Supply-Chain Coordination

A typical supply chain

Suppliers Manufacturing Distribution Channels/retailers End users

Materials, products, services, information, money

Supply chain activities

- Design
- Manufacturing
- Procurement
- Planning and forecasting
- Order fulfillment
- Distribution

Equilibrium solution for the decentralized supply chain (DSC)

Supplier's wholesale price (w)	$w=(a+c)/2$
Retailer's quantity (q)	$q=(a-c)/4b$
Market price (P)	$P=(3a+c)/4$
Supplier's profit (Π_S)	$\Pi_S=(a-c)^2/8b$
Retailer's profit (Π_R)	$\Pi_R=(a-c)^2/16b$
Total SC profits (Π)	$\Pi=3(a-c)^2/16b$

Comparison of the decentralized (DSC) and centralized supply chains (CSC)

	Decentralized Supply Chain (DSC)	Centralized Supply Chain (CSC)
Supplier's wholesale price (w)	$w=(a+c)/2$	?
Retailer's quantity (q)	$q=(a-c)/4b$	$q^*=(a-c)/2b$
Market price (P)	$P=(3a+c)/4$	$P^*=(a+c)/2$
Supplier's profit (Π_S)	$\Pi_S=(a-c)^2/8b$	?
Retailer's profit (Π_R)	$\Pi_R=(a-c)^2/16b$	?
Total SC profits (Π)	$\Pi=3(a-c)^2/16b$	$\Pi^*=(a-c)^2/4b$

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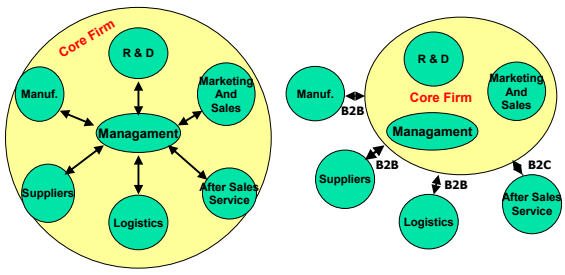
Retailer's quantity (Q)	$q=(a-c)/4b$	$q^*=(a-c)/2b$
Market price (P)	$P=(3a+c)/4$	$P^*=(a+c)/2$
Supplier's profit (Π_S)	$\Pi_S=(a-c)^2/8b$	$\Pi^*_S=(w-c)Q$
Retailer's profit (Π_R)	$\Pi_R=(a-c)^2/16b$	$\Pi^*_R=(P-w)Q$
Total SC profits (Π)	$\Pi=3(a-c)^2/16b$	$\Pi^*=(a-c)^2/4b$

Vertical vs. virtual integration



VERTICAL INTEGRATION *VIRTUAL* INTEGRATION