

How to measure country risk?

Produced by: *Cross-country Emerging Markets Unit*

For the Occasion of: *Second BBVA Research Emerging Market Seminar*

Madrid, July 13, 2011

Road map to the presentation

1. Previous work on country risk (CR)
2. Our methodology
3. Results
 - 3.a Key determinants of CR
 - 3.b Differences across regions
4. Conclusions

1. Previous work on country risk

Previous Economic Policy Research

	Dependent variable	Type of Model	Global Variables	Idiosyncratic Variables
IMF¹	EMBI Spread (Levels)	Static Long run (panel)	3 month Fed Funds Volatility Fed Funds VIX	Credit Rating Index
IADB²	EMBI Spread (Differences)	Dynamic & Static (panel ECM)	10 year US bond High Yield US corporate paper	Credit Rating Index
Bank of England³	EMBI Spread (Differences)	Dynamic & Static (PMG)	10 and 30year US bond US Baa-Aaa spread SP500 index	Fiscal Budget, Openness Amortization to Reserves Current Account Short term Ext Debt /Reserves
ECB⁴	Sovereign Debt Ratings (Levels)	Static (Ordered Probit)		GDP per capita, GDP growth, Unemployment, Inflation, Gov. Debt, Govt. Balance, Govt Effectiveness External Debt, Curr. Account, Reserves, Default History

(1) Hartelius et al (2008): "Emerging Market Spread Compression: Is it Real or is it Liquidity?". IMF WP 08/10
 (2) Gonzalez Rozada and Levy Yeyati (2006): Global Factors and Emerging Market Spreads. IADB WP 552
 (3) Ferruci (2003) Empirical determinants of emerging market economies' sovereign bond spreads BOE WP 205
 (4) Afonso et al (2007). What "HIDES" Behind Sovereign Debt Ratings. ECB WP 711

2. Our methodology

Sample coverage

Country risk (CR)_proxied by CDS spreads

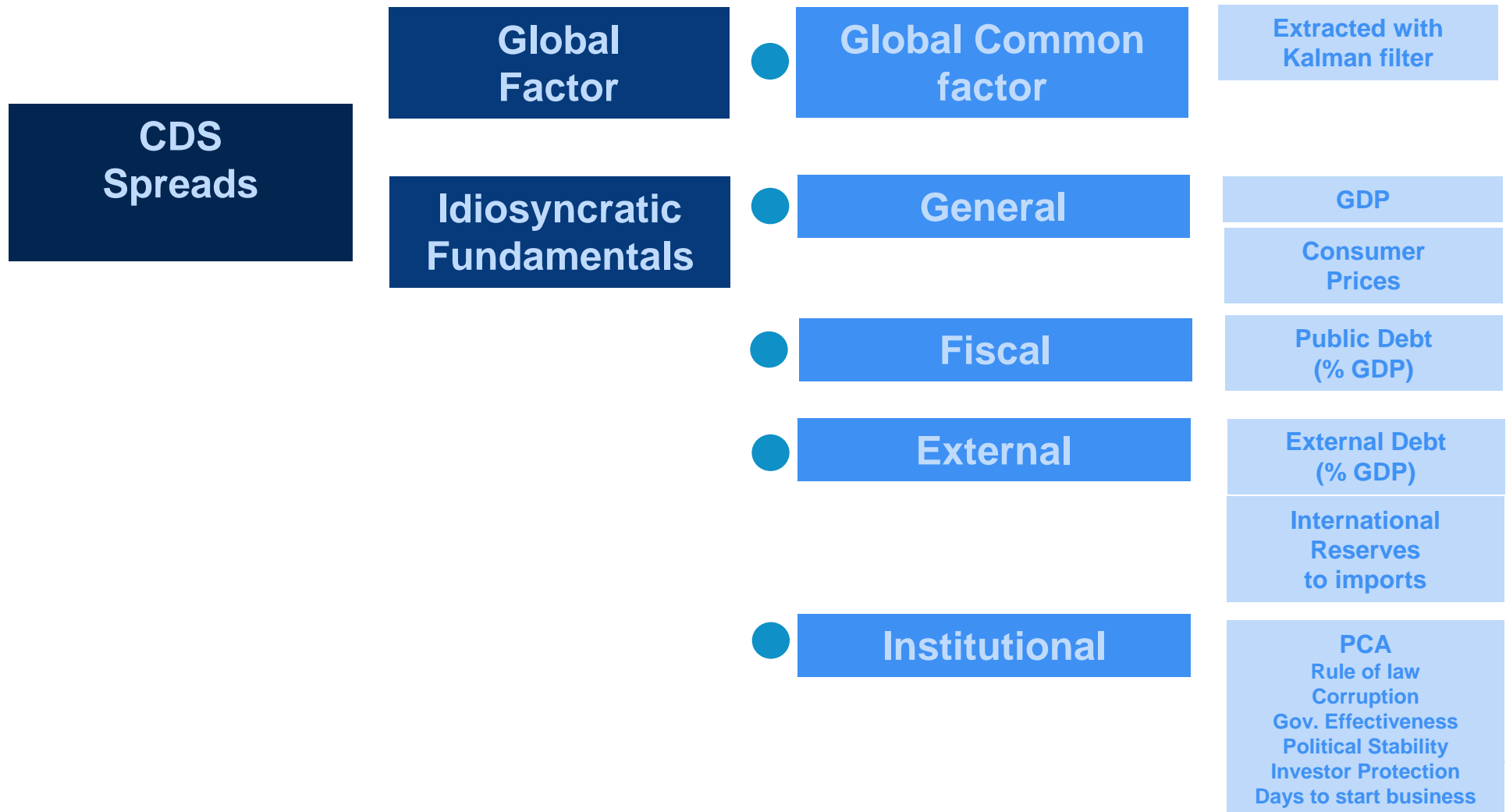
Sample period: lifespan of CDS (2004 to 2001)

Number of countries: determined by data availability
(mainly CDS but also CR determinants)

Developed Countries		Emerging Countries		
Europe	Asia	EMEA	Asia	Latam
Austria Belgium Denmark France Germany Greece Ireland Iceland Italy Norway Portugal Sweden Spain	Australia Japan	Bulgaria Croatia Czech Rep Hungary Poland Romania Russia Slovenia Slovakia Turkey South Africa	China Indonesia Malaysia Philippines S.Korea Thailand	Argentina Brazil Chile Colombia Mexico Peru Venezuela

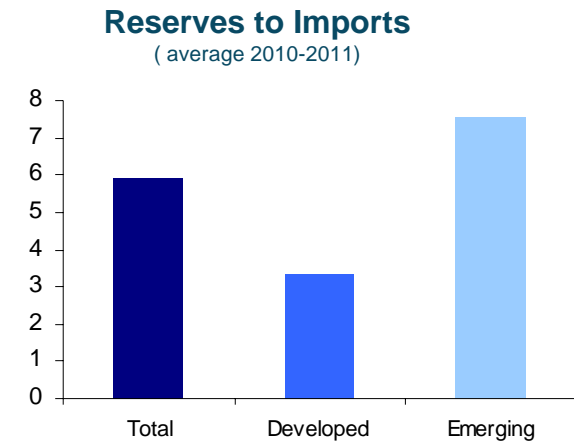
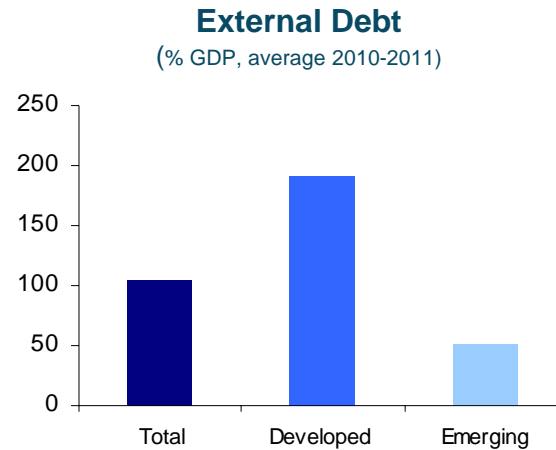
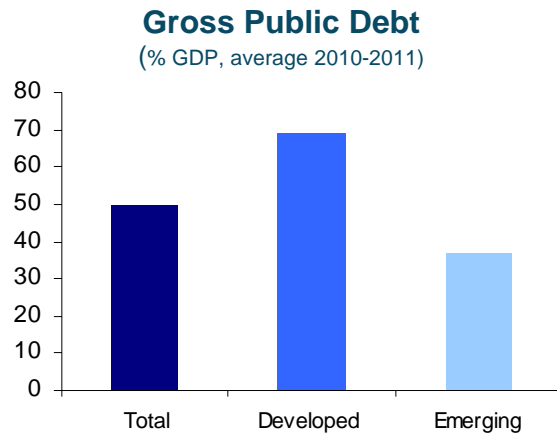
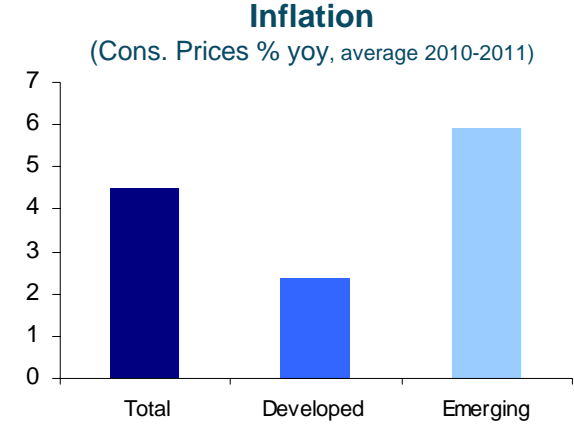
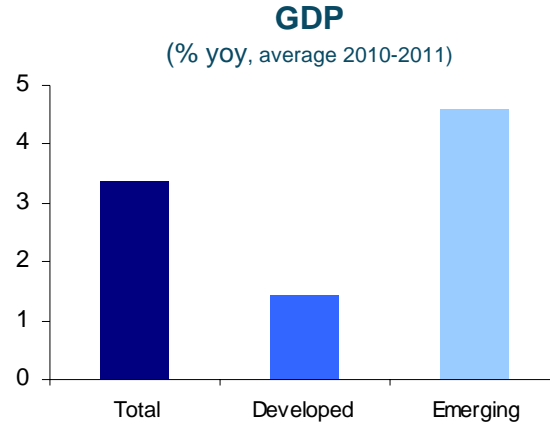
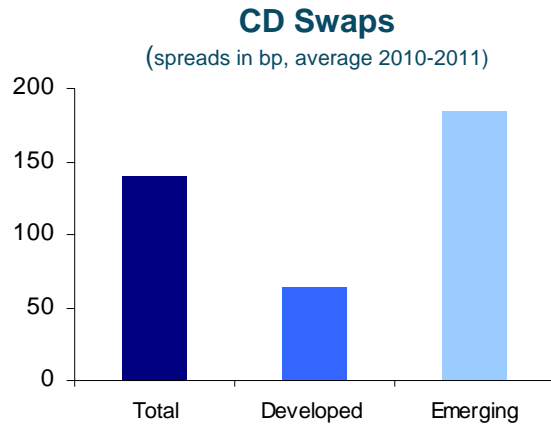


Variables chosen





A quick look at the data



Extracting the Global Component

State
Space
Model

Measurement Equation

$$CDSwaps_{i,t} = \mu_{1,t} + \beta_{j,t} x_{i,j,t} + v_{i,t},$$

State Equation

$$\beta_{j,t} = \beta_{j,t-1} + \omega_{\beta j,t-1},$$

$$\mu_{1,t} = \mu_{1,t-1} + \omega_{\mu 1,t-1}$$

Unobserved
CD Swaps
Global
Component

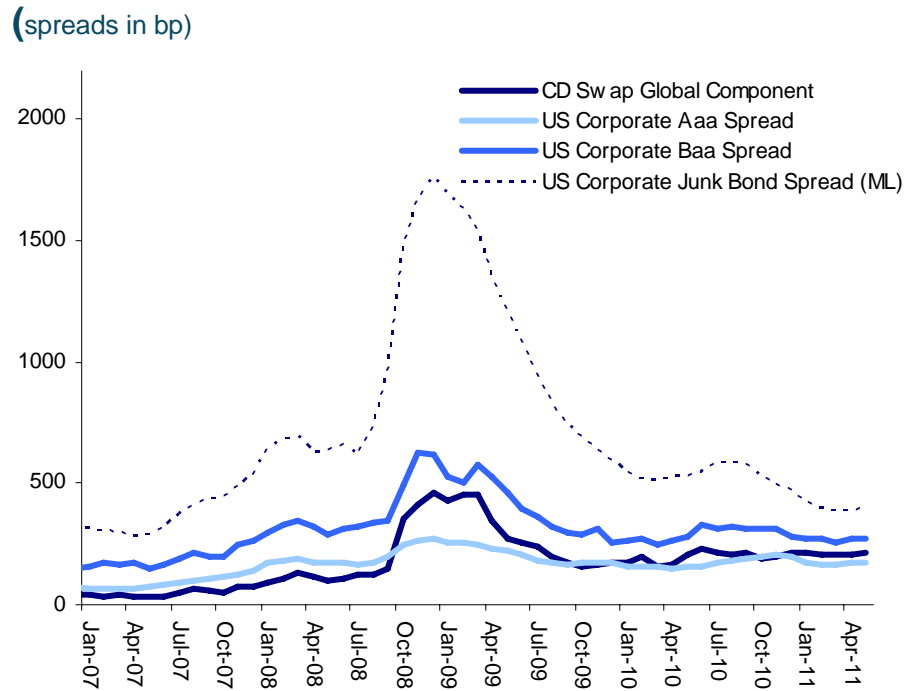
Where, $v_t \sim N(0, \Sigma_t)$ and $\omega_t \sim N(0, \Omega_t)$

$j \in (1, r), i \in (1, n)$

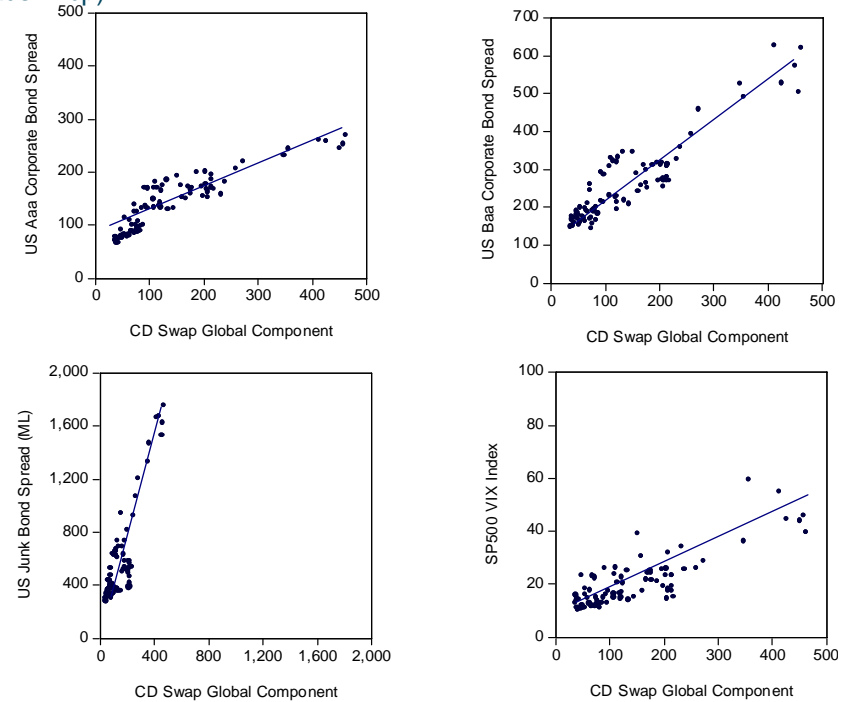
We use the State Space Model to isolate the Global from the idiosyncratic model in the most possible orthogonal way

Our global component vs other measures

Our measure vs alternatives Measures of Global Risk Aversion



CD Swap Global component vs alternative measures
(spreads in bp)



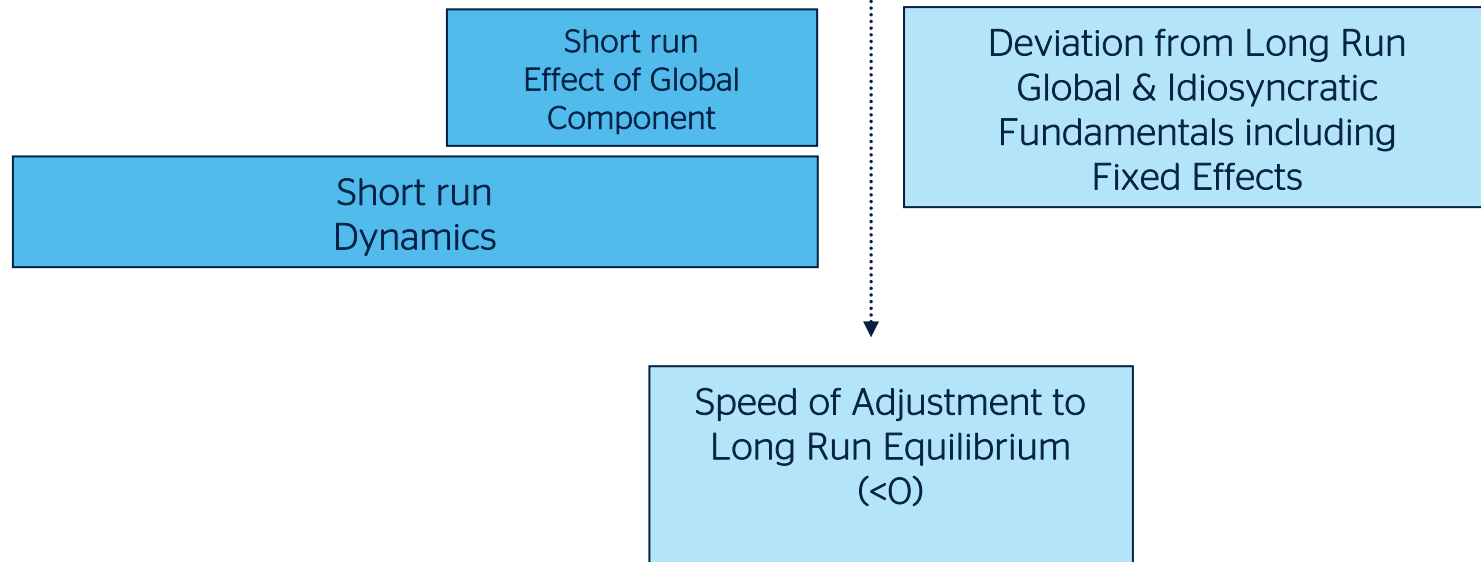
The extracted Global Component moves close to other alternative Global Risk Measures... Specially the US Baa Corporate Bond Spread. Junk bond too volatile

Panel Data Model to explain SR

Panel Data Dynamic Error Correction Model (ECM)

$$\Delta \log(CDSwap)_{i,t} = \beta \Delta \log(CDSwap)_{i,t-1} + \phi \Delta \log(Global)_{t-1} + \lambda (CDSwap)_{i,t-1} - \gamma X_{i,t-1} - FEff_i + \nu_{i,t}$$

Change
In Spreads





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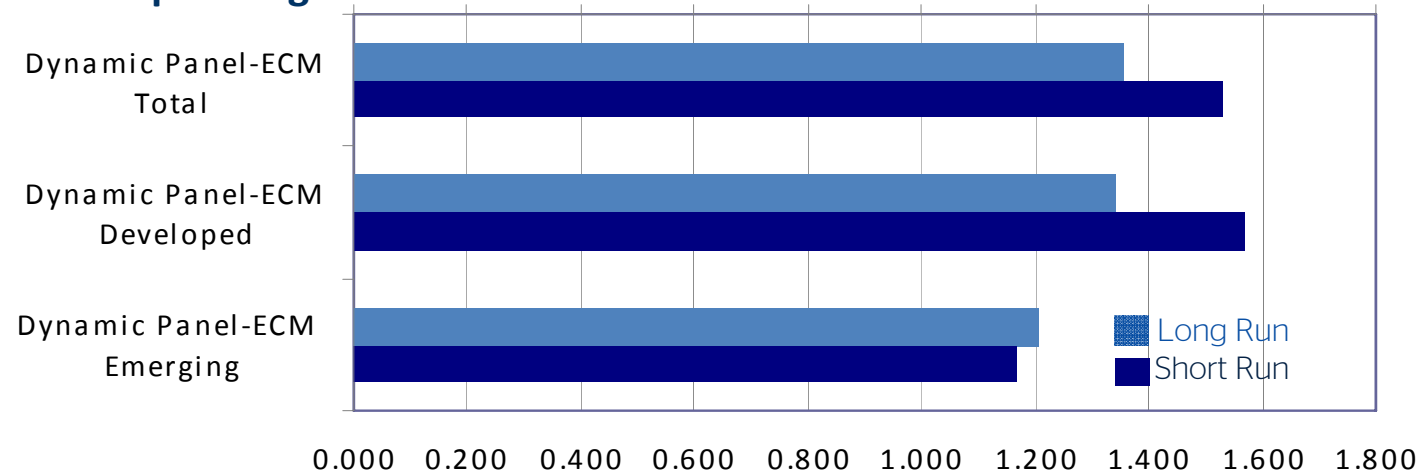
3 .Results

_3.a Key determinants of CR



Global risk aversion matters in the long run

CD Swaps Long & Short Run Elasticities: Global Factor

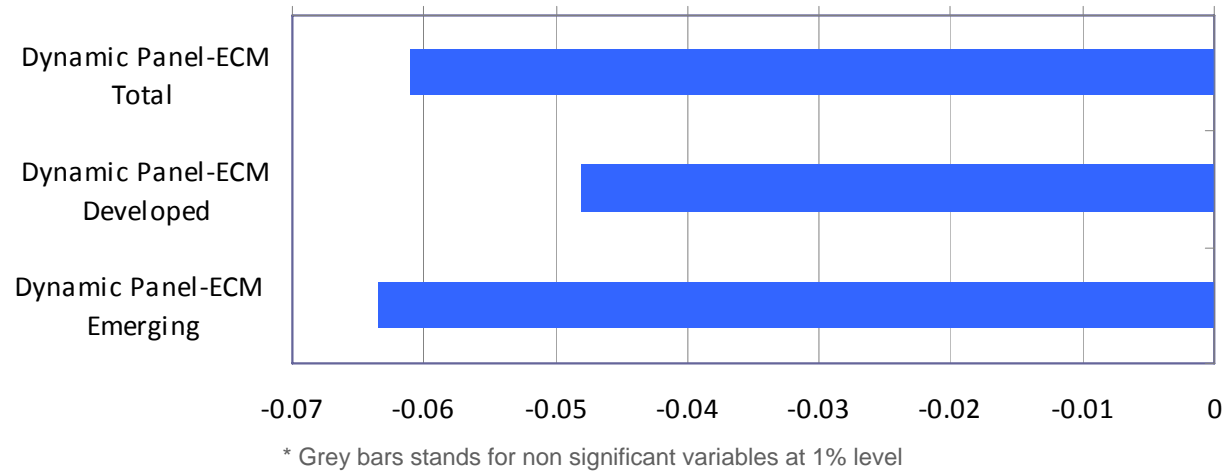


Global developments (global risk aversion) do matter even in the long run with a higher than unitary elasticity



Long -term results relevant

CD Swaps Speed of Adjustment to Long Run Equilibrium

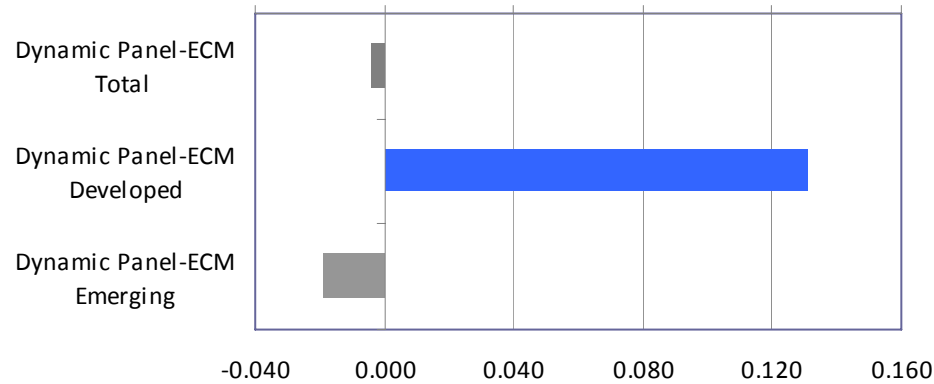


This is because the stimated speed of adjustment to the equilibrium is quick (75% of the shock adjusts in 1 year).



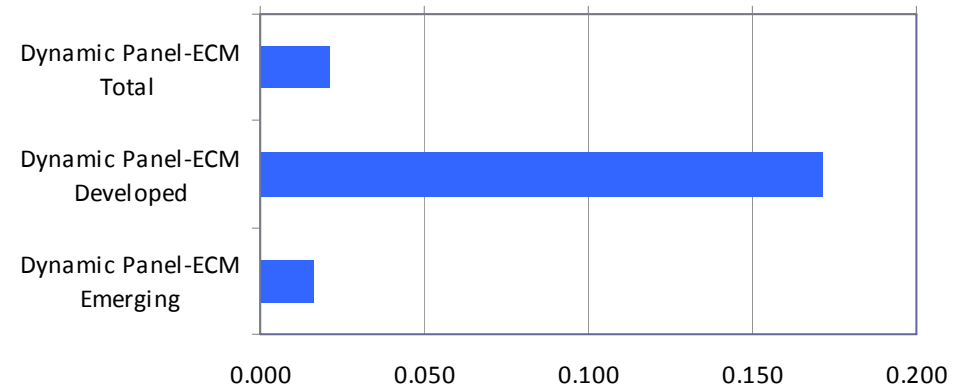
Relevance of GDP& inflation

CD Swaps Long Run Elasticities: GDP



* Grey bars stands for non significant variables at 1% level

CD Swaps Long Run Elasticities: Consumer Prices



* Grey bars stands for non significant variables at 1% level

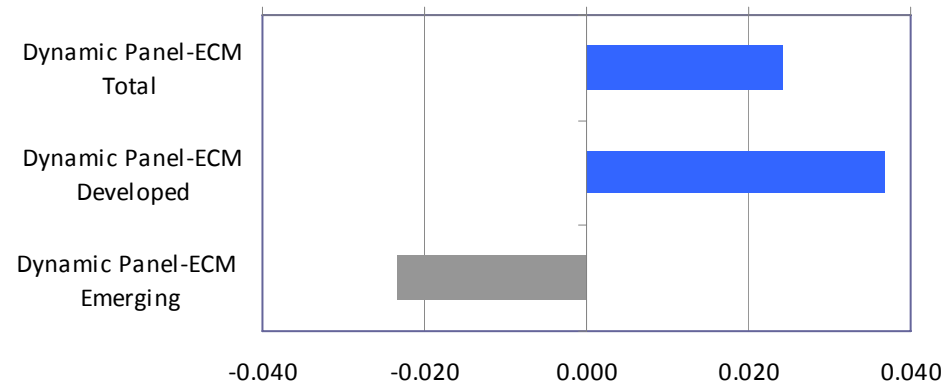
Economic growth does not seem relevant for emerging markets but it is for the developed world.

Inflation appears to be more relevant for the developed world (or the absence of it)



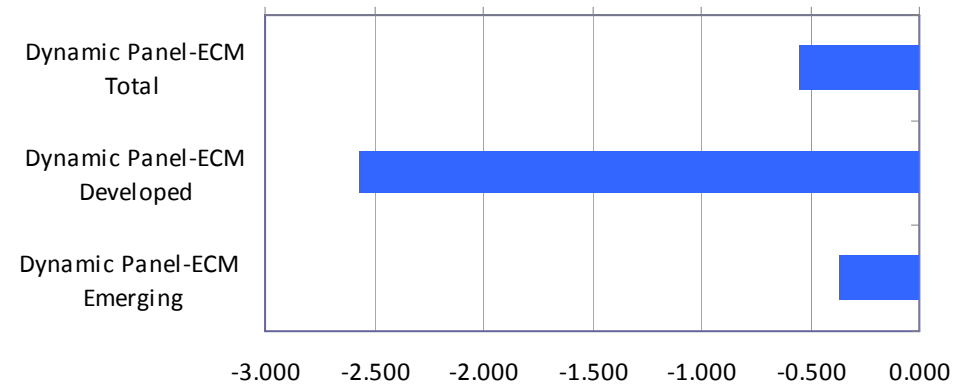
Relevance of Public Debt & Institutions

CD Swaps Elasticities: Public Debt (% GDP)



* Grey bars stands for non significant variables at 1% level

CD Swaps Elasticities: Institutional (kauffman)



* Grey bars stands for non significant variables at 1% level

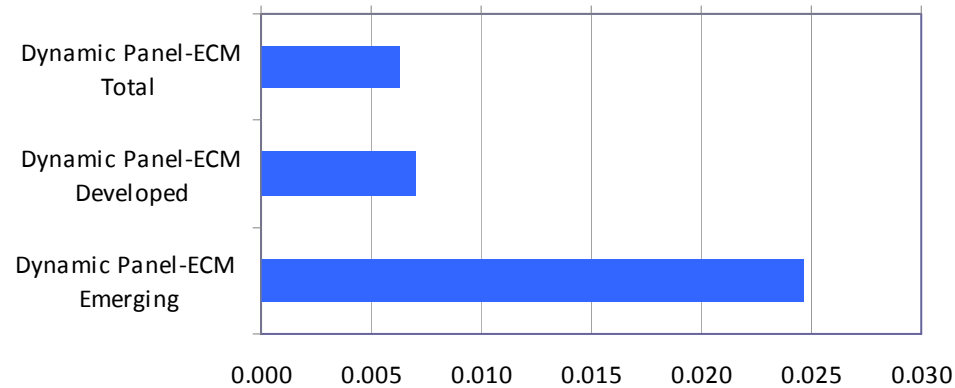
The increase in public debt worsens country risk in developed countries. The result is inconclusive for emerging economies

Institutional factors affect country risk, especially for developed economies

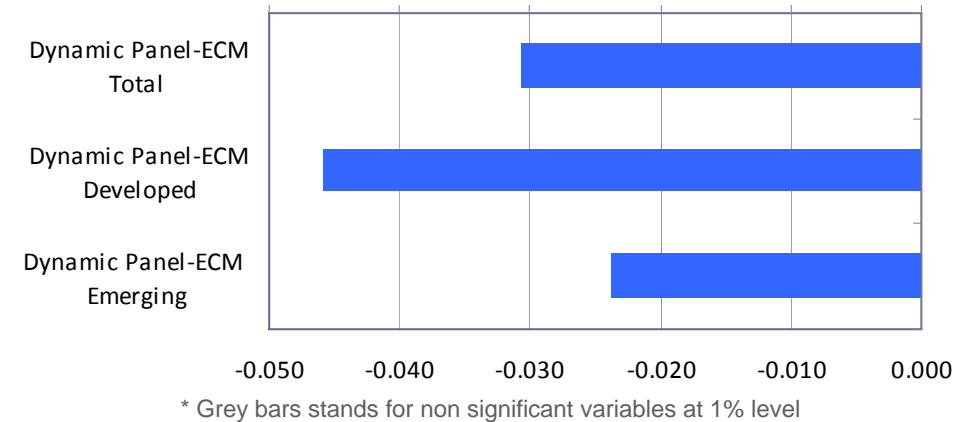


Relevance of external liquidity measures

CD Swaps Elasticities: External Debt to GDP



CD Swaps Elasticities: Reserves to Imports



External debt matters but especially in emerging markets

A comfortable liquidity position in terms of international reserves to imports helps to reduce the spreads



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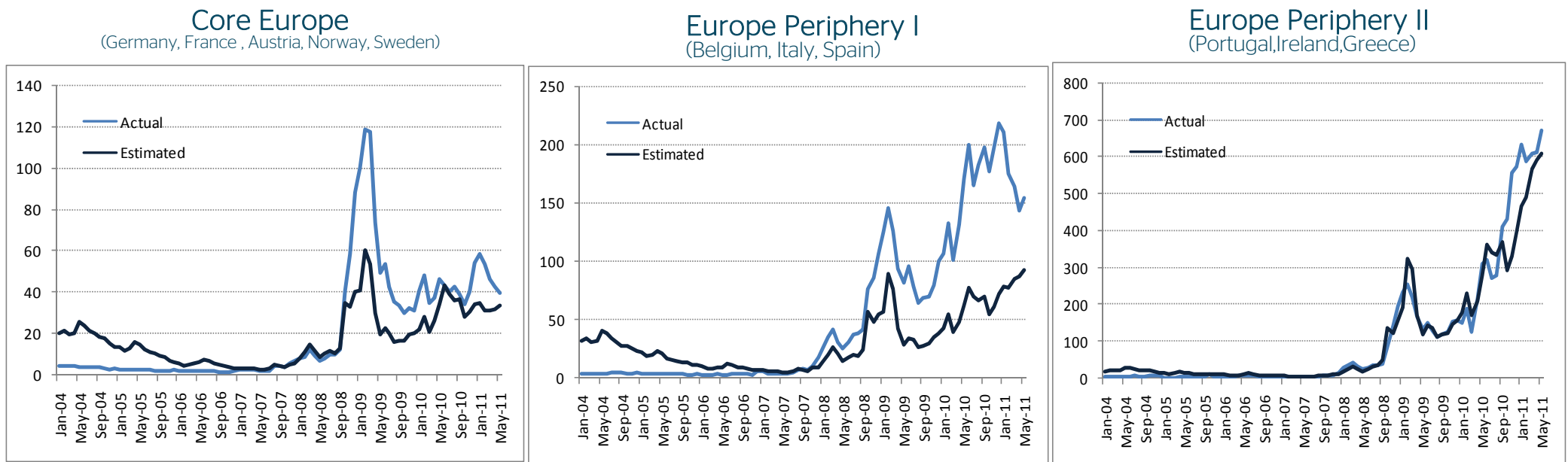
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3 .Results

_3.b Differences across regions

Developed Europe: Actual vs Equilibrium CR

Actual CD Swaps and estimated equilibrium CR from panel ECM (median CDSwaps by region)

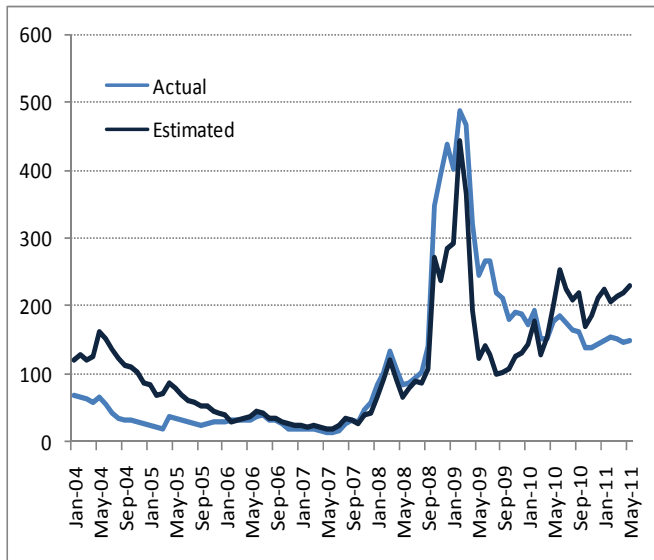


- Core Europe remains above but near “safe” long run equilibrium levels
- Portugal, Ireland and Greece current CDS level is similar to the equilibrium one
- Spain, Belgium and Italy’s country risk is clearly above the equilibrium: Contagion exists

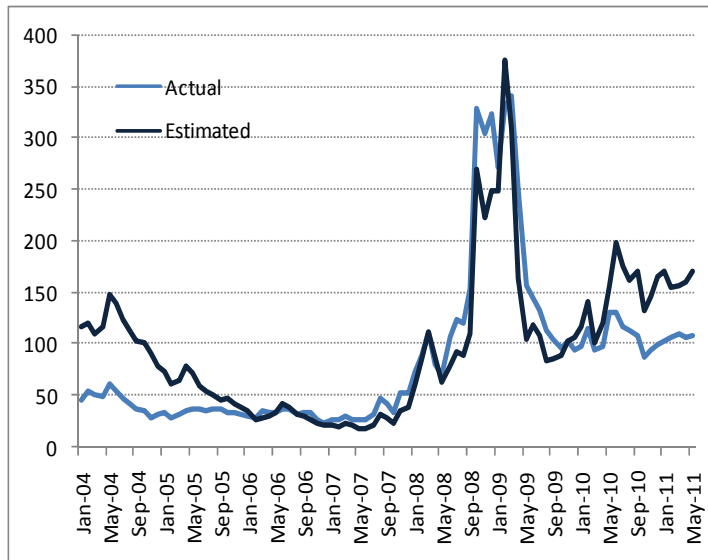
Emerging markets: Actual vs Equilibrium CR

Actual CD Swaps and estimated equilibrium CR from dynamic ECM (median CDSwaps by region)

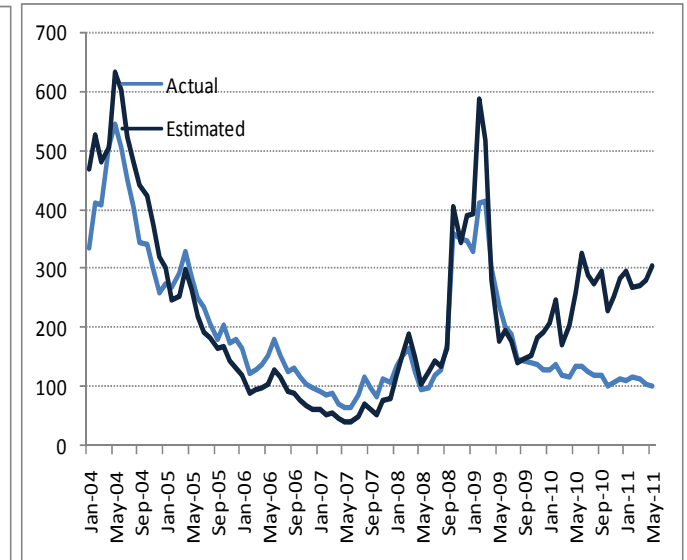
Emerging Europe



Emerging Asia



Latam

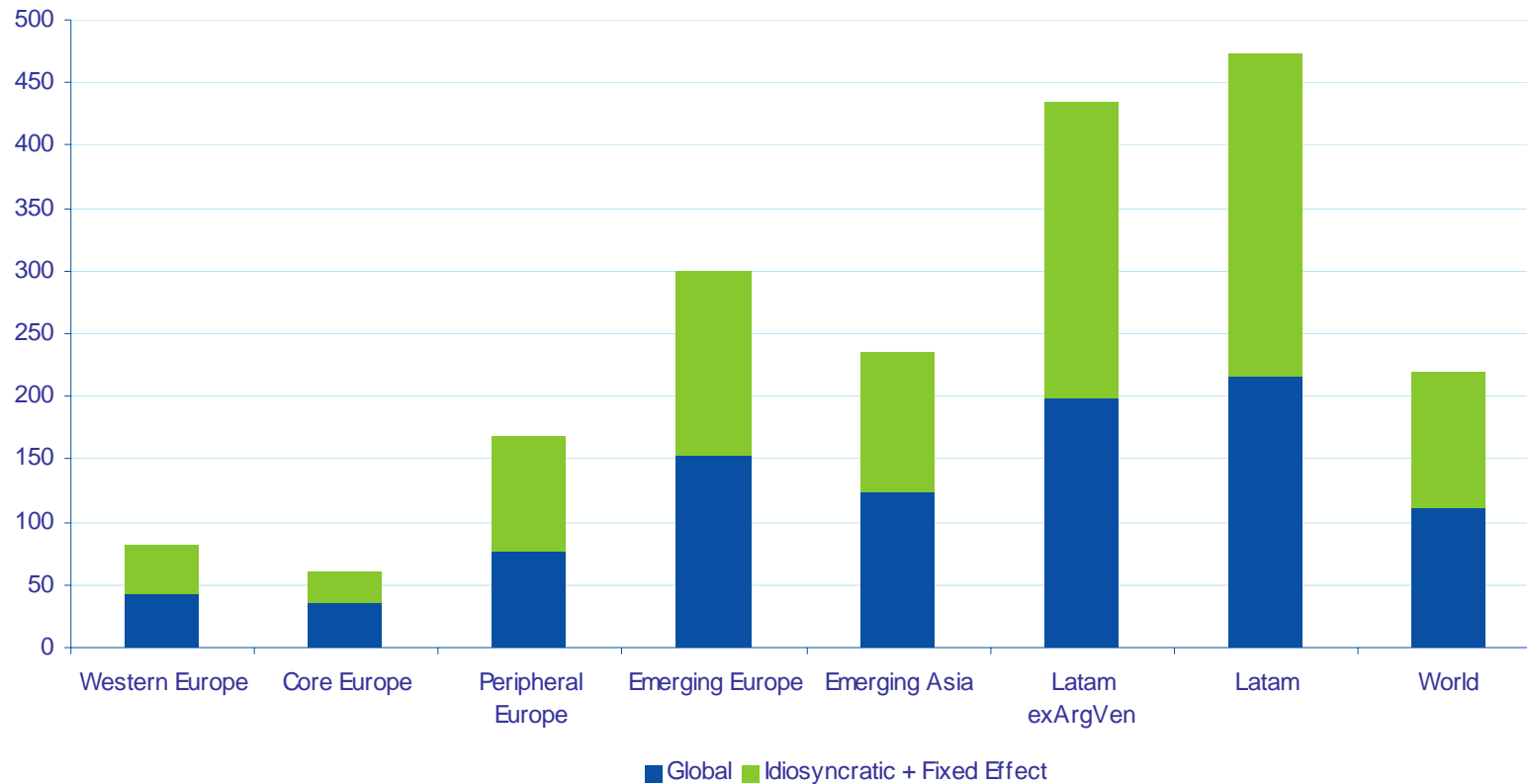


**Emerging Markets seem to be somehow overvalued by the market:
Equilibrium CR appears to be above current CDS level**



Global Risk Aversion vs idiosyncratic CR across regions

Average Contribution of different determinants of CR (based on coefficients estimated in Panel ECM)

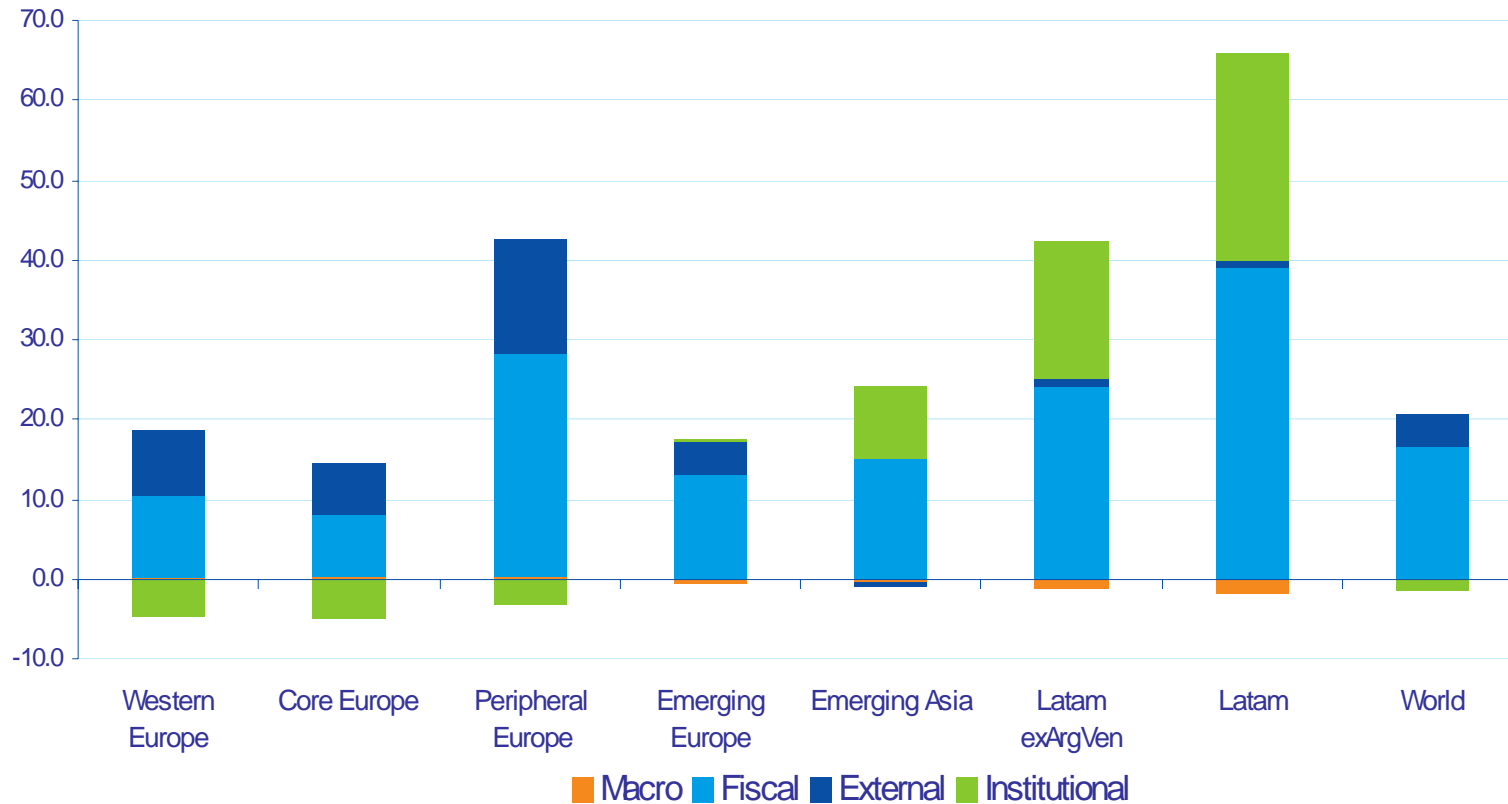


- Global risk aversion explains as much as half of CR across regions
- More relevant the riskier the region: **Latam and Pheripheral Europe**



Fiscal dominating idiosyncratic CR across regions

Average Contribution of different determinants of CR (based on coefficients estimated in ECM)

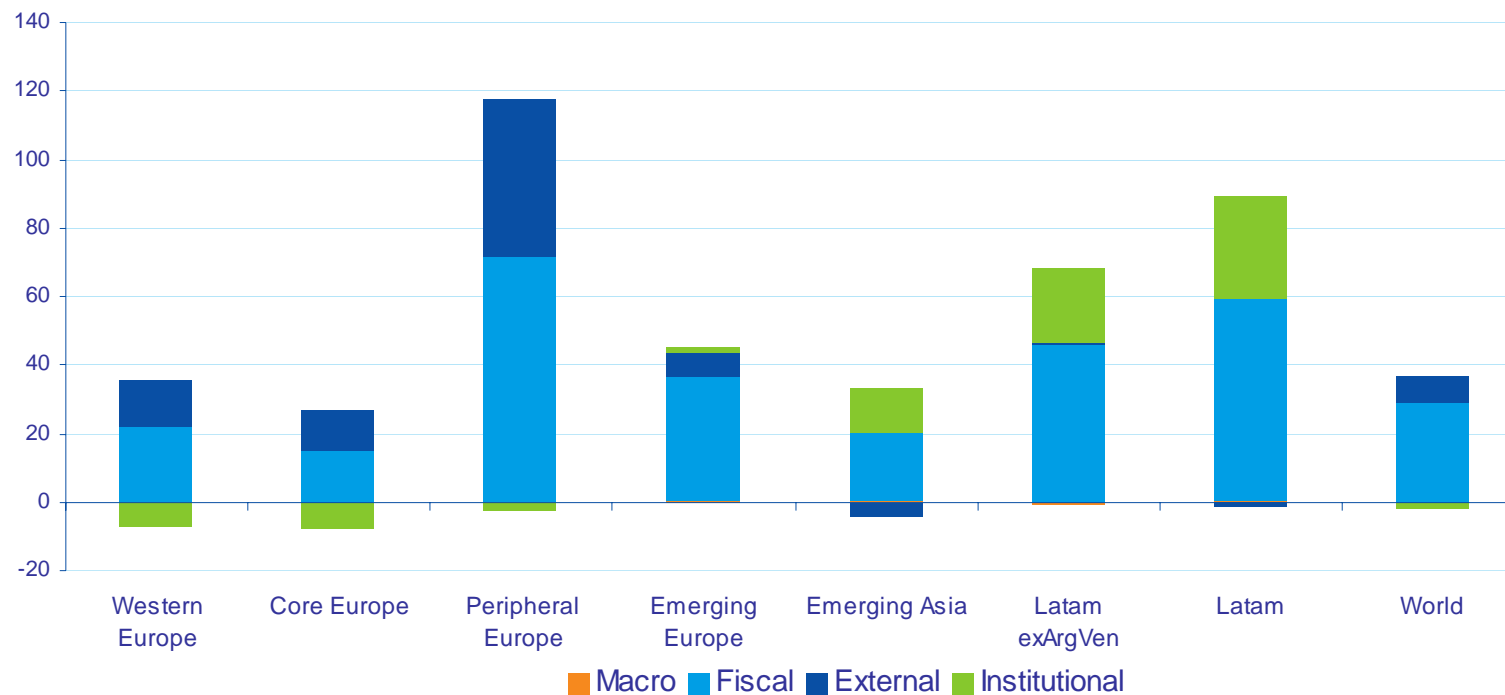


- Fiscal factors clearly dominate: specially important in **Peripheral Europe and Latam**
- External debt most relevant for **Europe**
- Quality of institutions specially important for **Latam**, followed by **Asia**
- Macro variables hardly relevant



In most recent period fiscal continues dominating

Contribution of different determinants of country risk (based on coefficients estimated in ECM)



- External liquidity factors become more relevant for **peripheral Europe**
- Institutions less relevant for **Latam and Asia**



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4. Conclusions



On our methodology

- Our CR aims at:
 - Estimating true CR of a country, compared to the market one (CDS)
 - Key is to separate global factors from idiosyncratic ones: strong methodology
 - Robustness tests to be conducted with other indicators
 - Focus on long-term CR because
 - Easier to separate global market factors from
 - Estimated speed of adjustment relatively short so long term relevant for policy making/risk assessment
 - Determining which are the key factors determining country risk
 - This allows to have different early warning indicators for different groups of countries
 - Model can also be used to predict CR
 - Using our forecasts of idiosyncratic variables
 - Forecast of global risk aversion harder
 - Work to be done on the latter



On our findings

- Global risk aversion is a key component of country risk even in long term
- In Western Europe, global risk aversion worsening CR beyond equilibrium level
- The opposite is true for the Emerging World: markets seem to be underestimating risk
- Among the idiosyncratic determinants of CR:
 - The fiscal situation has and continues to be the most relevant
 - Important warning for countries conducting reckless fiscal policies
 - External debt more relevant for European countries
 - Quality of institutions for emerging countries