Werner Raza, Bernhard Tröster, Rudi von Arnim

ASSESS_CETA: ASSESSING THE CLAIMED BENEFITS OF THE EU-CANADA TRADE AGREEMENT (CETA)

CETA: ÖKONOMISCHE BEWERTUNG DER PROGNOSTIZIERTEN EFFEKTE DES EU-KANADA FREIHANDELSABKOMMENS

Commissioned by the Chamber of Labour Vienna

August 2016

ÖFSE
Österreichische Forschungsstiftung
für Internationale Entwicklung

AK WIEN
GERECHTIGKEIT MUSS SEIN

Impressum

Medieninhaber: Kammer für Arbeiter und Angestellte für Wien,
Prinz Eugen Straße 20-22, 1040 Wien, Telefon: (01) 501 65 0
Offenlegung gem. § 25 MedienG: siehe wien.arbeiterkammer.at/impressum
Zulassungsnummer: AK Wien 02Z34648 M
ISBN: 978-3-7063-0620-1
Redaktion: Werner Raza, Bernhard Tröster, Rudi von Arnim

Grafik und Druck: AK Wien, 1040 Wien
Verlags- und Herstellungsort: Wien

Stand August 2016
Im Auftrag der Kammer für Arbeiter und Angestellte für Wien

CETA – WENIG ZU GEWINNEN, ABER VIEL ZU VERLIEREN

Demnächst steht auf EU Ebene die Entscheidung an, ob das ausverhandelte Freihandelsabkommen CETA zwischen der EU und Kanada angenommen wird. Die Europäische Kommission, aber auch andere BefürworterInnen werben für das Abkommen mit der Förderung des Außenhandels, mit einem höheren Wirtschaftswachstum, steigenden Einkommen und der Schaffung von Arbeitsplätzen. Die AK hat bei der Österreichischen Forschungsstiftung für Internationale Entwicklung (ÖFSE) eine Studie in Auftrag gegeben, die prognostizierten Effekte einer Überprüfung auf fundierter wissenschaftlicher Basis zu unterziehen. Dazu gehörte auch, alle bisherigen Untersuchungen und Studien zu beurteilen und ihre Annahmen und Ergebnisse auf Plausibilität zu prüfen. In einem zweiten Schritt wurden eigene Modellberechnungen angestellt, um zu aktuelleren und zusätzlichen Schlüssen zu gelangen. Die Ergebnisse der Studie erhärten die Fakten, dass für **Österreich keine bis extrem geringe positive wirtschaftliche Effekte aus CETA zu erwarten** sind.

Nicht berücksichtigt in diesen ökonomischen Modellen werden aber gesamtwirtschaftliche Kosten, die durch die Änderungen, Senkungen oder gar durch den gänzlichen **Entfall von Regulierungen** für die BürgerInnen, KonsumentInnen, ArbeitnehmerInnen oder die Umwelt entstehen können. Solch eine Berücksichtigung des gesellschaftlichen Nutzens von Regulierungen fehlt zudem, wenn es um den Wert hoher Standards bei öffentlicher Daseinsvorsorge und Infrastruktur geht.

Auch die Kosten, die durch das Investor-Staat-Streitbeilegungsverfahren entstehen, können – wie die Erfahrung in Kanada und anderen Staaten zeigt – enorme Ausmaße annehmen. Das droht auch europäischen Staaten, denn an den privilegierten Klagsrechten ändert auch das neu verhandelte CETA Tribunal nichts.

Wenn wir nun also den Nutzen und die Risiken bzw. Kosten, die durch das Freihandelsabkommen CETA bestehen, gegenüberstellen, dann ist das Ergebnis eindeutig. Es gibt keine bzw. marginale positive Effekte für den Handel, aber große Risiken bzw. Kosten für die Allgemeinheit. Diese Rechnung geht also klar ins Minus.

Rudi Kaske
AK Präsident

August 2016

Austrian Foundation
for Development Research

A 1090 Vienna, Sensengasse 3, Austria
T +43 1 3174010 F -150
E office@oefse.at I www.oefse.at

AUSTRIAN FOUNDATION FOR DEVELOPMENT RESEARCH

ASSESS_CETA: Assessing the claimed benefits of the EU-Canada Trade Agreement (CETA)

Updated Final Report, 03 August 2016

Werner Raza, Bernhard Tröster (ÖFSE)
Rudi von Arnim (University of Utah, USA)

A report commissioned by Arbeiterkammer Wien

CONTENTS

ZUSAMMENFASSUNG

Im Herbst 2016 steht auf EU-Ebene die Entscheidung an, ob das ausverhandelte Freihandelsabkommen **CETA** zwischen der EU und Kanada angenommen wird. Die Europäische Kommission (EK) wirbt für das Abkommen mit der **Förderung von Handelsbeziehungen** und der **Schaffung von Arbeitsplätzen**. Jedoch kommen auch die von der **EU-Kommission beauftragten Studien** nur zu einer **verschwindend geringen Steigerung der Wirtschaftsleistung durch CETA** von 0,03% bis 0,08% für die gesamte EU. Dies entspricht nach einer mehrjährigen Implementierungsphase des Abkommens einem **einmaligen Einkommensgewinn von 20 Euro pro EU-Bürgerln**.

Zudem gilt es, die **Annahmen und Modelle** hinter diesen Ergebnissen zu **hinterfragen** und die nicht beachteten **Risiken und Anpassungskosten offenzulegen**. Dies ist umso wichtiger, als nicht zuletzt die EU-Kommission selbst die Neuartigkeit des Abkommens betont, durch das in vielen Bereichen die Zusammenarbeit in Regulierungsfragen intensiviert und der Investorenschutz durch die vieldiskutierte Investor-Staat-Streitbeilegung (Investment Court System, ICS) ausgebaut wird. CETA gilt damit als eine Vorreiterin für die künftige Handelspolitik der EU, in der Themen wie Regulierung, Liberalisierung des öffentlichen Beschaffungswesens und Schutz von Investitionen im Mittelpunkt stehen.

In dieser Studie werden drei Hauptaspekte behandelt:

1) Die **bekannten Studien** zu ökonomischen Effekten von CETA werden **zusammengefasst und kritisch überprüft**. Dabei werden unzureichende Modellannahmen problematisiert und fehlende Risiken und **Anpassungskosten** dargestellt.

2) Basierend auf dem **ÖFSE Global Trade Model** werden die **ökonomischen Effekte von CETA** auf die Mitglieder des Abkommens und andere Weltregionen – aber auch speziell für Österreich – geschätzt. Das verwendete **Modell** erlaubt dabei im Gegensatz zu herkömmlichen Ansätzen auch Aussagen zu **Effekten auf Beschäftigung, Löhne, Budgetdefizit und Leistungsbilanz**.

3) Modellbasierte Analysen zu den wirtschaftlichen Effekten von Handelsabkommen sind immer mit gewissen Unsicherheiten verbunden, da bestimmte Parameter nicht exakt abzuschätzen sind. In den Handelsabkommen der neuen Generation wie CETA wird dies durch die Bedeutung von nicht-tarifären Handelshemmnissen wie Regulierungen und technische Standards noch verstärkt, da *ex-ante* unklar ist, wie stark Handelskosten durch regulatorische Zusammenarbeit gesenkt werden können. Deshalb wird mithilfe einer **Sensitivitätsanalyse die Schwankungsbreite der Ergebnisse** aufgrund der Variation von wichtigen Parametern **aufgezeigt**.

Kritik an bestehender Studien

Zu den wichtigen Studien zu CETA zählen die „Joint Study by the European Commission and the Government of Canada“ *(Joint Study*, 2008) und das EU Sustainability Impact Assessment *(SIA*, 2011), die beide von der EK beauftragt wurden. Außerdem ist die Studie von Francois/Pindyuk (2013) mit Fokus auf Österreich von Relevanz. Die in diesen Studien verwendeten Modelle beruhen alle auf angebotsseitigen, neoklassischen Annahmen und können nur bedingt Aussagen über wichtige makroökonomische Variablen wie insbesondere Beschäftigungseffekte machen.

Alle drei Studien zeigen **positive Effekte für die EU, Österreich und Kanada**. So zum Beispiel:

- **BIP Steigerung von 0,03% bis zu 0,08% für die gesamte EU; bis zu 0,22% für Österreich** (jeweils nach einem Anpassungszeitraum von 6 bis 10 Jahren)
- **Steigerung der EU-Exporte nach Kanada um 17%** (Joint Study), österreichische Exporte nach Kanada +50% (Francois/Pindyuk)
- **Reallohnsteigerungen um 0,06% (EU) bis 0,13% (Österreich)**

Mögliche Effekte aus der Liberalisierung des öffentlichen Beschaffungswesens für europäische Unternehmen werden von den Studien – soweit behandelt – als gering eingeschätzt.

Die große Bandbreite der Ergebnisse hängt von den verwendeten Modellen ab. So verwenden die Joint Study (2008) und Francois/Pindyuk (2013) eine **dynamische Modellierung**, aufgrund derer sich die **statischen Einkommenseffekte um das Fünffache erhöhen**. Die dafür unterstellte **Kausalitätskette (Ramsey-Struktur)** ist allerdings **nicht überzeugend**, wird doch angenommen, dass steigende Einkommen durch Exporte die gesamtwirtschaftliche Ersparnis erhöhen, was in Folge die Investitionen und den Kapitalbestand erhöht. Dieser Zusammenhang gilt allerdings nur unter der **unrealistischen Annahme der Vollbeschäftigung**. In diesem Sinne betont die Ramsey-Modellstruktur die Bedeutung der problematischen Vollbeschäftigungsannahme noch mehr als das Standardmodell, und muss sich derselben Kritik aussetzen.

Obwohl die berichteten Effekte nur langfristig gelten, berücksichtigen die Studien **kurz- und mittelfristige Anpassungskosten** nicht. Eine grobe Berechnung auf Grund der in Francois/Pindyuk (2013) angegebenen sektoralen Verschiebungen auf dem österreichischen Arbeitsmarkt ergibt eine **temporäre Arbeitslosigkeit in Höhe von rund 4.300 Stellen**. Die dadurch entstehenden **volkswirtschaftlichen Kosten** (Arbeitslosengeld, Ausfall von Steuer- und Sozialversicherungseinnahmen) schätzen wir auf **ca. 127 Millionen Euro**. Die **entspricht rund 20%** der von Francois/Pindyuk (2013) genannten Zugewinne in der Höhe von ca. 600 Millionen Euro durch CETA in Österreich.

Für die **EU insgesamt ergeben sich Anpassungskosten** aufgrund von temporärer Arbeitslosigkeit und den damit verbunden Mehrausgaben für Arbeitslosigkeit bzw. Mindereinnahmen bei Steuern und Sozialausgaben sowie durch entfallenden Zolleinnahmen **von bis zu EUR 5,5 Mrd. über den Anpassungszeitraum von 10 Jahren**. Dem gegenüber stehen mögliche Einkommensgewinne durch CETA in der Größenordnung von EUR 4 Mrd. (SIA, 2011) bis EUR 12 Mrd. (Joint Study, 2008).

ÖFSE Simulation der Effekte von CETA

Mit dem **ÖFSE Global Trade Model** ist es möglich die ökonomischen Effekte von CETA auf einzelne EU-Länder und Regionen sowie Kanada, USA und andere Weltregionen und für 20 Sektoren zu berechnen. In diesem nachfragebasierten Modell werden explizit **Beschäftigungseffekte und makroökonomische Einflussgrößen** ausgewiesen. Es werden insgesamt **vier Szenarien** berücksichtigt[1], wobei es zum einen um die Reduktion der verbliebenen Zölle im bilateralen Handel und zum anderen um die Angleichung unterschiedlicher Standards, Normen und Regulierungen – sog. Nicht-Tarifärer Handelshemmnisse (NTM) – geht. Daraus ergeben sich **für alle CETA-Mitgliedstaaten positive, aber sehr geringe Effekte** (langfristiges Szenario):

[1] Szenario 1: Zollreduktion zwischen EU und Kanada um 100%; Szenario 2: Reduktion der nicht-tarifären Handelshemmnisse (NTM) im bilateralen Handel um 25%; Szenario 3 (Kurzfristiges Szenario): Zollreduktion um 75% und NTM-Reduktion um 10%; Szenario 4 (Langfristiges Szenario): Zollreduktion um 100% und NTM-Reduktion um 50%.

- **Wachstum des BIP** um **0,023% in der gesamten EU** und **0,062% in Kanada**. Diese Zuwächse sind als **langfristiger Niveaueffekt** zu verstehen, d.h. erhöhen das BIP einmalig während des Umsetzungszeitraums von CETA von rund **10-20 Jahren**.
- **Stärkere Effekte für große EU-Länder** (Deutschland, Frankreich, Italien) führen dazu, dass andere EU-Länder wie Österreich anteilig am EU-BIP verlieren.
- Auf EU-Ebene, profitieren vor allem die Sektoren **Nahrungsmittel (+0,13%)** und **Automobil (+0,08%)**.
- Die **Beschäftigung** steigt in der gesamten **EU leicht um +0,018%.** Die Reallöhne sinken für ArbeitnehmerInnen mit geringer Qualifikation um -0,011%, bzw. steigen um +0,014% für ArbeitnehmerInnen mit höherer Qualifikation.
- Für **Österreich** ergibt sich ein **realer Einkommenszuwachs von 0,016% oder knapp 50 Millionen Euro**, das sind **6 Euro pro ÖsterreicherIn**. Die Veränderung liegt damit unter dem EU-Durchschnitt.
- Die Effekte stammen sowohl aus dem **Abbau von Zöllen als auch von NTM**, die Wirkung von NTM-Anpassungen ist allerdings für die meisten EU-Länder und auch Österreich etwas weniger relevant.
- Auf sektoraler Ebene können **in Österreich** vor allem die **Sektoren Automobil (+0,10%), Nahrungsmittel (+0,06%) und Maschinenbau (+0,03%)** leicht **profitieren**. In Dienstleistungssektoren kommt es zu sehr geringen Veränderungen (ca. 0,01%).
- Die Veränderungen auf die **Beschäftigung in Österreich** bleiben mit einem **Zuwachs von rund 450 Vollzeitstellen** (+0,013%) gering und folgen damit der leicht positiven Entwicklung des BIP.
- Bei den österreichischen **Reallöhnen** ergibt sich eine **leicht negative Veränderung bei Beschäftigten mit niedrigerem Ausbildungsstand** (-0,0023%); Reallöhne von besser ausgebildeten Beschäftigen steigen minimal (0,009%).

Diese **Ergebnisse** sollten als **‚Best Case Szenario'** interpretiert werden, da eine deutliche Senkung von Handelskosten aus nicht-tarifären Handelshemmnissen (NTM) von 50% angenommen wird. Zudem wird in diesem Modell aus methodischen Gründen davon ausgegangen, dass die Senkung von Handelskosten aus nicht-tarifären Handelshemmnissen nur positive ökonomische Effekte bringt. Mögliche Kosten, die bei der Anpassung von Standards entstehen, sowie allfällige soziale Kosten der Senkung von Standards sind nicht berücksichtigt.

Weitere mögliche **Anpassungskosten können** während der Implementierungsphase durch vorübergehende sektorale Arbeitsplatzverluste **entstehen**. Eine dynamische Simulation des ÖFSE Global Trade Models, ergibt aufgrund der insgesamt äußerst geringen Wachstumseffekte nur minimale Anpassungskosten auf dem Arbeitsmarkt. Letztere hängen somit stark von der gewählten Modellstruktur ab. Je höher die erwarteten Effekte auf das BIP, desto größer auch die zu erwartenden Anpassungskosten auf dem Arbeitsmarkt. Dementsprechend schwanken die **Schätzungen zur vorübergehenden Arbeitslosigkeit zwischen nahezu Null** (ÖFSE Weltmodell)**, rund 4.300 Stellen in Österreich** (unsere Schätzung auf Basis von Francois/Pindyuk 2013) und **167.000 Stellen in der gesamten EU** (unsere Schätzung auf Basis von SIA 2011)**.**

Sensitivitätsanalyse

Die angegebenen **Modellergebnisse** sind **mit** einer **Unsicherheit verbunden**, da einige wichtige Parameter für die Modellanalyse geschätzt werden müssen. Besonders die Schätzungen zu den Handelskosten der nicht-tarifären Handelshemmnisse (NTM) variieren in den untersuchten Studien stark. Eine Sensitivitätsanalyse unserer diesbezüglichen Ergebnisse zeigt deutlich, dass diese einer **beträchtlichen Schwankung** unterliegen. Für Österreich bedeutet dies konkret:

- Die **BIP Veränderungen** schwanken **zwischen -0,01% und 0,015%**.
- Auf **sektoraler Ebene** sind **negative BIP-Effekte für alle Sektoren** möglich.
- Für die **Beschäftigungseffekte** ergibt sich eine **Schwankungsbreite von +/- 300 Vollzeitstellen** aus NTM Veränderungen.
- In Kombination mit den leicht positiven Effekten aus Zollsenkungen für Österreich (+325 Jobs), ist somit eine **Bandbreite der Beschäftigungseffekte von nahezu Null bis knapp 600 Vollzeitstellen** möglich.

Insgesamt kann man also davon ausgehen, dass auch im positiven Fall die **wirtschaftlichen Effekte von CETA für Österreich gering** sind. Im Gegensatz dazu können potenziell **negative Effekte aus NTM Veränderungen die Gesamteffekte Richtung Null bringen**.

Auf EU-Ebene gilt ebenfalls für **alle EU Länder und Regionen, dass das BIP je nach Reduktion der Handelskosten durch NTMs um bis zu +/- 0,05% schwanken kann**. Am deutlichsten zeigt sich dies für Großbritannien, wo negative Veränderungen bis zu -0,05% auftreten können. Die Beschäftigungseffekte für Großbritannien sind etwas geringer und liegen im Bereich von -0,03% und 0,04%. Die Veränderungen in BIP und Beschäftigung für die anderen EU-Länder bzw. Regionen sind zum Teil deutlich geringer.

EXECUTIVE SUMMARY

In late 2016, a decision will be made by the Council of the European Union whether to launch the ratification process of the free trade agreement between the EU and Canada (**CETA**). The European Commission (EC) is promoting the agreement with the prospects of **more trade, stronger economic relations and job creation**. However, **studies** on the **economic impact of CETA** report only **marginal effects on GDP** of 0.03% to 0.08% for the whole of the EU. In other words, CETA is expected to generate a one-time income effect of around 20 EUR per EU citizen after a 10 years implementation period.

Despite these small effects by CETA, it is worthwhile to **question models and assumptions** that stand behind these estimations and **show neglected risks and adjustment costs**. This task is highly relevant, given that the EC is stressing the innovative character of the agreement as it includes intensive regulatory cooperation and strengthens investor protection via the controversially discussed investor arbitration mechanism. CETA is therefore considered the blueprint of the future EU trade policy that focuses on new topics such as regulation, liberalization of public procurement and the promotion and protection of investment.

This report consists of three major parts:

1) The **results** of often-cited reports on the economic impacts of CETA are **summarized and critically assessed**. The problematic model assumptions and the neglected risks and **adjustment costs** are **analyzed**.

2) Based on the **ÖFSE Global Trade Model**, the **economic effects of CETA** for the member countries – with a focus on Austria – and on non-parties are **estimated**. In contrast to standard trade models, we are able to report **effects on employment, wages, budget deficits and current accounts**.

3) Model-based analysis on the economic impacts of free trade agreements are always subject to a level of uncertainty given that certain model parameters have to be estimated. This is specifically relevant for trade agreements of the 'new generation' with their focus on non-tariff measures (NTMs) such as regulations and standards, as it ambiguous ex-ante by how much trade costs related to NTMs can be reduced. Based on a **sensitivity analysis**, the **variability of our model outcomes** is **assessed**.

Critique on existing CETA studies

The reports on CETA include the „Joint Study by the European Commission and the Government of Canada" *(Joint Study*, 2008) and the EU Sustainability Impact Assessment *(*SIA, 2011), which were both commissioned by the EC. In addition, a study of Francois/Pindyuk (2013) is assessed that focuses on Austria. All of these studies use models that are based on supply-side, neoclassical assumptions and cannot speak to important macroeconomic variables such as employment.

All three studies show positive effects for the EU, Austria and Canada. For instance:

- **Real GDP growth ranges from 0.03% to 0.08% for the EU** and up to 0**.22% for Austria** (after an implementation period of 6 to 10 years).

- **Increase in EU exports to Canada by 17%** (Joint Study), in Austrian exports to Canada by 50% (Francois/Pindyuk).
- **Real wage gains by 0.06% (EU)** and up to **0.13% (Austria)**.

Potential effects from the liberalization of public procurement are estimated to have marginal effects on European companies.

The wide range of results highly depends on the applied type of model. As the Joint Study (2008) and Francois/Pindyuk (2013) use a long run **model with capital accumulation**, their **dynamic results for income exceed static effects by a factor of five**. These results rely on a **controversial chain of causation** – the so-called "Ramsey-structure" – as it is assumed that growing income from exports leads to higher overall savings, which in turn creates investment and higher capital stocks. However, this relation is only valid if full employment is assumed. In this sense, the 'Ramsey structure' compounds the **problematic assumptions of price-clearing markets (specifically labor markets)** made in the baseline static neoclassical CGE models.

Even though the reported effects are long-term gains, the studies do not consider short- and medium term adjustment cost. A rough calculation based on **inter-sectoral displacements in the Austrian labor market** reported by Francois/Pindyuk (2013), shows that **4,300 full-time jobs** are **threatened by temporary unemployment**. This amounts to **adjustment costs** (unemployment benefits and foregone taxes and social contributions) of around **EUR 127 million**. This is **equivalent to about 20% of the gains from CETA** of around EUR 600 million for the Austrian economy reported by Francois/Pindyuk (2013).

For the EU, adjustment costs due to inter-sectoral job displacements and foregone tax and social security contributions and tariff revenues could **sum up to EUR 5.5 billion over a ten year implementation period**, against estimated gains from CETA between EUR 4 billion (SIA, 2011) to EUR 12 billion (Joint Study, 2008).

ÖFSE Simulations on CETA Effects

Based on the **ÖFSE Global Trade Model**, it is possible to estimate economic effects of CETA on specific EU countries and regions as well as on Canada, USA and other world regions and for 20 sectors in each country. The demand-based model explicitly **reports employment effects and changes to macro-economic variables**. In total, **four scenarios** are considered[2] that include the reduction of tariffs in EU-Canada trade and the effects of regulatory alignment of so called non-tariff measures.

Our results show **positive, but marginally low effects** for all CETA-member states in the long run scenario:

- **Real GDP grows by 0.023% for the EU and 0.062% for Canada**; these changes represent **long run level effects**, meaning that the GDP changes occur over a 10-20 year implementation period.

[2] Tariff scenario: tariff reduction between EU and Canada by 100%; NTM scenario: Reduction of NTMs by 25%; Short run scenario: tariff reductions by 75% and NTM reductions by 10%; Long run scenario: Tariff reduction by 100% and NTM reductions by 50%

- **Stronger effects occur in the larger EU countries** (Germany, France, Italy), meaning the other EU countries such as Austria are losing ground relative to these EU partners.
- On the EU level, above-average gains appear in the sectors **'processed foods' (+0.13%)** und '**motor vehicles' (+0.08%)**.
- **EU employment** increases slightly by **+0.018%.** However, real wages shrink slightly for lower skilled workers (-0.011%), whereas small gains for high skilled workers are possible (+0,014%).
- For Austria, **real income effects amount to 0.016% or EUR 50 million**, which is roughly **6 EUR per Austrian citizen**. These effects are below EU average.
- The effects are caused both by tariff and NTM reductions; NTM trade cost reductions are crucial for Canada but of less importance for EU countries and Austria.
- On the sectoral level in **Austria**, the **sectors 'motor vehicles' (+0.10%),** '**processed foods' (+0.06%) and 'other machinery' (+0.03%)** show above-average gains. In the service sectors only small changes appear (around 0.01%). **Changes in employment in Austria (+450 full-time jobs or 0.013%**) are **small** and follow the small positive gains in GDP.
- Changes in Austrian **real wages** are different for the two skill-levels. While the real wage of high skilled workers increases slightly (0.009%), **lower skilled workers see declines in real wages (-0.0023%)**.

These **results** should be interpreted as a **'best case scenario'**, since the long run version includes reduction of NTM trade costs of 50%. Effects of changes in NTMs that are potentially trade facilitating, are not modeled here. Further, potential costs associated with the alignment of regulations and standards as well as social costs of lower standards are not considered in this model.

Adjustment costs caused by temporary unemployment during the implementation period of CETA **are possible**. However, due to the small growth effects, a dynamic simulation of the ÖFSE Global Trade Model shows only marginal adjustment costs in the EU and Austrian labor markets. Thus, these costs are related to the magnitude of overall changes due to trade liberalization. Higher effects on GDP also cause higher adjustment costs. Therefore, the **estimates** for these costs **range from close to zero** (ÖFSE Model) **to around 4.300 jobs in Austria** (our estimates based on Francois/Pindyuk 2013) and 167.000 jobs in the whole EU (our estimates based on SIA 2011).

Sensitivity Analysis

The reported **model results** are **subject to uncertainty**, as a wide range of parameters have to be applied. Particularly the estimations regarding trade costs of NTMs vary substantially in the analyzed studies. A sensitivity analysis of our results shows that changes in NTM reductions can increase the range of variation of our results substantially. For Austria this means:

- **GDP changes** range **from -0.01% to 0.015%.**
- On a **sector level**, negative effects on value added are possible in all sectors.

- For **employment**, the range of variation is +/- 300 full time jobs due to NTM variations.

- In combination with the small gains from tariff reductions for Austria (+ 325 jobs**), total employment effects range from close to zero up to 600 additional jobs.**

Overall, this analysis underlines that the **economic effects of CETA for the Austrian economy** are **marginal, even in the most positive scenario**. Contrary, potentially **negative effects from NTM reductions might bring down overall outcomes to zero**.

On the EU level, **GDP effects in all EU member states are also subject to variations of +/- 0.05%,** if changes in the NTM trade cost reductions are allowed for. These negative impacts are most pronounced for the UK with -0.05% on the downside and +0.05% on the upside. Employment effects in the UK are smaller and range from -0.03% to 0.04%. GDP and employment effects are less pronounced for all other EU countries.

1. CONTEXT AND MOTIVATION

Free Trade Agreements (FTAs) have become an increasingly popular policy instrument during recent years. The WTO reports that the number of active bilateral or regional FTAs has increased from around 50 in 1990 to more than 400 in 2015. Likewise, the EU is currently engaged in a number of FTA negotiations, inter alia with MERCOSUR, ASEAN, the ACP group of countries, Japan, and most importantly, with the US on TTIP. However, the first third generation FTA is not TTIP, but the Comprehensive Economic and Trade Agreement (CETA) between the EU and Canada. Negotiations started already in June 2009, and were concluded in September 2014. Discussion and, eventually, the launching of the ratification process of the agreement are scheduled for fall 2016 in the European Parliament.

As many commentators believe, in many regards CETA serves as a blueprint for the TTIP negotiations. Crucial and, notably, extremely controversial features of TTIP, in particular investor-to-state-dispute settlement and regulatory cooperation prominently feature already in CETA.

The decisive question for policy-makers when confronted with FTA negotiations is of course: Cui bono? More precisely: What are the effects of trade liberalization on economic growth, the structure of the economy and the distribution of income? These questions have preoccupied trade policy-makers throughout, in fact, modern history. While advocates of free trade have traditionally emphasized the positive welfare gains of trade, it is well-known that trade liberalization leads to a – often sizable – redistribution of income between owners of production factors. Those negatively affected will eventually resist trade liberalization, making it difficult for governments to pursue a pro-liberalization agenda. Thus there exists a political need to base political decisions about trade liberalization upon reliable empirical information about the likely impacts of a particular FTA on the countries involved.

In an effort to promote the political debate on CETA, several ex-ante reports have been published by the European Commission and others, that try to shed light on what the agreement would mean in terms of economic benefits to be expected (see below for details). In general, the studies find comparatively small but positive effects on trade and income. So far, these reports have been instrumental in delivering a message that there are substantial, and above all, easy gains to be harvested. In times of economic crisis, this is indeed an appealing message to the general public.

The standard tool for ex-ante assessments of the impacts of trade liberalisation are so-called Computable General Equilibrium (CGE) models. The latter have become a routine element of the Trade Sustainability Impact Assessments of the European Commission, and are also the methodological backbone of most of the pro-CETA studies produced so far. However, most of these CGE studies are constructed upon a methodology that is heavily biased towards demonstrating the positive effects, while sidelining potential negative effects of the agreement. The lack of providing information on central macroeconomic variables like employment, government balances or the current account, has to be seen as a severe shortcoming of mainstream CGE-models. The neoclassical, and also New Keynesian, justifications that all possible adjustment costs, such as job losses due to trade liberalisation, are short-term and will eventually disappear, as the economy moves towards a new equilibrium, are certainly not convincing, neither from a theoretical point of view, nor on empirical grounds. In order to tackle any negative impacts in due time, from a policy-making perspective it is therefore imperative to identify them as precisely as possible. Only afterwards can appropriate remedies be designed and implemented. Furthermore, it is not the case that any adjustment costs are short-term and temporary. There may well be persistent impacts on employment, or on the environment. These need to be identified and taken into consideration, before taking far-reaching decisions about trade negotiations.

It should thus come as no surprise that the results of most CGE-modelling exercises, including those performed by the pro-CETA studies, have been biased towards presenting overly optimistic predictions on the welfare and growth enhancing effects of trade liberalization. What is needed instead is an alternative methodology, which takes relevant policy variables such as unemployment, the distribution of income, public finances, or the external balance explicitly into account and is hence equipped to present a more realistic picture of trade liberalization impacts. Only with this information can informed decisions about the appropriate design of trade agreements be achieved.

In order to rebalance the political debate on CETA, we will in the following critically examine the beneficial claims made by these reports, lay open their methodological foundations and biases, and provide an alternative assessment of the potential economic effects of the TTIP upon key indicators of public interest, in particular income, employment, wages, the public household and the current account.

2. CURRENT TRADE RELATIONS WITH CANADA

2.1. Trade patterns

Overall, trade with Canada plays a relatively minor role for the Austrian economy with 0.8% of total exports going to Canada, and 0.3% of imports stemming from this partner (see Table 1 and Table 2).[3] The highest shares can be seen in trade in services, where 1.0% of Austrian exports go to Canada, and in exports of manufacturing goods (0.8%). Also 0.6% of imports in services are sourced from Canada. Tables 1 and 2 also show a comparison of Canada with the US, with the latter trading partner being significantly more important for the Austrian economy. Also the overarching relevance of intra-EU trade for Austria is clearly visible.

Table 1: Share of Austrian Exports by Destination, 2011

Exports	Agriculture	Primary Commodities	Processed Foods	Manufacturing	Services	Total
EU	85.1%	86.3%	77.1%	68.0%	68.9%	68.8%
Canada	0.0%	0.0%	0.1%	0.8%	1.0%	0.8%
USA	0.3%	1.0%	6.8%	8.1%	6.1%	7.5%
RoW	14.6%	12.7%	16.0%	23.2%	24.1%	22.9%

Source: GTAP 9

Table 2: Share of Austrian Imports by Origin, 2011

Imports	Agriculture	Primary Commodities	Processed Foods	Manufacturing	Services	Total
EU	86.4%	7.1%	90.2%	79.8%	67.7%	74.9%
Canada	0.1%	0.0%	0.0%	0.3%	0.6%	0.3%
USA	0.9%	2.5%	0.7%	3.3%	5.3%	3.4%
RoW	12.7%	90.3%	9.0%	16.7%	26.3%	21.3%

Source: GTAP 9

[3] Data are reported for GTAP 9 base year 2011

On an EU-28 level, trade relations with Canada are more intense with an overall export share of more than 1.1% and an import share of 0.9%. Particularly the EU trade in services with Canada is relevant (export share of 1.9% and import share of 1.2%). Also imports from Canada in agricultural (share of 1.2%) and primary commodities (share of 1.1%) play a certain role, while EU exports in processed foods to Canada (share of 0.9%) are more pronounced on the EU-level compared to Austrian trade data (see Table 3 and Table 4).

Table 3: Share of EU Exports by Destination, 2011

Exports	Agriculture	Primary Commodities	Processed Foods	Manufacturing	Services	Total
EU	76.2%	64.0%	72.0%	60.7%	54.6%	60.3%
Canada	0.2%	1.3%	0.9%	0.8%	1.9%	1.1%
USA	1.2%	1.9%	5.0%	7.4%	10.2%	7.7%
RoW	22.4%	32.8%	22.1%	31.1%	33.4%	31.0%

Source: GTAP 9

Table 4: Share of EU Imports by Origin, 2011

Imports	Agriculture	Primary Commodities	Processed Foods	Manufacturing	Services	Total
EU	58.0%	7.3%	77.7%	63.6%	55.3%	57.4%
Canada	1.2%	1.1%	0.3%	0.7%	1.2%	0.9%
USA	4.1%	1.2%	1.9%	6.5%	12.3%	7.0%
RoW	36.7%	90.4%	20.1%	29.2%	31.2%	34.7%

Source: GTAP 9

UN Comtrade data on Austrian trade in goods for 2014 show that Canada is ranked as the 23rd most important destination of Austrian goods exports. On the import side, Canada is only ranked on position 41. In goods exports to Canada, the most important sectors are machinery and equipment (here named 'other machinery') with a share of 37% in 2014, followed by chemicals (13%) and motor vehicles (10%). This pattern changed over time, as 'motor vehicles' were the most important Austrian export sector in 2004 with a share of 29%. On the import side, transport equipment and metals are the most important Canadian sectors with a share of 34% and 19%, respectively. Similar to the exports side, the relevance of the motor vehicles sector declined substantially as it accounted for 30% of imports from Canada in 2003 and decreased to 2% in 2014 (Source: UN Comtrade Database).

For the whole EU-28 similar sectoral patterns are visible in the exports to Canada, with the sectors machinery and equipment (23%), chemicals (20%) and motor vehicles being most relevant in 2014. On the imports side, additional sectors are crucial compared to the Austrian trade patterns. Besides metals (23%) and transport equipment (12%), also minerals (11%), crude oil (6%) and wheat (3%) have a crucial share in EU goods imports from Canada (Source: UN Comtrade Database).

Overall, Austrian trade with Canada developed dynamically in recent years. In particular goods exports increased from USD 520 million in 2002 to more than USD 1.3 billion in 2014. Imports from Canada to Austria increased as well from USD 304 million to 407 million over the same period. Consequently, the strong export expansion created a substantial surplus in goods trade for Austria against Canada in recent years. Taking also service trade

into account inflates the Austrian trade surplus even more. The same trend is true for the EU-28, however the surplus is as distinct as in the Austrian case with goods exports to Canada amounting to around USD 41 billion and imports to more than USD 35 billion in 2014 (Source: UN Comtrade Database).

2.2. Tariffs

Trade-weighted tariffs show that the average Canadian tariff protection against EU imports with 3.4% in total is higher than the corresponding tariff level of 1.43% in the EU (Austria 1.74%). The protection is highest for Canadian processed foods and other manufacturing. Thus, for the important Austrian and EU export sectors, machinery and equipment (here named 'other machinery') and chemicals, the Canadian tariff protection is already low. On the Austrian/EU side, tariff protection is highest in processed foods, motor vehicles, and agriculture (see Table 5).

The crucial role of non-tariff barriers (NTM) for the new generation of free trade agreements such as CETA will be discussed in detail below.

Table 5: Bilateral tariff rates by sector, 2011

	Canada	Austria	EU
Agriculture Forestry Fisheries	1.84%	1.87%	3.04%
Other Primary Sectors	0.01%	0.10%	0.00%
Processed Foods	20.48%	13.06%	12.99%
Chemicals	0.90%	1.77%	1.96%
Electrical Machinery	0.23%	0.75%	1.12%
Motor Vehicles	5.37%	5.19%	6.77%
Other Transport Equipment	0.76%	1.36%	1.30%
Other Machinery	0.38%	1.67%	1.59%
Metals and Metal Products	0.47%	2.64%	0.66%
Wood and Paper Products	1.62%	0.75%	0.21%
Other Manufacturing	6.52%	3.76%	2.79%

Source: GTAP 9

3. THE PRO-CETA REPORTS – SUMMARY AND DISCUSSION

Various reports have been commissioned which focus on the economic effects of CETA upon the European Union, Canada and upon particular EU countries including Austria. We will focus on those studies which have been cited most widely and thus had the strongest impact upon the political debate so far. These are:

Joint Study by the European Commission and the Government of Canada (Joint Study)[4]: the study was produced in response to a request formulated by political leaders at the 2007 EU-Canada Summit und published in 2008. The report covers 35 sectors; the results are reported only for EU and Canada. The evaluation of the economic impact is based on a GTAP-style CGE model with an extension to monopolistic competition and long-run

[4] Joint Study by the European Commission and the Government of Canada: Assessing the costs and benefits of a closer EU – Canada economic partnership, Brussels 2008, see http://trade.ec.europa.eu/doclib/html/141032.htm

investment dynamics. The results show absolute gains in GDP and welfare for both, EU and Canada, with higher GDP percentage changes occurring for Canada (0.77%; EU: 0.08%). However, negative sectoral output changes appear mainly in the Canadian economy.

EU Sustainability Impact Assessment (SIA):[5] the report was commissioned by the European Commission and published in 2011. Besides an economic assessment, the study analyses social and environmental impacts of CETA. Trade cost reductions due to NTM alignments follow the approach by the Joint Study (2008). The CGE model, however, does not include capital accumulation, meaning that economic effects are positive but lower compared to the Joint Study results with GDP changes ranging from 0.03% for the EU and 0.36% for Canada. The study also reports effects on non-CETA countries/regions and detailed sectoral results. In total 57 sectors are covered. The report also shows potentially negative, but small, impacts on non-CETA countries and regions.

Francois/Pindyuk (F/P):[6] this study focuses on the impact of three free trade agreements (EU-US, EU-Canada and EU-Moldova/Georgia/Armenia) on the Austrian economy and was published as FIW-Research Report in 2013. The effects of regulatory alignment are based on specific NTM trade cost estimations. Importantly, Francois/Pindyuk (2013) apply a long-run, dynamic model that incorporates effects resulting from capital accumulation. Overall, this leads to accelerated national income gains of 0.215% from CETA in Austria. In addition, employment and real wages are expected to increase. However, most results are reported for Austria only and use 21 sectors.

3.1. Economic effects of CETA in detail

Even though a direct comparison of study results should be taken with care due to the differences in database, base year, baseline assumptions, as well as scenario design and other factors, in the following we present a summary of results from the three selected studies.

National Income/GDP Impacts

All three studies report changes in national income which is measured by equivalent variations (EV). This measure reports a change in real income that allows consumers to obtain the same utility level after a change in prices, due to trade liberalization, for example, as before, but at the original relative prices.[7]

In the case of the comparative-static (short-run) model results, the Joint Study (2008) reports higher EV effects for Canada (EUR 4,100 million) compared to EU gains (EUR 2,527 million) (see Table 6). In contrast, SIA (2011) sees higher EVs on the EU side (EUR 3,400 million) than for Canada (EUR 2,932 million). However, in the dynamic model of the Joint Study (2008), the static gains are lifted by factors 2 to 4, leaving higher EVs for the EU (EUR 10,539 million) compared to Canada (EUR 8,364 million). This significant dynamic investment effect is also reported by Francois/Pindyuk (2013) with total long-run gains exceeding static gains by a factor of 5. The EV for Austria amounts to USD 684 million.

---

[5] Development Solutions: A Trade SIA relating to the negotiations of a comprehensive economic and trade agreement between the EU and Canada, Final Report, Study commissioned by the European Commission, Trade 10/B3/B06, June 2011, see: http://ec.europa.eu/trade/policy/policy-making/analysis/sustainability-impact-assessments/assessments/#study-geo-14 Listed as Kirkpatrick et al. (2011) in the references

[6] Francois, J./Pindyuk, O: Modeling the Effects of Free Trade Agreements between the EU and Canada, USA and Moldova/Georgia/Armenia on the Austrian Economy: Model Simulations for Trade Policy Analysis, FIW Research Report 2012/13 N° 03, Vienna, January 2013, see: http://www.fiw.ac.at/fileadmin/Documents/Publikationen/Studien_2012_13/03-ResearchReport-FrancoisPindyuk.pdf

[7] Potential problems with the EV measure due to the lack of empirical substance as well as the concept of welfare itself are discussed in Raza et al. (2014, p.45) in more detail.

Table 6: National Income effects (EV), in million EUR

	EU / Austria	Canada
Joint Study	2,527 (Stat) 10,539 (Dyn)	4,100 (Stat) 8,364 (Dyn)
SIA	3,400	2,932
F/P	684 (USD)	-

Notes: Changes in million EUR; 'Stat' refers to changes in comparative-static (short-run) model, 'Dyn' refers to changes in dynamic model; Francois/Pindyuk results for Austria only.

The contribution to national income changes due to tariff and NTM reductions in goods and services varies among the studies due to different trade cost estimates of NTMs. While the Joint Study (2008) and the SIA (2011) gains follow from tariff and services NTM reduction, Francois/Pindyuk (2013, Table 15, p.19) see around two thirds of higher national income in Austria coming from reductions in goods NTMs.

The absolute changes should however be related to effects per household or capita, as the population in the EU-28 (508.3 million people in 2014, source: World Development Indicators) exceeds the Canadian population (35.5 million people in 2014) by a factor of more than 14. Thus the most optimistic estimates in the Joint Study (2008) would be equal to additional income of about 20 EUR per EU citizen and about 235 EUR per Canadian citizen. This size-effect also shows up in percentage GDP changes.

In contrast to the absolute effects, the percentage changes in GDP show large differences between the CETA-member states. While the EU sees only minor effects ranging from 0.03 to 0.08%, the Canadian GDP increases by 0.36 or 0.77%, respectively (see Table 7). The difference between the upper and lower bounds is again related to the application of dynamic and static models. Overall, all studies show a positive impact of CETA on GDP and national income. However the effects are marginal for the EU and moderate for Canada, even if all long-run dynamic and variety/specialization gains are included.

Table 7: Changes in GDP, in percent

	EU	Canada
Joint Study	0.08 (Dyn)	0.77 (Dyn)
SIA	0.03 (Stat)	0.36 (Stat)
F/P	0.215* (Dyn)	-

Note: * Francois/Pindyuk report changes in national income

Sectoral Output Impacts

Even though aggregate GDP effects might be minor, sectoral output impacts are more differentiated, specifically for Canada. All three studies report sectoral output changes with the highest degree of detail included in the SIA (2011). However, similar patterns among declining and expanding sectors can be identified only to a limited degree in the Joint Study (2008) and SIA (2011). The sectoral results for Austrian output in Francois/Pindyuk (2013) are an exception as they are throughout positive for all sectors except one. This reflects also the different modelling approaches.

The Joint Study (2008) sees substantial sectoral changes in the Canadian economy ranging from a decline of -6.0% in the processed foods sector to gains of 11.0% in the metals sector as a result of the relative sizes of the two economies. Most Canadian manufacturing

sectors benefit significantly from CETA, while effects for the Canadian service sectors are mixed and contractions are reported for processed foods and beverages & tobacco. On the EU-side, negative changes are notable in a number of manufacturing sectors (metals, transport equipment and machinery & equipment with up to -0.7%). All other sectors show marginal and slightly positive output changes, with the processed foods sector seeing the strongest expansion (+0.6%).

The static model results in the SIA (2011) show less pronounced sectoral output effects compared to the Joint Study (2008). However, it underlines the pattern of stronger changes for Canada and the mixed results in the manufacturing sector on both sides. The main differences in the sectoral results appear in the agricultural and processed foods sectors. The disaggregated sectoral effects in the SIA see most EU sub-sectors such as wheat, red meat and other meat products as loosing sectors due to CETA, while the corresponding Canadian sectors gain from the agreement. The reverse effect is reported for the dairy sector with substantial losses in the Canadian dairy sector of more than -12.5%, while the EU-dairy sector gains close to 1%. Thus, the SIA (2011, p.15) highlights potentially large CETA effects in sensitive food products.

The sectoral output changes due to CETA for the Austrian economy in Francois/Pindyuk (2013, p.15, Table 10) are positive for all sectors except for the 'other goods' sector. All other sectors increase production ranging from 0.05% in chemicals up to 0.74% in motor vehicles. The positive output effects reflect the dynamic investment impacts assumed in the model which leads to broad increases across most sectors. Corresponding effects for Canada are not reported.

Trade Impacts

In the studies, output changes are related to changes in trade due to the trade liberalisation. These changes reflect the reductions in trade costs that come from elimination of tariffs and trade costs related to NTMs.

Only SIA (2011) reports changes in total exports with a marginal increase of 0.07% for the whole EU and 1.56% for Canada in their most comprehensive scenario D. This results in an improvement of the EU's balance of trade of close to USD 200 million, meaning that growth in EU's exports exceeds growth in imports by that amount. This is largely driven by effects from service liberalisation (SIA 2011, p.45, Figure 3). For Canada, the balance of trade improves by almost USD 500 million as Canada also benefits from tariff cuts (SIA 2011, p.45, Figure 4).

Changes in bilateral trade are reported in the Joint Study (2008, for EU-Canada) and by Francois/Pindyuk (2013, for Austria-Canada) (see Table 8). In the Joint Study (2008) percentage changes in bilateral trade are almost identical with 16.8% in EU exports to Canada and 16.5% in Canadian exports to the EU. Based on the different initial trade volumes, this leads to a higher absolute change in exports by EUR 11.5 billion in the case of EU exports to Canada compared to increased exports from Canada to the EU by EUR 6.4 billion. Changes in EU exports exceed corresponding Canadian exports in both industrial goods and services. In addition EU exports in processed foods contribute significantly to higher EU exports with an increase of more than EUR 5.5 billion or 326%.

Table 8: Changes in bilateral exports, in percent

	EU / Austria	Canada
Joint Study	16.8	16.5
F/P	50.3	71.9

Francois/Pindyuk (2013) see higher positive bilateral export effects for Canadian exports to Austria. With an increase of 71.9%, the trade gains for Canadian exports exceed changes of 50.3% for Austrian exports to Canada. In absolute terms, the translates to export gains for the Austrian economy of USD 586 million while imports from Canada grow by 2.1 billion and therefore exceed export growth by a factor of 3.6.[8] Austrian export gains appear mainly in manufacturing sectors (motor vehicles and textiles) as well as processed foods. Exports to Canada in agriculture/fishery/forestry even decline slightly. In service sectors, Austrian export gains exceed the corresponding growth rates for Canadian exports. Otherwise, Canadian sectoral export changes generally surpass Austrian export changes in the primary and manufacturing sectors. Overall, this would result in substantial negative trade impacts for the Austrian economy, with a negative change in the bilateral trade balance of around USD 1.5 billion according to Francois/Pindyuk. That the authors nonetheless report positive changes in output shows the relevance of dynamic investment effects in their model.

Wages and Employment Impacts

Commonly used macroeconomic closures in standard CGE models require holding constant either real wages or employment. In the Joint Study (2008) no results on wages and employment are reported. In the SIA (2011) results for changes in real wages are shown (see Table 9). In accordance to percentage changes in output, changes for both skill levels are higher in the Canadian economy. For the whole EU, the changes in real wages are minor. Due to the application of a static CGE model, employment supply is fixed in the SIA (2011) analysis.

Francois/Pindyuk (2013) report changes in both variables for the Austrian economy. Real wage changes amount to around 0.13%. In addition, changes in employment are reported with an increase of 0.065% in unskilled employment and 0.064% in skilled employment due to CETA as Francois/Pindyuk assume an upward sloping labor supply curve following Dee et al. (2011). Employment changes are however smaller compared to changes in national income and capital formation.

Table 9: Changes in real wages by skill level, in percent

	unskilled		*skilled*	
	EU / Austria	**Canada**	**EU / Austria**	**Canada**
SIA	0.06	0.52	0.07	0.49
F/P	0.131	-	0.129	-

Public Procurement

In recent years, the EU Commission has been pushing for the inclusion of far-reaching public procurement clauses in FTAs, given that potential benefits from cost reductions and trade facilitation are expected. Even though OECD data suggest that procurement spending often amounts to more than 10% of GDP in developed countries, the international dimension of these expenditures is ambiguous (Cernat/Kutlina-Dimitrova, 2015). As a substantial part of public procurement such as e.g. in social services and in specific sectors and goods (military) are not tradable or too sensitive for negotiations, the relevance of public procurement in FTAs is arguably limited. Therefore, none of the CETA studies estimates specific

[8] Reported percentage and absolute changes in Francois/Pindyuk imply that bilateral trade flows in 2011 would amount to USD 1.16 billion (USD 586 million / 0.503) in Austrian exports and USD 2.92 billion (USD 2.1 billion / 0.719) in Austrian imports from Canada. These data are not in accordance to any other trade data source where Austria has a positive trade balance with Canada.

economic effects based on public procurement provisions.[9] Nevertheless, the Joint Study (2008) and SIA (2011) emphasize that liberalization would potentially benefit the EU, as the WTO Agreement on Government Procurement (GPA) already provides Canadian companies broad access to EU procurement processes. Canada, however, still excludes its sub-central government entities from international competition, also from the US. Thus, liberalization and increased competition would occur on the Canadian side and not on the already comparatively open EU market. However, it is highlighted in the SIA (2011, p.258) that it would be EU companies with existing foreign subsidiaries, hence multinational firms, that would benefit from Canadian procurement liberalization first and foremost.

With regard to the procurement chapter in the consolidated CETA text, thresholds have been implemented, which range from SDR 130,000 (equivalent to current EU threshold EUR 135,000) for goods and services procurement to SDR 5 million (equivalent to current EU threshold of EUR 5.225 million) for construction projects, thus limiting the access for foreign bidders and concomitantly the economic gains to be expected.

Overall, this indicates that potential effects for the EU from public procurement provisions of CETA are rather limited. This conclusion is further supported by the fact that Canada is about to open up its public procurement via TPP and other FTAs – which would intensify competition for EU companies in the Canadian market.

3.2. Discussion of the Methodologies applied in the pro-CETA Studies

CETA is set up as a free trade agreement aiming at 'deep integration' of the trading partners' economies. This necessarily involves the reduction of trade costs associated with non-traditional barriers to trade, so called non-tariff measures (NTMs). However, many components of these trade costs are unobservable. In recent years, econometric analysis based on gravity models has evolved as the standard approach to derive the size of these barriers to trade. Berden/Francois (2015, p.3) define the resulting trade cost equivalents of NTMs in bilateral trade as the quantified difference in regulatory systems between the trading partners. Consequently, a reduction of NTM trade costs is equal to the "lowering of the differences between regulatory systems" (Berden/Francois 2015, p.4) either through harmonization, mutual recognition or elimination of standards. Such a process is managed via the institutionialization of 'regulatory cooperation' in the agreement. An alignment of regulatory divergence does therefore not necessarily lead to a lowering of standards. However, it is likely that the process involves at least adjustment costs for different actors in the economy (see also Raza et al., 2016a).

Besides the absolute size of NTM trade cost estimations, the actionability of NTMs is crucial. The term 'actionability' expresses the possibility to change current regulations and standards in order to facilitate trade. Based on expert interviews Ecorys (2009) conclude that roughly 50% of existing NTMs are potentially 'actionable' and recent trade impact assessments on TTIP (for instance CEPR 2013) typically assume that half of these actionable regulatory divergences can be reduced in a bilateral FTA. This yields a NTM trade cost reduction of 25% which can be deducted from the estimated trade cost equivalents. Alternatively, other studies apply an approach that uses the intra-EU integration towards the single market as a benchmark for potential trade effects through regulatory convergence.

[9] Estimation by CEPR (2013) on TTIP could serve as upper bound estimation. According this study public procurement liberalization contributes 1/10th to the overall benefits. The size of the Canadian market and the one-sided liberalization might reduce these effects even more.

On NTM Reductions

In the Joint Study (2008), two different approaches are used for NTM trade cost estimations and reductions in the goods and service sectors. While in non-commodity goods sectors trade costs generated by NTMs are reduced simply by a uniform cut of 2% of the value of trade, all commodity sectors (coal, oil, gas, minerals) as well as primary agriculture are excluded from NTM trade cost reductions and only tariff cuts apply for these sector. The authors justify their assumed reduction rate of 2% by "anecdotal evidence" (p.41) without citing specific studies supporting this assumption.

For the service sectors, the impact of the intra-EU liberalisation on intra-EU service trade flows are used as an upper-bound solution that is assumed to be achievable also in the EU-Canada context. According to results of other studies co-authored by Joseph Francois, the level of intra-EU trade in services is 35% higher compared to a non-EU scenario. To achieve similar increases in EU-Canada service sector trade, bilateral trade costs have to be reduced by 2 to 10% depending on the specific sector. In this context, the total trade cost estimates are also reported. These range from 24 - 52% for trade in services into Canada and from 18 to 24% for trade in services into the EU. This means that NTM trade cost equivalents are reduced by 16% for EU exports to Canada and by 22% for Canadian exports to the EU.

Given the larger trade cost reductions in service sectors compared to the goods sectors, the growth in national income and GDP in the Joint Study (2008) is largely determined by service trade. This is also the case in the SIA (2011) as the latter's scenarios explicitly refer to Joint Study NTM reductions in the service sectors. Importantly, SIA (2011) includes only reductions in tariffs and service sector NTMs to varying degrees in their four scenarios; reductions in goods NTMs are not considered.

The NTM reductions in Francois/Pindyuk (2013) refer also to the Joint Study (2008), but the reported reductions for the service sector differ from the original data in the Joint Study. As Francois/Pindyuk (2013, p.10) reduce actionable barriers to trade by 25%, they assume a higher rate of reduction compared to 16% (Canada) and 22% (EU) in the Joint Study (2008). However the underlying magnitude of trade cost estimations are not reported.[10] It is also unclear, if the reported EU-27 NTM reductions refer to changes in relation to the US, Canada or Moldova/Georgia/Armenia, or if all three FTA partners are taken into account. Francois/Pindyuk (2013) see the highest trade cost reductions in the Canadian motor vehicles (12.3%), transportation equipment (9.4%) and construction sectors (8.6%). On the EU side the insurance sector (15.0%), motor vehicles (12.5%) and finance (9.6%) liberalize the most. Overall, the reductions in goods sectors with 5.2% for exports to Canada and 6.2% for export to the EU are notably higher than the assumed uniform reduction of 2% in the Joint Study (2008). Consequently, the NTM reductions in goods contribute most (two thirds) to the gains for the Austrian economy from CETA.

All three studies uniformly see NTMs only as barriers to trade that involve costs for producers and consumers as well as efficiency losses. However, quantity-based approaches (gravity models) to estimate trade cost equivalents also show negative results meaning that regulations have trade-facilitating effects.[11] The intuition behind this idea is that certain standards and regulations such as quality or fair trade certifications address consumer concerns in the importing country with respect to health, environmental and safety issues and thus have a positive effect on trade. This can be particularly relevant for agricultural goods and food. For instance, Bratt (2014) and Beghin et al. (2012) estimate that about 46% and

[10] The reference to an OECD report by Dee et al. (2011) reveals that unpublished survey data by Ecorys (2009) were used to construct NTM indices and trade cost equivalents also for the EU-Canada trade relations. However, details are missing in in Dee et al. (2011) and Francois/Pindyuk (2013).

[11] In contrast, a prominent study on NTMs by Kee et al. (2009) sets AVE to be non-negative by construction.

39%, respectively, of the product lines affected by NTMs exhibit negative tariff equivalents (AVEs). Also Dean et al. (2009), using a price-based NTM quantification methodology, see partial positive correlations between NTM restrictiveness and country income, given that regulatory barriers can also reflect income sensitive demand for higher consumer protection for instance in food products. So far, approaches to include these potential trade-facilitating effects of NTMs are not included in the standard NTM estimations used in the standard impact assessments.

On dynamic CGE Models

As described in section 3.1., the magnitude of reported results crucially depends on the application of 'dynamic' or 'long-run' CGE models. In contrast to 'static' or 'short-run' CGE models, the former type of models include changes in factor utilization (accumulation). Importantly, the term 'dynamic' in standard CGE modelling – as applied in the Joint Study (2008) and Francois/Pindyuk (2013) – does not imply that the model is actually solved as a system of differential equations. Rather, it merely renders factor use endogenous. Specifically, a dynamic CGE model, according to this terminology, includes capital accumulation. Traditional (static) models feature fixed factor endowments (Shoven/Whalley, 1984). As standard CGE models usually yield positive efficiency gains from trade liberalisation, additional changes in capital stocks will further exaggerate the overall results. In the case of Francois/Pindyuk (2013) dynamic results are five times higher than the static gains.

These mechanisms are controversial, as growth effects are introduced through the backdoor (Rodrik, 2015). Moreover, the implied causal chain is subject to criticism, as it is assumed that growing income through higher exports can generate higher savings and therefore lead to higher investments. This, however, depends again on the unrealistic assumption of full employment.

In sharp contrast, in the ÖFSE Global Trade Model the term 'dynamic' has the standard meaning: the system of simultaneous equations consists of differential equations, and solutions for endogenous variables are functions of time (see section 4.3 for a further discussion).

Dynamic CGE modelling approaches are rooted in economic growth models à la Solow and Ramsey. The basic idea of these models on capital accumulation and steady states are also included in Francois/McDonald/Nordström (1996). In this paper, which serves as reference for the models in the Joint Study (2008) and Francois/Pindyuk (2013), capital accumulation in CGE models is differentiated between a static case and two steady-state, dynamic closures. These three cases also show up in the standard descriptions of CGE models à la Francois in Francois/Pindyuk (2013, p.28): "For investment demand, in the short run, we assume a fixed savings rate. In the long-run, the model can alternatively incorporate a fixed savings rate, or a rate that adjusts to meet steady state conditions in a basic Ramsey structure with constant relative risk aversion (CRRA) preferences."

In the short run, the ratio of income going to savings is fixed. However, the capital stock is not allowed to change as efficiency gains are simply realized by more efficient allocation of given production factors (labor and capital). In the long run, two possibilities are given in these models. Firstly, the savings rate remains fixed but the whole model is assumed to change until a steady state is reached. Implicitly, this is based on the assumption that all regions are initially in a steady state which also Francois/McDonald/Nordström (1996, p.9) call "a convenient although admittedly unrealistic assumption". Similar to the mechanisms in a Solow growth model, efficiency gains through trade liberalization shift output (=income), and therefore savings, up. As a consequence, the capital stock expands until savings and investment are just enough to replace depreciated capital. In other words, a fixed proportion

of the static gains flows into savings and investment. This generates additional income, which in turn is saved and invested until a steady state is reached. In this case, induced investment is simply a multiple of the static gain. The magnitude of the multiplier depends on the output-capital elasticity and increases with higher capital shares in the production function (Francois/McDonald/Nordström 1996, p.4).

Secondly, a dynamic closure is possible that allows for endogenous savings rates and endogenous capital stocks as it is applied in Francois/Pindyuk (2013). In this case the savings rate is determined via optimization of consumption over time 'in a basic Ramsey structure'. The Ramsey problem refers to the optimal inter-temporal allocation of consumption (see Blanchard/Fisher, 1989, chapter 2 and Taylor, 2004, chapter 3). There are infinitely-living households that trade off consumption levels of future and current generations in order to maximise overall utility stemming from consumption. In the absence of technological progress, this optimization process results in a steady state with constant levels of consumption and capital stock per worker. In contrast to the well-known golden-rule condition à la Solow with the marginal product of capital being equal to the rate of depreciation plus population growth, a rate of time preference is included in the inter-temporal Ramsey structure, setting the steady state below the golden rule level. This rate of time preference – or rate of time discount or rate of impatience – expresses the desire to consume now instead of at a future point in time. Thus, the more patient a representative household is in order to postpone consumption to later points in time, the smaller is the rate of time preference and the smaller is the difference to the golden rule steady state as higher investment levels are available in the current time period. This also means that the marginal product of capital (and therefore, in competitive factor markets, the real interest rate) is determined by tastes towards timing of consumption, while technology determines the capital stock that is consistent with the interest rate (Blanchard/Fisher, 1989, p.45).

As noted above, this steady state condition is commonly assumed to hold in a standard CGE model in the base year (Francois/McDonald/Nordström,1996). In the case of a shock, all variables are adjusted in order to achieve a new steady state à la Ramsey. As optimization problems in CGE models are solved via the equation of prices and marginal costs, it is the price of capital in terms of consumption goods (return to capital), showing up in the dynamic Francois model in equation (24) (Francois/Pindyuk 2013, p.30). It is then this price of capital that is determined by the rate of time preference (discount) and the rate of depreciation, which allow the savings rate to be determined endogenously. With this flexible savings rate the optimality condition of equivalence between the marginal cost of capital formation and the return to investment can be guaranteed. This is achieved as initially boosted returns to capital due to trade liberalisation initiate capital accumulation via savings and investments until the marginal return to capital falls back to the steady state level.

The application of a Ramsey structure therefore allows for changes in the capital stock – which are ultimately determined by a jump from one steady state condition to another. As Taylor (2004, p.101) notes, it is not the uncertain trajectory between the two steady states that is interesting for mainstream economists, but the unique event of a jump between the equilibrium states. This of course requires full rationality. Further, the optimization process depends on perfect competition as well as full employment of factors, both of which are rather stringent and unrealistic assumptions. Nevertheless, the Ramsey structure is commonly applied in CGE models as it creates an automatic mechanism for capital accumulation to occur if trade liberalisation boosts returns to capital. This is seen as an enhanced way to integrate potential endogenous linkages between trade policy, investment, and steady-state growth (Francois/McDonald/Nordström, 1996, p.1)

In their numerical example Francois/McDonald/Nordström (1996) show that the second steady-state closure generates higher changes in real GDP and welfare than the first option for most countries. In addition, the inclusion of monopolistic competition and therefore increasing returns to scale play a role in lifting up model results. In the case of the Francois/Pindyuk (2013) study for Austria, the second steady-state closure with endogenous savings rates and sectors with monopolistic competition is applied. This implies that the authors assume "an interaction of investment and variety/specialization gains" (Dee et al. 2011, p.41) in the long-run which is able to boost results by a factor of five compared to the outcomes in the static version. Crucial factors for the magnitude of dynamic effects are the assumptions on the rate of preferences and the rate of depreciation that determine the price of capital. The smaller one assumes these rates, the stronger is the capital accumulation effect. However, values of these rates are usually not published in the study. In addition, Francois/Pindyuk (2013) also include a long-run labor market closure based on Dee et al. (2011) which allows for an expansion in labor supply if wages go up. Therefore, Francois/Pindyuk (2013) are able to report growth in real wages and employment. However, the changes in capital stock of 0.481% due to CETA are higher than changes in employment (0.065% for less skilled labor and 0.064% in more skilled labor) which indicates a clear capital-friendly effect of a CETA trade liberalization. There is no detailed model description available for the Joint Study (2008), only a short technical background on the modelling framework is provided (pp.50-51).

In summary: the 'basic Ramsey structure' compounds the problematic assumptions made in the baseline static neoclassical CGE model. Recall that the static model calculates efficiency gains from trade liberalization under the assumption of price-clearing markets. Especially (but not only) in labor markets, this assumption is deeply flawed, and renders model results irrelevant for the most pressing questions policy makers have. Further, the size of calculated gains depends on the size of trade barriers removed and the magnitude of elasticities applied. As discussed elsewhere, assumed (and removed) NTM barriers as well as elasticities are likely vast overestimates. Last but not least, models do not calculate costs versus benefits – as the implicit assumption always is that regulations that underlie NTMs represent only costs to society. For all of these reasons, calculated gains are an extremely optimistic upper bound of the likely effects of "new trade agreements."

The 'basic Ramsey structure' further exaggerates these highly optimistic results. It does so based on the assumption that base year as well as post-liberalization equilibria represent inter-temporal steady states. In such steady states, all factors are in full employment, and the economy experiences balanced growth. These assumptions are obviously not satisfied in reality, but it provides an operational route to multiply static gains.

3.3. Potential Adjustment Costs

Trade agreements have effects on the structure of an economy as well as the well-being and behavior of all actors in the public and private sectors. The economic effects of trade liberalization are commonly assumed to be positive in the aggregate. However, two crucial aspects are often neglected in the discussion: (1) Long-run outcomes can be unevenly distributed among countries/regions and social groups within a country; (2) There can be transitory adjustment costs involved until effects are achieved in the long run. While we concentrate on the latter aspect here, we also want to point towards the discussion on social costs of regulatory changes associated with the 'deep integration' approach in the new generation of free trade agreements (see for more details: Raza et al. 2014 and Raza et al. 2016a).

Labor Market Adjustment Costs

Conventional theory postulates gains from trade due to comparative advantage, as countries specialize and accumulate production factors in specific sectors while labor and capital is withdrawn in less competitive sectors. These specialization effects typically show up in the results of standard CGE models as changes in employment by sector. Given fixed labor supply as an assumption of standard CGE models, a certain number of jobs switch from less productive to more productive sectors, leading to a more efficient distribution of labor and production. Based on these insights it is possible to calculate a replacement index that indicates how many workers have to change jobs due to trade liberalization, following the approach by CEPR (2013, p.77). Based on this index, we provide a rough estimation of costs stemming from potential unemployment in the transition process and foregone public income from taxes and social contributions for Austria and the EU similar to the calculation in Raza et al. (2014, pp.17-19).

For Austria, Francois/Pindyuk (2013, Tables 11 and 12) report changes in employment by sector due to CETA. According to their results, employment in 14 out of 21 sectors increases, led by motor vehicle (+0.48%) and electric machinery (+0.33%). However, in seven sectors employment is falling, with the sectors other goods (-0.23%) and transport (-0.15%) being most affected.[12] Overall this results in a displacement index of approximately 0.12, meaning that 12 workers out of 10,000 have to find jobs in other sectors. Given a number of 3.6 million full-time equivalents (2011, Statistik Austria), this implies that roughly 4,300 jobs are affected by labor displacement due to CETA in Austria. For the EU, SIA (2011) provides estimates changes in employment by sector in their Appendix. Based on these data an EU displacement index of 0.069 is calculated, meaning that roughly 7 jobs out of 10,000 switch sectors. Given that in 2011, 242 million people were employed in the EU, almost 167,000 jobs would be affected.

Given the difficult labor market situation in many EU countries and in Austria, we assume that 10% of displaced persons will not find another (full-time) job and will thus become long-term unemployed. We assume that the average length of their unemployment is five years during the ten year implementation period of CETA. In accordance with most national unemployment benefit schemes, we further assume that during the first year workers will receive a higher net replacement rate (66% in Austria and 65% in the EU) than for the following four years (57% in Austria and 43% in the EU). For annual wages and replacement rates we use averages derived from OECD statistics. We assume that 90% of displaced workers will become re-employed after six months on average, without a loss compared to their pre-CETA wage level – again we are on the optimistic side. We also consider the foregone public income from taxes and social security contributions from unemployment. Upon that basis, we calculate cumulative adjustment costs of CETA during the ten year implementation period.

Our rough calculations show that even these small displacement effects based on the optimistic outcomes by Francois/Pindyuk (2013) could cause adjustment costs on the Austrian labor market of more than EUR 127 million (see Table 10 Part I). In relation to the reported economic gains of USD 684 million, (or around EUR 600 million), these costs amount to around 20% of total benefits expected for Austria. For the whole EU, labor market adjustment costs cumulate to more than EUR 2.4 billion which would be a large offset of proclaimed static benefits of 0.03% of GDP (or around EUR 4 billion) according to SIA (2011). Even if these amounts are only an approximation, the omission of these costs in economic

[12] Francois/Pindyuk (2013) report changes in employment by sector according to skill level. The percentage changes are very similar, however.

impact analyses can lead to simplified and overly optimistic assessments of benefits from free trade agreements.

Table 10: Potential Adjustment Costs, in EUR

Part I Austria	**Cumulative - 10 year period**
a. Unemployment Benefits	
430 long-term unemployed post-CETA (Year 1)	8,542,120
430 long-term unemployed post-CETA (Year 2 - 5)	29,518,599
3,870 short term unemployed (6 months)	38,439,540
Sub-Total	***76,500,259***
b. Foregone Public Income from Taxes and Social Contributions	
430 long-term unemployed post-CETA (Year 2 - 5)	26,830,092
3,870 short term unemployed (6 months)	24,147,083
Sub-Total	***50,977,176***
Cumulative Adjustment Costs – TOTAL (EUR)	**127,477,435**

Part II EU	**Cumulative - 10 year period**
a. Unemployment Benefits	
16.698 long-term unemployed post-CETA (Year 1)	266,700,914
16.698 long-term unemployed post-CETA (Year 2 - 5)	712,928,286
150.282 short term unemployed (6 months)	30,905,873
Sub-Total	***1,010,535,073***
b. Foregone Public Income from Taxes and Social Contributions	
16.698 long-term unemployed post-CETA (Year 2 - 5)	737,608,253
150.282 short term unemployed (6 months)	663,847,428
Sub-Total	***1,401,455,682***
Cumulative Adjustment Costs – TOTAL (EUR)	**2,411,990,754**

Sources: OECD Employment Statistics, Benefits and wages statistics, http://www.oecd.org/els/benefits-and-wages-statistics.htm (02/06/2016); Eurostat Labour Market Statistics

Assumptions: Average duration of long-term unemployment during TTIP implementation phase: 5 years; Average duration of short-term unemployment during TTIP implementation phase: 0.5 years; Number of displaced persons post-CETA ratification: in Austria 4,300 (based on displacement index calculated based on Francois/Pindyuk, 2013) and in the EU 167,000 (SIA, 2011) – 90% of unemployment is short-term, 10% long-term; Average annual net income per worker (simple average 4 family types, 100% Average Wage, 2014): 30,070 EUR (AUT), 24,473 EUR (EU); Net Replacement Rate (60 month unemployed, simple average 6 family types and 100% Average Wage): 57% (AUT), 44% (EU); Net Replacement Rate (initial unemployment phase, simple average 6 family types and 100% Average Wage): 66% (AUT), 65%(EU); Implicit tax rate on labor (2012): 41.5% (AUT), 36.1% (EU).

Foregone tariff revenues

As 75% of all customs duties collected from the member states are transferred to the EU revenue for customs duties amounts to more than 10% of the EU budget. In 2014, total customs duties in the EU summed up to around EUR 21.9 billion of which EUR 16.5 billion became part of the EU Budget.[13] In the case of CETA, the EU Commission (2016) estimates that foregone tariff revenues from Canadian imports into the EU are EUR 158 million per year from industrial goods alone. When tariffs on other goods (agricultural and food products) are added, the foregone revenue for the EU would increase to around EUR 330 million per year or EUR 3.3 billion over a implementation period of 10 years (UNCTAD-TRAINS data, average 2010-2014).

Even though these results are only a rough calculation, data on potential adjustment costs and foregone public revenue are lacking in CETA assessments. These potential downsides are even more relevant in the case of marginal benefits as reported for CETA. Again, potential gains range from EUR 4 billion (SIA, 2011) to EUR 12 billion (Joint Study, 2008) after an implementation period of up to 10 years. In contrast, adjustment costs on EU labor markets and foregone tariff revenues would sum up to more than EUR 5.5 billion during the same time period.

4. ALTERNATIVE SIMULATION RESULTS WITH THE ÖFSE GLOBAL TRADE MODEL

In this part, a new assessment of the economic costs and benefits to Canada and the EU based on the ÖFSE Global Trade Model, a structuralist CGE Model, is provided. The distinct difference of our model to standard CGE models is the macroeconomic causality we apply. In our model, output and income are determined by aggregate demand. Another central feature of the model is that labor market clearance is not required. Therefore, the labor market features unemployment. The pricing power of firms is included as output prices are mark-ups on nominal unit labor costs. Also distributional aspects are considered by way of including a wage bargaining process. However, changes in imports and exports are functions of relative prices and demand, in standard fashion. Thus, as in standard CGE models, imports react to changes in trade costs via tariff reductions and NTM alignments (see Raza et al. (2016b) for details).

In the following, we briefly discuss the database, model calibration and policy scenarios. In subsequent sections, we present simulation results for four scenarios, discuss the possibility of economic adjustment costs in the transition to the post-liberalization equilibrium, and document various exercises on sensitivity analysis, so as to contextualize results.

4.1. Aggregation, calibration and scenarios

The database is disaggregated into eleven countries and regions, and twenty sectors. The eleven regions are five EU countries – Germany, France, Italy, Austria and UK – and two sub-regions, Northern Europe (NE) and Southern & Eastern Europe (SEE). Canada and the US are two further individual countries. Remaining countries are disaggregated into "other OECD" and the rest of the world (ROW). In total, 20 sectors per country/region are included with sectoral breakdowns defined by GTAP (all details included in Table A in the Annex).

[13] Source: http://ec.europa.eu/taxation_customs/customs/policy_issues/facts_and_figures/customs_mean_revenue_en.htm (01/06/2016)

The database feeding this aggregation is the GTAP standard (version 9, base year 2011), which includes data on tariffs. Non-tariff measures (NTMs) are inexorably difficult to estimate. Available estimates are sparse, and not easily reconcilable, as the methodological analysis of other studies shows. Ecorys (2009)[14] represents a standard source. These data are, however, not available for Canada. Thus we assume that US NTMs vis-à-vis EU exports also apply to Canada. The presumption is that the Canadian regulatory structure (as a NAFTA partner) is not radically different than the US's. As this is necessarily an assumption subject to some uncertainty, we conduct simulations with different NTMs to gauge robustness of results to the Ecorys data. These exercises are discussed in more detail in the chapter on sensitivity analysis (see section 4.4).

As is well known, parameter choices strongly affect simulation results. We apply the GTAP trade price elasticity structure, albeit at empirically defensible magnitudes. Choices on other parameter values build on the "baseline calibration" discussed in more detail in Raza et.al. (2016b). Import price elasticities, tariffs and ad-valorem equivalents of NTMs are reported in Table B in the Appendix.

Four different scenarios are investigated:

1) Tariff scenario

In this scenario, all remaining tariffs between EU member countries and Canada are reduced to 0. The scenario wants to investigate the effect of a full removal of all remaining tariffs. This is substantiated by the results of the CETA negotiations. According to the consolidated CETA agreement text, the tariffs for 98.6% of all Canadian tariff lines and 98.7% of all EU tariff lines will be fully eliminated within a period of up to 7 years.

2) NTM scenario

In this scenario, Ecorys NTMs are reduced by 25%. CETA aims at the alignment of NTM through an institutionalized process of regulatory cooperation. In this scenario we assume that 25% of all actionable regulations will be removed over the medium term through this process and thus specifically look upon the effects of NTM alignment.

3) Short run scenario

The short run scenario presumes that 75% of all remaining tariffs are removed, and 10% of Ecorys NTMs are removed. This scenario tries to gauge the short-term impact of CETA during the first years of its implementation, given that first a number of tariff lines in both the EU and Canada will not be reduced to 0 in the short run or exempted from tariff elimination altogether, and second that NTM reduction in the short run will at best achieve some alignment in selected industries.

4) Long run scenario

In the long run scenario, all tariffs are reduced to 0, and Ecorys NTMs are reduced by an ambitious 50%. This scenario tries to envisage a very optimistic upper bound of achievable liberalization results over a long term period of up to 20 years.

The next section presents simulation results.

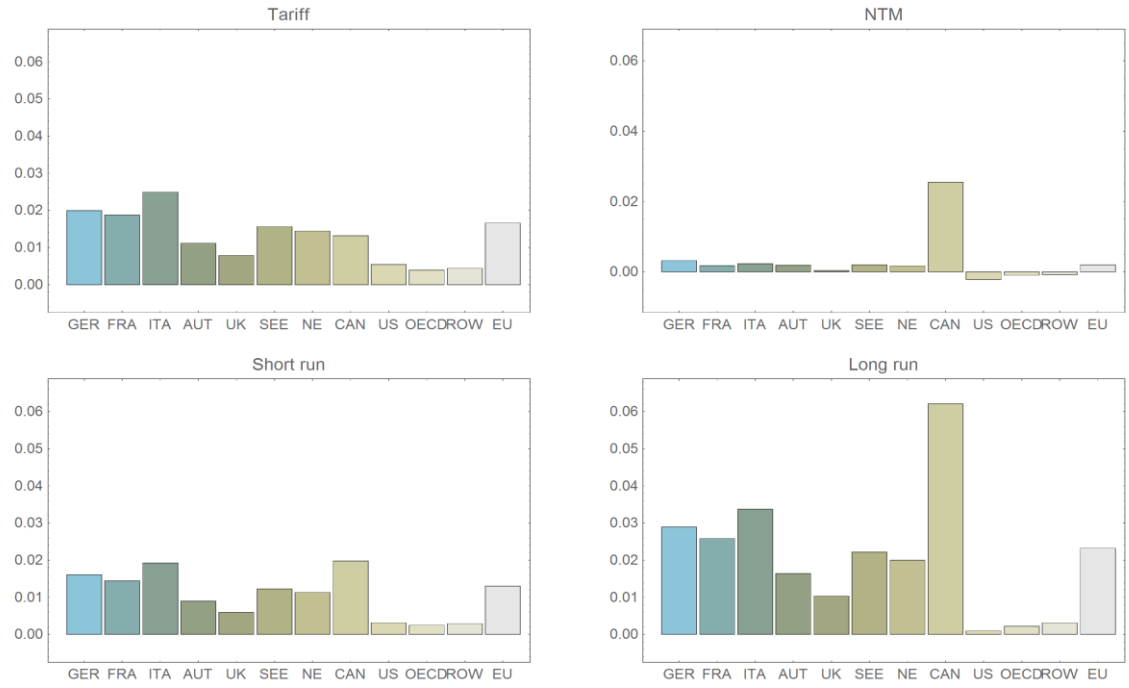
[14] Listed as Berden et al. (2009) in the references. Ecorys data are used in CEPR (2013) on TTIP; CEPR (2013) is listed as Francois et al. (2013).

4.2. Simulation results

In this section, we will discuss simulation results based on one specific calibration. This calibration applies (a) Ecorys NTMs and (b) GTAP trade price elasticity structures, as well as (c) other conservatively chosen parameter values. In the following section, we will present simulation results based on different assumptions in all three areas. Thus, results discussed here and there should be read and interpreted in that context: given significant uncertainty (and controversy) about NTMs, elasticities and parameters there is no single calibration or scenario that indicates "true effects" of CETA. In context, however, the multitude of simulations paints a picture that provides insights.

That said, these first simulation results confirm what is well-known: the economic benefits of 'new trade deals' are overwhelmingly meager. Figure 1 highlights this aspect. Canada, among the countries with the strongest economic gains, sees about 0.06% growth in real GDP (see bottom right chart in Figure 1). Put differently, if Canada's GDP in the base year were 100, its post-liberalization CETA GDP would be 100.06; or, if Canada's real GDP growth rate is on average two per cent per year, CETA might increase that to 2.006 for ten years. These results are in line with other studies on CETA even though our results for the Canadian economy are substantially lower than in other reports as well as similar studies on the other large "new trade deal" under negotiation, TTIP.

Figure 1: Country-level real GDP growth



The figure shows growth rates of real GDP in percentage points for 11 model countries and regions as well as the EU. The four panels show results for the four different scenarios. For example, Germany (GER) experiences an increase of GDP of about 0.02% in the tariff scenario (top left). The US, other OECD and the rest of the world (ROW) are the only regions with negative growth in some scenarios.

Figure 1 further indicates that Canada, Italy and Germany are the biggest beneficiaries of CETA. Other EU countries see smaller gains than Italy and Germany, across the vast majority of scenarios. The rest of the world – US, OECD, ROW – might see losses, especially due to NTM reductions in CETA partners. Moreover, EU countries, and among these again especially Germany, benefit from tariff reduction to a larger degree than Canada.

The small changes in GDP also suggest that changes in macroeconomic balances are marginal. For most EU countries these indicators do not change, only Canada sees a small decline of 0.10% relative to GDP (or -0.32% in net exports, see Table 11) in the foreign balance (exports minus imports), meaning that the country's imports increase more than the exports. At the same time, the Canadian public balance (government expenditure minus government income) expands by the same rate of roughly 0.10% of GDP to achieve an overall macroeconomic balance, meaning that public borrowing expands.

Selected results for the long run scenario can be found in Table 11. GDP changes are similar to the one displayed in the bottom right panel of Figure 1. Bilateral exports change by 7.5% in the EU average and more than 5% for Canada. Employment follows roughly changes in GDP. Changes in low skilled real wages in most EU countries are negative.

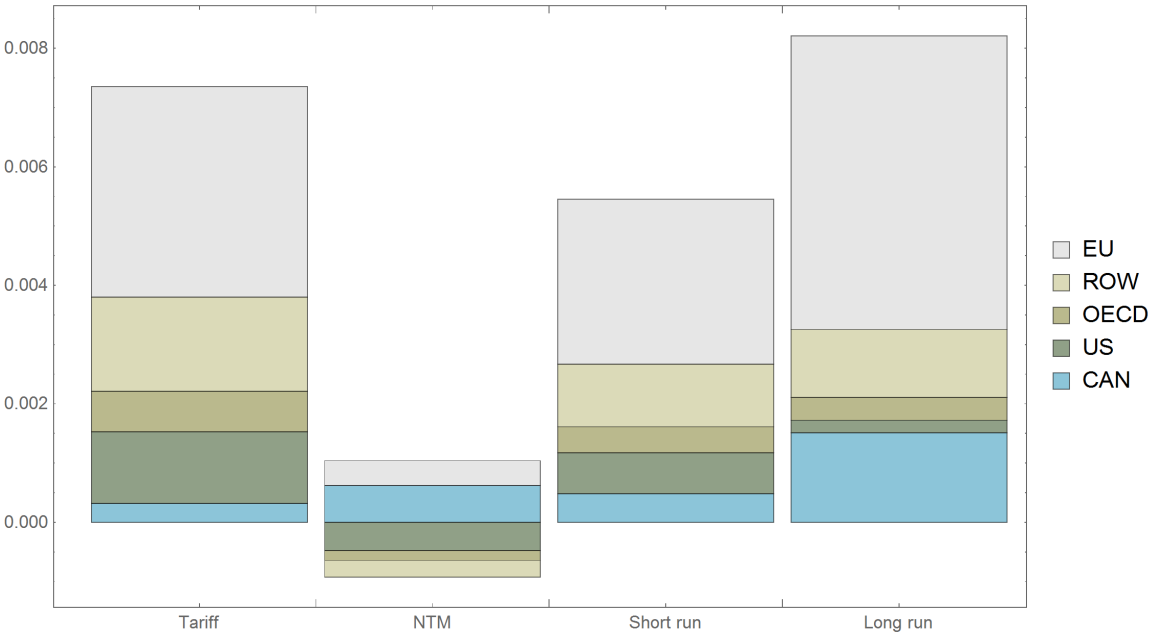
Table 11: Selected model outputs: long run scenario

	GDP	Bilateral Exports	Profit rate	Wage share	Employ-ment	Real Wages	Low skilled employ-ment	LS real wages	High skilled employ-ment	HS real wages
Germany	0.029	8.36	0.02	0.00	0.02	0.01	0.03	-0.003	0.02	0.02
France	0.026	10.57	0.02	0.00	0.02	0.01	0.02	-0.002	0.02	0.02
Italy	0.034	13.49	0.03	0.00	0.03	0.01	0.03	-0.005	0.03	0.02
Austria	0.016	6.56	0.02	0.00	0.01	0.00	0.01	-0.002	0.01	0.01
UK	0.010	5.81	0.01	0.00	0.01	0.01	0.01	-0.001	0.01	0.01
NE	0.022	5.97	0.02	0.00	0.02	0.01	0.02	-0.002	0.02	0.01
SEE	0.020	6.68	0.02	0.00	0.02	0.01	0.02	0.000	0.01	0.01
EU	0.023	7.53	0.02	0.01	0.02	0.01	0.02	-0.011	0.02	0.01
Canada	0.062	5.13	0.00	0.05	0.04	0.09	0.04	0.043	0.04	0.12
USA	0.001	0.00	0.00	0.00	0.00	0.00	0.00	-0.001	0.00	0.00
OECD	0.002	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	0.00
ROW	0.003	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	0.00

Note: All numbers are growth rates in percentage points, employment effects are reported for low (LS) and high (HS) skill labor.

Global growth is hardly affected by CETA. Figure 2 shows that the effect of the long run policy scenario (100% tariff reduction, 50% NTM reduction) amounts to only 0.008% growth of global real GDP – the global effects are an order of magnitude smaller than the country effects. In the NTM scenario, the gains in Canada and EU barely outweigh losses in the rest of the world.

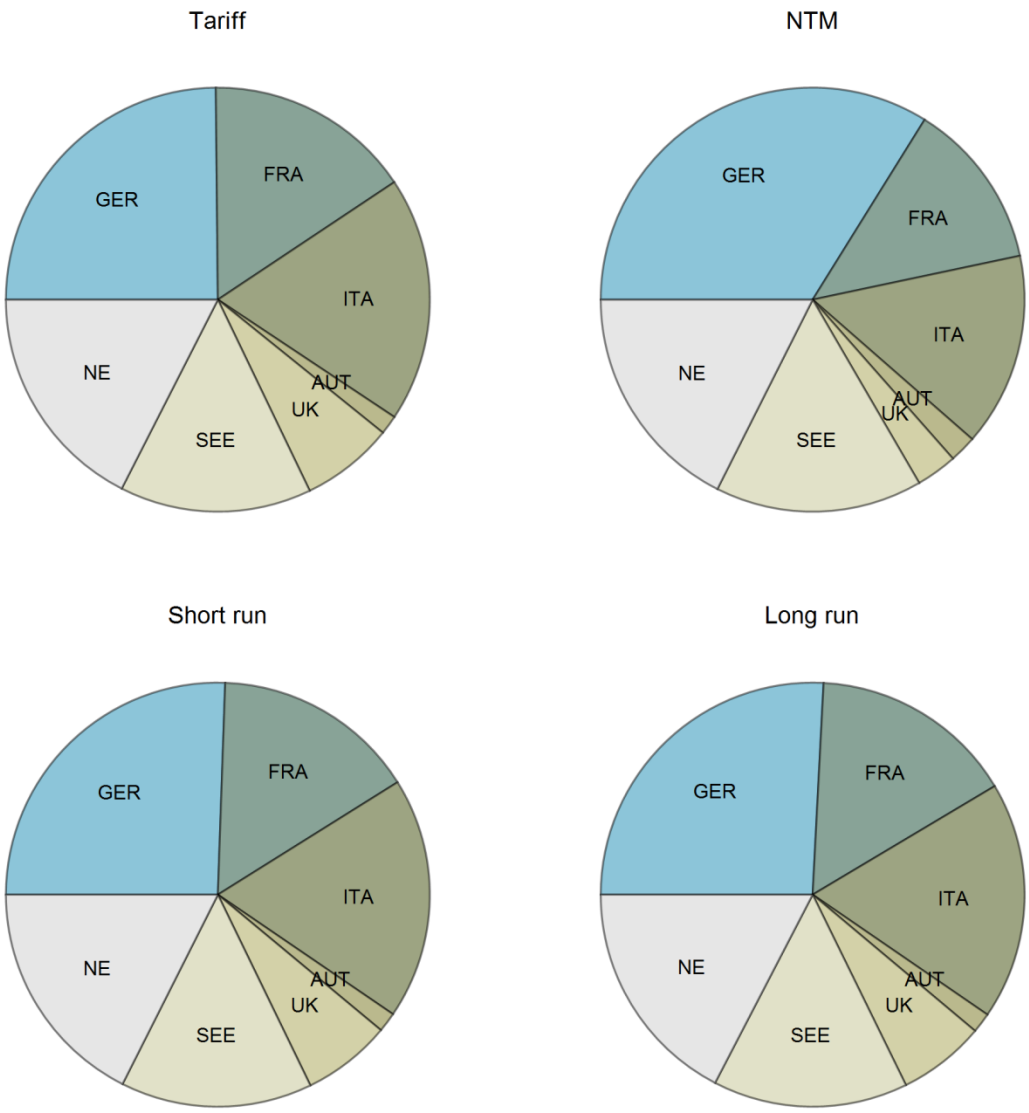
Figure 2: Contribution to global growth



Each bar shows global real GDP growth in percentage points in response to a specific policy scenario. In each bar, the size of the sub-bars indicates the contribution of one of five regions or countries to that global growth. For example, the tariff scenario triggers global real GDP growth of 0.007%, to which the EU contributes the majority. In the NTM scenario, small gains in EU and Canada barely outweigh the losses in the non-CETA regions and countries.

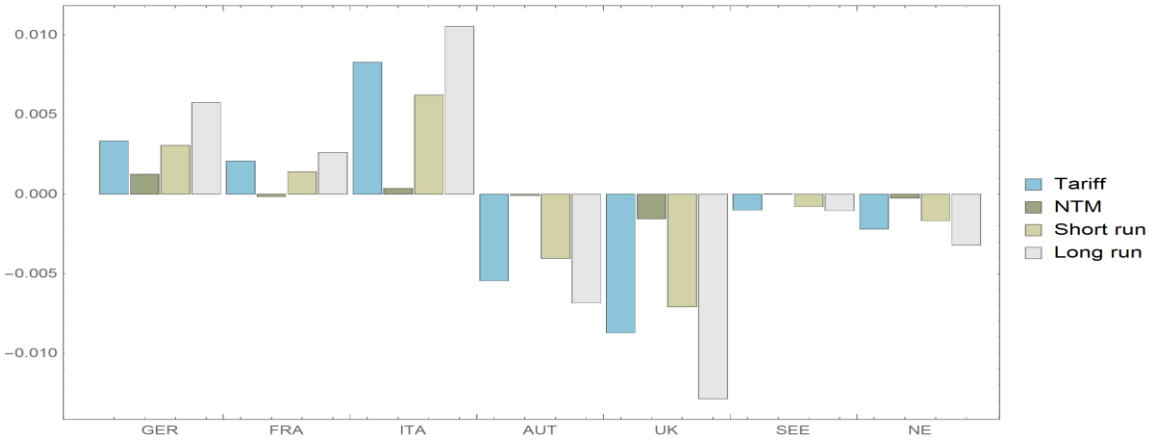
EU growth is unevenly distributed. Figure 3 reports the contributions to EU growth by the seven EU countries and regions across the four scenarios. Germany's real GDP growth rate across all four policy scenarios exceeds the EU's aggregate real GDP growth rate: its share in EU GDP is rising. See Figure 3a for an overview of changes in EU GDP shares.

Figure 3: Contribution to EU growth



Each pie chart shows country contributions to EU real GDP growth in response to a specific policy scenario.

Figure 3a: Share in EU GDP



The chart shows the changes in EU countries/region's share of EU GDP. Germany, France and Italy gain across scenarios; all other countries including Austria and regions are losing ground.

Sectoral contributions to growth are as well unevenly distributed (see Table 12) In EU countries sectoral output changes are small, but almost in all sectors positive. The exception is the metal sector in the UK. The results are mixed for Canada. The country gains in 'other transport' which is already the most important export sector to the EU. On the downside Canada loses some ground in the 'other machinery' sector, which is again currently the most important sector for goods imports from the EU.

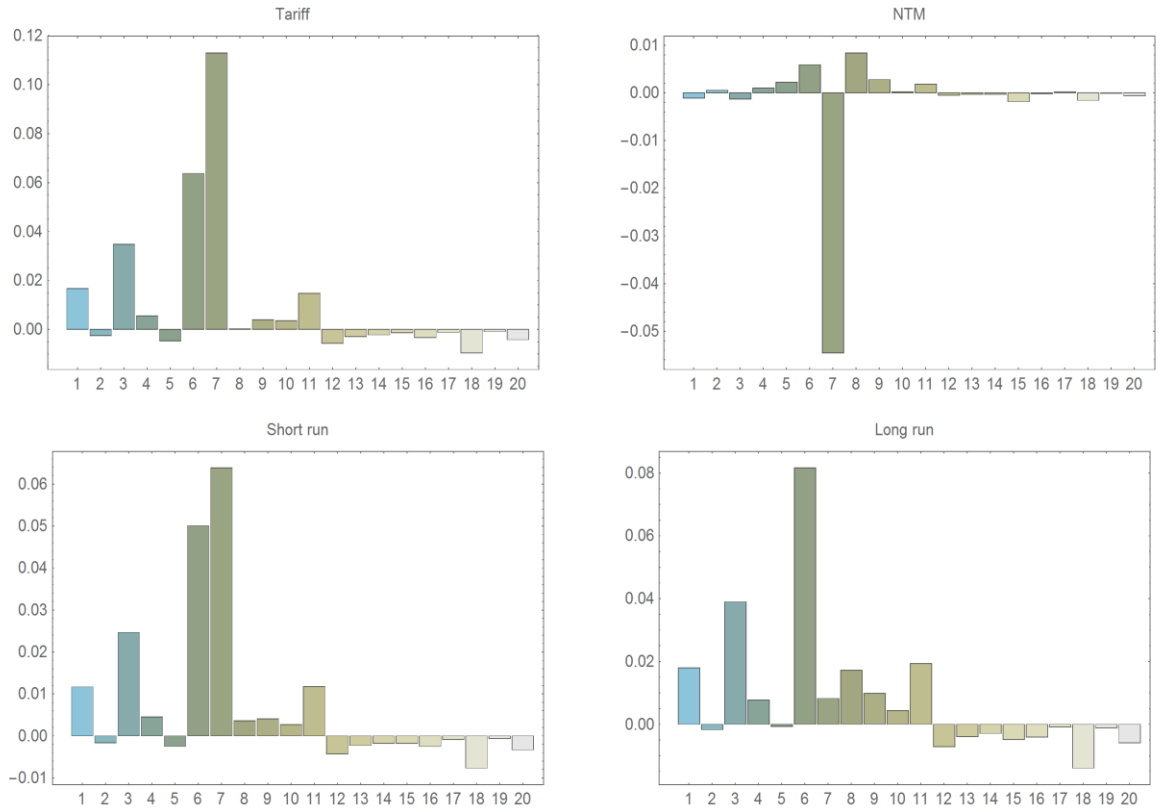
Table 12: Sectoral output changes, long-run scenario

	Long-run scenario	GER	FRA	ITA	AUT	UK	NE	SEE	EU	CAN	USA	OECD	ROW
1	Agriculture Forestry Fisheries	0.06	0.08	0.12	0.03	0.08	0.07	0.04	0.06	-0.10	0.00	0.01	0.01
2	Other Primary Sectors	0.02	0.02	0.02	0.01	-0.01	0.02	0.02	0.01	0.01	0.00	0.00	0.01
3	Processed Foods	0.11	0.18	0.18	0.06	0.10	0.18	0.07	0.13	1.16	0.01	0.01	0.01
4	Chemicals	0.04	0.05	0.04	0.02	0.06	0.05	0.03	0.04	0.10	0.00	0.01	0.01
5	Electr. Machinery	0.01	0.02	0.02	0.02	0.03	0.02	0.01	0.02	0.14	0.00	0.00	0.00
6	Motor Vehicles	0.12	0.04	0.07	0.10	0.08	0.07	0.05	0.08	0.36	0.01	0.01	0.00
7	Other Transport Equipment	0.03	0.03	0.05	0.02	0.12	0.05	0.02	0.05	0.66	0.01	0.00	0.00
8	Other Machinery	0.03	0.04	0.03	0.03	0.05	0.04	0.02	0.03	-0.06	-0.01	0.00	0.00
9	Metals	0.03	0.02	0.02	0.03	-0.12	0.02	0.02	0.01	0.29	0.00	0.00	0.00
10	Wood and Paper	0.03	0.03	0.04	0.02	0.01	0.02	0.03	0.02	0.02	0.00	0.00	0.00
11	Other Manufacturing	0.05	0.04	0.07	0.04	0.03	0.03	0.04	0.05	0.17	0.00	0.00	0.00
12	Water Transport	0.02	0.02	0.03	0.01	-0.01	0.01	0.01	0.01	-0.11	0.00	0.00	0.00
13	Air Transport	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.05	0.00	0.00	0.00
14	Finance	0.03	0.02	0.03	0.01	0.00	0.01	0.02	0.02	0.13	0.00	0.00	0.00
15	Insurance	0.03	0.02	0.03	0.01	0.00	0.02	0.02	0.02	0.15	0.00	0.00	0.00
16	Business Services	0.03	0.02	0.03	0.01	0.01	0.01	0.02	0.02	-0.01	0.00	0.00	0.00
17	Communications	0.03	0.02	0.03	0.02	0.01	0.02	0.02	0.02	0.02	0.00	0.00	0.00
18	Construction	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	Personal Services	0.03	0.02	0.03	0.02	0.01	0.02	0.02	0.02	0.04	0.00	0.00	0.00
20	Other Services	0.02	0.01	0.02	0.01	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00

Note: All numbers are growth rates in percentage points.

In Austria, the sectors with the most positive effects are motor vehicles (+0.10%), Processed Foods (+0.06%) and other Manufacturing and Machinery (+0.04% and +0.03%). Output changes in service sectors are marginal in percentage growth rates, however, these sectors dominate value added and employment. Thus weighting sectoral effects by sector size give additional insights.

Figure 4: Changes in sectoral share of GDP, Austria



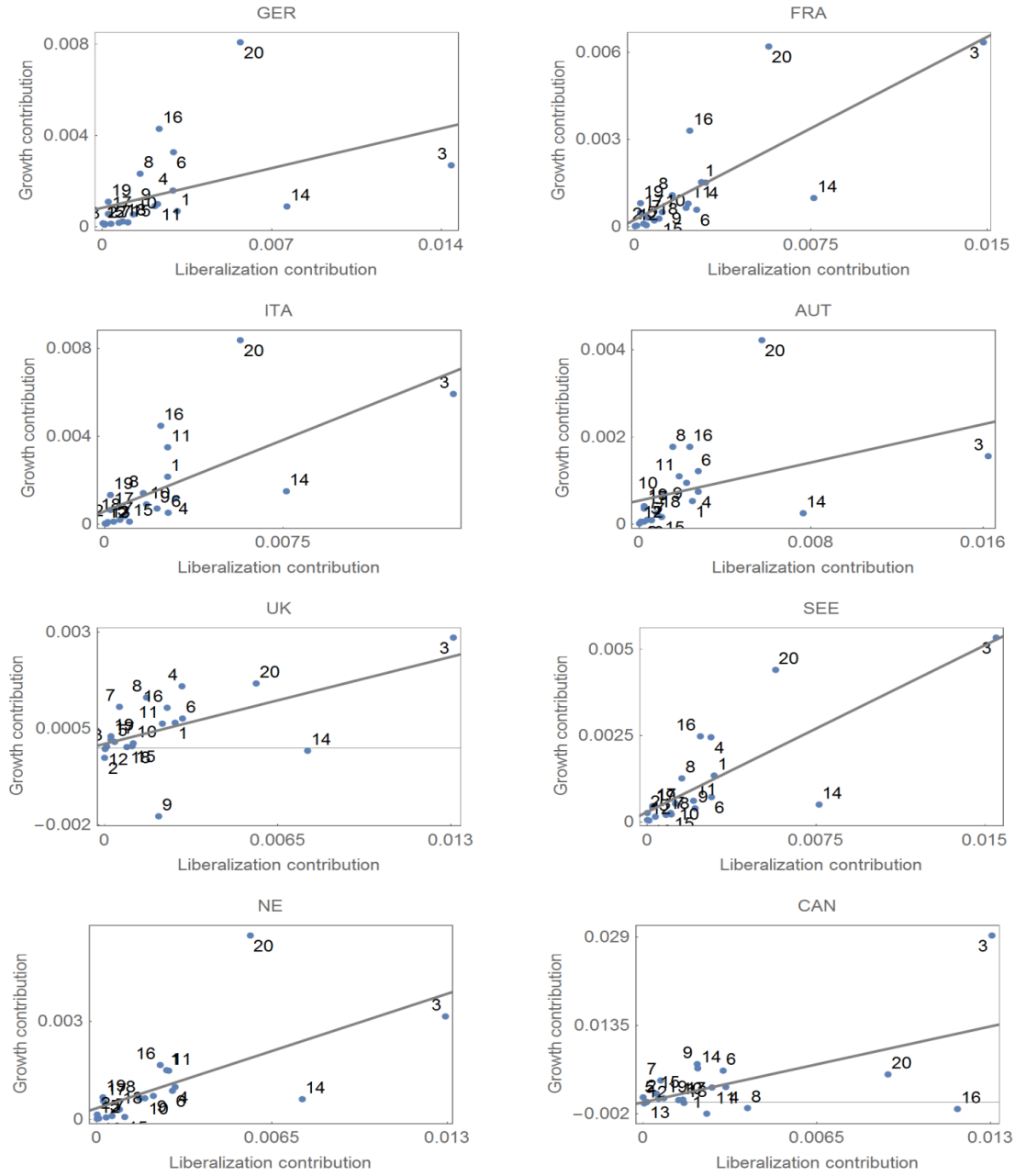
This figure shows the change in sectoral shares of GDP, and thus Austria's "relative winners and losers."

Figure 5 demonstrates the linkages between the magnitude of liberalization in the export destination in a sector and the sectoral contribution to growth in the exporting country. The vertical axis shows sectoral contributions to growth in value added, so that the sum of the observations along this axis equals the growth in aggregate value added. The horizontal axis denotes sectoral contributions to liberalization *in the trading partner*: The steeper the reduction in trade barriers in a sector in the EU, the larger is liberalization, and the larger that sector's share in value added, the higher its contribution to overall liberalization. Liberalization is measured as the negative of the sum of reductions in tariffs and NTMs, so that a higher positive value implies steeper liberalization. Put simply, the positive correlation between sectoral growth contributions and (trading partner's) sectoral liberalization contribution illustrates the very causal linkages from price changes to trade flow changes to growth of value added.

Now, for an example, consider the sector "processed foods." This sector is labeled 3 and shows up in every country on the very right, indicating a significant contribution to liberalization due to the initially high level of tariffs and NTMs in the EU and Canada. However, the growth distribution of that sector is not outsizing the liberalization trend, indicated by the regression lines. Importantly, these results are determined by the estimated trade costs due to NTMs, as the sensitivity analysis in section 4.4. shows. A major contribution to growth

also comes from the sector 20 due to its role in the multiplier process. The sector aggregates various services from public administration, social and health work to dwellings and has a large weight in the input-output tables as it provides important intermediate services for all other sectors. However, its role in trade is limited. Thus, the sector can be crucial in steering overall results due its size and should always be treated with care.

Figure 5: Sectoral growth contribution



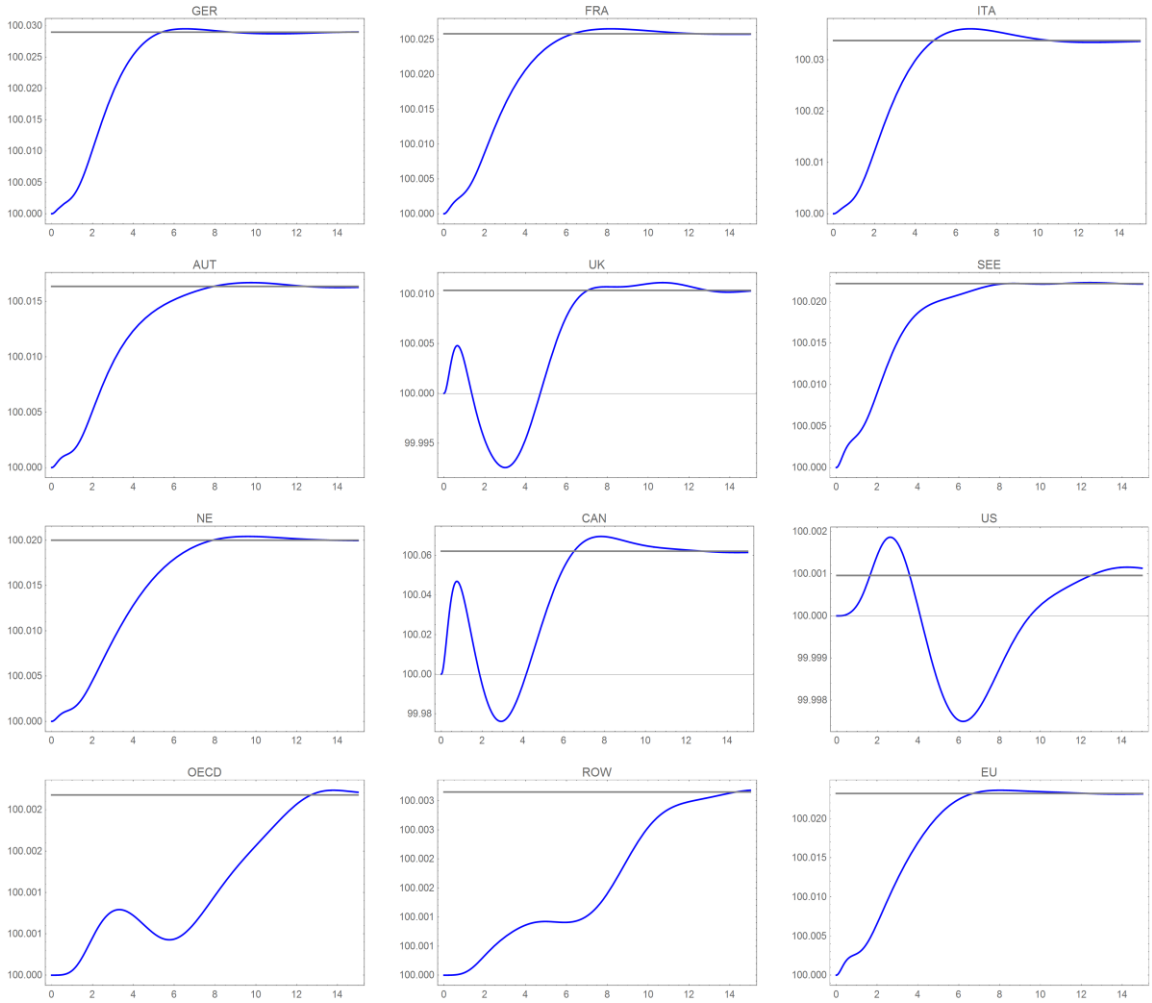
Each panel shows sectoral contributions to growth of real GDP in relation to the sector's "liberalization contribution" in the trading partner. The numbers reflect sectors (i.e., 3 is 'processed foods' and 20 'other services'). Growth contribution is calculated as the product of the sector's share of value added and the sector's growth rate of value added. The lines are linear regressions. Numbers of sectors are shown in Table 11.

4.3. Adjustment costs

Standard trade theory predicts aggregate gains from trade, but not that everybody wins. In theory, this is recognized in full employment models as falling returns to factors – i.e. specific skill groups, or sectors might see falling real wages. In practice, it is understood that employment is not full, but rather that shrinking sectors release labor, and public support for unemployment benefits, re-training and similar measures are necessary. In our income-expenditure model, the gradual adjustment of production and employment to changing demand patterns implies *adjustment costs*.

It is therefore relevant to consider the economy's path towards the new equilibrium. In other words, it is relevant to consider as well the dynamic and not only the static simulation. Importantly, dynamic simulation in our model refers to the process over time until static equilibrium is reached after a liberalization shock. The term 'dynamic' in the context of other CGE models is used to describe the behavior of the investment function in addition to static effects (see also discussion in section 3.2). Figure 6 shows such a dynamic path for the long run scenario.

Figure 6: Real GDP: Dynamic simulation of long run scenario

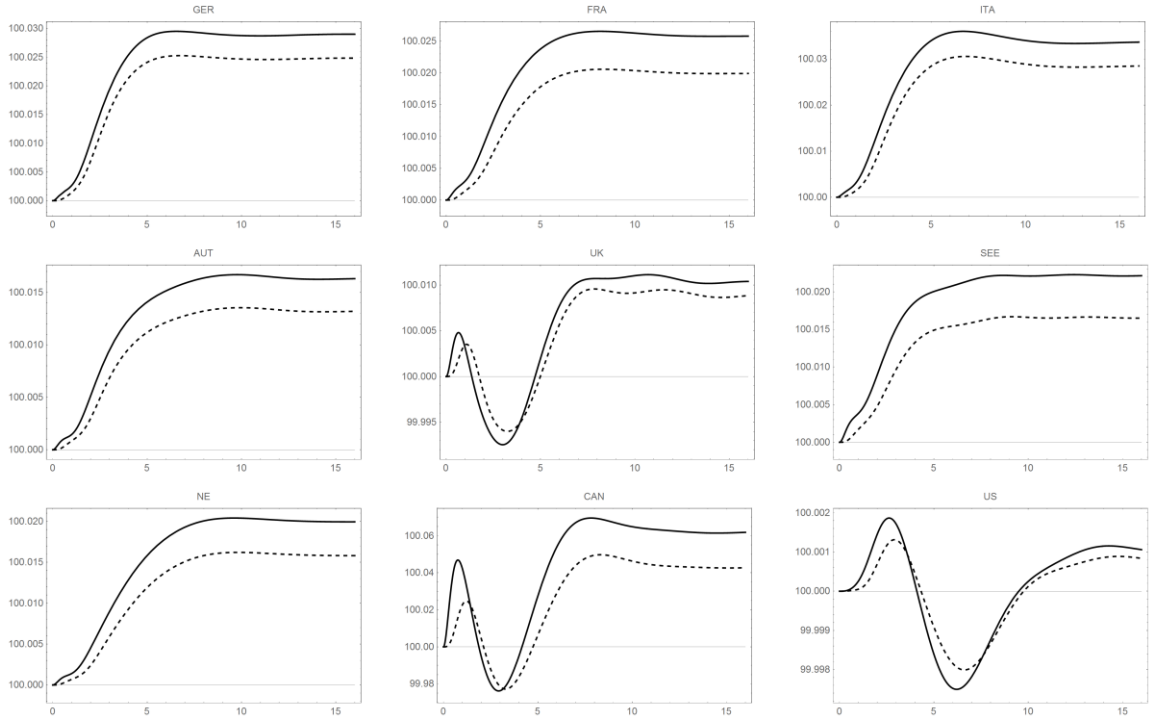


Each panel shows trajectory (blue) and post-liberalization equilibrium value (gray/thick horizontal line) of real GDP relative to pre-liberalization real GDP. The post-liberalization equilibrium values (gray) correspond to long run scenario statistics shown in Figure 1; Base year GDP = 100.

The panel in Figure 6 shows (a) base year real GDP at an index value of 100, the (b) real GDP resulting from the static simulation result (gray, horizontal line) and the (c) time path of real GDP, each in percentages relative to base year real GDP. Austria's real GDP growth in the long run scenario is 0.016%; see the horizontal bar in Figure 5. The gray line at 100.016 thus shows the post-liberalization equilibrium within (roughly) a 10 year period. The blue line indicates the dynamic adjustment path towards this new equilibrium. The UK and Canada are the only CETA members with significant GDP index values below 100 that see therefore short-term declines in GDP before a long-run equilibrium is reached after 10 years.

Figure 7 shows dynamic changes in employment in combination with real GDP effects. The figure underlines that employment follows GDP effects in our model. Values in the employment index below 100 indicate job losses during the implementation period of CETA. As before, this would only occur in the UK and Canada. But also the US as a close trading partner of Canada would see short-term negative employment effects.

Figure 7: Real GDP and employment: Dynamic simulation of long run scenario

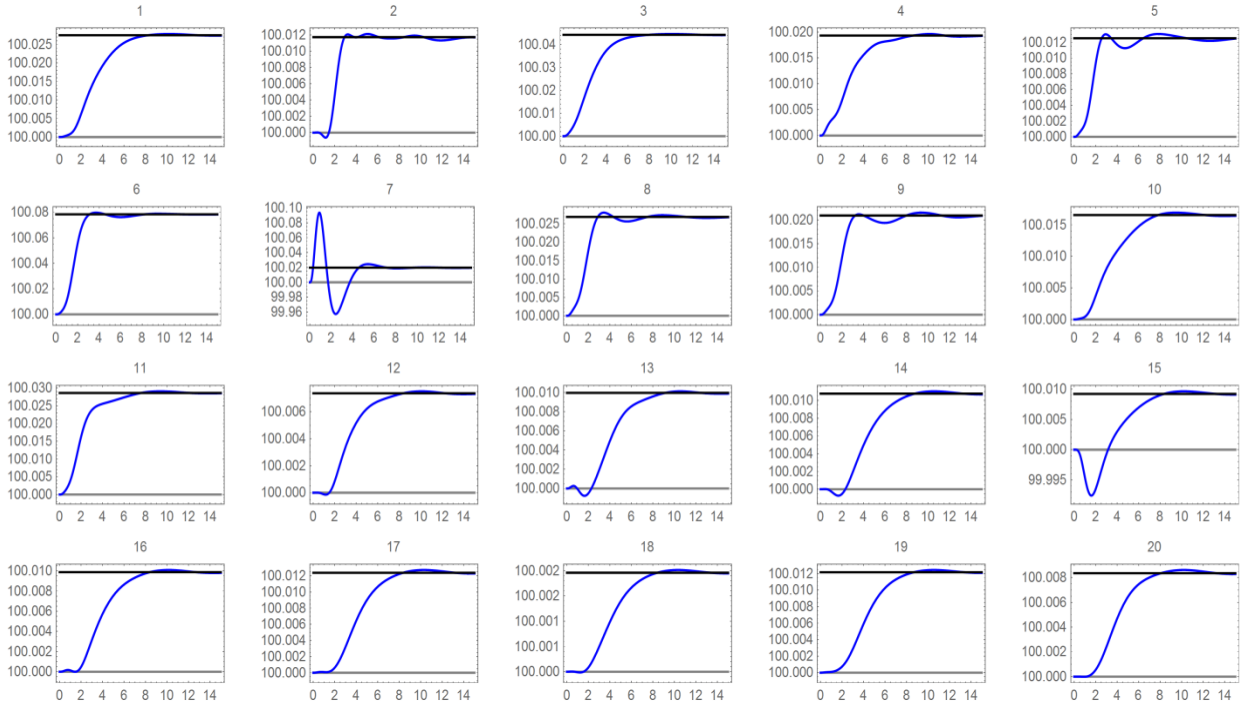


Each panel shows trajectory of real GDP (solid) and employment (dashed), changes in real GDP correspond with Figure 5; Base year GDP = 100.

As indicated above, values in the employment index below 100 could be used to calculate adjustment cost temporary unemployment. However, the results in Figure 6 and Figure 7 indicate that in the aggregate, real GDP and employment changes in the majority of countries, including Austria, are not negative (=below 100). More detailed sectoral results shown in Figure 8 indicate that several sectors in Austria see short term employment losses. For instance, sectors 7 (other transport equipment), 14 (finance) and 15 (insurance) see small dips in the employment index below 100 in 1 or 2 years. However, the magnitude of these changes is too small to show meaningful results on adjustment costs for Austria. This is mainly related to the marginal changes in GDP in the first place. This is also true for the whole EU where adjustments in the sectoral employment are only temporarily negative in selected cases (see Figure A in the Appendix). It is mainly Canada which has higher ad-

justment costs due to CETA as most Canadian sectors see temporary unemployment effects (see Figure B in the Appendix). Larger impacts on trade and value added by other free trade agreements might well trigger noteworthy adjustment costs through unemployment also in EU countries.

Figure 8: Austria's sectoral employment dynamics, long run scenario



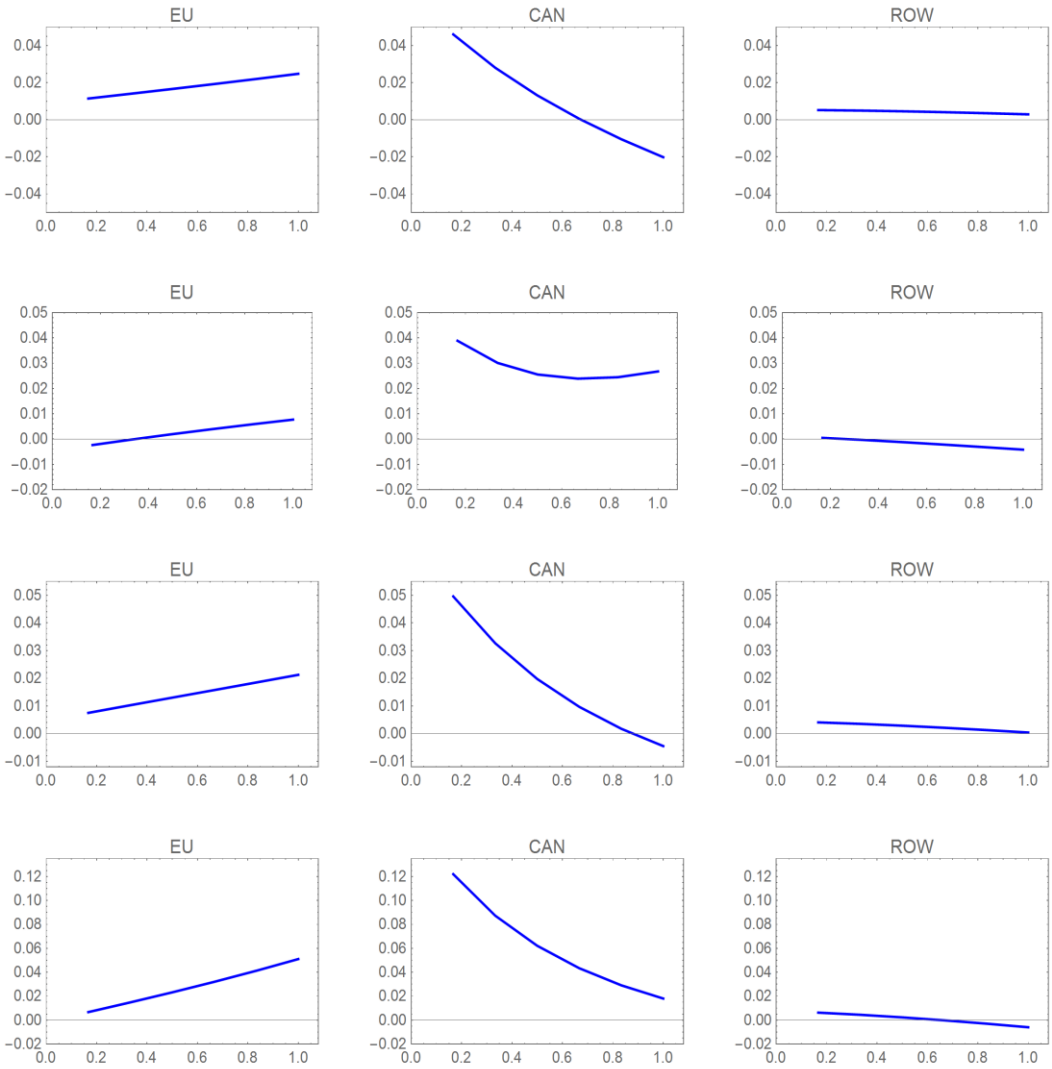
Horizontal black line: static solution, blue: dynamic trajectory; Base year employment = 100.

4.4. Sensitivity analysis

In this section, we discuss sensitivity analysis. Given significant uncertainty about the "true" CETA-related reduction in NTMs, the "true" trade price elasticities and the "true" other parameters of the model, we report simulation results across a wide variety of calibrations.

To begin, Figure 9 shows sensitivity of model results to variations in trade price elasticities. Here we aggregate model countries and regions into three major areas: EU, Canada, and the rest of the world (ROW). As the caption details, each panel shows real GDP growth rates against trade price elasticity magnitudes: the horizontal axis notes the fraction of GTAP elasticities that are applied. Consider Canada in the tariff scenario. With GTAP elasticities at roughly 1/5th their value, Canada gains about 0.04% of real GDP; with elasticities at "full" value, Canada loses about 0.02% of real GDP. (Recall that we employ 0.5 of GTAP elasticities in the scenario simulations). The impact is largest here – across all other panels results are relatively robust to changes in elasticity magnitudes. For the whole EU, a positive relation between GDP growth and the magnitude of trade price elasticities is visible.

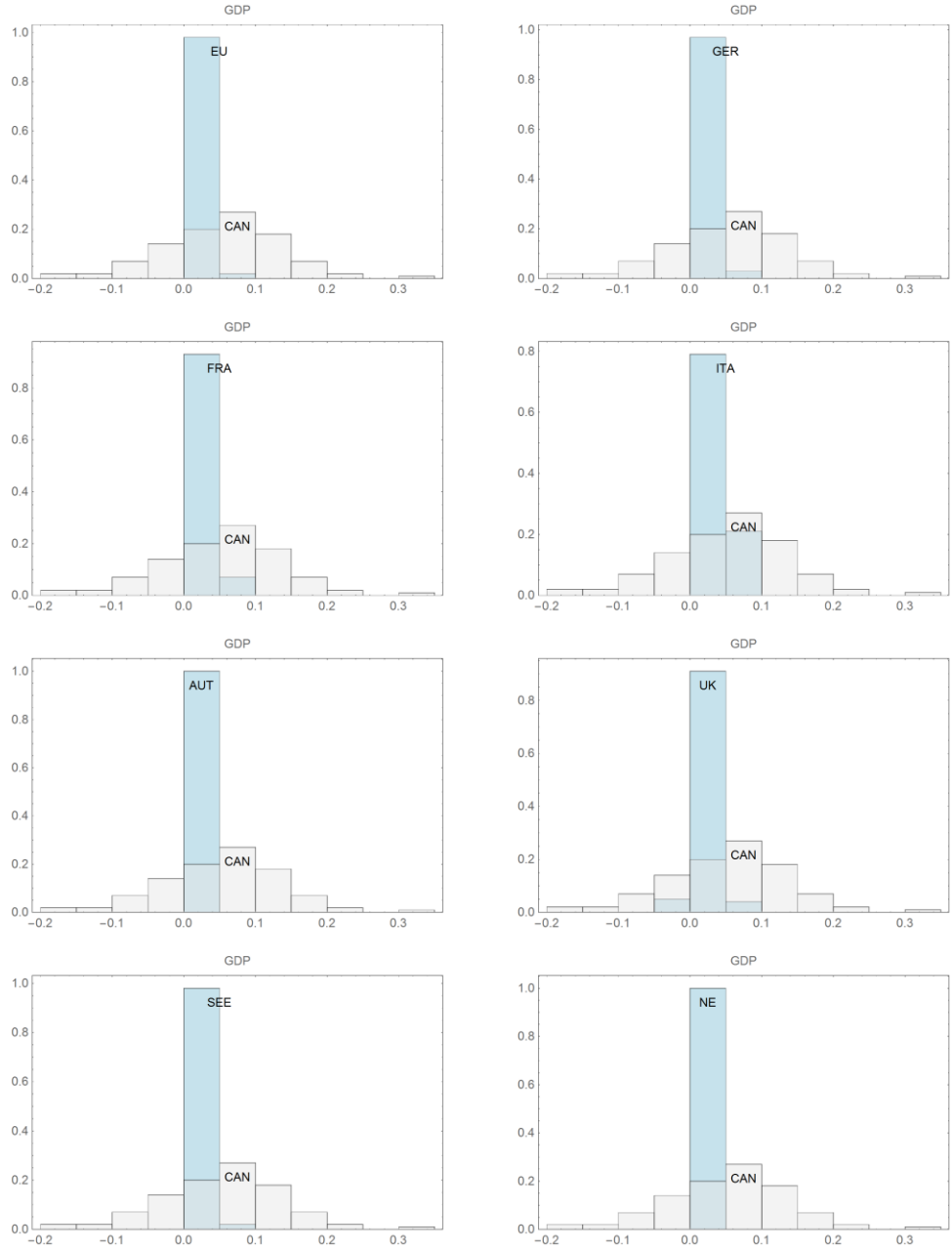
Figure 9: Sensitivity analysis – trade price elasticities



Each panel shows trade price elasticities (horizontal axis) against real GDP growth rates (in percentage points, vertical axis). The horizontal axis indicates the fraction of GTAP elasticity values that are applied, between about 1/5th and full value. Panels from left to right show EU, Canada and "ROW" aggregate growth, where ROW contains all non-CETA regions and countries. Top to bottom row: tariff, NTM, short run, long run scenario.

In Figure 10 we demonstrate the effect of parameter variations in combination with the long run scenario. Here, trade price elasticities as well as other parameters are randomly varied within reasonable ranges. The resulting real GDP growth rates are shown in probability histograms. (These panels should be compared to Figure 1). First, the range of results for Canada is quite wide, compared to the very narrow EU results. This underlines also the size-effects as changes in large trading partners, as the EU is for Canada, trigger more significant results. With the exception of UK, the variation in model parameters still yields positive results that are most likely in range from 0% to 0.05%.

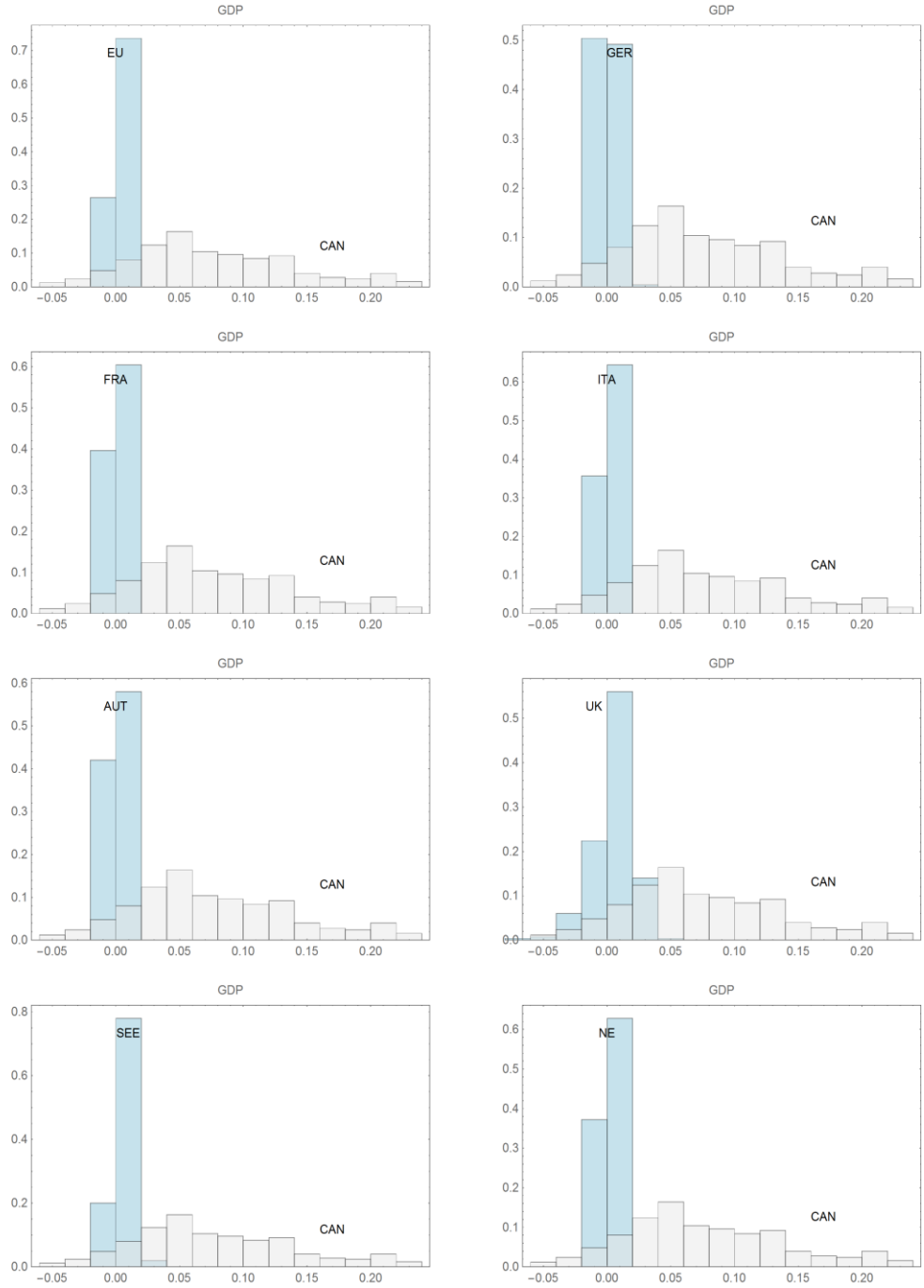
Figure 10: Sensitivity analysis – parameter variation; long run scenario



Each panel shows histograms of real GDP growth rates (in percentage points, horizontal axis) against probabilities (vertical axis). Each such observation is generated by one (long run scenario) simulation, and each simulation features a different, randomly drawn parameter set.

Figure 11 further illustrates the relevance of the distribution of NTM reductions. Here, we use *the same* random parameter sets as in Figure 10, but add to that *randomized* NTM reductions. These are assumed to be uniformly distributed between 0% and 15%, which at the upper end roughly corresponds to an ambitious NTM scenario. As the panels indicate, Canada's range of results further widens – and in several other EU countries and regions losses appear possible. Thus, model results largely depend on the one hand on the estimations of trade costs of NTMs, which can vary substantially (see also Berden/Francois, 2015). On the other hand, the assumptions on actionability and the potential to adjust regulations and standards are crucial.

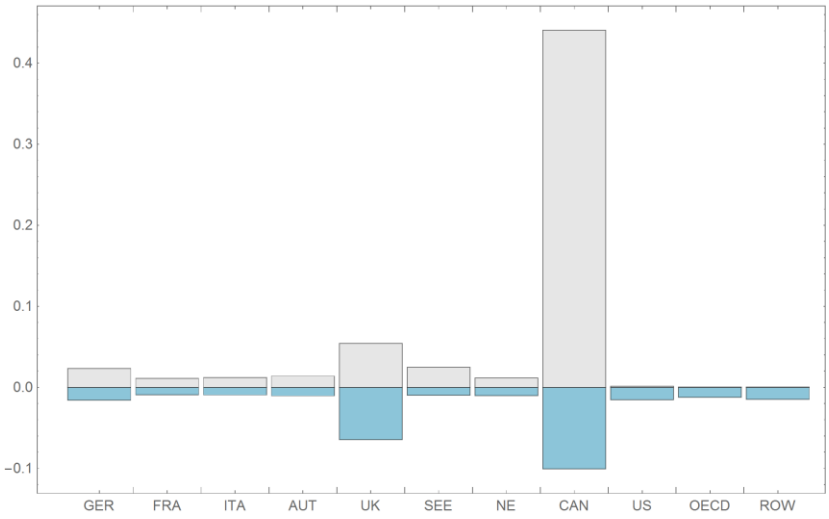
Figure 11: Sensitivity analysis – parameter variation *and* random NTM reduction



Panels show histograms of real GDP growth rates (in percentage points, horizontal axis) against probabilities (vertical axis). In each simulation, the set of crucial parameters is randomly drawn; *and* the reduction of NTMs is randomly drawn. The range of NTM reduction covers 0% to 15%, which corresponds at the upper end roughly to the NTM component of the long run scenario. Tariff rates are not changed.

Figure 12 highlights the results stemming from these sensitivity simulations. The figure shows the lowest and highest growth numbers for each region. The crucial message of this chart is clear: every single region faces the potential of economic losses from NTM liberalization. These results can be interpreted as a variation around the results of the tariff scenario (scenario 1) with its small gains from tariff reductions. Thus, variations in NTM liberalization might increase positive effects but also counterpoise these gains.

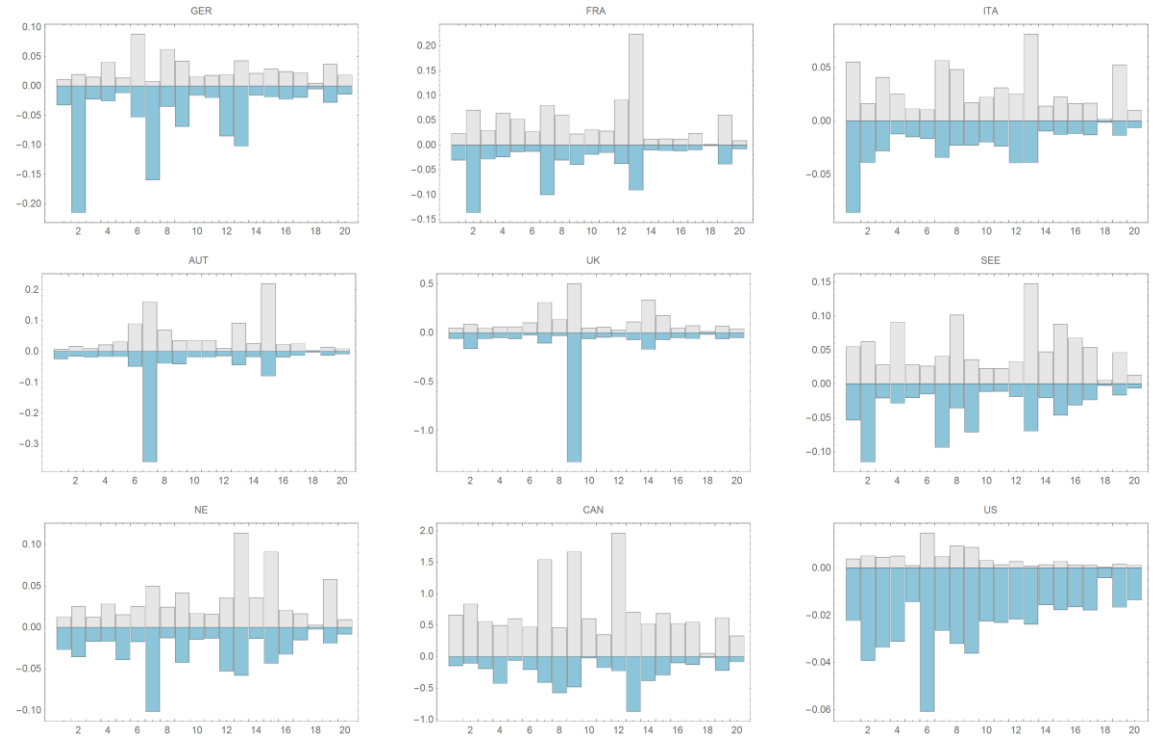
Figure 12: Sensitivity analysis – potential losses and gains



Each bar shows minimum and maximum real GDP growth rates (in percentage points) from simulations underlying Figure 11. For example, the largest loss in the UK real GDP represents about 0.05%; the largest gain about the same increase.

The same downside risk from NTM-reductions is visible on a sectoral level. As Figure 13 shows, in most EU countries, the sector 'other transport equipment' (7) has the largest negative effects in these simulations. Still, the magnitude of changes remains limited for EU countries. Only Canada sees larger changes that are biased to the upside.

Figure 13: Sensitivity analysis –sectoral growth of real value added.

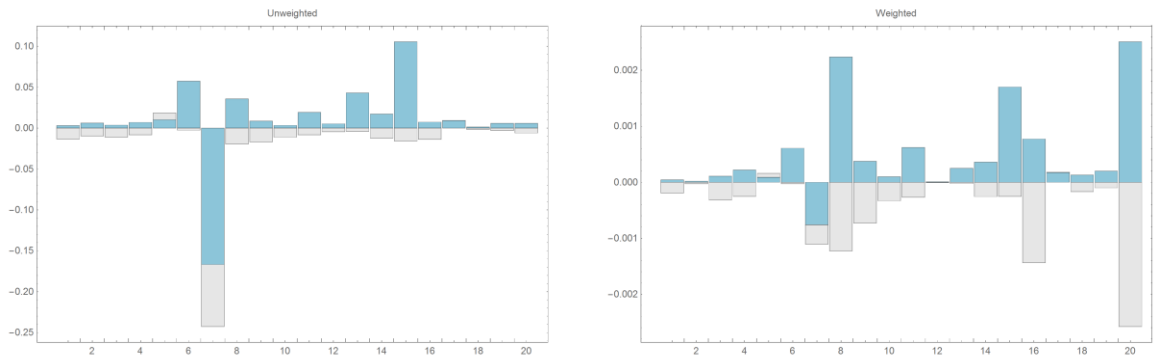


Each bar shows minimum and maximum growth rates of real value added (in percentage points) for each country's twenty sectors from simulations underlying Figure 11. For example, the largest contraction in Germany across all those model runs occurs in sector 2 (-0.21%), the largest gain in sector 6 (+0.09%).

As employment follows changes in value added, also employment varies with changed trade costs related to NTMs. Similar to the ranges in real GDP shown in Figure 13, employment in the single EU member states can potentially be lower or lifted according to different NTM liberalization outcomes. Although the changes in employment are smaller than changes in real GDP, the most pronounced scenarios would result in a loss in UK employment by more than -0.03% on the downside and an increase of up to 0.04% on the upside. For all other EU states changes are small, but all show potential losses in employment depending on the variations in parameters and NTM trade cost reductions.

For Austria, the effects on employment can be described in more detail. Changes in employment in the most positive set and the most negative set out of all 250 simulation runs is displayed in Figure 14 in unweighted and weighted terms. In terms of full-term equivalents, employment effects range from around -300 to +300 jobs. Again, these variations can be interpreted as variations around the effects from a tariff reduction. Thus, gains of around 325 jobs in Austria from tariff reductions might be almost eliminated by negative effects from NTM reductions. In the most positive scenario, more than 600 jobs in total would be created.

Figure 14: Sensitivity analysis – sectoral employment growth in Austria



The panels build on the sensitivity analysis underlying Figure 11. First, the largest aggregate employment contraction (gray) and expansion (blue) across these model runs is picked. The left panel shows sectoral employment growth for these two model runs. The right panel shows the same data *weighted* by each sector's share in aggregate employment. In the right panel, the sum across all blue (gray) bars is the largest aggregate employment expansion (contraction). The largest changes occur in sector 7 and 15; but the largest contributions emanate from 20.

5. CONCLUSIONS

Our analysis of CETA, the free trade agreement between the EU and Canada, was focused on an assessment of the economic impact of the agreement. We used a critical survey of existing studies (see section 3) as a benchmark for our own, alternative assessment based on the ÖFSE Global Trade Model, a structuralist CGE model, which in particular allows for an assessment of the impacts of trade liberalization on employment, income distribution and macroeconomic balances.

Our results may be summarized as follows:

1) Real GDP grows by 0.023% for the EU and 0.062% for Canada; these changes represent long run level effects, meaning that the GDP changes occur over a 10 to 20 year implementation period.
2) Stronger effects occur in the larger EU countries (Germany, France, Italy), meaning the other EU countries such as Austria are losing ground relative to these EU partners.
3) The effects are both caused by tariff and NTM reduction; NTM trade cost reductions are crucial for Canada but of less importance for EU countries and Austria.
4) For Austria, real income effects amount to 0.016% or EUR 50 Mio, which is roughly 6 EUR per Austrian citizen. These effects are below EU average.
5) On the sectoral level in Austria, the sectors 'motor vehicles' (0.10%), 'processed foods' (0.06%) and 'other machinery' (0.03%) show above-average gains. In the service sectors only small changes appear (around 0.01%).
6) Changes in employment in Austria (+450 full-time jobs) are small and follow the small positive gains in GDP.
7) Changes in real wages are different for the two skill-levels. While the real wage of high skilled workers increases slightly (0.01%), lower skilled workers see declines in real wages (-0.002%).

These results should be seen, in general, as best case scenarios. They should be interpreted as upper limits of the overall effects of CETA, since the potential positive effects of rules and regulations and hence the social costs of their alignment are not considered. Instead, our model – like others – adopts the narrow perspective that regulations in general impose only costs, and their reduction through a CETA-lead process would bring about economic benefits. Regulatory alignment, regardless of whether it is done by mutual recognition, harmonization or elimination of a regulation thus always confers a benefit to society. We do, however, know that regulations aim at serving the public interest. Thus, a balanced assessment of regulatory alignment would also have to consider its effect on the social benefits a regulation brings to the public.

In addition, our model (as most others) does not include a proper assessment of many of the other elements of new generation trade agreements, in particular investment liberalization, the protection of intellectual property rights, or the liberalization of public procurement. Other 'side effects' of trade liberalization, such as environmental or human rights impacts are equally not taken into account. Thus, in effect, our model (as others) measures a subset of the costs and benefits of CETA only, and, arguably, has a tendency to overestimate the benefits of trade.

REFERENCES

Beghin, J./Disdier, A. C./Marette, S./Van Tongeren, F. (2012): Welfare costs and benefits of non-tariff measures in trade: a conceptual framework and application. In: World Trade Review, 11(03), pp. 356-375.

Berden, K./Francois, J. (2015): Quantifying Non-Tariff Measures for TTIP. Paper No. 12 in CEPTS-CTR project ‚TTIP in the Balance' and CEPS Special Report No. 116 / July 2015.

Berden, K./Francois, J./Thelle, M./Wymenga, P./Tamminen, S. (2009): Non-tariff measures in EU-US trade and investment – An economic analysis. In: ECORYS, Study for the European Commission, Directorate-General for Trade. See: trade.ec.europa.eu/doclib/docs/2009/december/tradoc_145613.pdf (11/25/2015).

Blanchard, O. J./Fischer, S. (1989): Lectures on macroeconomics. MIT press.

Bratt, M. (2014). "Estimating the bilateral impact of non-tariff measures (NTMs)", Working Paper WPS 14-01-1, Université de Genève

Dean, J.M./Signoret, J./ Feinberg,R.M./Ludema, R.D./Ferrantino, M.J. (2009): Estimating the Price Effects of Non-Tariff Barriers. The B.E. In: Journal of Economic Analysis & Policy, 9(1), Art. 12

Dee, P./Francois, J./Manchin, M./Norberg, H./Nordås, H./van Tongeren F. (2011): The Impact of Trade Liberalisation on Jobs and Growth. OECD Trade Policy Working Papers No. 107, OECD: Paris.

European Commission (2016): CETA – Summary of the final negotiating results. See: http://trade.ec.europa.eu/doclib/docs/2014/december/tradoc_152982.pdf (09/06/2016)

European Commission and Government of Canada (2008): Assessing the Costs and Benefits of a Closer EU-Canada Economic Partnership. See: http://trade.ec.europa.eu/doclib/html/141032.htm (05/11/2016)

Francois, J.F./McDonald, B./Nordstrom, H. (1996): Liberalisation and the capital accumulation in the GTAP model. GTAP Technical Paper No. 7. See: http://docs.lib.purdue.edu/gtaptp/8/ (20/05/2016)

Francois, J./Manchin, M./Norberg, H./Pindyuk, O./Tomberger, P. (2013): Reducing Transatlantic Barriers to Trade and Investment – An Economic Assessment. In: CEPR, Study for the European Commission, Final Project Report.

Francois, J./Pindyuk, O (2013): Modeling the Effects of Free Trade Agreements between the EU and Canada, USA and Moldova/Georgia/Armenia on the Austrian Economy: Model Simulations for Trade Policy Analysis, FIW Research Report 2012/13 N° 03, Vienna. See: http://www.fiw.ac.at/fileadmin/Documents/Publikationen/Studien_2012_13/03-ResearchReport-FrancoisPindyuk.pdf (04/11/2016)

Hertel, T./McDougall, R./Narayanan, B./Aguiar A. (2014): GTAP 8 Data Base Documentation – Chapter 14 Behavioural Parameters. See: https://www.gtap.agecon.purdue.edu/resources/download/7047.pdf (04/11/2016)

Kirkpatrick, C. et al. (2011): A Trade SIA Relating to the Negotiation of a Comprehensive Economic and Trade Agreement (CETA) Between the EU and Canada. Trade 10/B3/B06. See: http://ec.europa.eu/trade/policy/policy-making/analysis/sustainability-impact-assessments/assessments/#study-geo-14 (04/11/2016)

Raza, W./Tröster, B./von Arnim, R. (2016a): The blind spots of trade impact assessment: macroeconomic adjustment costs and the social costs of regulatory change. In: European Journal of Economics and Economic Policies: Intervention. 13(1), pp. 87-102.

Raza, W./Taylor, L./Tröster, B./ von Arnim, R. (2016b): Modelling the impacts of trade on employment and development: A structuralist CGE-model for the analysis of TTIP and other trade agreements. ÖFSE Working Paper No. 57.

Raza, W./Grumiller, J./Taylor,L./Tröster, B./von Arnim, R.(2014): ASSESS TTIP: Assessing the claimed benefits of the Transatlantic Trade and Investment Partnership. See: http://guengl.eu/uploads/plenary-focus-pdf/ASSESS_TTIP.pdf (11/25/2015).

Rodrik, D. (2015): The War of Trade Models. See: http://rodrik.typepad.com/dani_rodriks_weblog/2015/05/the-war-of-trade-models.html (05/31/2015)

Shoven, J. B./Whalley, J. (1984): Applied general-equilibrium models of taxation and international trade: an introduction and survey. In: Journal of Economic Literature, 22(3), pp. 1007-1051.

Taylor, L. (2004): Reconstructing Macroeconomics: Structuralist Proposals and Critiques of the Mainstream Harvard University Press.

APPENDIX

Table A: Sectoral Disaggregation

No.	Model sectors	GTAP Sectors (GTAP terminolo-	ISIC rev 3.1 sectors
1	Agriculture Forestry Fisheries	pdr wht gro v_f osd_c_b pfb ocr ctl oap rmk wol frs fsh	ISIC 01-05
2	Other Primary Sectors	coa oil gas omn	ISIC 10-14
3	Processed Foods	cmt omt vol mil pcr sgr pfd b_t	ISIC 15-16 ISIC 01-05
4	Chemicals	p_c crp	ISIC 24-25
5	Electrical Machinery	ele	ISIC 30-32
6	Motor Vehicles	mvh	ISIC 34
7	Other Transport Equipment	otn	ISIC 35 ISIC 01-05
8	Other Machinery	ome	ISIC 29,31,33
9	Metals and Metal Products	i_s nfm fmp	ISIC 27-28
10	Wood and Paper Products	lum ppp p_c	ISIC 20-22
11	Other Manufacturing	tex wap lea nmm omf	ISIC 15-37, all remaining ISIC 01-05
12	Water Transport	wtp	ISIC 61
13	Air Transport	atp	ISIC 62
14	Finance	ofi	ISIC 65,67
15	Insurance	isr	ISIC 66 ISIC 01-05
16	Business Services	obs	ISIC 70-74
17	Communications	cmn	ISIC 64
18	Construction	cns	ISIC 45
19	Personal Services	ros	ISIC 91-93
20	Other Services	ely gdt wtr osg trd otp dwe	ISIC 40,41,50-52,63,75,80,85,90

Source: CEPR 2013, pp.103-104

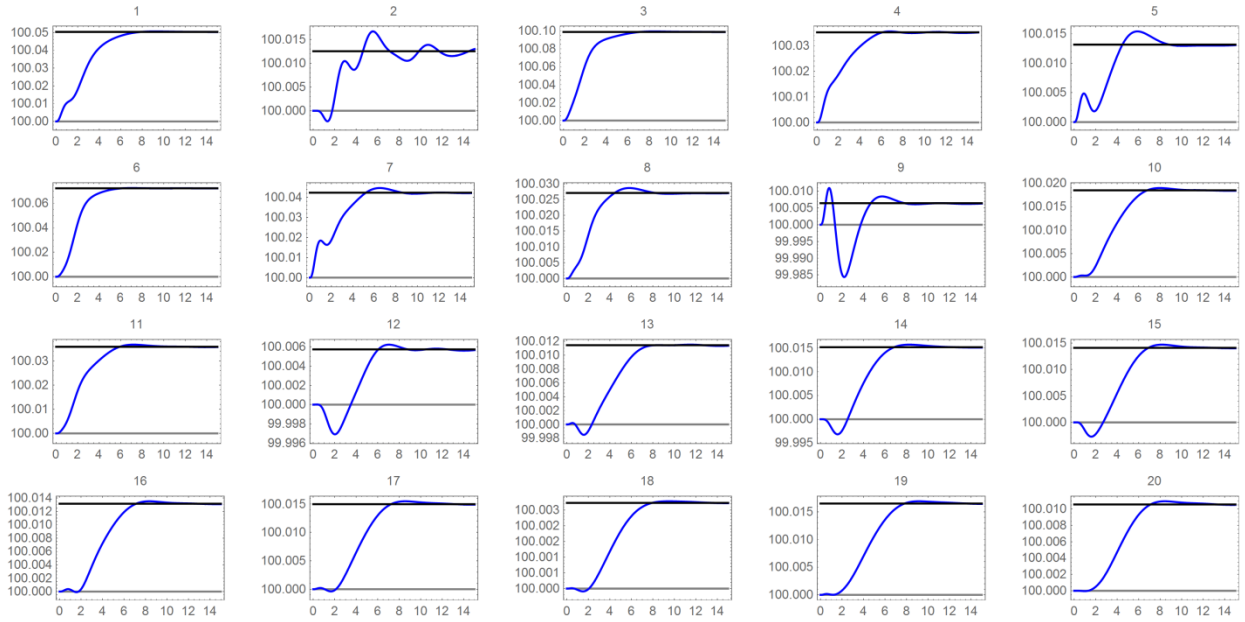
Table B: Parameters and Trade Costs ÖFSE Global Trade Model

	Import Price Elasticities	**EU on Imports from Canada** *Tariffs*	*AVEs of NTMs (in %)*	**Canada on Imports from the EU** *Tariffs*	*AVEs of NTMs (in %)*
Agricult. Forestry Fisheries	1.20	3.0%	18.9	1.8%	24.4
Other Primary Sectors	2.83	0.0%	0.0	0.0%	0.0
Processed Foods	1.26	13.0%	56.8	20.5%	73.3
Chemicals	1.49	2.0%	13.6	0.9%	19.1
Electrical Machinery	2.20	1.1%	12.8	0.2%	14.7
Motor Vehicles	1.40	6.8%	25.5	5.4%	26.8
Other Transport Equip.	2.15	1.3%	18.8	0.0%	19.1
Other Machinery	2.03	1.6%	15.7	0.4%	17.4
Metals and Metal Prod.	1.86	0.7%	11.9	0.5%	17.0
Wood and Paper Products	1.58	0.2%	11.3	1.6%	7.7
Other Manufacturing	1.62	2.8%	15.7	6.5%	17.4
Water Transport	1.40	0.0%	2.0	0.0%	2.0
Air Transport	0.95	0.0%	8.0	0.0%	8.0
Finance	0.95	0.0%	11.3	0.0%	31.7
Insurance	0.95	0.0%	10.8	0.0%	19.1
Business Services	0.95	0.0%	14.9	0.0%	3.9
Communications	0.95	0.0%	11.7	0.0%	1.7
Construction	0.95	0.0%	4.6	0.0%	2.5
Personal Services	0.95	0.0%	4.4	0.0%	2.5
Other Services	1.10	0.0%	4.4	0.0%	2.5

Sources: Hertel et al. (2012, S. 9, Table 14.2) (Elasticities); GTAP 9 (Tariffs); CEPR (2013, S. 20; Table 2) (NTM AVEs)

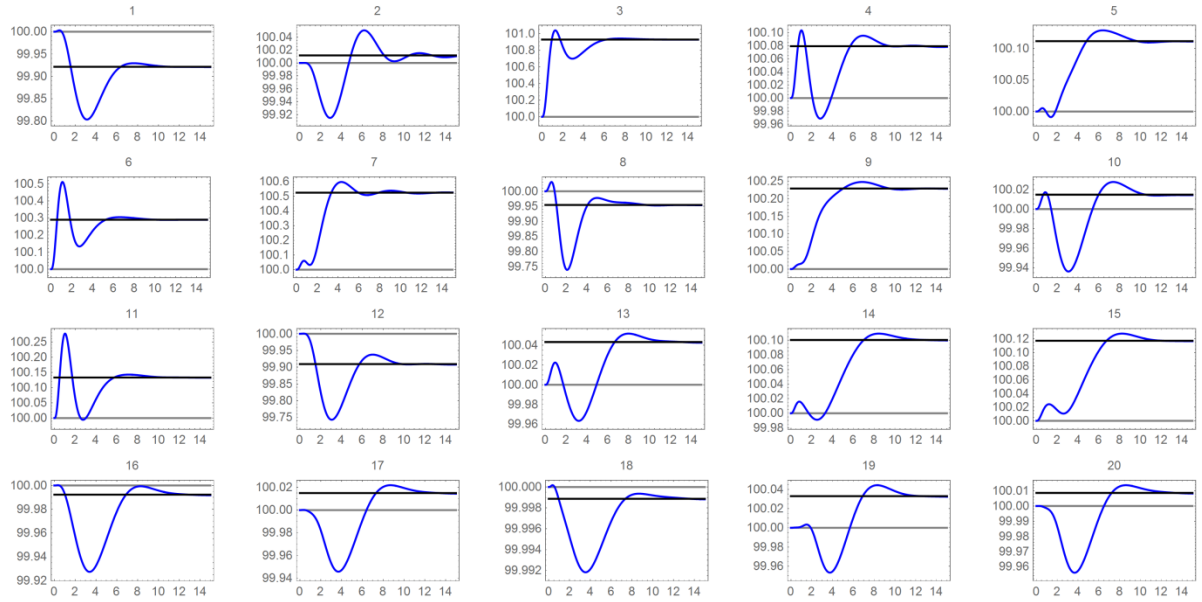
FIGURES

Figure A: EU's sectoral employment dynamics, long run scenario



Horizontal black line: static solution, blue: dynamic trajectory; Base year employment = 100.

Figure B: Canada's sectoral employment dynamics, long run scenario.



Horizontal black line: static solution, blue: dynamic trajectory; Base year employment = 100.

ABOUT THE AUTHORS

Werner Raza is Director at ÖFSE – Austrian Foundation for Development Research in Vienna. He holds ad PhD in Economics from the University of Economics and Business in Vienna. His areas of work include International Trade and Development Economics.

Bernhard Tröster is researcher at ÖFSE. He holds a diploma in Economics from the University of Regensburg and a M.A. in International and Development Economics from HTW Berlin. His areas of works are Development Economics, International Trade and Commodity Markets.

Rudi von Arnim is Assistant Professor at the Department of Economics, University of Utah, USA. He holds a PhD in Economics from The New School for Social Research. His areas of specialization are Macroeconomics and International Economics.

ISBN: 978-3-7063-0620-1

wien.arbeiterkammer.at