

# Welfare Costs of Border Delays

## Numerical Calculations from a Canadian Regional Model

Paper Prepared for SOEGW 2008

Trien Nguyen<sup>1</sup> Randall Wigle<sup>2</sup>

<sup>1</sup>Department of Economics  
University of Waterloo

<sup>2</sup>School of Business and Economics  
Wilfrid Laurier University

June 11, 2008

# Outline

- 1 Motivation
- 2 Literature Review
- 3 Data & Model
- 4 Experiments
  - Data Issues
- 5 Results
  - Discussion

# Background and Motivation

- **Canada–US bilateral trade**
  - US:  $3/4$  of Canada exports;  $1/2$  of Canada imports
  - about a billion dollars per minute
- **post-9/11**
  - heightened security (long line-ups at borders)
  - need passports to enter US (including US citizens)
- **bottlenecks**
  - concern re congestion and delays at many crossings
  - case in point: Windsor–Detroit

- **our focus**
  - border delays of **merchandise trade**
  - skill dimension
  - regional computable general equilibrium model
  - **CREAP** data, **BMRT** model
- **our points**
  - on-going research (preliminary results)
  - magnitude of welfare costs relative to initial shocks are surprising
  - delays have amplified impact on structure of wages by skill

# Selected Literature

- **post-9/11: security-driven**
  - Ontario Chamber of Commerce
  - Canada Border Services Agency
  - Canada-US-Ontario-Michigan
- **Brück (2005)**
  - private cost (passports, waiting time)
  - public cost (border guards, scanning devices)
- **Huang & Whalley (2006)**
  - added dimension (larger inventory to avoid out-of-stock)
  - Baumol-Tobin theory of demand for money
  - inventory cost could be as big as waiting cost

- *Martin et al (2005)*
  - Québec provincial input-output model
  - 32 minutes/shipment (added costs to truckers)
  - C\$290 million for Canadian exporters
- *Walkenhorst & Dihel (2006)*
  - simulation with GTAP global trade model
  - added security costs: 1–3% of value of goods
  - worldwide welfare costs of heightened security
    - in terms of Hicksian equivalent variations
    - US\$75 billion (0.7% GNP) for 1% cost

# Data & Model

- **CREAP Data**
  - details online at <http://creap.wlu.ca>
  - source: StatCan 2001 provincial IO data (S-level)
  - Aggregation:
    - 23 commodities, 12 sectors, 3 skill levels
    - 5 regions (QC, ON, BC, AC, PP)
- **BMRT Model**
  - static, perfectly competitive, nested functions,
  - constant returns to scale, small open economy

# Experiments

- ① Merchandise Trade<sup>1</sup> subject to 2% delay cost in all regions of Canada
- ② Merchandise Trade subject to 2% delay cost in each region of Canada separately
- 'Delay cost' is composed of real resources (TRS) used up by delay.
- These experiments correspond loosely to:
  - Walkenhorst & Dihel
  - Huang & Whalley

---

<sup>1</sup>Merchandise trade excludes electricity, natural gas, services.

# Data Issues

- *across-the-board cost increases*
  - would prefer to differentiate cost increases by provinces, goods, exports and imports
- *transport mode*
  - which transport mode for which trade flows?
- our model can accommodate different rates for each commodity and destination (*if data are available*)

# Preliminary Results

	Canada			
	Welfare (\$M)	Welfare (%)	GDP (\$M)	GDP (%)
Canada	-13422.8	-1.7	-15177.6	-1.5
	Atlantic Canada			
Atlantic Canada	-691.8	-1.3	-629.8	-0.9
	Québec			
Québec	-2681.1	-1.6	-2471.6	-1.1
	Ontario			
Ontario	-6882.3	-2.1	-6762.8	-1.7
	Prairies			
Prairies	-2338.5	-1.5	-2254.1	-1.2
	British Columbia			
British Columbia	-1171.8	-1.1	-1004.5	-0.7

## Real Wages Overview (%)

All Canada Faces Border Delays			
	LOW	MED	HIGH
Atlantic Canada	1.9	-5.0	-5.6
Québec	4.7	-5.1	-3.9
Ontario	3.8	-6.2	-3.9
Prairies	4.7	-4.6	-3.2
British Columbia	2.9	-2.9	-1.8
Provinces Individually Face Delays			
	LOW	MED	HIGH
Atlantic Canada	1.4	-4.8	-1.7
Québec	4.0	-5.1	-2.3
Ontario	3.2	-6.2	-3.0
Prairies	4.6	-4.6	-1.9
British Columbia	1.7	-3.6	-0.8

# Discussion

- Welfare and GDP losses are very large **relative** to the direct costs implied.
- **Why?**
  - delays cause resources to be wasted
  - border crossing intensity of some sectors
- Effect on skill structure of wages is also large. †
- **Why?**
  - 73% of earnings in transportation and storage sector goes to low-skilled workers.
  - 2% is a modest share of cost, but amounts to a significant increase in demand for transportation.