

# Chapter 9 Structural Empirical Analysis of Vertical Contracting

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# Outline - Theory

Introduction

Basics

Non-cooperative bargaining models

- The offer game

- The bidding game

Nash-in-Nash bargaining

# Introduction



# Basics

- Setting
  - A upstream seller  $U$  and a downstream buyer  $D$  agree on a contract  $\mathcal{C}$  from some feasible set.
  - The contract  $\mathcal{C} = \{y, t\}$ ,  $y$  includes other provisions and  $t$  is a lump-sum transfer.
  - Firms' payoffs:  $\Pi_U(\mathcal{C}) \equiv \pi_U(y) + t$ ;  $\Pi_D(\mathcal{C}) \equiv \pi_D(y) - t$
- Pareto efficient contract

$$y^* \in \operatorname{argmax}_{(y,t) \in \mathcal{Y} \times \mathcal{R}} \pi_U(y) + \pi_D(y) \quad (1)$$

- Bilateral contracting principle: complete information and lump-sum transfers.

## Basics - example: successive monopoly setting

- A monopolist manufacturer sells a product to a monopolist retailer.
  - Vertically integrated:  $p^m(c) \equiv \operatorname{argmax}(p - c)D(p)$ ,  $p^m(c_M + c_R)$  maximizes the bilateral surplus.
  - Price unilaterally:  $p^m(w + c_R)$  maximizes the retailer's profit.
  - $p^m(w + c_R) > p^m(c_M + c_R)$ : double marginalization problem.

## Basics - example: negotiation by Nash bargaining

- The parties will agree to a contract that solves

$$\max_{C \in \mathcal{C}^+} [\Pi_D(C) - \bar{\Pi}_D]^b \cdot [\Pi_U(C) - \bar{\Pi}_U]^{1-b} \quad (2)$$

## The offer game

# The bidding game



## Nash-in-Nash bargaining

# Conclusion