Research

Sovereign Risk in Credit Markets

An Empirical Study of the Euro IG Corporate Market

10 October 2012

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PLEASE SEE ANALYST CERTIFICATIONS AND IMPORTANT DISCLOSURES BEGINNING ON PAGE 29.

Motivation – Adjustments to the Traditional Framework

European credit portfolios are exposed to a new source of risk – sovereign risk

- What does this mean for credit portfolio managers?
  - Is the behaviour of credit markets affects?
  - Are traditional relationships intact?
- Do they need to change their asset allocation or risk framework?

- Before the crisis
  - Treasury exposure: High/Low rated countries
    - 2007 ratings: Greece A2; Italy AA3; Spain AAA
  - Corporate exposure: Industry selection

Motivation – Adjustments to the Traditional Framework

- What changed?
  - The old paradigm does adapt to the new reality along several dimensions
    - Volatility increase, correlation breakdown, etc
  - The old paradigm does not capture some of the new relationships
    - Treasuries: Dynamic and volatile definition of the blocks
    - Corporates: Significant regional considerations; volatile dependency on sovereigns; can certain firms stay out of this influence?

- The role of specific determinants
  - Country of risk
  - Industry membership
  - Issuer characteristics: Size, international issuance, etc

- We discuss implications for risk management and portfolio construction
- How this could play out in other markets / regions

Agenda

- Motivation
- Data used and evidence of changes in corporate markets
- Analysis of corporate portfolios: industry and regions
- Add sovereigns: relationships with corporates
- Are corporates influenced by sovereigns? Some evidence and risk consequences
- Conclusion

Data and

Evidence of Changes in Corporate Markets

The Data

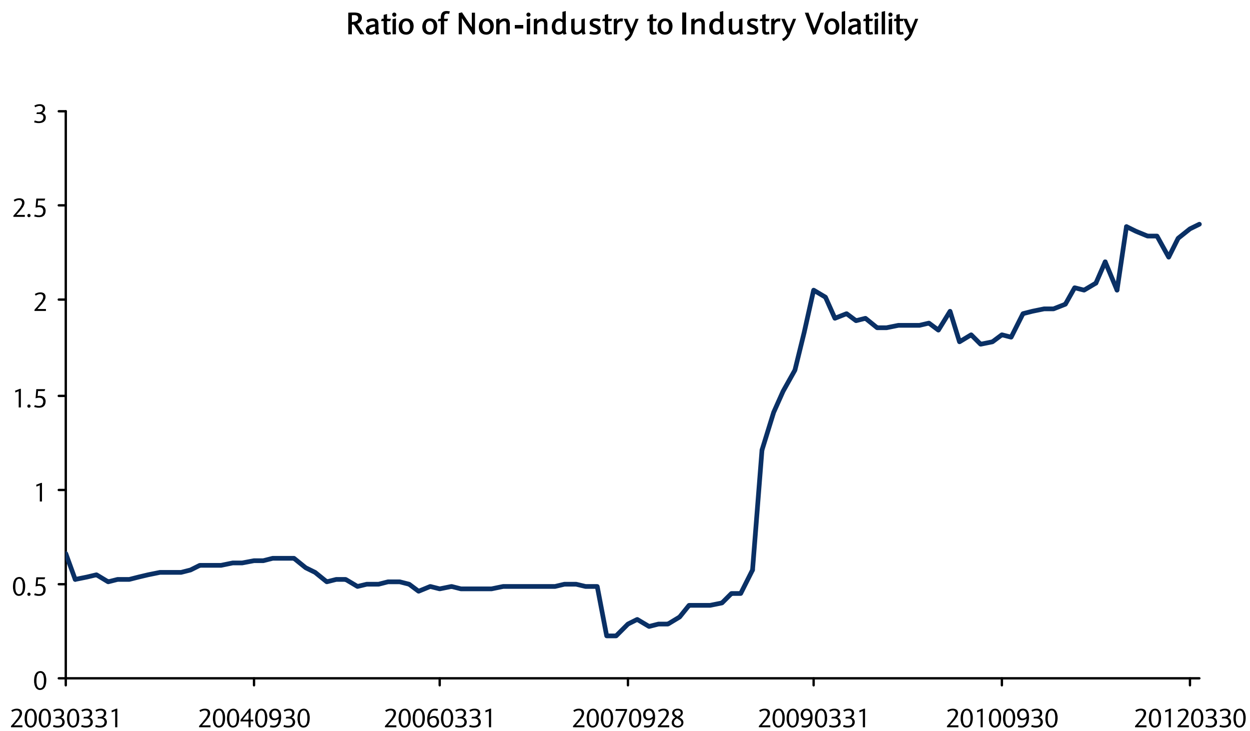
- Barclays European Corporate Index
  - Investment Grade Euro-denominated bonds
- Monthly data from January 2005 to June 2012
- Two regions:
  - Local (L): Spain (ES) and Italy (IT)
  - Core (C): France (FR), Netherlands (NL)
  - Exclude Germany: need treasury spreads
- Issuer returns consolidated across issues

Number of Issuers				
	Total	**Financials**	**Large**	**Large Fin**
Spain	**17**	8	5	2
Italy	**25**	12	7	3
France	**59**	20	14	4
Netherlands	**26**	11	6	3
Total			**32**	**12**

Source: Barclays Research

Changes in Corporate Markets

- From our POINT credit risk model:
  - Excess Return = industry return + non-industry (all other) return
  - Compare the relative importance of both sources of returns



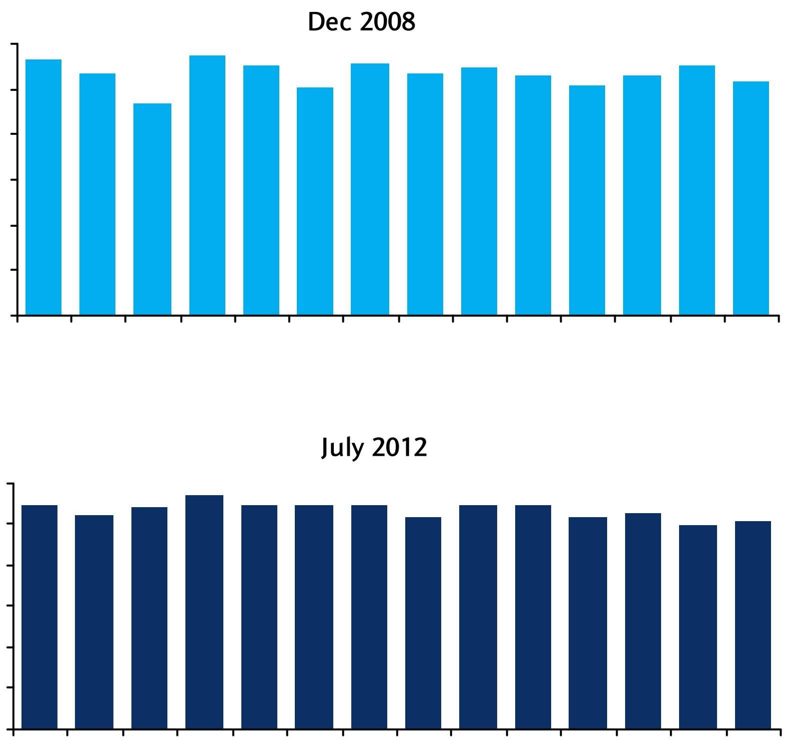
Source: Barclays Research

- What happened? What are the sources of this other volatility?

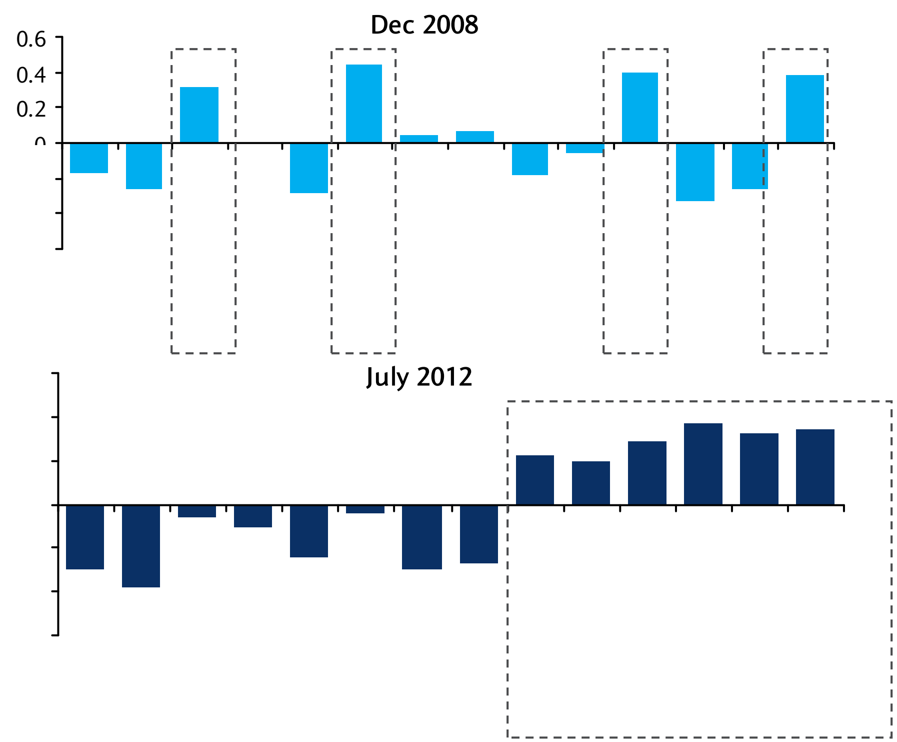
PCA Analysis: Country x Industry Factor Correlation

- Analyze the correlation matrix of 15 buckets: 5 countries x 3 regions
- PC1 explains about 80%: indicates significant commonality
- PC2 explains roughly 6%: 2008 crisis in industry-driven; 2012 is region-driven

PC1 loadings in the 2008 and 2012



PC2 loadings in the 2008 and 2012



Source: Barclays Research

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Explaining Excess Returns of Country Sub-Indices (cont)

- Unexplained returns: Difference between the realized returns of a country sub-index and the returns projected by factor models
- The better the model, the smaller the volatility of unexplained returns
- The Country-Industry factor model seems to do a significantly better job, especially recently

Volatility of Unexplained Returns by Country Sub-Indices (%/m)

Spain		
Period	Industry Only Model	Country-Industry Model
Jan 2008 - Dec 2009	0.68	0.36
Jan 2010 - Dec 2011	0.51	0.24
Jan 2012 - Jun 2012	1.26	0.41

Italy		
Period	Industry Factors	Country-Industry Factors
Jan 2008 - Dec 2009	0.42	0.44
Jan 2010 - Dec 2011	0.85	0.43
Jan 2012 - Jun 2012	1.10	0.26

Germany		
Period	Industry Factors	Country-Industry Factors
Jan 2008 - Dec 2009	0.56	0.44
Jan 2010 - Dec 2011	0.30	0.17
Jan 2012 - Jun 2012	0.69	0.17

France		
Period	Industry Factors	Country-Industry Factors
Jan 2008 - Dec 2009	0.52	0.43
Jan 2010 - Dec 2011	0.47	0.26
Jan 2012 - Jun 2012	0.49	0.21

Source: Barclays Research

- Evidence suggests the use of Industry and Region as major sources of risk

Corporate Portfolios

Describing the Setting

- The basic metric that we use throughout is

  Percentage Change in Spreads (PCS)

  - Note that

    Return = - Duration x Spread x PCS = - DTS x PCS

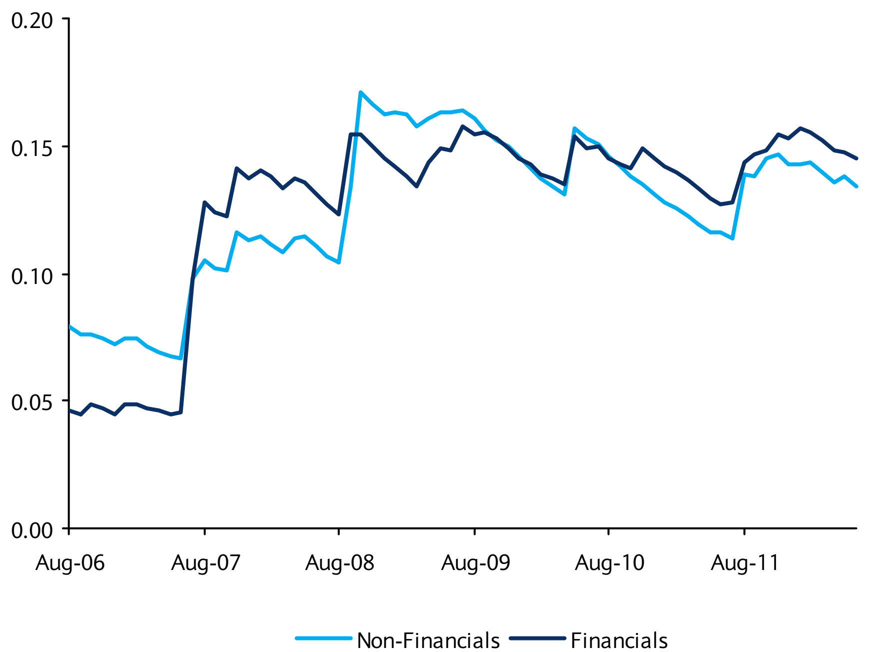
    - Spreads are defined against German Treasuries
    - For spread markets, long-term average values of volatility of PCS is about 10%
    - Changes in the markets not explained by changes in Duration and Spreads

- For each series, we analyze:
  - Construct market value –weighted portfolios for the series
  - Report all analytics as a time-weighted (12 months half life) statistics

Analysis across Industries

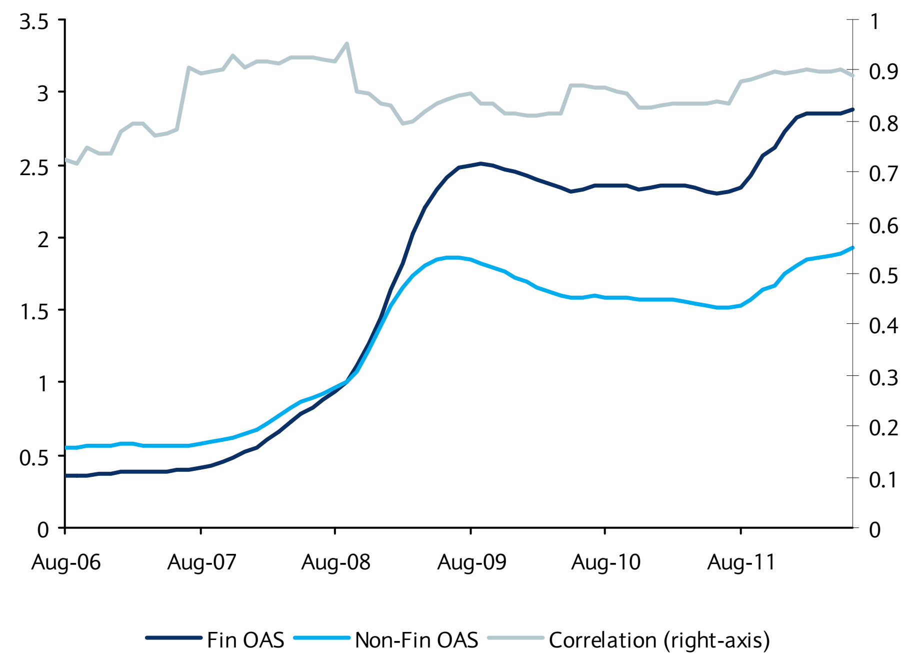
- Volatility of PCS increased significantly in 2007 for financials
- Recently, Financials and Non-Financials have exhibited similar volatilities of PCS (14%)
- For Financials, spread levels increased significantly through 2007 and 2008, and again more recently; OAS are significantly above Non-Financials
- Correlations of PCS across industries remained relatively flat

Volatility of PCS



Source: Barclays Research

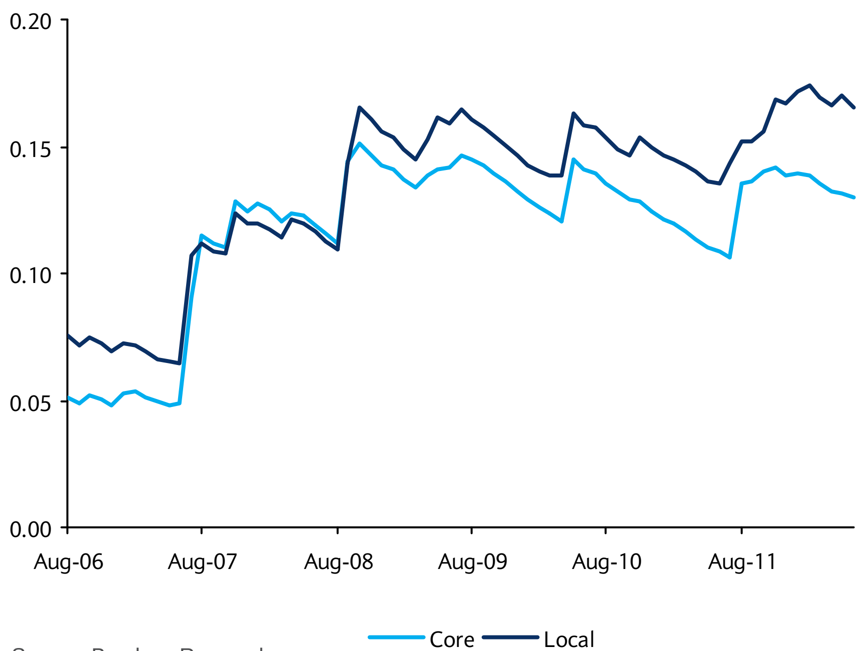
Spread Levels and Correlations



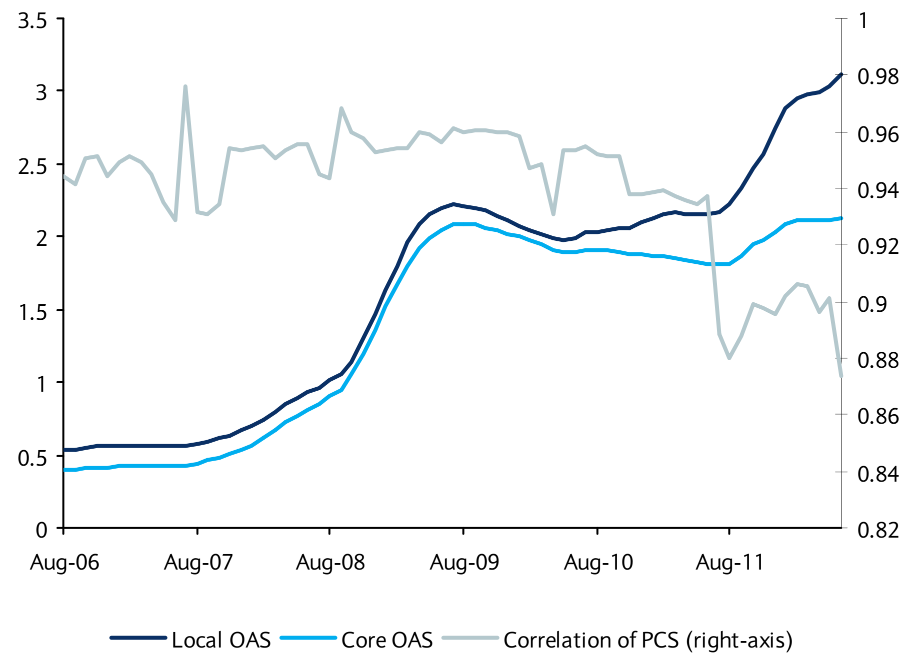
Analysis across Regions

- Volatilities of spreads increase more for local markets (16.5% vs 13%)
  - The divergence is particularly clear more recently
- Spread levels increase significantly more for local markets (3.1% vs 2.1%)
  - Especially with the sovereign crisis
- Correlations of PCS across regions decrease, though not significantly
- Traditional corporate models will have difficulty in capturing this divergence

Volatility of PCS



Spread Levels and Correlations of PCS

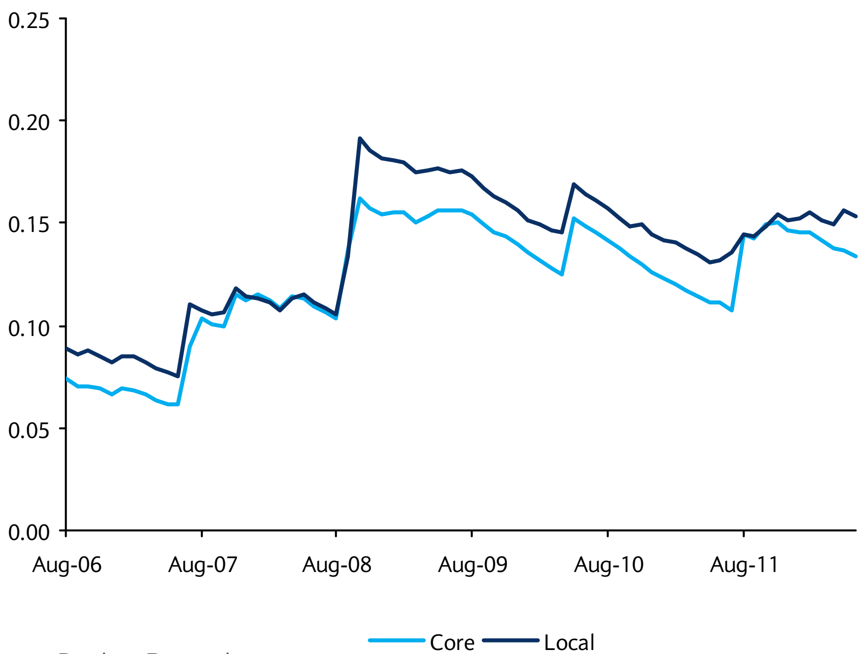


Source: Barclays Research

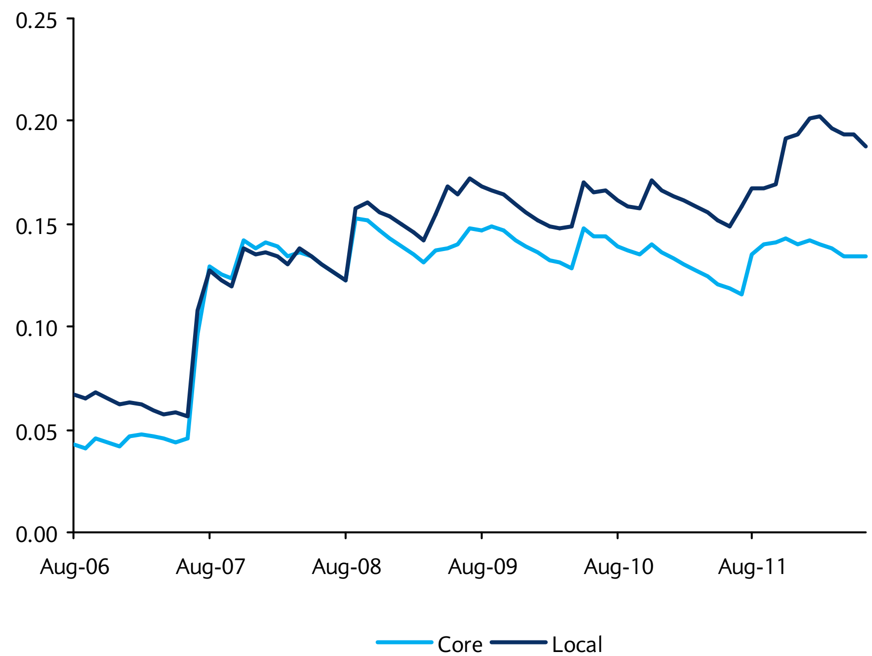
Analysis across Industries & Regions

- For Non-Financials, major shifts came with the credit crisis
- Divergence of behavior in PCS volatility comes mainly from the Financials
- Differences are important: Bonds with the same DTS profile show
  - 50% higher volatility for Local Financials (vs Core Financials)
  - 40% higher volatility for Local Financials (vs Local Non Financials)

Volatility of PCS – Non Financials



Volatility of PCS – Financials



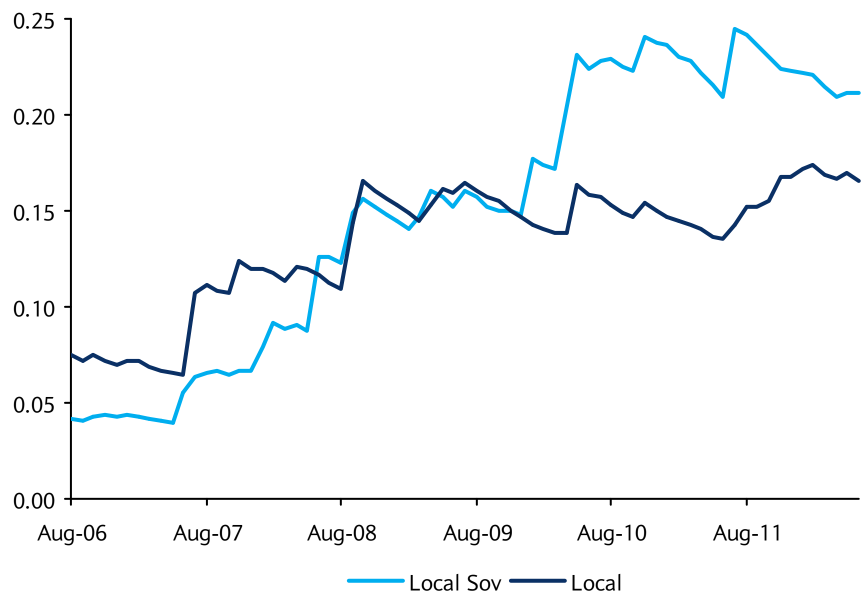
Source: Barclays Research

Adding Sovereigns

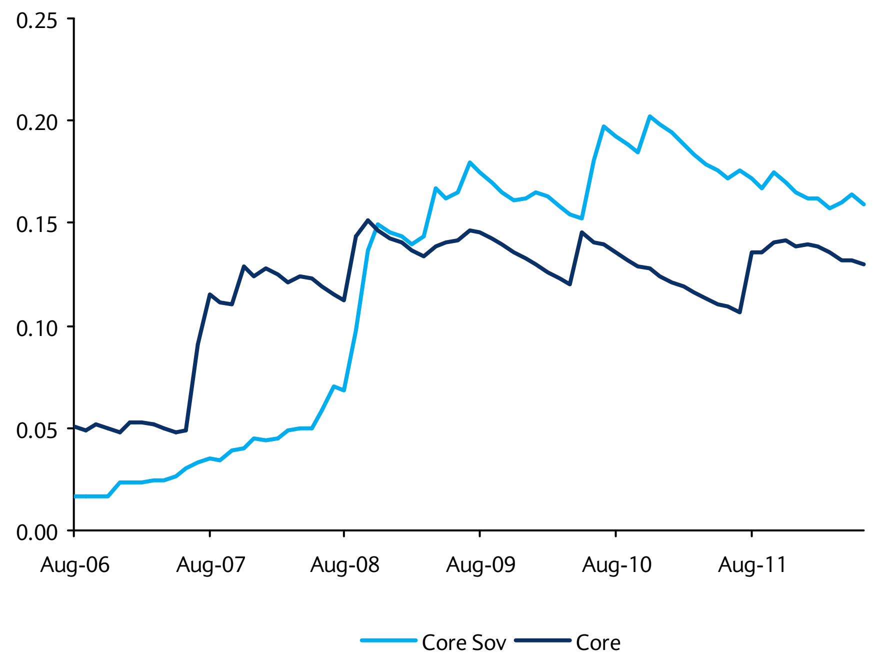
Sovereigns vs Corporates – Volatility of PCS

- Volatility of PCS for Sovereigns *higher* than that of Corporates
  - Stable after the credit crisis for Core
  - Continuously increasing for Local (high close to 25%!)
- Volatilities of PCS merged with credit crisis, but took off after that
- Similarity of volatilities hides significant differences between Core and Local sovs
- Close to Financials: are sovereigns like other non-corporates?

Volatility of PCS - Local



Volatility of PCS - Core

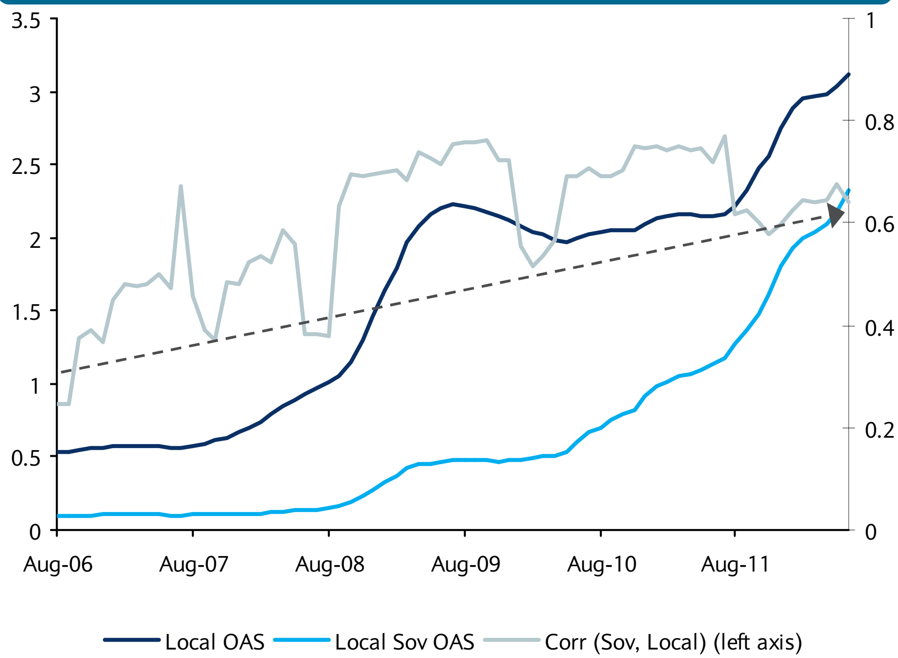


Source: Barclays Research

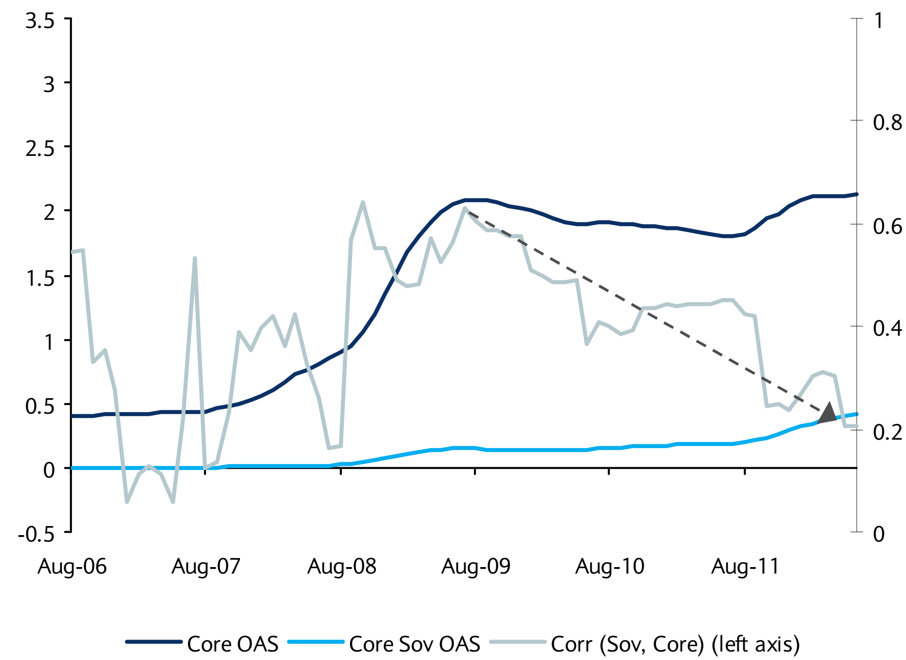
Sovereigns vs Corporates – Spreads and PCS correlations

- For Local region:
  - Spread levels increase significantly and continuously
  - Correlation between PCS of Sovs and Crps increase with OAS
- For Core region:
  - Muted increases in sovereign spreads
  - Significant decrease in correlations, even with stable corporate spreads
- Traditional frameworks may have difficulty in capturing this distinctive behavior of correlations
- Change in correlations have significant effect on effective durations

OAS & PCS Correlations - Local



OAS & PCS Correlations - Core



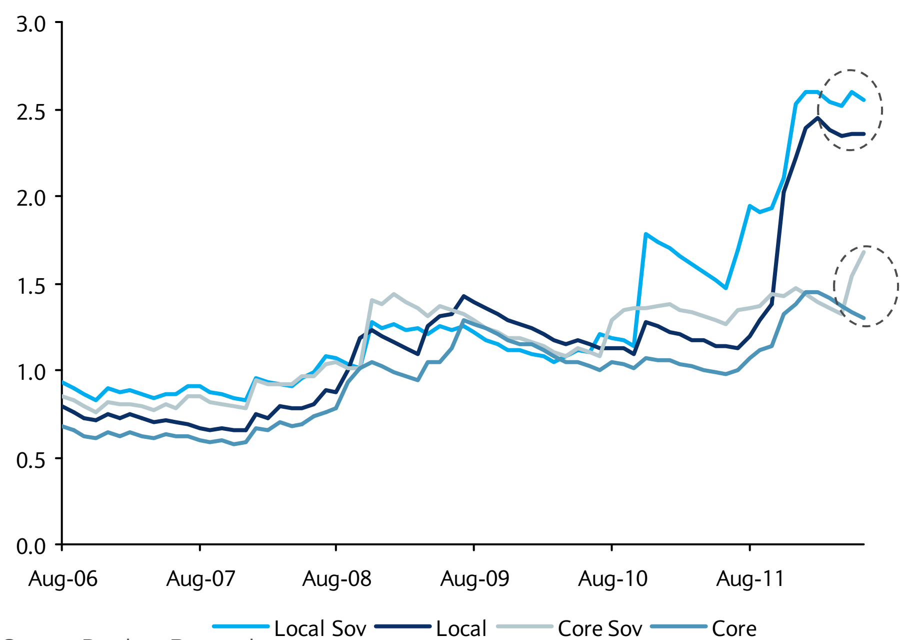
Source: Barclays Research

Comparison with German Treasuries

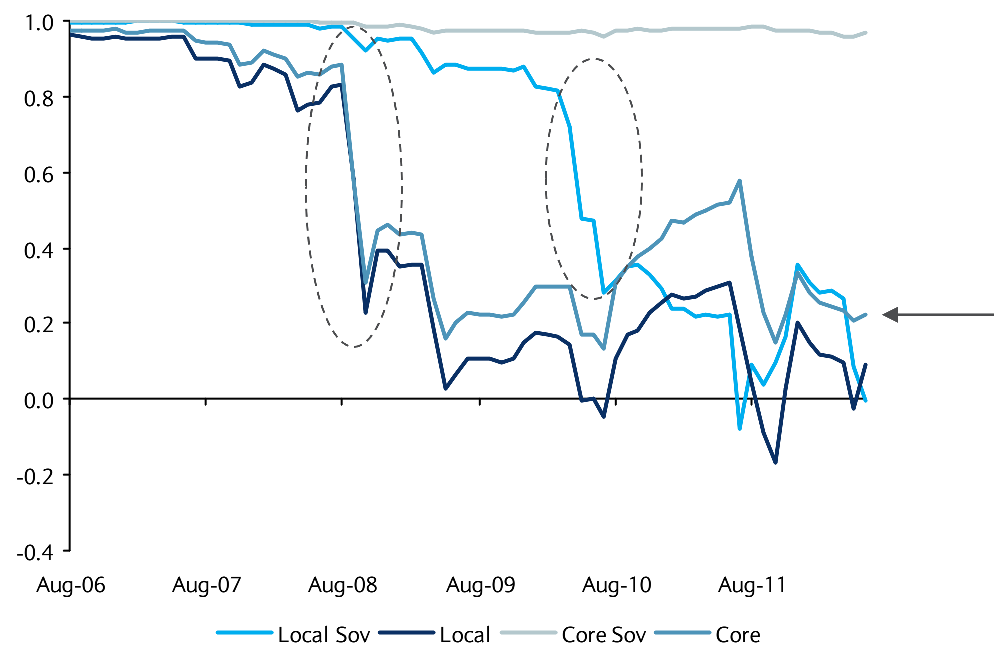
Shift the analysis to Total Returns (German Treasuries have no spreads)

- Divide in terms of volatility between local and core regions (spread level differences)
- Pattern of historical correlations with German treasuries:
  - Corporate correlations collapse after the credit crisis (Core stable at about 0.4)
  - Sovereign Local correlations collapse during the present crisis
  - Sovereign Core correlations are steady at close to one

Volatility of Total Returns



Correlations with German Treasuries



Source: Barclays Research

Analysis so Far…

- Significant change in the European corporate markets over the last 5 years
  - Brought by both the credit and the sovereign crisis
  - Significant relative increases in volatility
  - Significant increase in volatilities for Financials
  - Significant increase in Sovereign volatilities

- Significant divergence of behaviour
  - Across sovereigns
  - Across corporates
  - Between corporates and sovereigns

Traditional approaches may have trouble coping with these changes

↓

Dynamic Dependency on Sovereigns

Corporate Dependencies on Sovereign Spreads

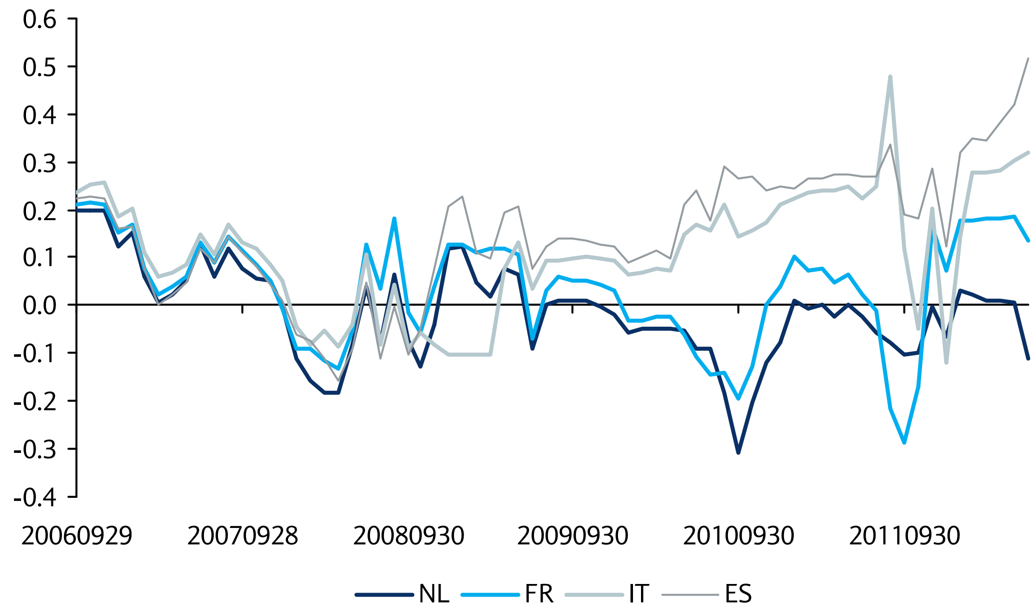
Lead-Lag Between Sovereign and Corporate Spreads

- Changes in sovereign spreads lead changes in corporate spreads?

- Consider Corporate-Sovereign spread correlations with a one-month lag

- A visible recent divide between Local and Core countries

Correlation of Corporate and Lag Sovereign PCS



- Fore the Local countries

$$PCS_t^{CRP} = \alpha + \beta_S PCS_{t-1}^{SOV} + \beta_C PCS_{t-1}^{CRP}$$

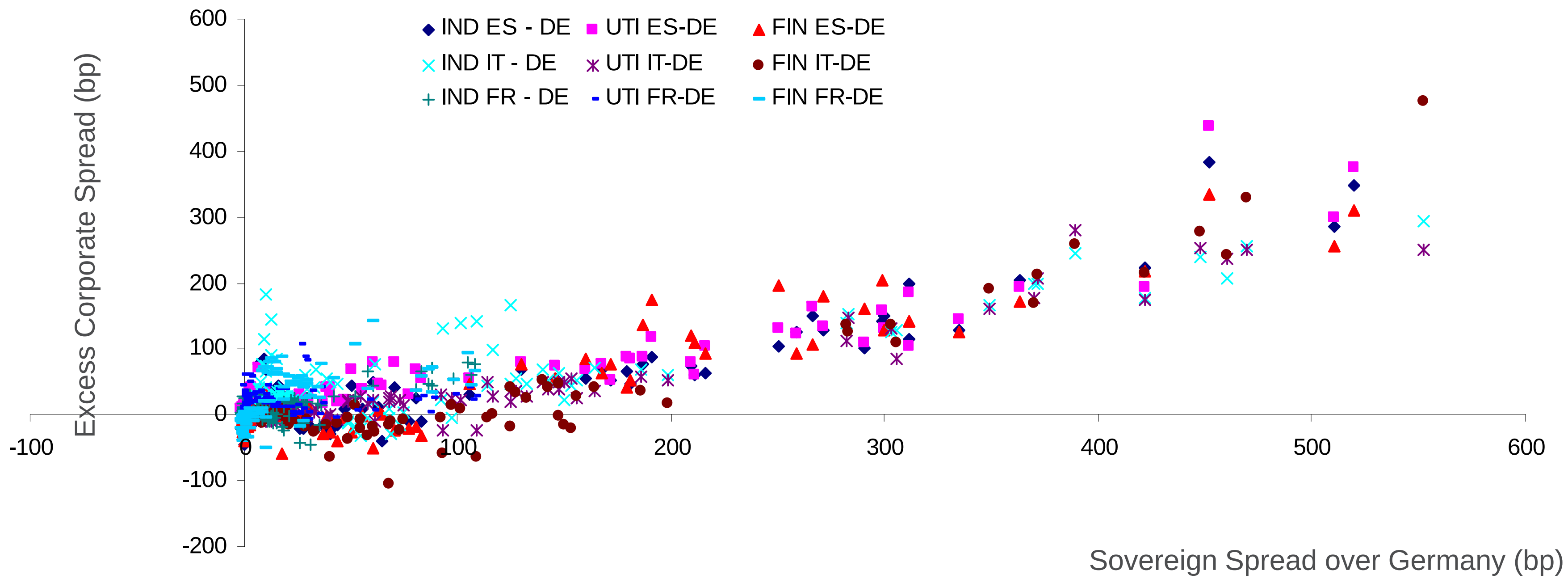
	α	β_S	β_C
Estimate	0.00	0.26	0.12
t-stat	-0.62	2.48	0.95

Source: Barclays Research

Comparison with German Corporates

- Plot excess spread of corporates vs German peers
  - Analysis per country x industry
- Spread premia over German peers seem to be positively related to sovereign spread levels beyond a 100-200 bps threshold
- The relationship seems to be similar for different country / industry groups

Excess Corporate Spreads (by Industry x Country) over German Peers vs. Sovereign Spreads

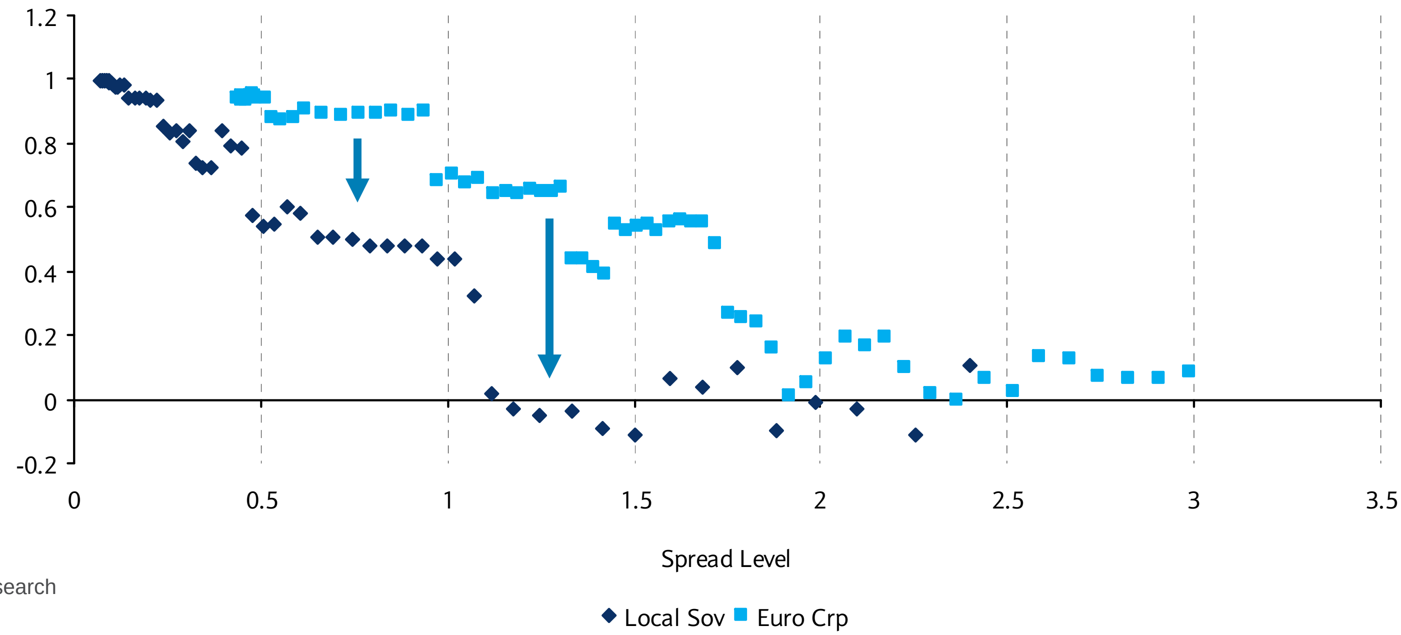


Source: Barclays Research

Comparison between Corporates and Sovereigns

- How does volatility with German Treasuries change with level of spreads?
- Are sovereigns like corporates?

Total Return Correlation with German Treasuries by OAS level



Source: Barclays Research

- The collapse of correlations is quite premature in terms of spreads
- Euro corporates: close to US and to EM Sovereigns

Analysis so Far II…

- Corporate dependencies on Sovereigns
  - Sovereign seem to lead corporate spreads for local markets
  - Premium corporate spreads demanded for Sovereign with spreads > 100/200 bps

- Specific characteristics
  - Volatilities of sovereigns significantly higher than comparable corporates
  - Correlations with DE Treasuries collapse for sovereigns spreads > 100/200 bps

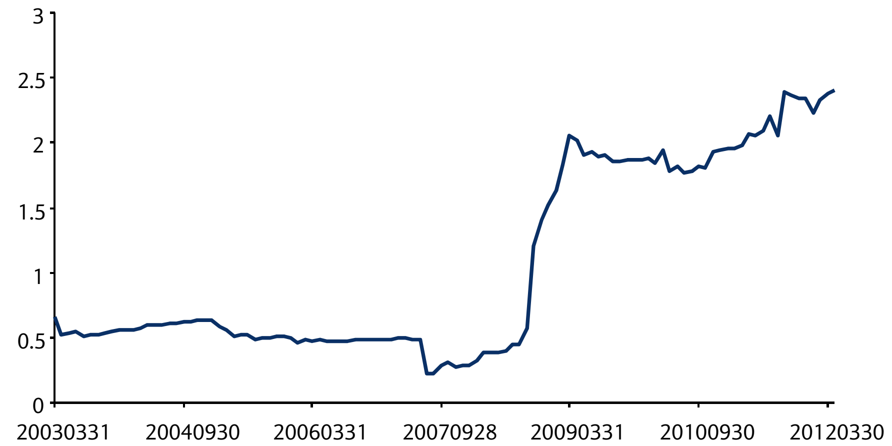
- Distressed developed sovereign factor?
  - Specific country group is dynamic
  - For treasuries: historical data may not be relevant when countries can move between groups rapidly; What if the situation deteriorates in France? Or improves in Spain?
  - For corporates: Specific sovereign risk that may overwhelm industry effects?
  - What is the exposure of corporates to this factor? Uniform across issuers?

Implications for Risk

- Sovereign have impact on the level and behavior of corporate spreads
- How can we introduce this fact on a risk framework?
  - Directly impose a relationship between a corporate and its sovereign
    - Corporate = Sovereign + Basis
    - Significant drawbacks:
      - Sovereigns behave very differently than corporates, even for distress countries (vols of PCS are much higher, correlations colapse faster)
      - For some countries, sovereigns does not relate with spreads
  - Allow for an indirect relationship through correlations of systematic risk sources
    - More flexible and adaptable model
  - Example:
    - Industry still a significant source of risk
    - Idiosyncratic risk (from an industry model) still has important country effects
    - Different firms will load into this country effect based on specific characteristics

Implications for Risk

- Idio volatility from an industry-only factor risk model



Source: Barclays Research

- Using the idio to compute country corporate risk factors

Volatility of Percentage Change in Spreads (PCS)				
Model	**France**	**Netherlands**	**Italy**	**Spain**
Country Factor	0.02	0.02	0.04	0.10
Corr with Sovs	*0.01*	*0.00*	*0.51*	*0.12*
Industry Benchmark	0.15	0.15	0.15	0.15
	0.60	*0.59*	*0.61*	*0.57*
Industry + Country	0.15	0.15	0.16	0.19

Source: Barclays Research

- Different experiences per country: specific firm behavior, level of Sov OAS, etc

Sovereign Risk and Corporate Characteristics

- Does sovereign risk influence equally all issuers

- We investigate along the following dimensions:
  1. Industry membership: Financials vs Non-Financials
  2. Size: Large vs small
     - Issuer is large if MV issues in the top 40%
  3. Issuance footprint: External issuance
     - Issuer is international if issues in more than one country
  4. Relative issuer rating
  5. Relative Issuer spread

- No particular patterns across these dimensions in terms of correlations
  - Except for Financials
  - Read our analysts reports – there is a wide range of behaviours

Results

- Significant change in the European corporate markets over the last 5 years
  - Brought by both the credit and the sovereign crisis
  - European markets now closer to the US market
  - In addition to industry, an important role for country in corporate portfolios
- Corporate side
  - Significant increase in relative volatility across Corporates
  - Significant increase in the risk of Financials from Local markets
- Adding Sovereign
  - Significant increase in volatility across all sovereigns
  - Significant divide between Local and Core countries
  - Core corporates move significantly apart from their Sovereigns
  - Significant lead and spread premium effect for sovereign spreads
- Interaction of Sovereigns with corporates change significant when sovereign spreads >100/200 bps
- Inconclusive firm analytics perspective

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