

Quantifying the USMCA

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Abstract: This study develops a quantitative analysis of the impact of the Canada-United States-Mexico Agreement (USMCA), as signed on 30 November 2018. The USMCA provides a major overhaul of the North American Free Trade Agreement (NAFTA) based largely on the Trans-Pacific Partnership (TPP) text, introducing only minor changes to market access, while intensifying trade and investment diversion, increasing uncertainty by weakening the institutional framework of the NAFTA, and seeking to change the net benefits of the NAFTA by shifting them towards the United States.

The evaluation of the USMCA is developed using simulations on a computable general equilibrium (CGE) model, based on a dynamic specification of the Global Trade Analysis Project (GTAP) model, modified to directly represent goods and services trade conducted through foreign affiliates, as well as on a cross-border basis, and to reflect the impact of liberalization of FDI. The impact of the USMCA is assessed against a baseline that reflects an in-force NAFTA. These results can, however, be compared to the impacts of NAFTA lapsing to infer the difference between the USMCA and a “hard” NAFTA exit scenario.

The policy shock generated by the USMCA is unusual in that it has little traditional tariff liberalization and has many features that promise to be restrictive of trade. We evaluate non-tariff measures based on the extent to which the USMCA reduces/increases the parties’ scores on indexes measuring restrictiveness of regimes for goods, services, and investment. For goods, we examine possible improvements upon the WTO Trade Facilitation Agreement (TFA) commitments as measured by the OECD’s Trade Facilitation Indicators (TFI). For services, we consider the liberalization implied by the services commitments evaluated on the basis of changes to the parties’ scores under the OECD’s Services Trade Restrictiveness Index (STRI). For investment, we consider the changes implied against the parties’ scores on the OECD’s Foreign Direct Investment Restrictiveness (FDIR) index. For services and investment, we consider the value of binding market access commitments.

Major modelling challenges include quantifying the impact of the changes in the rules of origin for the automotive and textiles and apparel sectors, incorporating the implications of the USMCA regimes for intellectual property and the digital economy, and taking into account the heightened uncertainty about market access to the United States. An over-arching issue is how to treat the policy signals from the various linkages of the USMCA with other features of US trade policy, including the trade war with China, the restrictions on entry of asylum seekers through Mexico, and the implications for North American integration of the Trump Administration’s identification of national security with domestic re-industrialization.

Keywords: USMCA, CGE, uncertainty, rules of origin, value of bindings,

JEL Classification: F02, F13, F15

1 Introduction and Overview

This study develops a quantitative analysis of the impact of the Canada-United States-Mexico Agreement (USMCA), as signed on 30 November 2018. The USMCA provides a major overhaul of the North American Free Trade Agreement (NAFTA) based largely on the Trans-Pacific Partnership (TPP) text, introducing only minor changes to market access, while intensifying trade and investment diversion through more restrictive rules of origin, increasing uncertainty by weakening the institutional framework of the NAFTA, and seeking to change the net benefits of the NAFTA by shifting them towards the United States.

The evaluation of the USMCA is developed using simulations on a computable general equilibrium (CGE) model, based on a dynamic specification of the Global Trade Analysis Project (GTAP) model, modified to directly represent goods and services trade conducted through foreign affiliates, as well as on a cross-border basis, and to reflect the impact of liberalization of FDI (Ciuriak et al., 2017a). The impact of the USMCA is assessed against a baseline that reflects an in-force NAFTA. These results can, however, be compared to the impacts of NAFTA lapsing to infer the difference between the USMCA and a “hard” NAFTA exit scenario.

As regards its substantive measures, the USMCA overhauls the NAFTA drawing heavily on the Trans-Pacific Partnership (TPP). While it modernizes the text, it introduces only relatively minor changes in market access; introduces a more restrictive regime for accessing USMCA preferences; increases uncertainty about future market access, which in effect raises non-tariff barriers for services and investment; only marginally improves the border regime for Canada and Mexico while making the border thicker for goods entering the United States; and expands protection for intellectual property (IP) and data in order to capture international rents for the United States.

The USMCA poses some major modelling challenges in that there is no settled art in terms of how to quantify many of these measures (e.g., rules of origin and uncertainty). An over-arching issue is how to treat the policy signals from the various linkages of the USMCA with other features of US trade policy, including the trade war with China, the restrictions on entry of asylum seekers through Mexico, and the implications for North American integration of the Trump Administration’s identification of national security with domestic re-industrialization, including the use of Section 232 tariffs to put pressure on Canada and Mexico in the negotiations.

As regards market access for goods, the policy shock in this assessment takes into account the managed trade elements (e.g., dairy quota changes) and the impact of the new rules of origin regime on specific industrial sectors. As regards non-tariff measures, we consider the extent to which the USMCA reduces/increases the parties’ scores on indexes measuring restrictiveness of regimes for goods, services, and investment. For goods, we examine possible improvements upon the WTO Trade Facilitation Agreement (TFA) commitments as measured by the OECD’s Trade Facilitation Indicators (TFI). For services, we consider the liberalization implied by the services commitments evaluated on the basis of changes to the parties’ scores under the OECD’s Services Trade Restrictiveness Index (STRI). For investment, we consider the changes implied against the parties’ scores on the OECD’s Foreign Direct Investment Restrictiveness (FDIR) index. For services and investment, we take into account the value of binding market access commitments.

Table 1 summarizes the key quantifiable elements of the agreement.

Table 1: Policy Shock Summary

Measure	Shock construction	Comment
Industrial goods tariffs	De Minimis tariff savings in Canada rise from about US\$ 125 million in 2020 to a little over US\$ 300 million in 2025. Mexico’s de minimis savings are less than 5% those of Canada due to less liberalization and much smaller levels of cross-border ecommerce over the projection horizon.	Liberalizing
Agricultural market access	<ul style="list-style-type: none"> Canadian import quota expansions from the United States of US 226 million by 2025 for dairy and US 196 million for poultry US\$ 50 million diafiltered milk added to US chemicals exports Canada’s exports to the “rest of the world” reduced by US\$ 70 million per annum Wheat marketing NTB on Canadian imports from US removed – quantitative impact unclear US phases out out-of-quota peanut tariff, and expands TRQs for sugar and dairy from Canada 	<ul style="list-style-type: none"> Trade liberalizing welfare effects contingent on quota admin. Trade restrictive Unclear impacts Quantitative impacts positive but magnitude likely minor
Trade facilitation (general)	<ul style="list-style-type: none"> USMCA commitments represent a small improvement on current level of border practice as committed under WTO TFA Tightened anti-circumvention/input tracking results in border thickening 	<p>Liberalizing for all three parties</p> <p>Small net negative impact in the US</p>
ROOs: Automotive	<p>Changes imply higher cost for NA production and trade and imposition of an NTB on NA imports from third countries.</p> <ul style="list-style-type: none"> LVC: <ul style="list-style-type: none"> 0.75% tariff increase on US imports from Mexico; RVC raised to 75%: <ul style="list-style-type: none"> NTB on Canadian and Mexican imports of auto parts from third parties Diversion of US sourcing for domestic production to third party sources More complex rules and sub-optimal allocation – 1% cost on traded output: cost increase of 0.8% for Canada and Mexico; 0.3% for USA 	Negative welfare impact due to higher costs, sub-optimal sourcing, trade diversion, tariff incidence increasing
ROOs: Textiles and Apparel	Additional ROOs requirements on sewing thread: 0.5% trade diversion in Canada and Mexico through commensurately scaled NTBs on 3 rd party sources. Assumes full utilization of TPLs	Negative welfare impact due to higher costs, sub-optimal sourcing
ROOs: Production inputs	<ul style="list-style-type: none"> Higher RVC required for chemicals and steel result in some trade diversion away from third party sources. Given highly regionalized North American market, we assume this amounts to 10% of third party imports into Canada and Mexico diverted to the United States Tighter administration of ROOs results in a cost increase for traded production: 0.27% cost increase in industrial goods for Mexico; 0.17% cost increase in Canada; and 0.025% cost increase in the US, given NAFTA export shares 	Negative welfare impact due to higher costs, sub-optimal sourcing

Goods regulation	<p>Four product-specific annexes and a general “good regulatory practices” (GRP) chapter</p> <ul style="list-style-type: none"> • GRP • Telecoms: no restrictions on encryption imports • Pharma: mainly redundant • Cosmetics: small and maybe no impact • Chemicals: unclear implications 	<ul style="list-style-type: none"> • No impact • No material impact • No material impact • No material impact • No material impact
Services	<ul style="list-style-type: none"> • Some liberalization in financial services by all three parties, plus some in communications and “other transport” (US) and in communications and business services (Mexico). • Unbinding of services market access except in specified sectors results in increased uncertainty of market access 	<p>Trade Liberalizing</p> <p>Increased uncertainty = more restrictive</p>
Investment	<ul style="list-style-type: none"> • No change for goods sectors investment commitments • Services sectors investment commitments weakened by unbinding of some commitments on market access 	<p>No change</p> <p>Increased restrictiveness</p>
Intellectual Property	<ul style="list-style-type: none"> • Biologics term extension: cost increase for Canada of US\$ 200 million, growing to US\$ 268 million by 2025; smaller increases for Mexico • Copyright term extension in Canada: annual royalty payment outflows rising from US\$ 30 million in 2020 to about US\$ 40 million in 2025; corresponding increased inflows of royalties of US\$ 12 million in 2020, rising to almost US\$ 16 million in 2025 	<p>Increased transfers from Canada and Mexico to US</p> <p>Transfers represent welfare gain for US</p> <p>Impacts on innovation of the copyright extension are negative for Canada</p>

Source: see derivation of the shocks in the body of the paper.

The main improvements in market access are import quota expansions in Canadian dairy trade and to a lesser extent poultry (partially offset by some forced trade restrictions on Canada’s dairy exports to third parties); and higher de minimis limits for Canadian and Mexican cross-border shopping.

Related to the tariff, the rules of origin for the automotive sector have been revised with a higher regional value content, and new requirements concerning the level of wages that must be paid for stipulated shares of automotive production to qualify under the USMCA rules (“labour value content”). This is expected to reduce Mexico’s tariff-free access to the US auto market and raise costs for the industry. There is some offset through higher de minimis limits for full rules of origin certification; however, the practical impact of the latter measures is not yet clear.

The trade rules in the USMCA build on those negotiated in the TPP and the WTO Trade Facilitation Agreement (TFA). While there are some modest improvements upon existing commitments as per the TFA (which supersedes the 1993 NAFTA measures as the baseline), there is also language about stricter border controls which signals another round of border thickening, for the United States in particular.

Some of the more significant USMCA measures relate to intellectual property (IP) and data, particularly the latter.

The USMCA expands IP protection by extending the term for copyright for Canada from 50 years to 70 years; and raises the term of protection for biologic pharmaceuticals to 10 years.

The measures on data include commitments to free flow of data across borders and non-use of data localization measures, with a carve-out for measures required to achieve “legitimate” public policy objectives, while leaving undeveloped the scope for regulation to address issues such as privacy and security for data in its role as the soft infrastructure of a digital economy. For example, the measures covering personal information protection requirements, which call for a legal framework to protect the personal information of users of digital trade, include a footnote that acknowledges that enforcing voluntary undertakings of enterprises related to privacy is sufficient to meet the obligation; this falls well short of the requirements under the European Union’s (EU) General Data Protection Regulation (GDPR) and creates potential conflict for firms competing both in the North American and EU markets.

The structure of the measures puts the presumption in favour of free flow of data and the onus of necessity on any measures developed to address issues related to use of data; in this regard, the language of USMCA has the appearance of even stricter requirements for derogations than the comparable language in the TPP. In particular, the measures do not recognize the value of data (i.e., data as the “new oil”) over and above its role in facilitating commercial transactions; accordingly, the access by (mainly US) Internet firms to the commercial data of the Parties on a royalty-free basis is locked in, as the exceptions to data localization would not cover industrial policies of any of the Parties aimed at capturing some of this value.

At the same time, it should be borne in mind that the expansive interpretation by US authorities of “national security” in respect of using Huawei equipment in the build-out of 5G networks implies that security requirements go well beyond localization requirements to include even sourcing of equipment. How big a Pandora’s Box this national security argument has opened remains a wide open question.

Finally, it is important to recognize that Canada and Mexico have already signed onto similar data rules in the context of the Comprehensive and Progressive Partnership for Trans-Pacific Trade (CPTPP).¹ Given that rules tend to apply multilaterally, the USMCA’s marginal contribution is to bind the United States. In this light, it is simply not clear what effect the USMCA implies for the North American economy through its data provisions.

Finally, the negotiating tactics and several features of the USMCA raise uncertainty about the future durability of the trade and investment arrangements. In institutional terms, the USMCA can be characterized as a progress from three amigos to two bilaterals under one institutional setting. The absence of the term “North America” from the name of the agreement underscores the sense that emerged from the negotiations that there is no “North America” in the sense of an integrated trade and investment bloc.

At the same time, the USMCA, through a number of acts of omission and commission, introduces a new level of uncertainty about effective access to the US market which will tend to work – and

¹ There are some differences in language, in particular, the USMCA removes exceptions for localization of computing facilities as a condition of doing business; accordingly, the public policy exceptions must be based on the cross-border flow of data. See Lee-Makiyama (2018) for a discussion.

from the US side intentionally so – to cause investors to choose the United States over Canada or Mexico. In particular:

- It does not silence the new measure of ad hoc protection that the United States has used aggressively, namely the Section 232 tariffs. The tariffs on steel and aluminum have not removed and US forbearance in applying Section 232 tariffs to Canada and Mexico on autos is only incorporated through a side letter.
- Negative signals about future market access are sent by the new quotas on duty-free access into the United States for automotive products, and the threat of loss of market access should a party sign a free trade agreement with a non-market economy (Section 32.10).
- The introduction of a sunset clause, the lapse of investor-state dispute settlement for US-Canada investment, the grudging retention of the Chapter 19 binational panel mechanism, interpreted in light of the rhetoric of the Trump Administration, and the US resistance to fixing the dysfunctional state-to-state dispute settlement provisions in NAFTA (Lester, 2019) do not encourage confidence in the robustness of the institutional framework for trade and investment going forward.

Uncertainty acts like a non-tariff barrier (NTB) to trade and investment (Crowley and Ciuriak, 2018); accordingly, these measures point to reduced levels of intra-North American trade, in particular through reduced entry into trade by new exporters. These general uncertainty effects are not incorporated in the main reported results as the scale of the investment shock would be highly speculative. However, they constitute a caveat to the results.

Table 2 sets out the main results for the USMCA parties and compares these to the impacts from NAFTA lapsing (based on prior analysis of the United States walking away from the NAFTA; Ciuriak et al., 2017b). As can be seen, the USMCA impacts are negative for all three parties, but leave the three parties marginally better off than under a scenario in which NAFTA lapses altogether. The biggest difference between the two scenarios is for Mexico; for Canada and the United States the difference is minor and these countries should be largely indifferent to the choice.

Table 2: Summary of Main Results

	USMCA		NAFTA Lapsing	
	Real GDP (% change)	Welfare (USD millions at 2019 prices)	Real GDP (% change)	Welfare (USD millions at 2019 prices)
Canada	-0.40	-10.8	-0.49	-13.9
Mexico	-0.79	-14.9	-1.09	-23.0
United States	-0.10	-17.4	-0.10	-22.4

Source: calculations by the authors; Ciuriak et al. (2017b). Note that the “NAFTA Lapsing” figures from the latter study are for the scenario in which NAFTA lapses but Canada and Mexico continue to have free trade, which is now assured with the CPTPP in place. Further, the figures reported in Ciuriak et al. (2017b) are converted from original GTAP V9 data in 2011 USD to 2019 USD. Finally, note that the USMCA results reported here do not include an estimate of the impact of the increase in general uncertainty about future market access in the United States. The latter effect could be quite large as it undermines the attractiveness of Canada and Mexico as investment sites for North American production.

The protectionist elements in the USMCA, which dominate any positive effects of the agreement, are comparatively modest compared to the scale of the tariff increases under NAFTA lapsing.

Nonetheless, the economic impacts of the two scenarios are similar in order of magnitude. This reflects the fact that the USMCA NTBs, which are cost raising, have a more damaging effect on economic welfare and efficiency than do tariffs that would be imposed under the NAFTA lapsing scenario, which are transfer payments. The relative scale of outcomes is consistent with the understanding that tariffs are an efficient form of protection while NTBs are inefficient.

Overall, the impacts of the USMCA are relatively small and, in the context of a growing North American economy would not likely be observed as outright declines in trade and economic output but rather in less robust growth than otherwise might have been the case. Given that the uncertainty of USMCA going ahead has already dampened economic growth, the observed effect would likely be a rebound on market relief; however, this should not be interpreted as indicative of the assessment of the agreement by markets compared to the status quo of an in-force NAFTA.

There is limited empirical analysis of the USMCA as negotiated in the public domain. An IMF study by Burfisher et al. (2019) provides estimates for all three Parties; USITC (2019) provides estimates for the United States alone.

The Burfisher et al. (2019) estimates are similarly derived using a multi-region CGE model. In this study, the model used is static in structure. Like the present study, Burfisher et al (2019) use the GTAP v10 database with a base year of 2014. Notable innovations include recalibration of the protection data based on ad valorem tariffs from the World Bank’s World Integrated Trade Solution, ad valorem equivalents of rules of origin, ad valorem equivalents of non-tariff barriers to services trade drawn from Fontagne et al. (2016), and an updated baseline that reflects the CPTPP, and the tariffs imposed by the parties and others in the context of the trade wars through August 2018. Another notable innovation is to split the automotive sector into vehicles and parts to better apply the USMCA ROOs provisions.

The study takes into account five provisions of USMCA: (1) higher vehicle and auto parts regional value content requirement; (2) new labor value content requirement for vehicles; (3) stricter rules of origin for USMCA textile and apparel trade; (4) agricultural trade liberalization that increases U.S. access to Canadian supply-managed markets; and that reduces U.S. barriers on Canadian dairy, sugar and sugar products, and peanuts and peanut products; and (5) trade facilitation measures. In contrast to the present study which evaluates the USMCA trade facilitation measures against the OECD TFI index against a post-TFA baseline, Burfisher et al. (2019) make an assumption of a 1/10th of a percentage point reduction in trade costs across all sectors save textiles, apparel, dairy, vehicles and parts, based on the Hillberry and Zhang (2015) estimate that global adoption of best practices in trade facilitation pursuant to the TFA could reduce trade costs by about 1% ad valorem. The main results are reported in Table 3.

Table 3: USMCA Impacts, Burfisher et al. (2019)

	Real GDP	Welfare 2019 USD millions
Canada	0.02	795
Mexico	-0.01	647
United States	0.00	-860

Source: Burfisher et al. (2019). Note that the welfare estimates are converted from 2014 USD to 2019 USD for comparability with the present study. The conversion factor is 1.0836.

The study reports an overall welfare gain from the USMCA; however, this stems entirely from trade facilitation gains of about US\$ 1.4 billion, which offset the net losses from the other effects. The assumption that drives the trade facilitation gains is not grounded in the commitments under the USMCA, which improve only very marginally upon the WTO TFA commitments made by the parties, but rather represent a discount on the estimates of the gains from the TFA. Moreover, the tightening of border clearance measures to prevent circumvention is not factored in. Otherwise, the effects of the USMCA in this study are essentially a wash-out with negligible real GDP impacts and minor welfare impacts, which reflect price changes that might reflect primarily the modelling protocol as regards choice of closure.

USITC (2019) by contrast finds a fairly significant effect on the US economy from the USMCA. This study uses the GTAP-FDI model, which incorporates FDI stock and FAS data but runs the simulation of the USMCA in a comparative static mode. Results for Canada and Mexico are not reported. The base year of the model was updated from 2014 to 2017 which reduces the comparability of the results with the present study. This study provides a highly detailed assessment of the USMCA as negotiated. Its main finding is that, excluding the data provisions which reduce future uncertainty about data regulations, the USMCA has a negative impact on the US economy of about -0.12%, which in value terms translates into about USD -22.6 billion. These figures are close to those obtained in the present study.

Table 4: USMCA Impacts: USITC Assessment

	Impact of provisions reducing policy uncertainty		
	None	Moderate	High
U.S. real GDP	-0.12	0.35	1.21
U.S. real GDP (USD billions)	-22.6	68.2	235

Source: USITC (2019), Tables 2.6 and 2.7.

The USITC study however attributes a very powerful impact to the provisions governing free flow of data and prohibiting data localization. We make three observations on the estimates of the data provision impacts. First, they do not reflect the fact that Canada and Mexico are already subject to similar (although not identically worded) disciplines on data protectionism; accordingly, the USMCA primarily binds the United States, and it is not clear that the USMCA will have a big effect there. Second, the highly expansive reading of national security that the Trump Administration has taken in the Internet of Things (IoT) area suggests that all three parties will have considerable latitude to develop regulations on data flow to ensure national security in the backbone services sectors (communications, transportation and finance). Third, regulation to address issues that have flared with the digital transformation in areas ranging from privacy, to competition policy, to taxation, to protection of democratic processes is being actively pursued worldwide. The ultimate framework for data regulation remains unclear. We decline to make estimates of the possible effects of the data provisions for these reasons. Absent this effect, our results are broadly in line with the USITC results; we infer that the USITC results for Canada and Mexico would be similar to those we find.

The rest of this report is organized as follows: Section 2 describes the modelling framework and assumptions. Section 3 walks through the derivation of the policy shocks. Section 4 presents the results. Appendix A describes the GTAP-FDI model.

2 Implementation of the USMCA Policy Shocks

2.1 Modelling Setup

The regional disaggregation for the global CGE model simulations is set out in Table 5 below; the sectoral disaggregation in Table 6.

Table 5: Regions for the GTAP-FDI Simulations

USA	China	India
Canada	Taiwan	Argentina
Mexico	Japan	Australia
UK	Korea	ASEAN
EU27	Brazil	ROW
Turkey	Russia	

Source: the authors.

Table 6: Study sectors for the GTAP-FDI Model Simulations

Agriculture	Resource-based	Manufacturing	Services
Cereal grains	Forestry and Wood Products	Textiles, Apparel and Leather	Construction
Fruit and Vegetables	Fishing	Chemicals, Rubber and Plastics	Trade
Oilseeds and Vegetable Oil	Fossil Fuels	Ferrous Metals	Transportation Services
Other Farming	Mineral Products	Non-Ferrous Metals	Communication
Sugar		Metal Products	Financial Services
Dairy		Automotive	Business Services
Beef		Transport Equipment	Recreational Services
Pork and Poultry		Electronic equipment	Other Services
Food Products		Machinery & Equipment	
Beverages and Tobacco		Other Manufacturing	

Source: the authors.

2.2 Baseline

The impact of the USMCA is assessed against a baseline that reflects an in-force NAFTA. The database for the simulations is the GTAP V10 dataset with a base year of 2014. For the simulations, the database is extrapolated to 2025 using GTAP dynamic tools and drawing on the International Monetary Fund's World Economic Outlook database (October 2018) for guidance as to growth rates for the projection period. The USMCA shock is implemented in 2020. The read-out of the impacts is in 2025.

We report impacts in US dollars at 2019 prices. The original GTAP data are in 2014 USD prices; these are converted to 2019 values on the basis of the change in the US GDP deflator in the IMF World Economic Outlook database of April 2019 (IMF, 2019) between 2014 and 2019; the conversion factor is 1.08357446.

2.3 Closures

We use a dynamic version of the GTAP model in which capital supply responds to changes in changes in the rate of return and that incorporates a new dynamic labour supply module in which labour supply is endogenized. Both labour and capital are assumed to be mobile across all sectors within a country. Since capital is mobile internationally, we adopt the external closure that allows the external trade balance to adjust.

3 Derivation of the Policy Shock

3.1 Goods Market Access

3.1.1 Industrial goods tariffs

Industrial goods tariffs remain unchanged from NAFTA levels; preferential import tariffs remain at zero for originating goods. The USMCA also retains the NAFTA prohibition on export duties, taxes, and other charges, and the waiver of specific customs processing fees.

One notable change as regards applied tariffs is the **de minimis** level of imports for cross-border shopping that is allowed in duty-free without formalities. Canada and Mexico raised their duty-free thresholds to C\$ 150 and US\$ 117 respectively and Canada doubled its GST/HST-free threshold to C\$ 40. This promises to reduce the collection of tariffs on cross-border shopping.

Table 7: De Minimis changes in the USMCA

Thresholds for imposition of customs duties and taxes, and application of import procedures		
	Customs duty threshold	Sales tax/VAT threshold
United States	USD\$800	USD\$ 800
Mexico	USD\$ 117 (NAFTA US\$ 50)	USD\$ 50
Canada	C\$ 150 (NAFTA: C\$ 20)	C\$40 (NAFTA: C\$ 20)

Source: USMCA Article 7.8

We adopt the estimate of tariff savings developed by McDaniel et al. (2016) of \$85 million for a \$150 million de minimis (taking the average of estimates for \$100 and \$200 de minimis levels). Converted to 2014 USD for modelling purposes, this amounts to tariff savings of USD 61 million. The raising of the VAT-free allowance to C\$40 from C\$20 should, however, add to the volume of sales through this window. Further, since shipments below de minimis require less paperwork for the major e-commerce express delivery companies and attract less attention from customs, there promises to be some reduction in the time to move small parcels across borders using e-commerce, adding further stimulus to sales. To reflect these latter considerations, we double the estimate of tariff savings to about USD125 million in 2014 USD. Finally, since cross-border ecommerce is commanding a growing share of retail sales on trend, we expand this over the projection horizon, from an estimated 8.1% in 2018 to 15% in 2025.

Assuming that cross-border ecommerce grows its share in line with the above assumptions, **the estimated tariff savings for 2018 would build from about USD 125 million to a little over USD 300 million in 2025.** To convert these tariff savings to ad valorem equivalents, we need to allocate them by sector. Given that consumer online purchases are heavily concentrated on clothing and

electronics, and given that the MFN tariffs on consumer electronics are low, we allocate 80% of these savings to textiles and clothing and the remainder to electronic equipment.

For Mexico, we estimate tariff savings on the basis of a ratio to tariff savings in Canada. The following data are used to approximate the ratio:

- Mexican retail online sales are about one-fifth of the level in Canada;
- The liberalization in Mexico is about 30% the liberalization in Canada
- The boost from VAT exemption increase does not apply to Mexico; only time and frictional cost savings; accordingly, the boost from this source is about half the size in Canada;
- Tariff levels for clothing and electronics are similar in Canada and Mexico.
- On this basis we calculate that Mexico’s tariff savings will be about 4.7% of the level in Canada.

Table 8: Impact of de Minimis changes on tariff savings on retail imports in Canada

	2018	2019	2020	2021	2022	2023	2024	2025
Canada								
GDP	1,744,963	1,814,507	1,889,542	1,966,524	2,050,330	2,135,019	2,223,330	2,315,366
Retail sales	462,926	481,376	501,282	521,705	543,938	566,405	589,834	614,250
Ecommerce Retail Sales	37,497	43,324	50,128	57,388	65,273	73,633	82,577	92,137
Share of retail sales	8.10%	9%	10%	11%	12%	13%	14%	15%
Tariff savings	125	144	167	191	218	245	275	307
Mexico								
Ecommerce retail sales	6	7	8	9	10	12	13	15
Ratio to Cdn Tariff Savings	4.72%	4.72%	4.72%	4.72%	4.72%	4.72%	4.72%	4.72%

Source: calculations by the authors, based on estimates of e-commerce retail sales from Statista; all figures in USD at 2014 prices, consistent with the base year for the model.

While the raising of the threshold by Canada and Mexico is trade-liberalizing, there will likely be mixed impacts.

- While consumers benefit from this trade liberalising measure, there will be some negative impacts on Canadian retailers who lose market share to ecommerce platforms like Amazon. These negative impacts will show up in the estimates of the impact on domestic value-added for the goods sectors affected – mainly textiles, clothing and leather and electronic equipment – and in domestic sales of the “trade” sector.
- As commerce increasingly shifts to on-line forms, it will be necessary to ensure tax neutrality. The USMCA, however, goes in the other direction and deepens the non-neutral taxation of consumer goods purchased through e-commerce platforms from abroad. Generally, Canadian merchants registered for the GST/HST must charge and collect the GST/HST on all taxable goods sold for delivery in Canada. However, under the USMCA, goods imported from the United States are not subject to the GST/HST for values under C\$ 40. Thus, where tariffs create a tax-driven and hence welfare-reducing discrimination against imports, the USMCA deepens a tax-driven and hence welfare-reducing discrimination against domestically-sourced products.

- The USMCA also allows a Party to reduce its thresholds to match that of another Party. Accordingly, the US de minimis could fall to the Canadian and Mexican levels, which would reduce market access compared to NAFTA. Even if this were to happen, it is likely to have a minimal impact on US imports. We make no allowance for this.

3.1.2 Trade Facilitation

The USMCA updates the NAFTA measures addressing customs procedures and cooperation to be consistent with modern practice as reflected in the WTO TFA and the TPP, including expedited express shipments. We evaluate the impact of the USMCA measures on Canada’s, Mexico’s and the US’ scores on the OECD Trade Facilitation Indicators as a way to quantify the degree of improvement of the border regime. This improvement is considered not against the original NAFTA but against the countries’ scores taking into account their commitments under the more modern WTO Trade Facilitation Agreement (TFA), since these improve upon NAFTA and thus set a higher base level. We identify two measures for Canada, four for Mexico and one for the United States on which the USMCA implies a change in the respective country’s TFI score.

Table 9: Trade Facilitation Indicator-based Improvements

TFI Category	Description	Canada		Mexico		USA	
		Pre	Post	Pre	Post	Pre	Post
OECD-A	Publication of necessary information on advance rulings	0.095	0.095	0.000	0.095	0.095	0.095
OECD-C	Maximum time by which the advance ruling will be issued	0.000	0.182	0.000	0.182	0.000	0.182
OECD-H	Other border controls supported by a risk management system	0.057	0.057	0.000	0.057	0.057	0.057
OECD-I	Authorized Operators programs	0.000	0.182	0.000	0.091	0.182	0.182

Source: OECD Trade Facilitation Indicators; calculations by the authors.

On this basis, the USMCA improves the total TFI score all three countries scores marginally; for Canada, the improvement is about 2.2% from a TFI score of 17.86 to 18.25. Mexico has the largest improvement (2.68%) and the United States is required to make the least change (1.51%).

To translate these improvements into actual cost reductions these changes in the TFI index must be related to actual trade costs. Total non-tariff trade costs across the US-Canada and US-Mexico borders have been estimated at 29.49% and 29.13% of the value of goods, respectively, according to the ESCAP-World Bank Trade Cost Database. However, not all of these costs are related to the measures addressed by trade facilitation, since they include language differences, distance etc. Anderson and Van Wincoop (2004) find that the ad valorem equivalent of border-related trade barriers is about 44%, of which 6% is accounted for by information costs, and 3% by security-related costs; the rest being due to tariffs and other traditional trade barriers (8%), language barriers (7%), and currency barriers (14%). Using this decomposition, trade facilitation measures would have traction on about 9% of the total 36% of non-tariff-related border costs, or 25% of the total. Applying this ratio to the approximately 30% NAFTA border costs, puts facilitation-related border costs at 7.5%. For modelling purposes, we assume facilitation-treatable border costs are about 10%. **Given the impact of the USMCA, we derive reductions in trade costs (AMS shocks)**

into Canada of 0.2%, into Mexico of 0.21% and into the United States of 0.14% from this source.

At the same time, the USMCA's Customs chapter establishes new mechanisms on anti-circumvention and duty evasion, which promise to **thicken the border**. The intensification of border measures in the United States in the post-9/11 era raised the ad valorem tariff equivalent of the premium on shipping goods across the Canada-US border from 0.33% during the 1994 to 2000 period to 0.62% between 2005 and 2009 (Brown, 2015) or by about 0.29%. We apply a similar increase in border costs into the United States. We assume that this effect is partly asymmetrical, with trade moving out of the United States also affected due to some degree of harmonization of procedures on the Canadian and Mexican side of the border, but only to half the extent that trade moving into the United States is affected. Border thickening more than offsets the 0.14% cost reduction from the positive USMCA measures for the United States and results in a **net increase of 0.2% for trade costs into the United States; for Canada and Mexico, it reduces the trade facilitation gain by 0.165% to a net of 0.013% for Canada and 0.03% for Mexico.**

Table 10: Trade Cost Impacts due to USMCA Trade Facilitation/Border Thickening

	Before	After	% Change	Total TFI-related Border Costs	TFI-related border costs Pre-USMCA	TFI-related border costs Post-USMCA	Trade Cost Reduction (%)	Border Thickening	Net Trade Cost Impact (%)
Canada	17.86	18.25	2.20%	10	1.88	1.71	-0.18	0.165	-0.013
Mexico	15.86	16.29	2.68%	10	2.79	2.60	-0.19	0.165	-0.028
USA	18.11	18.38	1.51%	10	1.77	1.65	-0.12	0.330	0.206

Source: OECD Trade Facilitation Indicators; calculations by the authors.

The USMCA updates the framework for goods trade by:

- adding new provisions for transparency in import licensing and export licensing procedures;
- expanding the provisions governing import and export restrictions to include, inter alia, prohibition of requirements to use local distributors for importation, restrictions on the importation of commercial goods that contain cryptograph, import restrictions on remanufactured goods (prohibitions on used goods continue to be allowed), and requirements concerning consular transactions and associated fees and charges;
- updating provisions for temporary admission of goods to cover shipping containers etc.

These measures would not likely materially impact the level of trade in goods.

3.1.3 Rules of Origin: Autos

The most significant goods market trade innovation concerned **rules of origin for autos**, where the USMCA:

- increased overall regional value content (RVC) from 62.5% (60% for heavy trucks) under NAFTA to 75% (70% for heavy trucks);
- introduced new distinctions between “core” parts, “principal” parts, and “complementary” part, with varying content requirements 75-70-65% on a net cost basis respectively for passenger vehicles and light truck parts, and 70-65-60% respectively for heavy truck parts;

- introduced a new requirement for passenger vehicles and light trucks (but not heavy trucks) that specified “core” parts, including engines, advanced batteries for electric or hybrid vehicles, transmissions, and suspension and steering systems, must be originating in order for the whole vehicle to qualify as originating;
- introduced a new requirement that 70% of the steel and aluminum come from North American sources;
- introduced new rules based on labour value content (LVC), requiring that 40% of the LVC of passenger vehicles and 45% of the LVC of trucks be made in facilities in which workers earn at least US\$16 an hour.

The USMCA provides a five-year transition period for passenger vehicles and light trucks and a seven-year period for heavy trucks during which up to 10% of a producer’s shipments qualify for preferences without meeting these new requirements; however certain content requirements, including those pertaining to steel and aluminum, must be met from the start.

Below, we develop specific assumptions for the impact of each of the changes. Given that many corporate decisions remain to be taken how to approach the adjustment to the new ROOs, it is not possible to realistically differentiate the impact on BC from the Rest of Canada.

LVC

The LVC rule is met by US and Canadian production: average wages in automobile assembly and parts production are above USD 20/hour in both Canada and the United States (Dziczek et al., 2018). We assume this rule has no impact on either Canadian or US sourcing for NAFTA trade or for production intended for domestic sales.

For Mexico, average wages are well below the USMCA threshold: USD 7.34/hour in auto assembly and USD 3.41/hour in parts (these are based on 2017 data; Dziczek et al., 2018). The Centre for Automotive Research (Dziczek et al., 2018) concludes that:

“Average wages in the Mexican automotive and parts industries fall so far short of the North American average that paying the MFN rate for Mexican exports will be the preferred strategy for nearly all manufacturers of vehicles that are not classified as trucks. Once manufacturers have to pay the MFN tariff, the work could move even further offshore with an even lower chance of there being any U.S. content in the resulting product.”

Mexico’s Trade Minister Ildefonso Guajardo acknowledged Mexico would not be able to meet the LVC requirements for all of its production and anticipated that some 30% of US auto imports from Mexico would pay the 2.5% passenger vehicle tariff. We assume that Mexican production of light trucks, which attracts a 25% tariff will migrate to the United States or Canada, while passenger vehicle assembly will migrate to make optimal use of existing facilities and take advantage of Mexico’s low wages. **Accordingly, we apply a tariff of 0.8% to US imports from Mexico.**

RVC

The higher regional value content required under the USMCA ROOs imply some sourcing currently obtained from abroad must shift to North America. The overall incremental additional

value added is 12.5%. We assume that 4.8% of this will be made up by counting R&D (4.8% is the share of costs of the North American firms accounted for by R&D). This leaves 7.7% of the value of automotive input sales to be shifted from 3rd party sources. We calculate that this amounts to about 5% of the value of automotive exports from Mexico to the United States and about 6% for Canada to the United States, and about 3.5% for US exports to Canada and Mexico. **We apply an NTB to third party automotive sector imports to drive trade diversion equal to these percentages for the USMCA parties.**

Administrative/sourcing costs from greater complexity of the automotive ROOs

The multiple criteria to satisfy originating status increase the complexity of administering the ROOs. Moreover, although producers will have some flexibility to meet the North American content requirements by averaging qualifying inputs across models, inevitably the multiple binding constraints are likely to force sub-optimal sourcing of inputs. We assume a 1% cost increase for producers for traded production. **This implies a 0.8% production cost increase for automotive production in Canada and Mexico and a 0.3% increase for the United States, based on the share of production exported within North America.**

Quota-based exemption from national security tariffs

The USMCA side letters provide a tariff-rate quota for Canada and Mexico if the United States imposes Section 232 national security tariffs on automotive products. We assume the TRQ is not binding and do not introduce a trade restriction on this account. The negative impact of this and other features of the USMCA that dissuade investment into Canada and Mexico to serve the North American market are not incorporated in the simulations; their effect on investment into Canada represents a caveat to the analysis.

3.1.4 Rules of Origin: Textiles and apparel

The USMCA introduces some tweaks to the “yarn forward” provisions in the NAFTA rules of origin for textiles and apparel. The new provisions require that some additional inputs, including sewing thread, pocketing fabric, narrow elastic bands, and coated fabric be made in the region for the finished product to qualify as originating. In addition, the USMCA introduces detailed provisions for textile-specific verification of originating status. Given the minor value content of these components in finished products, this tweak would dictate North American sourcing to avoid tariffs on the entire value of the finished product; accordingly, this would constitute a prohibitive non-tariff barrier to third-party imports of these products for apparel manufactured for the North American market. There appears to be some modest scope for additional trade diversion towards North American sourcing in these products. For example, for sewing thread alone, 0.6% of Canada’s total imports of textiles come from outside NAFTA (although some of this would be for final consumption in Canada). We make a simple assumption that 0.5% of textile imports will be diverted by this measure. We model this by implementing **a scaled non-tariff barrier (NTB) on Canadian and Mexican imports of textiles from third parties designed to achieve the 0.5% trade diversion.** We observe that this will create opportunities for increased prices and will thus be welfare reducing.

3.1.5 Rules of Origin: Production inputs

ROOs have also been made more restrictive for industrial inputs, including chemicals, steel-intensive products, glass, and optical fiber. As a stylized fact, Canadian exports of industrial goods to the NAFTA region amount to about 17% of Canada's GDP. For Mexico, the comparable figure is about 27%; for the United States about 2.5%. Accordingly, restrictions on sourcing of production inputs have a much larger effect in terms of sourcing decision on producers in Mexico and Canada than on US producers. That being said, for ferrous metals and chemicals, there is little in the way of imports from third parties to divert towards US sources. Canada and Mexico each sources only about US\$ 23 million annually in these products from overseas. **We apply an NTB to third party chemical and ferrous metal imports to drive a 10% reduction in these imports from third parties for Canada and Mexico. We assume this has no impact on US imports from third parties.**

The higher administrative costs of monitoring compliance and reporting of the tighter ROOs on production inputs likely has a greater effect on costs. Rules of origin compliance costs overall are generally estimated to be ad valorem equivalents on the order of 2 to 7%. Labelling costs run on the order of 1%. As increasing North American content is the single most important policy objective of the USMCA, it seems fair to assume that vigilance will be high, requiring companies to invest in the record-keeping and input-tracing to ensure they are not caught offside and are charged duties (which could be applied retroactively in the case of post-entry audits). We assume this amounts to about a 1% cost of traded production. **This translates into a 0.27% cost for Mexican industrial production, a 0.17% for Canadian production and a 0.025% increase for US industrial production.**

3.1.6 Goods market regulation

As regards goods market regulations, the USMCA includes a number of provisions.

Chapter 12 promotes **regulatory alignment** for several manufacturing sectors, including information and communication technology, pharmaceuticals and medical devices, cosmetic products, and chemical substances.

- For information and technology products, the USMCA prohibits restrictions on imports of products for commercial applications containing encryption or requiring disclosure of the encryption keys, etc.; promotes electromagnetic compatibility; provides for mutual recognition for conformity assessments; and addresses regulations related to terminal equipment.
- For pharmaceuticals and medical devices, the USMCA promotes alignment of technical regulations, standards, conformity assessment procedures, marketing authorization, and notification procedures.
- For cosmetic products, the USMCA requires risk-based methods in developing regulations related to safety and health concerns, prohibits retesting solely for different shades or fragrant variants of a product, promotes alignment of labelling practices and requirements for tamper-evident packaging in the United States and security packaging in Canada.

- For chemicals, the USMCA promotes a risk-based approach to the assessment of chemicals for hazards to health or the environment, and promotes alignment of risk assessment methodologies and risk management measures.

It is not clear whether there are actual irritants that are being addressed by these measures (e.g., the cosmetics double-testing is carried over from the TPP, in which context it appeared to be aimed principally at Chile and Peru, which were afforded 5-year compliance periods). Accordingly, there is no basis for establishing a potential trade impact. Further, the specific issues addressed appear to have a very narrow incidence in terms of product coverage, so any trade impact would also be very narrow.

Finally, it is to be noted that the thrust of the measures is to align with the US risk-based approach to product safety regulation as opposed to the EU's approach which incorporates the precautionary principle, and so is globally not trade-promoting but rather creates grounds for future frictions and market distortions (for example, the difference between US and EU regulations concerning pig feed additives results in a sharp bifurcation of markets for producers who align with US standards and those who align with EU standards).

Chapter 28 provides for good regulatory practices in general; this addresses similar commitments already made by the parties under OECD and APEC codes and thus will not likely impact materially on goods market regulation.

3.2 Agricultural products market access

The NAFTA update has only limited general treatment of agricultural trade and bifurcates into separate annexes for Canada-US trade and US-Mexico trade. As regards the general elements, the measures dealing with biotechnology products establish a non-onerous regime for dealing with Low Level Presence (LLP) Occurrence of unauthorized DNA. This implies some easing of NTBs but the quantitative implications for intra-North American trade cannot be readily assessed.

As regards **dairy**, we calculate the average unit value of Canada's imports for the various quota categories over the period 2015-2017, converted to US dollar values expressed in 2014 USD for compatibility with the underlying GTAP V10 database, and calculate the straight-line increase in quota value over the first six years of the implementation period. **This results in additional dairy imports by year six of about US\$ 227 million. This is about two-thirds of Canada's dairy imports from the United States in recent years.**

Given the source of the US pressure on Canada in respect of dairy – which stemmed from Wisconsin which has a subsidy-driven excess supply in search of markets – and given the open questions about how the quota system would actually work, it was not possible to work out the impacts of Canada's concessions at the provincial level differentiated by province on any empirically grounded basis. Accordingly, the impacts are allocated by province based on established patterns of dairy imports from the United States.

Table 11: Canada’s Dairy Market Access Commitments, MT and USD ‘000s at 2014 prices

Product	Quota (MT)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Cheese (MT)	12,500	2,083	4,167	6,250	8,333	10,417	12,500
Value of Quota (USD)		15,467	30,934	46,401	61,868	77,335	92,802
Fluid Milk (MT)	50,000	8,333	16,667	25,000	33,333	41,667	50,000
Value of Quota (USD)		5,059	10,118	15,176	20,235	25,294	30,353
Cream	10500	1,750	3,500	5,250	7,000	8,750	10,500
Value of Quota		4,457	8,914	13,370	17,827	22,284	26,741
Skim Milk Powder	7,500	1,250	2,500	3,750	5,000	6,250	7,500
Value of Quota (USD)		2,485	4,970	7,455	9,940	12,425	14,910
Butter and Cream Powder	4,500	865	1,730	2,595	3,460	4,325	5,190
Value of Quota		3,433	6,866	10,298	13,731	17,164	20,597
Concentrated and Condensed Milk	1,380	230	460	690	920	1,150	1,380
Value of Quota (USD)		206	412	618	824	1,030	1,237
Yogurt and Buttermilk	4,135	689	1,378	2,068	2,757	3,446	4,135
Value of Quota		2,641	5,282	7,923	10,564	13,205	15,846
Powdered Buttermilk	520	87	173	260	347	433	520
Value of Quota (USD)		264	527	791	1,054	1,318	1,582
Products of Natural Milk Constituents	2,760	460	920	1,380	1,840	2,300	2,760
Value of Quota (USD)		1,843	3,686	5,529	7,372	9,215	11,058
Ice Cream and Ice Cream Mixes	690	115	230	345	460	575	690
Value of Quota (USD)		366	732	1,098	1,464	1,830	2,197
Other Dairy	690	115	230	345	460	575	690
Value of Quota (USD)		267	534	800	1,067	1,334	1,601
Whey	4,134	689	1,378	2,067	2,756	3,445	4,134
Value of Quota (USD)		1,229	2,457	3,686	4,914	6,143	7,371
Total Value of Quota		37,715	75,431	113,146	150,862	188,577	226,293

Source: calculations by the authors.

Canada also committed supply management reforms by eliminating class 7 milk, which was created to allow Canadian dairy suppliers to supply downstream Canadian cheese and processed food manufacturers at lower prices to compete with diafiltered milk ingredients: these are non-fat milk solids filtered to achieve a high protein concentration and trade not as dairy products but mainly under HS 3504 (milk protein isolates) as well as HS 2106 (protein concentrates) and HS 3502 (albumins). These tariffs line were not constrained by supply management. **The impact of Canada’s measures to offset the imports of diafiltered milk reduced imports from the United States of HS 3504 by about US\$ 50 million. We assume that this will be added back into US chemical exports to Canada due to the changes in supply management administration.**

The USMCA offers Canada reciprocal market access in dairy but also slaps tariffs on any Canadian exports above Canada’s global WTO limits for subsidized agricultural products. In addition, the agreement establishes a price floor for skim milk solids used to produce non-fat dry milk, milk protein concentrates, and infant formula; this floor will be set by the US price for non-fat dry milk. Further, Canada agreed to cap its exports of skim milk powder and milk protein concentrates, which had increased in volume from around 17,000 tons to about 73,000 tons. Under the agreement, the aggregate export cap will be 55,000 tons in the first year, falling to 35,000 MT in the second year and thereafter. Exports that exceed this threshold will face an export surcharge of C\$0.54 per kilogram, which is about a 30% export tax. **We reduce Canada’s dairy exports to the “rest of the world” by US\$ 35 million in 2020 and by US\$ 70 million in each year after, based on the unit value of the product group in 2017.** As this rollback does not impact BC’s exports, it is entirely allocated to the Rest of Canada.

Infant formula exports also come under a new export cap. This will be 13,333 MT in the first year, increasing to 40,000 MT in the second year. The increase appears to accommodate the Feihe dairy processing plant being constructed in Kingston, Ontario to produce infant formula for export to China. We make no adjustment for this as the expansion would be implicitly in the baseline. Both caps will be increased by 1.2 percent a year as a normal growth increment, thereafter. This is beyond the projection horizon for the study.

We follow the same procedure to calculate the value of the tariff rate quota commitments for **poultry and eggs**. This results in an increase over six years to almost US\$ 200 million in additional poultry and egg imports (Table 12)

Table 12: Canada’s Poultry Market Access Commitments, MT and USD ‘000s at 2014 prices

Product	Quota commitment (MT)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Chicken	57,000	47,000	49,000	51,000	53,000	55,000	57,000
Value of Quota (USD)		127,684	133,117	138,550	143,984	149,417	154,851
Turkey	5,000	1,000	1,000	1,000	1,000	1,000	1,000
Value of Quota (USD)		4,797	4,797	4,797	4,797	4,797	4,797
Eggs and Egg Products (units)	10,000,000	1,666,667	3,333,333	5,000,000	6,666,667	8,333,333	10,000,000
Value of Quota (USD)		6,074	12,148	18,222	24,296	30,370	36,444
Total Value of Quota		138,554	150,062	161,569	173,076	184,584	196,091

Source: calculations by the authors.

Finally, the USMCA requires changes to Canada’s **wheat grading system**. Both Canada and the United States are major exporters of wheat to the rest of the world and bilateral trade is relatively small as a share of total exports to the world for both. Insofar as the changes reduce quality standards (an allegation of Canada’s wheat farmers), it is negative; insofar as it removes an NTB to US exports to Canada, the USMCA represents a minor point of liberalization. We were unable to put a value on this element of the USMCA.

3.3 Services

We develop the shock for the USMCA based on changes to the OECD services trade restrictiveness index (STRI), taking into account both changes to applied measures and in bindings. The changes are evaluated compared to the levels of market access provided under the NAFTA. The difference between applied and bound market access is “water” – that is liberalization that can be withdrawn without penalty under the NAFTA. “Water” is a proxy for uncertainty as it measures the extent to which a country’s restrictiveness could increase. Following Ciuriak, Dadkhah and Lysenko (forthcoming),² we assign “water” a value equal to 0.4 times the restrictiveness power of actual restrictions. Thus the change in market access is calculated as change in applied market access (i.e., a change in the USMCA STRI relative to the NAFTA) plus 0.4 times the change in “water” due to the operation of the USMCA:

$$NTB = \text{Applied} + 0.4 * (\text{Bound} - \text{Applied})$$

² For previous studies, we have relied on the estimate of the coefficient on uncertainty from Ciuriak and Lysenko (2016) of 0.5. This study has been accepted for publication by the World Trade Review on the basis of revised estimates which place this parameter at 0.4. For this and future studies, we will be using this value.

We convert the percentage change in the NTB into a trade cost impact by first aggregating the 24-sector breakdown of services into 9 GTAP study sectors, on the basis of simple averages, and apply the percentage changes in the NTBs at the GTAP study sector level to estimates of sectoral trade costs in ad valorem equivalent (AVE) terms.

As regards sources for the underlying assumptions, we obtain AVEs for GTAP services sectors from Fontagné, et al. (2016). We assume that only 25% of measured AVEs correspond to barriers to services trade in the OECD’s STRI framework and thus amenable to change under the USMCA. This assumption is consistent with the general conclusion obtained from the ECORYS (2009) survey of non-tariff measures to goods and services, that 50% could in principle be removed – i.e., that they were “actionable”; and the CEPR (2013) assessment that an ambitious FTA could reduce barriers by 50% of actionable measures (i.e., by 25% of the total observed measures).

Table 12 sets out the scores respectively for Canada Mexico and the United States, aggregated to the GTAP sectors.

Table 13: Services Commitments Under the USMCA, Applied and Bound

	NTB Before	NTB After	% Change	NTB AVEs	Trade Cost Impact USMCA %
Canada					
Construction	0.103	0.103	0.000	21.1	0.00
Trade	0.079	0.079	0.000	15.1	0.00
Transport nec	0.096	0.096	0.000	10.3	0.00
Water Transport	0.119	0.122	0.030	16.5	0.50
Air Transport	0.232	0.232	0.000	25.9	0.00
Communications	0.100	0.105	0.057	17.0	0.97
Financial Services	0.093	0.082	-0.113	18.5	-2.09
Insurance	0.077	0.077	0.000	15.2	0.00
Business Services	0.088	0.101	0.144	16.4	2.36
Trade-weighted					0.86
United States					
Construction	0.144	0.144	0.000	21.1	0.00
Trade	0.070	0.070	0.000	17.6	0.00
Transport nec	0.178	0.176	-0.013	7.6	-0.10
Water Transport	0.128	0.132	0.028	30.5	0.85
Air Transport	0.254	0.254	0.000	22.8	0.00
Communications	0.079	0.078	-0.016	14.6	-0.24
Financial Services	0.106	0.096	-0.099	16.1	-1.59
Insurance	0.086	0.086	0.000	10.2	0.00
Business Services	0.110	0.116	0.054	11.7	0.63
Trade-weighted					0.06
Mexico					
Construction	0.148	0.148	0.000	39.2	0.00
Trade	0.076	0.076	0.000	19.1	0.00
Transport nec	0.191	0.191	0.000	13.4	0.00
Water Transport	0.108	0.108	0.000	40.4	0.00
Air Transport	0.254	0.254	0.000	40.6	0.00
Communications	0.107	0.103	-0.042	30.3	-1.26
Financial Services	0.152	0.141	-0.069	35.7	-2.47
Insurance	0.083	0.083	0.000	6.6	0.00
Business Services	0.160	0.153	-0.046	38.9	-1.78
Trade-weighted					-1.83

Source: OECD STRI and calculations by the authors.

As can be seen, overall the USMCA does not liberalize services for Canada or the United States; indeed, it results in a marginal increase in restrictiveness, notwithstanding some liberalization of financial services, mainly due to the fact that it reduces the value of the parties' commitments through a clause that allows the parties to revert to their WTO GATS regime, without penalty. This in effect removes the binding effect of some of the commitments made under the NAFTA, which did not include this clause. Mexico, however, does improve on its NAFTA commitments, with improved market access in business services, financial services, and communications.

3.4 Investment

We develop the shock for the USMCA investment measures based on changes to the OECD foreign direct investment restrictiveness (FDIR) index, taking into account both changes to applied measures and the effect of changes in bindings for services sector Mode 3 market access. The changes are evaluated compared to the levels of market access provided under the NAFTA. The percentage changes in the index are applied to the phantom tax in the GTAP-FDI model framework. Table 14 sets out the implications of the USMCA for investment.

Table 14: Investment Commitments Under the USMCA, Applied and Bound

	NTB Before	NTB After	% Change USMCA
Canada			
Construction	0.106	0.121	13.69%
Trade	0.160	0.173	8.06%
Transport nec	0.084	0.089	6.26%
Water transport	0.218	0.360	64.95%
Air transport	0.413	0.413	0.00%
Communication	0.220	0.253	14.61%
Financial services nec	0.0586	0.0594	1.37%
Insurance	0.090	0.095	5.18%
Business services nec	0.088	0.119	35.42%
United States			
Construction	0.071	0.078	10.27%
Trade	0.078	0.085	8.78%
Transport nec	0.250	0.206	-17.41%
Water transport	0.291	0.427	46.86%
Air transport	0.375	0.375	0.00%
Communication	0.154	0.152	-1.19%
Financial services nec	0.169	0.170	0.47%
Insurance	0.155	0.159	3.01%
Business services nec	0.057	0.062	8.20%
Mexico			
Construction	0.107	0.107	0.00%
Trade	0.097	0.097	0.00%
Transport nec	0.282	0.281	-0.41%
Water transport	0.279	0.279	0.00%
Air transport	0.375	0.375	0.00%
Communication	0.243	0.220	-9.42%
Financial services nec	0.198	0.199	0.40%
Insurance	0.148	0.153	3.15%
Business services nec	0.141	0.126	-10.10%

Source: OECD STRI, GTRI and FDIR, indexes and calculations by the authors. Note a negative impact on the NTB denotes a reduction in investment barriers and liberalization; a positive impact means an increase in NTBs.

As with services, the main impacts are on the removal of bound commitments under the NAFTA through the escape clause that allows parties to revert to their GATS commitments without penalty. One measure is applicable horizontally across all sectors, including goods: (Article 14.11: Senior Management and Boards of Directors). However, there is a horizontal reservation in the schedule of commitments for US and Canada and Mexico does not have any restrictions; accordingly, it does not improve upon existing practice.

The larger impact of the USMCA on investment, however, could come from an increase in uncertainty for investment in Canada and Mexico aimed at serving the US market. The “America First” stance by the Trump Administration, including the “weaponization” of uncertainty through the threat of tariffs on US firms that invest abroad to serve the US market, will tend to reduce the optimal level of investment for firms in Canada, given the strong orientation of Canada to serving the US market. The exodus of foreign investment out of the United Kingdom since the Brexit referendum suggests that the impact of heightened uncertainty will impact existing investments – notwithstanding sunk costs – and not only future investments.

How large this effect might be is unclear. A slowdown in inflows into or a general exodus of foreign investment from Canada that could be attributed to the Trump Administration uncertainty effect is not in evidence. Moreover, there is no clear empirical evidence that including ISDS provisions increases investment – and conversely, ISDS has been criticized in Canada for a chilling effect on legitimate public sector regulation. Finally, uncertainty has been increased with or without the USMCA in place and in effect should be treated by Canada as a sunk cost. **Accordingly, a general chilling effect on investment into Canada is not incorporated in the simulations.**

Nonetheless, this remains a caveat concerning the results, since the USMCA incorporates measures that instrumentalizes this uncertainty through the sunset provisions, elimination of investor-state dispute settlement (for Canada), the extremely grudging acceptance of retention of the binational panel review of trade remedy decisions, the resistance to fixing the dysfunction NAFTA state-to-state dispute settlement mechanism, and caps on exports on autos, and other elements of “managed trade”. A sense of its potential scale can be obtained based on the following considerations. The share of total shipments of goods and services that go to the United States from Canada in total shipments to all destination (including the domestic market) is rather small. Based on the GTAP V10 database estimates for domestic shipments and trade, this share is about 11% (excluding social services). If the optimal level of investment in Canada were reduced by that full share, the decrease in the FDI stock in Canada would amount to about US\$ 66 billion. Accordingly, the amount that is put at risk is large.

3.5 Intellectual Property

The USMCA intellectual property (IP) chapter is modelled on the 2016 Trans-Pacific Partnership (TPP), with some modifications in the direction of increasing the level of protection, principally by lengthening the term of protection, increasing the severity of penalties for infringement, and increasing border enforcement (Lipkus and Maddox, 2018).

3.5.1 Term Extension for Data Protection for Biologics

The USMCA extends data protection for biologics from eight years (Canada’s current level), to 10 years. A costing of this provision is not available, although estimates of tens to hundreds of millions in additional health care costs have been ventured in media commentaries. The Australian Productivity Commission concluded that term extension provisions in Australian law cost the Australian Pharmaceutical Benefits Scheme about AUD 260 million annually of which about 70% would be additional payments for imports. **Converted to a Canadian context, adjusting for exchange rate and size of the economy, we derive an estimate of USD 200 million increased annual spend.**

Biologics are the fastest growing drug segment so this figure will grow. At the same time flanking measures for review of drug pricing (which in a sense is an endogenous response of governments to the pressure to extend protection) could ameliorate the impact on drug prices. Overall spending on drugs in Canada is rising at about 4% per year (as per estimates for 2018); assuming 50% faster growth in biologics, we grow the increased spending on imported biologics at 6% per annum. This yields the following additional rent payments to the United States (in the simulations, this is treated as a reduction of welfare in Canada – as a reduction of gross national product rather than gross domestic product).

Table 15: Increased spending on biologics, USD millions at 2014 prices

	2020	2021	2022	2023	2024	2025
Canada	200	212	225	238	252	268
Mexico	50	53	56.25	59.5	63	67

Source: calculations by the authors based on various source.

3.5.2 Copyright Term Extension

The USMCA extends copyright protection to life of the author plus 70 years, an increase from the 50 years that Canada currently provides. While various estimates from hundreds of millions to billions have been floated for the present value of the extension on the value of copyrighted works, there is little empirical evidence on the impact of term extension on annual flows of payments (Watt, 2007). Rappaport (1998), in a Congressional Research Service study, examined the commercial value of books, music and movies from the period 1922-1941, whose copyrights were to expire during 1998-2017 under the 50-year term limit then in force in the United States. This studied generated estimates based on random sampling to determine what percentage of works were still commercially viable, and attributing average values to them. It concluded that, in 2017 (valued at 1997 prices), annual royalties for works created in 1922-1941 and renewed in 1950-1954 would total on the order of \$330 million. The greatest value in 2017 would be from the youngest cohort of copyrightable works exhausting copyright terms: for books, movies and musical works published between 1937 and 1941 and renewed in 1965-1969, the royalties were valued at US\$202 million.

Over the period 2020-2025, the works with copyright expiring would be from the period 1970-1975. Leveraging the estimate of US\$202 million, we convert that to US\$ at 2014 prices, which yields an estimate of US\$273 million. Projecting that forward for works losing copyright in 2020-2025 on the basis of Rappoport’s estimate of the increase for works with copyright expiring

between 2008-2012 and 2013-2017, we expand that to about US\$400. For Canada, a comparable figure would then be about 10% of that or about US\$40 million. Given the dominance of foreign content, **we make a round figure assumption of US\$30 million in annual increased outflows in 2020. We further grow this at about 5% per annum (rising to US\$ 38 million per year in 2025 or 35% greater than the 2020 figure.**

We use the ratio of Canadian exports to imports of cultural products (about 40%) to generate an estimate of the royalties to Canada coming in from abroad (for practical reasons, we assign this entirely to the United States). The results are set out in Table 16. We treat this as an impact on welfare (effectively as a change of gross national product, as opposed to gross domestic product).

Table 16: Payments and Receipts for Copyright under Extended Copyright Protection, USD millions at 2014 prices

	2020	2021	2022	2023	2024	2025
Copyright Payment Outflows	30.0	31.6	33.3	35.1	37.0	38.9
Copyright Receipt Inflows	12.0	12.6	13.3	14.0	14.8	15.6

Source: back of the envelope calculations by the authors based on various sources.

3.5.3 Other Intellectual Property Changes

Chapter 29(b) addresses “Transparency and Procedural Fairness for Pharmaceutical Products and Medical Devices”. It introduces the Australia-US FTA language concerning “the need to recognize the value of pharmaceutical products and medical devices through the operation of competitive markets or by adopting or maintaining procedures that appropriately value the objectively demonstrated therapeutic significance of a pharmaceutical product or medical device.” It also provides for a review that affords firms the opportunity to obtain a reconsideration of a disputed ruling. Australian experience suggests that this works to raise pharmaceutical prices and health costs and thus to reduce consumer welfare. While this measure will likely increase rent outflows from Canada and Mexico to the United States, we are unable to assign an impact estimate, especially given that policy efforts will likely be made to offset any cost increase from this avenue.

The main other areas where the USMCA introduced changes to which we do not attempt to assign quantitative impacts include:

- restoration of patent term for Patent Office delays (new for Canada);
- new criminal and civil penalties for trade secret theft;
- intensified border measures to interdict counterfeit and pirated goods in transit in Canada;

3.6 Data and Digital Economy Measures

3.6.1 Digital Services

We draw on the recently released estimates of OECD’s STRI for digital services to evaluate the USMCA impact on data flows in their capacity as the medium for delivery of services. As can be seen, the USMCA does not liberalize an already highly liberal environment for digital trade; however, it does substantially improve the binding of current applied practice. We do not attempt to construct a quantitative impact estimate of this since an empirical basis has not been established.

Table 17: USMCA Impact on Digital Services, Applied and Bound

	Current Practice		USMCA	
	Current	Bound	Current	Bound
Canada	0.123	0.660	0.123	0.408
Mexico	0.141	0.581	0.141	0.368
USA	0.123	0.620	0.123	0.368

Source: OECD STRI and calculations by the authors.

3.6.2 Data as asset

Data has various roles in the emerging data-driven economy (DDE) based on big data, artificial intelligence (AI) and machine learning (ML) (Ciuriak, 2018). Trade agreements to date address only its role as a medium of services delivery and provide carve-outs for data regulation for other issues, such as the treatment of data in its role as the soft infrastructure of the DDE and the regulation of use of data (privacy, social and political influence). There is, however, a third role for data as the essential capital stock of the DDE. In this role, it has substantial asset value, as is evidenced by the market valuation of the world’s largest firms, much of which is underpinned by their intangible assets, of which data is the primary component. The value of data promises to grow steeply as the Internet of Things (IoT) develops – indeed, there is a “data goldrush” underway because of the anticipated competitive benefits to companies with proprietary data. The value of data in this sense is not captured in the economic accounts and thus cannot at this point be included in quantifications of USMCA impacts. What can be stated with reasonable confidence is that the value flows are very large and the impact of the USMCA data provisions on the net benefits, if material, would likely dominate the impact of the USMCA overall.

4 Results

Table 18 summarizes the macroeconomic impacts of the USMCA on the global economy. Generally, the agreement has negative effects, but with North America, these mainly disproportionately heavily on Canada and Mexico. While the United States suffers a lesser impact than its North American partners, the trade-restrictive features outweigh the more modest liberalizing measures and result in an overall negative impact. Accordingly, North American output and welfare fall. Global welfare declines by over CAD 50 billion.

Table 18: USMCA Impact on Global Output and Welfare

	Real GDP (% change)	Welfare (USD millions at 2019 prices)
Canada	-0.40	-10.8
Mexico	-0.79	-14.9
United States	-0.10	-17.4
China	0.00	-0.2
EU28	0.01	1.0
Memo: NAFTA	-0.18	-43.0
Memo: World total	-0.03	-40.7

Source: calculations by the authors.

Table 19 breaks down the impacts by source, showing the impact of the tariff-related and ROOs measures on goods, of services measures, of FDI measures and the IP changes. The major impacts

on welfare come from the restrictive measures of goods trade. The services impacts are virtually nil for Canada and the United States, and only register at the third decimal point in percentage terms on Mexico's real GDP. The FDI measures (which do not take into account the impact of the USMCA on investment from the threat of restricted future access to the US market), have a modestly negative impact on Canadian real GDP but otherwise do not affect the region materially. The IP measures reduce Canadian welfare by about USD 440 million, while raising US welfare by about USD 460 million.

Table 19: USMCA Sources of Impacts

	Real GDP (% change)				Welfare (USD billions at 2019 prices)			
	Goods	Services	FDI	IP	Goods	Services	FDI	IP
Canada	-0.371	0.000	-0.024	-0.008	-9.79	0.02	-0.58	-0.44
Mexico	-0.797	0.004	0.003	-0.003	-14.89	0.06	0.06	-0.11
United States	-0.097	0.000	0.000	0.001	-17.95	0.11	0.00	0.46

Source: calculations by the authors.

Table 20 summarizes the macroeconomic impacts for the North American economies. Generally, the cost-raising features of the USMCA are more negative for real GDP than would be simple tariffs (which, as noted, are a more efficient form of protection). Accordingly, for the amount of trade diverted, the cost is higher. The net effect on US prices is to push them higher resulting in a positive change in the value of GDP, notwithstanding the decline in the quantity of output; however, for Canada and Mexico, the strong negative impacts on real GDP drive prices down.

Table 20: USMCA Macroeconomic Impacts on the North American Economies

	Canada	Mexico	United States
Macroeconomic Impacts			
Economic Welfare (USD millions)	-10,782	-14,876	-17,378
Economic Welfare (% change)	-0.493	-0.825	-0.089
GDP value change (USD millions)	-15,713	-24,901	3,602
GDP value change (%)	-0.606	-1.210	0.016
GDP volume (% change)	-0.404	-0.794	-0.096
GDP deflator (% change)	-0.203	-0.420	0.112
Terms of Trade (% change)	-0.045	0.101	0.088
CPI (% change)	-0.148	-0.427	0.086
GDP by Expenditure Category			
Consumption (% change)	-0.533	-0.835	-0.092
Government Expenditure (% change)	-0.347	-0.512	-0.052
Investment (% change)	-0.395	-1.489	-0.139
Total Exports of Goods & Services (% change)	-0.644	-1.180	-0.096
Total Imports of Goods & Services (% change)	-0.802	-1.657	-0.089
Trade balance (USD millions)	1,579	4,782	2,338
Factor Markets			
Capital Stock (% change)	-0.098	-0.406	-0.033
Real wage of Unskilled labour (% change)	-0.239	-0.406	-0.031
Real wage of skilled labour (% change)	-0.235	-0.490	-0.040
Jobs (Number)	-16,427	-87,781	-20,370
Productivity (% change)	-0.321	-0.638	-0.084

Source: calculations by the authors. Note: Job impacts are based on a labour supply elasticity of 0.35 to the real wage.

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Appendix A: The GTAP-FDI Model

This appendix provides a non-technical overview of the modelling methodology used to generate the simulations. We apply a recursive-dynamic variant of the standard Global Trade Analysis Project (GTAP) computable general equilibrium (CGE) model which incorporates foreign direct investment (FDI) to assess the impacts of the policy shocks. The technical specifications of the GTAP-FDI model are described in Ciuriak, Xiao and Dadkhah (2017).

CGE models integrate a number of accounts to provide a complete description of an economy:

- The standard national income and expenditure accounts;
- A breakdown of industry by sector that reflects inter-sectoral input-output links, which take into account internationally-sourced intermediate goods and services (in all, the GTAP dataset allows for the representation of up to 57 sectors, 43 of which are goods);
- A production function for each sector that combines sector-specific inputs of capital, skilled and unskilled labour, and intermediate inputs; and
- A trade account that models the international linkages for each sector of the economy.

The CGE framework generates impact results for the following aggregates:

- National accounts (consumption, investment, government expenditure, real exports, and real imports);
- Economic welfare (equivalent variation);
- Sectoral production, imports, exports, and domestic shipments;
- Impacts on capital formation and labour (skilled and unskilled);
- Price impacts (consumer prices and terms of trade); and
- Government revenue.

On the production side, the model evaluates efficiency gains from reallocation of factors of production across sectors. In the first stage, land, labour (skilled and unskilled), and capital substitute for one another to generate domestic value added by sector; intermediate inputs, which include imported intermediates, substitute for domestic value added in a second stage.

On the demand side of the model, an aggregate Cobb-Douglas utility function allocates expenditures to private consumption, government spending, and savings so as to maximize per capita aggregate utility. Following a shock, the changes in consumption are allocated across these three aggregates based on their income shares in each region. Private household demand responds to changes in prices and income based on the standard Constant Difference of Elasticities demand system in the GTAP model.

The trade module assumes imperfect substitution based on product differentiation across regions. The key parameter determining the scale of impacts on trade from a tariff shock is the elasticity of substitution – a high elasticity of substitution generates relatively large trade impacts for a given size of tariff shock. Note that the GTAP sectors reflect relatively large aggregates of individual

products; accordingly, substitution elasticities are lower than they would be for product categories that are defined more narrowly and, thus, are more substitutable for each other.

Economic welfare is based on “equivalent variation”, the lump sum payment at pre-shock prices that would have to be made to households to leave them as well off as in the post-shock economy.

We use a perfect competition specification of the GTAP model. Some models incorporate imperfect competition for industrial goods sectors, introducing price mark-ups that represent monopolistic pure profits in equilibrium. These price mark-ups are reduced by intensified competition under trade liberalization, generating additional welfare gains.³ A number of recent models incorporate features of heterogeneous firms, which generate productivity gains from reallocation of market shares to more productive firms under trade liberalization.⁴ The key distinction across modelling approaches is how they address the relationship between trade and productivity. We address this issue through the modelling protocol, as described below in the discussion of closures, rather than through the specification of the model itself. An appropriate test for reasonableness of the estimates of economic gains is the comparison of the impacts on two-trade in real terms and the change in GDP. Another key benchmark for reasonableness is the relationship between real wages and productivity. When these relationships are broadly aligned with historical experience, there is greater confidence that the estimates are in a reasonable zone.

For a technical description of the basic GTAP model, see Hertel (1997); for a discussion of the degree of confidence in CGE estimates, see Hertel et al. (2004).

³ See Roson (2006) for a review of the issues raised by this methodology.

⁴ These include Zhai (2008); Dixon et al. (2013); Balistreri and Rutherford (2013); Oyamada (2013); and Itakura and Oyamada (2013). See Roson and Oyamada (2014) for a review.