GLOBALIZATION AND COMPETITION IN AGRI-FOOD SUPPLY CHAINS

Johan SWINNEN

LICOS – Centre for Institutions and Economic Performance

KU Leuven

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- 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.

“Misconceptions of modern agricultural markets”

- Sexton (AJAE 2012)
- Microeconomics textbooks continue to point at “agricultural markets” as standard examples of “competitive markets”.

Typical textbook example

- “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.”

Reality

- In 1999, the US Dept of Justice sued to prevent the merger of Cargill and Continental Grain Company to protect US farmers.

- Sales of “thousands” of Canadian wheat farmers were controlled by a single state trader (the Canadian Wheat Board) …

Misconceptions of modern agricultural markets

- Agricultural markets as examples of competitive markets.
- Three 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

Misconceptions of modern agricultural markets

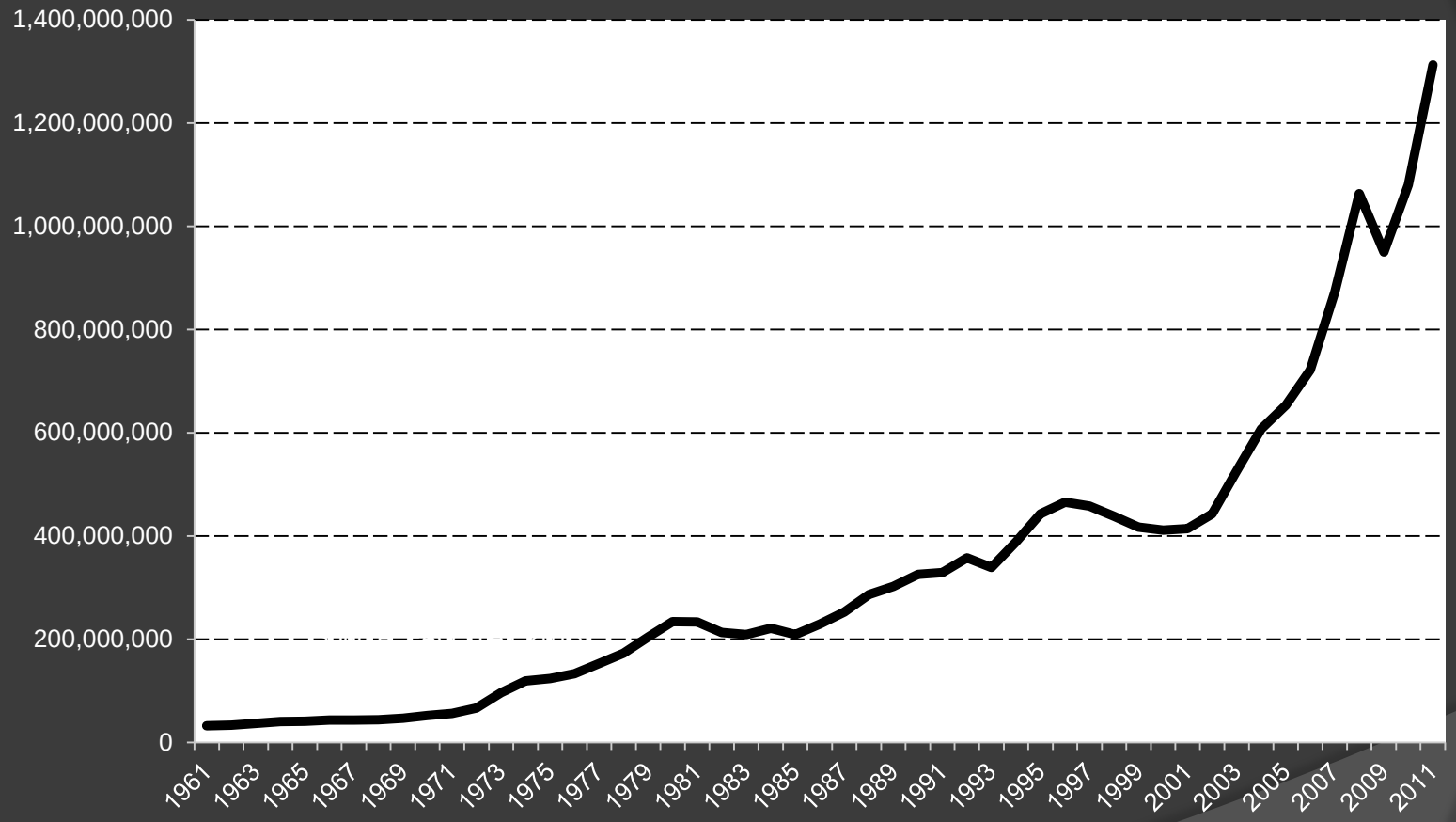
"I don't know of any modern agricultural market that meets all three of these conditions. Most don't meet any of them"

(Sexton 2012)

Crucially important…

- Concentration
- Quality & diversity
- Contracting & long-term vertical relationships
  - Both in “rich” and “poor” countries !

Global agri-food trade (US $)



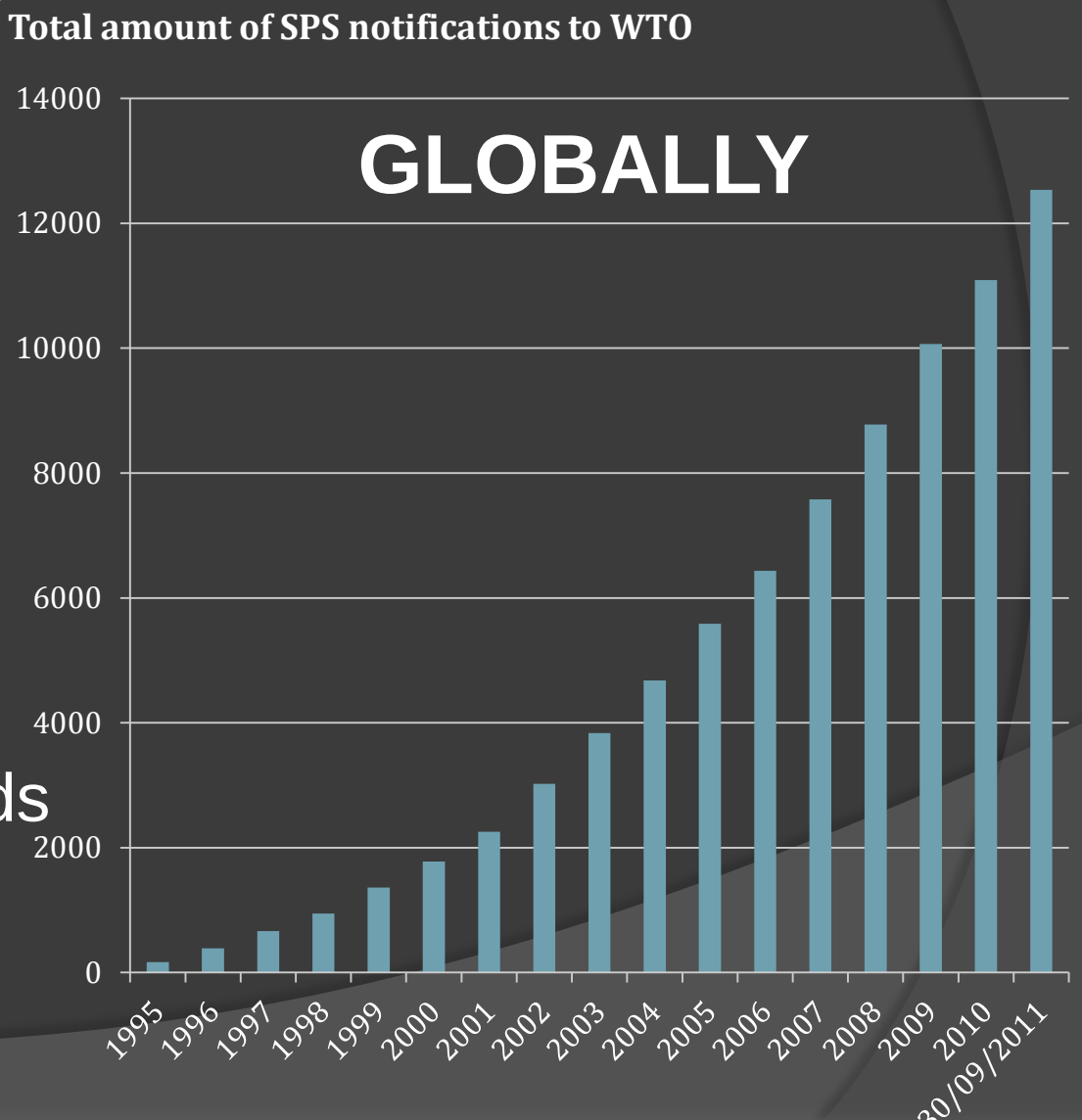
Changing structure of world trade

Share in Agri-Food Exports (%)	World Exports		Developing Country Exp	
	1980	2010	1980	2010
TROPICAL products (Cocoa, tea, coffee, sugar, …)	**22.0**	**11.1**	**39.2**	**17.5**
TEMPARATE products (Meat, milk, grains, …)	**46.3**	**36.4**	**28.8**	**27.3**
SEAFOOD, FFVs	**19.8**	**33.5**	**21.6**	**42.2**
Other PROCESSED (tobacco, beverages, …)	**11.9**	**16.2**	**10.4**	**13.2**

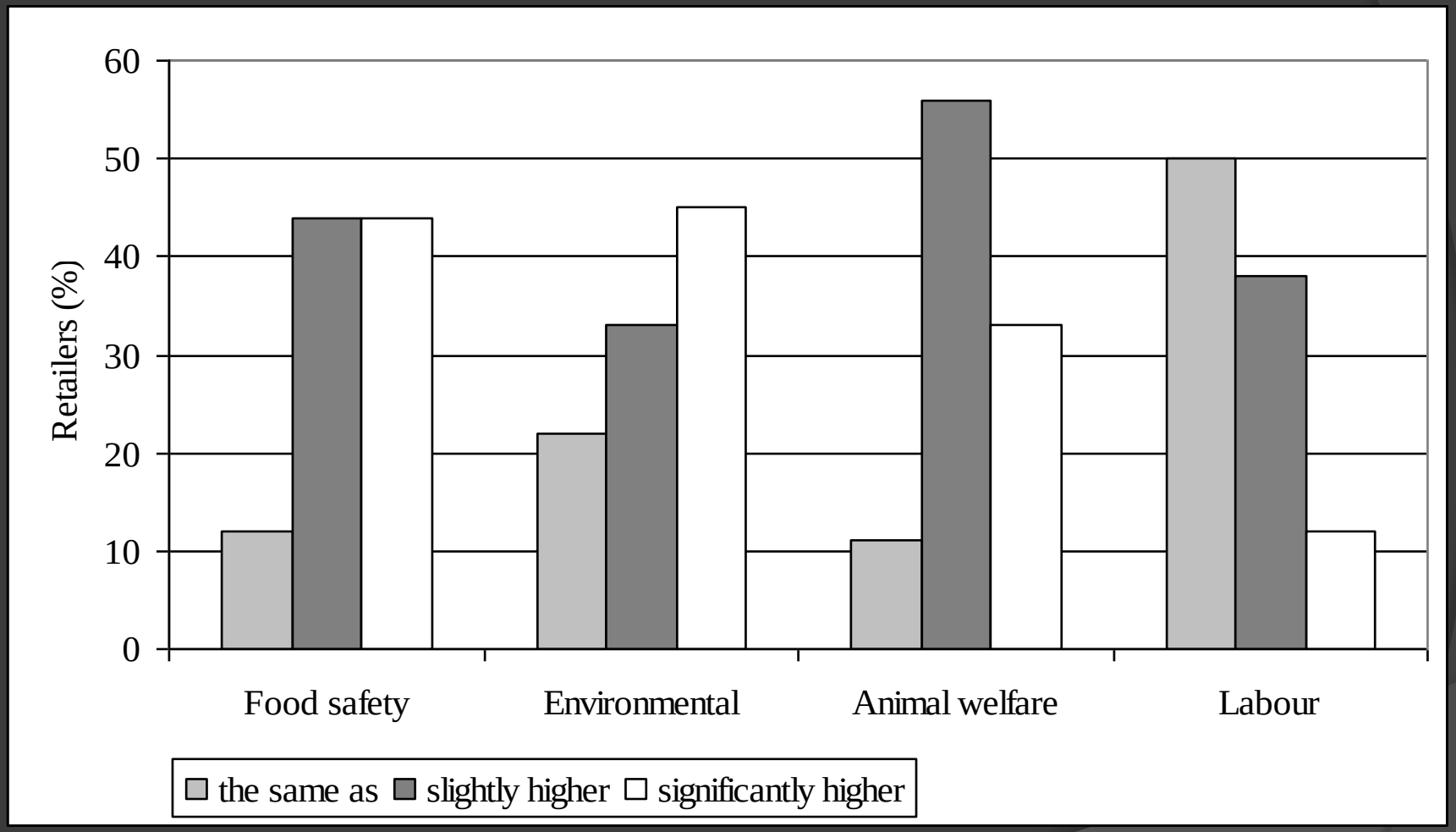
Food Standards & Regulations

In EU

- Public
  - EFSA
  - …
- Private
  - Retail standards
  - Organic
  - …



Private standards more restrictive than public standards



(Source Fulponi 2006)

Crucially important…

- Concentration
- Quality & diversity
- Contracting & long-term vertical relationships
  - Both in “rich” and “poor” countries !

However …

- The implications for the welfare effects of competition and market power are not trivial.

From the media …



Polish government (2009)

- “Food retailers in Europe failed to pass on price reductions to consumers, keeping their margins high and causing many farmers to abandon agriculture”.

Farmer protest against low supermarket prices (Belgium)



Protests against Wal-mart in Mexico



- Workers complain that Wal-Mart pays low wages & drives small shops out of business with its low prices

Protest against opening up the retail sector to FDI in India



Also from the media …



Indian farmers protest pro opening Western-style supermarkets



Farmers : "Reliance buys up farm produce from local farmers. For many farmers it saves them money because they no longer have to go through traditional middlemen to sell their goods."

Demonstrations of consumers pro modern supermarkets …

In Nitra, Slovakia, consumers demanded that the city government would give Lidl a license to open a supermarket in their part of town, which was disproportionately populated by pensioners and low wage consumers – consumers which hoped to benefit from increased competition and low prices (2007).

2010 - After months of controversy, LIDL finally opened its budget shop in Wolverhampton, UK...



Hundreds of customers were queuing before the doors …

Pensioners argued:

"I'm delighted because the prices here are better than other shops in the area, which are just too expensive for pensioners who have to watch the penny".

From development organizations …

- “EBRD will give a Euro 150m loan to Kaufland EUR and 25 m loan and Spar to finance expansion of their retail chains in Croatia, Bulgaria, Romania” (2011).
- The aim :
- “ **to benefit consumers by a wider variety of choice at competitive prices**, and
- **to benefit local producers by**

Insights from studies

1. Concentration
2. Conceptual / theoretical issues
3. Empirical insights

Evolution of Concentration in Food Chains

- Growing consolidation in agri-food industry:
  - But data are imperfect
  - In food processing & retailing
    - Mostly through mergers and acquisitions
  - Less so at the global level
  - Except for specific product lines where multinationals dominate

Evolution of Concentration in Food Chains

- Concentration in retailing is relatively recent
- Until 1980s concern was of fragmented retail sector facing large food companies

Some conceptual issues

Theory I: the simple argument

High concentration → market power →

a) buyer power: lower prices for suppliers

b) seller power: higher consumer prices

Theory II: some complications

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)

- Vertical relationships matter

  (McCorriston & Sheldon, 2007)

Theory III: some more complications

… high concentration **may <u>enhance</u> welfare** if concentration :

- Increases SCALE economies
- Reduces TRANSACTION costs
- Secures return on investments in R&D
- Offsets market power of other agents supplier (“COUNTERVAILING power”)

Empirical Evidence

- empirical studies have focused mostly on consumer side

Empirical Evidence - consumers

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

OECD COUNTRIES

- **Positive correlation :**
  Hall et al. (1979), Lamm (1981), Marion et al. (1993), Cotterill (1986), Cotterill and Harper (1995), Cotterill (1999)

- **Negative or insignificant correlation :**
  Kaufman and Handy (1989), Newmark (1990), Binkley and Connor (1998), Binkley et al. (2002)

Empirical Evidence - consumers

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

  DEVELOPING COUNTRIES

  - **Lower prices :**
    Reardon and Hopkins (2006), D'Haese and Van Huylebroeck (2005), Neven et al (2006)

  - **Higher prices** :
    Minten (2011)

Empirical Evidence - farmers

- Results vary and depend on variety of model assumptions in RICH COUNTRIES

  - **Significant market power:**
    - Lloyd et al (2009)

  - **No or weak market power:**
    - Dobson et al (2001), Scokai et al (2009)

Empirical Evidence - farmers

- Results vary also in TRANSITION, EMERGING & DEVELOPING COUNTRIES
  - Competition enhances farmer revenues & growth:
    - Sadler et al (2007)
  - Strong benefits for farmers despite monopoly buyer:
    - Minten et al (2009), Maertens et al (2009)

Need a new paradigm for “modern”global value chains ?

Misconceptions …

- Rich Sexton: "*Modern agricultural markets no longer resemble the traditional schoolbook example of competitive spot markets*"

- Crucial is the importance of:
  - Concentration
  - Quality & diversity
  - Contracting & long-term vertical relationships

Focus on US (developed) markets

- Similarly, recent research on value chains in emerging & developing countries emphasized:

  - quality,
  - market imperfections
  - contracting in supply chains
  - emerging/developing countries

- Swinnen, J., and A. Vandeplas. 2010. "**Market Power and Rents in Global Supply Chains**." *Agricultural Economics* 41: 109–120.

- Swinnen, J., and Anneleen Vandeplas. 2011. "**Rich Consumers and Poor Producers: Quality and Rent Distribution in Global Value Chains**." *Journal of Globalization and Development* 2 (2): 1-28.

Both analyses conclude :

- “new architecture of modern agricultural markets” has important implications for equity and efficiency
- market power/concentration and its effects are not obvious
- although types of “architecture” may differ between ‘rich’ and ‘poor’ countries

Question :

- What are competition effects if one takes into account “modern” characteristics of supply chains ?
  - Quality requirements
  - Specific investments
  - Contracting/vertical coordination
  - Transaction costs and market imperfections

Types of “contracting costs”

		Value outside of the contract	
		Value > 0	Value = 0
Cost advantage of repeat suppliers	Adv = 0	External INPUTS	MONITOR. costs
	Adv > 0	TRAINING costs	SEARCH costs

Theory :

Integrate …

- Spot markets and contracting
- Quality requirements
- (Factor) market imperfections
- Contract enforcement problems
- Two-sided hold-ups/contract breach

The General Model

- Company sells “high” quality commodities internationally or domestically (“processor”):
  - Needs high-quality raw material
  - Sales price for high quality (HQ) product = p_h
- Local supplier (“farm”) produces one unit of supplies, either:
  - Supply of **low quality (LQ)** product to local market at price p_l
  - Supply of **high quality (HQ)** product to processor
  - HQ production requires specific inputs I (eg technology, seeds, pesticides, …)

Factor Market Imperfections & Contract Enforcement

- Farm has constrained access to specific inputs
- Processor considers providing interlinked contract:
  - processor provides inputs to supplier
  - costs are settled at the time of delivery of the HQ raw material

Contract motivations for farmers
Central Asia (Cotton)

Reason for contracting (%)	Kazakhstan 2003
Guaranteed prices	4
Guaranteed sales	6
Access to credit	81
Access to quality inputs	11
Access to technical assistance	0
Other	4

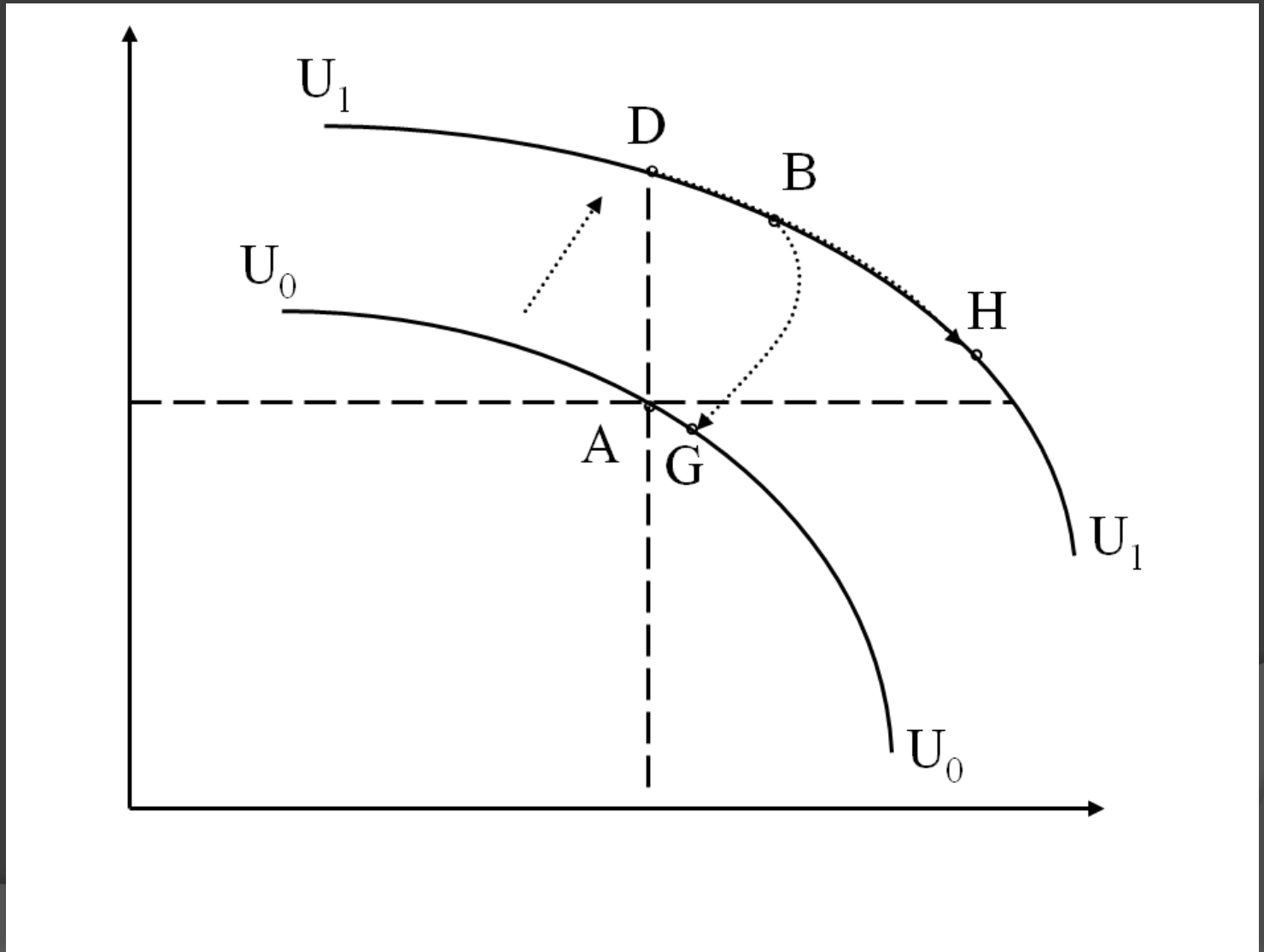
Contract motivations for farmers

Sub Sahara Africa (Vegetables)

	Madagascar	Senegal
Reasons for contracting (%)	2004	2005
Stable prices	19	45
Higher income	17	15
Higher prices		11
Guaranteed sales		66
Access to inputs & credit	60	63
Access new technologies	55	17
Stable income	66	30
Income during lean period	72	37

Source: Maertens et al., 2006; Minten et al., 2006

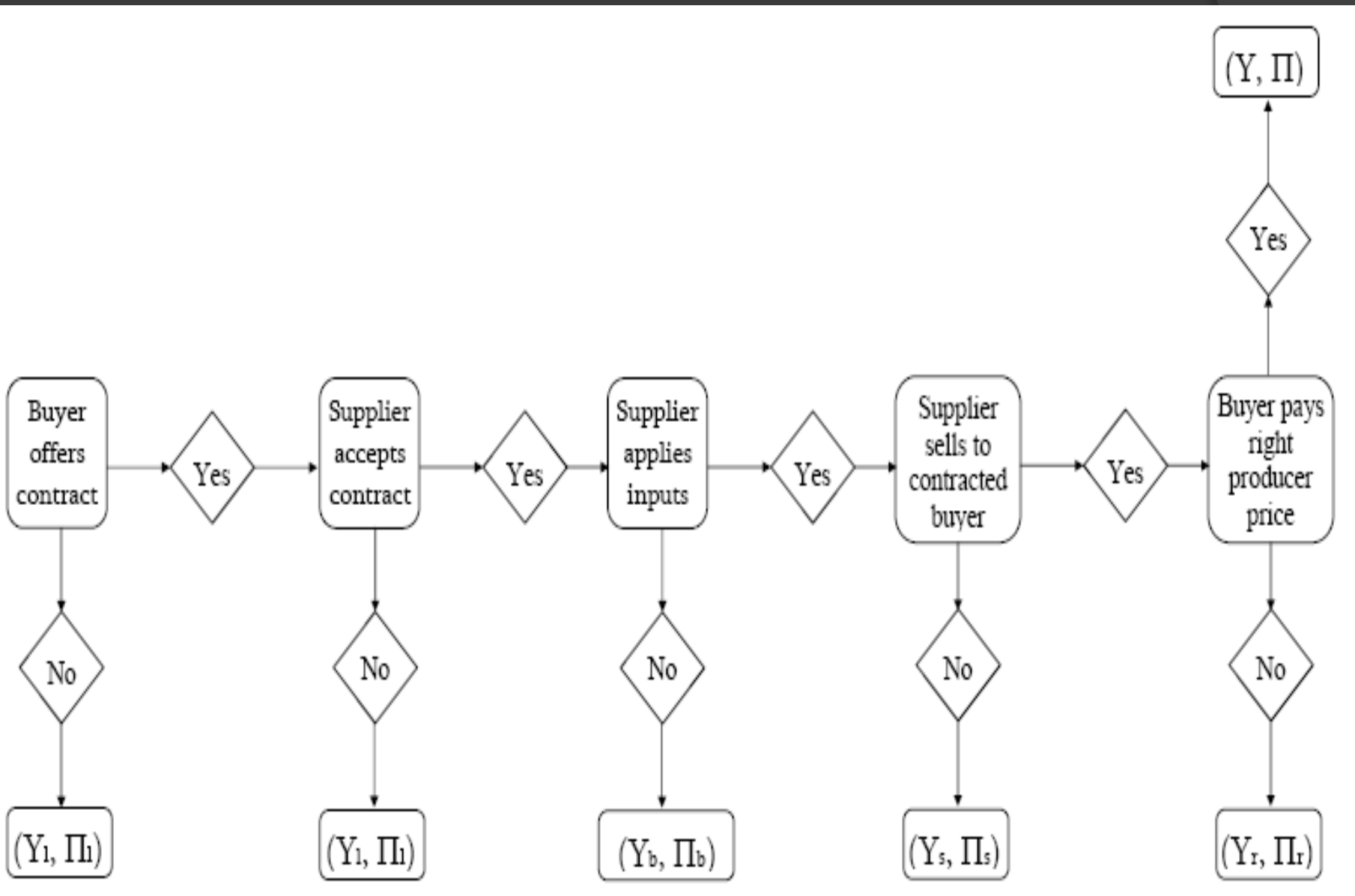
Equity and efficiency effects of competition and contracting in supply chains



Problems of Enforcement

- Hold-up opportunities
  - Supplier (S):
    - Divert/resell inputs I & sell LQ prod. at local mkt (Y_b)
    - Apply inputs, sell HQ prod. to other buyer (Y_s)
  - Processor (P):
    - Ex post renegotiate producer price (or postpone payment…) (Π_r)

Game Tree

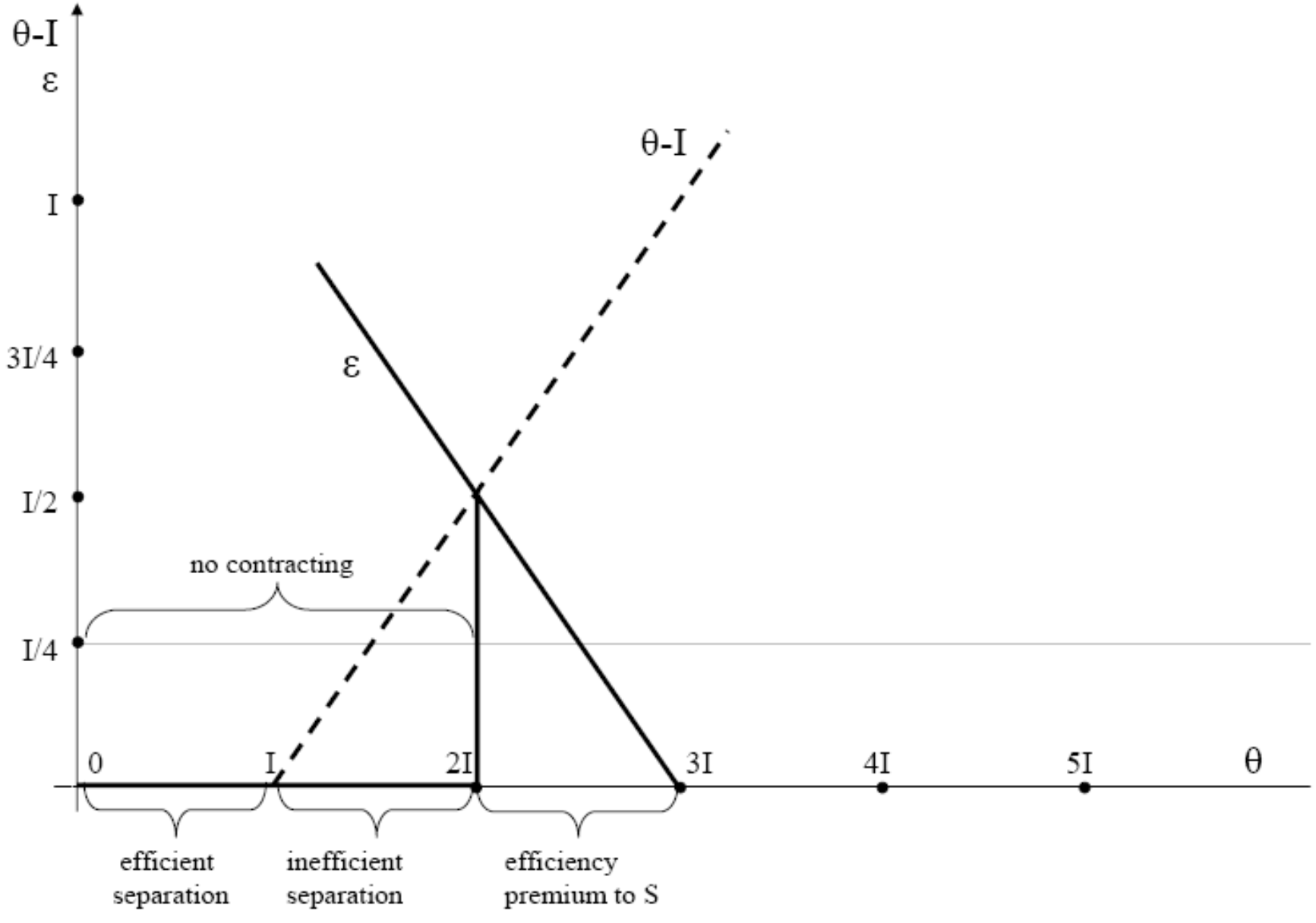

Buyer offers contract
Yes
Supplier accepts contract
Yes
Supplier applies inputs
Yes
Supplier sells to contracted buyer
Yes
Buyer pays right producer price
(Y, Π)
No
(Y1, Π1)
No
(Y1, Π1)
No
(Yb, Πb)
No
(Ys, Πs)
No
(Yr, Πr)

Value Matters !

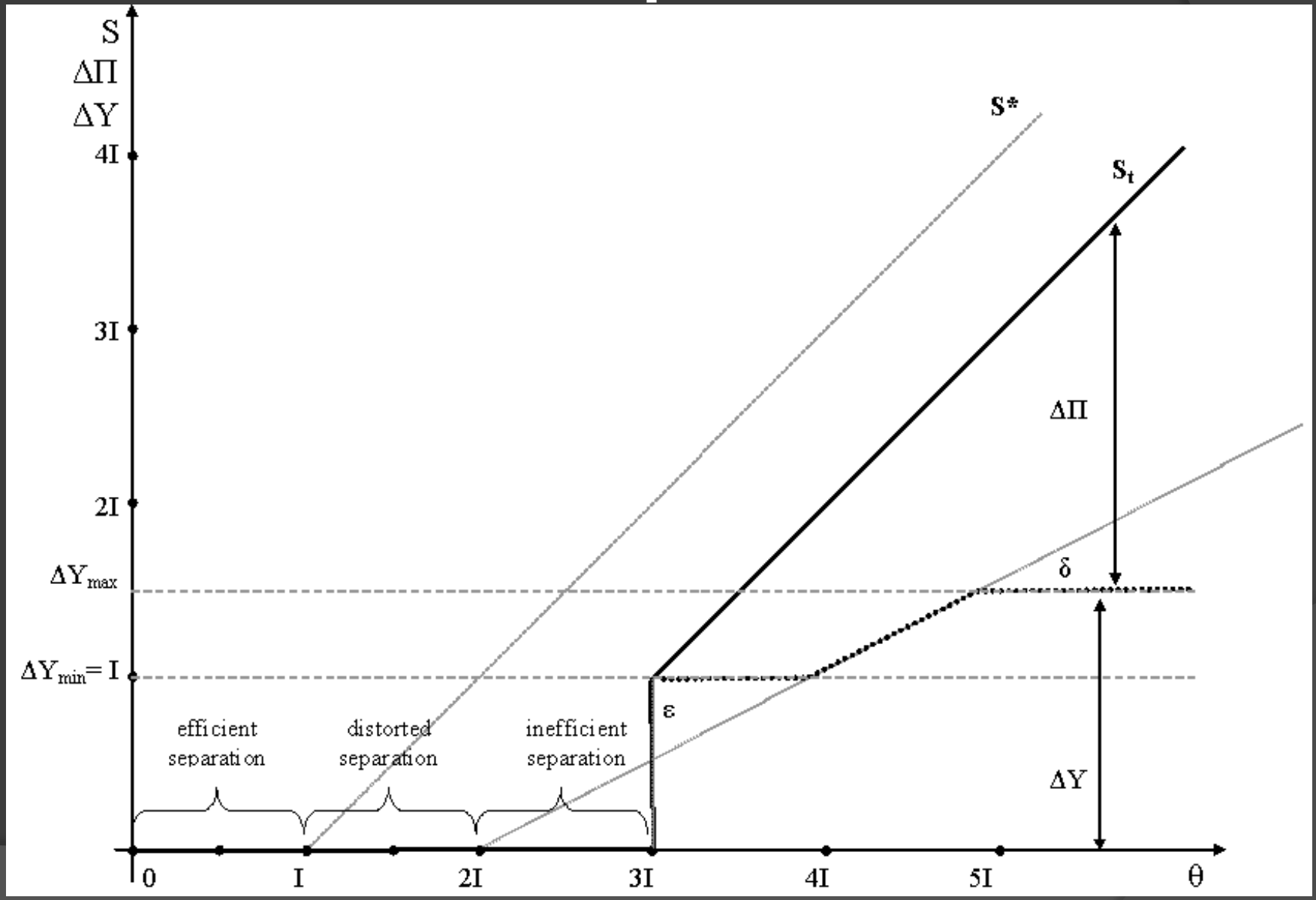
Condition for contract feasibility
(without external enforcement)

- $\theta \geq \theta_{min}$
- $\theta_{min} = max\,[I+t,\ 2I+t-\varphi^f,\ I+t+(\gamma-\alpha)p_h-\varphi^f]$

Efficiency Premium



Surplus creation and distribution with enforcement problems



Impact of Competition *

- On farmer's income:

$$\frac{\partial Y}{\delta \Psi} = \frac{\partial Y}{\delta \alpha} \cdot \frac{\partial \alpha}{\delta \Psi} + \frac{\partial Y}{\delta \varphi^f} \cdot \frac{\partial \varphi^f}{\delta \Psi} + \frac{\partial Y}{\delta \gamma} \cdot \frac{\partial \gamma}{\delta \Psi}$$

  - with $\partial Y/\partial \alpha \geq 0$, $\partial Y/\partial \varphi^f \leq 0$, $\partial Y/\partial \gamma \geq 0$

- On contract feasibility:

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

  - with $\partial\theta/\partial\alpha < 0$, $\partial\theta_{min}/\partial\alpha \leq 0$, $\partial\theta_{min}/\partial\varphi_f \leq 0$, $\partial\theta_{min}/\partial\gamma \geq 0$

* ignoring scale economy effects

Impact of Competition - I

- Increase ex ante outside option for supplier
  - Increase surplus share for supplier
- Improve manager incentives (eg cost reduction and innovation)
  - More surplus creation
- Increase buyer reputation costs
  - Increase surplus share for supplier

Impact of Competition - II

- Reduce supplier reputation costs
  - Less surplus creation (contracting less likely)
- Increase ex post outside option for supplier
  - Less surplus creation (contracting less likely)

Impact of Competition

1. Increase ex ante outside option for supplier
   - Increase surplus share for supplier
2. Improve manager incentives (eg cost reduction and innovation)
   - More surplus creation
3. Increase buyer reputation costs
   - Increase surplus share for supplier
4. Reduce supplier reputation costs
   - Less surplus creation (contracting less likely)
5. Increase ex post outside option for supplier
   - Less surplus creation (contracting less likely)

Conclusions

- Concentration in the food sector has increased
  - Potential welfare loss through market power
  - Potential welfare gains through scale economies, …
  - Mixed evidence

Conclusions

- Growth in global supply chains:
  - Increases market opportunities for developing country farmers: even with monopolies in specific markets, they may enhance overal choices for farmers (and thus competition for his output)
  - With market imperfections and contract enforcement problems, efficiency premiums provide additional benefits
  - Increased competition may benefit farms by improving contract conditions, but may hurt them as contract enforcement becomes more complicated.
  - Effects will depend on variety of factors, including “value”, perishability, infrastructure, “stage of development” ….

Conclusions

- 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 ….