Categories, Creditworthiness and Contagion

How Investors’ Shortcuts Affect Sovereign Debt Markets

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Variation in Market-Based Constraints

• The prices governments pay to borrow on international markets vary markedly:
  • Across countries (sovereign credit ratings, macroeconomic fundamentals)
  • Over time (liquidity, risk appetite, elections)
    (Archer et al 2007; Bernhard and Leblang 2006; Cantor and Packer 1996; Hardie 2006; Jensen and Schmith 2005; Mosley 2003; Tomz 2007)

• And different types of governments are treated differently:
  ➢ developed vs. developing (Mosley 2003)
    ➢ After accounting for policy outcomes, emerging and frontier market countries pay higher risk premiums than developed nation borrowers.
  ➢ borrowers from commercial banks vs. bond markets (Kaplan 2012)
  ➢ Commodity vs. manufacturing exporters (Campello 2012, Wibbels 2006)
Are market constraints also interdependent?

- Professional investors often manage diversified portfolios of highly dissimilar assets
  - sovereign debt, corporate debt, equities, derivatives, cash
  - in a broad range of geographic locations.

- They rely on information shortcuts to assess risk (heuristics)
  - Summary indicators of fiscal and monetary outcomes.
  - Also: *categories*
    - Professional investors sort countries into “peer” groups
    - “developed” vs. “developing”
    - peripheral Europe: “emerging Europe” in the 1990s → “eurozone” in the 2000s → “PIIGS” in the 2010s
For the (financial) record...

Ministers deny contagion in the Eurozone.

"Spain is not Greece" - Elena Salgado, Spanish Finance Minister, Feb 2010.

"Portugal is not Greece" - The Economist, April 2010.

"Greece is not Ireland" - George Papaconstantinou, Greek Finance Minister, Nov 2010.

"Spain is neither Ireland nor Portugal" - Elena Salgado, Spanish Finance Minister, Nov 2010.

"Ireland is not in 'Greek Territory''" - Irish Finance Minister Brian Lenihan, Nov 2010.

"Neither Spain nor Portugal is Ireland" - Angel Gurria, Secretary-general OECD, Nov 2010.

"Italy is not Spain" - Ed Parker, Fitch MD, June 2012.

"Spain is not Uganda" - Spanish PM Mariano Rajoy, June 2012.

"Uganda does not want to be Spain" - Ugandan Foreign Minister, June 2012.

Heard through Alex Banbury of Hamilton Capital who sent this to IFRAsia.
Government Bond Rates, 2005-2011

- Austria
- Belgium
- France
- Germany
- Greece
- Ireland
- Italy
- Netherlands
- Portugal
- Spain
- United Kingdom
- United States
Interdependent Sovereign Risk

• Over the long term, sovereign risk assessments should vary with country fundamentals.

• In the short term, sovereign risk also may correlate across nations due to contagion from crises or changes in global liquidity.

• But, even after controlling for these short- and long-term effects, we expect an additional effect of “country category”
  • Country risk premiums will be significantly correlated with the risk premiums paid by other borrowers in the same category.

• This implies that investors’ responses to domestic policy are neither fixed, nor fully objective.
Sovereign Peer Groupings

• Investors may over- or under-estimate sovereign risk based on the category into which the country is grouped:

  • When investors are more optimistic about a given group of countries, each country in that group will experience an improvement in market access.

  • When investors are more pessimistic about a category of countries, a borrower within that category may suffer – even if the country’s fundamentals do not warrant such pessimism.
Which Peer Groups Matter?

1. **Region:**
   - Asia, Western Europe, post-Communist Europe, Latin America, Non-Latin Caribbean, Middle East and North Africa, North America, South Asia, and Africa [World Bank categories]

2. **Market and Economic Development:**
   a. **MSCI:** Emerging Markets; Frontier; Developed
   b. **FTSE:** Emerging Markets; Frontier; Developed; Advanced Emerging; Secondary Emerging

3. **Risk Rating:**
   - Long-Term Sovereign Credit Ratings [Fitch]
Data and Method

• **Dependent variables:**
  • Sovereign spreads (EMBI): monthly and annual data for 26 emerging market economies, 2001-2010.
  • Credit default swap (CDS) prices, monthly data for 26 developed and developing countries, 2000-2010.

• **Independent variables:**
  • Domestic economic: government debt, budget balance, inflation, current account deficit, capital account openness, level of development.
  • Domestic political: democracy, government ideology, opposition party ideology, electoral cycle, presidential/parliamentary.
  • Global: US interest rate, US treasury bond yields, US stock market returns, commodity prices. [Also, direct effect of category]
  • Peer group (spatial lag)
Data and Method

• We estimate cross-sectional time series models, using an Error Correction Model (ECM).
  • This allows us to consider both the short-term and long-term effects of the regressors.
  • Generalized least squares estimator, country fixed effects, linear time trend.
Main Findings

Other significant correlates of risk/spreads (annual analysis):

- Sovereign debt (+)
- Budget balance (-)
- Capital account openness (-)
- Time to elections (-)
- US interest rates (+)

| Peer Category                | Annual EMBI Spread | Monthly EMBI Spread | Monthly CDS Price |
|------------------------------|--------------------|---------------------|-------------------|
| Geographic Region            | Short Term         | Short Term          | Short Term        |
|                              | Long Term          | Long Term           |                   |
| Market: MSCI (3 category)    | Short Term         | Short Term          | Short Term        |
|                              | Long Term          |                     |                   |
| Market: FTSE (5 Category)    |                     | Short Term          |                   |
|                              | Long Term          |                     |                   |
| Credit Rating (Fitch)        | Short Term         | Short Term          |                   |
Caveats and Conclusion

• The ways in which countries are grouped – and changes in groupings – may be important determinants of governments’ access bond markets.
  • How, then, do categorizations change over time?

• Annual (and even monthly) data obscure what are often shorter-term movements:
  • Almost all of the disturbances to equilibrium in risk premiums are corrected within one year.
  • Many of the political variables included in our models, however, are measured on an annual basis.
  • Sample: a limited set of countries (e.g. those for which there is a CDS market or which are included in EMBI+)

• More generally, aggregate-level observational data may not be the best way to assess our proposed causal mechanisms.
  • Survey of professional investment managers, using an experimental research design (Response rate issues)
|                  | Table 1. Explaining Annual Changes in Sovereign Debt Spreads |  |
|------------------|-------------------------------------------------------------|---|
|                  | DV: Annual Δ Spread                                         |  |
| Peer Category:   | Table 1. Explaining Annual Changes in Sovereign Debt Spreads |  |
| Peer Diffusion   | Coef. Std. Err.                                             | Coef. Std. Err. | Coef. Std. Err. | Coef. Std. Err. |
| Spread t-1       | 0.21 ** 0.10                                                | 0.22 * 0.13     | -0.26 *** 0.09  |
| t-1 Δ             | 0.37 *** 0.07                                               | 0.13            | 0.09            |
| Maturity          | t-1 1.15 5.10                                               | -3.85 7.16      | -2.40 4.82      |
| Δ                | -1.79 3.56                                                 | -6.35 3.62      | -2.77 3.51      |
| Inflation         | t-1 0.03 0.46                                               | 0.07 0.48       | 0.63 0.52       |
| Δ                | 0.02 0.33                                                  | -0.11 0.34      | 0.02 0.39       |
| Debt              | t-1 4.37 ** 2.18                                            | 4.15 ** 1.88    | 5.51 *** 2.10   |
| Δ                | 6.40 *** 2.26                                               | 5.78 *** 1.76   | 7.88 *** 2.15   |
| Democracy         | t-1 11.86 14.17                                             | 20.07 14.42     | 15.10 12.90     |
| Δ                | 22.40 23.77                                                | 25.12 21.99     | 32.87 22.03     |
| Years to Election | t-1 -32.76 ** 14.63                                         | -29.64 15.49    | -25.52 ** 13.04 |
| Δ                | -9.47 9.92                                                 | -12.17 9.98     | -7.66 8.88      |
| Opposition Right  | t-1 36.95 40.40                                             | -673.79 * 399.72| -642.29 * 377.14| -650.50 * 346.34|
| Opposition Left   | t-1 116.75 * 70.25                                          | 104.07 68.31    | 93.53 67.58     |
| System            | t-1 -52.33 39.09                                            | -7.75 39.06     | 39.05           |
| Common Shocks     | US Prime Rate                                               | 30.99 *** 12.44 | 34.93 *** 13.21 | 33.09 *** 13.00 |
| Time              | t-1 -12.85 8.95                                            | -22.22 *** 8.47 | -9.43 9.64      |
| Const.            | 25956 17088                                                 | 44910 ** 16975  | 19192 1951      | 38372 ** 16896  |
| N. obs            | 171                                                        | 171             | 171             |
| Waldchi²          | 454.59                                                      | 1333.14         | 479.68          | 444.68          |
| Prob > chi²       | 0                                                          | 0               | 0               |

FGLS error correction model of annual change in Sovereign Spread. *** p<0.01; ** p<0.05; * p<0.1
### Explaining Monthly Changes in Credit Default Swap Prices

| DV: Monthly ΔCDS | (1) Region | (2) Risk Rating | (3) FTSE | (4) MSCI |
|------------------|-----------|----------------|---------|---------|
|                  | Coef.     | Std. Err.      | Coef.   | Std. Err. | Coef.   | Std. Err. | Coef.   | Std. Err. |
| CDS              |           |                |         |          |         |          |         |          |
| t-1              | -0.109*** | 0.018          | -0.118*** | 0.017    | -0.076*** | 0.016    | -0.086*** | 0.020    |
| Peer Diffusion   |           |                |         |          |         |          |         |          |
| Peer CDS         |           |                |         |          |         |          |         |          |
| t-1 Δ            | 0.007     | 0.021          | -0.005   | 0.012    | -0.025   | 0.022    | -0.013    | 0.025    |
| Categories’ Direct Effect |      |                |         |          |         |          |         |          |
| Category         |           |                |         |          |         |          |         |          |
| t-1 Δ            | -        | 1.550          | 3.287    | -1.911    | 3.651    | 115.797  | 95.155    |
| Domestic Politics and Economy |     |                |         |          |         |          |         |          |
| Debt             |           |                |         |          |         |          |         |          |
| t-1 Δ            | 0.697**   | 0.313          | 0.808*** | 0.287    | 1.455*** | 0.556    | 1.186*    | 0.670    |
| Budget Balance   |           |                |         |          |         |          |         |          |
| t-1 Δ            | -0.413    | 1.283          | -0.298   | 1.190    | 1.421    | 1.282    | 0.127     | 1.647    |
| Current Account Balance |     |                |         |          |         |          |         |          |
| t-1 Δ            | 0.679     | 0.653          | 0.556    | 0.666    | 0.717    | 0.638    | 0.906     | 0.881    |
| Inflation        |           |                |         |          |         |          |         |          |
| t-1 Δ            | 0.775     | 1.017          | 0.458    | 0.971    | 1.030    | 1.168    | 1.288     | 1.390    |
| GDP per capita   |           |                |         |          |         |          |         |          |
| t-1 Δ            | 0.018     | 0.016          | 0.015    | 0.019    | -0.003   | 0.014    | 0.006     | 0.019    |
| KA Open          |           |                |         |          |         |          |         |          |
| t-1 Δ            | -3.960    | 5.046          | -5.582   | 4.476    | -5.439   | 5.031    | -7.823    | 7.319    |
| FX Rate          |           |                |         |          |         |          |         |          |
| t-1 Δ            | 448.631***| 121.959        | 406.193***| 98.061   | 438.020***| 97.828   | 449.537***| 122.503  |
| Democracy        |           |                |         |          |         |          |         |          |
| t-1 Δ            | -0.563    | 1.018          | -0.580   | 0.965    | 0.286    | 0.732    | 0.465     | 1.233    |
| Months to Election |       |                |         |          |         |          |         |          |
| t-1 Δ            | 0.006     | 0.108          | 0.030    | 0.100    | -0.034   | 0.096    | -0.020    | 0.129    |
| Common Stocks    |           |                |         |          |         |          |         |          |
| US Prime Rate    |           |                |         |          |         |          |         |          |
| t-1 Δ            | -1.095    | 1.505          | -1.772   | 1.374    | -1.368   | 1.818    | -0.537    | 2.031    |
| US Stock Market  |           |                |         |          |         |          |         |          |
| t-1 Δ            | -16.209   | 11.160         | -24.851**| 9.973    | -24.099**| 10.281   | -27.524** | 13.263   |
| Invest. Grade Yield |         |                |         |          |         |          |         |          |
| t-1 Δ            | -3.020*** | 0.859          | -4.535***| 0.756    | -3.261***| 0.747    | -3.048*** | 1.043    |
| High Yield       |           |                |         |          |         |          |         |          |
| t-1 Δ            | -2.794*** | 0.488          | -3.954***| 0.420    | -3.356***| 0.404    | -2.901*** | 0.660    |
| Treasury Yield   |           |                |         |          |         |          |         |          |
| t-1 Δ            | -10.277** | 4.913          | -7.549*  | 4.471    | -11.091**| 4.623    | -6.701    | 5.687    |
| Volatility Premium |       |                |         |          |         |          |         |          |
| t-1 Δ            | -7.627    | 10.280         | -7.183   | 9.252    | -10.269  | 8.374    | -8.504    | 11.548   |
| Equity Premium   |           |                |         |          |         |          |         |          |
| t-1 Δ            | 245.374   | 717.482        | 111.000  | 644.827  | 880.823  | 620.661  | 133.458   | 782.645  |
| Term Premium     |           |                |         |          |         |          |         |          |
| t-1 Δ            | 1.365     | 2.406          | 2.278    | 2.143    | 2.837    | 1.965    | 2.959     | 2.684    |
| Stock Flows      |           |                |         |          |         |          |         |          |
| t-1 Δ            | -51.067   | 34.865         | -65.267***| 31.732   | -99.449***| 32.831   | -114.839***| 42.740   |
| Bond Flows       |           |                |         |          |         |          |         |          |
| t-1 Δ            | -53.423** | 22.117         | -65.180***| 20.187   | -82.229***| 20.693   | -94.636***| 26.757   |
| Energy Index     |           |                |         |          |         |          |         |          |
| t-1 Δ            | 0.000     | 0.000          | 0.000    | 0.000    | 0.000    | 0.000    | 0.000     | 0.000    |
| Time             |           |                |         |          |         |          |         |          |
| t-1 Δ            | -0.106    | 0.217          | -0.077   | 0.194    | 0.046    | 0.328    | 0.195     | 0.325    |
| Constant         |           |                |         |          |         |          |         |          |
| t-1 Δ            | -2.252    | 28.879         | -2.094   | 56.988   | 2.497    | 56.537   | -134.346  | 116.496  |

| N                | 927       | 1021           | 825      | 885      |
| Wald χ²          | 447.631   | 480.874        | 508.820  | 368.359  |
| Prob. > χ²       | 0         | 0              | 0        | 0        |

FGLS error correction model of monthly change in CDS prices.  
*** p<.01; ** p<.05; * p<.1.
## Explaining Monthly Changes in Sovereign Bond Spreads

| DV: Monthly EMBI | (1) Region | (2) Risk Rating | (3) FTSE | (4) MSCI |
|------------------|-----------|----------------|----------|----------|
| **EMBI**         | Coef.     | Std. Err.      | Coef.    | Std. Err. | Coef.    | Std. Err. | Coef.    | Std. Err. | Coef.    | Std. Err. |
| t-1              | -0.122*** | 0.017          | -0.119***| 0.013     | -0.108***| 0.014      | -0.101***| 0.016     |
| Δ                | 0.056***  | 0.019          | -0.013   | 0.010     | 0.008    | 0.021      | 0.016    | 0.022     |

### Peer Diffusion

#### Peer EMBI

| t-1              | 0.492***  | 0.045          | 0.039***  | 0.014     | 0.330***  | 0.068      | 0.343***  | 0.048     |

#### Categories’ Direct Effect

#### Category

| t-1              | 2.575     | 2.665          | 0.459     | 2.604     | -69.661*  | 38.010     | 112.390  |

### Domestic Politics and Economy

#### Debt

| t-1              | 0.288     | 0.238          | 0.447**   | 0.224     | 0.147     | 0.395      | 0.300    | 0.423     |

#### Current Account Balance

| t-1              | -0.738    | 1.017          | -1.554    | 1.021     | -0.877    | 0.934      | -1.107   | 1.029     |

#### Inflation

| t-1              | 1.100     | 0.861          | 0.429     | 0.848     | 0.010     | 0.871      | 0.147    | 0.944     |

#### GDP per capita

| t-1              | 0.026**   | 0.013          | 0.034**   | 0.016     | 0.028**   | 0.011      | 0.021    | 0.013     |

#### KA Open

| t-1              | -3.834    | 4.170          | -6.304    | 3.942     | -4.891    | 4.524      | -8.141   | 5.131     |

#### FX Rate

| t-1              | 423.703***| 92.772         | 414.844***| 80.726    | 396.472***| 75.466     | 391.487***| 84.073    |

#### Democracy

| t-1              | 4.745*    | 2.680          | 2.721     | 2.643     | 1.825     | 1.743      | 6.596***  | 1.975     |

#### Months to Election

| t-1              | -0.016    | 0.092          | 0.085     | 0.087     | 0.085     | 0.079      | 0.055    | 0.091     |

### Common Shocks

#### US Prime Rate

| t-1              | 0.001     | 1.237          | -1.889    | 1.184     | -2.719**  | 1.242      | -1.414   | 1.397     |
| Δ               | -8.785    | 9.612          | -16.836*  | 8.956     | -18.168*  | 9.654      | -15.345  | 10.361    |

#### US Stock Market

| t-1              | -1.844*** | 0.703          | -4.407*** | 0.649     | -2.300*** | 0.770      | -1.933** | 0.789     |
| Δ               | 0.585     | 0.375          | 0.687*    | 0.374     | 0.464     | 0.369      | 0.451    | 0.397     |

#### Invest. Grade Yield

| t-1              | 10.286*   | 5.937          | 15.674*** | 5.670     | 12.279**  | 6.014      | 15.440** | 6.008     |

#### High Yield

| t-1              | 5.700     | 4.498          | 13.519*** | 4.301     | 12.254*** | 4.604      | 14.447***| 4.533     |

#### Treasury Yield

| t-1              | -3.146    | 8.900          | -6.066    | 8.773     | -6.348    | 8.456      | -6.166   | 9.133     |

#### Volatility Premium

| t-1              | -0.021    | 0.352          | -0.572*   | 0.341     | -0.161    | 0.349      | -0.143   | 0.355     |

#### Equity Premium

| t-1              | -684.621  | -637.559       | 2409.243***| 602.452   | -       | 661.678    |
| 2001.165***      |          | 3256.430***    | 2165.226***|          |

#### Term Premium

| t-1              | -0.446    | 1.954          | -0.798    | 1.955     | -0.473    | 1.940      | -0.370   | 2.050     |

#### Stock Flows

| t-1              | -75.523** | 31.015         | -99.812***| 29.805    | -88.432***| 30.169     | -99.549***| 33.008    |
| Δ               | -9.290    | 20.898         | -14.108   | 20.200    | 9.496     | 20.475     | 3.988    | 21.805    |

#### Bond Flows

| t-1              | -0.000    | 0.000          | -0.001*** | 0.000     | -0.000    | 0.000      | -0.000*  | 0.000     |
| Δ               | -0.000    | 0.000          | -0.000    | 0.000     | -0.000    | 0.000      | -0.000   | 0.000     |

#### Energy Index

| t-1              | -0.185**  | 0.077          | -0.229*** | 0.070     | -0.207*** | 0.072      | -0.217***| 0.076     |

#### Time

| -0.150          | 0.168      | -0.046         | 0.166     | -0.132    | 0.210      | 0.067      | 0.198    |

#### Constant

| 2.636           | 22.365     | -33.663        | 47.754    | -35.713   | 44.449     | -3.795     | 59.086   |

| N               | 940        | 1023           | 911       | 959       |           |           |           |

| Wald χ²         | 771.753    | 741.527        | 877.219   | 777.530   |           |           |           |
| Variable      | Obs | Mean   | Std. Dev | Min   | Max    |
|--------------|-----|--------|----------|-------|--------|
| Spread       | 493 | 573.76 | 754.82   | 0.00  | 6342.27|
| Debt         | 962 | 53.11  | 36.92    | 0.65  | 384.01 |
| Maturity     | 970 | 17.21  | 7.89     | 0.00  | 48.38  |
| Inflation    | 1821| 28.07  | 247.55   | -16.12| 7481.66|
| Budget       | 1081| -1.51  | 8.11     | -202.70| 29.06  |
| GDP/cap      | 1930| 10315  | 11202    | 221   | 56389  |
| Fitch        | 2046| 1.91   | 2.12     | 0     | 12     |
| KA Open      | 1783| 0.85   | 1.56     | -1.85564| 2.45573|
| System       | 1888| 1.65   | 0.63     | 1     | 3      |
| Yrs Office   | 1887| 6.42   | 7.48     | 1     | 46     |
| Left         | 1885| 0.13   | 0.34     | 0     | 1      |
| Right        | 1885| 0.77   | 0.42     | 0     | 1      |
| Opp Right    | 1614| 0.57   | 0.49     | 0     | 1      |
| Opp Left     | 1614| 0.36   | 0.48     | 0     | 1      |
| US Prime     | 2046| 6.64   | 2.07     | 3.25  | 10.01  |