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SECTORAL AND LABOUR MARKET IMPACTS OF BORDER DELAYS IN CANADA

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Abstract

Being heavily trade-dependent and small, the Canadian economy is vulnerable to external shocks ranging from market-related price shocks to non-market security-related shocks. In this paper, we explore the economic implications of border delays using a static regional computable general equilibrium (CGE) model for Canada. We considered two sample scenarios of border delays, namely, (a) base case with delay costs of 1% on both merchandise and service trades, and (b) high case with delay costs of 2% on merchandise trade and 1% on service trade. Simulation results showed that border delays could significantly affect the economic performance in terms of welfare, wage structure, sectoral employment and other repercussions at both provincial and national levels. More importantly, the nature and extent of impacts varies across regions and sectors. For example, some provinces were badly hurt (e.g., Machinery in Ontario and Québec) while several sectors in other provinces experience expansion and growth. The findings had relevant policy implications for Canada's regional trade development not only for the traditional trade link with the United States in the south but also for the emerging trade initiatives with Asia-Pacific countries in the west.

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1 Introduction

Canada is a heavily trade-dependent small open economy, with exports accounting for as much as 40% of its gross domestic product. As a result, the Canadian economy is particularly vulnerable to external shocks affecting intra-continental trade across the land border with the United States in the south as well as inter-continental trade across the Pacific Ocean with Asian countries in the west. The types of shocks it receives range from market-related shocks (e.g., a rise in world prices of crude oil and refined petroleum products or a fall in world prices of manufactured goods from China) to non-market security-related shocks (e.g., continually tightened customs and immigration inspection at the Canada-US border including shutdown of the American airspace in events of security alerts). As a result, these security-induced border delays present an added dimension to the trade costs to Canada, on top of other structural cost elements such as transportation, congestion, bottlenecks, and pollution.

The purpose of this paper is to explore the economic implications of border delays using a static regional computable general equilibrium (CGE) model for Canada. The static CGE framework is particular useful for addressing issues of long-term resource reallocation such as impacts from changes in the trade costs arising from border delays. We consider two sample scenarios of border delays, namely, (a) base case of 1% border delay costs applied across-the-board on both merchandise and service trades, and (b) high case of 2% border delay costs on merchandise trade and still 1% border delay costs on service trade. These two experiments were designed to explore the bounds for the range of possible impacts of border delays on the Canadian economy.

In particular, our modelling framework has a provision to incorporate detailed data on labour skills into the general equilibrium market structure of the economy. For example, data from the Census have up to 26 occupational categories which can now be aggregated into a wider and more detailed range of skill levels than the usual crude skilled-unskilled dichotomy in the literature (e.g., [7] [9]). The model is then extended to represent separate markets for workers of different skill levels (here low, medium and high skills). This interesting and novel feature allows us to identify separate effects on different levels of skill intensity of labour employment by sector and by province. This adds an important domestic labour policy dimension to our earlier work. It also adds further insight into the benefits of facilitating trade with Canada's major trading partners in North America and abroad.

Simulation results suggested that border delays could significantly affect the economic performance in terms of welfare, wage structure, sectoral employment and other repercussions at both provincial and national levels. More importantly, the nature and extent of impacts varies across regions and sectors. For example, some provinces were badly hurt (e.g., Machinery in Ontario and Québec) while other provinces experienced expansions and growth (e.g., Machinery in BC and Mining in Ontario).

The plan of the remaining of the paper is as follows. Section 2 provides a brief review of the literature on the impacts of border delays. Section 3 outlines the features of the model and data, including a discussion of the skill intensity of various sectors. Section 4 reports

results of the two experiments considered, namely, base case and high cases of border delay costs applied on merchandise and service trades. Section 5 concludes the paper with a brief summary and concluding remarks on the policy implications.

2 Literature Review

This section provides a brief review of the recent literature on the impacts of border delays in the aftermath of the 9/11 terrorist attack in New York City in 2001. Early reports on delays occurred at the Canada-US border include studies by governments (e.g., Canada-US-Ontario-Michigan Border Transport Planning/Need Feasibility Study [3], Canada Border Services Agency [2], Ontario Chamber of Commerce [16] [17]) and private agencies (e.g., Canadian Manufacturers and Exporters [5], and Canadian Centre for Pollution Prevention [4]). These documents give useful background on border delay issues.

In 2008, a series of newspaper articles [1] [10] [12] in the Globe and Mail expressed Canadian concerns about the increased rate of incidents of secondary border inspections even for travellers with pre-screen clearance, added processing fees, and inadequate border staffing causing additional delay costs.

Martin et al [11] used the Québec provincial input-output table and extraneous trucking cost data to estimate that border delays could cost truckers up to 32 minutes per shipment. In terms of dollar values, these time costs amount to about C$290 million per year for Canadian exporters. As the estimates were applicable to truckers only (i.e., excluding business travels and tourism), they can be best viewed as a lower bound for the actual costs of border delays.

Huang and Whalley [8] used the inventory-theoretic approach to the theory of demand for money to show that, in the presence of costly border delays, importers tend to hold larger inventories to guard against the risk of being out of stock. They found that, in the simple case with certainty in border delays, the social cost of border delays are twice the time delay costs (i.e., the additional inventory costs equal the time delay costs). In case of uncertainty in border delays, for a given average delay, the added inventory costs tend to increase with the variance of the delays.

Along this line, the Conference Board of Canada [6] reported that business executives on both sides of the border have used inventory stockpiling as an insurance policy against the risk of costly late shipments of time-sensitive merchandise due to border delays. This is a reversal of the optimal "just-in-time" inventory strategy which keeps inventory holding at the minimum and orders shipments only as needed. The inventory stockpiling effect reflects an additional dimension of the social costs of border delays.

In their CGE simulations of the global welfare costs of border security, Walkenhorst and Dihel [20] considered counterfactual scenarios for ten regions and ten sectors of the world economy in which border security results in an ad-valorem increase of 1% in transportation costs of all traded goods. Their results show that, in a static global framework, the welfare cost of worldwide heightened border security, calculated in terms of Hicksian equivalent

variations, could be about US$75 billion per year or 0.7% of the world gross national product.

In contrast with the global economy focus of Walkenhorst and Dihel [20], Nguyen and Wigle [15] explored the issues of welfare costs of border delays in the context of Canada's regional small open economy. Two counterfactual experiments were conducted: (a) base case of 1% border delay costs which is comparable to that of Walkenhorst and Dihel [20] and (b) high case of 2% border delay costs to capture the added cost component of border delays through the inventory-theoretic argument advanced by Huang and Whalley [8]. Their results showed that the welfare costs of border delays for Canada as a whole could range from 1% of gross national product in case (a) and 1.8% of gross national product in case (b).

Across provinces, the share of the welfare burden of border delays was not even, with the two highly trade-dependent provinces of Ontario and Québec being hardest hit in terms of welfare losses. This has a significant trade policy implication for Canada at both national and regional levels.

3 Modelling Framework

This section provides a brief non-technical description of the modelling framework underlying the two border delay experiments in this paper. Detailed descriptions of the model and data can be found in their documentation [13] [14]. In addition, the technical appendix in Nguyen and Wigle [15] gives a concise mathematical description of the general structure of the model.

3.1 Economic Structure

In general, we used a static CGE model with the usual features of constant returns to scale technology and competitive market structure. The regional structure consists of ten provinces and one aggregate region for the territories. Trade is engaged at both interprovincial and international levels.

On the production side, each sector has a multi-output technology taking an input aggregation (primary factors and intermediate goods) and processing it through an output transformation function. For each region, the outputs are then transformed into goods destined for the own province market, and goods destined for export (i.e., other provinces or the rest of the world).

On the demand side, besides the federal government, each region has its own regional representative private consumer, a provincial government and (optionally) a local government. The representative private consumer owns all primary factors in the region and demands a composite of consumption and investment goods. All governments collect taxes according to their jurisdictions and spend revenues on either government expenditures or investments. To ensure government balanced budgets, initial surpluses or deficits are ac-

commodated by offsetting endowments of foreign exchange. As revenues change, governments adjust their expenditures to maintain the initial deficit or surplus.

On the trade side, each region acts as a small open economy facing the rest of the world. For exports, this means that the provinces are price takers in world markets for their goods. For imports, the demands for goods (both final and intermediate) in a given region are represented as an aggregates of production outputs originated from three sources, namely, home province, other provinces, and rest of the world. Initial trade imbalances are accommodated by giving each province's representative consumer an offsetting endowment of foreign exchange.

3.2 Data Structure

The data set was built upon the 2001 S-level provincial input-output table compiled by the Input-Output Division of Statistics Canada [19]. This table was in a rectangular format which means that each sector can produce a vector of outputs (multi-product). This data structure makes our model different from the usual single-product case as in most CGE models with squared data.

The raw data were assembled and balanced to produce a micro-consistent benchmark data set satisfying the usual zero profit and market equilibrium conditions. In essence, this benchmark data set provides a numerical snapshot of a general equilibrium state of the Canadian regional economy which can then be used for the calibration of model parameters.

The original version of the data set was fairly sizeable with 10 provinces, 3 territories, 25 production sectors, and 56 aggregated commodities. There were additional details on energy, taxes, and trade data components to allow explorations in a wide range of policy issues. In this paper, we aggregated the data to 9 provinces, 12 production sectors, and 21 aggregated commodities see Tables 1, 2, 3). This level of data aggregation provides a proper balance between model complexity and sufficient policy detail. The quality of skill and IO data for the Territories and Prince Edward Island are rather poor because of significant problems arising from suppression of data for confidentiality regions. As a result, we aggregated the respective Territories with the province with which they have the most trade. PEI was aggregated with Nova Scotia.

3.3 Skill Intensities

The labour-related classes of inputs (wages and salaries plus supplementary labour income) used in each sector were allocated among skill classes based on employment and earnings information from the 2001 Census [18]. The employment and income data were classified according to the the National Occupational Classification (NOC) system. The NOC classifications were aggregated into three general skill classes, namely, low (NOC levels C, D), medium (NOC level A), and high (NOC levels O, A).

To summarize the skill intensity of various sectors, we constructed the skill intensity index $I_S = 1.4\ \alpha^h + \alpha^m + 0.75\ \alpha^\ell$ which was based on the proportions of labour cost paid to workers in each of three skill classes: low (α^ℓ), medium (α^m), and high (α^h). The sectors were then ranked accordingly. Based on the index, the 12 sectors were split into three average skill groups (low, medium, high). Each group contains four sectors and can be described as follows:

low average skill :	proportion of high skill $\leq 10\%$	proportion of low skill $\geq 45\%$
medium average skill:	proportion of high skill 13–18%	proportion of low skill 29–51%
high average skill :	proportion of high skill $\geq 20\%$	proportion of low skill $\leq 50\%$

The three groups are separated by a horizontal line in Table 4. The table also presents the share of employment income attributable to each sector for Canada as a whole. Note that the column 'Dominant Skill Intensity' corresponds only to the skill level with the highest share of labour cost. In this light, the sectors which are predominantly high-skill intensive include Services (SGS), Utilities (UTL), and Mining (MIN). The next five sectors which are predominantly medium-skill intensive include Construction, Wholesale, Chemicals, Forestry, and Agriculture. The remaining four sectors are predominantly low-skill intensive.

3.4 Regional Characteristics

We briefly describe some regional characteristics which have some bearing on the border delay experiments in this paper. We consider three manufacturing sectors ranked in terms of their level of processing and factor intensity. At one extreme, the Food, Textiles, and Publishing (M1) sector (including clothing) is relatively labour intensive. At the other extreme, the Chemicals, Rubber, Plastic and Metals (M2) sector is both highly energy and capital intensive. Within these two extremes, the Machinery, Equipment, Vehicles and Furniture (M3) sector is not energy-intensive and has a capital-labour share between the other two.

From a regional perspective, the relative importance of a sector varies significantly across provinces. For example, the Forestry, Fishing and Trapping (FFT) sector is significantly more important to the Atlantic provinces (NF, NS, NB) and British Columbia than to the rest of the country. On the other hand, almost 63% of Canada's mining industry is located in Alberta, composed largely of oil and gas extraction. Finally, manufacturing is crucial to Ontario, and to a lesser extent Québec and British Columbia. In particular, Ontario's dominance is mainly in the Machinery, Equipment Vehicles and Furniture (M3) sector which accounts for over 70% of the total production in the country.

The most internationally open market in Canada is that for the Machinery, Equipment and Vehicles (MEV) commodity. In that case, over 85% of the domestic demand is supplied from foreign markets. Similarly, almost 80% of Canadian production is exported. This openness is due in no small part to the huge bilateral trade in motor vehicles and parts

between Canada and the United States. Table 5 presents the provincial and sectoral composition of production in Canada and Table 6 presents the role played by trade in the supply and demand for various goods in Canada.

4 Experiment Results

This section reports simulation results of two counterfactual experiments on border delays, namely, (a) the base case of 1% border delay costs on both merchandise and service trades, and (b) the high case of 2% border delay costs on merchandise trade and still 1% border delay costs on service trade. These two experiments were designed to explore the bounds for the range of possible impacts of border delays on the Canadian economy. We present the findings in terms of welfare impacts as well as sectoral and market impacts on various regions of the economy.

4.1 Welfare Impacts

Table 7 reports the welfare impacts of the border delays on the regions as well as Canada as a whole. The percentage welfare change (%) corresponds to the percentage change in the welfare of the representative agent. The dollar value welfare change ($M) is calculated by multiplying this percentage welfare change (%) with the total benchmark expenditure on consumption plus investment.

The results show that all regions suffer welfare losses of border delays (measured in terms of equivalent variations). In the base case, the losses range from C$94 million in Newfoundland to C$1.4 billion in Québec and C$3.7 billion in Ontario. These two biggest provinces were hardest hit due to their highly trade-dependent production structure and strong trade ties with the neighbouring United States (e.g., the Ontario-Midwest automobile corridor). In the high case, the pattern of welfare impacts remained the same although the loss figures were higher as expected.

For Canada as a whole, the welfare loss was about 0.9 % of gross domestic product which was with the range of the global estimate of 0.7% reported by Walkenhorst and Dihel [20]. For the high case, the loss figure was again higher as expected.

4.2 Real Wages

Table 8 reports the impacts of border delays on real wages by province and skill level. In both experiments wages in higher-skill groups fall as lower-skill real wages rise. The following discussion focuses on both the real wage changes and the change in wage structure.

Border delays will tend to have a direct effect on the transportation sector and an indirect effect on other sectors. In the case of transportation, the delays make imports more expensive relative to domestic goods, and they make the producers price of exports lower. This will tend to cause trade to fall. The net impact on wages in the transportation sector in

part depend on how much trade falls. In our experiments, total trade falls by less than the required added transportation costs rise.

As noted previously, Transportation has both the highest share low-skilled workers and was ranked lowest by our overall skill ranking. As a result, the increased demand for transportation services amounts to a shift in total labour demand toward less-skilled workers, driving the wages of low-skilled workers up.

Trade effects can also affect the skill structure of wages in many ways. For example, the Machinery, Equipment and Vehicles Sector declines significantly in Canada as a whole as a result of the delays. It is in the middle of our overall skill ranking, meaning this reduction tends to a broad-based reduction in demand for all skills. The interaction of these (and many other influences) contributes to the shift of the wage structure against medium and high-skill workers relative to low-skill workers.

Generally, the increase in transport costs by border delays caused total real labour income to fall Canada-wide in both experiments. In particular, real wages fell in all regions for the medium and high skill classes. These wages were made up by low skill workers across the regions.

4.3 Sectoral Employment

Table 9 reports the change in total employment (all skill classes) by sector and region. Explaining the sectoral impacts of border delays at the provincial level requires disentangling a number of influences.

As mentioned above, border delays make imports more expensive and reduce the producer price of imports. All of the sectoral impacts (reported as percentage changes in employment) reflect the fact that overall economic activity has fallen by over 0.5%. Beyond that, some sectors suffer cutbacks while some other gain. For example, in the base case, the Machinery sector (M3) in Ontario which includes automobile and auto parts contracts by 14% while the Transportation sector (TRN) expands in all regions of Canada.

One relevant feature of sectors is their trade orientations in their output (e.g., export-oriented versus import-competing). Their input market orientation (e.g., how much of a given sector's inputs are imported from abroad) also matters. There is a further level to this discussion of trade orientation. If a given sector in a given province exports to other provinces where the major competitor is foreign imports, border delays may make those provincial markets more attractive.

Because all the provincial economies are linked through trade, the impacts on a given sector can depend in part on how competing sectors in other provinces are affected by the border delays. Some cases are abundantly clear. For example, Ontario's Machinery, Equipment Vehicles and Furniture (M3) sector posts the largest percentage decline in sectoral employment. This sector exports a very large share of production and relies heavily on imported inputs. The situation in the same sector in Québec is similar. The Forestry, Fishing and Trapping (FFT) sector is very export oriented and also suffers in most provinces. The exception is Ontario, where the sector is very small.

As noted above, the transportation (TRN) sector expands its employment in all provinces. This is as a result of the adjustment of that sector to border delays. In our modelling, the delays cause more transportation inputs to be required to achieve a given volume of trade. As long as the trade volume goes down by less than the rate that the transportation cost per unit of trade goes up, the total inputs required in the transportation sector goes up. We are aware that this is contradictory to the usual view that border delays should hurt the transport sector. The scenario we model is one where the delays have become routine and are built into all planning.

The Construction (CON) sector, which is mostly oriented to the domestic markets, declines by somewhat less than the reduction in GDP reported in (Table 7) for the economy as a whole. Although reduced economic activity causes decreased demand for construction, that effect is mitigated by the relative increase of goods prices to service prices.

Looking briefly now at the provinces that were hurt the most (Ontario) and the least (BC) in proportional terms, we see variations in impact effects between different provinces.

For example, in Ontario, the sizeable decline in its externally-oriented manufacturing has important repercussions for other parts of the province. A number of other sectors absorb the employees released by that sector. This is particularly the case for 14.2% increase in Mining (MIN), 2.9% in Forestry (FFT), 2.8% in Agriculture, as well as other sectors of manufacturing.

On the other hand, there is an amazing contrast between the impacts of border delays on the Machinery (M3) sector in BC (expanding by 6.9% in the base case) and in Ontario (contracting by 14% in the base case). This is probably because BC's sector is primarily import competing, whereas Ontario's is both export oriented and import dependent.

5 Concluding Remarks

This paper explores the impacts of border delays using a regional CGE model of Canada. Simulation results suggested that border delays could significantly affect the economic performance in terms of welfare, wages, the skill wage structure, sectoral employment and other repercussions at both provincial and national levels. More importantly, the nature and extent of impacts varies across regions or sectors. For example, some provinces were badly hurt (e.g., Machinery in Ontario and Québec) while other provinces experienced expansions and growth (e.g., Machinery in BC and Mining in Ontario). The findings had relevant policy implications for Canada's regional trade development not only for the traditional trade link with the United States in the south but also for the emerging trade initiatives with Asia-Pacific countries in the west.

Our research points out the importance of understanding our linklages within Canada as well as those outside Canada. The impacts of continuing border delays are not only widespread, but the breadth and depth of impacts are not obvious a priori.

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Table 1: Region Listing

Code	Description
NF	Newfoundland
NS	Nova Scotia
NB	New Brunswick
QC	Québec
ON	Ontario
MB	Manitoba
SK	Saskatchewan
AB	Alberta
BC	British Columbia
CD	Canada

Table 2: Sector Listing

	Code	Abbreviation	Description
1	UTL	Utilities	Utilities
2	AGR	Agriculture	Agriculture
3	MIN	Mining	Mining
4	CON	Construction	Construction
5	FFT	Forestry	Forestry, fishing, trapping
6	SGS	Social services	Social, health and government services
7	M1	Food	Food, textiles and publishing
8	M2	Chemicals	Chemicals, rubber, plastic and metals
9	M3	Machinery	Machinery, equipment, vehicles and furniture
10	WRF	Wholesale	Wholesale, retail, financial, commercial services
11	TRN	Transportation	Transportation
12	ACE	Accommodation	Arts, entertainment, accommodation, travel

Table 3: Commodity Listing

	Code	Abbreviation	Description
1	AGR	Agriculture	Agricultural goods
2	FFT	Forestry	Forestry, fishing, trapping
3	MIN	Mining	Mining
4	FBT	Food	Food, beverages, tobacco
5	TCL	Textiles	Textiles, clothing, and apparel
6	LWP	Lumber	Lumber and wood products
7	MMP	Metal	Metal and metal products
8	MEV	Machinery	Machinery, equipment, vehicles
9	OMP	Other manufactures	Other manufactured products
10	CON	Construction	Construction
11	TRS	Transportation	Transportation and storage
12	UTL	Utilities	Utilities,
13	CFS	Commercial	Commercial, financial services
14	AFB	Accommodation	Accommodation, food, beverage services
15	SGS	Social services	Social, health, and government services
16	ELY	Electricity	Electricity generation plus transmission
17	COL	Coal	Coal
18	CRU	Crude oil	Crude oil
19	GAS	Natural gas	Natural gas
20	RPP	Refined petroleum	Refined petroleum products
21	ORP	Other petroleum	Other petroleum and coal products

Table 4: Skill Intensity by Employment, Canada (%)

		Skill Shares			Predominant
Code	Sector	Low	Med	High	Skill Intensity
SGS	Services	18	23	59	high
UTL	Utilities	26	22	52	high
MIN	Mining	21	39	40	high
CON	Construction	21	46	33	medium
WRF	Wholesale	33	36	31	medium
M3	Machinery	37	33	30	low
M2	Chemicals	34	41	25	medium
ACE	Accommodation	37	35	27	low
FFT	Forestry	37	49	14	medium
AGR	Agriculture	36	57	7	medium
M1	Food	52	27	21	low
TRN	Transportation	63	23	15	low

Table 5: Regional Shares of National Sectoral Output (%)

Region	Utilities UTL	Agriculture AGR	Mining MIN	Construct CON	Forestry FFT	Social SGS
Newfoundland	1.7	0.3	3.4	2.1	5.1	1.8
Nova Scotia	2.6	2.1	1.8	3.0	9.1	3.9
New Brunswick	3.8	2.1	0.7	1.7	5.8	2.4
Québec	26.4	16.3	3.3	17.3	19.7	22.7
Ontario	36.7	23.1	5.7	33.4	10.9	38.1
Manitoba	4.6	9.6	1.0	2.8	1.2	3.9
Saskatchewan	3.4	14.7	9.9	3.9	2.5	3.3
Alberta	11.9	22.9	64.2	23.3	4.8	10.5
British Columbia	8.9	8.9	10.0	12.6	40.9	13.5

Region	Food M1	Chemicals M2	Machinery M3	Wholesale WRF	Transport TRN	Accomm ACE
Newfoundland	1.1	0.8	0.1	1.0	1.0	1.0
Nova Scotia	2.9	1.7	0.7	2.5	2.4	2.6
New Brunswick	3.6	2.9	0.2	1.6	2.4	1.7
Québec	30.4	24.9	18.8	20.0	18.7	21.0
Ontario	34.3	48.4	71.0	44.6	35.4	40.6
Manitoba	3.1	1.7	1.6	3.0	5.0	3.3
Saskatchewan	1.7	2.0	0.5	2.5	3.8	2.7
Alberta	8.4	12.7	4.5	12.1	15.4	12.7
British Columbia	14.4	4.8	2.7	12.7	16.0	14.4

Table 6: Trade Orientation of Goods Demand and Supply (%)

		Source of Demand		Destination of Supply	
Code	Commodity	Domestic	Imports	Domestic	Exports
ELY	Electricity	94.4	5.6	87.1	12.9
OMP	Other manufactures	27.7	72.3	52.8	47.2
TRS	Transportation	88.4	11.6	75.9	24.1
UTL	Utilities	93.6	6.4	94.7	5.3
COL	Coal	9.2	90.8	64.3	35.7
CRU	Crude oil	41.7	58.3	50.0	50.0
GAS	Natural gas	74.8	25.2	31.6	68.4
ORP	Other petroleum	11.6	88.4	53.7	46.3
RPP	Refined petroleum	98.8	1.2	85.5	14.5
AGR	Agriculture	78.0	22.0	77.3	22.7
MIN	Mining	69.1	30.9	66.0	34.0
CON	Construction	100.0	0.0	100.0	0.0
FFT	Forestry	92.4	7.6	88.5	11.5
FBT	Food	72.3	27.7	77.0	23.0
TCL	Textiles	23.9	76.1	46.8	53.2
LWP	Lumber	68.6	31.4	50.5	49.5
MMP	Metal	51.9	48.1	59.4	40.6
MEV	Machinery	14.1	85.9	22.9	77.1
CFS	Commercial	96.1	3.9	94.7	5.3
AFB	Accommodation	88.4	11.6	89.1	10.9
SGS	Social services	99.5	0.5	99.5	0.5

Table 7: Welfare Summary

Base Case: 1% on Merchandise, 1% on Services				
Region	Welfare Change		GDP Change	
	($M)	(%)	($M)	(%)
Newfoundland	-93.64	-0.71	-121.03	-0.69
Nova Scotia	-184.32	-0.72	-386.92	-1.12
New Brunswick	-165.57	-0.97	-224.23	-0.99
Québec	-1445.09	-0.84	-1867.48	-0.84
Ontario	-3727.93	-1.16	-4532.05	-1.14
Manitoba	-185.01	-0.69	-253.72	-0.72
Saskatchewan	-158.56	-0.63	-191.55	-0.60
Alberta	-885.76	-0.81	-992.04	-0.75
British Columbia	-578.24	-0.54	-739.13	-0.55
Canada	-7424.13	-0.91	-9308.16	-0.90

High Case: 2% on Merchandise, 1% on Services				
Region	Welfare Change		GDP Change	
	($M)	(%)	($M)	(%)
Newfoundland	-169.80	-1.28	-221.43	-1.27
Nova Scotia	-334.86	-1.31	-715.93	-2.08
New Brunswick	-306.94	-1.79	-415.45	-1.84
Québec	-2667.02	-1.56	-3426.03	-1.54
Ontario	-6765.66	-2.10	-8243.27	-2.07
Manitoba	-347.27	-1.29	-472.92	-1.35
Saskatchewan	-278.70	-1.11	-341.44	-1.06
Alberta	-1630.70	-1.49	-1822.62	-1.38
British Columbia	-1003.45	-0.93	-1298.76	-0.96
Canada	-13504.40	-1.65	-16957.83	-1.65

Table 8: Real Wage Change (%)

Base Case: 1% on Merchandise, 1% on Services			
Region	Low Skill	Med Skill	High Skill
Newfoundland	2.16	-1.86	-2.40
Nova Scotia	3.50	-1.54	-3.54
New Brunswick	4.70	-2.88	-3.22
Québec	4.93	-2.42	-2.55
Ontario	4.50	-3.40	-2.20
Manitoba	3.47	-1.31	-2.25
Saskatchewan	5.08	-1.67	-2.18
Alberta	6.01	-2.30	-2.30
British Columbia	3.36	-1.49	-1.64

High Case: 2% on Merchandise, 1% on Services			
Region	Low Skill	Med Skill	High Skill
Newfoundland	4.15	-3.44	-4.33
Nova Scotia	6.58	-2.83	-6.46
New Brunswick	8.86	-5.37	-5.84
Québec	9.24	-4.56	-4.67
Ontario	7.78	-6.02	-3.83
Manitoba	6.25	-2.47	-4.03
Saskatchewan	10.00	-3.03	-3.93
Alberta	11.76	-4.32	-4.32
British Columbia	6.16	-2.57	-2.90

Table 9: Sectoral Employment Change (%)

Base Case: 1% on Merchandise, 1% on Services											
Code	Sector	NF	NS	NB	QC	ON	MB	SK	AB	BC	CD
UTL	Utilities	-2.1	0.0	-1.4	0.5	-0.2	1.2	-0.6	-0.9	7.4	0.5
AGR	Agriculture	-4.7	-1.9	-2.9	0.1	2.8	-0.4	-3.2	-0.6	-1.6	0.1
MIN	Mining	1.5	1.5	1.0	0.8	14.2	-1.6	1.6	0.9	0.0	2.2
CON	Construction	-0.8	-0.6	-0.5	-0.5	-0.5	-0.4	-0.5	-0.3	-0.4	-0.5
FFT	Forestry	-5.3	-0.7	-0.5	-0.2	2.9	-1.3	-2.2	-2.9	-3.5	-1.7
SGS	Social services	-0.5	-1.8	-1.0	-0.7	-0.8	-0.7	-0.4	-0.5	-0.5	-0.7
M1	Food	-6.2	-0.7	-0.8	-0.2	1.5	-2.6	-6.0	-3.8	-3.7	-0.6
M2	Chemicals	1.4	-1.7	-5.3	-0.4	1.6	-1.9	-1.1	0.1	-4.1	0.3
M3	Machinery	5.2	6.3	7.8	-6.7	-14.0	-4.1	0.9	-5.8	6.9	-9.9
WRF	Wholesale	-1.2	-0.5	-0.7	-0.4	1.0	-0.8	-1.9	-1.1	-0.8	0.1
TRN	Transportation	5.4	5.5	2.8	6.6	9.3	5.5	2.7	3.1	3.3	6.3
ACE	Accommodation	-2.0	0.2	-1.5	-2.4	-4.3	-0.6	-0.5	-1.8	-2.0	-2.8

High Case: 2% on Merchandise, 1% on Services											
Code	Sector	NF	NS	NB	QC	ON	MB	SK	AB	BC	CD
UTL	Utilities	-4.0	-0.1	-3.0	1.1	-0.3	2.4	-1.3	-1.6	14.5	1.2
AGR	Agriculture	-9.0	-3.7	-5.7	0.5	5.5	-1.1	-6.7	-1.4	-3.0	0.1
MIN	Mining	2.7	2.6	2.1	2.2	27.4	-3.3	2.6	1.4	-0.2	4.1
CON	Construction	-1.4	-1.1	-0.8	-0.9	-0.9	-0.7	-0.8	-0.6	-0.6	-0.8
FFT	Forestry	10.3	-1.8	-1.4	0.1	5.7	-2.2	-3.9	-4.6	-7.0	-3.3
SGS	Social services	-0.9	-3.3	-1.8	-1.2	-1.4	-1.2	-0.8	-0.8	-0.8	-1.2
M1	Food	12.1	-1.7	-2.0	0.0	3.2	-4.6	-11.5	-6.5	-7.5	-0.8
M2	Chemicals	2.2	-3.2	-10.2	-0.6	3.0	-4.4	-2.2	0.1	-7.7	0.6
M3	Machinery	10.8	12.1	13.7	-15.0	-26.9	-7.8	1.3	-12.4	11.4	-19.7
WRF	Wholesale	-2.1	-0.9	-1.2	-0.6	1.9	-1.3	-3.5	-2.0	-1.5	0.2
TRN	Transportation	10.7	10.3	5.7	12.7	17.6	10.1	6.7	6.7	7.3	12.2
ACE	Accommodation	-3.7	0.5	-2.5	-3.9	-6.6	-0.7	-1.2	-2.9	-2.9	-4.4