Clear(ed) decision: The effect of central clearing on firms’ financing decision

Maximilian Jager, University of Mannheim
Frederick Zadow, University of Mannheim
AFA 2022 Poster Session
Research question(s)

(How) does credit derivative regulation affect the real economy?

1. Does central clearing of a Credit Default Swap (CDS) affect the company against whose default the contract insures?
2. What channels are responsible for the effects?
Institutional setting - what is central clearing?

Over-the-counter derivative market

Centrally cleared derivative market

New market environment is safer (less risk) but more expensive (collateral, fees)!
Institutional setting - two channels

1. **Arbitrage channel**
   - Increased attractiveness of CDS over bond trading after central clearing (lower risk)
     ⇒ Investors shift capital from bond markets to CDS markets
     ⇒ Predictions: bond demand down, CDS demand up (*Substitute*)

2. **Hedging channel**
   - Central clearing increases CDS trading costs and thereby cost of hedging
     ⇒ Investors reduce hedging activity (CDS market)
     ⇒ Predictions: bond demand ambiguous, CDS demand down (*Complement*)
Under Dodd-Frank (January 1st 2013), no mandatory clearing requirement for single-name CDS, but strong regulatory incentives

Clearing entities determine which firms are eligible for clearing (details soon)

Single-name CDS clearing highly concentrated with only one player (ICE Clearing)

Firms do not become eligible at the same time → staggered introduction to CC
There is identifying variation from the staggered introduction. But, we want to add variation using a never-treated group!

Potential problem: Clearing entities decide based on CDS trading volume ⇒ Are average cleared firms different from average control firms?
→ Run logit to predict eligibility decision
→ Propensity score matching
→ Matched sample consists of 50 cleared firms + 50 firms from the S&P1000 with a traded CDS from Q1-2012 until Q2-2019*

* some cleared firms do not have sufficient data, others cannot be matched properly; these 50 firms are a representative sample of the cleared firms
Empirical setting and data - exogeneity (with controls)

Impact on Total Debt (Including time FEs)

Impact on Total Assets (Including time FEs)

joint F-test: \( p = 0.91 \)
No pre-treatment divergence between treatment and control group!

joint F-test: \( p = 0.83 \)
Relevance of central clearing - diff-in-diff design

- Estimate regression model of the following form:

\[ y_{i,t} = \theta 1(t \geq \text{Eligibility}_i) + \beta x_{i,t-1} + y_{i,t-1} + \alpha_i + z_t + u_{i,t} \]

- \( 1(t \geq \text{Eligibility}_i) \) equals one after firm \( i \) becomes eligible for clearing in period \( t \)
- \( x_{i,t-1} \): (log of) total assets, revenue, cash, capex, return on assets and leverage
- \( \alpha_i (z_t) \): firm (time) fixed effects
- Heterogeneity of treatment effects? De Chaisemartin and d’Haultfoeuille (2020) methodology suggests not
## Relevance of central clearing - diff-in-diff results

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total debt</td>
<td>Long-term debt</td>
<td>Total assets</td>
</tr>
<tr>
<td>Eligibility;</td>
<td>-0.027***</td>
<td>-0.029***</td>
<td>-0.016**</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.012)</td>
<td>(0.007)</td>
</tr>
<tr>
<td>Matched sample</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm FEs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Time FEs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
</tr>
<tr>
<td>adj. $R^2$ (within)</td>
<td>0.81</td>
<td>0.81</td>
<td>0.88</td>
</tr>
</tbody>
</table>

Clustered standard errors in parentheses.

Firms decrease (long-term) debt and assets after central clearing eligibility!
## Channel analysis - results

<table>
<thead>
<tr>
<th>(1) Outstanding bonds</th>
<th>(2) Bond issuance</th>
<th>(3) Bond yield</th>
<th>(4) CDS notional</th>
<th>(5) CDS spread</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eligibility_i</strong></td>
<td>-0.022**</td>
<td>-0.020*</td>
<td>0.300</td>
<td>-0.024</td>
</tr>
<tr>
<td></td>
<td>(0.009)</td>
<td>(0.010)</td>
<td>(0.291)</td>
<td>(0.043)</td>
</tr>
<tr>
<td>Matched sample</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Time FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>2363</td>
<td>2000</td>
<td>2455</td>
<td>1134</td>
</tr>
<tr>
<td>adj. $R^2$ (within)</td>
<td>0.93</td>
<td>0.23</td>
<td>0.43</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Clustered standard errors in parentheses.

Bond quantity down, yields stable $\rightarrow$ Bond demand down

CDS quantity stable, prices up $\rightarrow$ CDS demand up

$\Rightarrow$ Arbitrage channel dominates
### Real effects - results

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross PPE</td>
<td>Net PPE</td>
<td>Employment</td>
<td>ROA</td>
<td>Stock price</td>
</tr>
<tr>
<td>Eligibility;</td>
<td>-0.015***</td>
<td>-0.014**</td>
<td>-0.036</td>
<td>-0.0023*</td>
</tr>
<tr>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.021)</td>
<td>(0.0013)</td>
<td>(0.018)</td>
</tr>
<tr>
<td>Matched sample</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Firm FEs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Time FEs</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>N</td>
<td>2278</td>
<td>3000</td>
<td>552</td>
<td>3000</td>
</tr>
<tr>
<td>adj. $R^2$ (within)</td>
<td>0.87</td>
<td>0.87</td>
<td>0.65</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Investment, profitability, and stock prices down $\rightarrow$ adverse real effects.
1. **CCPs:** CCP has asset pricing implications (Du et al. (2019); Loon and Zhong (2014)), but financial stability effect unclear (Biais et al. (2012); Biais et al. (2016); Duffie and Zhu (2011))

⇒ Our contribution: CCPs also questionable from real economic perspective

2. **CDS and corporate finance:** Existence of CDS market good for firms (Duffee and Zhou (2001); Saretto and Tookes (2013)); interaction with corporate debt markets complex (Oehmke and Zawadowski (2015); Che and Sethi (2014))

⇒ Our contribution: CCPs give new impetus to this link as a more attractive CDS market is *bad* for firms

3. **Financial regulation and the real economy:** Impact of financial regulation on real economic outcomes non-trivial (Fraisse et al. (2020); Buss et al. (2016); Kaldorf and Wicknig (2021))

⇒ Our contribution: CCPs have consequences beyond financial markets, too
• Firms decrease debt and assets after central clearing eligibility ⇒ investment and profitability drop
• Arbitrage channel (risk reduction) dominates
• More results in paper: stock prices decline around clearing announcement, firms increase bank loan demand

⇒ Clearing reform of credit derivatives has adverse real economic spillovers


