New Paradigm of the World Agriculture

Productivity, Sustainability, Innovations

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Globalization & competition in agri-food Chains

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Evaluation of agricultural policy in the “Good Old Days” (example: EU tariffs)
“Misconceptions of modern agricultural markets”

• Microeconomics textbooks continue to point at “agricultural markets” as standard examples of “competitive markets”.
  
  – “Thousands of farmers produce wheat, which thousands of buyers purchase to produce flour and other products. As a result no single buyer can significantly affect the price of wheat.”

• (Sexton, AJAE 2012)
Agricultural markets as “examples of competitive markets” requires several conditions:

- Buyers and sellers must be many and small relative to the total size of the market.
- Products must be homogenous.
- Information must be perfect, so all buyers and sellers are aware of prices and product characteristics.
- Contracts are enforced.
Misconceptions of modern agricultural markets

“I don’t know of any modern agricultural market that meets all three of these conditions. Most don’t meet any of them”

(Sexton 2012)
Some issues

- Who are the “consumers” and the “producers”? A broader value chain focus.

- The “consumers” and “producers” may be quite differently structured.

- The markets are “interlinked” – through contracting, capital constraints, search costs, ...

- The “commodity” is not just defined by “quantity” and “price” but by additional characteristics – “standards”.

- ...

All these factors will affect the productivity (efficiency) and distribution of income/rents (equity). If important, one cannot ignore them (or assume them away) – Swinnen et al (2015).
The farm share of value in the chain

1 - 2 eurocents

20 eurocents

2 euro

5 euro
The World is Complex
(Theory & Empirics are Nuanced)

See also:
- Beghin et al ARRE 2015
- Swinnen Ag Econ 2016
- Swinnenen AJAE 2017
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A simple value chain model:

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The Cocoa - Chocolate Value Chain

• Farmers: produce cacao beans concentrated in a few countries, with Africa contributing 72% of total global production. 90% produced by smallholders (less than 10 ha).
The Cocoa - Chocolate Value Chain

• Cocoa Grinding

Mostly in destination countries: 50% - 60% in Europe (40-45%) and North America (12%)

Highly concentrated: 41% of processing conducted by just three companies

– Archer Daniel Midland (14%)
– Cargill (14%)
– Barry Callebaut (13%)
The Cocoa - Chocolate Value Chain

• **Chocolate Manufacturing**

  *Europe and North America:* approximately **85% of global production** in the Candy and Chocolate Manufacturing sector

  Highly **concentrated**: almost **50%** of manufacturing conducted by just **four companies**:

  – Mondelez International Inc. (14.7%)
  – Mars Inc. (14.1%)
  – Nestlé SA (12.2%)
  – Ferrero Group (7.7%)
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A simple value chain model

- Input/Technology Company
  - Finance
  - PRODUCT (Technology & Inputs)
- Farmer
  - Finance
  - PRODUCT (Raw Material)
- Processor
  - Finance
  - PRODUCT (Processed)
- Consumer
Value chain innovation

Technology Company

Farmer

Processor

Consumer

Finance

Raw Material

Processed product

TECHNOLOGY & INPUTS
What other analyses find ...

“69% of 35 billion $ credit in the Brazilian agri-food system is supply-chain credit”

Banco do Brasil (March 2004)
## VC in Romanian Dairy - 2004

<table>
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<th>Type of support</th>
<th>DANONE</th>
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<th>PRO-MILCH</th>
<th>RA-RAUL</th>
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<td>Bank loan guarantees</td>
<td>X</td>
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<td>X</td>
</tr>
</tbody>
</table>
Dairy Equipment in Russia

- Special purpose vehicle (SPV) to distribute among partners
- Leasing dairy equipment by joint project Wimm Bill Dann -- De Laval in Russia

Diagram:
- Processing co.
- Special Purpose Vehicle
- Farm
- Technology Company
- Bank
**IMPACT**

**Poland Dairy 1995 - 2003**

VCD innovations & small farm investments (milk cooling equipment)

(Dries & Swinnen, WD 2002)
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Recent: Rapid Growth of Standards
More, More stringent, More widespread

SPS notifications to WTO

GlobalGAP certifications

Public

Private
China

After ...
Value & VC

Commodity Value & Standards
(& Characteristics)

Governance of Value Chain (incl VCF)

Surplus Creation & Surplus Distribution along the Value Chain
Efficiency and Equity in VCD with Imperfect Markets

Value affects both **surplus creation** and **surplus distribution**
With vertical coordination and value chains, policy changes that affect output markets will also affect input provisions ("endogenous vertical coordination").

Value and Standards Matter!

Condition for contract feasibility
(without external enforcement)

Minimum value required to enforce contracts via efficiency premia

=> Private VCD works better in high value markets than low value commodities (eg staple foods)

Q: WHO BENEFITS?
Market power and globalization in agri-food chains is an important economic issue and a sensitive item on the policy agenda all around the world.
Reality: Crucially important...

• Major growth in concentration in parts of the agri-food value chains, in particular at the retail sector
Reality: Crucially important...

• Major growth in concentration in parts of the agri-food value chains, in particular at the retail sector

• Contracting & vertical relationships are widespread in modern supply chains
Reality: Crucially important...

- Concentration & market power
- Contracting & vertical relationships
- Quality & Diversity requirements
Policies for the “new paradigm” ...

• The welfare implications are complex

• The policy implications are not trivial

OUR BOOK !!!

CAP Evaluation in the “Good Old Days”
Policy Evaluation in the “New Paradigm”

• On farmer’s income:

\[ \frac{\partial Y}{\partial \Psi} = \frac{\partial Y}{\partial \alpha} \cdot \frac{\partial \alpha}{\partial \Psi} + \frac{\partial Y}{\partial \phi^f} \cdot \frac{\partial \phi^f}{\partial \Psi} + \frac{\partial Y}{\partial \gamma} \cdot \frac{\partial \gamma}{\partial \Psi} \]

  – with \( \partial Y/\partial \alpha \geq 0, \partial Y/\partial \phi^f \leq 0, \partial Y/\partial \gamma \geq 0 \)

• On contract feasibility:

\[ \frac{\partial [\theta - \theta_{\text{min}}]}{\partial \Psi} = \left[ \frac{\partial \theta}{\partial \alpha} - \frac{\partial \theta_{\text{min}}}{\partial \alpha} \right] \cdot \frac{\partial \alpha}{\partial \Psi} - \frac{\partial \theta_{\text{min}}}{\partial \alpha} \cdot \frac{\partial \phi^f}{\partial \Psi} - \frac{\partial \theta_{\text{min}}}{\partial \gamma} \cdot \frac{\partial \gamma}{\partial \Psi} \]

  – with \( \partial \theta/\partial \alpha < 0, \partial \theta_{\text{min}}/\partial \alpha \leq 0, \partial \theta_{\text{min}}/\partial \phi_f \leq 0, \partial \theta_{\text{min}}/\partial \gamma \geq 0 \)
Agricultural Policy Discussion

From

“(un)fair prices”

to

“(un)fair trading practices” (UTPs)
Conceptual and Empirical Studies find complex and mixed effects on farmers and households.
Theory: The simple argument

High concentration → market power →

a) buyer power: lower prices for suppliers

b) seller power: higher consumer prices
While concentration is a useful first indicator of market power, high concentration does not necessarily translate into market power.

- **Asymmetries** in size, cost, or strategy may impede collusion. (Compte et al., 2002; Kühn, 2002; Barla, 2000; Dobson et al., 2001)
Theory: Some complications

While concentration is a useful first indicator of market power, high concentration does not necessarily translate into market power.

- Vertical relationships matter: strong competition may lead to break-down of buyer-supplier relationships.

(McCorriston & Sheldon, 2007; McCorriston, 2015; Swinnen et al 2015)
Theory: Some more complications

... high concentration may enhance welfare if it:

- Increases SCALE economies
- Reduces TRANSACTION costs
- Secures return on investments in R&D
- Offsets market power of other agents supplier ("COUNTERVAILING power")
  - (Very different debate today than 20 years ago)
Empirical Studies - consumers

- Diverging conclusions on the effects of retail concentration / modern retail on consumer prices:

  **OECD COUNTRIES**
  - **LOWER PRICES or NO EFFECT:** Kaufman Handy (1989), Newmark (1990), Binkley Connor (1998), Binkley et al. (2002)

  **DEVELOPING COUNTRIES**
  - **HIGHER PRICES:** Minten (2011)
  - **LOWER PRICES:** Reardon and Hopkins (2006), D’Haese and Van Huylebroeck (2005), Neven et al (2006)
Empirical Evidence - farmers

• Results vary and depend on variety of model assumptions & case specificities (McCorriston, 2015)

  – RICH COUNTRIES
    • Significant market power (e.g. Lloyd et al 2009)
    • No or weak market power (e.g. Dobson et al (2001), Scokai et al (2009))

  – EMERGING and DEVELOPING COUNTRIES
    • Mixed findings (Sadler et al 2007; Minten et al (2009), Maertens et al (2009))
Conclusion: A Complex Chain System

• Obvious need for better understanding

• Data & information is limited:
  – “it is practically impossible to measure retailers buying power as prices paid by retailers to their suppliers are typically not revealed” (Sexton et al 2005)
  – With contracts, data problems are worse

• Endogeneity problems:
  – Comparative analyses between commodities and countries are problematic because the vertical structure of the chain is likely to be endogenous to the institutional constraints and commodity characteristics ....
Sources

• Conceptual frameworks and reviews:
  – Swinnen (2016), IAAE Presidential Address (published in *Agricultural Economics*)
  – Swinnen and Kuijpers (2018), Value Chains and Technology Transer, *Food Policy*

• Comparative Studies:
  – Dries et al (2009), *World Development*

• Dairy in India:
  – Janssen and Swinnen (2017) Food Policy
  – Burkitbaeva, Janssen and Swinnen (forthcoming)