Y Yield Correlations to OBL Yield



Source: Bloomberg, Crédit Agricole CIB

Expected 12M Forward GG Deficit/GDP



Source: Bloomberg, Crédit Agricole CIB

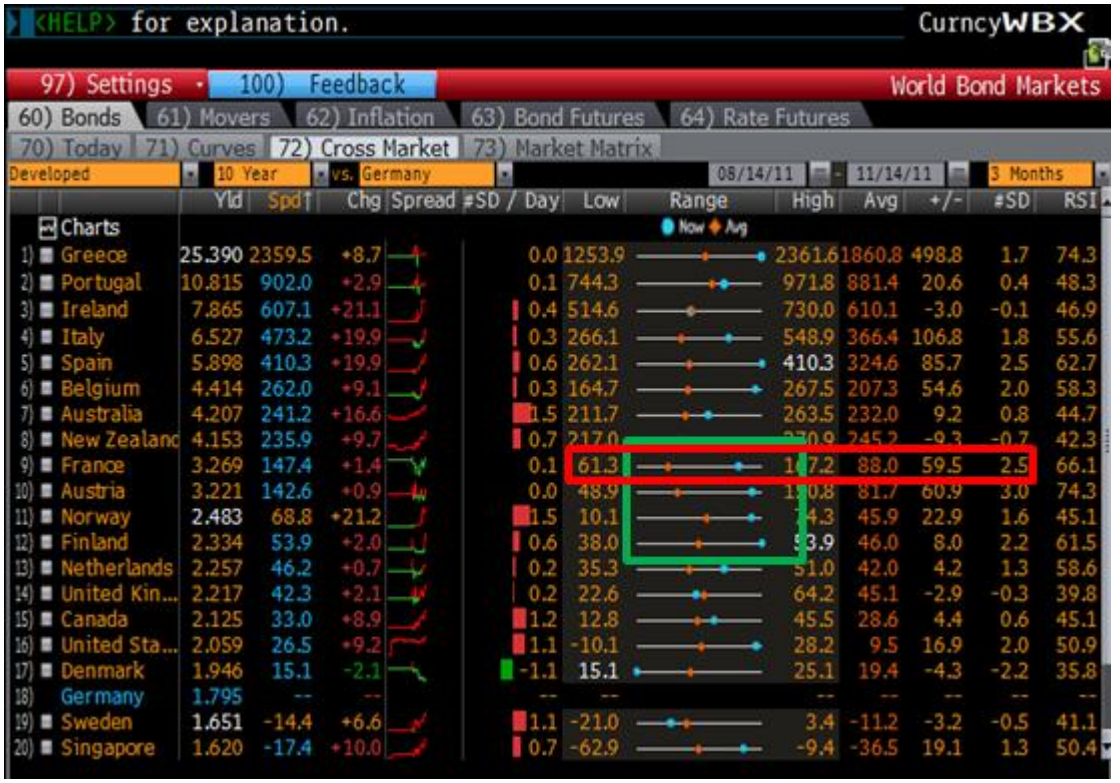
How to Monitor and Analyze Credit and Counterparty Risk

Fiona Lui, Credit Derivatives Specialist, Bloomberg
Yedau Ogoundele, Credit Derivatives Specialist, Bloomberg

Government Bond Yields Increasing Relative to Germany

Over the Past Months, Yields of Government Bonds in Most Developed Countries Have Increased Significantly Compared to Germany

- **Impact is no longer limited to peripheral European countries**
- **Spreads between French and German government bond yields have widened noticeably**



Source: Bloomberg

Sovereign Risk Concern Also Seen in Credit Derivatives

Increased Concern Over Sovereign Risks Can Also Be Seen in the Credit Derivatives Markets

- **Significant rise in sovereign CDS notional amount and number of contracts**
- **CDS trading activities referencing France and Germany have also increased: overtaking Italy and Spain, respectively, for the first time in August 2011**

Source: Bloomberg

Direct Impact on Firms That Hold Sovereign Debt

There is also a direct impact on financial institutions that hold sovereign debt -- e.g., Greece

- **After the Greek banks, French and German banks are the largest Greek debt holders**
- **Many large European banks are expected to be hit by Private Sector Involvement (PSI)**

Name	Date	Debt Amt (EUR, Mln)	% Outstanding Debt
Greece Sovereign Debt		277,455.23	100.00
Total of Bank Holders		60,765.04	21.90
1) National Bank of Greece SA	Q2 2011	12,243.00	4.41
2) EFG Eurobank Ergasias SA	Q2 2011	9,839.00	3.55
3) Piraeus Bank SA	Q2 2011	9,672.02	3.49
4) Agricultural Bank of Greece	Q2 2011	6,568.47	2.37
5) Alpha Bank AE	Q2 2011	6,139.58	2.21
6) Marfin Popular Bank PCL	Q2 2011	2,953.85	1.06
7) Bank of Cyprus Plc	Q2 2011	2,221.28	.80
8) BNP Paribas SA	Q3 2011	1,600.00	.58
9) Commerzbank AG	Q3 2011	1,400.00	.50
10) Dexia SA	Q3 2011	1,292.00	.47
11) Deutsche Postbank AG	Q2 2011	923.00	.33
12) Deutsche Bank AG	Q3 2011	881.00	.32
13) Societe Generale SA	Q3 2011	800.00	.29
14) Banco Comercial Portugues SA	Q3 2011	671.00	.24
15) Royal Bank of Scotland Group P	Q3 2011	638.77	.23
16) Intesa Sanpaolo SpA	Q2 2011	559.00	.20
17) Banco BPI SA	Q2 2011	530.38	.19
18) HSBC Holdings PLC	Q3 2011	371.78	.13
19) KBC Groep NV	Q3 2011	300.00	.11
20) Emporiki Bank SA	Q2 2011	292.18	.11
21) Attica Bank	Q2 2011	255.40	.09

Source: Bloomberg

Some Banks Feeling More Pressure

Some Banks Are Under More Pressure Than Others as Peers Become More Reluctant to Lend to Them

- **Banks that are currently under pressure – e.g., French banks and UBS – have been offering higher-than-average rates since mid-August**
- **Bigger dispersion in banks' contribution is seen:**
  - CA-CIB 0.575%
  - HSBC 0.3%

Source: Bloomberg

Liquidity and Counterparty Risk Issues

In Addition to Sovereign Exposures, These Banks Are Also Facing Liquidity and Counterparty Risk Issues

- **Before 2008, EONIA and 3m-Euribor were at similar levels**
- **Euribor-OIS spreads peaked in late 2008, and picked up again since July 2011**
- **However this recent hike is also contributed by fall in OIS**

Source: Bloomberg

Mitigating Counterparty Risks in Derivatives Transactions

Various Means Are Used in the Derivatives Market to Mitigate Counterparty Risks for Derivatives Transactions

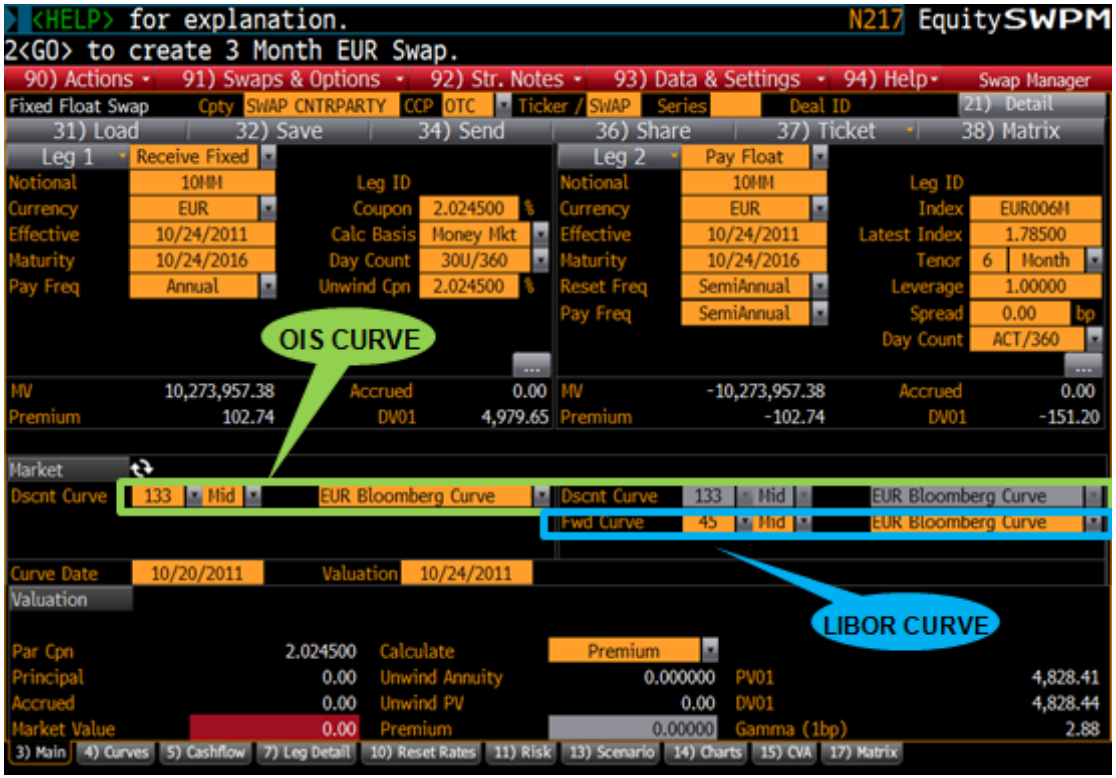
- **Collateralized transactions**
  - Many derivatives are traded under Credit Support Annex (CSA), where counterparties post a collateral amount equal to the net mark-to-market of the trades
  - Collateral amounts are usually remunerated at OIS flat

- **Uncollateralized transactions**
  - Counterparty risks are reflected by Counterparty Valuation Adjustments (CVA)
  - CVA = market price of counterparty risk
  - CVA charges may be applied

Dual-Curve Discounting

For Collateralized Transactions Traded Under CSA, Market Participants Are Moving to "Dual-Curve Discounting"

- **OIS curves are used for discounting cash flow**
- **Whereas forward rates are calculated using regular swap curves**

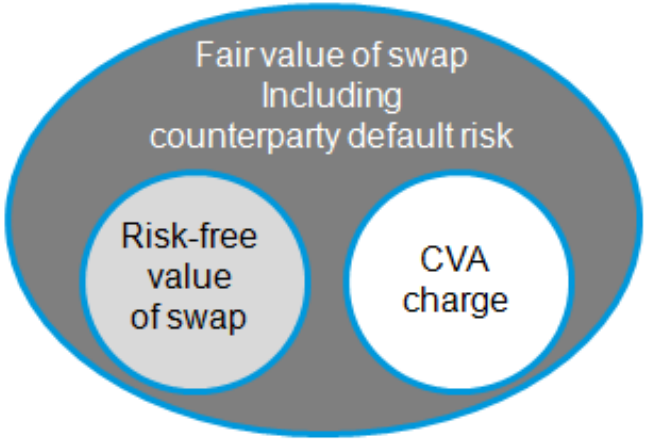


Source: Bloomberg

Counterparty Valuation Adjustment

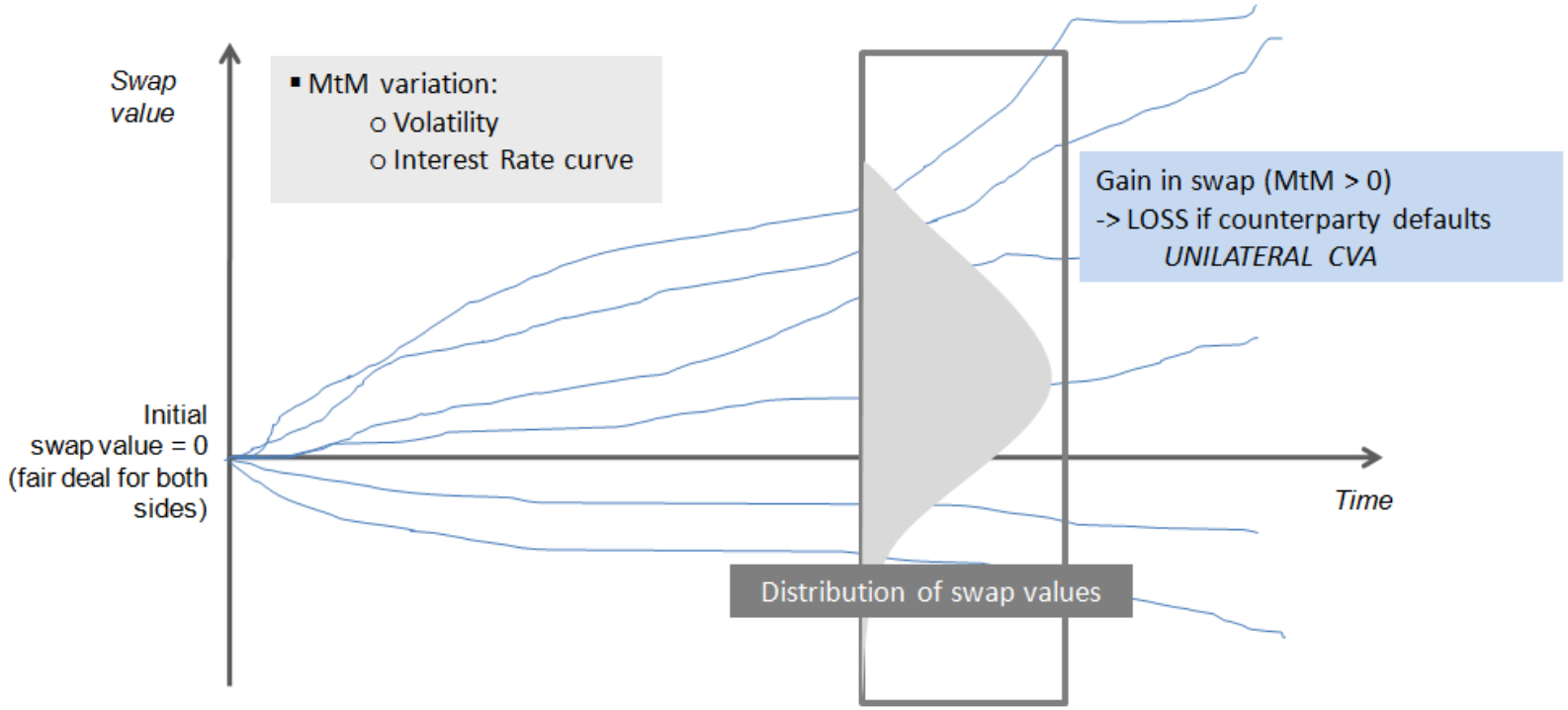
For Uncollateralized Transactions, the CVA of Each Deal Can Be Calculated and a Hedge Can Be Carried Out Accordingly

- **Counterparty Valuation Adjustment = market value of counterparty default risk**



- **To determine CVA**
  - What is the value of my swap at any date in the future?
  - How likely is my counterparty to default?
  - If a default happens, how much could be recovered?

Counterparty Valuation Adjustment



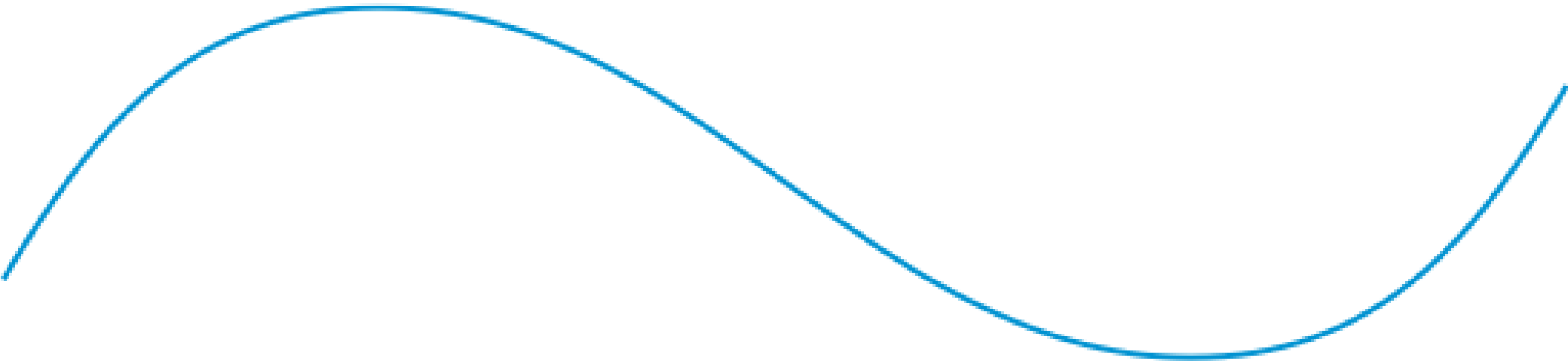
- **Unilateral CVA**
  - = Max (MtM,0) * Counterparty Default Probability * (1 – Recovery Rate)
    - Counterparty Default Probability derived from counterparty CDS spread
    - Actual loss amount in case of default

CVA Charges Affect Deal Pricing

CVA Charges Can Lead to Significantly Different Pricing for the Same Deal

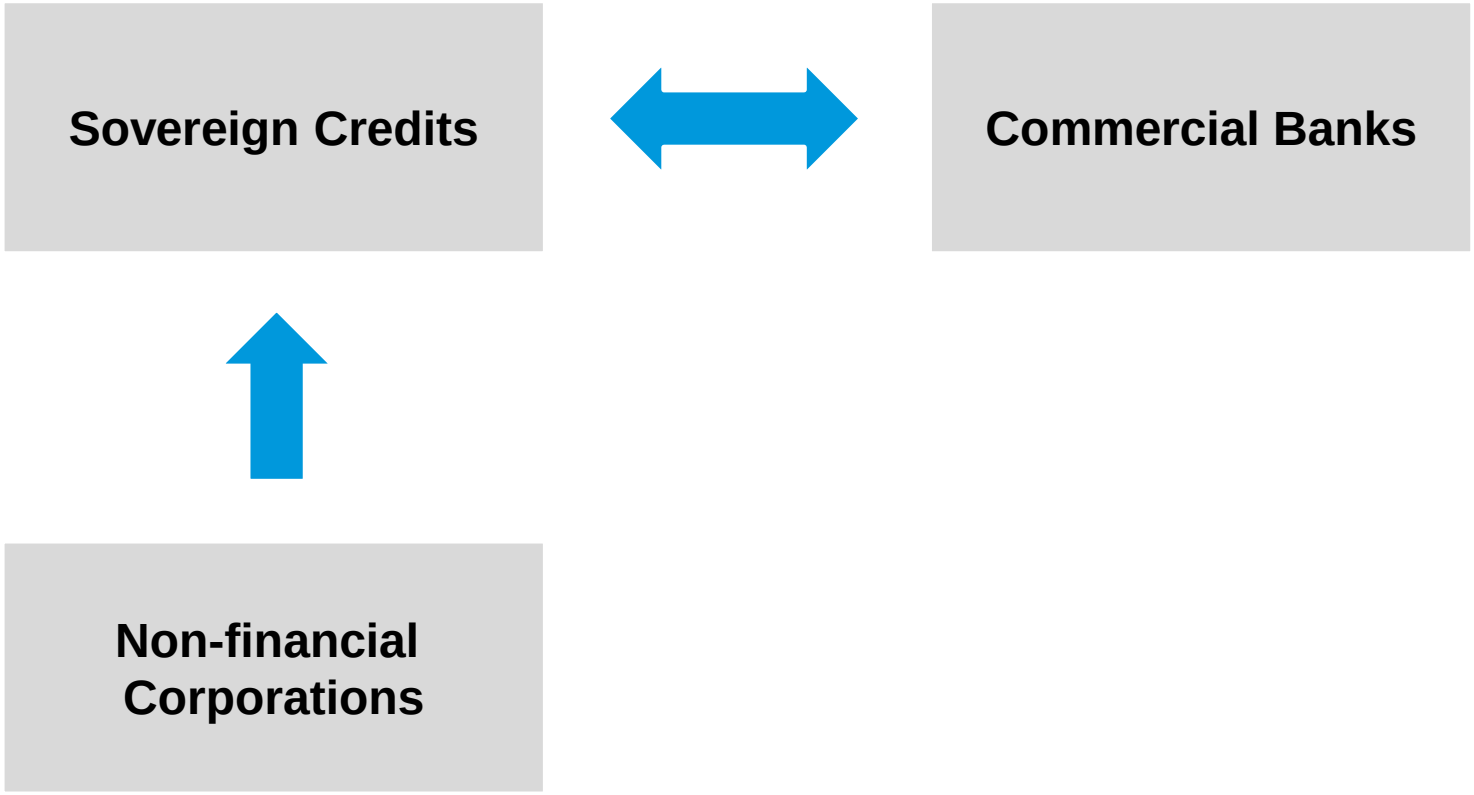
- **Depending on counterparty default probability derived from CDS spread**
- **Bilateral CVA mitigates CVA charges by taking into account risk of both counterparties**

Credit and Counterparty Risks



Elliot Noma, Managing Director, Garrett Asset Management

Interrelationships Among Credit Risks



Data Inputs for Predicting Results

- Corporate balance sheet/income statements
- Bond/CDS spreads
- Macroeconomic data
- Equity prices
- Bank operations measures

Altman's Z Score for Non-financial Corporates

- $Z'' = 3.25 + 6.56X_1 + 3.26X_2 + 6.72(X_3) + 1.05(X_4)$
- X_1 = Current Assets - Current Liabilities / Total Assets (TA)
- X_2 = Returned Assets / TA
- X_3 = EBIT (Operating Income) / TA
- X_4 = Book Value Equity / Total Liabilities

Source: Altman, Karlin (2008) Defaults and returns in the high yield bond market the year 2007 in review and outlook

Bond Equivalent Rating vs. Average Z Score

U.S. Equivalent Rating	Average Z" Score
AAA	8.15
AA+	7.62
AA	7.36
AA-	7.00
A+	6.85
A	6.65
A-	6.40
BBB+	6.25
BBB	5.85
BBB-	5.65
BB+	5.25
BB	4.95
BB-	4.75
B+	4.50
B	4.15
B-	3.75
CCC+	3.20
CCC	2.50
CCC-	1.75
D	0.00

Source: Altman and Hartzell (1995) and Altman and Hotchkiss (2005)

Distance to Default

- **Assets = Equity + Liabilities**

- **The distance-to-default = (Assets - Liabilities + drift) / AssetVolatility**

- **Calculation steps**
  1. Daily estimates of Assets inputting EquityPrice + Liabilities into a version of the Black-Scholes formula
  2. From the daily asset series calculate the asset volatility
  3. Estimate beta using the CAPM model and multiply by a risk premium to estimate the drift
  4. Substitute values into the distance-to-default formula above
  5. The probability of default is the area below the normal distribution corresponding to the distance-to-default

Z-Metrics Model

- **Companies are evaluated on a 1- and 5-year horizon**
- **1-year model is based on 13 financial statement and market data items**
- **Market data includes price and volatility**
- **Market data includes price and volatility**
- **5-year model is based on 5 financial statement items**
- **Credit score is a weighted sum of the variables**

$$\text{Probability of default} = \frac{1}{1+\exp(\text{credit score})}$$

Sovereign Credit Risk Assessment Strategies

- **Top-down macroeconomic**
  - Debt service ratio
  - Import ratio
  - Investment ratio
  - Variance of export revenue
  - Domestic money supply growth

- **Credit default swap**

- **Bottom-up economic analysis**
  - Select a large set of public and private companies
  - Evaluate the probability of default for each company
  - Use a country statistic, such as the median probability of default across all companies as a measure of sovereign risk

Indicators for Regional Banks at Risk of Default

- One-year relative change in claims of customers
- Troubled loans/total loan volume
- One-year relative change in loan loss provisions
- Total volume in excess of loan limit/total loan volume
- Assessment base for capital requirement/total loan volume
- One-year relative change in total equity
- Profit on ordinary activities/balance sheet total
- Hidden reserves/balance sheet total
- Absolute value of change in profit on ordinary activities
- One-quarter relative change in consumer price index

Source: Halling, Hayden (2006) Bank failure prediction a two step survival time approach

Ranking Methodologies for Banks

	Fitch	Moody's	S&P
Stand-alone	Off-balance sheet commitments Liquidity risk	Capital ratios	Risk-adjusted Performance
All-in ratings	Consider sovereign support	Joint analysis of banks and supports	Anticipated support given bank's systemic importance
System-wide assessment	Macro indicators Average bank rating	None	Macro indicators Industry and regulatory environment

Source: Parket, Tarashev. Ranking methodologies for banks. BIS Quarterly Review, June 2011

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