

Market Structure, Industrial Concentration, and Price Transmission

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Introduction

- Doha Round of WTO is a “development round”, focus on increasing LDC access to DC markets
- Little attention paid to food marketing system in DCs in analyzing commodity exports of LDCs:
 - Vertical/horizontal structure
 - Increasing consolidation
- Who captures the benefits of trade reform when downstream markets are imperfectly competitive?

Structure of Food Marketing in Developed Countries

- Food manufacturing concentrated in US and EU, e.g., average 3-firm concentration of 67% in EU
- Food retailing concentrated at national level in EU, and at regional and local level in US
- Increasing consolidation via mergers and acquisitions
- Structure of *successive oligopoly/oligopsony*

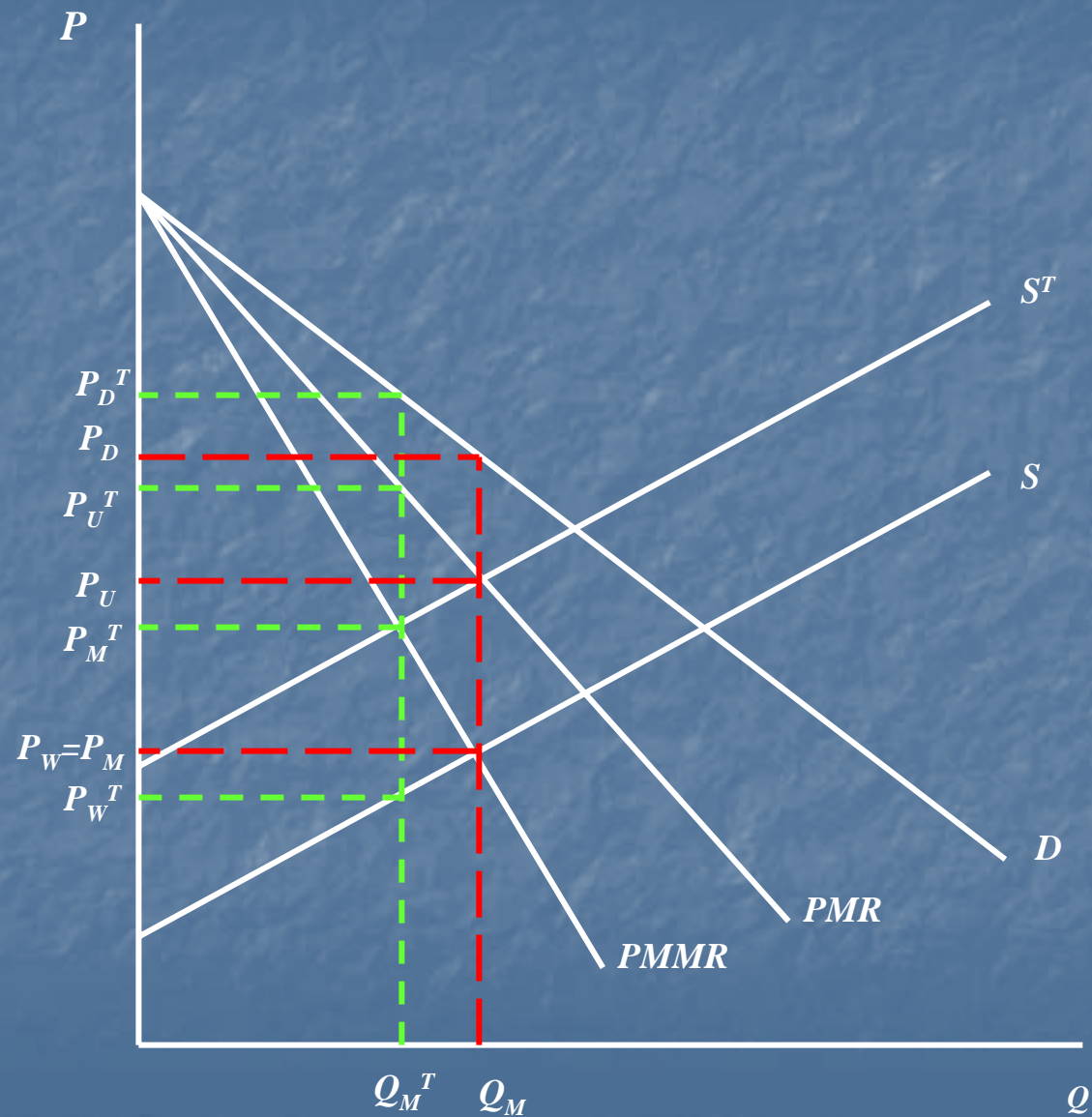
Market Structure Might Matter

- Declines in LDC commodity prices not necessarily passed through in lower consumer prices (Oxfam, 2001)
- LDCs do not necessarily gain full benefits of trade reform, e.g., Mozambique cashew nuts (McMillan, *et al.*, 2002)
- Typical CGE analysis of Doha Round ignores downstream marketing system (Anderson and Martin, 2005; 2006)

Trade Liberalization and Industry Consolidation in a Vertically-Related Market

- If markets were competitive, ignoring vertical market structure would not matter
- Only recently have models examining optimal trade policy included imperfect competition (Ishikawa and Spencer, 1999; Sheldon *et al.*, 2001)
- With imperfect competition, incidence of benefits of trade liberalization is important (Figure 1)
- Increasing consolidation in food marketing also affects share of value added received by LDC exporters

Figure 1: Trade Liberalization and the Vertical Marketing Chain



Vertical Markets Model

Inverse commodity export supply function:

$$p^a = u(X) \quad (1)$$

Downstream:

$$c_i^d = k^d + p^u x_i \quad (2)$$

$$p^d = \varphi(X) \quad (3)$$

$$\frac{\partial(X - x_i)}{\partial x_i} = \alpha^d \left(\frac{X - x_i}{x_i} \right) \quad (4)$$

$$p^d \left\{ 1 - \frac{(\alpha^d + (1 - \alpha^d) s_i^d)}{\eta^d} \right\} = p^u, \quad 0 \leq \alpha^d \leq 1 \quad (5)$$

$$p^d \left(1 - \frac{Y^d}{\eta^d} \right) - p^u = 0, \quad 0 \leq Y^d \leq 1 \text{ and } Y^d = \alpha^d + [(1 - \alpha^d)/n] \quad (6)$$

$$\eta^d > Y^d, \quad F^d > 1 - \frac{\eta^d}{Y^d}$$

$$\pi^d = (p^d - p^u)X - k^d n \geq 0 \quad (7)$$

Upstream:

$$c_j^u = k^u + p^a x_j \quad (8)$$

$$p^u = \theta(X |, \eta^d, Y^d) \quad (9)$$

$$p^u \left\{ 1 - \frac{(\alpha^u + (1 - \alpha^u) s_j^u)}{\eta^u} \right\} = p^a, \quad 0 \leq \alpha^u \leq 1 \quad (10)$$

$$p^u \left(1 - \frac{\gamma^u}{\eta^u} \right) - p^a = 0, \quad 0 \leq \gamma^u \leq 1 \text{ and } \gamma^u = \alpha^u + [(1 - \alpha^u)/m] \quad (11)$$

$$\eta^u > \gamma^u, \quad F^u > 1 - \frac{\eta^u}{\gamma^u}$$

$$\pi^u = (p^u - p^a)X - k^u m \geq 0 \quad (12)$$

Assume ($k^u=0, \gamma^u = 0$) and $0 \leq \gamma^d \leq 1$, i.e, $\partial p^u / \partial p^a = 1$:

$$\frac{\partial p^d}{\partial p^u} = \frac{1}{\left(1 - \frac{\gamma^d}{\eta^d} + \frac{F^d}{\eta^d} \right)} \begin{matrix} > \\ < \end{matrix} 1 \text{ as } F^d \begin{matrix} < \\ > \end{matrix} 1. \quad (13)$$

For linear downstream demand:

$$\frac{\partial p^d}{\partial p^u} = \frac{1}{1 + \gamma^d} \leq 1 \quad (14)$$

Profit effects:

$$\frac{\partial \pi^d}{\partial p^u} = g_{p^d} \frac{\partial p^d}{\partial p^u} + g_{p^u} = \frac{-X\gamma \left[1 - \frac{1}{\eta^d} + \frac{F^d}{\eta^d} \right]}{1 - \frac{\gamma^d}{\eta^d} + \frac{F^d \gamma^d}{\eta^d}} < 0 \quad (15)$$

iff $F^d > 1 - \eta^d$, where for linear downstream demand:

$$\frac{\partial \pi^d}{\partial p^u} = \frac{-2\gamma^d X}{1 + \gamma^d} < 0 \quad (16)$$

Numerical Simulation (Sexton *et al.*, 2003; 2006)

- Key market power parameters are γ^u , γ^d , λ^u , and λ^d – as these lie in range 0 to 1, simulate over entire unit interval
- Consider equal departures from competition, e.g., in case of successive oligopsony and downstream oligopoly, $\lambda^u = \lambda^d = \gamma^d$
- Farm share of revenue under no tariff competitive equilibrium set at $f = 0.5$ – when f is small, diminishes impact of oligopsony
- Per-unit tariff at competitive equilibrium set at $T=0.2$
- Price elasticity of farm supply and downstream demand evaluated at no-tariff competitive equilibrium, $\varepsilon^a = \eta^d = 1$

Figure 2: Change in Export Price from Trade Liberalization

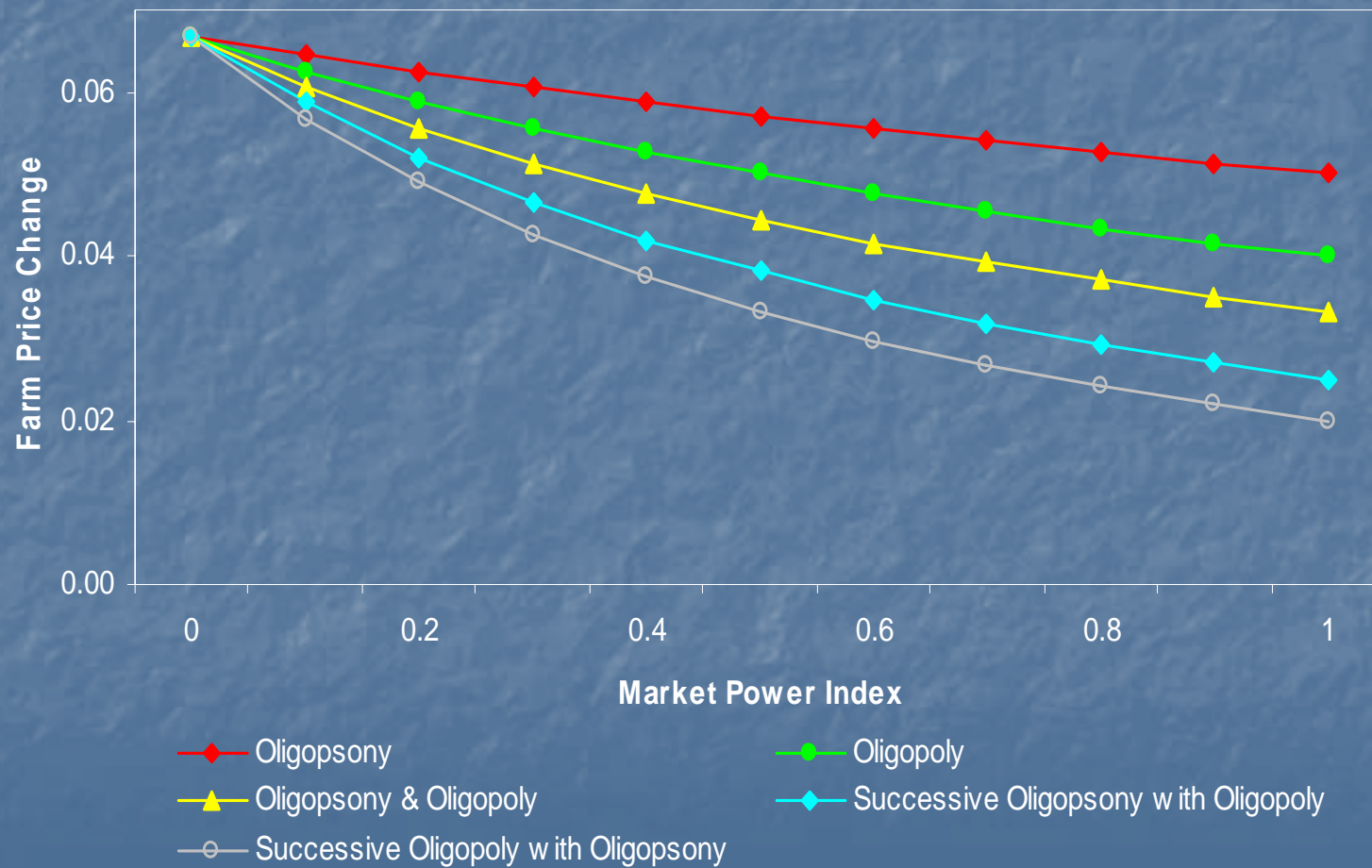


Figure 3: Change in Producer Surplus from Trade Liberalization

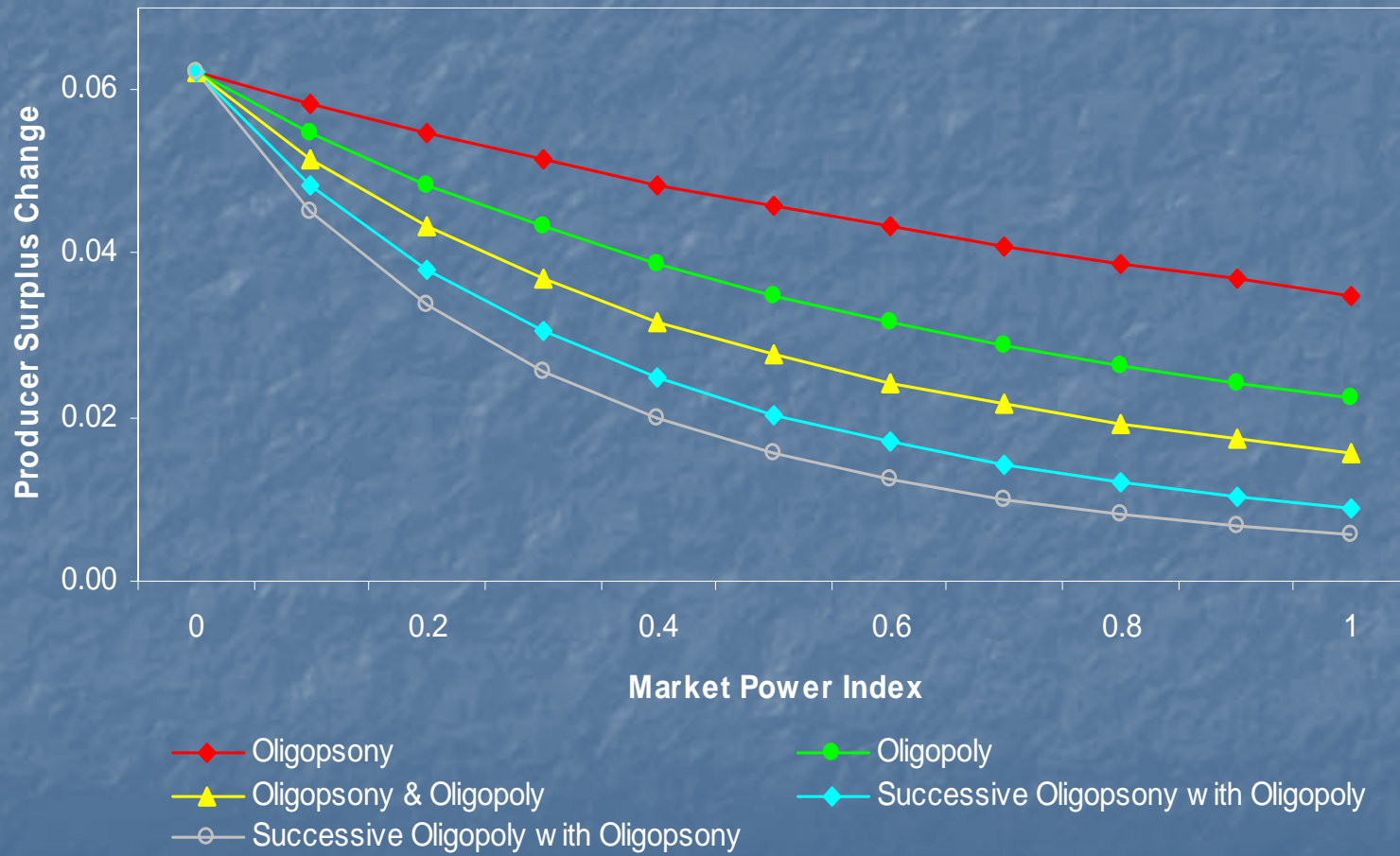


Figure 4: Change in Producer Surplus, Consumer Surplus and Marketers' Profits from Trade Liberalization for the Case of Processor Oligopsony and Retail Oligopoly

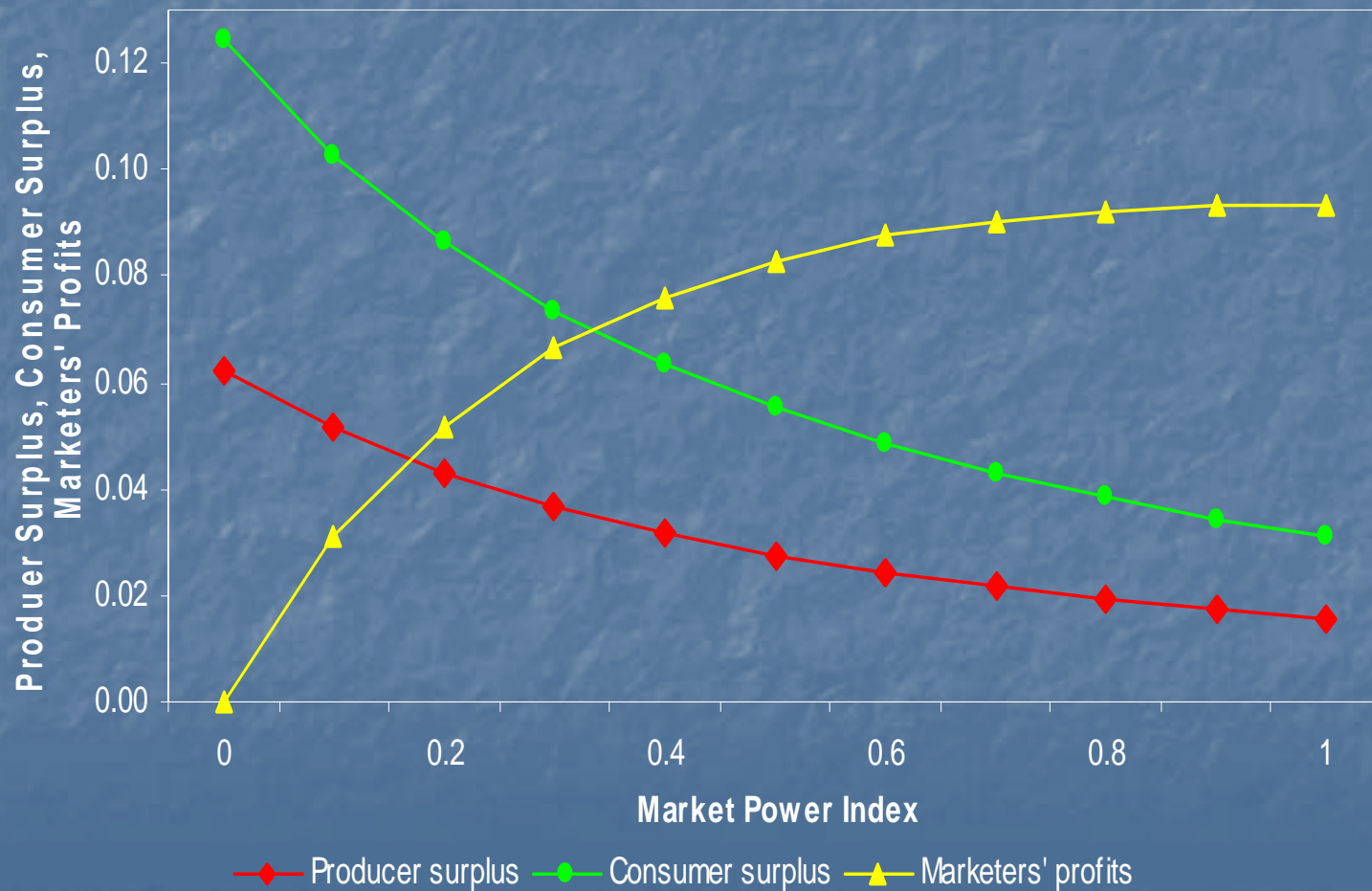
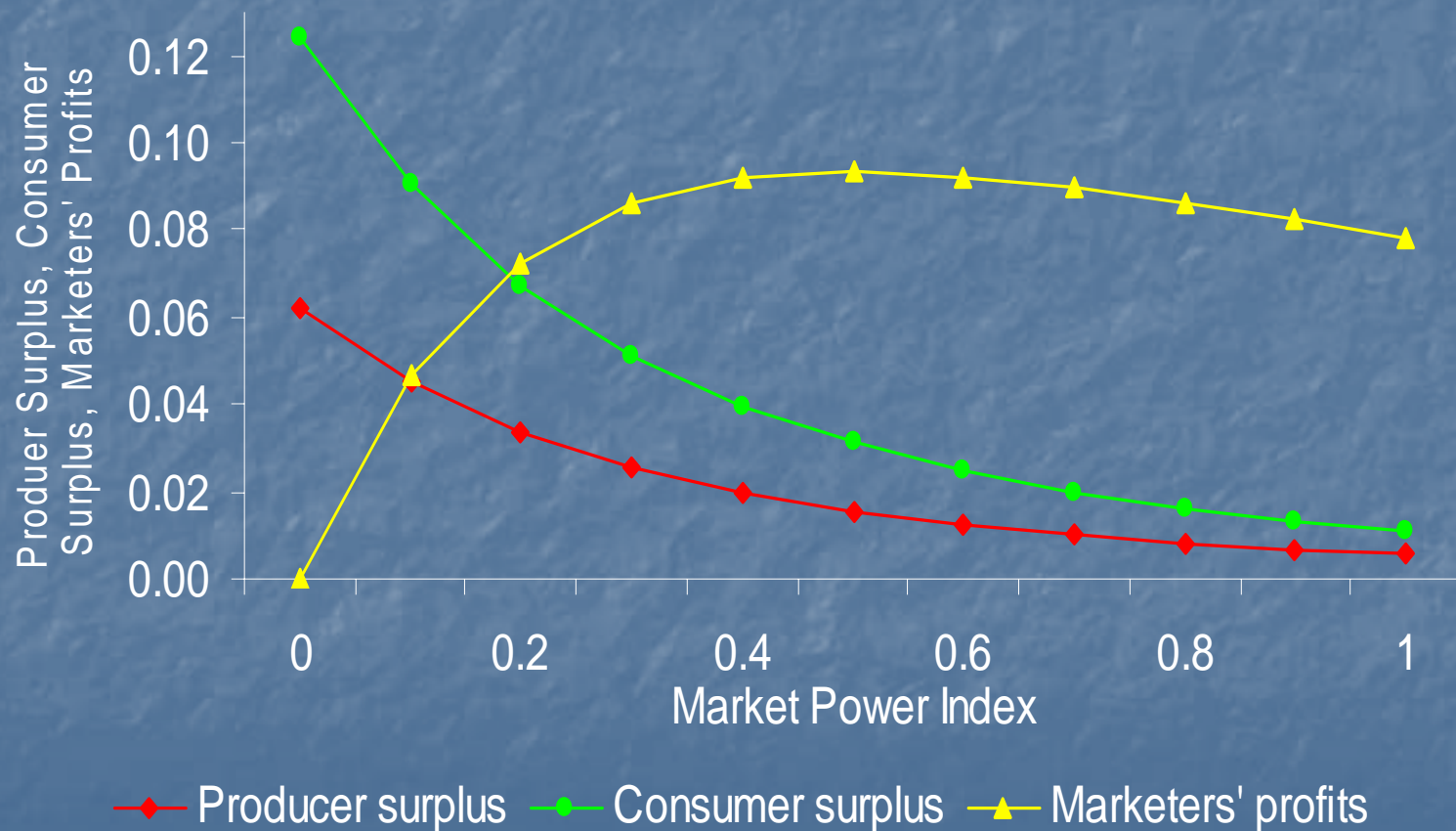


Figure 5: Change in Producer Surplus, Consumer Surplus and Marketers' Profits from Trade Liberalization for the Case of Successive Oligopoly with Processor Oligopsony



Summary and Conclusions

- **Structure of food marketing system in DCs may matter for who gains from trade liberalization**
- **Results sensitive to assumptions about downstream technology and convexity of commodity supply function**
- **It is one thing to show imperfect competition can affect pass-through, another to infer imperfect competition from econometric analysis of price transmission**