Competing Under Financial Constraints

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Motivation

- Information asymmetries between borrowers and lenders lead to financial constraints
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Our question:

*How is this cost split between borrowers, lenders and other agents?*
Approach: A Model of Trade Credit

- **Trade credit**: A supplier allows a customer to delay payment for goods already delivered
  - Usually involves transactions of *intermediate goods*
- This is a financial relation where the *supplier becomes a lender* and the *customer is a borrower*
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- Evidence shows
  - It is an **important source of firms’ finance**
    → Around 25% of total assets and 50% of short-term debt of a representative UK firm between 1993 and 2002.
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  - It is an important source of firms’ finance
    - Around 25% of total assets and 50% of short-term debt of a representative UK firm between 1993 and 2002.
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- A widely accepted branch of literature finds a rationale for trade credit on the presence of financial constraints
  - The following model builds on Burkart and Ellingsen (2004)
Related Literature

- **Trade credit**

- **Endowment and product market competition**
  - *Does debt toughen or soften companies in the product market?* Brander and Lewis (1986) versus Bolton and Scharfstein (1990)

- **Pricing and vertical restraints**
  - Rey and Verge (2005)
The Model: Market and Agents

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- A **penniless retailer** (entrepreneur) producing \( q_e \) that borrows input from its supplier
  - No production: every unit of input leads to a unit of output
  - Total output: \( Q = \sum_{i=1}^{N} q_i + q_e \)
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- A **monopolistic supplier** with a unit cost $c_u$
  - Credit line of $L$ units of input at a price $T(I)$
    - $I \leq L$ is the amount of input borrowed by the retailer
  - Double marginalization
The Model: Moral Hazard

- Retailer’s output and sales revenues are verifiable

- Input purchase and investment are not contractible

\[ \text{Moral hazard: input can be diverted to generate non-verifiable private benefits} \]

Each unit of input diverted gives a private benefit \( \beta c u \), which measures input liquidity.

Consequence: Debt is honored only to the extent of market revenues.

Retailer’s utility function is:

\[ \pi e = \max_n \sum_{i=1}^{N} q_i q e I (I) + \beta (I q e) \]
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$$\pi_e = \max \left\{ \left( M - \sum_{i=1}^{N} q_i - q_e \right) q_e - T(I), 0 \right\} + \beta (I - q_e)$$
The Model: Timing

1. **Supplier offers** a credit line of $L$ units of input at a price $T(I)$, which is observed by incumbents.

2. **Retailer borrows** $I \leq L$ and the supplier incurs a cost $c_u I$.

3. Retailer and incumbents simultaneously **launch $q_i$ and $q_e$**
   - $(I - q_e)$ is diverted.

4. Consumers purchase and **revenues are realized**.

5. **Debt is honoured** to the extent of market revenues.
Proposition. For a given \((M, c, c_u, \beta)\), there exist \(\hat{N}_1 < \hat{N}_2 < \bar{N}\) such that:

\[ q_e \]

\[ \pi_e \]
Linear Prices

- **Proposition.** For a given \((M, c, c_u, \beta)\), there exist \(\hat{N}_1 < \hat{N}_2 < \bar{N}\) such that:

![Graphs showing \(q_e\) and \(\pi_e\) as functions of \(N\)]

**Insights**

- Firms may gain **competitive advantage** by relying on external funds.
- Self-financed firms may have **higher adjustment costs** to an increase of competitive pressure if their rival is financially constrained.
Optimal Contracts

Optimality

- A contract is optimal if and only if:
  - Supplier’s profits are those of a Stackelberg leader in the downstream market with a unit cost of $c_u + \beta$
  - Retailer’s profits are those that make her just incentive compatible, i.e. $\pi_e = \beta I$
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Two-Part Tariff

- The optimal contract can be implemented with a two-part tariff $\{F, p_w\}$ such that the retailer is never financially constrained.
  - For high levels of competitive pressure the optimal fixed fee is negative
  - Relation between financial constraints and suppliers’ capacity to extract surplus
Discussion and Scope

- Results apply to industries where suppliers have market power.
- Connection between input suppliers and the banking sector.
- Relation between financial constraints and suppliers’ ability to extract surplus.
- A new mechanism through which firms can take advantage of limited liability.
- A rationale for lump sum transfers from suppliers to retailers.
- Conciliation of different results about the strategic use of debt and the effects of leverage in the product market.
Thank You!