Agrifood Supply Chains in the NAFTA Market

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Outline

- Do borders still matter? Two hypotheses.
- Conceptual framework
  - Identify key drivers for change
  - Effect on Transaction costs
  - Implications for supply chain relationships
- Challenges to cross-border supply chains
  - Border frictions
  - National policy responses to regional problems
- Conclusions
Do borders still matter?

- Expectations that regional trade agreements will lead to a **deepening** of economic integration, e.g. increase in cross-border supply chains
- If borders no longer mattered we would expect to see no difference in the way in which supply chains are organized within a country and between countries
- Evidence from Gravity models suggests that borders still matter (Jayasinghe & Sarkar, 2004; Moodley et al., 2000)
Two Hypotheses

If borders still matter, what will be the effect on vertical coordination across the border?

Two hypotheses:
1. Firms pursue strategy of **closer** vertical coordination across borders to better plan for border friction and proactively provide information to reduce border irritants.
2. Firms pursue **less** vertical coordination across borders to reduce dependency-based risks associated with border closures, disruptions, costs.

Depends on characteristics of product & position of border within the supply chain.

Need a conceptual framework.
Transaction Cost Economics provides insights into changing nature of vertical coordination.

Information/search costs

Negotiation costs

Monitoring & Enforcement costs

Transaction costs affect the vertical coordination outcome.
Vertical Coordination

- Spectrum of vertical coordination possibilities from spot markets, through contracts, strategic alliances, joint ventures, and vertical integration
- Trend toward closer vertical coordination in domestic agrifood markets
- Drivers for change: regulatory, socio-economic, technological
- E.g. Food quality; food safety; ethical attributes; environment; information technology
Conceptual model of forces driving vertical coordination

External Drivers: e.g.
- Socio-Economic
- Regulatory
- Technology

Product Characteristics
Transaction Characteristics

Transaction Costs Reducing Competitive Pressure

Institutional Adaptation

Vertical Coordination

Adapted from Hobbs and Young (2000)
Transaction Characteristics

- Changes in transaction characteristics affect transaction costs
- **Asset specificity:** vulnerability to opportunistic behavior; incentive for vertical integration
- Frequency
- Complexity
- **Uncertainty:** closer vertical coordination to mitigate higher search & monitoring costs
Uncertainty

- Uncertainty for buyer over **product quality** (search costs; monitoring costs)
- Uncertainty for buyer over **reliability of supply** (quantity & timeliness)
- **Price uncertainty** for buyer & seller (time lag)
- Uncertainty for seller in **finding a buyer** (search costs)
<table>
<thead>
<tr>
<th>Product Characteristics, e.g.</th>
<th>Uncertainty for buyer quality</th>
<th>Uncertainty for buyer: supply reliability (timeliness and quantity)</th>
<th>Uncertainty for buyer and seller: price</th>
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Border Effects

- Regulatory drivers can affect transaction characteristics directly,
- e.g. increased border security measures following 9/11
- Border delays increase uncertainty
  - over timeliness of delivery;
  - over (net) price (higher transportation costs);
  - over quality (perishable goods)
- Crossing a border can significantly increase the complexity of the transaction
### Transaction Characteristics

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<th>Relationship-specific investment</th>
<th>Complexity of transaction (variety of outcomes)</th>
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*Source: Adapted from Hobbs and Young (2000)*
Conceptual model of forces driving vertical coordination

External Drivers: e.g.
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Institutional Adaptation

- Institutional adaptation through transaction-cost reducing innovations

  - e.g. private sector: third party service providers

  - e.g. public sector institutional adaptations: GreenLane Maritime Cargo Security Act
The good news

- NAFTA chapter 11 facilitated more secure cross-border investments, e.g. Walmart - expansion into Mexico; Cargill (greenfield investment in Alberta; Tysons (purchase of plant in Brooks, Alberta)

- Removal of tariffs likely more important for increasing transborder trade rather than deepening economic relations through closer vertical coordination (not affect product characteristics or transaction characteristics)

- Removal of quantitative restrictions may have reduced some supply chain uncertainties re: access to quota allotments
The bad news

- Challenges to the growth of cross-border supply chains include:
- Policy distortions, e.g., supply management, sugar, Canadian Wheat Board, subsidies
- Border frictions
- Persistence of national policy solutions to regional problems
Border Frictions

- Border delays reduce the efficiency gains available from just-in-time delivery systems
- Customs procedures and border inspection costs
- Lack of harmonization of standards & technical regulations
- International law opaque with respect to transboundary liability
- Exchange rate risk
- People movement
Crossing a border within Europe
(Schengen Group)

“A typical Schengen Border Crossing

“It’s lunch time . . . this must be Belgium”
W.A. Kerr (numerous)
US border
Border Delays

“Often it takes from two to five days and at least three pieces of equipment (trucks and trailers) and three or four drivers, to cross the Rio Grande river with a loaded truck, while actual driving time from Chicago to Laredo (1600 miles) is only two days” (Haralambides and Londono-Kent, 2004, Intl. J of Transport Economics, emphasis added)
Border delays

“Transport of a trailer over the 1600 miles from Chicago to Monterrey involves 10 movements with a minimum of three different trucks and various pieces of equipment for loading and unloading “. . . pre-clearance at the US border is “a process that takes 12 to 74 hours”. Following pre-clearance, a Mexican truck transfers the product across the border “crossing time varies 1 to 8 hours” (Haralambides and Londono-Kent, 2004, emphasis added)
“it takes from two to five days
... a process that takes 12 to 74 hours
... Crossing time varies 1 to 8 hours”

uncertainty

Estimated time northbound Mexico to US across Nuevo-Laredo border varies from 1.6 to 13.1 hours; Southbound US to Mexico varies from 12.1 to 82.4 hours (Haralambides & Londono-Kent, 2004)
Implications

- Problem for perishable products
- Problem for just-in-time delivery systems
- Uncertainty: reliability of supply; quality
- Suppliers may be restricted to participating in less efficient supply chain relationships
- Retailers will prefer to source domestically rather than across the border (e.g. Walmart in Mexico)
Compared to . . .

“It’s lunch time . . . this must be Belgium”
Customs Procedures & Border Inspection Costs

- Particular challenge for B-to-C Ecommerce in perishable and specialty food products
- Lumpiness in border inspection costs put smaller-scale Ecommerce shipments at a competitive disadvantage
- Incentive instead to vertically integrate across border and ship in bulk for distribution within target country
Failure to harmonize standards

- E.g. different organic standards (definition, protocols, labeling requirements); different regulations on natural health products
- Transborder movement of organic products may require closer vertical coordination to reduce monitoring costs
- NAFTA committees on harmonization of technical regulations and standards not delivered
- Implication: increased transaction costs leading to institutional adaptation, e.g. growth of private standards such as retailers’ Good Agricultural Practices
Different commercial legal systems

- Growing emphasis on traceability, in part to facilitate assigning liability for food safety problems & encourage due diligence
- Transboundary liability is unclear
- Complicates cross border supply chain relationships between independent firms
- Implication: increases the complexity of the transaction, increases uncertainty
Exchange rate risk – North America

- Creates price uncertainty for buyers & sellers
- Hedge E/R risk but major structural shifts a problem
- Vertical integration across the border a possible strategy to internalize the price risk
Europe (13 countries)

(now much easier to go to Belgium for lunch!)
People Movement

- Establishing business relationships likely requires frequent cross-border movement of personnel (search & negotiation costs)
- Ongoing business relationships likely require movement of technical personnel, etc.
- Some NAFTA provisions for some professions, but still requires documentation, passports; often not a transparent process
- New passport requirement for US-Canadian border
Lunch in Belgium

No passport required!
Compared to . . .
People Movement: Implications?

- Can affect ways in which cross-border supply chains are coordinated
- E.g. use subsidiaries to coordinate after-sales service. Difficult in market entry stage.
- E.g. contract with foreign firms for after-sales service
Supply chain solutions

- Joint venture with existing firms as a market entry strategy (e.g. Walmart’s initial foray into Mexico through JV with Cifra), OR
- Internalize costs by vertically integrating across the border, OR
- Use spot markets and hire the service provider
- Whether border frictions lead to closer OR looser coordination will depend on transaction and product characteristics and the effect on transaction costs at the margin
Supply chain solutions

- Institutional adaptation: growth of firms providing services which reduce the transaction costs of moving goods across borders. May reduce the effect of borders on supply chains.
- Difficult to test empirically. Need time series data on degree & nature of cross border commerce and growth/decline of third party service providers.
National Policy Responses to Regional Problems

- National policy decisions can increase risks of cross-border supply chain investments
- E.g. increased border security measures following 9/11
- E.g. Effect of BSE on cross-border supply chains: closure of US border to Canadian cattle for an extended period
- E.g. anti-dumping & countervail actions
- E.g. Threat of country of origin labelling
- → create uncertainty; add to complexity of the transaction
- → disrupt cross-border supply chains and increase costs/risks of investments in these supply chains
- Difficult to anticipate ex ante
The Canadian-US border on 9/12

The day after the attacks, trucks were backed up 27 kilometres from the U.S. border on Highway 402 at Reece's Corners, southern Ontario. Heightened security checks slowed cross-border traffic to a trickle.
Conclusions

- NAFTA borders still matter
- Full potential for *deepening* economic integration remains unrealized
- Bilateral supply chains in North America more costly than those within one country
- Difficult to predict how this inefficiency will manifest itself:
  - as closer supply chain coordination to internalize costs,
  - or looser coordination to avoid dependency risks
- Need to examine product characteristics and transaction characteristics of specific industries to determine
- Further attention needed to border frictions and common policy approaches within NAFTA to encourage greater cross-border supply chain activity in the agrifood sector
Lunch anyone?