

Assessment of: “Employment Implications of Trade Liberalization with East Asia” (Canadian Auto Workers, September 2006).

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Executive Summary

The CAW-commissioned study assesses the impact on Canadian jobs of Canadian free trade agreements (FTAs) with Korea, Japan and China. However, both in design and from the perspective of technical execution, the study is unsound; its conclusions are unreliable.

The CAW study excludes agricultural trade liberalization. Since a Canada-Korea FTA without agriculture would not be viable, this study’s conclusions are not relevant to any realistic deal.

The study uses bilateral trade balance and sectoral job impacts to measure the benefits of an FTA. Bilateral trade balances are not meaningful in a context in which Canada trade with over 200 partners. Sectoral job impacts represent adjustment costs as labour and capital shift from declining to gaining sectors, not permanent losses. At the same time, the study ignores the usual measures of the benefits of trade liberalization, namely efficiency gains from increased specialization in areas of a country’s comparative advantage and consumer benefits in the form of lower prices and increased competition in the market.

In assessing the impact of FTAs on Canadian jobs, the study assumes that all import growth from FTA partners comes entirely at the expense of Canadian production and jobs. This would only be true if Canada did not import from third countries and if lower prices in the domestic market did not expand consumer purchases. These assumptions are not valid and result in gross errors, which are especially egregious in a sector such as autos where third country imports account for the lion’s share of domestic sales.

In assessing Canada’s benefits in terms of increased exports to Korea as limited to nil, the study relies on econometric analysis which is not robust and collapses under scrutiny.

The CAW study also employs an “historical analogy” approach which invites the reader to conclude that the impact of the Canada-Korea FTA on future trade flows would match the average historical pattern of export and import growth with Canada’s existing FTA partners. In this regard, the CAW study implicitly attributes to an FTA all increase in trade due to growth of the respective economies, exchange rate shifts, and commodity price shifts that might occur in the post-FTA period. This approach is not scientifically sound: the effects of an FTA should be assessed on the basis of “all else being equal”, that is, eliminating the effects on trade of other factors. Notably, it was this approach, coupled with some extreme assumptions (no Korean sensitivity to tariff cuts and exclusion of agriculture), that underpinned the headline figure of 33,000 jobs lost from a Canada-Korea FTA.



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1. Introduction

The CAW-commissioned study purports to assess the impact on Canadian employment of Canadian free trade agreements (FTAs) with Korea, Japan and China. The study conducts two types of analysis:

- (a) An “elasticities approach”: what is in effect a stripped-down partial equilibrium trade model is used to generate net trade impacts by sector, which are then multiplied by sectoral job data to generate employment impacts.
- (b) An “historical experience” approach: average post-FTA growth of exports and imports with Canada's FTA partners is applied to Canada-Korea trade to generate a net trade impact, which then similarly generates employment impacts.

2. Scope of the Assessment

The CAW study focuses its attention on the industrial sector and excludes agricultural trade liberalization. For example, the eye-catching figure of more than 33 thousand job losses as a result of a Canada-Korea FTA, cited in the Jim Stanford op-ed article based on the study¹, is based on liberalization of industrial goods only – this notwithstanding that many of the gains that are anticipated for Canada in terms of market access are in agricultural products in which Canada has an advantage over Korean producers and which benefit from substantial protection in the Korean market. Since an FTA between Canada and Korea that entirely excluded agriculture would not be viable, this study's conclusions are not relevant with respect to any realistic deal, even if the study's analytic approaches were otherwise sound.

3. Trade Balance and Net Job Impacts as Measures of the Impact of FTAs

The approach taken by the CAW study to assessing the costs and benefits of an FTA, which emphasizes bilateral trade balance and sectoral job impacts, is not meaningful. The economic benefits from trade liberalization stem from several sources:

1. Efficiency gains in production from increased specialization in areas of a country's comparative advantage.
2. Consumer benefits in the form of lower prices and increased competition in the domestic market.

Changes in bilateral trade balances, on which the CAW study focuses, are *not* a measure of either benefit or cost of a preferential trade agreement.

- It should be kept in mind that a country exports in order to earn foreign exchange to spend on imports. An increase in a country's net exports with one partner would generate foreign exchange to spend on imports from others. There is no reason in economic theory or practice for a country to seek balanced trade on a bilateral basis, or to use additional foreign exchange earned on expanded exports to one partner on imports from that partner.



- Moreover, there are equilibrating macroeconomic effects to take into account: increases in a country's overall trade surplus (deficit) tend to lead to exchange rate appreciation (depreciation) which in turn erodes (enhances) overall competitiveness of a country's exports. In other words, if the immediate impact of an FTA is a higher surplus, the second round impacts will tend to work in an offsetting direction.
- Generally speaking, the purpose of trade liberalization is to enable countries to achieve more efficient resource allocation and an increase in GDP; trade liberalization is not a vehicle for reducing a trade deficit or increasing a surplus. The size of a country's current account surplus (or deficit) is determined by a broad range of economic variables including its attractiveness as an investment location (which will impact on capital flows and capital goods imports), the volume of domestic savings relative to domestic investment and national and global economic growth rates.

As regards jobs impacts, FTAs will result in a decline in market share for domestic industry in those sectors in which a country has a comparative disadvantage vis-à-vis the FTA partner. This decline in a sector's market share may be sufficiently large to result in an absolute decline in sectoral output and employment if the income gains generated by the FTA are insufficient to induce enough net new spending on the sector's products to offset the market share lost to imports – in economic terminology, a sector suffers absolute declines if the price effect of tariff elimination dominates the income effect. In the latter case, there are adjustment costs as resources (both labour and capital) shift from declining to expanding sectors. Jobs are not permanently lost in this process; rather, jobs are shifted from weaker sectors to those which are more viable. At the same time, the gains in efficiency are reflected in higher productivity and standards of living. The jobs measure of the impact of an FTA that the CAW study proposes is thus in effect a measure of the adjustment cost and not the bottom line as regards the overall impact of an FTA.

The study is silent on the conventional measures of the benefits of an FTA, including most importantly the impact of the FTA on consumer welfare, the most commonly cited “bottom line” assessment of FTAs in the economic literature.

4. Quantitative Models/Methods

From a technical economic point of view, the quantitative impacts derived in the study are fundamentally flawed for reasons set out below.

The “elasticities approach”

In the “elasticities approach”, the CAW study derives the impact of the FTA on Canadian imports from Korea by multiplying an assumed elasticity of substitution times the tariff reduction times the initial level of imports. The expansion of Korean auto sales is then entirely taken as being at the expense of Canadian production and in turn at the expense of Canadian jobs. This would be true, assuming an appropriate assumption for the elasticity, only if the following conditions held:

- (a) Canada had *no* trade in the relevant sectors with third countries. Applying this two-country approach to Canada, which trades heavily with third countries, most importantly the United States, necessarily results in gross errors.



- (b) There were *no* consumer response in the form of higher demand stimulated by lower prices due to the tariff cut. Failure to account for higher sales in the domestic market due to the tariff cut compounds the size of the first error.

As demonstrated in the box below, these errors result in the CAW grossly over-stating the impact on Canadian production and jobs in the auto sector, with roughly 85% of the error due to failure to account for third country imports and roughly 15% to failure to account for consumer response. Since imports account for a significant market share in other sectors, this error is repeated in the CAW assessment across all sectors.

Evaluating the Auto Sector Impacts of Korean imports in the CAW Study

To demonstrate the impact of using a two-country “model” to analyze a preferential tariff cut on Canadian auto imports from Korea, while ignoring consumer response to lower prices, we apply a standard 3-country model, the COMPAS model, developed for the US International Trade Commission for analysis of impacts on particular sectors of tariff changes affecting one source of imports. In the simulation described below, the parameters of the model are those used by the CAW study (elasticity of substitution and job loss ratio), or are chosen to satisfy CAW assumptions (e.g., full pass-through of the tariff cut by Korean auto producers). The model is “tuned” to exactly reproduce the CAW estimated Korean import gains by selecting Canadian and third-country import supply elasticities from a reasonable range (see end-notes for details of data sources and assumptions).²

Canadian Auto Market Sales	2005 Actual	Change due to CKFTA	Canadian job impact
Domestic Producers			
Quantity (units):	408,582	-4,819	
Value (millions):	\$9,427.3	-\$133.3	-94
Korean Imports			
Quantity (units):	127,673	70,387	
Value (millions):	\$1,571.9	\$718.8	-526
Third Country Imports			
Quantity:	1,043,774	-14,838	
Value (millions):	\$27,973.8	-\$454.0	
Total Domestic Sales			
Quantity (units)	1,580,029	50,730	
Value (millions):	\$38,972.9	\$131.6	

As can be seen, if the full change in Korean imports (\$718.8 million) were absorbed by domestic production, the job impact would be 526 jobs lost, as the CAW study asserts, given their estimated job loss ratio. However, in reality, most of the Korean import gain would come at the expense of third country suppliers, especially the United States which account for the lion’s share of Canadian domestic sales; the latter would lose about \$454 million worth of sales in this simulation. Further, domestic consumption would rise by a moderate amount (\$132 million) in response to the downward pressure on prices in the Canadian auto market from lower Korean prices. Taking into account both effects reduces the job impact to less than 100. This still likely over-states the impact on the Canadian auto sector because it adopts the CAW’s high assumptions for pass-through of tariff cuts and the elasticity of substitution. Industry Canada, using the COMPAS model and what we believe to be more plausible assumptions for these parameters, found a job impact in a range from -5 to -35.



An FTA with Korea would open up market opportunities in Korea for Canadian producers. The CAW study applies the same technique to measure Canadian export growth to Korea engendered by the FTA. However, it mounts an argument that the elasticity which drives the calculation of Canadian export gains in the Korean market should be substantially reduced compared to the same elasticity in the Canadian market. The study offers two alternatives: (a) elasticities which are half the size of those applying in the Canadian market; and (b) Korean elasticities of substitution are all zero – implying no impact whatsoever from the FTA on Canadian exports to Korea.

The study adduces some empirical evidence in support of this argument. It proposes that import penetration (measured as imports of goods and services divided by GDP) rises with declines in average tariff protection – defined as the ratio of collected tariff revenue to total imports of goods and services. The study finds that, for the period 1980-2004, this measure of average protection apparently explains about 85% of the growth in import penetration in Canada. By contrast, for Korea, this measure has no explanatory power whatsoever. The study concludes that a tariff cuts by Canada would accordingly elicit a significant expansion of imports from Korea but Korean tariff cuts would elicit much less, if any, increase in Canadian exports.

There are several obvious general criticisms of this empirical evidence.

- Tariffs are not collected on services; accordingly including services imports in the measure of sensitivity of goods imports to tariffs is inappropriate.
- Tariff revenues are not a good measure of protection since a prohibitively high tariff results in zero tariff revenues and hence zero implied protection. A reduction in tariffs in such cases leads to an increase in tariff revenue which in this instance would be interpreted as a rise in protection.
- Time series data on import penetration can be highly misleading in developing countries as a measure of openness to imports. This reflects the fact that, in many developing countries, the non-traded sector does not operate at world prices – this is reflected in the fact that so-called “purchasing power parity” exchange rates for many developing countries are much higher than the market exchange rates. As a country develops, domestic price structures tend to converge to world prices; during this period, the domestic economy expands in nominal terms much faster than the traded sector, leading to a decline in the observed share of imports in GDP.
- Time series data on import penetration of countries that experience large real exchange rate shifts can also be highly misleading as a measure of openness to imports. In Japan’s case, the very steep rise of the yen in the period after 1985 resulted in the price of imports in yen terms falling steeply. While the volume of imports increased in response to the lower prices, the value as a share of GDP fell (e.g., from 11.04 in 1985 to 7.41 in 1986 according to the CAW study data; this particular movement was due to the price impact of the exchange rate). Failure to control for such movements can result in biased estimates of the response of imports to tariff cuts.

Accordingly, one would not expect a robust result from this approach.



More specifically, the CAW study ignores changes in Korea's trade regime that might have impacted significantly on the relationship which they examine: "The import liberalization in Korea was pursued in two stages. The first phase of the import liberalization was implemented during the period from the early 1980s through 1988, and was accomplished by (1) liberalization of import licensing and (2) reduction of tariff rates. Both of these measures were intended to provide competitive pressure for domestic industries. The second phase of import liberalization was launched in 1988 and took the form of a then new five-year tariff reduction program during 1989 to 1993. During this period, a more extensive and accelerated tariff reduction program was implemented."³

To control for the effects of the change in Korean trade policy between the period up to 1988 and the subsequent period, a dummy variable can be added to the CAW equation. With this simple modification, the apparent insensitivity of Korean import penetration to changes in average tariff revenue vanishes.

<i>Regression Statistics</i>	CAW study	With regime dummy
Multiple R	0.0021	0.6792
R Square	0.0000	0.4613
Adjusted R Square	-0.0434	0.4123
<i>Coefficients (t-stats in parentheses)</i>		
Intercept	33.55 (15.7)	1.175 (12.67)
Regime dummy		-0.2244 (-4.34)
Average tariff revenue	-0.0039 (-0.0098)	-0.2855 (-3.56)

Similarly, if one takes account of the role of the large swings in the Canada-US exchange rate, which changed the relative price of non-traded to traded goods, the role of average tariff revenues in explaining import penetration in Canada is reduced.

<i>Regression Statistics</i>	CAW study	With Canada-US Exchange Rate
Multiple R	0.9179	0.9499
R Square	0.8426	0.9023
Adjusted R Square	0.8357	0.8935
<i>Coefficients (t-stats in parentheses)</i>		
Intercept	1.4894 (41.57)	0.5617 (2.21)
Canada-US Exchange Rate		0.6289 (3.67)
Average tariff revenue	-0.6567 (-11.09)	-0.4803 (-7.09)

Thus, the CAW results are wholly unreliable as a guide to the relative sensitivity of Korean and Canadian imports to tariff cuts.

The larger point with respect to the line of argument taken by the CAW study is that it is not correct to assume that Canada's export gains could come only from additional sales to Korea. Domestic Canadian economic adjustment to increased imports from Korea in some sectors would result in shifts of resources into other sectors which export to third countries which would be aided by equilibrating exchange rate adjustment in the event that Canada-Korea trade led to an initial deterioration of Canada's external balance.

The "historical experience approach"

In the “historical experience approach”, the CAW study implicitly attributes to an FTA all increase in trade due to growth of the respective economies, exchange rate shifts, and commodity price shifts that might occur in the post-FTA period. The effects of an FTA, however, should be assessed on the basis of “all else being equal”. To cite a handful of examples which illustrate the dangers of the CAW approach which ignores the impact of a multitude of relevant factors on trade trends, consider the following:

- The emergence of China as a massive force in trade globally means that Canada’s share in *all* markets is now lower than it would have been, all else being equal, prior to China’s emergence. The measure of the impact of an FTA is whether the FTA mitigated the erosion of market share.
- The fact that the United States is entering into FTAs with some of Canada’s trading partners (e.g., Israel) means that Canada would suffer preference erosion without its own FTA with that country.
- While Canada's imports from Chile have increased by \$1.3 billion since 1997, most of this (\$723 million or about 55%) was accounted for by higher copper imports. In good measure, the increased value of copper imports was driven by a large increase in the price of copper over that time. The rise in copper prices had nothing to do with Canada’s FTA with Chile. In a similar vein, the Chilean peso devalued considerably (by over 20%) in real terms against the Canadian dollar (from 303 in 1997 to 461 in 2005 in nominal terms, with a cumulative differential in inflation rates of about 11%); this also played an important role in trade impacts.

It is noteworthy that the figure of 33,000 jobs to be lost from a Canada-Korea FTA that was cited in the op-ed article was based on the historical analogies approach.

5. Conclusion

The study, both in design and from the perspective of technical execution, is unsound; its conclusions are unreliable.



¹ Globe and Mail, 25 September 2006

- ² The assumptions used to generate the simulation of auto sector impacts were as follows:
- The basic data for Canadian auto sector production, consumption and imports from Korea and from third countries, as provided by Ward’s AutoInfoBank, is inputted into the COMPAS model.
 - To provide for full pass-through of the tariff cut to Canadian consumers, as assumed by the CAW study, import supply from Korea is set to be perfectly elastic (less than full pass-through would be expected in a differentiated product sector such as autos; this assumption thus overstates the gain in Korean auto imports).
 - The elasticity of substitution is set at 7.5, as assumed by the CAW study. It is to be noted that this elasticity was indirectly based on an international data base (GTAP version 5) that has since been updated; in the up-dated GTAP 6 data base, the relevant substitution elasticity for the auto sector has been lowered from that in the GTAP 5 data base. The use of higher elasticities tends to expand the Korean auto import gains.
 - Moderate supply elasticities were chosen for domestic production (5) and third country imports (7), broadly consistent with usual practice; the specific values were chosen to “tune” the model output to yield exactly the expansion of Korean imports derived in the CAW study (the results are not very sensitive to this choice).
 - The “job content” of domestic auto production is based on the coefficient used in the CAW study (0.73 jobs per million dollars of motor vehicle manufacturing).
 - An aggregate elasticity of demand in the domestic market of -1 is chosen (this assumption means that a one percent change in price leads to a one percent increase in quantity demanded).

Note that this same COMPAS model was used by Industry Canada in their report entitled “Partial Equilibrium Analysis of the Impact of a Canada-Korea FTA on the Canadian Automotive Industry.” In their study, Industry Canada obtains substantially lower impacts in terms of job losses than demonstrated in this example – the highest impact scenario in the Industry Canada simulations involves 35 jobs lost. The difference between the estimated job loss in the scenario developed in this report (97) and that generated in the CAW report (526) is entirely due to taking account of the three-country vs. two-country model issue and allowing for a non-zero own price elasticity of demand in the auto market. The further differences between the CAW study and the Industry Canada study reflect different choices for particular parameters:

	CAW study	DFAIT simulation of CAW study	Industry Canada
Elasticity of substitution: domestic vs foreign	7.5	7.5	2.1 to 3.5
Elasticity of substitution across alternative foreign	n.a.	7.5	4.2 to 7
Elasticity of Supply to Domestic Market – domestic producers	n.a.	5	2.5 to 5
Elasticity of Supply to Domestic Market – Korean producers	n.a.	1000	5 to 10
Elasticity of Supply to Domestic Market – third country producers	n.a.	7	5 to 10
Aggregate elasticity of demand	n.a.	-1	-0.5 to -1.5
Value of auto sector output per job	\$1,367,158	\$1,367,158	\$1,421,939

³ Yung Y. Yang and Min Hwang, " Effects of Trade Liberalization on Domestic Prices: The Evidence From Korea, 1983-1995", January 1999.