Corporate Hedging, Contract Rights, and Basis Risk

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Takeaway points

- **Setting**
  - **Research question**: What is the impact of derivative termination rights in default on corporate hedging outcomes?
  - **Model:** Endogenize exercise of termination right in Bolton and Oehmke (2015) framework and study impact on firm hedging choice
  - **Data:** US public firms from Compustat. More detailed hedging data on airlines, oil-gas-coal firms
  - **Methodology:** Reduced-form correlational analysis & causal inference on exercise policy

- **Key model predictions**
  - Optimal to terminate derivative in default when fair value (FV) for counterparty is high
  - More likely to terminate if high bankruptcy costs and basis risk
  - Inefficiency of termination leads to suboptimally low hedging

- **Key empirical findings**
  - 60% of derivative positions are terminated in default
  - More likely if positive FV for counterparty or if high bankruptcy costs
  - Drop in hedging ratios in default and no full, immediate re-hedging

Overall assessment

- Nice blend of theory and empirics
- Both analysis of equilibrium correlation patterns arising from the model and causal inference (legal quasi-natural experiment, great placebo tests)
- Very useful and policy-relevant insights into corporate hedging choices
- Advanced stage analysis and highly readable

Comment 1: Basis risk and selection of contracts to be terminated

- **Basis risk** features prominently in the title, abstract, and model
- Prediction that "exercise threshold also decreases in [...] basis risk of the hedging portfolio" is not really discussed in the **empirical part**!
- On average, conditional on default status, derivative contracts are terminated when FV is positive for the derivative counterparty part ($V_1 > 0$), consistent with theoretical default condition ($C_1 = C_1^L$ & $V_1 = V_1^H$). What is this telling us?
  - Given $P[V_1^H|C_1^H] = P[V_1^L|C_1^L] = \rho > 1/2$, does this mean that termination (and default) is more likely for firms with **high basis risk**? (Only hinted)
  - Assuming hedging with simple forward contracts, does this mean that termination is more likely for **inefficient firms**, i.e., those that become distressed during good industry times (high commodity-related revenues for oil-gas firms, low commodity-related op. costs for airlines and coal firms)?
  - That some firms (with bad governance?) take large **speculative positions** rather than hedging?
- Possible to provide evidence on effectiveness of hedging (e.g., in terms of impact on volatility of cash flows)? Possible to provide a direct estimate of basis risk in terms of ρ?
  - Table 1D: 24% (53%) of firms report negative (positive) FV of derivatives in bankruptcy $\rightarrow$ Partial effectiveness of hedging

Comment 2: Default events

- The model characterize default as a **violation of a net worth covenant**
  - Net worth threshold contingent on derivative FV?
- Covenant violations are also mentioned in the abstract
- Termination clauses become active upon default events
  - Violations of **financial covenants** (e.g., on net worth, current ratio, EBITDA, etc.) are among "standard events of default" in the form of "cross-default (e.g., a default on a loan or a breach of a financial covenant)"
  - Credit downgrades are among "additional events"
- Why including credit downgrades but not violations of financial covenants among events of default in the empirical analysis?
  - 0.32%, 1.62%, 0.37% of firm-years in bankrupctcy, with credit downgrade, with fraud-related restatement, respectively (Table 1A)
  - 31% of firms with loans containing net worth covenants experience a violation (Chava and Roberts, 2008)
  - Between 5% and 19% per year of nonfinancial US firms in Compustat-EDGAR report a financial covenant violation between 1997 and 2016 (Griffin et al., 2019)
  - To what extent the variable "Default-related words frequency" captures covenant violations?
  - Dataset of actual covenant violations by Nini et al. (2012) could give you more statistical power to study terminations by enlarging the sample of defaulted firms?

Comment 3: Termination rights and hedging by banks

- Focus on set of industries for which hedging activities can be measured well (airlines, oil-gas-coal companies)
- Also for **banks** we observe well both **risk exposures** (credit risk, interest rate risk, etc.), **derivative positions** (credit derivatives, interest rate derivatives, etc.), and breakdown of derivatives based on their purpose (risk management vs. other goals)
- To what extent termination rights explain limited hedging with derivatives by banks? (It would be a different paper, of course)
  - Limited use of credit derivatives for hedging, mostly large banks, which also use them for dealer activities (Minton et al., 2009)
  - Limited use of interest rate derivatives, in many cases even to increase exposure rather than to hedge (Vuillemey, 2019)
- What are the implications of termination clauses for financial institutions operating as derivative dealers, which may keep a "matched book" yet be exposed to counterparty risk?

Comment 4: Rationale for termination rights

- Elaborate more on how termination rights arise endogenously?
  - The systemic risk story, adapted from safe harbor provisions, seems indeed not compelling, as pointed out in the paper
  - Mitigation of moral hazard and adverse selection issues seems a more promising avenue
  - Analogy between derivative termination rights and **MAC clauses** in credit lines?
    - Credit lines can also be seen as a form of hedging against liquidity risk (Acharya et al., 2014), for which derivatives are not commonly available (Bagnara and Jappelli, 2022)
    - MAC clauses are prevalent in credit lines, but, unlike termination rights, are rarely used, possibly due to reputation concerns (e.g., Boot et al., 1993; Demiroglu and James, 2011)

Comment 5: Size of hedging positions

- **Default** if violation of net worth covenant

$$C_1 - D_1 - V_1 < 0$$

- Condition satisfied only if both
  - $C_1 = C_1^L$: negative shock to cash flows
  - $V_1 = V_1^H$: negative shock to FV derivative position
- At the same time, Assumption 1 imposes size limit on derivative position

$$\rho(C_1^L + C_2^L) > V_1^H$$

- Empirically, what is the **size** of exposures to be hedged, notional outstanding, and FV of derivatives relative to firm size?
  - Information available for airlines only (Table 1C): avg. fuel exp./op. exp. ratio of 20.21% (airlines) against avg. hedge ratio of 31.23% (airlines, oil-gas-coal producers) $\rightarrow$ Avg. outst. notional of 6.31% of op. exp.
  - Default in the model hinges on realization of V_t (derivative FV). Only information on FV is on defaulted firms: avg. of \$44M (Table 1D). More details would be useful, also as back-of-the-envelope calculation

Comment 6: Some econometric points

- **Short- vs. long-term effects** of contract terminations
  - Specifications in Tables 4-5 measure short-term effects of default/termination on hedging outcomes, i.e., for the firm-years in which the firm experiences default/termination?
  - Does this mean that firms whose derivative was terminated in default, once out of default, are compared against those that were never terminated?
  - Possible to look at long-term effects of terminations on hedging outcomes?
  - Figures 2 and 3 go in this direction (maybe adding confidence intervals?)
  - But it could be informative to regress hedging outcomes on an indicator equal to 1 for all periods after which a firm experiences a termination
  - This would capture possible long-lasting reputation effects of terminations and how they shape the risk management culture of firms (abstracting from survivorship bias)

- Poisson instead of $\ln(1+y)$ transformation for hedge maturity (e.g., Cohn et al., 2022)?

- Why not using interacted specification ("Event of default $\times$ Termination") in Table 5 (similarly for low vs. high cost bankruptcies in Table 4B, where test of differences in coefficients is missing)?

Comment 7: Model extensions

- Possible to test further implications from model implications?
  - Derivative **collateralization**: can asset tangibility (typically statistically insignificant, but the model predicts a nonlinearity) be seen as a proxy for pledgeability?
  - **Multiple counterparties**: to what extent it is possible to identify instances with multiple counterparts (Appendix A suggests that is possible in several instances; 70 observations out 121 in Table 1D)?

- Bundled hedging and lending
  - Counterparties that are also lenders internalize negative consequences of termination, so they exercise the option less frequently (confirmed empirically)
  - At the same time, upon bankruptcy or covenant violation, **control rights** shift from shareholders to creditors
  - How could this modify condition (21)?

Other comments

- Several specifications provide rather indirect evidence
  - E.g., Table 4 correlates hedging outcomes to default status based on the (empirically-motivated) premise that terminations are more likely during default
  - Table 5 narrows down the economic mechanism by distinguishing between defaults with terminations vs. those without but only for the detailed sample
  - Why not performing the same analysis for the Compustat/SEC sample with "Hedging intensity" as dependent variable?
- Appendices A and B are never directly referenced in the paper
- Do you validate Compustat/SEC hedging measures against the hand-collected ones for the detailed sample (e.g., checking their correlation)?
- The "bag of words" approach to construct, e.g., "Hedging intensity" seems to be based on a quite restrictive list of words. Why not including other words such as "option" or "exercise price" in the list?
- Typos
  - P. 29: "associated with 25.1% lower [higher?] probability of contract right exercise"
  - Table 4: the caption does not describe the difference between Panels A and B
  - P. 34: "did not [have] to make the", "waives it[s] right"

Literature I

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