Business Responses to Food Supply Chain Dynamics

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Agenda

- Cascading events that foster dynamics in the food supply chain
- Examine some business responses to these dynamics
- Characterize commodity markets so as to better understand business responses
- Examine strategic partnering alternatives
- Implications and conclusions
Recent Cascading Events Resulting in Chain Dynamics

- Biotechnology
- Food safety
- Animal welfare
- IT: dramatically decreased costs of information flow

Results in a shift in the basis of rivalry
Technological Advances: Information Technology

- Rapid advances in IT
- Puts premium on strategy development and implementation that includes the management of knowledge
Intellectual Property

- Rights to commercial biotechnology are firm specific intangible assets
- Significant increases in intellectual property resulting from the science of biotechnology
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# Food Processing Industry Dynamics

## Traditional
- Undifferentiated Farm Products
- Commodity Manufacturers
- Branded and Commodity Products

## The Future

### Customized Raw Materials
- Variety
- Source of genetics
- Harvest & storage
- Traceability
- Cultural practices

### Food Processing
- Processing Efficiency
- Safer Products
- Enhanced Product
  - Genetics
  - Sanitation
  - Contamination
  - Healthy
  - Nutritional
  - Flavorful
  - Stable
Firm Responses to GFS Dynamics

Strategy Choices Resulting in Commercialization of New Products

Internal
- Own R&D
- Internal: In-house Experts

External
- License Product or Process Technology
- External: Contract Research
- Acquisition
- Strategic Alliance
- Joint Venture
Characteristics of New Rivalry in Global Food System

Old
- Tangible Assets
- Manufacture
- Build/Acquire Key Manufacturing Facilities
- Achieve Scale Economies

New
- Intangible Assets
- Create/Add Value
- Quickly Out-source and Partner with Other Firms
- Excel in Low-volume Target Markets
Characteristics of New Rivalry in Global Food System

Old
- Reward Individuals
- Fix Quality Problems When They Occur
- Rivalry Based on Cost

New
- Utilize Teams
- HACCP
- Rivalry Based on Product Differentiation
Characteristics of New Rivalry in Global Food System

**Old**
- Have Many Competitive Suppliers
- Secret Strategic Plans

**New**
- Limit Suppliers to One or a Few
- Vertical System Goals; Off-load Some R&D to Upstream Suppliers
Characteristics of New Rivalry in Global Food System

**Old**

- Rivals are Other Firms in the Same Industry
- Operating Income and Return on Invested Capital

**New**

- Rivals are Other Vertical Network Alliances (Chain-on-Chain Rivalry)
- *Controllable Earnings*-- Operating Income minus Capital Usage Charge
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Market Alternatives Continuum: Commodities and the Identity Preservation

Mass Marketed and Commingled Commodities

Differentiated (But Not Branded) Agricultural Commodities

Branded Commodities or Further Processed Products
Mass Markets: undifferentiated and commingled commodities

Differentiated Commodities

Numerous small specialized end-use niche markets with branding or differentiation
Sequential and Reciprocal Dependency
in Commodity Marketing Channels

Sequential Dependency
- Food Grains
- Feed Grains
- Semi-processed products
- Cotton/wool

Reciprocal Dependency
- Fruits and vegetables for processing
- Milk
- Broilers
- Eggs
Differentiated

Sequential Dependency

Blue Diamond
Farmland
Cenex Harvest States

SoyLink
Plains Cotton Cooperative Association (PCCA)
Cargill

Reciprocal Dependency

Tyson
Smithfield Foods
Welch Foods

DFA
United Producers

Generic
Differentiated Sequential Dependency
Spot Markets and Buffer Stocks

Differentiated Reciprocal Dependency
Contracts

Generic Sequential Dependency
Generic Reciprocal Dependency
Alternative Supply Chains

- Based on work by Rice and Hoppe; Peterson; Sporleder and Peterson on future of chain-on-chain competition.

- As adapted here:
  - **Chain master**: supply chain managed by a domain firm
  - **Chain web**: individual firms move in and out of multiple chains as needed
  - **Chain organism**: the chain competes as one entity without a dominant member.
Characteristics of SC

- **Chain Master**
  - Dominant agrifood model
  - Strong in generating chain efficiency
  - Weak on incentives for innovation by suppliers, KM and learning

- **Chain Web**
  - Computer industry & smaller food firms
  - Strong when firms must compete in multiple chains
  - Weak on incentives for KM and learning
Most Sophisticated SC

- **Chain Organism**
  - Strong in creating chain efficiency
  - Strong in creating incentives
  - Toyota supply system as key example (Dyer and Nobeoka)
    - Network-level KM systems exist.
    - Intellectual property rights reside at the network level and not at the firm level.
    - The “creator” of knowledge appropriates 100% of benefits in the short run.
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Strategic Partnering Alternatives

- Strategic Partnering
  - Upstream and Downstream Relationships
    - Contracts
    - Strategic Alliances
      - Non-Equity Alliances
      - Equity Alliances
      - Joint Ventures
    - Ownership Integration, Mergers, and Consolidations
Strategic Alliance

- What is it?
- How does it differ from other arrangements?
- What are the economic factors driving choice of a strategic alliance compared to alternative arrangements?
Strategic Alliance

- Is it just another contract?
Strategic Alliances
Definitional Considerations

- Strategic alliance is a general class of several alternative interfirm arrangements
- Equity and the nature of trust are important distinctions
Strategic Alliances

Alternative Arrangements

- Joint venture
- Minority equity agreement
- Consortia
- Non-equity agreement
Dynamics of Strategic Alliances

Non-equity Strategic Alliance

Equity Alliance

Joint Venture

Time
Food Processor:
Strategic Alliances with Suppliers

- Most common reason is **cost control**
- Second most common reason is **R&D**
  - developing prototype products
  - improving product formulations
Improving product quality 20%
Refrigeration and shelf life 2%
Products 6%
Package design 11%
Analytical instrumentation 3%
Developing product prototypes 25%
Cost control 27%
Other 3%
Marketing strategies 3%
Improving product quality 20%
Creating healthy products 6%
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- Examine some business responses to these dynamics
- Characterize commodity markets so as to better understand business responses
- Examine alternative vertical interfirm cooperation mechanisms, especially contracts and strategic alliances
- Implications and conclusions
Some Conclusions

- Buffer stocks, especially for storable commodities, are a substitute for contracting.
- The extent of perishability helps determine the governance structure (spot & contract).
- Firms, as economic agents in the agrifood supply chain, think of IP as a signaling problem.
Some Conclusions

- Intellectual property increases the intangible assets portion of a firm’s balance sheet—this has many implications for firm strategy.
- Private firms increasingly rely on strategic alliances as a tactic which supports or may even replace contracting.
Some Conclusions

- Chain master model is the most common SC type—implies dominant firm with substantial influence over contract terms employed.
- Motives for strategic alliances by food processors mostly to gain efficiencies and share R&D expenses with upstream suppliers.