A Review of Canadian Rail Activity in the North American Free Trade Agreement Era

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A brief history of trade policy in Canada

Canada is – and always has been – a trading nation. Yet the pathway to becoming a trading nation from a trade policy perspective has varied and the economic benefits have been mixed. In fact, over the last 150 years Canada has evolved from a protectionist-based trade policy platform to a more progressive free trade era. With time, the principal driving force for multi-lateral trade liberalization has been anchored in a philosophy that access to larger markets will aid productivity growth and lower import prices for consumers and producers.

Launched in 1879, the Macdonald government's National Policy marks the beginning of Canada's protectionist-based trade policy era. This policy, which had a lasting effect until the end of the Second World War, introduced several import tariffs designed to strengthen Canadian industry, stimulate trade across the country, and collect the revenues necessary to develop a national railway system. As Alexander and Keay note, the average weighted tariff rose immediately from 14 to 21 per cent, and reached a peak of 32 per cent in 1891[i]. While the literature is limited in terms of its ability to accurately quantify the effects of the National Policy to the Canadian economy, economists suggest that it successfully stimulated industrial capacity, increased revenues for Government, and was generally a catalyst for improving employment. However, it is also believed that the costs for foreign and domestic goods were much higher than necessary, and overall the tariff-based policy position resulted in a net welfare loss for Canada and a weakening of its manufacturing sector[ii].

Canadian trade policy began to evolve shortly after the Second World War when the country signed the General Agreement on Tariffs and Trade (GATT) in 1948. With twenty-three country signatory parties, this historical agreement sought to avoid another Great Depression and mitigate the effects of a slumping post-war economy by reducing or eliminating trade tariffs, quotas and subsidies[iii]. For Canada and the United States (U.S.), GATT became the basic agreement that governed the trade relationship between them.

However, GATT itself was not substantive enough to prevent the near collapse of the Canadian automotive industry in the late 1950s, which prompted the Government in 1960 to establish a Royal Commission on the Automotive Industry to assess the condition of the industry and prospects for its economic longevity. Led by Dean Vincent Bladen from the University of Toronto, the Commission provided a suite of recommendations such as the removal of the existing excise tax on automobiles, duty-free provisions for imported products that meet specific content requirements, and the introduction of an import tax on vehicles manufactured in the United Kingdom[iv]. In response to the Commission's report the Government adopted an export duty rebate program in 1963 for key automotive components used in vehicle production[v].

[1] Presented at the 53rd Annual Meetings of the Canadian Transportation Research Forum, June 3-6, 2018 at Gatineau, Quebec.

Welcomed by large auto manufacturers, independent American auto parts manufacturers pleaded that the export duty program was a subsidy to Canadian manufacturers and was causing them to lose contracts in the U.S.. In search of a remedy, Canada and the U.S. signed the Auto Pact in 1965. At its time the Auto Pact was believed to be the most innovative and transformative agreement in the world, creating a continental market for the auto manufacturing industry by stimulating labour productivity and lowering producer costs for automobiles. For Canada, the agreement was a success, increasing auto production from 7.1 per cent in 1965 to 11.2 per cent in 1971, and a shift from an auto-trade deficit to a trade surplus[vi]. It also provided the impetus to liberalize trade from sector to country-specific agreements.

A period of stagnate economic growth from the mid-1960s to the 1980s prompted the Canadian government to review its trade policies and identify opportunities for propensity. In fact, real Gross Domestic Product (GDP) growth over the period began to erode from an annualized growth rate of 6.04 per cent (1961 to 1970) to 4.34 per cent (1971 to 1980), 3.14 per cent (1981 to 1990)[vii]. Through an Order in Council, the Government established the Royal Commission on the Economic Union and Development Prospects for Canada in 1982, directing it to investigate and report on "the long-term economic potential, prospects and challenges facing the Canadian federation and its respective regions, as well as the implications that such prospects and challenges have for Canada's economic and governmental institutions, and for the management of Canada's economic affairs.[viii]"

Chaired by the Honourable Donald S. Macdonald, the Commission completed a monumental and exhaustive piece of work that ultimately recommended that Canada should pursue free trade with the U.S. to secure market access and growth opportunities for Canadian industry. The report was fully embraced by the Mulroney administration and by 1989 a Free Trade Agreement (FTA) between Canada and the U.S. came into effect[ix]. At its time the FTA was the most comprehensive trade agreement in the world with provisions to remove all tariffs between the two countries by 1998 and establish a binding bi-national panel to resolve disputes arising from trade between each country.

In parallel to the FTA, the Mexican government sought remedies to stimulate economic development through trade liberalization, joining the GATT in 1986 and expressing an interest to develop a bilateral FTA with the U.S.[x]. Sensing an economic opportunity for Canadians, while recognizing a potential loss of the Mexican market to the U.S., Canada pushed for a continental FTA that eventually resulted in the North American Free Trade Agreement (NAFTA). Signed in 1993, the key provisions of the agreement included tariff and non-tariff trade liberalization, rules of origin, services trade, foreign investment, intellectual property rights protection, government procurement and dispute resolution[xi]. Ultimately NAFTA created the largest marketplace in the world, providing Canada and the U.S. with increased access to Mexico, while opening up the U.S. to increased imports from Mexico and Canada.

Post NAFTA successive governments have collectively deepened Canada's bilateral relationships through modern trade agreements in Europe and emerging economies throughout Asia. Recent efforts have translated into the Canada-Korea Free Trade Agreement (2015), Canada-European Union Comprehensive Economic and Trade Agreement (2016) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (2017). Moreover, Government is currently pursuing exploratory talks with China and regional groupings such as the Pacific Alliance (Chile, Columbia, Mexico and Peru), MERCOSUR (Argentina, Brazil, Paraguay and Uruguay) and the Association of Southeast Asian Nations[xii]. Currently Canada has 14 FTAs in force throughout the world[xiii].

The pace of trade agreements under the modern era posits that Canadian Governments can pursue trade negotiations with relative ease. However, the literature indicates that the objective of trade agreements can vary with some designed to achieve mutual economic benefits and others more focused on partisan politics[xiv]. The renegotiation of NAFTA would appear to be case and point, with the Canadian Government stating that the agreement should be modernized to reflect 21st century realities, and as a result, ensure that the benefits of trade are shared more broadly and with more people[xv]. Conversely the U.S. Government is more direct underscoring that their President "believes that NAFTA has not been a good deal for many American workers and businesses" and that if their negotiation objectives are achieved, the U.S. will obtain "more open, equitable, secure, and reciprocal market access"[xvi].

Partisan politics aside, NAFTA has supported the creation of inter-connected supply chains that enable the trade of goods across North America and to the rest of the world. As part of these supply chains, privately-owned freight railroads connect and serve nearly every industrial, wholesale, retail and resource-based sector of the economy, offering a distinct perspective on how trade powers our economy. Yet as the negotiations continue over the balance of this year, these respective supply chains, especially those relevant to transportation, will rarely be a principle point of discussion throughout the negotiation process. As a result the role that railways play in facilitating trade will remain largely misunderstood.

Overview of Paper and Methodology

This paper provides an overview of how railways enable trade opportunities for Canadians. It focusses on the trade relationship between Canada and the U.S. and includes a comprehensive summary of the role Canadian railways play in facilitating between the two countries. In response to the numerous concerns associated with the potential decertification of NAFTA, a hypothetical model has been created to characterize the potential impacts to traffic and railway revenues.

Three primary sources of data were analyzed to characterize trade flows between Canada and the U.S. and transborder rail activity. The sources include: i) Industry Canada's Trade Data Online database, which includes information about the origin and destination of exports and imports for ninety-nine commodity groupings defined by World Customs Organization's Harmonized Commodity Item Description and Coding System; ii) U.S. Department of Transportation's Transborder Freight Database which provides information about transborder freight movements at a province-state level by primary mode of transportation; and iii) Statistics Canada's economic account tables for GDP. Supplementary information was obtained from railway annual reports and investor factbooks, and the Bank of Canada for price indices and foreign exchange rates. The value rather than volume of goods has been used to characterize trade flows and commodities throughout this report, and all monetary values have been adjusted to 2017.

Information was collected and aggregated into sixteen commodity groupings, seven Canadian regions (Maritimes, Quebec, Ontario, Prairies, BC, North, and Other/Unknown), and nine regions using the Bureau of Economic Analysis' (BEA) groupings for U.S. States (New England, Mideast, Great Lakes, Plains, Southeast, Southwest, Rocky Mountain, Far West, Other/Unknown). An additional Other/Unknown region was created for origin-destination data that was not allocated to a defined Canadian or U.S. region.

Trade profiles were developed for each Canadian region to help characterize the flow of goods pre (i.e. 1990-1993) and post (i.e. 2014-2017) NAFTA's implementation. The later period is the basis for the decertification model that estimates the potential decrease in railway revenues resulting from NAFTA's decertification. The model calculates the regional impact of a decrease of trade for a range of shocks from

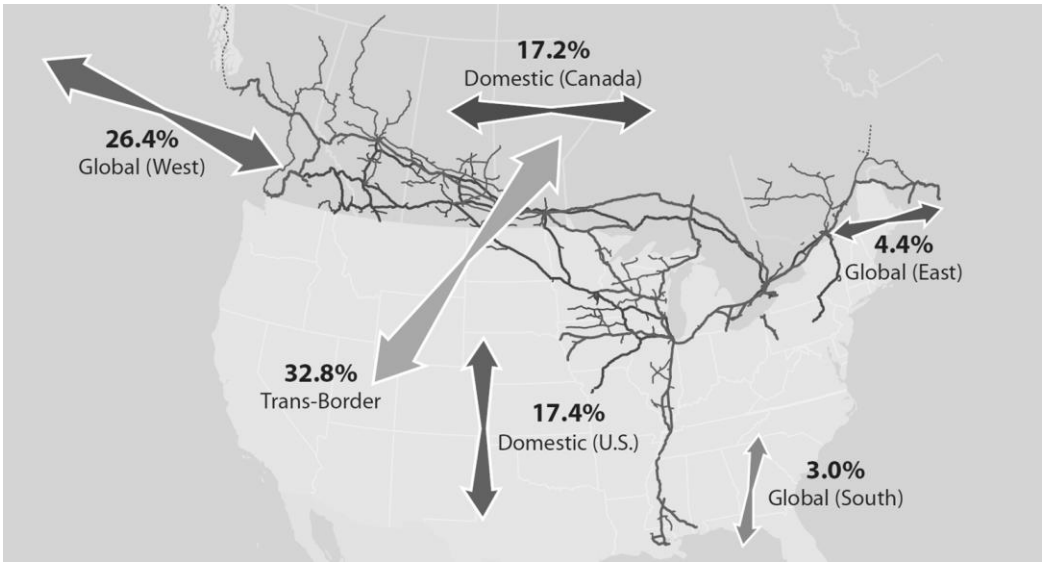
5 to 15 per cent. While this model assumes a uniformly distributed decrease in trade, a more precise model has been developed to evaluate shocks to regional trade correlated to a decrease in trans-border rail activity for steel and auto parts and automobiles.

International Trade Profile for Canadian Railways

Canada's freight railways have played an integral role in the country's economic development for more than 150 years. Without railways, Canadian industry would be challenged to compete in the global economy as the fully do today. Conversely, railways depend on trade as a principal driver to create a demand that necessitates their services.

In 2015, more than 65 per cent of all railway revenues could be attributed to trade-related traffic, of which the majority of these revenues flow between Canada and the U.S. (Figure 1). In terms of tonnage, approximately 75 per cent of Canadian originated traffic is exported to the U.S. and other international destinations[xvii]. With respect to container traffic carried by Class I railways, nearly 71 per cent is moved for trade purposes across North America.

Figure 1: Class I railway revenue geographic distribution



When focusing exclusively on export traffic moved by rail, railways currently move approximately 50.5 per cent of Canada's goods destined for export by volume[xviii]. Since 2002, rail traffic destined for export increased by 27.5 per cent (from 139.6 million (M) metric tonnes (MT) in 2002 to 177.9 M MT in 2016), highlighting the critical role railways play in moving Canadian commodities to North American and global markets[xix]. This growth has been largely driven by agriculture and food, petroleum, miscellaneous manufactured products, and grain. Comparatively less automotive and mineral products were moved over the same period. **Table 1** provides a comparison of the top five rail commodity exports in 2002 and 2016, while a comprehensive overview of traffic between Canada and the U.S. is presented in the subsequent section.

Table 1: Top 5 Commodities Exported by Rail (in Million metric tonnes)	
2002	**2016**
Forest Products (27.0 M MT)	Agriculture & Food (26.2 M MT)
Coal (20.9 M MT)	Grains (22.9 M MT)
Fertilizer Materials (18.9 M MT)	Forest Products (22.8M MT)
Grains (16.2 M MT)	Coal (22.6 M MT)
Chemicals (13.2 M MT)	Fertilizer Materials (21.0 M MT)

Over the same period, rail-related imports have increased by more than 83.0 per cent, 28.0 M MT in 2002 to 51.3 M MT in 2016.

Railways support trade by connecting Canadian businesses to the marketplace, either by moving their products for export, or receiving products from international destinations. They enable trade in Canada through[xx]:

- Employing more than 31,000 Canadians to support railway operations and customers seeking to diversity their market reach;
- Generating more than $1.7 billion (B) in provincial and federal taxes to supplement trade-related investments in infrastructure;
- Offering some of the most competitive rail rates in the world that allow one tonne of freight to travel one kilometre for ₵3.15;
- Productive and fuel-efficient operations where one tonne of freight can travel 215 kilometres on a single litre of fuel; and
- Providing a safe service where there are just 2.02 accidents per billion gross-ton miles – making Canadian railways the safest in North America.

The abovementioned items are possible because of the railway industry's unwavering commitment to invest significant levels of capital back into its network each year. Currently Class I railways invest approximate 18 per cent of their revenues back into their capital, which unlocks the trade potential of Canadian industry. Since NAFTA came into effect in 1994, Canadian-owned railways have invested nearly $50 B to establish a tri-coastal continental railway network that is fully integrated into a North American supply chain required to facilitate the trade of raw materials, industry products and consumer goods.

In the context of NAFTA, these investments have deepened Canadian-owned railway reach into the U.S. through the strategic acquisitions of the Illinois Central Railroad (1999), Wisconsin Central Railroad (2001), Great Lakes Transportation LLC (2004) and the Elgin, Joliet & Eastern Railway (2009). While these acquisitions are unquestionably important for expanding market reach and enabling the north-south flow of goods between Canada and the U.S., annual investments to track and roadway are equally instrumental in their ability to support trade. These investments are critical for replacing and enhancing track infrastructure and for the renewal of rail, ties, ballast, signals, and bridges. They also fund strategic initiatives to enhance rail capacity through new and or extended sidings, high-clearance tunnels, the continued implementation of Centralized Traffic Control, and the development of inland ports across the railway network.

Today, CN and CP maintain a continental network that spans 32,000 miles that includes direct access to nine provinces, one territory and twenty-four States[xxi]. An additional four shortline railways provide services in the U.S. particularly in the states of Washington, Vermont, New Hampshire and Maine.

Analysis of trade flows between Canada and the U.S.

The analysis found that trade between Canada and U.S. has essentially doubled since NAFTA was ratified, averaging $334 B between 1990 and 1993 and $656.6 B between 2014 and 2017. Machinery and transportation-related goods continue are the main commodities traded between Canada and the U.S., with cereals and grain, minerals, and processed foods seeing the sharpest increases over the study period. Pre-NAFTA, trade was concentrated in 3 BEA regions representing 67.1 per cent and included the Great Lakes, Mideast, and the Southeast. For the later study period, these regions evolved to the Great Lakes, Southeast, and Far West, representing 62.6 per cent of trade which suggests that post-NAFTA trade has diversified.

As supply chains adjusted and new technologies emerged, trade flows changed. Geographically, two divergent dynamics occurred. For Quebec and Ontario, geographic links diversified. This can be noted by looking at the variation of regional trade for the top 3 BEA regions for each province as presented in **Table 2** below. For the rest of Canada, geographic links became more concentrated with the top 3 BEA regions growing from 62.9 per cent to 66.1 per cent.

In terms of commodities traded, a similar divergent dynamic appeared. Quebec, Ontario, and British Columbia saw a diversification of the commodities they trade and an increase in the number regions they trade with, while for the rest of Canada their top 3 commodity groupings increased (in terms of their percentage of trade) and were concentrated to a few U.S. regions.

Table 2: Canada-US Trade Summary Table		
In Billion 2017 Canadian dollars (unless otherwise indicated)		
	1990-1993 Average	2014-2017 Average
Total Annual Bi-directional Average Trade Flow		
Maritimes	$10.2 B	$30.1 B
Quebec	$50.2 B	$83.8 B
Ontario	$209.6 B	$356.7 B
Prairies	$40.9 B	$159.7 B
BC	$23.1 B	$40.4 B
North	$47.1 Million	$242.0 Million
Top 3 BEA Regions of Origin-Destination of Trade (value of total regional trade with US)		
Maritimes	• New England ($4.2 B) • Mideast ($1.7 B) • Southeast ($1.6 B) 74.6 % of total regional trade with US	• New England ($11.8B) • Mideast ($6.4 B) • Southeast ($4.7 B) 75.9% of total regional trade with US
Quebec	• Mideast ($14.2 B) • New England ($10.0 B) • Great Lakes ($8.6 B) 65.4 % of total regional trade with US	• Mideast ($17.9 B) • Southeast ($16.6 B) • Great Lakes ($14.3 B) 58.2 % of total regional trade with US
Ontario	• Great Lakes ($105.4 B) • Mideast ($36.1 B) • Southeast ($21.6 B) 77.9 % of total regional trade with US	• Great Lakes ($151.6 B) • Southeast ($61.7 B) • Mideast ($47.2 B) 73.0 % of total regional trade with US
Prairies	• Great Lakes ($11.2 B) • Plains ($8.6 B) • Far West ($5.9 B) 62.9 % of total regional trade with US	• Great Lakes ($58.8 B) • Plains ($26.2 B) • Southwest ($20.6 B) 66.1 % of total regional trade with US
BC	• Far West ($11.3 B) • Great Lakes ($3.3 B) • Southeast ($2.4 B) 73.6 % of total regional trade with US	• Far West ($21.7 B) • Great Lakes ($5.3 B) • Southeast ($3.8 B) 76.2 % of total regional trade with US
North	• Far West ($18.5 M) • Great Lakes ($18.0 M) • Southeast ($1.7 M) 90.8 % of total regional trade with US	• Far West ($210.4 M) • Southwest ($19.9 M) • New England ($5.2 M) 97.4 % of total regional trade with US
Top 3 Commodities Traded with US (value of total trade with US)		
Maritimes	• Minerals ($2.4 B) • Paper Products ($1.9 B)	• Minerals ($18.3 B) • Live Animals, Raw Meat, & Fish ($2.9 B)

	• Live Animals, Raw Meat, & Fish ($1.5 B) 57.5 % of total regional trade with US	• Chemical Products ($2.1 B) 77.1 % of total regional trade with US
Quebec	• Machinery and Transportation Related Goods ($16.8 B) • Paper Products ($6.9 B) • Metals ($6.6 B) 60.3 % of total regional trade with US	• Machinery and Transportation Related Goods ($16.2 B) • Metals ($13.7 B) • Minerals ($9.7 B) 47.3 % of total regional trade with US
Ontario	• Machinery and Transportation Related Goods ($98.1 B) • Electronics ($33.5 B) • Metals ($15.5 B) 70.2 % of total regional trade with US	• Machinery and Transportation Related Goods ($144.8 B) • Electronics ($44.1 B) • Chemical Products ($31.2 B) 61.7 % of total regional trade with US
Prairies	• Minerals ($19.6 B) • Machinery and Transportation Related Goods ($4.7 B) • Electronics ($4.1 B) 69.6 % of total regional trade with US	• Minerals ($93.0 B) • Chemical Products ($13.6 B) • Electronics ($12.5 B) 74.6 % of total regional trade with US
BC	• Lumber & Wood Products ($5.5 B) • Paper Products ($3.3 B) • Machinery and Transportation Related Goods ($3.1 B) 51.6 % of total regional trade with US	• Minerals ($6.5 B) • Lumber & Wood Products ($6.0 B) • Metals ($4.3 B) 41.7 % of total regional trade with US
North	• Manufactured Goods from Metals & Minerals ($17.7 M) • Minerals ($5.1 M) • Electronics ($3.0 M) 76.7 % of total regional trade with US	• Metals ($133.2 M) • Live Animals, Raw Meat, & Fish ($42.5 M) • Minerals ($37.7 M) 88.2 % of total regional trade with US

Railway transborder movements are more difficult to analyze due to the lack of available information before and after NAFTA came into force. However, the U.S. Department of Transportation provides information from 2006 to 2017 for transborder activity by all modes of transportation. A review of their data indicates that transborder rail movements in 2006 reflected 16.1 per cent (by value) and 23.5 per cent (by volume) of all goods traded between Canada and the U.S. By 2017 these values changed to 16.2 per cent and 20.2 per cent respectively (**Table 3**).

Table 3: Canada-US Trade - Regional Summary of Trade Flows by Rail vs. All Modes of Transportation

	Weight (in million tonnes)				Value (in million 2017 CAD)			
	Rail		All Modes		Rail		All Modes	
	2006	2017	2006	2017	2006	2017	2006	2017
Canada	75,593	75,136	321,667	372,746	90,358	72,539	562,444	448,519
Atlantic	2,541	2,023	33,212	35,543	1,763	1,002	17,874	15,348
Quebec	11,347	9,006	39,369	32,674	12,137	6,855	69,194	52,411
Ontario	18,276	13,227	89,301	65,372	53,003	42,877	307,858	239,989
Prairies	29,732	42,697	128,621	216,011	16,380	17,561	112,019	94,580
British Columbia	13,696	8,182	31,162	23,044	7,076	4,244	34,923	27,315
North	0	0	1	101	0	0	87	140
Unknown	0	0	0	0	0	0	20,489	18,736
Percent by Rail			**23.5%**	**20.2%**			**16.1%**	**16.2%**

The statistics indicate that the drop in volume and relative plateauing in value were a result of fewer commodities traded between Ontario, British Columbia, Quebec and the U.S. The most significant drop was observed in British Columbia where less wood and lumber (6.8 B MT) and paper (1.8 B MT) were moved over the period. Volumetric decreases were also found in Ontario and Quebec, with fewer minerals (14.4 B MT), machinery and automotive goods (3.6 B MT) and paper products (2.3 B MT) shipped to and from Ontario, and less paper (2.4 B MT), wood and lumber (933.7 M MT) and chemical products (863.2 M MT) from Quebec. Growth was principally driven by the Prairie provinces including an increase in minerals/shale (84.3 B MT) coming from Saskatchewan and food and plant products (2.2 B MT) from all prairie provinces to the U.S.

When measured by value from 2012 to 2016, the top three commodities moved by rail to and from the U.S. were lumber and wood products (47.8 per cent of all trade), chemical products (32.7 per cent), and paper products (27.6 per cent). **Table 4** provides an overview of the top 3 commodities moved by rail for each region in Canada.

Table 4: Canadian and U.S. Regional Rail Transborder Movements Summary (2012-2016 average)

Region	Percentage of regional transborder trade moved by Rail (by value)	Top-3 Commodities Moved by Rail (percentage of total trade that is moved by rail)
Canada	16.9%	• Lumber & Wood Products (47.8%) • Chemical Products (32.7%) • Paper Products (27.6%)
Maritimes	7.7%	• Lumber & Wood Products (55.7%) • Paper Products (46.3%) • manufactured goods from metals & minerals (26.4%)
Quebec	15.9%	• Metals (38.0%) • Lumber & Wood Products (36.6%) • Paper Products (33.8%)
Ontario	17.6%	• Machinery and Transportation Related Goods (33.4%) • Lumber & Wood Products (30.9%) • Chemical Products (22.3%)
Prairies	17.9%	• Lumber & Wood Products (66.0%) • Chemical Products (62.5%) • Cereals & Grain (59.4%)
BC	16.1%	• Lumber & Wood Products (54.8%) • Paper Products (41.1%) • Metals (32.4%)
North	0.2%	• Chemical Products (5.4%) • Electronics (1.1%) • Minerals (0.17%)

Hypothetical model to project the effects from NAFTA decertification

To understand the impact of a potential decrease in trade following the decertification of NAFTA, we reviewed regional trade flows for the last four years (i.e. 2014-2017). Our model includes regional and commodity-specific components to consider the fact that certain Canadian regions and specific commodities are more sensitive to the risk brought by decertification. It identifies decreases to determine which regions and commodities will potentially bear the brunt of the impact from NAFTA decertification.

Assuming a uniformly distributed decrease of trade across all commodity groupings, a five per cent decrease in trade following decertification would result in a loss of $28.8 B. Given that on average, rail carried 16.9 per cent of transborder trade on a dollar basis, the loss of revenue for railways could be $262 M. In the case of a fifteen per cent decrease in trade, the loss is expected to be $86.3 B, with the railway sector losing an estimated $780 M in revenue. The regions most affected by this decrease would be Ontario, the Prairies, and Quebec.

Since targeted tariffs have recently been mentioned as policy tools considered by the Trump administration, we also assessed the potential impact to steel and automotive products. Again, two scenarios against five and fifteen percent were completed (**Table 5**). Under these scenarios, expected losses to railway revenues associated with iron and steel would be $19.8 M and $59.3 M, with losses for automotive products forecasted to be $94.7 M and $284.2 M.

Table 5: Effects of Selective Tariffs on US-Canada Trade and Potential Loss of Revenues for Canadian Class 1 Railways		
In Million Current CAD, Based on Average 2014-2017 Trade		
	Iron and Steel	**Automotive**
Amount Traded between Canada and the US	$24,743	$118,577
Percentage of trade moved by Rail	19.47%	37.52%
Possible Loss in million CAD of Rail Revenues from a decrease in trade of Commodity of:		
5%	$19.8	$94.7
15%	$59.3	$284.2

Conclusion

This paper highlights that Canada has benefitted from the shift away from protectionist-based measures and towards multi-lateral trade liberalization. It clarifies the critical role that railways play in facilitating NAFTA's success and the economic prosperity of Canadians, underscoring the need for future trade policies to be cognizant of the need for a fluid, low-cost, safe and financially healthy rail sector.

In terms of the potential decertification of NAFTA, this paper provides a framework for assessing trade flows and forecasting the potential loss of trade revenues for regional economies and railways. While novel and yet to be subject to peer review, the framework's outputs support the argument that NAFTA's decertification would have a negative impact on the railway industry and the competitiveness of several Canadian provinces, a view also supported by the investment community[xxii].

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