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# Aftershocks: Quantifying the Economic Impacts of a US Border Adjustment Tax

*A major overhaul of US corporate taxation is possible that would include a border adjustment tax. Our modelling shows that such a tax would be highly distortionary and negative for the United States and its trading partners.*

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## THE STUDY IN BRIEF

For apparently irreconcilable domestic political reasons, the United States is an outlier among economically advanced countries as the only one that does not have a value-added tax (VAT), which is the conventional and World Trade Organization-sanctioned approach to applying an economically efficient and non-trade-distorting consumption tax. Under a VAT regime, the same tax is applied on imports as on domestic purchases. This means that all goods sold in a country are subject to the same amount of tax regardless of country of origin. At the same time, all VAT paid on intermediate inputs – whether domestically sourced or imported – in producing a good is refunded for goods that are exported, which provides a level playing field for exports with products from other sources since they all face the same sales taxes applicable in the destination country, with no consumption- or sales-tax burden from their country of origin.

The perception that the lack of a VAT has put US trading firms at a disadvantage in international trade has led to attempts to construct an alternative tax that replicates in some sense the trade neutrality of a VAT. Such a “border adjustment tax” (BAT) has been promoted by Speaker of the House Paul Ryan and supported by White House trade policy adviser Peter Navarro, among others.

In simple accounting exercises that ignore the reaction of firms to the changed incentives, the BAT can be characterized as having a neutral effect on the overall balance of US trade. Critically, this finding depends on an exactly offsetting revaluation of the US dollar. This is an unlikely outcome, because, at the product- and firm-level, the BAT invites switching from imported inputs to domestic inputs, and switching from domestic sales to foreign sales, to reduce tax liabilities. Given differences across firms and products in the ability to take advantage of such switching, the BAT implies potentially significant shocks to established value chains involving US firms.

We quantify the impacts of such a BAT and demonstrate that it is trade-distorting and economically damaging to the United States and its trading partners. The BAT is not a VAT because of the trade-distorting effects at the product level, where substitution elasticities are high. The aggregate effects are negative because the disruption of imports at the product level is much more powerful than the impact of export subsidies on the decision to export.

Canada is heavily exposed to the ramifications of a BAT: the preliminary findings suggest a decline in real GDP of about 1 percent and a decline in Canadian prices of about 2 percent, as Canadian firms reduce prices to limit the erosion of their exports to the United States.

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## The United States has a hate affair with taxes. As one result, it is the only industrialized country without a value-added tax (VAT).

It is not that the United States does not tax consumption – 46 states effectively have sales taxes. However, a federal initiative in this space would meet with insuperable political problems since it would involve selling the public and the states on the benefits of a tax. Canada faced similar problems in implementing a harmonized federal-provincial value-added tax (HST), but with a co-ordination problem an order of magnitude smaller and greater public acceptance of the benefits of tax-funded public services. One can only sympathize with US policymakers in this regard.

Be that as it may, any alternative tax initiative adopted by the United States must be assessed on its likely actual impacts. To this end, we evaluate a stylized version of a border adjustment tax (BAT) that has been put in play by Speaker of the US House of Representatives Paul Ryan and Ways and Means Committee chair Kevin Brady.

The BAT is part of a proposed tax package that involves the repeal of the US corporate income tax, which is currently levied at 35 percent of taxable profits and its replacement with a so-called destination-based cash-flow tax (DBCFT), levied at 20 percent for incorporated businesses and 25 percent for unincorporated businesses. Like a VAT, the BAT would incorporate border adjustments: It would tax imports and exempt exports. The DBCFT package has other features affecting investment that we do not address. For the moment, we examine the impact on international trade of the border adjustments alone; the assessment thus makes no claims to a comprehensive treatment of a possible US tax package.

Most of the commentary concerning the international trade ramifications of a BAT has been on the aggregate impact of the BAT on the US balance of trade and the value of the US dollar (see, e.g., Hufbauer and Lu 2017) and on pass-through to consumer prices (PwC 2017). As regards the balance of trade and the value of the dollar, much depends on the general equilibrium effects of a trade tax change: An initial strong import-reducing and export-expanding effect would drive up the value of the US dollar in international currency markets and thereby undermine the competitiveness of US export-oriented businesses while eroding the protection afforded by the BAT to US import-competing businesses. In the end, it could be a wash on net exports – at least in a simple accounting analysis that does not take into account firm-level responses.

This latter point is evident from a table developed by PwC (2017), which shows that the BAT raises the tax liability of a firm when imported inputs are no longer deductible and works through the implications of exchange-rate adjustment and pass-through into prices. We add in three columns to the PwC (2017) table to illustrate the implications of input-source switching and market switching. Note that these simple accounting examples do not take into account real-world implications of switching markets, including pass-through of the export subsidy into export prices to capture additional market share. We address these latter issues below in the discussion of the policy shock and modelling outcomes.

The critical feature of the plan from an international trade perspective would seem to be at the product level in terms of what would happen to firm-level decisions.

On the input-sourcing decisions, the relative prices of competing products change from the perspective of the purchasing firm. As the import-tax component of the BAT is given effect by denying deductibility of imported inputs as a business expense, a company that is currently sourcing inputs from abroad but has an option to switch to domestic sources would reduce its taxable income by switching.

The same would be true on the export component: Given a choice between an export sale and a domestic sale, the firm would face a tax liability on revenues from the domestic sale but none on the export sale, and so would choose to make the export sale. With a VAT, where the vendor is collecting a tax on the consumer, after-tax income is not affected and there is no incentive to direct the sale one way or the other for tax reasons.

As these effects materialize and the US dollar appreciates, the BAT would be anything but neutral as the ripple effects flow through globalized production networks:

- Countries with differing exposure to US trade would be impacted differentially: Terms of trade would change and there would be pervasive impacts on economic welfare across countries.
- At the firm level, different firms would have different capabilities of switching input-sourcing, meaning that there would be non-neutral impacts across firms.
- At the product level, conditions of competition in the United States would shift pervasively, with significant variation across products.
- Finally, there would also be differences across products in terms of the ability of firms to pass through higher costs to consumers. The BAT would not be neutral in that aspect, either.

The extent of the impact of the policy change on US trade in aggregate, at the product/firm/sector

level and on the US dollar is thus an intensely empirical issue.

## POLICY SHOCK AND RESULTS

The BAT is implemented in a computable general equilibrium (CGE) model that is a variant on the widely used Global Trade Analysis Project (GTAP) model, modified to introduce a foreign-owned representative firm in each GTAP region-sector.

In the GTAP production framework, firms produce goods with factor inputs (land, capital, skilled and unskilled labour), which substitute against each other depending on factor prices; and with intermediate inputs that are based on input-output table coefficients and do not substitute against primary factors. The intermediate factors are sourced from domestic representative firms and from imports. Importantly, the domestic and imported intermediates substitute for one another according to price. This allows the imposition of the 20-percent tax on imported intermediates to illustrate the input-source-switching effect of the BAT. This appears to be a reasonable approach given that the firm's decision to purchase the imported intermediate generates a tax liability relative to the decision to source domestically.

As regards the export component of the BAT, we address this issue by introducing an export subsidy equal to 20 percent of the capital rental return in each sector, which is a proxy for profits, generated by the value of exports in that sector. (To illustrate the export subsidy calculation, see Table 2.) This construction captures the static impact of reducing the overall tax on US corporations but does not capture the incentive effect to redirect production from the domestic market to export markets. This latter effect is difficult to capture, however. For a US firm to expand its export sales by virtue of the lowered tax liability, it would have to pass through the tax cut in the form of lower export prices. This would put it technically into a position of dumping, unless the firm also lowered its domestic price.

**Table 1: Example of the BAT Import Component**

Impact on Hypothetical Corporation	Tax with no Border Adjustment	Tax with Border Adjustment					
		No Economic Response	Input Source Switching	Market Switching	Input Switching and Market Switching	25% Dollar Appreciation	25% Domestic Price Level Increase
		<i>(US \$)</i>					
<b>Revenues</b>							
Domestic Sales	1,000	1,000	1,000	500	500	1,000	1,000
Foreign Sales	0	0	0	500	500	0	0
<b>Costs</b>							
Domestic Inputs	300	300	600	300	600	300	375
Foreign Inputs	300	300	0	300	0	240	300
<b>Pre-tax income</b>	400	400	400	400	400	460	575
<b>Taxable income</b>	400	700	400	200	-100	700	875
<b>Tax @ 20%</b>	80	140	80	40	-40	140	175
<b>After-tax income</b>	320	260	320	360	440	320	400
<b>At pre-reform prices</b>							320

Source: PwC (2017); input source switching and market switching columns added by authors.

**Table 2: Example of the Export Subsidy Construction-Hypothetical Amounts**

Sector Production	Sector Capital Rental Return	Aggregate Sectoral Rate of Return	Exports	Export Subsidy
100	10	10%	20	= 10% * 20 = 2

Source: Authors' calculations.

Not all firms will be in a position to use market switching to lower tax liability. We leave this issue for future analysis.

The database for the simulations is the GTAP V9 dataset with a base year of 2011. For the simulations, the database is extrapolated to 2022

using GTAP dynamic tools and drawing on the International Monetary Fund's World Economic Outlook database (October, 2016) for guidance as to growth rates for the projection period. Sectoral and regional aggregations are shown in the reporting tables. The shock is implemented in 2017;

the results are based on the full effect of the impacts once equilibrium has been restored in 2022.

### US Macroeconomic Impacts

Table 3 shows the main economic indicators for the United States. The negative impact of the tax on imports dominates the macro-level impacts, overwhelming the effects of the export subsidy. Strong terms-of-trade gains for the United States boost nominal GDP, but real GDP and welfare decline due to loss of competitiveness and higher consumer prices. Trade is hardly left neutral as optimistic assessments of a BAT suggest might happen: The US trade balance improves and US two-way trade declines sharply. The impact on US exports in real terms dominates the reduction of imports in real terms.

### Global Macroeconomic Impacts

The non-neutral impacts of the BAT at the product level mean that there is a cascading, almost random impact on third parties, depending on how the BAT-driven restructuring of US supply chains reverberates throughout the world. Key points that emerge from review of the international impacts are that major US trade partners – the European Union and China – are projected to have significant negative welfare impacts. And of course, the closest US trading partners – Canada and Mexico – experience disproportionately large negative impacts relative to the size of their economies.

### Sectoral Impacts on the United States

#### *The Import Component*

The behavioural response of firms to the non-deductibility of imported inputs reduces imports and exports across the board. Accordingly, it de-integrates the United States from the global economy. The impact on output is negative in overall terms and, not surprisingly, output falls

in most sectors. A few sectors do, however, come out ahead, with electronic equipment and metal products standing out as benefiting from large reductions in two-way trade. The major sectors most negatively impacted are transport equipment, automotive and the chemicals, rubber and plastics complex. As can be seen from Table 5, the effects are likely to be highly non-neutral across sectors.

#### *The Export Component*

As noted in the discussion of the policy shock, the behavioural response of US firms to the export subsidy is difficult to characterize and calibrate in a modelling context. For the moment, we restrict ourselves to reflecting the improvement in US corporations' rates of return from the elimination of tax on export earnings (Table 6). The behavioural response is thus limited to the general response of production decisions to improved earnings and does not actively incorporate the destination-switching decision (export vs. domestic markets) and the full set of pricing decisions that such a decision would entail.

Table 7 provides the combined effects of the import tax and export subsidy components. The main takeaway point is that a simple theoretical assessment of a balanced import tax and export subsidy as being neutral is shown to be invalid once the specifics of the implementation and the reaction of agents are factored into the analysis.

### Impacts on Canada

Canada's exports to the United States are heavily weighted to intermediate inputs, including raw materials, basic fabricated materials and manufactured inputs such as auto parts that go into value chains sponsored by US multinationals. The import component of a BAT thus affects Canada heavily, once behavioural reactions of economic agents are factored into the impact analysis. Terms-of-trade effects again dominate, with Canada

**Table 3: Impacts of the BAT on the United States**

	Import Tax	Export Subsidy	Total
<b>Major Indicators</b>			
Economic Welfare (USD millions)	-101,238	34,315	-66,923
Economic Welfare (% change)	-0.72	0.24	-0.47
GDP Value Change (USD millions)	495,991	216,043	712,034
GDP Value Change (%)	3.06	1.33	4.39
GDP Volume (% change)	-1.54	0.26	-1.28
GDP Deflator (% change)	4.77	1.07	5.84
CPI (% change)	3.63	1.08	4.71
<b>Components of Real GDP</b>			
Consumption (% change)	-0.73	0.27	-0.45
Government Expenditure (% change)	-0.52	0.12	-0.40
Investment (% change)	-3.95	0.54	-3.41
Real Exports of Goods and Services (% change)	-21.02	2.51	-18.52
Real Imports of Goods and Services (% change)	-15.75	2.33	-13.43
<b>Trade Account</b>			
Total Exports of Goods and Services (USD millions)	-408,424	42,152	-366,272
Total Imports of Goods and Services (USD millions)	-466,961	60,138	-406,822
Trade Balance (USD millions)	58,537	-17,987	40,550
Terms of Trade (% change)	3.63	1.08	4.71
<b>Factor Markets</b>			
Capital Stock (% change)	-1.30	0.19	-1.12
Real Wage of Unskilled Labour (% change)	-1.23	0.19	-1.03
Real Wage of Skilled Labour (% change)	-0.98	0.20	-0.78

Source: Authors' calculations.



Table 4: Impacts of the BAT on Third Parties

	Real GDP (percent change)			Welfare (US\$ millions)		
	Import Tax	Export Subsidy	Total	Import Tax	Export Subsidy	Total
USA	-1.539	0.262	-1.277	-101,238	34,315	-66,923
Canada	-0.979	0.112	-0.867	-36,739	4,058	-32,681
Mexico	-1.295	0.142	-1.153	-34,468	3,925	-30,542
<b>Americas</b>						
Chile	-0.225	-0.017	-0.242	-2,192	22	-2,170
Colombia	-0.086	-0.021	-0.107	-1,263	-18	-1,281
Peru	-0.078	-0.001	-0.079	-819	30	-789
Central America	-1.689	0.124	-1.565	-3,489	309	-3,180
Other South America	0.002	-0.040	-0.039	-82	-42	-124
<b>Europe</b>						
EU28	-0.025	-0.011	-0.036	-26,107	60	-26,046
Switzerland	-0.042	-0.008	-0.049	-1,541	-57	-1,598
Norway	0.038	-0.023	0.015	-774	-156	-930
Other EFTA	-0.216	-0.002	-0.218	-95	7	-88
<b>West Asia</b>						
Israel	-0.331	0.050	-0.280	-1,909	284	-1,625
Pakistan	0.281	-0.069	0.212	556	-129	427
Turkey	0.267	-0.088	0.179	1,901	-899	1,002
<b>East Asia</b>						
China	-0.029	-0.007	-0.036	-36,003	-3,357	-39,360
Hong Kong	-0.032	-0.001	-0.032	-1,287	175	-1,111
Taiwan	-0.184	0.016	-0.168	-3,590	288	-3,302
Japan	0.032	-0.016	0.016	-4,323	55	-4,267
India	0.064	-0.037	0.027	-3,014	-1,148	-4,163
Korea	-0.047	0.007	-0.041	-4,962	498	-4,465
Indonesia	0.162	-0.049	0.113	69	-634	-564
Malaysia	-0.194	-0.012	-0.205	-2,326	-20	-2,346
Philippines	0.029	-0.038	-0.009	-478	-39	-517
Singapore	-0.315	0.021	-0.294	-3,484	199	-3,285
Thailand	0.045	-0.033	0.013	-810	-80	-890
Vietnam	-0.271	0.050	-0.221	-1,007	200	-807
Other ASEAN	0.032	0.001	0.033	-91	13	-78

**Table 4: Continued**

	Real GDP			Welfare		
	Import Tax	Export Subsidy	Total	Import Tax	Export Subsidy	Total
<b>Oceania</b>						
Australia	0.020	-0.025	-0.005	-2,327	-495	-2,822
New Zealand	0.040	-0.036	0.004	-277	-54	-331
<b>Africa</b>						
Kenya	0.103	-0.109	-0.006	-42	-43	-85
Rwanda	0.116	-0.073	0.043	-3	-8	-11
Tanzania	0.079	-0.010	0.069	0	-1	-1
Uganda	0.190	-0.103	0.087	14	-31	-17
Ethiopia	0.054	-0.039	0.015	-11	-25	-35
Mozambique	0.163	-0.048	0.115	2	-12	-10
Rest of East Africa	0.152	-0.042	0.110	40	-41	-2
ACU	0.101	-0.051	0.051	-302	-251	-553
Other TFTA	0.009	-0.027	-0.018	-1,319	2	-1,317
ROW	0.070	-0.032	0.038	-16,623	-3,561	-20,184

Source: Authors' calculations.

absorbing a good portion of the tariff while still feeling a significant shift in US firms' sourcing away from imports to domestic product. Overall, the BAT would reduce Canada's real GDP by almost one percentage point and Canadian prices by about two percentage points.

The sectoral impacts on Canada are set out in Table 9. The main takeaway from these impacts is that the BAT would tend to reduce bilateral trade in both directions. This would ease pressure on Canada's import-competing industries and negatively affect Canada's export-oriented industries. Generally, this would be regressive for Canada from an industrial-policy perspective.

## CONCLUSIONS

A major overhaul of US corporate taxation may be in the works under President Donald Trump's

administration. One possibility is a destination-based cash-flow tax (DBCFT) that incorporates border adjustments, taxing imports and exempting exports. In simple accounting exercises, such a framework may seem to be neutral in terms of the aggregate trade impacts on the United States and its partners, while addressing a number of issues unrelated to trade but rather to international gaming of the US tax system by its own multinational corporations. In this working paper, we provide preliminary results that show, once the behavioural reactions of firms are taken into account, the border adjustment tax portion of the reform is not neutral at the product level; in fact, it is highly distortionary and negative for the United States and its trading partners.

Table 5: US Sectoral Impacts: Import Tax

US Sectoral Impacts	Total Exports (US\$ millions)	Total Imports (US\$ millions)	Total Exports (percent)	Total Imports (percent)	Share in Value Added (percent)	Value Added (percent)
Rice	-309	-24	-11.4	-2.8	0.018	-4.88
Wheat & Cereals	-1,689	-522	-4.8	-27.8	0.310	-2.85
Fruit & Vegetables	-572	-1,561	-4.3	-6.8	0.261	0.14
Oil Seeds & Vegetable Oils	-2,748	-1,916	-7.0	-20.1	0.173	-2.97
Sugar	-73	-654	-20.8	-17.6	0.033	3.56
Other Farming	-1,950	-2,567	-8.2	-13.8	0.296	-1.35
Dairy	-945	-410	-17.4	-15.9	0.219	-1.48
Forestry	-299	-127	-8.5	-20.2	0.077	-1.24
Fishing	-61	-276	-5.0	-9.7	0.035	0.06
Fossil Fuels	-63,833	-76,713	-36.3	-17.1	1.607	-1.65
Mineral Products	-2,292	-6,249	-7.6	-18.2	0.694	-0.25
Beef	-1,063	-564	-13.1	-12.6	0.203	-1.58
Pork & Poultry	-1,983	-27	-16.2	-1.0	0.166	-2.86
Food Products	-3,374	-1,713	-9.9	-3.4	0.931	-1.75
Beverages & Tobacco	-684	-982	-5.5	-4.4	0.352	-1.48
Textiles & Apparel	-4,466	-3,035	-22.6	-2.2	0.608	-1.81
Leather Products	-697	656	-26.1	1.7	0.040	-7.92
Wood Products	-9,518	-18,373	-16.2	-20.2	2.477	-0.41
Chemicals, Rubber & Plastics	-62,225	-47,319	-19.3	-16.4	2.757	-3.27
Metal Products	-28,964	-45,190	-22.8	-26.6	1.945	0.96
Automotive	-23,894	-24,685	-16.4	-10.4	0.976	-3.27
Transport Equipment	-24,334	-15,971	-22.9	-27.5	0.817	-5.63
Electronic Equipment	-35,154	-57,930	-33.0	-18.3	0.490	4.08
Machinery & Equipment	-81,382	-99,729	-22.0	-24.9	3.730	-0.72
Other Manufacturing	-5,802	1,248	-20.6	1.3	1.470	-2.56
Other Services	-8,785	-7,968	-8.2	-16.6	31.759	-0.62
Construction	-988	-959	-9.7	-24.8	6.516	-3.11
Trade	-2,489	307	-9.7	1.1	12.788	-1.14
Transport	-12,059	-15,450	-14.1	-15.1	2.848	-1.90
Communications	-1,634	-2,251	-10.2	-16.2	2.102	-0.98
Financial Services	-7,319	-11,578	-8.2	-13.5	9.646	-0.67
Business Services	-11,729	-23,742	-9.3	-21.6	10.382	-0.69
Recreational Services	-5,110	-687	-10.5	-4.7	3.277	-1.89

Source: Authors' calculations.

**Table 6: US Sectoral Impacts from the BAT Export Subsidy Component**

US Sectoral Impacts	Total Exports (US\$ millions)	Total Imports (US\$ millions)	Total Exports (percent)	Total Imports (percent)	Share in Value Added (percent)	Value Added (percent)
Rice	39	31	1.437	3.646	0.018	0.359
Wheat & Cereals	509	59	1.434	3.137	0.310	0.948
Fruit & Vegetables	267	431	1.986	1.881	0.261	0.123
Oil Seeds & Vegetable Oils	384	265	0.980	2.773	0.173	0.731
Sugar	2	57	0.626	1.524	0.033	-0.380
Other Farming	194	358	0.815	1.920	0.296	-0.194
Dairy	33	100	0.603	3.876	0.219	0.082
Forestry	196	20	5.553	3.099	0.077	0.943
Fishing	16	37	1.345	1.312	0.035	0.155
Fossil Fuels	4,967	6,490	2.826	1.446	1.607	0.111
Mineral Products	334	585	1.107	1.707	0.694	0.216
Beef	-133	163	-1.634	3.639	0.203	-0.207
Pork & Poultry	-364	118	-2.984	4.290	0.166	-0.408
Food Products	718	1,082	2.102	2.154	0.931	0.208
Beverages & Tobacco	206	274	1.642	1.222	0.352	0.402
Textiles & Apparel	1	3,452	0.004	2.494	0.608	-1.293
Leather Products	61	574	2.268	1.511	0.040	-1.723
Wood Products	1,164	2,367	1.978	2.605	2.477	0.107
Chemicals, Rubber & Plastics	13,145	7,855	4.076	2.719	2.757	0.938
Metal Products	418	3,313	0.329	1.947	1.945	-0.587
Automotive	-643	4,525	-0.442	1.902	0.976	-0.439
Transport Equipment	150	1,469	0.141	2.531	0.817	-0.241
Electronic Equipment	-1,057	5,775	-0.992	1.826	0.490	-1.692
Machinery & Equipment	7,188	10,373	1.947	2.595	3.730	-0.004
Other Manufacturing	3,785	2,956	13.455	3.105	1.470	0.550
Other Services	6,188	725	5.756	1.507	31.759	0.254
Construction	-102	79	-1.000	2.048	6.516	0.441
Trade	519	668	2.013	2.365	12.788	0.150
Transport	1,483	1,538	1.729	1.504	2.848	0.204
Communications	1,419	301	8.886	2.162	2.102	0.465
Financial Services	356	1,783	0.401	2.087	9.646	0.130
Business Services	563	2,009	0.448	1.830	10.382	0.123
Recreational Services	147	307	0.301	2.093	3.277	0.248

Source: Authors' calculations.

Table 7: US Sectoral Impacts from the BAT: Import Tax and Export Subsidy Combined

US Sectoral Impacts	Total Exports (US\$ millions)	Total Imports (US\$ millions)	Total Exports (percent)	Total Imports (percent)	Share in Value Added (percent)	Value Added (percent)
Rice	-270	7	-9.99	0.80	0.018	-4.52
Wheat & Cereals	-1,180	-464	-3.33	-24.68	0.310	-1.90
Fruit & Vegetables	-305	-1,129	-2.27	-4.92	0.261	0.26
Oil Seeds & Vegetable Oils	-2,364	-1,651	-6.04	-17.30	0.173	-2.24
Sugar	-71	-598	-20.17	-16.09	0.033	3.18
Other Farming	-1,756	-2,209	-7.38	-11.84	0.296	-1.54
Dairy	-913	-310	-16.85	-11.97	0.219	-1.40
Forestry	-103	-108	-2.93	-17.09	0.077	-0.30
Fishing	-44	-238	-3.62	-8.40	0.035	0.21
Fossil Fuels	-58,866	-70,223	-33.50	-15.64	1.607	-1.54
Mineral Products	-1,957	-5,664	-6.48	-16.53	0.694	-0.04
Beef	-1,195	-401	-14.71	-8.98	0.203	-1.79
Pork & Poultry	-2,347	91	-19.22	3.31	0.166	-3.27
Food Products	-2,657	-631	-7.78	-1.25	0.931	-1.54
Beverages & Tobacco	-478	-708	-3.81	-3.15	0.352	-1.08
Textiles & Apparel	-4,465	417	-22.64	0.30	0.608	-3.10
Leather Products	-636	1,230	-23.84	3.24	0.040	-9.64
Wood Products	-8,353	-16,006	-14.19	-17.62	2.477	-0.31
Chemicals, Rubber & Plastics	-49,080	-39,463	-15.22	-13.66	2.757	-2.33
Metal Products	-28,546	-41,877	-22.49	-24.61	1.945	0.37
Automotive	-24,536	-20,159	-16.87	-8.47	0.976	-3.71
Transport Equipment	-24,184	-14,502	-22.75	-25.00	0.817	-5.88
Electronic Equipment	-36,210	-52,155	-34.00	-16.49	0.490	2.39
Machinery & Equipment	-74,193	-89,357	-20.09	-22.35	3.730	-0.73
Other Manufacturing	-2,017	4,204	-7.17	4.42	1.470	-2.01
Other Services	-2,598	-7,243	-2.42	-15.05	31.759	-0.36
Construction	-1,090	-880	-10.73	-22.75	6.516	-2.67
Trade	-1,971	975	-7.65	3.45	12.788	-0.99
Transport	-10,576	-13,912	-12.33	-13.60	2.848	-1.70
Communications	-215	-1,951	-1.35	-14.03	2.102	-0.51
Financial Services	-6,963	-9,794	-7.84	-11.46	9.646	-0.55
Business Services	-11,166	-21,733	-8.88	-19.80	10.382	-0.57
Recreational Services	-4,963	-381	-10.16	-2.59	3.277	-1.64

Source: Authors' calculations.

**Table 8: Impacts of the BAT on Canada**

	Import Tax	Export Subsidy	Total
<b>Major Indicators</b>			
Economic Welfare (USD millions)	-36,739	4,058	-32,681
Economic Welfare (% change)	-2.07	0.23	-1.85
GDP Value Change (USD millions)	-75,111	1,889	-73,221
GDP Value Change (%)	-3.72	0.09	-3.63
GDP Volume (% change)	-0.98	0.11	-0.87
GDP Deflator (% change)	-2.83	-0.01	-2.84
CPI (% change)	-1.89	-0.14	-2.03
<b>Components of Real GDP</b>			
Consumption (% change)	-2.14	0.26	-1.88
Government Expenditure (% change)	-1.43	0.18	-1.25
Investment (% change)	-1.80	0.14	-1.66
Real Exports of Goods and Services (% change)	-2.57	0.39	-2.18
Real Imports of Goods and Services (% change)	-5.88	0.75	-5.13
<b>Trade Account</b>			
Total Exports of Goods and Services (USD millions)	-22,624	1,429	-21,195
Total Imports of Goods and Services (USD millions)	-23,853	1,400	-22,453
Trade Balance (USD millions)	961	34	995
Terms of Trade (% change)	-3.31	0.41	-2.90
<b>Factor Markets</b>			
Capital Stock (% change)	-0.51	0.04	-0.47
Real Wage of Unskilled Labour (% change)	-0.99	0.12	-0.87
Real Wage of Skilled Labour (% change)	-0.98	0.12	-0.86

Source: Authors' calculations.

Table 9: Impacts of the BAT on Canada: Import and Export Effects Combined

Canada Sectoral Impacts	Bilateral Exports (US\$ millions)	Bilateral Imports (US\$ millions)	Bilateral Exports (percent)	Bilateral Imports (percent)	Total Exports (US\$ millions)	Total Imports (US\$ millions)	Total Exports (percent)	Total Imports (percent)	Share in Value Added (percent)	Value Added (percent)
Rice	0	-13	0.4	-6.6	0	0	0.2	0.1	0.001	0.30
Wheat & Cereals	-334	-12	-24.5	-2.7	-3	-11	0.0	-2.3	0.327	1.16
Fruit & Vegetables	-78	-86	-5.7	-1.9	-41	-39	-1.0	-0.6	0.134	0.63
Oil Seeds & Vegetable Oils	-601	-75	-15.9	-5.0	-149	-66	-1.2	-3.6	0.402	0.65
Sugar	-34	-7	-16.2	-14.1	-30	-19	-9.1	-2.2	0.039	-1.10
Other Farming	-211	-57	-9.9	-6.6	-128	-42	-3.6	-1.7	0.287	0.80
Dairy	-7	-41	-6.6	-16.4	19	-53	4.7	-8.0	0.372	-0.43
Forestry	-21	-16	-15.6	-3.9	18	-18	1.1	-3.9	0.444	0.02
Fishing	-82	-20	-8.0	-3.2	-76	-20	-5.1	-2.6	0.123	-0.23
Fossil Fuels	-6,095	-3,842	-8.2	-20.1	-4,607	-2,423	-5.5	-6.6	5.657	-0.11
Mineral Products	-606	-480	-15.7	-6.2	-402	-555	-1.8	-4.1	1.473	0.11
Beef	-61	-138	-5.1	-12.8	114	-122	4.9	-8.4	0.336	0.69
Pork & Poultry	65	-211	5.5	-12.3	308	-151	8.8	-7.3	0.187	6.15
Food Products	2	-591	0.0	-6.2	87	-517	0.7	-3.6	0.966	0.60
Beverages & Tobacco	-23	-118	-1.9	-4.7	-18	-187	-1.1	-3.3	0.531	-0.64
Textiles & Apparel	98	-382	5.1	-14.1	144	-582	5.5	-3.9	0.430	2.00
Leather Products	9	-19	9.0	-12.2	13	-98	8.0	-3.6	0.029	2.51
Wood Products	-2,971	-1,505	-14.8	-11.0	-1,814	-1,303	-4.9	-6.1	2.555	-0.30
Chemicals, Rubber & Plastics	-4,196	-4,188	-10.4	-10.1	-2,897	-2,510	-4.8	-3.9	2.342	0.35
Metal Products	-7,078	-3,355	-21.7	-14.8	-4,705	-2,369	-7.1	-4.7	2.419	-1.59
Automotive	-4,898	-6,280	-8.2	-11.8	-4,524	-2,749	-6.8	-3.7	1.543	-1.98
Transport Equipment	-1,965	-1,106	-21.0	-14.6	-766	-499	-4.1	-3.8	0.601	-0.26
Electronic Equipment	-482	-1,060	-12.6	-17.6	-119	-728	-1.5	-3.0	0.467	1.58

**Table 9: Continued**

	Bilateral Exports (US\$ millions)	Bilateral Imports (US\$ millions)	Bilateral Exports (percent)	Bilateral Imports (percent)	Total Exports (US\$ millions)	Total Imports (US\$ millions)	Total Exports (percent)	Total Imports (percent)	Share in Value Added (percent)	Value Added (percent)
Machinery & Equipment	-4,322	-6,371	-18.7	-12.9	-2,867	-2,757	-7.4	-3.4	1.766	0.10
Other Manufacturing	541	-134	11.0	-6.0	722	-384	9.7	-5.3	2.461	0.37
Other Services	-299	-361	-10.7	-4.9	-70	-504	-1.0	-5.0	27.957	-1.18
Construction	-1	-2	-19.8	-10.4	26	-28	4.2	-4.3	7.308	-1.53
Trade	148	-201	8.1	-7.9	341	-377	5.9	-5.2	13.653	-0.96
Transport	-393	-511	-10.7	-10.8	80	-805	0.5	-4.1	2.530	0.06
Communications	-97	-34	-10.6	-3.6	3	-170	0.1	-4.5	2.859	-0.68
Financial Services	-495	-631	-7.7	-8.2	-187	-874	-1.6	-5.2	5.878	-0.51
Business Services	-1,191	-346	-16.8	-9.1	-37	-1,096	-0.1	-4.6	11.983	-0.44
Recreational Services	5	-426	0.3	-8.8	367	-398	4.6	-4.3	1.943	0.12

Source: Authors' calculations.



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## REFERENCES

- Hufbauer, Gary Clyde, and Zhiyao (Lucy) Lu. 2017. "Border Tax Adjustments: Assessing Risks and Rewards." PB 17-3. Peterson Institute for International Economic. January.
- PwC. 2017. "The House Republican Blueprint: A destination-based cash-flow tax." January.

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