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Putting Canada in the penalty box: trade and welfare effects of eliminating NAFTA

Abstract

Three years ago, very few economists would have imagined that one of the newest and fastest growing research areas in international trade is the use of quantitative trade models to estimate the economic welfare losses from dissolutions of major countries' economic integration agreements (EIAs). In 2016, "Brexit" was passed in a United Kingdom referendum. Moreover, in 2019, the existence of the entire North American Free Trade Agreement (NAFTA) is at risk if the United States withdraws - a threat President Trump has made if the proposed United States-Mexico-Canada Agreement is not passed by the U.S. Congress. We use state-of-the-art econometric methodology to estimate the partial (average treatment) effects on international trade flows of the six major types of EIAs. Armed with precise estimates of the average treatment effect for a free trade agreement, we examine the general equilibrium trade and welfare effects of the elimination of NAFTA (and for robustness U.S. withdrawal only). Although all the member countries' standards of living fall, surprisingly the smallest economy, Mexico, is not the biggest loser; Canada is the biggest loser. Canada's welfare (per capita income) loss of 2.11 percent is nearly two times that of Mexico's loss of 1.15 percent and is nearly eight times the United States' loss of 0.27 percent. The simulations will illustrate the important influence of trade costs - international *and intranational* - in contributing to the gains (or losses) from an economic integration agreement's formation (or elimination).

JEL-Codes: F100, F130, F140, F150.

Keywords: international trade, economic integration agreements, gravity equations.

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1 Introduction

Given that more than 300 international trade agreements have been recognized as in force by the World Trade Organization, a reasonable assumption is that there must be a net benefit to the member nations' standards of living, typically captured by increases in per capita gross domestic products (GDPs). Many studies using the "gravity equation" of international trade have confirmed *ex post* positive effects of economic integration agreements (EIAs) on country-pairs' trade flows. Estimates of the resulting partial (treatment) effects can then be used to calculate general equilibrium welfare effects based upon firm theoretical foundations. The vast majority of studies using these techniques have found that members of new EIAs improve their (average) standards of living.

Only three years ago, it would have been rare to have come across a serious observer of the world economy that conjectured the globalization of the world economy – in terms of the proliferation of economic integration agreements and trade-policy liberalizations – had peaked. Yet now in 2019 we have witnessed a sitting President of the United States of America (USA) suggesting the USA should withdraw from its most important EIA, the majority of voters in the United Kingdom voting in 2016 to leave the European Union ("Brexit"), and (following a 2018 national vote) the third largest economy in continental Europe – Italy – questioning its continued membership in the European Union.

On the heels of these events, one of the newest and fastest growing areas of research in international trade has become the use of modern medium-sized quantitative trade models to model the *dissolution* of historical EIAs; analyses of Brexit abound. In this context, this paper has three goals. First, extending Baier and Bergstrand (2007), Baier, Bergstrand, and Feng (2014) and Baier, Bergstrand, and Clance (2018), we estimate the partial effects of *six* different types of EIAs on bilateral trade flows using state-of-the-art econometric specifications of a microeconomic-founded gravity equation.[1] Unlike Baier and Bergstrand (2007) and Baier, Bergstrand, and Feng (2014), we distinguish among one-way preferential trade agreements (GSP), two-way preferential trade agreements (PTA), free trade agreements (FTA), customs unions (CU), common markets (CM), and economic unions (ECU).

Second, we use our estimate of the partial effect of an FTA to estimate the general equilib-

[1] The econometric specification is consistent with several recent theoretical foundations for the trade gravity equation based upon Krugman, Ricardian, Armington, and Melitz type models, cf., Baier and Bergstrand (2001), Eaton and Kortum (2002), Anderson and van Wincoop (2003), and Chaney (2008), respectively.

rium trade and welfare (or per capita GDP) effects of eliminating the North American Free Trade Agreement (NAFTA), alongside several related scenarios (including just the USA withdrawing from NAFTA). President Trump's administration subjected NAFTA to renegotiation in 2018, which led to the leaders of Canada, Mexico, and the United States signing a new agreement in November 2018, the United States-Mexico-Canada Agreement (USMCA). However, President Trump has stated on numerous occasions publicly that if the USMCA is not passed by the U.S. Congress, he will give six months notice that the United States will withdraw from NAFTA. Given this topical and important issue, a second goal of this paper is to provide a set of estimates of the per capita GDP implications for the three members – as well as for other economies – of NAFTA's elimination. Using techniques inspired by Head and Mayer (2014), Costinot and Rodriguez-Clare (2014), and Baier, Kerr, and Yotov (2017), we employ a structural gravity-equation foundation to estimate the welfare effects of the dissolution of NAFTA. Such techniques have been employed recently to explore the trade and welfare effects of the departure of the United Kingdom from the European Union (Brexit) and the possibility of "Non-Europe." This is the first study, to our knowledge, that uses this modern trade model approach to examine quantitatively the dissolution of NAFTA. In a robustness analysis, we will also provide welfare-effect estimates of several other possible scenarios.

Third, by considering the dissolution of NAFTA we are able to examine the relative impacts of economic sizes versus trade costs – both international *and intranational* – in determining the welfare gains from trade. In more traditional numerical general equilibrium models such as GTAP, the focus upon price elasticities often overshadows the roles of international and intranational trade costs. Typically, economically smaller countries – such as Mexico – would likely suffer the most in per capita GDP from elimination of NAFTA in traditional models. For the impatient reader, we find that Canada's economic loss of 2.11 percent of per capita GDP is almost *two times* that of Mexico's loss of 1.15 percent, and Canada's loss is nearly *eight times* the loss of the United States of 0.27 percent. The simulations will illustrate the important influence of international *and intranational* trade costs in contributing to the gains (or losses) from an economic integration agreement's formation (or dissolution). Our econometric estimates will generate evidence that intranational trade costs are smaller in Mexico than in Canada (attributable to the relative dispersions of intranational economic activity). The higher intranational trade costs in Canada relative to those in Mexico will contribute importantly to Canada's relatively larger welfare loss from an elimination of NAFTA.

The remainder of the paper is as follows. Section 2 provides an overview of the methodology and relevant literature. Section 3 discusses the theoretical foundation for the empirical work. Section 4 discusses the econometric methodology for estimating the partial EIA effects. Section 5 discusses the sources of data. Section 6 provides the empirical results for the partial effects. Section 7 addresses the methodology for estimating the general equilibrium effects of the elimination of NAFTA, provides the numerical results for the "No-NAFTA" scenario, and provides a robustness analysis of the general equilibrium estimates and considers some alternative scenarios. Section 8 provides conclusions.

2 Methodology and Literature Review

There is now a well established literature on estimating the general equilibrium (GE) effects of a trade-policy liberalization – or, in our case, a trade-policy restriction – on trade flows and welfare (where welfare is generally measured by per capita income or per capita GDP). The literature on this new wave of medium-sized quantitative GE models is summarized in Head and Mayer (2014), Costinot and Rodriguez-Clare (2014), and Baier, Kerr, and Yotov (2017). In this paper, we examine in particular the potential welfare losses for the three members of the North American Free Trade Agreement – Canada, Mexico, and the United States – of eliminating NAFTA using this approach. In contrast to the earlier computable general equilibrium (CGE) models of trade and welfare of the previous fifty years, a distinguishing feature of the newer models is the prominent role of bilateral international *and intranational* trade costs.

The approach to quantify the gains (losses) from forming (dissolving) an EIA requires first to estimate the partial (bilateral trade-flow) effects of an EIA. The empirical gravity-equation literature has advanced over the past decade econometrically such that researchers can better estimate *ex post* – with precision and consistency – the partial effects of different types of EIAs on country-pairs' trade flows. Panel econometric techniques and, more recently, high-dimensional fixed effects have facilitated generating these estimates. With the benefit of trade-flow and EIA data sets spanning a large number of country-pairs and a large number of years, studies such as Baier and Bergstrand (2007) and Baier, Bergstrand, and Feng (2014) have provided, respectively, estimates of an overall partial effect of EIAs on trade flows and estimates of the partial effects of one-way preferential trade agreements (GSP), two-way preferential trade agreements (PTA), free trade agreements (FTA), and "deeper" EIAs (combining together customs unions (CU), common markets (CM), and economic unions (ECU)). In contrast to Baier and Bergstrand (2007) and Baier, Bergstrand, and Feng (2014), the present paper will provide separate estimates of *all six* types of agreements.

A novel feature of the present study is the use of an *ex post* (treatment effect) estimate for an *ex ante* analysis. Historically, gravity equations have been used to estimate *ex post* the partial effects of specific agreements on trade flows, often years after the agreement was implemented. One of the benefits of this approach is that the "average treatment effect" captures *ex post* in principle *all* the factors that contributed to the trade-policy liberalization, tariff rates *as well as* policy-related *fixed* trade costs.[2] For *ex ante* analysis, average treatment effects from past agreements can be used to predict future agreements' average treatment effects. The present case is atypical in that it addresses the *dissolution* of an existing agreement. On the assumption of symmetric behavior, one can employ an *ex post* partial effect of the formation of NAFTA as the (negative of the) expected future partial effect of NAFTA's dissolution. We will provide a robustness analysis of our partial effect estimate.

Armed with an estimate of the average treatment (partial) effect of an FTA, we can combine this information with an estimate of the "trade elasticity," initial trade flows, populations, and national incomes to derive a quantitative estimate of the welfare loss from eliminating any EIA. Depending upon the underlying theoretical framework – Ricardian, Armington, Krugman, or Melitz model – the trade elasticity plays a central role in the welfare calculations. Typically, the trade elasticity is interpreted in an Armington or Krugman model as the elasticity of substitution in consumption. In a Ricardian or Melitz model, this elasticity is interpreted as an (inverse) index of the dispersion of firms' productivities. An entire separate literature exists estimating the value of the trade elasticity; most estimates lie in the range of 2 to 10. More importantly, Arkolakis, Costinot, and Rodriguez-Clare (2012) show the conditions for which – regardless of the underlying theoretical interpretation of the trade elasticity – the welfare estimates are isomorphic to the underlying model. In the section later on computing the welfare effects of eliminating NAFTA, we will discuss in detail

[2]Typically, *ex ante* analyses of proposed EIAs use tariff-rate reductions specified in a proposed agreement in the context of a structural trade model to predict the trade-flow effects, and then consequently the welfare effects of the proposed agreement. Unfortunately, researchers seldom can identify *quantitatively* fixed trade costs that also are liberalized in such agreements, understating potential trade and welfare effects. In our context (if properly specified econometrically), the average treatment effect captures *ex post* the effects on trade flows of all trade-policy-related factors that contributed to the EIAs impact (many of which cannot be quantified *ex ante*). We assume that the dissolution of an agreement removes symmetrically all of the policy liberalizations that occurred during the EIA formation, and so the treatment effect works in reverse.

how to estimate the numerical GE model. However, we note the relevance of this approach, used recently in similar timely EIA events. For instance, Brakman, Garretsen, and Kohl (2017) and Oberhofer and Pfaffermayr (2017) used the same methodology to evaluate the potential trade and welfare effects of the United Kingdom leaving the European Union (Brexit) and Mayer, Vicard, and Zignago (2018) recently used this methodology to evaluate the potential trade and welfare effects of a possible dissolution of the European Union (EU).

However, to our knowledge, no study has used this modern quantitative methodology based upon formal theoretical foundations to evaluate the possible dissolution of NAFTA. Moreover, our study is unique because we can distinguish sharply using a new numerical trade model the importance of *intranational*, as well as international, trade costs in the gains (losses) from formation (dissolution) of EIAs.

3 Structural Gravity for Trade Flows

Following Baier, Kerr, and Yotov (2017), it is now well established that aggregate bilateral trade flows between country-pairs can be explained theoretically by a (Melitz-model-based) general equilibrium structure:

$$X_{ij} = \left(\frac{\tau_{ij}}{\Pi_i \tilde{P}_j}\right)^{-\theta} (W_i L_i)(W_j L_j) \tag{1}$$

$$\Pi_i = \left[\sum_{j=1}^{N} \left(\frac{\tau_{ij}}{\tilde{P}_j}\right)^{-\theta} W_j L_j\right]^{\frac{-1}{\theta}} \tag{2}$$

$$\tilde{P}_j = \left[\sum_{i=1}^{N} \left(\frac{\tau_{ij}}{\Pi_i}\right)^{-\theta} W_i L_i\right]^{\frac{-1}{\theta}} \tag{3}$$

$$W_i = B\left(\frac{A_i}{\Pi_i}\right)^{\frac{\sigma-1}{\sigma}} \tag{4}$$

where X_{ij} represents the nominal trade flow from country i to country j, τ_{ij} represents trade costs including the (gross) *ad valorem* trade cost from i to j t_{ij} ($t_{ij} > 1$) and fixed trade costs f_{ij}^X, W_i represents the wage rate in country i, L_i represents the labor force (number of workers) in country i, A_i represents total factor productivity in i, θ is the (inverse) index of the dispersion of firms' productivities, σ is the elasticity of substitution in consumption, and B is a constant (and a function of the parameters θ and σ).[3] Multiplying W_i and L_i, the term $W_i L_i$ ($= Y_i$) is nominal income (and output) in i; we will use nominal GDP in i as a proxy for Y_i. The term Π_i is an exporter multilateral price resistance term that represents the weighted average of the prices to all importers from i (including i to itself), scaled by the importers' GDPs. $\tilde{P}_j$ is the converse of this, representing the importer's weighted average of the prices of all imports to j (including j to itself), scaled by the exporters' GDPs. The "trade elasticity" of trade flows to trade-cost changes is represented by $-\theta$ ($\theta > 0$) as standard to this class of models, i.e., $\frac{\Delta \ln X_{ij}}{\Delta \ln \tau_{ij}} = -\theta < 0$.[4]

4 Partial Effect Estimation Methodology

In this section, we summarize the state-of-the-art econometric methodology for estimating partial effects of an EIA, summarized in surveys by Bergstrand and Egger (2011), Head and Mayer (2014), and Baier, Kerr, and Yotov (2017). As noted in those papers, Baier and Bergstrand (2007), Baier, Bergstrand, and Vidal (2007), Baier, Bergstrand, Egger, and McLaughlin (2008), and Baier, Bergstrand, and Feng (2014) established that one can estimate with consistency and considerable precision the partial effect of an EIA using ordinary least squares on the following:

$$\ln X_{ijt} = \alpha + \Theta_{it} + \Psi_{jt} + \psi_{ij} + \delta EIA_{ijt} + \upsilon_{ijt} \qquad (5)$$

where Θ_{it} is an exporter-year fixed effect, Ψ_{jt} is an importer-year fixed effect, ψ_{ij} is a pair fixed effect, and υ_{ijt} is an error term. Equation (5) is commonly referred to as a "fixed effects" model. A key insight of Baier and Bergstrand (2007) was to show methodologically and empirically the importance of the country-pair fixed effect for controlling for the endogeneity of the EIA variable, alongside fixed effects Θ_{it} and Ψ_{jt} to account for exporters' and importers' time-varying GDPs and multilateral price terms in equation (1).[5]

There are limitations to specification (5). One limitation is that it imposes a common estimated average partial effect (β) for all EIAs. Naturally, EIAs differ in terms of the degree of trade

[3]In the context of the Melitz model, we note that $\tau_{ij} = t_{ij}(f_{ij}^X)^{\frac{1-\sigma-\theta}{\theta(1-\sigma)}}$ specifically.

[4]We choose a Melitz model for the underlying theoretical framework because EIAs typically reduce tariff rates as wells as some fixed trade costs.

[5]We will discuss alternative estimators later. Also, for now, we ignore zero trade flows, allowing a log-linear gravity equation. We address below how we account for firm heterogeneity and selection biases.

liberalization, with "deeper" agreements expected to have had greater trade liberalization. Historically, several studies have attempted to allow for (*ex post*) heterogeneous EIA effects by introducing instead a multitude of dummies – one for each agreement. For instance, Baier, Bergstrand, and Vidal (2007) introduced 26 different dummies for various of individual agreements. However, this approach often leads to weak estimates. The reason is that – unless the EIA is plurilateral with numerous common memberships – there is insufficient variation in the RHS dummy variables. This was the classic OLS dilemma Tinbergen (1962) faced, leading to the trivial EIA effects of the British Commonwealth and BENELUX economic union.[6] Baier, Bergstrand, and Feng (2014), or BBF, accounted for this – but avoided weak estimates associated with a multitude of dummies – by running a specification including only four separate dummies: one-way PTAs (OWPTA), two-way PTAs (TWPTA), FTAs, and a dummy combining customs unions, common markets, and economic unions (CUCMECU), due to the limited number of these more integrated EIAs in their sample ending in 2000. Hence, BBF avoided the multitude of dummies in earlier studies.[7] BBF ran the fixed effects model:

$$\ln X_{ijt} = \alpha_0 + \Theta_{it} + \Psi_{jt} + \psi_{ij} + \alpha_1 OWPTA_{ijt} + \alpha_2 TWPTA_{ijt} + \alpha_3 FTA_{ijt} + \alpha_4 CUCMECU_{ijt} + \upsilon_{ijt} \tag{6}$$

using OLS. Among other findings, BBF found that deeper economic integration agreements had, as expected, larger average partial effects on bilateral trade flows.[8]

The first potential contribution of this paper is to estimate the partial effects of EIAs for *all six types of EIAs* in the Baier-Bergstrand EIA data base.[9] Hence, we will use three-way fixed effects (FEs) to estimate using OLS:

$$\ln X_{ijt} = \alpha_0 + \Theta_{it} + \Psi_{jt} + \psi_{ij} + \alpha_1 GSP_{ijt} + \alpha_2 PTA_{ijt} + \alpha_3 FTA_{ijt} + \alpha_4 CU_{ijt} + \alpha_5 CM_{ijt} + \alpha_6 ECU_{ijt} + \upsilon_{ijt} \tag{7}$$

[6] There were only three countries in each agreement in his sample and only six "1's" in each of the dummy variables.

[7] In this paper, we have extended that data set to 2010, enlarging substantially the number of EIAs with customs unions (CUs), common markets (CMs), and economic unions (ECUs), and so will treat each of those types separately.

[8] One referee requested evidence of directional effects of eliminating NAFTA, i.e., one dummy for US exports to Mexico, one dummy for Mexican exports to the USA, etc. Although based upon discussion in the paper that we expected insignificant results, we ran these regressions. As expected, the coefficient estimates were statistically insignificant due to the limited RHS variation of each directional dummy, and so are not reported.

[9] See the April 2017 version of the data base at https://www3.nd.edu/∼jbergstr/.

where henceforth we will use GSP to denote one-way preferential trade agreements, since the bulk of one-way agreements are Generalized System of Preferences agreements, and we will then use PTA to denote two-way preferential (though not free) trade agreements.

For robustness, as in Baier and Bergstrand (2007) and Baier, Bergstrand, and Feng (2014), we will also estimate a first-difference (FD) version of the previous equation, still including three-way fixed effects to capture any time-varying unobservables for exporter-year changes, importer-year changes, and bilateral changes (say, due to (non-EIA) trends in globalization that may have heterogeneous effects on pairs' trade). As discussed extensively in Baier, Bergstrand, and Feng (2014), section 4, this specification can be referred to as the random growth first difference (RGFD) model. We estimate the following RGFD model using OLS:

$$\Delta_5 \ln X_{ijt} = \beta_0 + \Lambda_{it} + \Phi_{jt} + \phi_{ij} + \beta_1(\Delta_5 GSP_{ijt}) + \beta_2(\Delta_5 PTA_{ijt}) + \beta_3(\Delta_5 FTA_{ijt}) + \beta_4(\Delta_5 CU_{ijt}) + \beta_5(\Delta_5 CM_{ijt}) + \beta_6(\Delta_5 ECU_{ijt}) + \epsilon_{ijt} \quad (8)$$

where Δ_5 denotes the five-year differenced value of the variable. See Trefler (2004) and Baier, Bergstrand, and Feng (2014) for detailed explanations on the use of fixed effects in the first difference version of the model.

Finally, we address potential biases introduced by firm heterogeneity and selection of countries into trade (positive bilateral trade flows). As is well known, bilateral trade flows include numerous zeros. As noted in Helpman, Melitz, and Rubinstein (2008), or HMR, and Egger, Larch, Staub, and Winkelmann (2011), such zeros can be associated with selection bias ("selection into exporting"). This can arise potentially from the existence of fixed exporting costs and may be associated with firm heterogeneity in productivities. Second, even in the absence of selection bias, firm heterogeneity may bias our results. Hence, our results may be sensitive to absence of controls for sample-selection and firm-heterogeneity biases. While one option is to adapt the cross-sectional approach of HMR to our panel setting (which was done in the online appendix to Baier, Bergstrand, and Feng (2014)), it is unnecessary due to the random growth first difference (RGFD) approach we use. We explain in the context of a representative gravity equation generated from a Melitz model. Suppose there are fixed export costs and firm heterogeneity. The key issue is the existence of these two factors allows selection of firms in country i as exporters into destination market j. In the context of a Melitz model, let Z_{ijt} be a latent variable reflecting the ratio of variable export profits to fixed export costs for the most productive firm in country i in year t; positive exports from i to j occur if $Z_{ijt} > 1$. As discussed in HMR, coefficient estimates in an (aggregate) trade flow gravity equation need to control for variation in Z_{ijt}; HMR show that accounting for Z_{ijt} controls both for Heckman selection bias (because the inverse Mills' ratio is a monotonic function of Z_{ijt}) and for firm-heterogeneity bias (with a control that is a function of both Z_{ijt} and the inverse Mills' ratio (which is a function of Z_{ijt})). Hence, for our purposes, we need to account for fluctuations in Z_{ijt} across country pairs and over time. However, this is the purpose of using a random growth first difference model. If the factors influencing selection and firm heterogeneity evolve smoothly over time, the RGFD model will account for the controls used in HMR. Unlike the cross-sectional context of HMR and Egger, Larch, Staub and Winkelmann (2011), we use first differences to eliminate any unobservable differences between country pairs in the time-invariant components of *ad valorem* variable trade costs, bilateral export fixed costs, and Z_{ijt}, and we use the RGFD model to capture any pair-specific time-varying trends in these elements. Thus, the RGFD model accounts for (unobserved) changes across pairs and over time in Z_{ijt}.[10] [11]

5 Data

The only variables requiring data for estimating the partial effects are aggregate bilateral trade flows and dummy variables for the different types of EIAs. There are few data sources that classify EIAs for a broad group of country-pairs. The EIA data set constructed by Scott Baier and Jeffrey Bergstrand is a panel dataset of approximately 40,000 country-pairs annually from 1950-2012. The

[10]For robustness, in their online appendix, Baier, Bergstrand, and Feng (2014) considered an alternative two-stage approach to control for selection bias and firm heterogeneity in the spirit of HMR to capture changes in the controls that might not be fully accounted for using the RGFD model. We summarize the results of their sensitivity analysis; the actual results are presented in their online appendix. As anticipated based upon the discussion above, the main finding is that there is no material difference in the results after correcting for sample-selection bias and firm heterogeneity using a panel adaptation of the HMR cross-sectional approach. To emphasize, this does not imply that selection bias and firm heterogeneity are absent in the data; the results implied that such biases were largely eliminated due to the first-differencing and pair fixed effects in the RGFD regressions. Since the data set used in the present analysis is the same as that used in BBF, with the exception of adding two more 5-year intervals of data, we did not repeat the robustness analysis described in the online appendix to Baier, Bergstrand, and Feng (2014).

[11]It has also become common to estimate the partial effects using a Poisson Quasi-Maximum Likelihood (PQML) estimator. Noting the robustness analysis between PQML and OLS for aggregate goods trade flows in Bergstrand, Larch, and Yotov (2015), PQML estimates of partial effects of EIAs are slightly higher (about 15 percentage points than corresponding OLS estimates; see their Table 5). This is explained by the fact that PQML, using *levels* of trade flows, weights relatively more heavily country pairs with large trade flows. Since such countries empirically tend to have more EIAs, this tends to increase the PQML partial effects relative to the comparable OLS partial effects.

data is available at Jeffrey Bergstrand's website, www3.nd.edu/∼jbergstr/. An index system of 0-6 is used to define each agreement as follows: (0) denotes no existing economic integration agreement, (1) denotes a one-way preferential trade agreement (GSP), (2) denotes a two-way preferential trade agreement (PTA), (3) denotes a free trade agreement (FTA), (4) denotes a customs union (CU), (5) denotes a common market (CM), and (6) denotes an economic union (ECU). The definitions are described in detail in the database itself. One advantage of this data set is that for the vast majority of cells, when the EIA status of the country-pair changes, there is a hyperlink to a PDF version of the agreement itself.

To obtain data for bilateral trade flows, we used the United Nations COMTRADE database, which is the largest depository of international trade data. Since the data begins in 1962, we collected observations for every five years from 1965-2010 to construct the panel data, following Baier and Bergstrand (2007) and Baier, Bergstrand, and Feng (2014).[12] The rationale for 5-year intervals follows from Cheng and Wall (2005) and Wooldridge (2000). Cheng and Wall (2005) note that "Fixed-effects estimations are sometimes criticized when applied to data pooled over consecutive years on the grounds that dependent and independent variables cannot fully adjust in a single year's time" (p. 8). Wooldridge (2000) confirms the reductions in standard errors of coefficient estimates using changes over longer periods of time than using "year-to-year" changes (p. 423).[13] We used aggregate bilateral trade data only.

6 Partial Effect Empirical Results

The empirical results for the partial effects are presented in two parts. The first part examines the results from the log-level regressions for trade flows, as specified in equation (7). The second part examines the results from the first-difference-in-logs regressions for trade flows, as specified in equation (8). In both cases, we also "test" formally for reverse causality, using lead values of the right-hand-side (RHS) variables. As discussed above, we use ordinary least squares.

[12] For the first period, we used the three-year period 1962-1965.

[13] Since we only collected trade-flow data at 5-year intervals, we could not examine using shorter intervals. However, we could perform a robustness analysis using 10-year intervals; the results were not significantly different from those using 5-year intervals.

6.1 Results for Log-Level Regressions

Table 1 reports the regression results using equation (7). Column (1) reports the results using the contemporary values of the RHS dummy variables, ignoring lags and leads. Column (2) reports the results using the contemporary and 5-year lagged values of the RHS variables. Column (3) reports the results of using the contemporary, 5-year lagged, and 5-year lead values of the RHS variables.

In column (1) we find that – with the exception of (one-way) GSP agreements – all types of agreements have positive and statistically significant effects on the (log of) aggregate goods trade flows. Importantly, the coefficient estimates for the agreements increase in value as the agreements represent higher levels of economic integration. In the case of common markets (CM) and economic unions (ECU), the coefficient estimate for CM is slightly higher than that for ECU; however, there is no statistically significant difference between the two coefficient estimates. This initial set of results is in line with previous estimates in the literature using similar econometric methodology, and the results are economically plausible. For purposes later, we note that the effect of an FTA is 0.530, suggesting that the partial effect of an FTA on bilateral trade is 70 percent.

Column (2) reports the results adding a 5-year lagged value of the RHS variables. As discussed in Baier and Bergstrand (2007) and Baier, Bergstrand, and Feng (2014), the impact of an EIA may take years due to phasing-in of agreements and lagged effects on the terms-of-trade. Two points are worth noting. First, the lagged effects are statistically significant for all six agreement types (except GSP). Second, introducing the lagged values reduces slightly the effects of the contemporary RHS variables. However, the joint effects for each dummy variable are larger. For instance, the total effect of an FTA is now 0.641; the partial effect of an FTA is now 90 percent (with the coefficient estimate of the lag added).

Some researchers have found lead effects of EIAs on trade flows, suggesting reverse causality. A ready and useful test of reverse causality is to include lead values on the RHS. Column (3) reports the results including contemporary, lagged, and lead values. For these log-level regressions, lead values are statistically significant for PTA, FTA, and CM, although we note that the coefficient estimates for the leads are notably smaller. Moreover, we will find that such leads become statistically insignificant in the random growth first difference specifications below.

6.2 Results for the Random Growth First Difference Regressions

Table 2 reports the results using equation (8), which is referred to as the random growth first difference (RGFD) specification. There are two key aspects which are worth noting in the distinction between the (log) level and the RGFD specifications. The first distinction concerns the assumption regarding the error term process. As discussed in econometric detail in Baier and Bergstrand (2007) and Baier, Bergstrand, and Feng (2014), first differencing panel data provides some advantages over fixed effects. First, it is quite plausible that unobservable factors that influence the likelihood of an EIA are slow moving and hence serially correlated. If the error terms are serially correlated in equation (7), the inefficiency of fixed effects is exacerbated as the number of time periods gets large; first differencing the data may increase estimation efficiency. Second, aggregate trade flow data are likely close to unit-root processes. Using fixed effects is akin to differencing data around the mean; this may create a problem since the number of time periods is large in our data set. If data actually follow a unit-root process and the number of time periods is large, the "spurious regression problem" can arise using a panel with fixed effects.

Column (1) in Table 2 reports the results using the contemporaneous 5-year change. In this case there are statistically significant effects for FTA, CU, CM, and ECU. Once again, the coefficient estimates increase as the degree of economic integration increases, as expected. As in Baier, Bergstrand, and Feng (2014), the RGFD coefficient estimates are smaller than the respective log-level coefficient estimates.

Column (2) reports the results adding a lagged 5-year change in the RHS variables. Although none of the lagged changes is statistically significant on its own, F-statistics of the combined contemporary and lagged coefficient estimates indicate statistically significant joint effects for FTA, CU, CM, and ECU. For FTA, the joint effect of 0.307 is significant at 1 percent. For CU, the joint effect of 0.666 is significant at 1 percent. For CM, the joint effect of 0.474 is significant at 5 percent. For ECU, the joint effect of 0.889 is significant at 1 percent.

Column (3) adds the lead changes in the RHS variables. None of the lead changes were statistically significantly different from zero, and these coefficient estimates were very small.

Finally, our empirical specifications up to now have used an unbalanced panel. The coefficient estimates may be biased if any of the omissions of data are systematically biased. Consequently, we also ran all the specifications using a balanced panel. In the interest of brevity, we summarize the findings; however, we provide in column (4) of Table 2 the comparable results for the balanced panel to the results for the specification in column (3) using the unbalanced panel. We note several findings. First, the number of observations falls substantively from 83,914 to 41,496. Second, the coefficient estimates for the EIA variables tend to increase as we move from the unbalanced to balanced panels. For instance, comparing the joint FTA effects from columns (3) and (4), the FTA partial effect rises from 0.285 (which is statistically significant) to 0.564 (which is also statistically significant). Third, this FTA partial effect of 0.564 is very close to the FTA partial effect of 0.530 reported in column (1) in Table 1 for the main log-level regression. This result will be useful as we move next toward our numerical general equilibrium analysis which necessitates estimates of bilateral fixed effects from a log-level specification.

6.3 Discussion

For the second main goal of this analysis – to compute the general equilibrium effects on trade and welfare of the dissolution of NAFTA, henceforth, our "No-NAFTA" simulation – we need to choose point estimates of the partial effects, as well as estimates of the bilateral fixed effects from a log-level specification. As we will discuss comprehensively in section 7 below, to simulate the long-run economic effects of the (counterfactual of the) dissolution of NAFTA, we need to have initial estimates of the log-levels of international and intranational trade costs. Such estimates are generated from the log-level bilateral fixed effects (from any of the log-level specifications in Table 1) alongside (statistically significant) partial effect estimates of all types of EIAs.[14] While partial effect estimates using the RGFD specifications have desirable econometric properties, ideally such estimates should be consistent with long-run EIA partial effects. Fortunately, as shown above, the EIA partial effect estimates from the balanced panel RGFD specifications are closely aligned with the EIA partial effect estimates in column (1) of Table 1. Thus, we will use in the next section (long-run) EIA partial effect estimates from column (1) of Table 1 alongside the estimates of bilateral fixed effects from the specification in column (1) of Table 1 (which account for all non-EIA international and intranational bilateral trade costs).

Since NAFTA is a free trade agreement, we use the 0.530 FTA partial effect estimate from column (1) of Table 1. As just discussed, this value is not significantly different from the balanced

[14] Recall that the log-level bilateral fixed effects account for all bilateral (international and intranational) trade costs *other than* those related to EIAs.

panel (joint current and lagged) RGFD FTA estimate of 0.564. As a further confirmation of the relevance of our selection of a partial effect of 0.530, we are able to use the partial effect specifically estimated for NAFTA's formation in Baier, Bergstrand, and Vidal (2007) for guidance. Adopting the econometric methodology in Baier and Bergstrand (2007), Baier, Bergstrand, and Vidal (2007) examined in particular the *ex post* partial effects of all the various EIAs in the "Americas." Using the log-level estimation approach with fixed effects, Baier, Bergstrand, and Vidal (2007) found a contemporary effect of 0.37. Also, using the contemporary and 5-year lagged effects, the joint effect was 0.53. Noting that the log-level coefficient estimates are similar for NAFTA in Baier, Bergstrand, and Vidal (2007) and for FTA in this study, we believe that an FTA partial effect of 0.53 is reasonable.

Nevertheless, since this is a subjective determination, we will provide in a robustness analysis later of the general equilibrium results for trade and welfare a sensitivity analysis to alternative EIA partial effect estimates.

7 General Equilibrium Trade and Welfare Effects of "No-NAFTA" and Other Scenarios

7.1 Methodology

To evaluate quantitatively the general equilibrium (GE) trade and welfare effects of the dissolution of NAFTA, we return to the GE structural model of gravity described in equations (1)-(4). For the general equilibrium analysis, we need to consider two scenarios, a baseline scenario (denoted b) and a counterfactual scenario (denoted c). We discuss now two sets of steps, one to generate first the baseline values for trade flows, incomes, prices, and wage rates and then another to generate their counterfactual values.

using estimates from the regression results in the previous section along with GDP and population data, the first set of steps is to solve for baseline values of bilateral trade (including intranational trade) and prices.[15] The first step in this set is to solve equations (2), (3), and (4) for initial values of Π_i, $\tilde{P}_i$, and $BA_i^{\frac{\sigma-1}{\sigma}}$.[16] To solve the system of equations for initial baseline values, we require

[15]GDP is used to measure economic size (and, alongside aggregate trade flows, to impute intranational trade). Population is used with GDP to compute per capita real GDP (our baseline measure of the real wage rate).

[16]To close the model, we set world GDP ($\sum_{i=1}^{N} W_i L_i$) equal to the world's endowment of effective labor units

(exogenous) initial values of national incomes W_iL_i and bilateral trade-cost terms $(\tau_{ij}^b)^{-\theta}$. For national incomes, we use GDP data from 2010; the GDP data source was CEPII. Since this is a one sector model, we use real GDP per capita as our baseline measure of the (real) wage rate for each country. For $(\tau_{ij}^b)^{-\theta}$ estimates, we use the results from an empirical log-linear specification in Table 1 to form:

$$\widehat{(\tau_{ijt}^b)^{-\theta}} = exp[\widehat{\psi_{ij}} + \widehat{\alpha}EIA_{ijt}^b]. \tag{9}$$

where $\widehat{\psi_{ij}}$ is the estimate of the bilateral time-invariant fixed effect from specification (1) and $\widehat{\alpha}$ is obtained from the same specification.[17] The rationale for choosing bilateral fixed effect estimates from column (1) from Table 1 is because we need estimates of the (log-) *level* of bilateral time-invariant trade costs which the log-linear specification in equation (7) provides, not estimates of *changes* of non-EIA-related bilateral trade costs (which are generated using the specification in equation (8)). Given the baseline measures of real GDP, wages, and the matrix of bilateral trade costs, we solve for the initial multilateral price terms and wage rates by using the iterative fixed point algorithm described in the appendix in Baier and Bergstrand (2009).[18] Solving the system also requires specifying values for θ and σ; we use $\theta = 4$ and $\sigma = 3$ for the baseline scenario.[19] Once we have initial values of Π_i and $\tilde{P}_i$ pinned down, the second step is to use equation (1) to

$(\sum_{i=1}^N A_iL_i)$; that is, $\sum_{i=1}^N W_iL_i = \sum_{i=1}^N A_iL_i$.

[17]Note that we do not, at this stage, need to specify any value for $-\theta$; $\widehat{\psi_{ij}}$ and $\widehat{\alpha}$ imbed θ. Moreover, we will provide later in sub-section 7.3 a robustness analysis to estimates of the EIA coefficients from alternative RGFD specifications. It is also important to note that, when there is an EIA, $EIA_{ijt}^b = 1$. Then in the counterfactual $EIA_{ijt}^c = 0$.

[18]As discussed in Anderson and van Wincoop (2003), the multilateral price terms are not unique in the sense that if Π_i^0 and $\tilde{P}_j^0$ are solutions to the system of equations, so are $\lambda\Pi_i^0$ and $\tilde{P}_j^0/\lambda$ (for any $\lambda > 0$). In order to resolve this indeterminacy, we need a normalization. We normalize by identifying the level of (preference-adjusted) technology for each country, $BA_i^{\frac{\sigma-1}{\sigma}}$, such that effective labor units (i.e., A_iL_i for any country) sum up to world GDP, i.e., $\sum_{i=1}^N A_iL_i = \sum_{i=1}^N W_iL_i$. Since B does not vary across countries, we choose a value for $\bar{\varphi}$ such that B equals unity (see the next footnote for the theoretical value of B). Using wage-rate equation (4), we can solve for any country i's technology relative to that of the United States; that is, $A_i/A_{US} = (W_i/W_{US})^{\sigma/(\sigma-1)}(\Pi_i/\Pi_{US})$ where we use the ratio of the countries' real per capita GDPs as the wage-rate ratio between country i and the United States. Substituting this into our normalization, we can solve for U.S. technology A_{US}, where $A_{US} = (\sum_{i=1}^N W_iL_i)/[\sum_{i=1}^N (W_i/W_{US})^{\sigma/(\sigma-1)}(\Pi_i/\Pi_{US})L_i]$. Once we have calculated the technology for the United States, we can solve for the technologies of all other countries which are consistent with our normalization. Given these technologies, we can pin down the Π_is that are consistent with our normalization and substitute these values into the inward multilateral price terms to solve for the $\tilde{P}_i$s that are consistent with our general equilibrium model. We assume multilateral trade balance. Due to our wanting to capture a much larger number of countries in our analysis than the limited number of countries in the World Input-Output Data (WIOD) set (only 40), we used GDPs for national income measures to calculate intranational trade for 158 countries. However, the correlation coefficient for measures of intranational trade calculated using WIOD gross outputs versus measures of intranational trade using GDPs for those same 40 countries is 95.8 percent.

[19]In the context of the Melitz model described in Baier, Kerr, and Yotov (2017), $B = \left(\bar{\varphi}\frac{(\sigma-1)^{\theta+1}\sigma^{\frac{\theta\sigma}{\sigma-1}}}{\theta-\sigma+1}\right)^{\frac{\sigma-1}{\theta\sigma}}$. Also, in the robustness analysis in section 7.3, we will evaluate the sensitivity of the numerical GE results to alternative values for θ and σ.

generate initial values of trade flows that are consistent with initial (observed) GDPs, trade costs, wage rates, and prices indices.

In second set of steps, we compute the counterfactual values (c) of trade flows, incomes, prices, and wage rates. In the first step of this set, we adjust the trade-cost vector for the United States, Canada, and Mexico to reflect the ending of the NAFTA agreement. Hence, in the counterfactual, $\widehat{(\tau_{ijt}^c)}^{-\theta} = exp[\widehat{\psi_{ij}} + \widehat{\alpha} EIA_{ijt}^c]$.[20] In the second step, we recompute the multilateral price terms given the changes in trade costs. In the third step, we use the outward multilateral price term computed in step two just noted to recalculate the wage given by equation (4). With the new wage rates, we compute the new trade flows. We repeat these steps until the change in the wage rate meets a convergence criterion.

Finally, we calculate percentage changes for all the endogenous variables from the baseline values to the counterfactual values.

7.2 Results

The main results – associated with the dissolution of NAFTA ("No-NAFTA") – are presented in two tables, Tables 3 and 4. Table 3 presents the trade effects for the three NAFTA member countries – USA, Mexico, and Canada – and – for brevity – an aggregate of the 155 other countries in the rest of the world, i.e., ROW. Table 4 presents the effects on nominal wage rates, price levels, and real wage rates (or economic welfare) *for all 158 countries.*

Table 3 has three panels: A, B, and C. Each panel reports the results for percentage changes in exports and imports for the "titled" country denoted at the top of the panel with each of its two NAFTA trading partners, with itself (i.e., percentage change in *intranational* trade), and with the other 155 countries (aggregated) into ROW. For instance, Panel A reports the effect of eliminating NAFTA on the percentage changes in exports and imports of the USA with Canada, Mexico, itself, and ROW. There are several points worth noting.

First, the declines is USA exports and imports with either Canada or Mexico is smaller in percentage terms than the partial effect of 70 percent (i.e., 70 percent = $100 \times (e^{0.53} - 1)$). This reflects that multilateral price terms also increase due to the No-NAFTA shock (i.e., more restrictive trade among the three former NAFTA members), which then feeds back slightly into increased

[20]Hence, EIA_{ijt}^c will be 0 for the country-pairings of the NAFTA members.

bilateral trade between the former NAFTA members. In the absence of these multilateral feedback effects, bilateral trade for each pair would decline by 70 percent. The role of the multilateral resistance terms in increasing their bilateral trade is about one-third. Panels B and C report analogous bilateral trade effects with the other former NAFTA partners.

Second, each of the three panels reports the positive effects for each country on their *intranational* trade (marked with an "*a*" superscript, for ease of reference). As expected, the dissolution of the FTA leads to more protection among each former NAFTA pair and for each country trade is partly diverted from its former NAFTA partner to the home country (with trade diverted to *ROW* as well, as will be discussed shortly). Because the USA is such a large country with a large share of intranational trade already, the percentage increase in intranational trade is only 1.05 percent. However, bilateral trade of each of Canada and Mexico with the USA is a significant share of each of Canada's and Mexico's consumption and consequently creates a large percentage impact on (diversion to) intranational trade for each of Canada and Mexico. Interestingly, Canada's percentage increase in intranational trade (7.66 percent) is nearly *twice* that of Mexico (3.95 percent), and Mexico's increase is nearly *four times* that of the USA.

Third, the impacts of No-NAFTA on bilateral trade flows of each of the three former NAFTA members with the aggregate of the other 155 *non-NAFTA* trading partners are all positive, as expected. USA bilateral exports and imports with *ROW* increase by only 0.43 and 0.63 of one percent, respectively. By contrast, Canadian and Mexican bilateral exports and imports with *ROW* increase in percentage terms by considerably more. In fact, Canadian bilateral exports and imports with the other 155 countries increase the most in percentage terms. This diversion of international trade facing Canada due to No-NAFTA – to Canada's intranational market *and* to non-NAFTA countries – potentially bodes ill for Canada's overall welfare effect from No-NAFTA.

Table 4 presents for all 158 countries individually the net GE effects on nominal wage rates (W_i), overall price levels (P_i), and national welfare (or the real wage rate, W_i/P_i) of No-NAFTA. Several points are worth noting. First, the (real) welfare – or standard of living – of each of the three former NAFTA members (Canada, Mexico, and USA) declines; No-NAFTA reduces welfare on average, as expected. For all three of these countries, nominal wages decline, price levels rise, and these changes contribute jointly to the welfare declines.

Second, USA – the largest economy and consequently the one that trades the least with the rest of the world – is hurt the least, as expected. This is in line with virtually all quantitative GE models of trade policy; the less a country is exposed to world trade, the less a country is affected by trade policies (for a given partial treatment effect).

Third, non-NAFTA countries are hardly affected at all by the dissolution of NAFTA in terms of welfare. As expected, the *ROW* countries benefit from the diversion of trade from the elimination of NAFTA. However, these effects by country are very small. The largest gain in real income to a non-NAFTA country is only 0.1 of 1 percent and most non-NAFTA countries gain much less. As expected, the non-NAFTA countries benefitting the most from trade diversion are quite close physically, cf., Antigua and Barbuda (0.101), Guyana (0.062), Belize (0.055), and Honduras (0.051).[21]

Fourth, and most interesting, the largest welfare loss is incurred by Canada. Real income in Canada falls 2.11 percent. This change is nearly *twice* the welfare loss of Mexico, which is 1.15 percent. Moreover, Canada's welfare loss is nearly *eight times* the welfare loss of the USA (0.27 percent). The rationale for the greater welfare loss of Canada relative to Mexico is the following. *Intranational* trade costs in the USA are, not surprisingly, quite large given the vast size of the economy and the dispersion of substantive economic activity to different parts of the country (e.g., New York City, Chicago, Houston, Los Angeles).[22] However, our estimates of (non-EIA, time-invariant) intranational trade costs for Canada and Mexico are smaller, based upon our bilateral fixed effects estimates. Interestingly, our estimates suggest that – among Canada, Mexico, and the USA – intranational trade costs are the *least* in Mexico. Yet, an examination of the dispersions of economic activity in Canada and Mexico suggest this is quite plausible. For instance, while Mexico's population is four times that of Canada's, economic activity in Mexico is concentrated physically in an area that is only *one-fifth* the size of Canada (which itself is three times the geographic size of the USA). Even though half of Canada's GDP is concentrated in the adjacent provinces of Ontario and Quebec, half of Mexico's GDP is shared by the three largest metropolitan areas that are all within *only 450 miles* of each other.[23]

[21] The rest of the values are all below 0.05 of 1 percent.

[22] Recall that non-EIA, time-invariant intranational (as well as international) trade costs are estimated from the bilateral fixed effects from any of Table 1's specifications. We used estimates from the specification in column 1 of Table 1, as discussed earlier in the paper.

[23] We also know from innumerable gravity studies that several other "trade-cost" factors are imbedded in the bilateral intranational trade fixed effects, raising Canada's intranational trade costs. For instance, Canada is bilingual and Mexico is not. Also, Mexico has a common Spanish legal origin, whereas Canada has English and French legal origins.

With this context, we can interpret readily the larger welfare loss of Canada relative to Mexico's, even though Canada's GDP is twice the size of Mexico's. With the dissolution of NAFTA, trade between the (former) NAFTA countries is partly diverted to each country's domestic market (i.e., intranational trade increases in each country). In all three countries, nominal wage rates fall; yet the diversion of trade impacts the smaller GDP countries Canada and Mexico the most as they rely more on bilateral trade with the USA than the USA relies on bilateral trade with each of them. Consequently, nominal wage rates fall by larger percentages in Canada and Mexico than in the USA. Moreover, as shown in Table 3, the diversion of this former NAFTA trade is greatest to all three countries' domestic markets than to their other trading partners (i.e., intranational trade relative to *ROW* trade). However, by our estimates, intranational trade costs in Mexico are only 67 percent of those in Canada.[24] Given Canada's significantly higher intranational trade-cost estimate, our simulation reveals that the rise in prices in Canada is four times that of Mexico's rise in prices, and the latter is only 50 percent that of the USA (see Table 4). Consequently, the combination of the percentage changes in wage rates in the three countries and in prices in the three countries implies that Canada faces the largest percentage decline in welfare (or real wage rates) – nearly *twice* the decline of Mexico's welfare and nearly *eight times* the decline of welfare in the USA.

7.3 Alternative Scenarios and Sensitivity Analysis

As in most numerical GE analyses, results may be sensitive to certain assumptions and alternative underlying empirical results (such as coefficient estimates). Consequently, we consider some alternative scenarios, as well as the sensitivity of our numerical GE results to alternative partial effect estimates (from the regressions analysis) or to parameter assumptions for θ and σ. Naturally, the number of potential alternative scenarios is virtually unlimited. In this section, we consider six alternative cases. The first case is an alternative scenario of the USA "leaving" NAFTA, but Canada and Mexico remaining in the agreement (which is a feasible alternative to the elimination of NAFTA). In Cases 2 and 3, we consider using alternative partial effect (coefficient) estimates to the log-level specifications, using two alternative sets of estimates from the RGFD specifications for the (baseline) No-NAFTA scenario. In Case 4, we consider alternative values for θ and σ in the No-NAFTA scenario. In Case 5, we consider an alternative scenario that – alongside NAFTA's

[24] In the context of the model, this is implied by the log-level Mexico bilateral intranational trade fixed effect estimate of 11.18 being 1.502 times the log-level Canada bilateral intranational trade fixed effect estimate of 7.44.

dissolution – Canada simultaneously enters an FTA with the European Union. Finally, in Case 6, we consider an alternative scenario that – alongside NAFTA's dissolution – Canada simultaneously enters an FTA with China.[25]

7.3.1 Case 1: The USA Leaves NAFTA

A close reading of President Trump's statements on this subject reveals that, technically, his administration may give six months notice that the USA will "withdraw" from NAFTA. Consequently, Case 1 considers the alternative scenario of the USA withdrawing from NAFTA. Table 5 provides the wage rate, price level, and economic welfare (or real wage rate) effects of a U.S. withdrawal from NAFTA. For brevity, we do not report all the other 155 countries' wage, price, and welfare effects, because – as suggested in Table 4 – these *ROW* effects are trivial and do not differ in any substantive way for alternative numerical GE simulations. Since the USA is such a large economy, it is not surprising to find that the welfare effects of a scenario of the USA leaving NAFTA (but Canada and Mexico staying in NAFTA) are *virtually identical* to those of the baseline No-NAFTA scenario. Canada's welfare and Mexico's welfare declines are barely dampened. Since President Trump's threat is actually a "withdrawal" from NAFTA, these results here confirm the relevance of our No-NAFTA scenario.

7.3.2 Case 2: Alternative Partial Effects 1

As discussed extensively in sections 4 and 6, we provided partial effect estimates of the six different types of EIAs using both log-level fixed effects regressions as well as random growth first difference (RGFD) regressions (with the latter using 5-year log differences). Since the GE simulations should consider, in principle, a long-run effect of changing EIA status, our baseline GE effects were calculated using partial effect coefficient estimates from the log-level fixed effects regressions alongside log-level bilateral international and intranational trade cost estimates; specifically, we used partial effect estimates and bilateral fixed effects estimates from the specification in column 1 from Table 1. However, one might argue – based upon a greater emphasis on the econometric rationale for partial effects' estimation – that one should use coefficient estimates from a RGFD specification. Accordingly, we also simulated the baseline No-NAFTA scenario using instead a representative set

[25]The last two scenarios were recommended by one of the referees, due to Canada currently in negotiations for FTAs with both parties.

of RGFD coefficient estimates.

As discussed in section 6, if we were only interested in econometrically appropriate partial effect estimates (ignoring subsequent GE effect estimates), it is arguable that the balanced-panel coefficient estimates in column 4 of Table 2 would be appropriate to consider. However, for FTA, for instance, the sum of the statistically significant FTA coefficient estimates is 0.564 – which is not notably different from the FTA partial effect of 0.530 used in our baseline No-NAFTA GE estimates. Consequently, we used in this Case 2 the partial effects from a balanced-panel RGFD regression which excluded the "lead" first-differences (which were included in column 4 of Table 2). These partial effects were smaller; for instance, the sum of the concurrent and lagged FTA coefficient estimates was 0.438. This provided us with an alternative set of partial effect estimates that were notably smaller than those in the baseline No-NAFTA scenario.[26]

Noting that the (sum of concurrent and lagged) RGFD EIA coefficient estimates are smaller than the respective log-level coefficient estimates from column 1 of Table 1,[27] Table 6 reports that – as expected – all three countries' (nominal) wage rate, price level, and welfare effects are all slightly smaller relative to those in the baseline scenario reported in Table 4. Since an FTA has a smaller partial effect on trade flows in this alternative scenario, the effects on the three relevant economies of the elimination of NAFTA in terms of wage rates, price levels, and welfare are all diminished slightly. However, even though all three countries' overall effects are dampened, the *relative* wage, price, and welfare effects remain the same. Canada's welfare loss remains approximately twice that of Mexico's welfare loss and approximately eight times that of the United States' welfare loss.

7.3.3 Case 3: Alternative Partial Effects 2

We also considered the effects on wages, prices, and welfare of yet another set of partial effect estimates from section 6. In order to see the GE effects of a scenario with *even smaller* partial effects, we calculated the GE effects of No-NAFTA using the RGFD partial effects estimated using the unbalanced data set. In this case, we used the (sum of concurrent and lagged) RGFD coefficient estimates from column 2 of Table 2. The statistically significant coefficient estimates for FTA, CU, CM, and ECU were 0.204, 0.444, 0.381, and 0.551, respectively. Table 7 reports the results.

[26] The Alternative 1 partial effect (sum of concurrent and lagged) estimates for PTA, FTA, CU, CM, and ECU were 0.338, 0.438, 0.709, 0.885, and 1.211, respectively. GSP coefficient estimates were not statistically different from zero.

[27] The single exception is that for ECU.

Notably, the wage, price, and welfare effects for the three (former) NAFTA countries are again dampened in absolute terms, and even more than the respective effects in Table 6, as expected. However, as in Case 2, the *relative* effects on wages, prices, and welfare for the three countries of No-NAFTA remain the same.

7.3.4 Case 4: Alternative Values for θ and σ

It is possible that the relative wage, price, and welfare effects for Canada, Mexico, and the United States of No-NAFTA are sensitive to the (assumed) values of θ and σ. To see that this is not the case, we simulated No-NAFTA with alternative values of $\theta = 6$ and $\sigma = 4$. As is well known from Arkolakis, Costinot, and Rodriguez-Clare (2012), the welfare effect (in percentage) of a trade-policy liberalization (or restriction) should be inversely related to the "trade elasticity." In the context of our Melitz-model-based structural gravity framework, the trade elasticity is θ. A higher value of θ should lower the wage, price, and welfare effects relative to the baseline case. Table 8 reports that this is the case. Relative to Table 4's results, the absolute percentage changes in all three variables for all three countries are lower. However, the *relative* effects in Table 8 are nearly identical to those in Table 4. Canada's welfare loss is approximately twice Mexico's welfare loss and is approximately eight times the U.S. welfare loss.

7.3.5 Case 5: No-NAFTA and Canada Forms FTA with the European Union

All of the simulations so far have been related to the elimination of NAFTA or the withdrawal of the USA from NAFTA. In all of our simulations, the relative welfare loss of Canada is the largest. However, at this time, Canada is in the middle of negotiations with the European Union (EU) to form a FTA. We consider an alternative scenario where NAFTA is eliminated simultaneously with the formation of an FTA between Canada and the EU. The *relative* welfare losses of Canada should be dampened in this scenario. Table 9 reports the results of this simulation's scenario. As one would expect, the simultaneous formation of a new Canada FTA with the EU dampens for Canada the wage-deterioration effect of No-NAFTA a small amount, but dampens Canada's price-level effect of No-NAFTA considerably. The offsetting effect of the Canada-EU FTA reduces the welfare loss of Canada by approximately 20 percent, from -2.113 percent to -1.671 percent. Since, at the same time, the welfare losses of Mexico and the United States are affected trivially by the Canada-EU

FTA, the relative welfare loss of Canada (versus those for Mexico and USA) is diminished by the offsetting welfare gain of a Canada-EU FTA.

7.3.6 Case 6: No-NAFTA and Canada Forms FTA with China

We also considered one more scenario of No-NAFTA occurring simultaneously with the formation of a Canada-China FTA, which is at this time also under negotiation. Table 10 provides the results of this simulation's scenario. Consistent with Case 5 above, the simultaneous formation of a new Canada-China FTA dampens the wage-deterioration and price increase effects of No-NAFTA. However, the dampening effects of forming a Canada-China FTA in offsetting No-NAFTA's effects are considerably smaller than those from forming a Canada-EU FTA.

Finally, to demonstrate the robustness of our calculations to the welfare-effect measure of a trade-policy liberalization (or restriction) discussed in Arkolakis, Costinot, and Rodriguez-Clare (2012), we computed the (percentage change) welfare effect as the change in each country's intranational trade share raised to the (inverse) trade elasticity. Calculation of the welfare effects using this approach were identical to those calculated earlier.

8 Conclusions

Only three years ago, it would have been rare to have come across a serious observer of the world economy that conjectured the globalization of the world economy – in terms of the proliferation of economic integration agreements and trade-policy liberalization – had peaked. And yet now in 2019 we have witnessed a sitting U.S. President suggesting its most important EIA – NAFTA – should be eliminated, the majority of voters in the United Kingdom voting to leave the European Union, and the third largest country in continental Europe – Italy – questioning its continued membership in the European Union. For a half century, international trade economists have continued to develop and re-evaluate quantitative measurement of the gains from trade and – in particular – the welfare gains from bilateral and plurilateral economic integration agreements.

For the last two years, however, several researchers have begun to use our modern medium-sized quantitative trade models to model the *dissolution* of historical EIAs. For instance, Oberhofer and Pfaffermayr (2017) use a new quantitative trade model to estimate the negative welfare effects of Brexit; under a soft Brexit, welfare falls about 1.5 percent after six years, but under a hard Brexit by 3.5 percent. Mayer, Vicard, and Zignago (2018) estimate the potential costs of Non-Europe. In a model comparable to ours (without intermediates) the average European economy's welfare loss is 1.5 percent; with intermediates, the loss is 4.4 percent.

This paper has had three goals in mind. First, we provided the first set of estimates of partial (average treatment) effects of the six different types of EIAs, illustrating the consistency and precision of the modern econometric approaches based upon structural gravity models. Second, we provided estimates of the welfare losses for the three members of NAFTA of the elimination of this agreement, using conservative estimates of the partial effects of NAFTA's elimination. These estimates are well in line with previously mentioned losses estimated for the European cases. As expected welfare (in the long run) falls the least for the large U.S. economy (by 0.27 percent). However, the smaller Mexican and Canadian economies' levels of welfare fall much more. Third, Mexico's economic welfare loss of 1.15 percent is nearly four times that of the USA. But Canada's welfare loss of 2.11 percent is nearly twice that of Mexico's loss and nearly eight times the U.S. loss. The primary reason in our analysis is that our estimates of *intranational* trade costs are approximately 50 percent larger for the geographically larger and more economically dispersed Canadian economy compared to the geographically smaller and less economically dispersed Mexican economy. With the elimination of NAFTA and the extensive diversion of these three countries' bilateral trade to their home markets, Canada's economic welfare loss is considerably larger in the face of higher intranational trade costs.

Finally, in November 2018, Canada, Mexico, and the United States signed the US-Mexico-Canada Agreement, referred to frequently as USMCA. As of spring 2019, none of the three countries has passed approval in the respective legislatures. This agreement has widened and deepened liberalization in some areas of international trade between the members. However, it has also imposed some stronger restrictions in other areas, such as higher mandated value added content within North America for the automobile sector. At this time, establishing quantitatively the welfare effects of the finer distinctions between NAFTA and USMCA is beyond the scope of this paper, but remains a useful scenario to be analyzed in the future.

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Table 1: Log-Level Regression Results

	(1) $\ln TRADE_{ijt}$	(2) $\ln TRADE_{ijt}$	(3) $\ln TRADE_{ijt}$
GSP_{ijt}	0.019	0.014	0.088
	(0.038)	(0.045)	(0.056)
PTA_{ijt}	0.240^{***}	0.120^{**}	0.091
	(0.038)	(0.043)	(0.067)
FTA_{ijt}	0.530^{***}	0.393^{***}	0.318^{***}
	(0.037)	(0.045)	(0.059)
CU_{ijt}	0.836^{***}	0.415^{***}	0.388^{**}
	(0.098)	(0.117)	(0.137)
CM_{ijt}	1.113^{***}	0.777^{***}	0.563^{***}
	(0.072)	(0.095)	(0.129)
ECU_{ijt}	1.031^{***}	0.513^{**}	0.470^{*}
	(0.100)	(0.157)	(0.241)
$LagGSP_{ij,t-5}$		0.043	-0.013
		(0.046)	(0.052)
$LagPTA_{ij,t-5}$		0.261^{***}	0.226^{***}
		(0.054)	(0.064)
$LagFTA_{ij,t-5}$		0.248^{***}	0.217^{***}
		(0.052)	(0.064)
$LagCU_{ij,t-5}$		0.714^{***}	0.730^{***}
		(0.116)	(0.124)
$LagCM_{ij,t-5}$		0.380^{***}	0.444^{**}
		(0.114)	(0.161)
$LagECU_{ij,t-5}$		0.688^{***}	0.771^{***}
		(0.174)	(0.220)
$LeadGSP_{ij,t+5}$			-0.068
			(0.051)
$LeadPTA_{ij,t+5}$			0.120^{*}
			(0.047)
$LeadFTA_{ij,t+5}$			0.160^{**}
			(0.049)
$LeadCU_{ij,t+5}$			0.093
			(0.128)
$LeadCM_{ij,t+5}$			0.414^{***}
			(0.102)
$LeadECU_{ij,t+5}$			-0.021
			(0.168)
Fixed Effects:			
Exporter-Year (i,t)	yes	yes	yes
Importer-Year (j,t)	yes	yes	yes
Country-Pair (i,j)	yes	yes	yes
N	154,011	145,825	120,873
R^2	0.847	0.850	0.853

Notes: Standard errors are in parentheses. * denotes $p < 0.05$; ** denotes $p < 0.01$; and *** denotes $p < 0.001$.

Table 2: Random Growth First Difference Regression Results

	(1) $\Delta_5 \ln TRADE_{ijt}$	(2) $\Delta_5 \ln TRADE_{ijt}$	(3) $\Delta_5 \ln TRADE_{ijt}$	(4) $\Delta_5 \ln TRADE_{ijt}$
$\Delta_5 GSP_{ijt}$	0.069	0.095	0.088	0.075
	(0.055)	(0.057)	(0.068)	(0.064)
$\Delta_5 PTA_{ijt}$	0.001	0.026	0.071	0.251^{**}
	(0.055)	(0.057)	(0.082)	(0.085)
$\Delta_5 FTA_{ijt}$	0.175^{**}	0.204^{***}	0.156^{*}	0.245^{***}
	(0.058)	(0.062)	(0.074)	(0.073)
$\Delta_5 CU_{ijt}$	0.378^{**}	0.444^{**}	0.281	0.429^{***}
	(0.142)	(0.149)	(0.162)	(0.155)
$\Delta_5 CM_{ijt}$	0.358^{**}	0.381^{**}	0.375^{*}	0.563^{***}
	(0.119)	(0.129)	(0.174)	(0.168)
$\Delta_5 ECU_{ijt}$	0.453^{*}	0.551^{*}	0.490	0.781^{**}
	(0.203)	(0.219)	(0.280)	(0.293)
$Lag\Delta_5 GSP_{ijt}$		0.089	0.119	0.197^{**}
		(0.059)	(0.067)	(0.066)
$Lag\Delta_5 PTA_{ijt}$		0.075	0.114	0.169
		(0.073)	(0.087)	(0.089)
$Lag\Delta_5 FTA_{ijt}$		0.103	0.129	0.319^{***}
		(0.063)	(0.083)	(0.085)
$Lag\Delta_5 CU_{ijt}$		0.222	0.236	0.340^{*}
		(0.144)	(0.161)	(0.159)
$Lag\Delta_5 CM_{ijt}$		0.093	0.230	0.322
		(0.154)	(0.222)	(0.212)
$Lag\Delta_5 ECU_{ijt}$		0.338	0.499	0.430
		(0.235)	(0.287)	(0.300)
$Lead\Delta_5 GSP_{ijt}$			-0.121	-0.024
			(0.073)	(0.073)
$Lead\Delta_5 PTA_{ijt}$			-0.021	-0.064
			(0.066)	(0.072)
$Lead\Delta_5 FTA_{ijt}$			-0.078	0.063
			(0.070)	(0.070)
$Lead\Delta_5 CU_{ijt}$			-0.282	0.114
			(0.178)	(0.164)
$Lead\Delta_5 CM_{ijt}$			0.079	0.138
			(0.143)	(0.140)
$Lead\Delta 5 ECU_{ijt}$			0.136	0.009
			(0.246)	(0.252)
Fixed Effects:				
Exporter-Year (i,t)	yes	yes	yes	yes
Importer-Year (j,t)	yes	yes	yes	yes
Country-Pair (i,j)	yes	yes	yes	yes
N	115,264	107,669	83,914	41,496
R^2	0.203	0.209	0.224	0.183

Notes: Standard errors are in parentheses. * denotes $p < 0.05$; ** denotes $p < 0.01$; and *** denotes $p < 0.001$. Results in columns (1), (2), and (3) use unbalanced data set; those in column (4) use (smaller) balanced data set.

Table 3: General Equilibrium Trade Effects of NAFTA Dissolution

	(A) United States		(B) Mexico		(C) Canada	
	$\%\Delta Exports$	$\%\Delta Imports$	$\%\Delta Exports$	$\%\Delta Imports$	$\%\Delta Exports$	$\%\Delta Imports$
Canada	-49.17	-48.12	-46.06	-48.33	7.66[a]	7.66[a]
Mexico	-52.16	-48.84	3.95[a]	3.95[a]	-48.33	-46.06
United States	1.05[a]	1.05[a]	-48.84	-52.16	-48.12	-49.17
ROW	0.43	0.63	3.52	0.43	4.26	3.41

Notes: "a" denotes intranational trade.

Table 4: General Equilibrium Wage, Price, and Welfare Effects

	$\%\Delta Wage$	$\%\Delta Price$	$\%\Delta Welfare$
Canada	-0.795	1.318	-2.113
Mexico	-0.651	0.498	-1.149
United States	-0.029	0.241	-0.270
Afghanistan	0.051	0.050	0.000
Albania	0.052	0.052	0.000
Algeria	0.051	0.045	0.005
Angola	0.068	0.058	0.010
Antigua and Barbuda	0.087	-0.014	0.101
Argentina	0.038	0.035	0.003
Armenia	0.049	0.048	0.001
Australia	0.046	0.041	0.005
Austria	0.052	0.050	0.003
Azerbaijan	0.050	0.049	0.000
Bahamas	0.066	0.036	0.030
Bahrain	0.050	0.043	0.007
Bangladesh	0.064	0.061	0.003
Barbados	0.047	0.027	0.020
Belarus	0.050	0.049	0.001
Belgium	0.052	0.044	0.008
Belize	0.052	-0.003	0.055
Benin	0.050	0.050	0.000
Bermuda	0.029	0.022	0.006
Bhutan	0.051	0.051	0.000
Bolivia	0.049	0.043	0.006
Bosnia and Herzegovina	0.051	0.050	0.000
Botswana	0.050	0.050	0.000
Brazil	0.044	0.041	0.003
Brunei Darussalam	0.051	0.049	0.002
Bulgaria	0.051	0.050	0.001
Burkina Faso	0.051	0.051	0.000
Burundi	0.057	0.055	0.002
Cabo Verde	0.054	0.053	0.001
Cambodia	0.057	0.057	0.000
Cameroon	0.051	0.048	0.002
Central African Republic	0.050	0.049	0.000
Chad	0.054	0.054	0.000
Chile	0.039	0.027	0.012
China	0.053	0.053	0.001
Colombia	0.040	0.031	0.009
Comoros	0.061	0.060	0.002
Costa Rica	0.065	0.022	0.043
CÃŽte d'Ivoire	0.056	0.051	0.005
Croatia	0.051	0.050	0.001
Cuba	0.052	0.046	0.005
Cyprus	0.049	0.049	0.000
Czechia	0.051	0.049	0.002
Dem. Rep. of the Congo	0.053	0.050	0.003
Denmark	0.053	0.050	0.003
Djibouti	0.051	0.051	0.000
Dominica	0.044	0.028	0.017
Dominican Republic	0.076	0.051	0.024
Ecuador	0.054	0.042	0.012
Egypt	0.047	0.046	0.002
El Salvador	0.052	0.023	0.029
Equatorial Guinea	0.049	0.048	0.000
Eritrea	0.053	0.053	0.000
Estonia	0.053	0.049	0.004
Eswatini	0.059	0.057	0.002
Ethiopia	0.051	0.050	0.001
Faroe Islands	0.052	0.051	0.000
Fiji	0.066	0.056	0.011
Finland	0.052	0.049	0.003
France	0.051	0.048	0.003
Gabon	0.070	0.058	0.012
Gambia	0.050	0.049	0.000
Georgia	0.052	0.050	0.001

Germany	0.052	0.048	0.004
Ghana	0.052	0.048	0.004
Greece	0.052	0.050	0.001
Greenland	0.051	0.047	0.004
Grenada	0.053	0.039	0.014
Guatemala	0.039	0.012	0.027
Guinea	0.058	0.047	0.011
Guinea-Bissau	0.050	0.050	0.000
Guyana	0.071	0.009	0.062
Haiti	0.070	0.053	0.017
Honduras	0.075	0.025	0.051
Hong Kong	0.067	0.048	0.018
Hungary	0.051	0.049	0.001
Iceland	0.055	0.047	0.007
India	0.049	0.048	0.002
Indonesia	0.053	0.050	0.003
Iran	0.050	0.049	0.000
Iraq	0.051	0.048	0.003
Ireland	0.054	0.045	0.009
Israel	0.064	0.054	0.010
Italy	0.052	0.049	0.003
Jamaica	0.078	0.037	0.041
Japan	0.053	0.046	0.006
Jordan	0.046	0.044	0.003
Kazakhstan	0.050	0.048	0.002
Kenya	0.052	0.050	0.003
Kiribati	0.064	0.061	0.003
Korea	0.061	0.054	0.007
Kuwait	0.049	0.045	0.004
Kyrgyzstan	0.045	0.041	0.004
Laos	0.053	0.053	0.000
Latvia	0.052	0.050	0.001
Lebanon	0.049	0.048	0.001
Lesotho	0.071	0.064	0.007
Liberia	0.064	0.030	0.035
Libya	0.051	0.048	0.003
Lithuania	0.054	0.051	0.003
Luxembourg	0.051	0.049	0.002
Macao	0.068	0.063	0.005
Macedonia	0.051	0.049	0.002
Madagascar	0.059	0.056	0.003
Malawi	0.055	0.052	0.003
Malaysia	0.067	0.036	0.031
Maldives	0.060	0.058	0.002
Mali	0.054	0.053	0.001
Malta	0.054	0.049	0.005
Marshall Islands	0.070	0.020	0.050
Mauritania	0.049	0.048	0.000
Mauritius	0.058	0.053	0.005
Micronesia	0.049	0.044	0.005
Moldova	0.052	0.050	0.002
Mongolia	0.050	0.049	0.001
Morocco	0.046	0.043	0.003
Mozambique	0.051	0.050	0.001
Myanmar	0.051	0.052	0.000
Namibia	0.067	0.063	0.004
Nepal	0.056	0.055	0.001
Netherlands	0.049	0.043	0.006
New Zealand	0.052	0.044	0.008
Nicaragua	0.058	0.028	0.029
Niger	0.052	0.051	0.001
Nigeria	0.066	0.058	0.007
Norway	0.051	0.039	0.012
Oman	0.055	0.051	0.004
Pakistan	0.051	0.048	0.003
Panama	0.039	0.025	0.015
Papua New Guinea	0.048	0.046	0.002
Paraguay	0.042	0.040	0.002
Peru	0.048	0.036	0.012

Philippines	0.060	0.050	0.010
Poland	0.051	0.050	0.001
Portugal	0.052	0.049	0.003
Qatar	0.047	0.045	0.002
Romania	0.051	0.050	0.001
Russia	0.050	0.049	0.002
Rwanda	0.053	0.052	0.001
Saint Kitts and Nevis	0.081	0.055	0.027
Saint Lucia	0.052	0.030	0.022
Saint Vincent and the Grenadines	0.042	0.035	0.007
Samoa	0.053	0.050	0.002
Sao Tome and Principe	0.059	0.058	0.000
Saudi Arabia	0.054	0.048	0.006
Senegal	0.049	0.048	0.001
Seychelles	0.062	0.058	0.004
Singapore	0.064	0.042	0.023
Slovakia	0.051	0.050	0.001
Slovenia	0.051	0.049	0.002
Solomon Islands	0.053	0.052	0.001
South Africa	0.054	0.050	0.005
Spain	0.047	0.044	0.003
Sri Lanka	0.062	0.056	0.006
Sudan	0.048	0.048	0.000
Suriname	0.057	0.034	0.023
Sweden	0.054	0.050	0.004
Switzerland	0.057	0.051	0.006
Tajikistan	0.049	0.048	0.001
Tanzania	0.049	0.048	0.001
Thailand	0.054	0.049	0.005
Togo	0.049	0.046	0.003
Tonga	0.066	0.062	0.005
Trinidad and Tobago	0.072	0.024	0.048
Tunisia	0.047	0.045	0.002
Turkmenistan	0.050	0.050	0.000
Uganda	0.053	0.051	0.003
Ukraine	0.051	0.049	0.002
United Arab Emirates	0.049	0.046	0.002
United Kingdom	0.052	0.044	0.008
Uruguay	0.041	0.037	0.004
Uzbekistan	0.049	0.048	0.001
Venezuela	0.069	0.052	0.017
Viet Nam	0.053	0.053	0.000
Yemen	0.053	0.052	0.000

Table 5: USA Withdraws From NAFTA (Case 1)

	$\%\Delta Wage$	$\%\Delta Price$	$\%\Delta Welfare$
Canada	-0.822	1.254	-2.076
Mexico	-0.524	0.573	-1.097
United States	-0.030	0.240	-0.270

Table 6: Alternative Partial Effects 1 (Case 2)

	$\%\Delta Wage$	$\%\Delta Price$	$\%\Delta Welfare$
Canada	-0.629	1.036	-1.665
Mexico	-0.520	0.385	-0.905
United States	-0.022	0.192	-0.214

Table 7: Alternative Partial Effects 2 (Case 3)

	$\%\Delta Wage$	$\%\Delta Price$	$\%\Delta Welfare$
Canada	-0.264	0.424	-0.688
Mexico	-0.227	0.147	-0.374
United States	-0.009	0.081	-0.090

Table 8: Alternative Values for θ and σ (Case 4)

	$\%\Delta Wage$	$\%\Delta Price$	$\%\Delta Welfare$
Canada	-0.584	0.828	-1.412
Mexico	-0.478	0.290	-0.767
United States	-0.021	0.159	-0.180

Table 9: No-NAFTA and Canada Forms FTA with European Union (Case 5)

	$\%\Delta Wage$	$\%\Delta Price$	$\%\Delta Welfare$
Canada	-0.749	0.922	-1.671
Mexico	-0.668	0.482	-1.150
United States	-0.052	0.221	-0.273

Table 10: No-NAFTA and Canada Forms FTA with China (Case 6)

	$\%\Delta Wage$	$\%\Delta Price$	$\%\Delta Welfare$
Canada	-0.780	1.270	-2.050
Mexico	-0.653	0.496	-1.149
United States	-0.031	0.239	-0.271