Overview of Project
CETA and Processed Food
Introduction
Model
Simulation and Results
Conclusions

Implications of Transatlantic Trade and Investment Partnership and Trans-Pacific Partnership for Food Processing Sector

PD: Jeff Luckstead, University of Arkansas

Co-PD: Stephen Devadoss, Texas Tech University

USDA-NIFA AFRI Project Directors Workshop
Economics, Markets, and Trade
Outline

1. Overview of Project
2. CETA and Processed Food
3. Introduction
4. Model
5. Simulation and Results
6. Conclusions
Goal and Objectives

Goal:

- Comprehensively analyze the effects of regional trade liberalization on the value-added food and beverage sector.

Objectives

1. Formulate a theoretical model characterizing
   - the monopolistic competition and firm-level heterogeneity in food processing, and
   - MNEs to assess the effects of cross-border FDI in the food processing sector;

2. Quantify the effects of regional trade agreements on production, productivity, consumption, trade, and welfare

3. Draw policy implications from these trade liberalization analyses and provide recommendations for future trade agreements to policy makers and food producers.
Studies


Stephen Devadoss and Jeff Luckstead “Implications of the Comprehensive Economic and Trade Agreement for Processed Food Markets” revise and resubmit at *Canadian Journal of Agricultural Economics*. 
Implications of the Comprehensive Economic and Trade Agreement for Processed Food Markets

Stephen Devadoss and Jeff Luckstead
Introduction

Industrial organization of food processing firms

- Economy of scale & differ in size
- Highly differentiated food products & monopolistic competition
- Operate only domestically or also export
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Sustained growth (domestic sales & exports) on both sides of the Atlantic
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Sustained growth (domestic sales & exports) on both sides of the Atlantic

In Canada, the processed food and beverage industry

- employs more workers than any other manufacturing industry
- exports support more than 180,000 jobs
- over 200,000 producers
- thousands of small- to medium-sized agri-food entrepreneurs
Canada’s Agri-Food Industry

Success of agriculture in Canada depends on trade

- Canada exports about half the value of agri-food production
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- Reliance on exports:
  - 90% of all Canadian farms
  - 80% of commercially-oriented farms
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  - 65% of the cultivated area and 40% of pasture land.
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  - 33% of the value-added in agriculture
  - 22% of food and beverage manufacturing
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Canada is a top-five agri-food exporter and exports result in new records every year
Canada, EU, and US

Only 25 percent of EU tariff lines on Canadian goods are duty-free.

<table>
<thead>
<tr>
<th>Processed Food Trade ($ Mil.)</th>
<th>Ca</th>
<th>EU</th>
<th>US</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ca</td>
<td>0</td>
<td>4,490</td>
<td>17,762</td>
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<tr>
<td>EU</td>
<td>1,349</td>
<td>0</td>
<td>7,914</td>
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<tr>
<td>US</td>
<td>17,372</td>
<td>21,282</td>
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<th>Tariffs</th>
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<td>-</td>
<td>19.16%</td>
<td>2.01%</td>
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<td>EU</td>
<td>18.05%</td>
<td>-</td>
<td>3.21%</td>
</tr>
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<td>US</td>
<td>14.17%</td>
<td>10.74%</td>
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Canada, EU, and US key players in the world processed food market

- About a third of global trade in this market
Comprehensive Economic & Trade Agreement

CETA was signed on 30 October 2016:

- CETA eliminates tariffs on virtually all of our agri-food exports.
- Almost all tariff reduction occurs immediately, no longer than seven years.
- CETA does not cover NTBs.
- All imports from Canada have to satisfy EU rules and regulations.
- Preferential quotas access remains for sensitive products (beef, pork, sweetcorn for EU and dairy for Canada).
- Poultry and eggs are not covered under CETA.
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Objectives and Contribution

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- Develop a multi-regional trade model with
  - monopolistic competition
  - heterogeneous firms
  - endogenous operating decisions
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- Simulate the effects of trade liberalization under CETA on prices, bilateral trade, number of firms, productivity, and welfare.

Contribution

- Analyze impacts of CETA by accounting for
  - imperfect competition
  - productivity differences among firms
  - cross hauling
Model

Four-region model

- Canada, European Union, United States, and ROW
  - Monopolistic competition
  - Firm heterogeneity
  - Accounts for differences in
    - preferences across countries
    - firm-level production technologies
    - regional sizes
    - trade policies: tariffs and NTBs
Model

Dixit-Stiglitz Preferences

- Exogenous income
Model

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Production

- Maximize profits subject to consumer’s demand
- Productivity differences are Pareto distributed
- Transport costs, tariffs, and NTBs
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Operating Decision: domestic and export markets
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Operating Decision: domestic and export markets

Market clearing conditions
- Output markets
- Composite input
Data and Sources

Main data source: sectors 19-26 from GTAP 9 Data Base for 2011

- Aggregate processed food
  - domestic production, inputs, imports, exports, transport costs, and tariffs
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Elasticity of substitution: $\sigma_i$

- 3.4 for Canada, 3.5 for EU, & 3.6 for US
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Measure of firms: $n_i$ normalized to one
Calibration

Given the above data and parameters, we calibrate

- fixed operating cost: $f_{ij}$
- scale parameter, Pareto dist: $\mu_{ij}$
- scale parameter, supply function: $\gamma_i$
Simulation

Baseline simulation - Replicates GTAP 9 data
Simulation

Baseline simulation - Replicates GTAP 9 data

Alternate scenarios:

1. Canadian-EU tariff elimination
2. Canadian-EU tariff elimination and 40% reduction in NTBs
## Trade Liberalization Results

### Bilateral Trade Flows

<table>
<thead>
<tr>
<th>Elimination of Canadian tariff of 18.05% and EU Tariff of 19.16%</th>
<th>Ca</th>
<th>EU</th>
<th>US</th>
<th>ROW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ca</td>
<td>-14.419</td>
<td>55.975</td>
<td>-6.394</td>
<td>-6.295</td>
</tr>
<tr>
<td>EU</td>
<td>49.859</td>
<td>-1.685</td>
<td>0.571</td>
<td>0.677</td>
</tr>
<tr>
<td>US</td>
<td>-8.226</td>
<td>-1.871</td>
<td>0.380</td>
<td>0.486</td>
</tr>
<tr>
<td>ROW</td>
<td>-8.562</td>
<td>-2.231</td>
<td>0.013</td>
<td>0.118</td>
</tr>
</tbody>
</table>
## Trade Liberalization Results
### Cutoff Productivity and Operating Firms

<table>
<thead>
<tr>
<th>Cutoff Productivity $\bar{\omega}_{ij}$</th>
<th>Measure of Op. Firms $\bar{n}_{ij}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ca</td>
<td>EU</td>
</tr>
<tr>
<td>4.76</td>
<td>-14.24</td>
</tr>
<tr>
<td>EU</td>
<td>-12.57</td>
</tr>
<tr>
<td>US</td>
<td>2.94</td>
</tr>
<tr>
<td>ROW</td>
<td>3.04</td>
</tr>
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## Trade Liberalization Results
### Aggregates and Welfare

<table>
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<tr>
<td>Aggregate Price Index and Output (% Change)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$Y_j$</td>
<td>-0.67</td>
<td>0.59</td>
<td>-0.08</td>
<td>0.01</td>
</tr>
<tr>
<td>$P_j$</td>
<td>-2.97</td>
<td>-0.78</td>
<td>-0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Welfare ($ Millions)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes in</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prod. Surplus</td>
<td>1,581.84</td>
<td>-1,013.87</td>
<td>-378.28</td>
<td>-339.03</td>
</tr>
<tr>
<td>Cons. Surplus</td>
<td>3,123.34</td>
<td>6,063.18</td>
<td>170.12</td>
<td>-143.13</td>
</tr>
<tr>
<td>Gov’t Revenue</td>
<td>-3,735.93</td>
<td>-4,832.38</td>
<td>-14.88</td>
<td>-303.11</td>
</tr>
<tr>
<td>Net Welfare</td>
<td>969.25</td>
<td>216.93</td>
<td>-223.04</td>
<td>-785.27</td>
</tr>
</tbody>
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Conclusions

Lowering of trade barriers through CETA brings more competition:

- Highly efficient foreign firms force inefficient domestic firms out
- Domestic market: low productivity firms exit and average productivity increases
- Export market: firms enter and average productivity declines
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In all three regions, aggregate price index decreases

Canada and EU:

- Net increase in production
- Domestic sales decline
- Bilateral trade flows expand
- Consumption increases
- Welfare gain