

Modeling Behavior, Learning, and Interaction Networks in Dynamic Market Economies

Basic Concepts of Market Organization

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What is a "Market"?

- In modern usage, a *commodity* is anything of use that is available for purchase and sale in standardized form.

Examples: Haircut (service), Compaq Presario 6000 PC (physical asset), Australian dollar (financial asset), cell phone minutes, bandwidth

- A *market* is any context in which trading (buying and selling) of a commodity takes place

Important Aspects of Markets

□ Market Organization

- **Participants:** Who trades with whom? [e.g. business-to-business (B2B) transactions, business-to-consumer (B2C) transactions, etc.]
- **Forms:** In what types of market structures does this trading take place? [e.g. double auctions, single-sided auctions, exchanges, bilateral trades, etc.]

□ Learning Behavior and Strategic Interaction

- Price/quantity discovery *processes*
- *Formation* of buyer-seller interaction networks

Possible Market Forms?

B1

B3

B2

Bean
Producers

H1

H2

H3

H4

Hash
Producers

Producer-Consumer
Connections??

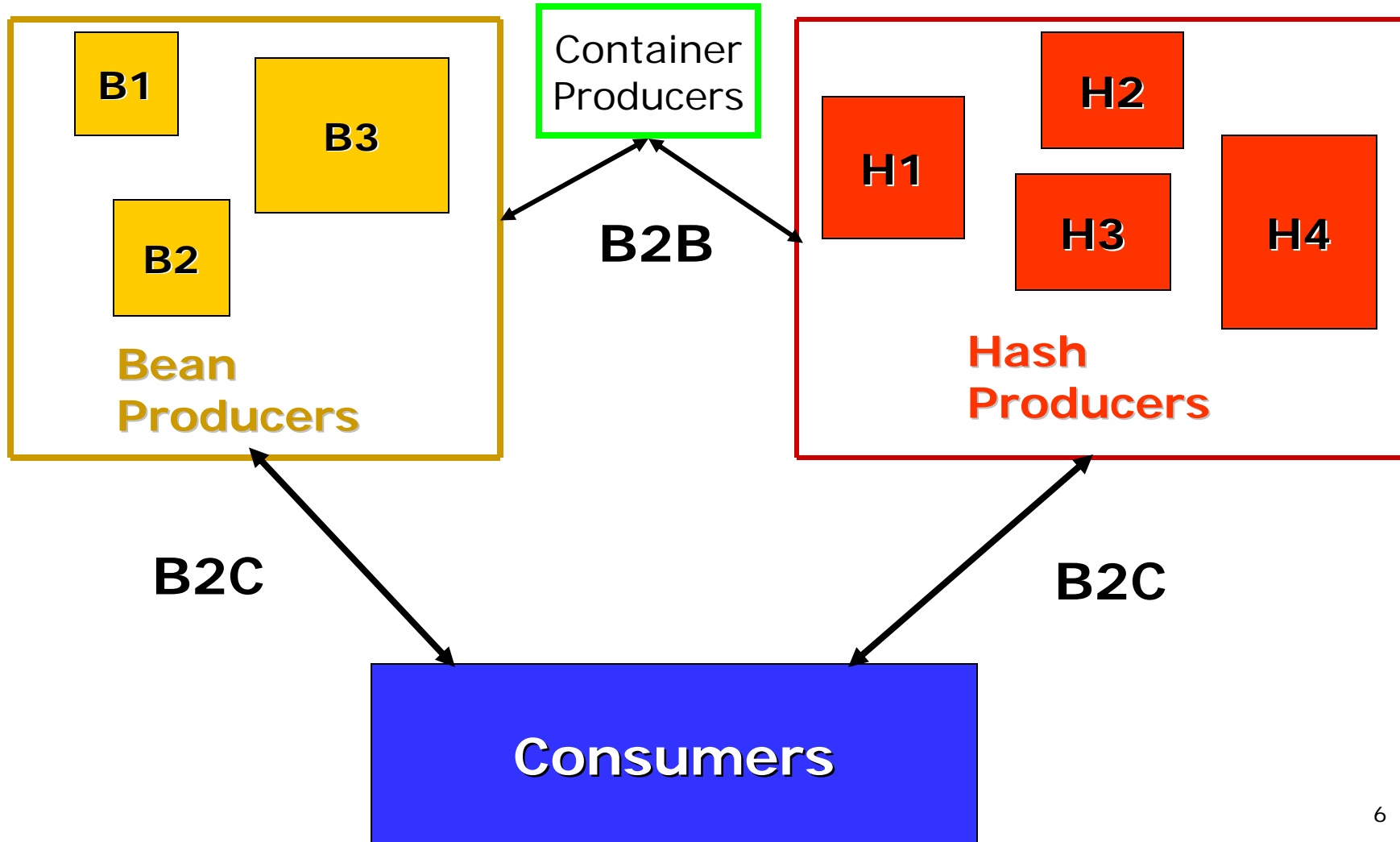
Consumers

Possible Market Forms?

- Two basic forms of market trading:
 - **1. Bilateral** trading (Seller ↔ Buyer)
 - **2. Mediated** trading
(Seller ↔ Mediator ↔ Buyer)

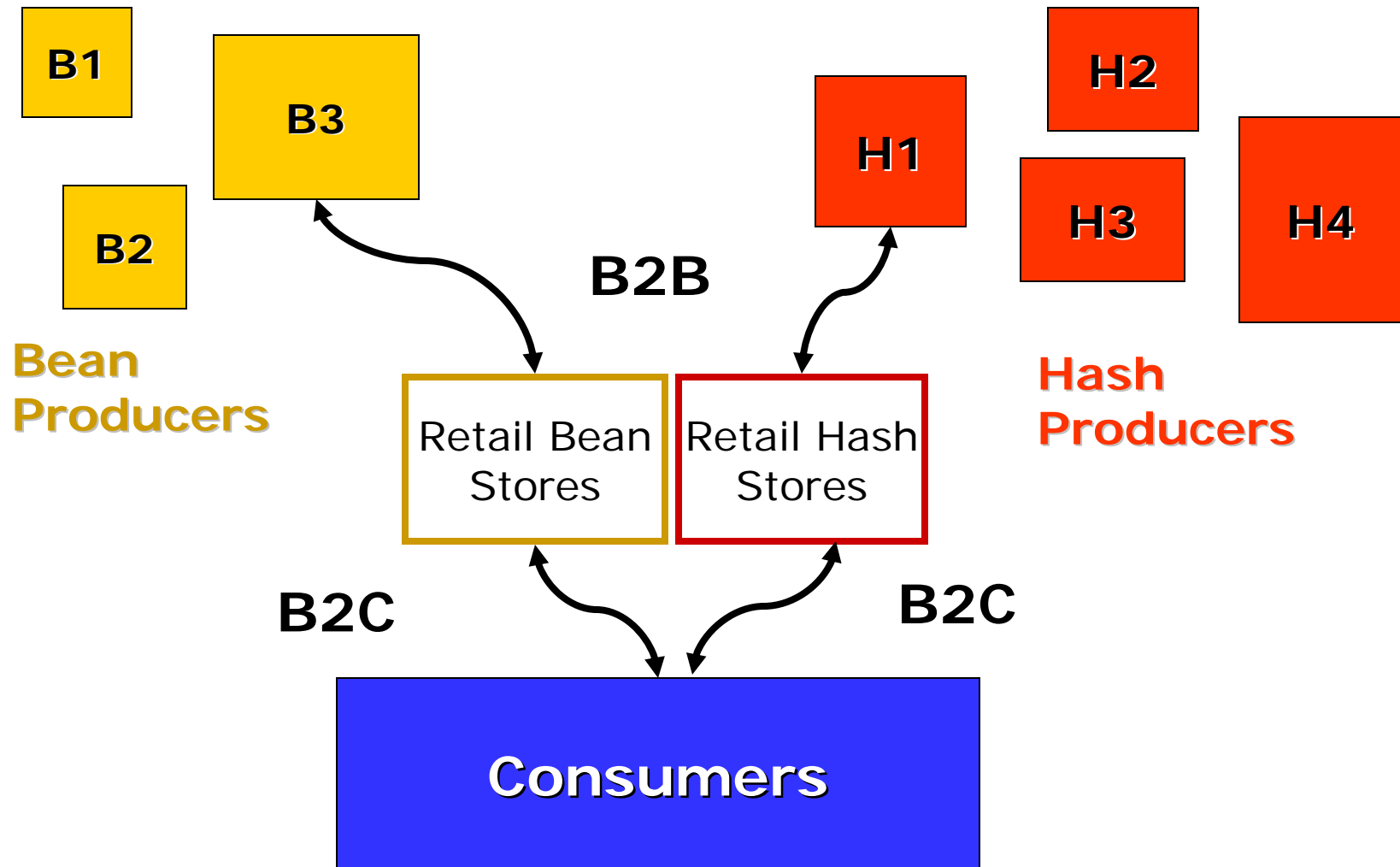
Example 1: Bilateral B2B & B2C Trade

(B2B=Business To Business, B2C=Business To Consumer)



Example 2: Mediated Trade

(Producers → Retail Stores → Consumers)



Key Types of Market Mediators

□ *Broker*

- Facilitates trade by matching buyers with sellers
- Does not take a position in the assets he/she trades (i.e., does not maintain an inventory of the assets)
- Earns profits through commissions charged to buyer/seller
- **Examples:** Stock broker; Real estate broker

□ *Dealer*

- Facilitates trade by matching buyers with sellers
- Takes a position in the assets traded ("makes the market")
- Earns profits by *selling high* and *buying low*
- **Examples:** Bond dealer; Car dealer; Retail store owner

Key Types of Mediated Market Forms

□ *Auction markets*

- Centralized facility (clearing house) managed by brokers
- **Examples:** Art auctions, U.S. Treasury bill auctions, etc.

□ *Over-the-Counter (OTC)*

- Decentralized facility managed by dealers
- **Examples:** NASDAQ stock market, gov't bond market

□ *Exchanges (Hybrid of Auction and OTC)*

- Centralized facility conducted through specialized broker/dealer intermediaries
- **Examples:** Retail stores, New York Stock Exchange,
**** Restructured Wholesale Power Markets****

Learning Behavior & Strategic Interaction in Markets

□ *Price/Quantity Discovery*

- *For sellers*, seeking to determine the most profitable amount to produce and/or the most profitable price to charge per unit in order to compete for business against rival sellers
- *For buyers*, seeking to determine what items are available for purchase and which sellers are willing to accept the lowest prices for the items they wish to purchase

□ *Buyer-Seller Interaction (Relational Goods)*

- How to behave in longer-term relationships (e.g., job situations, servicing contracts, loan contracts, repeat purchases from same supplier, etc.)
- Trust, honesty, punctuality, etc.

Key Types of Market Procurement Processes that Must Be Carried Out

- ◆ *Terms of Trade:* Set production and price levels
- ◆ *Seller-Buyer Matching:*
 - Identify potential suppliers/customers
 - Compare/evaluate opportunities
 - Make demand bids/supply offers
 - Select specific suppliers/customers
 - Negotiate supplier/customer contracts
- ◆ *Trade:* Transactions carried out
- ◆ *Settlement:* Payment processing and shake-out
- ◆ *Manage:* Long-term supplier/customer relations