Collusion through debt and managers

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Outline of the Talk

- Motivation of the paper
- Basic structures of the model
- Main results
- Implications

Motivation

- Influential recent empirical studies have brought back attention on firms' debt structure and corporate governance as drivers for collusion
  - Antón, Ederer, Giné and Schmalz (2021); Azar, Schmalz and Tecu (2018); Dasgupta and Žaldokas (2019); Ha, Ma and Schmalz (2021); Saidi and Streitz (2021).
- Collusion is a widespread phenomenon on both sides of the Atlantic.
  - Boyer and Kotchoni (2015); Smuda (2014); Symeonidis (2018).
- Little theoretical research has been conducted so far about the collusive effects of firms' financial structure and corporate governance.
- There exists consolidated evidence on the negative relationship between the intensity of competition and debt financing
  - Chevalier (1995a, 1995b); Chevalier and Sharfstein (1996); Kovenock and Phillips (1995, 1997); Phillips (1995).

Goal

- We explore the anticompetitive effects of debt financing and managerial incentives.
- Whenever a firm is unable to repay its debt, bankruptcy occurs.
- Despite limited liability, the manager of an insolvent firm faces personal costs of bankruptcy.
- Defaulting managers incur reputation costs, along with the loss of their job or a drastic wage cut
  - Eckbo and Thorburn (2003); Eckbo, Thorburn and Wang (2016); Gilson (1989); Gilson and Vetsuypens (1993); Kaplan (1994a, 1994b); Jenter and Kanaan (2015).

Main Findings

- Firms' shareholders may resort to *debt* and *managerial incentives* as *complementary strategic devices* to support collusion.
- Two opposite forces shape the impact of debt on the sustainability of collusion.
- As a result of this trade-off, the managerial costs of bankruptcy must be sufficiently responsive to the severity of financial distress.
- Higher debt is accompanied by higher-powered managerial incentives to ensure managers' participation.
- Limited commitment to debt and managerial contracts exacerbates shareholders' reliance on debt and managerial incentives.
- We extend the analysis to various forms of market structure.

The Model: Product and Credit Markets

- $N \geq 2$ firms set prices in each period $\tau \in \{1, ..., +\infty\}$, with a discount factor $\delta \in (0, 1)$.
- A firm obtains $\pi > 0$ in each period if all firms charge the monopoly price, whereas a deviant firm collects $N\pi$ in the deviation period.
- The profits of each firm vanish in the unique equilibrium of the stage game.
- A debt contract between firm i and its lender specifies (i) a loan L_i and (ii) a pledged repayment $b_{\tau i}$ in period τ.
- L_i is spent immediately on unproductive activities.
- Whenever a firm is unable to honor its debt contract, bankruptcy occurs and the firm's shareholders are protected by limited liability.

The Model: Managers

- A firm's shareholders delegate pricing decisions to a self-interested manager.
- The costs of bankruptcy faced by firm i's manager in period τ are

$$C\left(b_{\tau i}\right) \triangleq \left[k + \phi\left(b_{\tau i} - \pi_{\tau i}\right)\right] \cdot \mathbf{1}_b$$

  - $k \geq 0$: fixed component
  - $\phi \geq 0$: responsiveness to the severity of financial distress.

- Bankruptcy occurs if and only if $b_{\tau i} > \pi_{\tau i}$.
- The manager receives a share $\alpha_{\tau i} \in [0, 1]$ of net profits $\pi_{\tau i} - b_{\tau i}$.
- A non-defaulting manager has a reservation utility $u \in [0, \pi)$, which drops to zero after bankruptcy.

The Model: Collusion and Timing

- A (symmetric and stationary) collusive strategy prescribes that at $\tau = 0$ firms' shareholders announce
  - a debt contract with a per period pledged repayment b
  - a managerial contract with a profit sharing rule α.
- Each firm charges the monopoly price at $\tau = 1$ and continues to do so as long as all firms charged it in any previous period.
- In response to a deviation, firms revert to the competitive equilibrium, which leads to bankruptcy for $b > 0$.
- The sequence of events unfolds as follows.
  - At $\tau = 0$ firms' shareholders announce debt and managerial contracts.
  - From $\tau = 1$ onward, firms' managers engage in the product market game and contracts are executed. If a firm does not repay its debt, bankruptcy occurs.
- We look for a symmetric pure-strategy SPNE.

Collusion under Managerial Costs of Bankruptcy

- The collusion incentive constraint writes as

$$\frac{\alpha}{1-\delta}(\pi - b) \geq \alpha(N\pi - b) - \delta C(b) \implies \delta \geq \delta^*(\alpha, b).$$

- A higher α exacerbates the managers' temptation to deviate because they can grab a larger portion of deviation profits ($\partial\delta^*/\partial\alpha > 0$).
- A higher b generates two opposite forces on the scope for collusion

1. managers are more inclined to deviate because this triggers bankruptcy and cancels the residual debt due to limited liability
2. managers are more inclined to collude because bankruptcy is more costly.

- Debt facilitates collusion if and only if the responsiveness of the managerial costs of bankruptcy to the severity of financial distress is large enough ($\partial\delta^*/\partial b < 0$ if and only if $\phi > \widetilde{\phi}(\alpha)$).

Endogenizing Debt and Managerial Incentives

- There exists an intermediate region for the discount factor where firms' shareholders resort to debt and provide higher-powered managerial incentives.
- Debt financing and managerial incentives act as complementary strategic devices to sustain collusion.
- This occurs as long as the managerial costs of bankruptcy are sufficiently responsive to the severity of financial distress.
- Our analysis unveils a new channel that relates debt financing and managerial incentive schemes to the sustainability of collusion.

Intuition

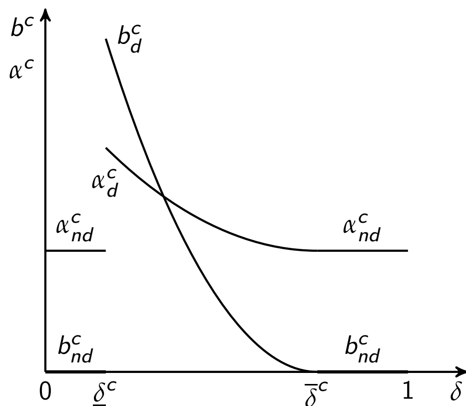

Figure: Debt repayment b^c and managerial profit share α^c under full commitment.

Limited Commitment

- We examine different forms of limited commitment to debt and managerial contracts
  - secret renegotiations
  - no commitment.
- Limited commitment exacerbates the shareholders' propensity to resort to debt and managerial incentives to sustain collusion.
- With secret debt renegotiations collusion can be sustained only under common lending.
- Collusion can still arise when a firm's shareholders cannot commit to any contract whatsoever with their manager.

Managerial, Empirical and Policy Implications

- High debt can be a firm's choice to discipline managerial behavior rather than the outcome of poor managerial performance.
- We try to reconcile theory with the well-documented anticompetitive effects of debt and corporate governance.
- We unveil a dark side of information sharing.
- Collusion is more likely to emerge in markets where firms resort more extensively to debt and managerial incentives.
- Lower enforcement of disclosure rules requires higher debt and managerial incentives to support collusion.
- The same applies with softer competition or higher demand elasticity.
- Collusion is more likely to emerge under common lending.

THANK YOU FOR YOUR ATTENTION!