Competitiveness of EU Agri-Food Supply Chains: A Conceptual Framework

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COMPETE Final Consultation Workshop
22nd September 2015
Brussels
What is competitiveness?
- Multidimensional, dynamic and relative concept – no unique and universally accepted definition!

How is it measured?
- Assessed at various levels, e.g. country, region, industry and firm, supply chain, and with a wide array of indicators

Agri-food supply chain competitiveness?
- Limited research on agri-food supply chain competitiveness per se
- Literature on agri-food industry competitiveness draws largely on trade, productivity and value added indicators
- Often it ignores social and environmental considerations, i.e. ‘sustainable’ competitiveness
WP2: Conceptual framework for assessing product chain competitiveness

D2.2 – Theoretical background and conceptual framework (Gorton et al., 2013)

Objectives:

- To define the term ‘competitiveness of product chain’
- To review existing theories of competitiveness & identify determinants and indicators of competitive advantage and their interactions
- To develop a conceptual framework for a comprehensive and comparative analysis of competitiveness of agri-food supply chains
Work Outline

- Theories of competitiveness
  - National competitiveness
  - Industry and firm
  - Supply chain
- Determinants of competitiveness
- Indicators & metrics
- Conceptual framework
- Concluding remarks
National Competitiveness

- A “country’s capacity to sustain and expand its share of international markets and at the same time to improve its people’s standard of living” (Fajnzylber, 1988:12)
- Roots in theory of Industrial Organisation, particularly the work of Porter (1998)
- Krugman’s criticism (1994): competition between firms is poor analogy for studying national or regional economies
- Traill and Pitts (1998): Porter’s model not suitable to assess agri-food competitiveness – fails to capture policy effects or environmental considerations

Porter’s Diamond Model

Source: Porter (1998:72)
National Competitiveness

- Most comprehensive approach by the World Economic Forum
- Global Competitiveness Index (GCI)
- Three stage model of economic development with 12 pillars
- Sustainability-adjusted GCI: two additional pillars on environmental & social sustainability

Stages of economic development & global competitiveness

<table>
<thead>
<tr>
<th>Stage 1: Factor-driven</th>
<th>Stage 2: Efficiency-driven</th>
<th>Stage 3: Innovation-driven</th>
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**Pillars 1-4:**
- Institutions
- Infrastructure
- Macroeconomic environment
- Health & primary education

**Pillars 5-10:**
- Higher education & training
- Goods market efficiency
- Labour market efficiency
- Financial market development
- Technological readiness
- Market size

**Pillars 11-12:**
- Business sophistication
- Innovation
Industry and Firm

- Definition: “the ability of firms to consistently and profitably produce products that meet the requirements of an open market in terms of price, [and] quality” (Domazet, 2012: 294-295)

- Two major schools of thought:
  - The Traditional Industrial Organisation → Structure - Conduct - Performance
  - The Resource-Based View (augmented by the natural-resource-based view of the firm)

Porter’s Five Forces Driving Industry Competition

- POTENTIAL ENTRANTS
- INDUSTRY COMPETITORS
  - Rivalry among existing firms
  - Bargaining power of suppliers
  - Bargaining power of buyers
- BUYERS
- SUBSTITUTES
  - Threat of substitute products/services
  - Threat of new entrants

Source: Porter (2004:4)
Supply Chain

- Competition is not limited to individual firms but encompasses complete value chains.
- The nature of supply chains relations can be a source of competitive advantage or disadvantage.
- Governance structure of global value chains (Gereffi et al., 2005).
- Captive value chains characterise the agri-food sector (Hingley et al., 2006).

Five Types of Value Chain Governance

Source: Gereffi et al. (2005:89)
Determinants of Competitiveness in Agriculture

<table>
<thead>
<tr>
<th>Endogenous Determinants (controlled by firms)</th>
<th>Exogenous Determinants (beyond the firm)</th>
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<tbody>
<tr>
<td>• Business size</td>
<td>• Factor endowment (e.g. labour, capital and land)</td>
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<tr>
<td>• Legal status (ownership)</td>
<td>• Consumer demand</td>
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<td>• Factor intensity (e.g. capital-labour ratio &amp; land-labour ratio)</td>
<td>• Government intervention in agriculture (e.g. policies, regulations, taxation)</td>
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<td>• Product specialisation vs diversification</td>
<td>• Research and development</td>
</tr>
<tr>
<td>• Production and marketing practices</td>
<td>• Investment in infrastructure</td>
</tr>
<tr>
<td>• Characteristics of (farm) labour</td>
<td>• Firm location</td>
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Source: Latruffe (2010) and OECD (2011)
Indicators and Metrics

- Agri-food industry competitiveness - trade, productivity & value added indicators
- Agri-food sector not addressed by GCI (only agricultural policy costs)
- Supply chain - order lead time, delivery reliability and total inventory costs (Gunasekaran et al., 2001)
  - But lack adaptation to the agri-food sector (derived from studies of electronic and automobile manufacturing)
- Agri-food supply chain performance: efficiency, flexibility, responsiveness and food quality

Source: Aramyan et al. (2007: 313)
Conceptual Framework – Key Domains

Sphere of Enterprises
(farms, food manufacturers and retailers)

Natural Environment
(biodiversity, climate)

Relationships between Agents and Domains

Consumers
(prices, safety, wellbeing, satisfaction)

Policy Makers and Government

Source: Own construction
## Conceptual Framework - Main Metrics

<table>
<thead>
<tr>
<th>Domain</th>
<th>Metrics</th>
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<tbody>
<tr>
<td><strong>Enterprises</strong></td>
<td>Profitability, productivity, return on assets, R&amp;D investment and financial stress</td>
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<tr>
<td><strong>Consumers</strong></td>
<td>International comparison of retail prices, consumer satisfaction/service quality scales, farm gate – retail price spreads</td>
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<tr>
<td></td>
<td>Food safety and consumer health</td>
</tr>
<tr>
<td><strong>Policy makers and government</strong></td>
<td>Trade indicators: revealed comparative advantage, domestic resource cost ratios, intra-industry trade</td>
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<td></td>
<td>Beneficiaries versus non-beneficiaries of support measures (propensity score matching analysis)</td>
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<tr>
<td><strong>Environment</strong></td>
<td>Emissions of N, P, K and heavy metals to soil and water (kg/ha), length of hedgerows (m/ha), number of threatened and characteristics species per ha, Greenhouse gas emissions per ha</td>
</tr>
<tr>
<td><strong>Relationships between agents and domains</strong></td>
<td>Profits, value added, and mark ups at each stage of the supply chain</td>
</tr>
</tbody>
</table>

*Source: Own construction*
Concluding Remarks

- Framework for conceptualizing the competitiveness of agri-food supply chains at the international level
- Basis for comprehensive and comparative analysis of agri-food product chains
- Study the determinants of agri-food supply chain competitiveness:
  - Trade performance & export competitiveness
  - Assessments of productivity & innovation strategies
  - Efficiency of domestic & international markets
  - Governance structures & market performance
  - Policy measures & business environment