Discussion of «Co-movements in equity and CDS illiquidity» by Miriam Marra

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Where the paper fits in

• How to think about commonalities/comovements:
  1. For a given asset class and a given metric, *across entities*: liquidity for equities (Hasbrouck and Seppi JFE 01, Chordia, Roll and Subrahmanyam JF 00), liquidity for commodities (Marshall, Nguyen and Visaltanachoti JBF 13), liquidity in FX (Banti, Phylatkis and Sarno JIntlMF 12, Karnaukh, Ranaldo and Söderlind 13), liquidity for CDS (Tang and Yan 06), liquidity for options (Cao and Wei JFMkts 10).
  2. For a given entity and a given metric, *across markets*:
    » (price discovery): equities across venues (Huang JF 02), equity and option (Chakravarty, Gulen and Mayhew JF 04), (IG) CDS and bond (Blanco, Brennan and Marsh JF 05) CDS and equity (Kapadia and Pu JFE 12);
    » (“liquidity” discovery): equity and bond (Chordia, Sarkar and Subrahmanyam RFS 05), CDS and bond (Pu JFxI 09), CDS, bond and equity (Jacoby, Jiang and Theocharides 10).
Main results

- Comovement in CDS and equity liquidity, establishing:
  1. Comovement in liquidity: time-varying (figures 1-4) and dependence on aggregate liquidity (table 3);
  2. Directionality of spillover: from CDS to equity (table 2);
  3. Drivers of commonality: demand (hedging-arbitrage channel) and supply (funding channel) determinants.
Time-varying comovement

Figure 4: Cross-Sectional Value-Weighted Average of Correlation Measures (Pearson, Kendall and Spearman) between CDS and Equity Bid-Ask Spreads
(Measured in decimals, Quarterly: March 2003 - December 2009, Cross-Section of 45 Firms)
Time-varying comovement

- Correlation increases during turbulent times...
- Form chart, values range between -0.025 and 0.125 (Kendall) but is close to zero between 2004-06. Are these values large?
- On economic magnitude, evidence and impact of stale (BA) quotes?
- Take CDS prices instead (indeed, quotes...) Hilscher, Pollet and Wilson JFQA forth (~800 U.S. firms between 2001 and 2007, table 1)

<table>
<thead>
<tr>
<th>% obs with CDS spread change</th>
<th>overall</th>
<th>A or above</th>
<th>BBB</th>
<th>BB or below</th>
</tr>
</thead>
<tbody>
<tr>
<td>72.4%</td>
<td>71.8%</td>
<td>73.1%</td>
<td>72.0%</td>
<td></td>
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</tbody>
</table>
Dependence on aggregate liquidity

\[ BA_{i,t} = \alpha_i + \beta_i BA_{M,t} + \gamma_i asset\ vol_{i,t} + \varepsilon_{i,t} \]

- Betas are generally positive and significant.
- Given: 1) interest in comovement, and 2) non-stationarity of spreads...
  - ...running the model in first differences seems more appropriate (CRS 00)
- There are no cross-sectional differences (sector, industry, size).
- No size effect in equity illiquidity (CRS 00, Table 4): large cap react more (although they have narrower spreads), possibly due to institutional herding.
  - Maybe not enough heterogeneity in firm size for entities in the CDX NA IG?
Direction of causality

- Granger test of causality supports the idea that CDS (il)liquidity causes equity (il)liquidity.
- Again, test is carried out using (possibly non-stationary) spreads;
- Hilscher, Pollet and Wilson: equity returns lead CDS returns while CDS returns do not lead equity returns (they revisit Acharya and Johnson JFE 07)

» Information flow vs. liquidity spillover

<table>
<thead>
<tr>
<th>Time period</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, above</td>
<td>-0.033</td>
<td>0.001</td>
<td>0.000</td>
<td>0.002</td>
<td>0.001</td>
<td>0.006</td>
<td>0.001</td>
<td>0.001</td>
<td>0.002</td>
<td>-0.001</td>
<td>-0.004</td>
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<tr>
<td></td>
<td>(9.45)**</td>
<td>(0.44)</td>
<td>(0.18)</td>
<td>(0.88)</td>
<td>(0.41)</td>
<td>(2.01)*</td>
<td>(0.25)</td>
<td>(0.26)</td>
<td>(1.05)</td>
<td>(0.47)</td>
<td>(1.46)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time period</th>
<th>0</th>
<th>1</th>
<th>2</th>
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<th>4</th>
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<th>7</th>
<th>8</th>
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<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>A, above</td>
<td>-0.18</td>
<td>-0.16</td>
<td>-0.09</td>
<td>-0.07</td>
<td>-0.05</td>
<td>-0.04</td>
<td>-0.02</td>
<td>-0.02</td>
<td>-0.01</td>
<td>-0.01</td>
<td>-0.03</td>
</tr>
<tr>
<td></td>
<td>(9.04)**</td>
<td>(12.29)**</td>
<td>(7.09)**</td>
<td>(5.73)**</td>
<td>(4.45)**</td>
<td>(3.41)**</td>
<td>(1.49)</td>
<td>(1.64)</td>
<td>(0.90)</td>
<td>(1.29)</td>
<td>(2.40)*</td>
</tr>
</tbody>
</table>
Drivers of liquidity commonality

• Supply-side (funding liquidity, Brunnermeier and Pedersen RFS 09): when markets decline or uncertainty increases, intermediaries reduce provision of liquidity: liquidity positively related to returns and negatively related to volatility (Huberman and Halka JFRes 01, Hameed, Kang and Viswanathan JF 10);

• Demand-side: correlated trading of investors (institutional investors/indexers, Kamara, Lou and Sadka JFE 08, mutual funds, Koch, Ruenzi and Starks 12), sentiment.
Drivers of liquidity commonality

\[ \text{COMM}_{i,t} = \alpha_i + \beta_i \text{FF}_t + \gamma_i \text{VIX}_t + \delta_i \text{TED}_t + \theta_i \text{HR}_{i,t} + \varepsilon_{i,t} \]

- Interpretation of VIX: inventory costs or funding channel?
- Interpretation of Mkt Exc Ret: inventory costs but what about splitting into downturns and upturns and use it as funding channel?
- Alternative choices for funding channel?
  » LIBOR-OIS spread (not much gain)
  » Adrian, Moench and Shin 13: BD leverage. Low frequency, should work for the analysis at quarterly frequency. Also, may reduce concerns of correlation between TED and VIX.
- More generally, given different identity of ‘dealers’ in the two markets, is there a way to find different proxies for funding channel in the two markets and assess (potentially asymmetric) impact?
The demand channel here/1

Spread in equity and spread in CDS move together, and comovement increases with $HR$. 

bond investor buys 1 CDS sells 1 CDS (RA) CDS dealer

sells $HR \times 1$ shares equity mkt
The demand channel here/2

» Spread in equity and spread in CDS move together, and comovement increases with $HR$. 

\[ \text{CDS} > \overline{\text{CDS}}(S, \sigma) \]

[Diagram showing the relationship between arbitrageur, equity market, and CDS dealer with corresponding actions and equations.]
The channels at work

\[ BACDS_{i,t} = \alpha_i + \beta(BAE_{i,t}HR_{i,t}) + \gamma(BAE_{i,t}HR_{i,t}Bond_{i,t}) + \delta CDSMispr_{i,t-1} + \text{others} + \varepsilon_{i,t} \]

- Evidence consistent with hedging channel and arbitrage channel - although purchased bonds not significant.
  - Insignificant \( \gamma \) is not troublesome – maybe not all bond purchases get protection.
  - The proxy for capital structure arbitrage be interacted with (equity spread x HR) as well.
The channels at work

• Although mispricing might have been there, there were hardly any cap structure arbitrageurs left to profit from it.

» Interacting arbitrage channel with time dummies may give more flexibility to detect presence (or absence) of arbitrageurs.

» Alternatively, include interaction with past performance of strategy source: Kapadia and Pu JFE 12

Fig. 4. Cumulative profits from capital structure arbitrage. The figure plots the cumulative profits on an equally weighted portfolio of capital structure arbitrage positions with an initial equity investment of $1,000,000.

source: Kapadia and Pu JFE 12
Conclusion

- CDS emerge as an ‘interesting’ asset class since they measure credit risk at ‘high’ frequency and are reasonably liquid –especially for corporate sector.
- CDS and equity prices *should* be related, unless arbitrage is limited. Market structures are, however, very different.
- Nice paper addressing *liquidity* for these two markets, and the first that digs deeper into the drivers of commonality of liquidity.