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**Research Report**

## Ex-ante versus ex-post assessments of the economic benefits of Free Trade Agreements: Lessons from the North American Free Trade Agreement (NAFTA)

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***Ex-ante versus ex-post assessments of the economic benefits of Free Trade Agreements: lessons from the North American Free Trade Agreement (NAFTA)***

Jan-Augustin Grumiller

Vienna, May 2014

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### IMPRINT

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## List of Abbreviations

CEPR	Centre for Economic Policy Research
CGE	Computable General Equilibrium
CUFTA	Canadian-US Free Trade Agreement
EU	European Union
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GNI	Gross National Income
NAFTA	North American Free Trade Agreement
NTB	Non-Tariff Barrier
NTM	Non-Tariff Measure
TAA	Trade Adjustment Assistance
TTIP	Transatlantic Trade and Investment Partnership
US	United States

## **Abstract**

Much of the current discussion about the Transatlantic Trade and Investment Partnership (TTIP) is focused on the potential welfare and employment effects. Supporters of TTIP often support their argument by highlighting the optimistic results of computable general equilibrium (CGE) models. CGE-models are the methodological backbone of most ex-ante impact assessments of free-trade agreements, as for instance published by the European Commission. The objective of this paper is to assess the accurateness of ex-ante studies by scrutinizing the example of the North American Free Trade Agreement (NAFTA). The analysis suggests that a considerable gap exists between ex-ante projections and ex-post evaluations with regard to NAFTA's effects on welfare, wages and employment. Most ex-ante models had a tendency to overestimate the benefits and underestimate the costs of free-trade. The experience of NAFTA reveals the weak credibility of ex-ante simulations. Policy makers should thus treat the formers' results with the appropriate skepticism.

# 1. Introduction

The European Union (EU) and the United States (US) are currently negotiating a free-trade agreement (FTA). Much of the discussion about the Transatlantic Trade and Investment Partnership (TTIP) is focused on the possible effects on welfare and employment. Supporters of TTIP typically dismiss opposing arguments by highlighting that trade liberalization promotes the general welfare of society. This is frequently supported by commissioned research. Within the EU, the European Commission, in particular the Directorate-General for Trade, regularly uses commissioned studies demonstrating the positive effects of trade liberalization in order to support its proposals to initiate new negotiations on FTAs. With regard to TTIP, for instance, Trade Commissioner Karel de Gucht frequently refers to a study conducted by the Centre for Economic Policy Research and its alluring promise of an increase of €545 in the annual disposable income per household in the EU (Francois et. al. 2013; e.g. de Gucht 2014: 6). This strategy is not new and has been applied in many similar instances in the past. Before the North American Free Trade Agreement (NAFTA) came into force 20 years ago in 1994, a campaign with a wide array of promises was launched under the headline of the promotion of growth and the creation of new jobs. President Bill Clinton argued on the basis of an optimistic interpretation of studies conducted by Hufbauer and Schott (1992, 1993), that NAFTA would result in boosting employment in the US by creating a net gain of 200,000 jobs within two years (Hufbauer/Schott 2005: 8). Similar to the discussions on TTIP, these projections turned out to be heavily contested by trade unions, NGOs and social movements, however, mainly on the basis of anecdotal evidence (e.g. Public Citizen 2014). In order to arrive at a conclusive assessment of the precision of ex-ante projections, a systematic comparison with ex-post evaluations is necessary. After being in force already for 20 years, NAFTA arguably provides a good example for detailed scrutiny.

This is precisely the objective of this paper: to examine the accuracy of ex-ante studies that presented projections on the economic impact of NAFTA on welfare/GDP, wages and employment. This is done by comparing the results of ex-ante simulations and ex-post evaluations. It is *not* the primary task to examine the methodology of the studies. The literature on the effects of NAFTA is extensive, thus this study survey cannot claim completeness. The analysis will nonetheless try to capture the general tendencies that emerged from some of the most widely cited studies.

Whereas forecasting methods rely mainly on computable general equilibrium (CGE) models, various approaches have been used to assess the actual impact of NAFTA. Most ex-post studies apply qualitative and quantitative research, as well as econometric analysis. The major limitation of ex-ante projections is their basis: shaky assumptions, in particular with regard to the results of the negotiations. On the other hand, ex-post evaluations suffer foremost from the very difficult task of distinguishing between what happened *since* NAFTA and what happened *because of* NAFTA.<sup>1</sup> The quality of results varies widely, since not all studies pay the attention necessary to these issues. For this reason, all presented results should be interpreted with caution. Another important matter is the difference between the scenarios as defined for the purpose of CGE modeling and the actually concluded trade agreement. Regarding tariffs, ex-ante simulations generally modeled the abolishment of all tariffs. These scenarios are roughly in line with NAFTA regulations, despite a few minor exceptions. Even though NAFTA was not fully implemented until 2008, most provisions were

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<sup>1</sup> The effect of NAFTA on trade is highly disputed. For example, Pacheco-López and Thirlwall (2004) believe that NAFTA had no significant effects on trade whatsoever. Other studies concerned with this subject are for example Agama/McDaniel (2002), Naanwaab/Yeboah (2012), Gould (1998), Colyer (2001), Okun et. al. (2003) and Krueger (2000). The evaluation of this issue is beyond the scope of this paper, but it should be kept in mind that all discussed ex-ante and ex-post estimates do imply an effect of NAFTA on trade flows.

already put into effect around the millennium.<sup>2</sup> Ex-ante simulations commonly also included non-tariff measures (NTMs)<sup>3</sup> and foreign direct investment (FDI)<sup>4</sup>. Because NAFTA did include a wide array of directives regarding the reductions of NTMs, CGE simulations accounting for the impact of NTMs should be included in the survey. Furthermore, NAFTA also covered the interests of foreign investors by applying national treatment, and by introducing investor to state dispute settlement (NAFTA 1992; Hufbauer/Schott 1993, 2005). Since the Canadian-US Free Trade Agreement (CUFTA) was already in place and Mexico had implemented comprehensive trade liberalization measures in the 1980s, Pacheco-López and Thirlwall (2004) believe the major effect of NAFTA to be on FDI.<sup>5</sup> For this reason also ex-ante FDI scenarios are included in the comparison.

The task of assessing the merits and limitations of ex-ante simulations is carried out in order to contribute to the debate on TTIP and other on-going trade negotiations. By scrutinizing the scientific debate on NAFTA some important lessons might be drawn from a benchmark discussion in the recent history of FTAs.

## 2. Ex-ante projections

In this section the overall tendencies of ex-ante projections for NAFTA will be assessed. A summary on the basis of 11 studies and 22 different experiments is presented in Table 1 and Figure 1. Further information on some of the cited studies is presented in Table 2. All results are based at least on tariff elimination. In addition, several studies include NTM reductions and a few FDI flows. Taking into account the actual importance of NTMs and FDI in the NAFTA agreement, some of the defined ex-ante scenarios do not seem to capture the full scope of NAFTA and therefore should present relatively conservative estimations, while more comprehensive scenarios should represent the concluded agreement in a more adequate manner.

Ex-ante projections of real GDP and national income were relatively homogeneous. For the US, NAFTA was expected to have only a small positive impact. Most predictions range between 0.1 % and 0.3 % real GDP growth as a result of NAFTA (Table 2). For Mexico, the expectations were more optimistic. Including NTMs in the scenarios, most studies projected real GDP growth well above 2 %. The consideration of FDI raised impact projections for NAFTA even further. To illustrate, Brown, Deardorff and Stern (1992) calculated a GDP gain of 5 % and Hinojosa-Ojeda and Robinson (1991) an increase of 6.4 % when including tariffs, NTBs and FDI in their experiments. Data for NAFTA projections on Canada is less extensive and varies widely. For example, Brown, Deardorff and Stern (1992) expected 0.7 %, Cox and Harris (1992) 1.49 % and Roland-Holst, Reinert and Shiells (1994) between 0.4 % and 10.6 % GDP/welfare growth as a result of NAFTA. Overall, this study survey reveals a median of 0.14 % GDP growth for the US, 2.27 % for Mexico and 1.1 % for Canada (Figure 1).<sup>6</sup>

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<sup>2</sup> Most tariff reductions were realized in 1994. The remaining tariffs were to be gradually phased out within 5, 10 and 15 years (NAFTA 1992). Several acceleration exercises speeded up the process (SICE 2014).

<sup>3</sup> The scenarios for NTMs vary widely. While some results are based on sectoral or partial NTM reductions, others are the outcome of the abolishment of "all" non-tariff barriers (NTBs) (Brown/Deardorff/Stern 1992; Francois/Shiells 1992). Regarding import quotas, NAFTA comes relatively close to the more optimistic scenarios (Hufbauer/Schott 1993, 2005; NAFTA 1992).

<sup>4</sup> Scenarios including FDI concentrate on the impact on Mexico. FDI are linked to an increase in capital stock and thus to an increase in output. In this study survey, increases of up to 10 % in Mexico's capital stock due to FDI were assumed (not necessarily coming from the NAFTA area). While there is little doubt that NAFTA boosted FDI dramatically (Cuevas/Messmacher/Werner 2005; Pacheco-López/Thirlwall 2004; Waldkirch 2003), the assumed positive effects remain questionable (see next chapter).

<sup>5</sup> Cuevas, Messmacher and Werner (2005) estimate, that NAFTA increased FDI inflows to Mexico by 60 %. Waldkirch (2003) gets similar results.

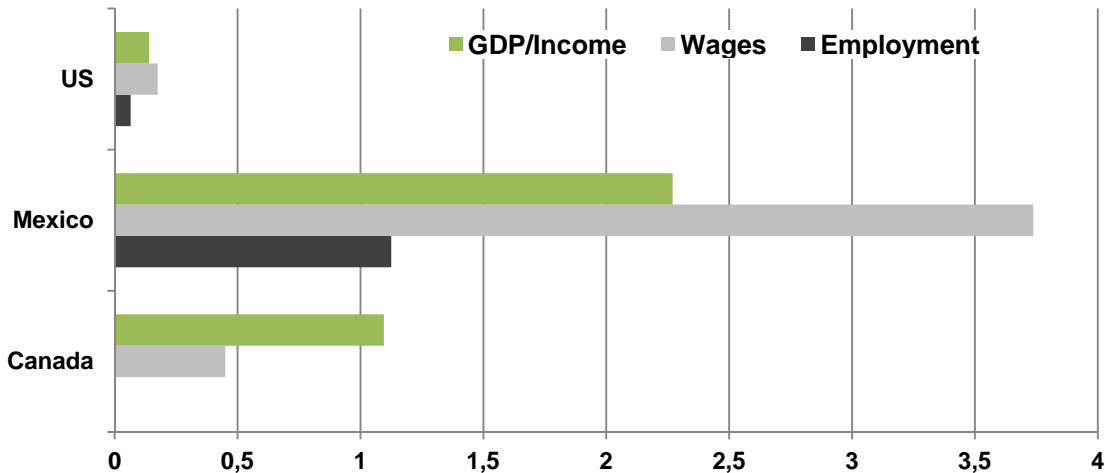
<sup>6</sup> By analyzing results of studies surveyed by the US International Trade Commission, Baldwin and Venables (1995) present a median of 0.16 % GDP growth for the US, 2.5 % for Mexico and 3.26 % for Canada.



The effects of NAFTA on real wages were expected to be positive for all three countries. The smallest impact was calculated for the US, generally projecting no more than 0.2 % of real wage growth. For Mexico, the estimated wage gains were enormous – also depending mainly on the inclusion of FDI in the CGE experiments. Whereas calculations without increasing FDI inflows as a result of NAFTA projected an impact of below 1 %, FDI would boost expectations for real wage growth in Mexico on the order of 6-9 % (Table 2). The most optimistic projection was given by Sobarzo (1991), presenting an impact of 16.2 % by holding employment fixed. For Canada, the limited literature shows relatively small gains of 0.4-0.5 % in the case of Brown, Deardorff and Stern (1992) and relatively large gains of 1.3 % in the case of Cox and Harris (1992).

Even though expected employment gains were used as the major sales argument in the US, ex-ante projections did not necessarily support this on a broad basis. The often cited free-trade advocates Hufbauer and Schott (1992, 1993) calculated a net gain of 130,000 to 170,000 jobs due to NAFTA, to materialize within a few years. DRI/McGraw-Hill (1992) expected an *annual* growth of 160,000 to 221,000 jobs in the US (1993-2000). Roland-Holst, Reinert and Shiells (1994) projected an increase between 0.08 % and 2.47 % in employment – depending on the set of assumptions (Table 2). Nonetheless, most studies did not expect a meaningful impact on the US labor market (O’Leary/Eberts/Pittelko 2012). For Mexico, expectations were however high. Most notably, the studies of KPMG Marwick (1991), Sobarzo (1991) and Roland-Holst, Reinert and Shiells (1994) calculated employment gains between 2.4 % and 6.6 %. In this literature review, only Roland-Holst, Reinert and Shiells (1994) presented employment projections for Canada, ranging between 0.61 % and 11.02 %.

**Figure 1: Results of ex-ante simulations for NAFTA**



Sources: Francois/Shiells 1992: Table 2a, 2b, 2c; Brown/Deardorff/Stern 1992: Table 1, 2; CBO 1992  
 Median change in %; Own calculations based on 11 studies and 22 different experiments. Not sufficient data for Canadian employment available. Data on real GDP/income reflects GDP except for two experiments.

**Table 1: Simulation results of most cited ex-ante studies**

	<b>United States</b>	<b>Mexico</b>	<b>Canada</b>
<b>Real GDP</b>	0.0 to 2.07	-0.35 to 11.39	0.12 to 10.57
<b>Real wages</b>	-0.7 to 0.95*	0.4* to 16.2	0.04 to 1.3**
<b>Employment</b>	-0.3 to 2.47	-0.1 to 6.6	0.61 to 11.02

Sources: extended table of Brookhart et. al. 1993: Table 2-1; see also Francois/Shiels 1992: Table 2a, 2b, 2c and Brown/Deardorff/Stern 1992: Table 1, 2. For more specific information about most of the here considered studies see Table 2.

In %; Summary based on 11 studies and 22 different experiments.

\*unweighted average of four different job classifications,

\*\*comparison base is the impact of the Canadian-US Free Trade Agreement.

**Table 2: Summary of most cited ex-ante CGE studies on NAFTA**

Summary of most cited ex-ante CGE studies											
Author, Year	Methodology	Experiment	Key Findings								
			Real GDP / Real Income			Wages			Employment		
			US	MEX	CAN	US	MEX	CAN	US	MEX	CAN
Brown, Deardorff and Stern, 1992	IRS, Static, IC	2	0.1	1.6	0.7	0.2	0.7	0.4	-	-	-
	IRS, Static, IC	3	0.3	5	0.7	0.2	9.3	0.5	-	-	-
KPMG Peat Marwick, 1991	CRS, Static, PC	2	0.02	0.3	-	0.02	-	-	-	0.9	-
	CRS, Static, PC	3	0.04	4.6	-	0.03	-	-	-	6.6	-
Hinojosa-Ojeda and Robinson, 1991	CRS, Static, PC	2	0	0.3	-	0.175*	0.4*	-	-	-	-
	CRS, Static, PC	3	0.1	6.4	-	0.175*	8.65*	-	-	-	-
	CRS, Static, PC	4	0.1	6.8	-	0.95*	6.55*	-	-	-	-
Roland-Holst, Reinert and Shiells, 1994	CRS, Static, PC	1	0.06	0.13	0.38	-	-	-	0.08	0.33	0.61
	CRS, Static, PC	2	1.34	2.27	7.22	-	-	-	1.88	1.49	8.96
	IRS, Static, IC	2a	1.3	2.57	5.82	-	-	-	1.79	1.73	7.29
	IRS, Static, IC	2b	2.07	3.38	10.57	-	-	-	2.47	2.4	11.02
Cox and Harris, 1992	IRS, Static, IC	1c	-	-	1.49	-	-	1.3	-	-	-
Sobarzo, 1991	IRS, Static, IC	1d	-	1.7	-	-	-	-	-	5.1	-
	IRS, Static, IC	1e	-	1.9	-	-	-	-	-	5.8	-
	IRS, Static, IC	1f	-	8	-	-	16.2	-	-	-	-
McCleery, 1992	CRS, Dynamic, PC	2	0.22	0.01	-	-	-	-	-	-	-
	CRS, Dynamic, PC	3	0.32	3.09	-	-	-	-	-	-	-
	CRS, Dynamic, PC	3g	0.51	11.39	-	-	-	-	-	-	-
Young and Romero, 1992	CRS, Dynamic, PC	1h	-	2.6	-	-	-	-	-	-	-
	CRS, Dynamic, PC	1i	-	8.1	-	-	-	-	-	-	-

Sources: Original studies; CBO 1992; Francois/Shiells 1992: Table 2a, 2b, 2c; Brown/Deardorff/Stern 1992: Table 1, Table 2

(1) = Tariff abolishment, (2) = 1 + NTM reductions, (3) = 2 + and FDI/capital flows, (4) = 3 + labor migration; (a) = Cournot competition, (b) = Contestable markets, (c) = comparison base is the impact of CUFTA, (d) = fixed wage, capital stock and trade balance, (e) = fixed wage, capital stock and exchange rate, (f) = fixed employment and exchange rate, international mobile capital, (g) = endogenous productivity, (h) = fixed interest rates at 10 % in Mexico, (i) = interest rates fall to 7,5 % in Mexico; CRS = Constant return to scales, IRS = Increasing return to scales, IC = Imperfect competition, PC = Perfect competition; \*unweighted average of four different job classifications. See Francois/Shiells (1992) for a more detailed discussion of the models.

### 3. Ex-post evaluations

The impact of NAFTA on real GDP and welfare as evaluated by ex-post studies seems to be significantly lower than expected by ex-ante projections, even though the literature is not extensive. Caliendo and Parro (2014) estimated an impact on welfare between 1993 and 2005 due to NAFTA tariff reductions to 0.08 % for the US, 1.31 % for Mexico and -0.06 % for Canada. This is by far the most optimistic estimate and is already well below most ex-ante expectations. A study conducted by the Congressional Budget Office (2003) estimates the annual impact of NAFTA on US-GDP to be between 0.001-0.005 % in 1994 and between 0.006-0.041 % in 2001. Similarly, a US International Trade Commission study finds the effect of NAFTA on US-welfare to be negligible (Okun et. al. 2003: 332). On the other hand, a World Bank study quantifies the increase of Mexican GDP per capita as a result of NAFTA to be at 4-5 % until 2002 (Lederman/Maloney/Serven 2003). Weisbrot, Rosnick and Baker (2004) show that the data used in the World Bank model is biased. By using the same model as the World Bank study with reasonable data, they find that NAFTA actually slowed the growth rate for Mexico. Along the same lines, Romalis (2007) discovers no effect of NAFTA on US and Canadian GDP, but a decrease of 0.3 % in Mexican GDP.

After NAFTA came into effect, real wages in member countries were either stagnating, or – as in the case of Mexico due to the peso-crisis – decreasing (Polaski 2006). While this development occurred *since* NAFTA, it cannot be attributed to NAFTA. Caliendo and Parro (2014) believe the impact of NAFTA tariff reductions on real wages between 1993 and 2005 to be positive for the US (0.11 %), Mexico (1.72 %) and Canada (0.32 %). Again, this study is relatively optimistic. Polaski (2006) attributes the decoupling of productivity growth from wages in the US and Mexico to the decreasing bargaining power of labor unions as a result of FTAs. A study on plant-closing threats in connection with NAFTA conducted by Bronfenbrenner (2000) supports this idea. McLaren and Hakobyan (2010) show that wage growth for workers in US-industries affected by NAFTA was substantially lower. Waldkirch (2008) believes that increased FDI inflows as a result of NAFTA raised productivity in Mexico, but FDI's “[...] effect on average compensation per worker is negative or zero at best” (ibid.: 3). Hanson (2003) finds that NAFTA contributed to rising income inequality in Mexico, with an unknown effect on the general wage level. Wage growth for high skilled workers and workers in the north with exposure to foreign markets and FDI turned out to be significantly higher than for unskilled workers and workers in the south. Generally, the link between increasing income inequality and NAFTA seems to be widely accepted (Abbott 2004: 12ff.). As a conclusion, most ex-post evaluations do not find a noteworthy positive effect of NAFTA on real wages. The few studies that do find a positive impact still cannot fulfill the big promises announced by ex-ante assessments (Figure 1).

Because the political discussion prior to the implementation of NAFTA focused especially on employment, the discussion on the actual impact of NAFTA has been heated. Nonetheless, the broad consensus is that expectations were not confirmed. Even the free-trade advocates Hufbauer and Schott, who's results were widely referred to before 1994, seem to have lost faith, stating that “[...] NAFTA is no more than a blip on US employment picture” (Hufbauer/Schott 2007: 85). Furthermore, the general discussion shifted from ex-ante projections trying to assess the job gains induced by NAFTA, to ex-post evaluations focusing on the question of net losses. Scott (2011) believes that 682,900 jobs in the US were displaced between 1994 and 2010 as a result of the NAFTA related trade deficit with Mexico. In his simple calculation, 791,900 jobs were created by US exports to Mexico and 1,474,800 jobs were lost due to US imports from Mexico. Kletzer (2002) estimates that the US lost 1,238,593 jobs due to NAFTA related imports, accounting for 24-27 % of manufacturing job losses and 10.7 % of total job losses between 1993 and 1999. Hinojosa-Ojeda et. al. (2000) concludes that 94,000 jobs in the US were “*put at risk*” every year due to NAFTA-related

imports (Data: 1990-1997). A highly recognized estimate for US job losses is presented by the Trade Adjustment Assistance (TAA), an institution implemented to absorb negative effects of free-trade related job displacement. Data from the NAFTA-TAA suggests that a minimum of 845,000 US workers were displaced due to increased imports from Canada and Mexico since 1994 (Public Citizen 2014). For Mexico, one would expect more positive estimates due to the longer lasting trade surplus with the US, but this is not the case. Polaski (2006) finds that NAFTA has only produced a disappointingly small net gain in jobs: *“Data limitations preclude an exact tally, but it is clear that jobs created in export manufacturing have barely kept pace with jobs lost in agriculture due to imports”* (ibid.: 1). Polaski believes that increasing productivity is a major job killer in Mexico. Salas (2006) concludes that approximately one-sixth of the Mexican population with jobs in the agricultural sector got displaced since the beginning of the 1990s – in part as a result of NAFTA. The biggest loss occurred in the corn production sector, accounting for 1,013,000 displaced jobs (Data: 1991-2000). Salas (2006: 49) also notes that FDI inflows into Mexico have grown significantly since NAFTA, but that these were mostly used to purchase existing assets and thus did not affect the real economy as much as was hoped.<sup>7</sup> This is particularly interesting since the highly optimistic ex-ante projections for Mexico were mainly an outcome of FDI flows.

#### 4. Conclusion

The review of the available literature suggests that a considerable gap exists between ex-ante projections and ex-post evaluations with regard to NAFTA's effects on welfare/GDP, wages and employment. Most ex-ante models had a tendency to overestimate the benefits and underestimate the costs of free-trade. Even though estimation techniques may have evolved to a more sophisticated level during the last two decades, the basic impact assessment methodology for trade liberalization has remained largely unchanged. The simulation of an uncertain future on the basis of questionable assumptions is problematic as soon as these models become the justification for economic policies: the experience of NAFTA reveals the weak credibility of simulation results. With respect to the current debate on TTIP, it is evident that supporters of free-trade once again try to enforce their arguments on the basis of very similar impact assessments. Especially policy makers should thus treat the results of ex-ante projections on FTAs with the appropriate skepticism. Furthermore, it must be stressed that it is also the responsibility of the authors of these studies to highlight the limited predictive power of their simulation based exercises.

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<sup>7</sup> Nonetheless, Waldkirch (2008) finds a connection between non-maquiladora FDI and productivity increases in Mexico.

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