Ways of alignment of NTMs between the EU and US

In what ways can alignment of differences in regulatory systems – non-tariff measures – between the EU and US be achieved, when is what way more optimal than its alternatives, and what are the pros and cons of each way?

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Preface and acknowledgements

Looking back at four years of student life, I can honestly say it was the most enervating period in my life. Rotterdam became my new haven, I met new people from all over the world and two trips outside Europe made me realize how relative my own point of view and culture actually are.

In the second year of my bachelor Economics and Business Economics my interest has been drawn to international economics and political decision-making. First of all, as our small country is highly depended on the international economics. I realize a good understanding of international economics and its impact on the Dutch economics is essential in order to become valuable as an economist in the Netherlands. Secondly, because political decision-making has its influence on people, and the well-being of people is very important to me. A good economist should know it is not all about economics.

In writing this thesis I have had the assistance and cooperation of several persons. I would like to offer my grateful thanks to all of them.
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Abstract

Non-tariff measures constitute the main trade barriers between the EU and the US. The last two decades the EU and US negotiated about these non-tariff measures and in some areas have come closer to each other; in other areas they – however – saw divergence in regulatory systems. Since the Transatlantic Trade and Investment Partnership (TTIP) the negotiations have accelerated. However, still a lot of work has to be done. This thesis describes the current situation between the EU and US concerning NTMs, focusing on the developments in the last two decades, the institutional setting and the current NTMs. In addition, this thesis elaborates on the different ways of alignment and their different economic impacts. This leads us to indicate which way of alignment to choose in which situation. We look at five ways of alignment: mutual recognition, harmonization, equivalence, giving the problem to the private sector and elimination of all NTMs. The economic impact has been determined by making use of the Global Simulation Model (GSIM). The political, technical and social impact of the different ways of alignment has been determined by literature research. We find that all ways of alignment have positive economic effects for the EU and US economies. The higher the cost savings, the higher the positive economic effect on welfare. The country that encounters the highest cost savings will have the highest export, and therefore the highest output, producer price and thus producer surplus. In the country with which this party chose to align, the highest competition on the market exists as import has increased. Due to this competition, consumer prices decrease here and output as well. Consequently there is a high consumer surplus but a low producer surplus; the net welfare effect is still positive though.

When we look at the different effects depending on the way of alignment, we find that it is difficult to recommend a certain way of alignment, as the optimal way of alignment depends on the circumstances. However, upward harmonization can be very practical when a party wants to guarantee its own standard level. MRA is recommended when the economic effect is very important, when there is trust between the parties and when the standards of the parties are quite similar. However, social aspects need to be taken into account as well when determining which way of alignment to choose.

Key words: non-tariff measures, alignment, mutual recognition, harmonization, GSIM

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Abbreviations and acronyms

AB	Appellate Body
AEO	Authorised Economic Operator
ANS	American National Standards
ANSI	American National Standards Institute
APR	Annual percentage rate
ATSC	Advanced Television Systems Committee
AVE	Ad Valorem tariff Equivalents
BRC	Brasil, Russia and China
CAB	Conformity Assessment Body
CAFÉ	Corporate Average Fuel Économy
CCMC	CEN-CENELEC Management Centre
CE	Conformité Européenne
CEN	European Committee for Standardization
CENELEC	European Committee for Electrotechnical Standardization
C-TPAT	Customs-Trade Partnership Against Terrorism
DG	Directorate-General
DVB-T	Digital Video Broadcasting Terrestrial
EC	European Commission
EFTA	European Free Trade Association
EMA	European Medicines Agency
ESO	European Standards Organization
ETSI	European Telecommunication Standards Institute
EU	European Union
FCC	Federal Communication Commission
FDA	Food and Drug Administration
FMRD	Financial Markets Regulatory Dialogue

FMVSS	Federal Motor Vehicle Safety Standards
FTA	Free Trade Agreement
GDP	Gross Domestic Product
GHS	Globally Harmonised System
GI	Geographical Indication
GMO	Genetically Modified Organism
GSIM	Global Simulation Model
HLWG	High-Level Working Group on Jobs and Growth
ICT	Information and Communication Technology
IEC	International Electrotechnical Commission
IFRS	International Financial Reporting Standards
ISO	International Organization for Standardization
ITU	International Telecommunication Union
JPG	Joint Presidents' Group
MSB	Market Strategy Board
NC	National Electrotechnical Committee
NIST	National Institute of Standards and Technology
NSA	National Security Agency
NSB	National Standardization Body
NTM	Non-tariff measure
PCAOB	Public Company Accounting Oversight Board
PE	Partial Equilibrium
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
ROW	Rest of the World
SDO	Standards Developing Organization
SEC	Securities and Exchange Commission
SMB	Standardization Management Board

SME	Small- and medium-sized enterprise
SOX	Sarbanes-Oxley Act
SPS	Sanitary and Phytosanitary Measures
STF	Special Task Force
TABD	Transatlantic Business Dialogue
TACD	Transatlantic Consumer Dialogue
TAED	Transatlantic Environmental Dialogue
TALD	Transatlantic Labour Dialogue
TB	Technical Body
TEC	Transatlantic Economic Council
TEU	Twenty feet Equivalent Unit
TIP	Technology Innovation Program
TRI	Trade-related Aspects of Intellectual Property
TSB	Telecommunication Standardization Bureau
TSCA	Toxic Substances Control Act
TTIP	Transatlantic Trade and Investment Partnership
ENECE	United Nations Economic Commission for Europe
UL	Underwriter's Laboratories
US	United States
US GAAP	United States Generally Accepted Accounting Principles
USNC	United States National Committee
WTO	World Trade Organization

Chapter 1: Introduction

Barack Obama in his State of the Union speech (2013) said the following:

> *To boost American exports, support American jobs, and level the playing field in the growing markets of Asia, we intend to complete negotiations on a Trans-Pacific Partnership. And tonight, I'm announcing that we will launch talks on a comprehensive Transatlantic Trade and Investment Partnership with the European Union, because trade that is fair and free across the Atlantic supports millions of good-paying American jobs.*

On February 12th 2013 in his State of the Union speech, US President Barack Obama announced the launch of talks on a comprehensive Transatlantic Trade and Investment Partnership with the European Union (Obama, 2013). One of the particulars is the alignment of non-tariff measures (NTMs) between the EU and US – also often called 'regulatory cooperation'. As this task is quite a complicated one, it has already been a point of discussion for several years. Non-tariff measures (NTM) are "non-price and non-quantity restrictions on trade in goods, services and capital" (Berden, Francois, Thelle, Wymenga, & Tamminen, 2009). An NTM ranges from tangible import obstructions directly at the border to measures that have a less direct link to trade like non-conformity to international product standards. NTMs, however, also relate to minimum levels of food and safety standards countries agree to adhere to. This thesis does not judge whether NTMs are there for a valid reason or not. This thesis focuses on the economic effects of NTMs and how the different ways of alignment impact on the economic effects. Different procedures exist to bring us to negotiations concerning NTMs (Baker, 2013).

The regulatory dialogue between the EU and US has – over time – led to an increased degree of coherence between the EU and US standards and regulatory systems (European Commission, 2014). In our certification infrastructure development systems for greater mutual recognition of product certification have been developed, i.e. the reduction of duplicate certification requirements and the testing of certification bodies. Specific regulations converge standards and/or recognition of equivalence for specific products.

1.1 | Relevance

The Economist of May 25th 2013 encourages the EU to pursue a free trade agreement with their biggest trading partner the United States, as the Eurozone needs growth-boosting reforms and

initiatives after the euro crisis of 2008 (The Economist, 2013). Europe's leaders must shake themselves out of their lethargy and if they do not, the euro zone faces stagnation or break up – possibly both. The positive economic impact of regulatory coherence is the primary mainspring of this paper.

Besides, alignment of NTMs is momentous as it will have a positive impact on political issues like youth employment – one of the regrettable consequences of the economic crisis. As alignment of NTMs will boost the economy, youth employment will increase. Alignment of NTMs must take place erelong as it will alleviate the burdens of the economic crisis.

Depending on the way of alignment, alignment can also bring consumer protection which will increase consumer confidence. This is the third point that endorses the relevance of this research.

1.2 | Research question

In order to clarify the situation regarding NTMs between the EU and US and to find the optimal way of alignment this thesis has been written aiming to answer the following question:

In what ways can alignment of differences in regulatory systems – non-tariff measures – between the EU and US be achieved, when is what way more optimal than its alternatives in terms of expected economic impact, and what are the pros and cons of each way?

The basis of the research is a rather pragmatic framework, consisting of three fundamental questions containing (1) the current situation, (2) the different ways of alignment and (3) finding the most optimal way for alignment in specific situations.

1.3 | Structure

Chapter two - *The development of NTMs and the institutional setting in the EU and US* - will answer the first fundamental question. This chapter will serve to place the findings in the proper context and to provide the information that will be needed to understand this research. We will look at the current situation between the EU and US regarding non-tariff measures by focusing on which NTMs are used nowadays, which are the sensitive ones and how have NTMs developed and disappeared over the last two decades. We also look at the institutional setting within which cooperation between the EU and US in terms of NTMs takes place.

The answer for the second fundamental question will be found in chapter 3 - *The different ways of alignment of NTMs -,* which is subsequently needed to research - and thereby answering - the third

fundamental question. Ways of alignment which will be discussed are mutual recognition agreements, harmonization, equivalence, elimination of standards and giving the problem to the private sector. For each of these ways of alignment the method will be defined, the manner of implementation will be explained, as well as the requirements regarding involvement and the appropriate opportunities and risks. Especially the legal perspective of these different ways are relevant.

Chapter four charts the economic impact of the different ways of alignment as they have to be taken into account by answering the fifth question. In chapter four - *The economic impact of the various ways of alignment* – I will derive a framework from other theses, which will be used to compare the economic impact of the different ways of alignment for specific sectors. This framework will be elaborated in a GSIM.

In chapter five the third fundamental question will be answered. We will focus on the best way of alignment regarding the scenario of maximizing GDP, optimizing consumer protection, creating the easiest way of implementation and the politically most feasible way of alignment.

Based on this research, practical instructions for both the EU and US institutions regarding alignment of NTMs will be given in the chapter *Recommendations*. These instructions will contain the optimal way of alignment in certain circumstances and these instructions will be supported by findings from this research.

In chapter seven the practical instructions from the recommendations will be translated to an answer to the main research question.

1.4 | Added value

As tariff rates have declined in the post World War II era, NTMs have become a more and more popular point on the agenda of policy makers, as did alignment of these NTMs. This explains the increase in documentation and research on this subject. However, one clear overview of the various ways of alignment and its effects has not been made yet. Therefore, the added value of this research is the unique overview of five different ways of alignment and the elaboration of each of these ways which gives us better insights in the alignment process. The relevance but also the simplicity of this research distinguishes this research from previous ones.

Chapter 2: The development of NTMs and the institutional setting in the EU and US

Non-tariff measures (NTMs) are all measures imposed on trade flows that are not tariff measures (SICE, 2014). Some of these measures may constitute non-tariff barriers (NTBs). NTBs are NTMs that have a protectionist impact. In this chapter we discuss the developments of NTMs in the last two decades, the institutional setting concerning NTMs on EU, US and international level and the current NTMs between the EU and US.

2.1 | Developments in the last two decades

In 1995 the New Transatlantic Agenda has been established, in order to make the EU and the US collaborate to achieve the expansion of world trade and further closer economic EU-US relations (European Commission, 1995). The NTA contained an action plan and established four dialogues: the Transatlantic Environmental Dialogues (TAED), the Transatlantic Business Dialogue (TABD), the Transatlantic Consumer Dialogue (TACD) and the Transatlantic Labour Dialogue (TALD).

Following from New Transatlantic Agenda, the US-EC Mutual Recognition Agreement was signed in 1997 in order to reduce duplicative regulatory compliance costs and emphasize access to the EU single market for US firms (Market Access and Compliance, 1997). The framework agreement was negotiated by the Office of US Trade Representative (USTR) and the European Commission's DG Trade while each of the six sectoral annexes were negotiated by the appropriate regulatory agencies responsible for the sector. These six sectors are the sectors of telecommunications equipment, electromagnetic compatibility, electrical safety, recreational craft, medical devices and pharmaceutical good manufacturing practices. While the agreement was negotiated between government officials, the Transatlantic Business Dialogue, representing large business interests in the US and the EU fostered the concept of mutual recognition agreements and pressured officials to move forward with the MRA processes.
In addition, in 1998 the Transatlantic Economic Partnership was established to foster bilateral trade relations.

In 1999 a Joint Statement on Early Warning and Problem Prevention Mechanisms was accepted (European Commission, 1999). The purpose of this Joint Statement was to identify regulations that could turn out into non-tariff measures at an early stage.

In 2001, the negotiations for a new multilateral trade agreement started (WTO, 2014). The aim of this agreement was to abolish trade barriers in the agricultural sectors mainly. These negotiations are called 'Doha-negotiations' and were held within the framework of the World Trade Organization. They should have been completed in 2006, but the economic powers failed to agree on the further opening of their agricultural and industrial markets and negotiations dragged on. The latest on the multilateral trade negotiations at this moment in time is that the draft deal that was negotiated has not been agreed upon because of a last-minute and ill-informed “no” from India.

In 2002, the EU and US reached agreements on Guidelines for Regulatory Cooperation and Transparency to encourage the EU and US agencies to deliberate with each other on a voluntary basis (European Commission, 2002). This was made more concrete with a Roadmap for EU-US Regulatory Cooperation and Transparency in 2004.

In 2005, the European Committee proclaimed regulatory cooperation between the US and EU a prime objective of transatlantic co-operation. In that same year the High-Level Regulatory Cooperation Forum (HLRCF) was established in order to develop a collective regulatory work plan. Political leaders – on top of this – agreed to go further in the fields of investment, public procurement, services and improvements in mutual recognition of professional qualifications. Furthermore a set of ‘best practices’ was prepared to guide regulators and complement EU rules and regulations.

2007 brought the Transatlantic Economic Framework and the Transatlantic Economic Council (TEC) which were designed to help to further strengthen the economic integration of the EU and US. The TEC aimed at reducing regulatory burdens and improve economic integration by bringing together governments, the business community and consumers to work on areas where regulatory convergence could bring profits for both sides of the Atlantic. The TEC priorities were recognized in the Framework for Advancing Transatlantic Economic Integration (European Union - External Action, 2014). Three advisory groups helped guide the work of the TEC (European Commission, 2014).

At the EU-US Summit meeting in 2011, the political leaders pointed at the TEC to establish a High-Level Working Group (HLWG) on Jobs and Growth, led by US Trade Representative Ron Kirk and EU Trade Commissioner Karel de Gucht (European Commission, 2014). “The Working Group was tasked to identify policies and measures to increase EU-US trade and investment to support mutually beneficial creation of employment, economic growth and international competitiveness – in a time when both the EU and US economies were in crisis” (European Commission, 2013). An interim report of the preliminary findings was published in June 2012 and the final report in February 2013. The

main conclusion was that a comprehensive agreement covering all sectors would be overwhelmingly positive, leading to more trade and a boost for economic growth and job creation for both sides of the Atlantic. Therefore the HLWG recommended launching negotiations (European Commission, 2014). This decision also stemmed from the continuing economic crisis and the stalling of the multilateral trade negotiations in the World Trade Organization – the so-called Doha Development Agenda (see above). The political leaders supported the HLWG conclusions and announced further negotiations (European Commission, 2014) (Obama, 2013).

Transatlantic Trade and Investment Partnership (TTIP)

The announcement for further negotiations debouched into the negotiations for the Transatlantic Trade and Investment Partnership (TTIP), which is a proposed free trade agreement (FTA) being discussed between the US and the EU (Akhtar & Jones, 2014). The aim of the TTIP is to abolish tariffs, differences in technical regulations, standards and approval procedures in order to make it easier to buy and sell goods and services between the EU and the US (Akhtar & Jones, 2014) (European Commission, 2014). The parties wish to conclude the negotiations in two years.

In June 2013 the EU Member States formally gave a mandate to the European Commission to negotiate a FTA with the US (EU in the US, 2014). The first round of TTIP negotiations was held the week of July 8, 2013 in Washington DC. This first round focused on the procedure of the negotiations (Bertelsmann Foundation, 2013). Priorities, technical work streams and ideas were exchanged to hopefully forestall discussion that could disrupt an agreement at the start of talks. Moreover, the parties increased transparency by US releasing the names of TTIP lead negotiators and EU releasing initial position papers (Bertelsmann Foundation, 2013). In addition, 24 working groups were established, each of them representing the issues expected to be included in any agreement.

The second round was planned the week of October 7, 2013 in Brussels (European Commission, 2014). However, due to the US shutdown the talks were postponed to November 11-15. During the second round the focus areas were: services, investment, regulatory issues and energy and raw materials (Bertelsmann Foundation, 2013). Negotiations about cross-borders services, telecommunications and e-commerce were productive. Moreover, US changed its initial reluctance to incorporate financial regulation into the TTIP by attending a special session on financial services regulation on November 27. Other discussion points were competition, intellectual property and small- and medium-sized enterprises (SMEs).

The third round took place from 16 to 20 December in Washington DC (European Commission, 2014). During this round negotiating issues from the first two rounds have been developed to more specific work (Bertelsmann Foundation, 2014). The EU and US negotiators made progress on

potential regulatory cooperation in sectors like automobiles, cosmetics, chemicals, information , ICT and medical devices. In the third round negotiations on tariff elimination started, continuing in the fourth round.
During the negotiations the EU lead negotiator Ignacio Garcia Bercero stated the US and EU have different points of view on the financial services sector and that the EU and US have yet to decide if financial-regulatory issues should be included in a final agreement (Bertelsmann Foundation, 2014). The US continued to oppose the inclusion of financial-services regulation.
Sanitary and Phytosanitary (SPS) was another subject of discussion. The EU said that SPS is an important point of discussion and that this subject will be diverged in certain areas, including genetically modified organisms (GMOs).

The fourth round of negotiations took place in Brussels from March 10 to 14, 2014 (Bertelsmann Foundation, 2014). The fifth round was held in Arlington, Virginia from May 19 to 23, 2014. During these rounds negotiations became more specific. Negotiators have begun crafting a final document now that the path towards an agreement became clearer.

In the third round the US and the EU exchanged tariff-elimination offers (Bertelsmann Foundation, 2014). None of the parties accepted these offers, as the counterparty would lack ambition to come to an agreement. The EU found the US proposal to reduce tariffs by 86 percent too low, while the US argued that the EU's 96-percent reduction proposal came with too many conditions (Bertelsmann Foundation, 2014). Both sides are preparing second offers.

For the fifth round the US set up an offer to reduce market access in services. However, the EU was not ready yet for such an offer (Bertelsmann Foundation, 2014). Therefore the EU asked to postpone this issue.

Regulatory cooperation in sectors like medical devices, automobiles and chemicals are in progress. Negotiators set up draft agreements and try to make the negotiation process more transparent (Bertelsmann Foundation, 2014). After the two negotiation rounds different stakeholders meetings are held that included briefings on the progress of the negotiations.

EU negotiators emphasized the need for better protections of geographic indications. However, the US was not enthusiastic (Bertelsmann Foundation, 2014). 177 members of the US House of Representatives signed a letter to US Trade Representatives in which they asked US negotiators to ensure TTIP does not include exceptions for EU products under the pretext of geographical indications.

Following the third round negotiations, US don't want to include financial regulatory cooperation in TTIP (Bertelsmann Foundation, 2014). US believe this cooperation is already managed by current forums like the Financial Stability Board.

From July 14 to 18 the sixth round of TTIP negotiations took place in Brussels (Bertelsmann Foundation, 2014). Negotiations about sectors with mutual recognition move forward. However, negotiations sectors without mutual recognition slow down as parties have not reached compromises yet.

In the sixth round no new tariffs offers were exchanged (Bertelsmann Foundation, 2014). However, the EU and US consider exchanging proposals on sanitary and phytosanitary measures (SPS) before the seventh round. Besides, the offers on market access for services and investment were discussed during the sixth round. The offers did not include provisions for investment protection. Negotiations about these provisions have to wait due to a period of public consultation for the EU.

Negotiators still deliberate about regulatory coherence for the sector of textiles, chemicals, cosmetics, ICT, cars, pharmaceuticals, medical devices, engineering and pesticides (Bertelsmann Foundation, 2014).

The negotiations about small- and medium-sized enterprises (SMEs) come closer and closer (Bertelsmann Foundation, 2014). A text addressing US-EU information sharing and enhancing trans-Atlantic cooperation on these issues is expected in the coming months.

This round ended with no agreement on procurement. The EU strives for greater access to procurement at the US-state level. As of now, US states have not been approached about opening their procurement markets to EU countries.

2.2 | Institutional setting – standard setting agencies

In this paragraph we elaborate the most important standard setting institutions on EU, US and international level. To do so, the way of alignment and the differences between the EU and US systems become clearer.

2.2.1 International standards setting organizations

The International Organization for Standardization (ISO)

ISO is an independent, non-governmental organization made up of members from the national standard bodies of 161 countries (ISO, 2014). Moreover, ISO is the world's largest developer of voluntary international standards (ISO, 2014). ISO's Central Secretariat is located in Geneva,

Switzerland. The foundation of ISO took place in 1947 and since then it has published more than 19,500 international standards covering almost all aspects of technology and business.

The General Assembly of ISO is an annual meeting attended by the members and the Principal Officers (ISO, 2014). The ISO Council takes care of most governance issues. It has a bi-annual meeting and is made up of 20 member bodies, the ISO Officers and the Chairs of Policy Development Committees. The Technical Management Board is in charge of the management of the technical work and the technical committees that lead standard development and any strategic advisory boards created on technical matters.

Three member categories exist: full membership, correspondent membership and subscriber membership (ISO, 2014). Each membership has a different level of access and influence over the ISO system. Full members influence ISO standards development by participating and voting in ISO meetings. Full members sell and adopt ISO International Standards nationally.
Correspondent members observe the development of ISO standards by attending meetings as observers. Correspondent members can sell and adopt ISO International Standards nationally as well.
Subscriber members keep up to date on ISO's work but cannot participate in it. They do not sell or adopt ISO International Standards nationally.

An ISO standard is developed by a group of experts, within a technical committee (ISO, 2014). These experts come from the relevant industry, but from consumer associations, academia, NGOs and government as well. When the need for a standard is clear, these experts meet to discuss and negotiate a draft standard. This draft standard is shared with ISO's members who can comment and vote on it. When consensus has been reached, the draft becomes an ISO standard.

International Electrotechnical Commission (IEC)

The IEC is an independent non-profit and non-governmental global organization founded in 1906. IEC develops and publishes International Standards for electric and electronic products which form a basis for national standardization. Additionally, IEC manages conformity assessment systems for electrotechnology. 162 countries participate in the IEC, of which 59 countries are full members, 22 countries are associate members and 81 are a developing country (IEC, 2010). Full members participate fully in al IEC activities and technical work and have the right to vote during meetings. These members are from a country with a developed industry, irrespective of their economic situation. Associate members benefit from all aspects of IEC technical work but have a limited participation in IEC activities. Besides they have voting rights in only four technical committees.

These members are from a country where the industry is developed but economic resources are limited.
In order to encourage developing countries to adopt International Standards and participate in IEC work, the IEC launched the IEC Affiliate Country Programme.
The council of the commission exists of Full Member National Committees, a council board and an executive committee. IEC knows for underlying 'boards': the Standardization Management Board (SMB), the Market Strategy Board (MSB) and the Conformity Assessment Board (CAB). The SMB is responsible for the overall management of the technical work. It creates technical committees and subcommittees that carry out the research of the standards. These committees exist of representatives of the Full Member National Committees coming from industry, government bodies, associations and academia.

International Telecommunication Union (ITU)

ITU is the United Nations specialized agency for information and communication technologies, based in Geneva (ITU, 2014). ITU develops the technical standards that ensure networks and technologies perfectly bundle and strains to improve access to ICTS to underserved communities worldwide.
ITU has both public and private sector membership: it counts 193 Member States, and ITU membership includes ICT regulators, leading academic institutions and some 700 private companies.

The Study Groups of ITU's Telecommunication Standardization Sector (ITU-T) exist of experts from the whole world to develop international standards, known as ITU-T Recommendations. The Telecommunication Standardization Bureau (TSB) provides secretariat support to ITU-T Study Groups through sophisticated electronic working methods and modern facilities in Geneva. This Bureau is responsible for providing cohesion to ITU-T's standards development process.

2.2.2 US Standards Organizations

The American National Standards Institute (ANSI)

The ANSI is a private, non-profit membership organization which has been founded in 1918. The purpose of the organization is to enhance global competitiveness of US business and the quality of American life by promoting and facilitating voluntary consensus standards and conformity assessment systems and fostering their integrity. ANSI it the only US representative full member of the two major international standards organization, the ISO and, via the US National Committee (USNC), the IEC. ANSI represents the interests of its nearly 1,000 members, existing of companies, organizations, government agencies, institutional and international members.

ANSI takes care of the development of American National Standards (ANS) by accrediting the procedures of standards developing organizations (SDOs) (ASSE International, 2008). These organizations work together in order to develop voluntary national consensus standards. Accreditation by ANSI means that the procedures for setting up standards meet ANSI's essential requirements for openness, balance, consensus and due process. The US standards system is decentralized and sector-based (Standards Portal, 2013). In each sector there is at least one standards developing organization responsible for the development of the sector specific standards. This decentralized, sector-based and market-driven standards system is extremely responsive to changing market demands. A disadvantage of this system is the entanglement of different organizations.

In the United States 90% of the standards are produced by the 20 largest SDOs. The other 10% has been set up by hundreds of other standards development bodies. The level of US participation is enormous as the groups themselves are set up of individual committees existing of experts. The maintenance of the ANSI accreditation has been achieved by consistently adhering to the 'ANSI Essential Requirements'. These requirements have been globally accepted and implemented by ISO, IEC and ITU.

2.2.3 European Standards Organizations (ESOs)

Three European Standardization Organizations are designated by the European Union: the European Commitee for Standardization (CEN), the European Committee for Electrotechnical Standardization (CENELEC) and the European Telecommunication Standards Institute (ETSI). These organizations collaborate on policy and technical matters of common interest, coordinated by the Joint Presidents' Group (JPG) (CEN CENELEC, 2014). JPG includes the Presidents and Vice-Presidents of CEN and CENELEC and their ETSI equivalents, together with the Director General of CEN and CENELEC and the Director General of ETSI. JPG monitors if there is a common approach to technical issues of interest to all three bodies. The EU has a top-down approach which means that institutions set the standards, instead of private firms (as is customary in the United States).

European Committee for Standardization (CEN)

CEN is a committee that assembles the National Standardization Bodies of 33 European countries and is situated in Brussels, Belgium (ANSI, 2014). The purpose of CEN is to develop European Standards and other technical documents in areas other than the electrotechnical and telecommunications fields (CEN, 2014). Each EU and EFTA member state has appointed a National Standardization Body. CEN actively supports international standardization and cooperates closely

with ISO and IEC, aiming to set one standard in the world (CEN CENELEC, 2014). CEN is the regional mirror organization to the ISO and the EU peer body to ANSI.

Next to CENELEC and ETSI, CEN is officially recognized by the European Union and by the European Free Trade Association (EFTA) as being responsible for developing and defining voluntary standards at European level. Members of CEN have been working together on European Standards since 1961. These Standards are based on a consensus, which mirrors the economic and social interest of the CEN Member countries. Most standards are initiated by industry. Other principles for developing European Standards are openness, transparency, national commitment and technical coherence. Nowadays CEN has 33 Members and 17 Affiliates collaborating to build a European Internal Market for goods and services (CEN, 2014). More than 50,000 technical experts work for CEN.

European Committee for Electrotechnical Standardization (CENELEC)

CENELEC is a committee that assembles the National Standardizaton Bodies of 33 European countries and is situated in Brussels. Officially CENELEC is responsible for standardization in the electrotechnical field (CENELEC, 2014). Designated as a European Standards Organization by the European Commission, CENELEC is a non-profit technical organization set up under Belgian law in 1973. CENELEC forms the European regional mirror organization to the IEC (ANSI, 2014). CENELEC ensures that the majority of its standards are identical to the standards developed by the IEC.

CENELEC's standards are based on a consensus, reflecting the economic and social interests of its 33 Member countries channeled through their National Electrotecnical Committees (NCs). More than 300 Technical Bodies work on the elaboration of normative documents like European Standards. A Technical Body can be a Technical Committee, Subcommittee or Task Force, all consisting of national delegations (CENELEC, 2014). The experts in these technical bodies come from all over Europe.

Besides, 13 National Committees from the Balkans, Eastern Europe, Northern Africa and the Middle-East participate in the work of CENELEC as Affiliates (CENELEC, 2014). The General Assembly is the supreme governing body of CENELEC and meets once a year (CENELEC, 2014). The General Assembly has the full power of decision with CENELEC and decides the policy. It is composed of the delegations from the National Electrotechnical Committees of each of the member countries.

Cooperation between CEN and CENELEC

Though their fields of competence are divergent, CEN and CENELEC cooperate in a number of areas of common interest (CEN/CENELEC, 2014). In 2010 the close cooperation between CEN and CENELEC has been consolidated in a common CEN-CENELEC Management Centre (CCMC) in Brussels (CEN/CENELEC, 2014). This CCMS forms a platform for the development of European standards across a wide range of sectors. For example, CEN and CENELEC both work in the field of innovative technologies like nanotechnologies, smart grids, ICT, medical equipment, railways, ecodesign and electric vehicles (CEN/CENELEC, 2014).

CCMS receives its tasks from the General Assemblies, Administrative Boards and the Technical Boards of both CEN and CENELEC (CEN/CENELEC, 2014). These tasks are carried out by 80 employees.

After a mandate of the Administrative Board of both organizations, the CEN and CENELEC instituted the CEN-CENELEC Presidential Committee in order to facilitate cooperation on strategic matters of common interests (CEN/CENELEC, 2014). The aim of this committee is managing non-sector specific policies and joint actions in relation to matters of common interest. The committee is composed of the two Presidents of CEN and CENELEC (CEN/CENELEC, 2014).

European Telecommunications Standards Institute (ETSI)

ETSI produces standards for Information and Communications Technologies which are applicable worldwide on the basis of consensus. The institute is a non-profit organization with more than 700 ETSI member organizations drawn from 62 countries across 5 continents (ETSI, 2014). The European Union has officially recognized ETSI as a European Standards Organization. ETSI is the regional mirror organization to the ITU.

The work on standards is carried out in Technical Bodies (TBs), which meet two to six times a year (ETSI, 2014). The TBs exist of three categories: Technical Committees, ETSI Projects and ETSI Partnership Projects (ETSI, 2014). A Technical Committee is a semi-permanent committee organized around a number of standardization activities addressing a specific technology area. Their results are often used by other Technical Committees. An ETSI Project seems a lot like a Technical Committee but is established on the basis of a market sector requirement rather than on a basic technology. An ETSI Partnership Project is a project which will be set up with another organization when the standardization cannot take place within an ETSI Project or Technical Committee.

For urgent cases which need more meetings, ETSI convenes a Specialist Task Force (STF). STFs are small groups of technical experts usually nominated from ETSI members, to collaborate a few months to accelerate the drafting work. The ETSI Directives is a set of documents that define the legal status, purpose, scope, and functional aspects of the Institute. In that manner it governs the work of ETSI. The General Assembly, together with the ETSI Board, is responsible for the ETSI Directives.

2.2.4 Collaboration and differences

The Transatlantic Business Dialogue (TABD) – in 2013 renamed Transatlantic Business Council (TBC) in a merger with the European American Business Council (EABC) – aims to reduce the non-tariff trade barriers between the US and the EU. Without having signed any formal agreement, CEN, CENELEC, ETSI and ANSI meet every 12 to 18 months (CEN CENELEC, 2014). In these meetings the parties discuss and negotiate about their standardization processes. This collaboration becomes more and more important due to the start of the negotiations for the Transatlantic Trade and Investment Partnership.

In principle, both the American and European standards organizations foster free trade between the EU and the US (CEN CENELEC, 2013). Nonetheless, good standards for the safety and health of their citizens often prevail and differences exist between their standards in certain sectors. Part of the regulatory differences is driven by geography, language, preferences, culture or history (Berden, Francois, Thelle, Wymenga, & Tamminen, 2009). For example, according to Daverveldt US are known for its risk-seeking culture and a minimum of government interference while the EU is known for more risk-averse behavior (Daverveldt, 2013).

This is reflected in the way standards are set up and maintained. US prefer to regulate on the basis of concrete evidence revealing identifiable risks and a clear balance of benefits over costs. The EU is more willing to regulate on a precautionary basis (Ernst-Ulrich & Pollack, 2003). The US risk-seeking culture also explains the differences in social safety nets between these countries and why Americans are more willing to invest in risky assets (Wall Street Journal, 2007).
We can also see these differences in the way standards activities are organized (Delaney, 2000). In Europe, a few centralized national and regional bodies focus on developing standards, i.e. a top-down approach (Warshaw & Saunders, 1995). The development of standards is organized by region and is subject to significant government influence. It contains a closed system that is integrated at

both national and regional levels. Only authorized representatives of European national standards bodies can participate in formal standards development activities. In Europe membership of such a body requires the member to be European or have a business interest or manufacturing presence in Europe and to be a member in a national standards body. The European Commission contracted CEN, CENELEC and ETSI to develop standards in support of EC legislation. European standards must be transposed into national standards, with the aim to receive an EC qualification. Consequently the standardization model of the EU is called integrated, formalistic and policy-driven (Deshpande & Nazemetz, 1998). Nevertheless, a disadvantage of this system is that regulations may differ per EU member state as EU member states may forsake to transpose the European standards directive into national standards. In principle, member states are required to transpose the standards as directives are not self-enforcing (Hanson, 2005). However, in practice it turns out member states may be negligent or do not have the time or means to incorporate European standards into the national system. Partially, the delays in transposition reflect national differences in culture and governing legal regimes (Hanson, 2005). For example in the UK directives are enforceable as soon as they come into effect, while in Germany new European standards have to be transposed into national law through the enactment of new legislation.

In the United States a decentralized structure has given room to hundreds of private standards development bodies (Warshaw & Saunders, 1995). The development of standards is organized by sector. There are standards developers representing professional societies and those representing trade associations. Membership of a standards body is unrestricted. Depending on the sector and global interest in the subject, therefore, membership on a U.S. technical committee can be international in scope. The major private sector standardization organizations all have a different points of view or objectives (Ernst-Ulrich & Pollack, 2003). Sometimes this makes it complicated to reach a common position and makes it difficult for the government to play a role. Due to the fact that the product requirements are not always consistent across the standards agencies, companies without offices in the US can face problems (BDI, 2013). The US prefers standards that have proven their value in the marketplace and sees no problem in conflicting standards until market approval is established (Ernst-Ulrich & Pollack, 2003). Therefore the US standardization system is often called fragmented, market-driven and pluralistic. The result is that the US have a lot more (different) standards than the EU.

2.3 | Current NTMs and their characteristics

In this section, we will describe a selection of the most important non-tariff measures between the EU and the US. In this way our research is less abstract and we know which problems play a role in which sector and which sectors deserve the highest priority during the alignment negotiations. Besides, we will present the most sensible negotiating issues, the ones we have to handle with extra care as negotiators have divergent point of views.

2.3.1 NTMs in the last five years

NTMs differ for each sector and are subject to change continuously. In the below sections, we explain sector-specific NTMs in more detail, with a special focus on the 'three Dutch top sectors'. These top sectors contain the Agro-food / Horticulture sector, the sector of high-tech systems and materials and the chemicals sector (Plaisier, Mulder, Vermeulen, & Berden, 2012).

The aerospace sector

NTMs in the aerospace market are relatively high due to their strategic and twofold use; military and civil (European Commission, 2010). Most NTMs are found in the areas of public procurement, government support for R&D and safety and functional standards. The aerospace sector is characterized by strong government involvement in both the EU and the US, a reduction of public activity cannot be expected.

Identified NTMs between the EU and the US are for example the financial and research support from the US to Boeing and from the EU to Airbus. Moreover, both parties maintain restrictions on foreign launch services. US support programmes of the government grant very limited access to foreign companies. Besides, the International Traffic in Arms Regulations (ITAR) state that US defense-related information and material can only be shared with non-US organizations if authorization is given by the Department of State through a Technology Assistance Agreement or an Export License (European Commission, 2010).

The Buy American Act dictates US public organization to buy American products. This is another NTM between the EU and the US as European companies cannot sell their products to US public organizations (Win Government Contracts, 2014). Moreover product and on-board equipment standards differ between the EU and the US which gives costly procedures to exporters.

Automotives

There are various discriminating elements in the automobile market between the EU and US. The Ecorys NTM study (Berden, Francois, Thelle, Wymenga, & Tamminen, 2009) estimates these NTMs

to be of medium level importance. The restrictions include the area of product testing and safety and the area of safety and environmental hazards (Win Government Contracts, 2014).

First of all, the main reason for NTMs in the automotive sector is that standards are set in a different way. The EU (partially) applies the international UNECE system of standards. In total the EU has more than 50 different standards, monitored by the EU and member state governments. In the US, the Federal Motor Vehicle Safety Standards (FMVSS) applies, containing 42 different standards to which products sold in the US need to conform. These federal safety standards are minimum safety requirements for motor vehicles and motor vehicle equipment (FMVSS, 2014). These different approaches give rise to many costly measures that hamper trade between EU and US firms.

CAFÉ, the Corporate Average Fuel Economy, is a civil penalty payment for automobiles that affects entry to the US market. A manufacturer or importer whose range of models has a sales-weighted average fuel efficiency below a certain level has to pay this CAFÉ payment. This payment is beneficial to producers of small cars but form a barrier to producers of premium cars.

Gas Guzzler Tax is another NTM affecting EU car exports to the US (EPA, 2014). Car producers that sell cars that do not meet certain minimum economy levels have to pay this tax containing several elements that discriminate against some EU car manufacturers.

In 1992 the American Automobile Labelling Act was approved (Kavalauskas & Kahane, 2001). Since then automobiles have to be labeled with the proportion of US and Canadian-made parts and the location of the final point of assembly. Therewithal there is an obligation to indicate the origin of engines that could discourage US manufacturers from importing parts from the EU.

The cetane rating of diesel is lower in the US than in the EU, which forces EU exporters to tune their US-bound diesel engines to the lower fuel standards. This is costly.

Cross-cutting NTMs can be found in government programs for public support like Technology Innovation Support (TIP) and in the double certification procedures due to protection from terrorism. Besides, trends in environmental regulation give NTMs.

Chemicals

Trade in chemicals between the EU and the US is hampered by differences in legislative systems. The EU and the US know different testing requirements and different licensing requirements (Berden, Francois, Thelle, Wymenga, & Tamminen, 2009). Additionally, different classifications and labeling

documentation and notification of new substances have to be provided. The EU already adopted this regulation, in contrast to the US that did not.

For US the most important NTM is the difference between the US regulatory systems (TSCA) and the new EU Regulation on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (European Commission, 2013).

Electronics

While IEC and US work together to abandon NTMs, different US standards still diverge from the internationally agreed IEC rules. Therefore, unhampered trade between the EU and the US is not granted (Berden, Francois, Thelle, Wymenga, & Tamminen, 2009).

Underwriter's Laboratories (UL) is a major independent organization for product certification (UL, 2014). It has complete discretion over standards on electrical safety at federal level. Nevertheless it is unclear to manufacturers who want to export to US to which requirements they have to comply with. This becomes even more complicated as different technical requirements exist for different states.

The EU and the US have different legislation for energy conservation. Moreover, different regulatory systems exist for various technical and safety regulations. One of the causes is that US adopted ATSC technology while the EU adopted the DVB-T standard. These two standards are incompatible.

Another difference between the EU and the US concerns the way the patent systems work. The EU knows a patent system based on the first-to-file principle while the US works with a patent system based on the first-to-invent principle.

Food and beverages

The US have various state and municipal regulations which create extra costs for both the EU and the US. For example the EU claims collective trademarks or certification trademark systems in the US are insufficient to fully protect geographical indications (GIs). "Geographical indications are names of places which are used to call certain products for its particular quality, reputation or other characteristic because they come from that place" (European Commission, 2013). Examples are 'Goudse Kaas' and 'Haagse Hopjes'. Consequently exporters in the EU experience discomfort when exporting products with a GI.

Besides US aims to maintain 100 percent scanning of all US-bound maritime cargo for radiological and nuclear threats in two years. According to the EU this will form a hidden NTM in the future.

The EU does not know a uniform approval process of agricultural biotechnology products and has two important EC directives about the traceability and labeling of biotechnology food and feed (European Commission, 2003). This is an NTM for US exporters.

Moreover, the EU has a maximum limit on SPS for different kind of food while US limits are higher. Also the EU requires 'organic' food, non-hormone treated beef and it sets high standards for vitamins and health food products. According to the US these measures are unnecessary present an NTM.

Office equipment

As noticed before, the EU adopted the DVB-T standard while US adopted ATSC technology (Berden, Francois, Thelle, Wymenga, & Tamminen, 2009). These two standard systems are incompatible with each other. This incompatibility harms the trade in office equipment between the EU and the US.

When exporting to the US, one needs a declaration at the custom authorities stating how the equipment meets appropriate Federal Communication Commission (FCC) technical specifications. For EU exporters this is an NTM.

In the US, the Technology Innovation Program (TIP) was established in 2007. This program supports the development of innovative technologies in a financial way. However, companies in the EU do not have equal access to this programme as they have to show that its participation will favor the economy of the US. An EU company can only become eligible for TIP if it invests a certain amount of money in research, development and manufacturing in the US. In addition, only US-owned companies or companies active in the US whose parent company is based in a country that provides the same rights to US companies can participate in this programme. This measure harms trade between the EU and the US.

On the other hand, the requirement of the EU that electronic devices are unaffected by electromagnetic disturbances from other electronics (i.e. Electromagnetic Susceptibility) and that electronic devices do not send out electromagnetic emissions are an NTM for US exporters. Furthermore, the Low Voltage Electrical Safety Directive, in order to make sure that the use of electronic devices is safe, differs between the EU Member States. This makes trade complicated to US exporters.

All electronic devices imported in the EU have to be provided with a 'CE' mark (Conformité Européenne) (European Commission, 2014). This measure brings with it extra work for US exporters.

Pharmaceuticals

Technical measures in the pharmaceutical sector differ between the EU and the US (Berden, Francois, Thelle, Wymenga, & Tamminen, 2009). In the US, we witness and increase in requirements for consumer and environmental protection of pharmaceuticals. The complexity of these regulatory systems form an important impediment to market access for EU exporters. In addition, differences in scientific research methods and in the methods approved by authorities give extra costs for pharmaceutical companies that want to operate in both markets.

US manufacturers can have protection on the ground of national security. The EU claims this may also be a hidden NTM. In addition, the US has import restrictions for certain drug precursor chemicals that are allowed in the EU.

Before a medicinal product can be sold in the US, the Food and Drug Administration (FDA) must approve it with a verification of the product labeling. This procedure can last for several years and most of the times this takes longer for products from outside the US than for products made in the US.

On the other hand, the EU has a very complicated and diverse approach for pharmaceuticals, that gives different regulations for price, volume and access to medicines for each of the Member States. With the Transparency Directive 89/105 the EU has tried to solve these problems (European Commission, 2013). The European Medicines Agency (EMA) plays an important role in this alignment. During the EU High-level Pharmaceutical Forum compromises were struck about information to patients, relative effectiveness and pricing and reimbursement in order to get a more common regulatory system on medicines (European Commission, 2013). However, still different rules for authorization of pharmaceuticals exist across EU Member States.

In addition, international reference pricing states that producers have to reveal the three lowest prices for their medicine within the EU, and often have to apply the lowest price in an EU country (EUCOPE, 2012). This can lead to very low prices for the EU benchmark which makes it uninviting for US manufacturers to export to the EU.

Financial services

The EU and the US have both been proponents of high international standards for global financial regulation through among others the G20, the Financial Stability Board and the Basel Committee (European Commission, 2014). Therefore the EU and the US have both tried to implement the international standards consistently. However, significant differences have arisen in the process of

implementation. Partly this is a consequence of different market structures in the EU and the US. These differences do not only form barriers to trade, but undermine the global financial stability as well.

NTMs from the EU's point of view

The EU claims there is a lack of convergence in the regulation of financial services across various US states which is considered very burdensome (Berden, Francois, Thelle, Wymenga, & Tamminen, 2009). In addition, the US impose discriminatory taxation on European financial institutions as they apply IFRS instead of US GAAP (PWC, 2013).
In addition, section 319 of the Patriot Act requires US banks to maintain certain records concerning foreign banks for which they provide correspondent accounts. These records must tell the owner of the non-US bank and secondly, the name and address of a US resident who is authorized by the non-US bank to accept service of legal process for records regarding its correspondent account (Tompkins, 2002). Moreover the Tax Code Reporting Requirements have to be satisfied by foreign-owned corporations.

In addition to this, there is a burdensome Sarbanes-Oxley Act and the implementation of the Basle II framework and the Securities and Exchange Commission (SEC) regulation differs per state.

The US Sarbanes-Oxley Act (SOX)

The US Sarbanes-Oxley Act (SOX) was signed into law on 30 July 2002 with the aim to change the way public companies do their business by setting up new rules concerning accounting, auditing, corporate governance of public companies, and by reforming the oversight of the accounting profession through establishment of the Public Company Accounting Oversight Board (PCAOB) (Pollman, 2008). To do so, US Congress hoped to restore investor confidence and to underwrite the integrity of financial information.

SOX contains a comprehensive framework to reform the oversight of public company auditing, to improve quality and transparency in financial reporting, and reinforced the independence of public company auditors. One of the key sections is Section 404, which requires a US public company to report annually on the operational effectiveness of the company's internal controls over financial reporting (Continuity Central, 2005). Moreover, company's auditors should confirm and report over the effectiveness of internal financial controls. Therefore, the legislation will have a profound impact on the governance and behavior of any business with a US listing, including 470 non-US companies.

Compliance with Section 404 means companies now have to report for the operational effectiveness of a lot of processes that have an impact on the accuracy of their annual financial performance and

reporting. The complexity of adapting to SOX is very high. Therefore SOX is difficult, time consuming and expensive for EU companies (Continuity Central, 2005).

The implementation of Basel II

In the 1980s, G-10 countries began to impose minimum capital requirements for riskier types of banking assets (European Parliament, 2011). However, these requirements differed among countries. Therefore bank regulators adopted uniform international capital standards for large, internationally active banks. The Basel Committee on Bank Supervision came to three risk-based capital agreements, known as Basel I, Basel II and Basel III. US implementation of Basel II was much slower than the implementation of Basel I. Therefore US exceeded the implementation date. The US implementation of Basel II is different from the international method of implementation of Basel II. First of all the implementation may differ per state. Additionally, US implementation has a more limited scope (only the largest banks), contains additional prudential safeguards, retains key aspects of the existing regulatory capital framework, and contains certain technical differences (European Parliament, 2011). This impedes the alignment between the EU and the US.

NTMs from US' point of view

On the other hand, the US view fragmentation per EU Member State in regulation of accounting standards and the implementation of the Basle-II framework as burdensome. Often a bank from the US has to deal with local licensing requirements. Besides the EU intellectual property rights are less broad than the US intellectual property rights.

The Financial Markets Regulatory Dialogue

Therefore since 2002, the EU and the US take part in regulatory discussions within the framework of the Financial Markets Regulatory Dialogue (FMRD) (European Commission, 2014). Within the TTIP framework, the EU wants to establish a transparent, accountable and rule-based process which would commit the EU and US to cooperate towards strengthening financial stability. However, US do not agree. They claim they do not see the utility of discussing this item in TTIP framework as the FRMD has worked well (EurActiv, 2014). Another reason they do not agree may be the US are concerned this might affect restrictions in the Dodd-Frank Act (European Parliamentary Research Service, 2014).

2.3.2 Sensitive negotiating issues

Among the NTMs between the US and EU are some sensitive ones which make negotiations troublesome and challenging if they are to be included. Sensitive NTMs are about genetically modified organisms (GMOs), protection of geographical indications (GIs), hormone-treated beef, financial regulations, and subsidized competition in the aerospace sector (Congressional Research

Service, 2008). Moreover, the 'Buy American' initiatives and the recent revelations about the United States eavesdropping PRISM program have harmed the relationship between the EU and the US (Shapiro, 2013). These issues bring difficulties in reaching a solution for NTMs.

Buy American clauses

Currently public organizations in the US have to answer 'Buy American' clauses that oblige organizations to buy American products. The underlying idea of this rule is that American taxpayer dollars should be spent procuring from US companies and workers (Stumo, 2013). In that manner this clause restricts the ability of European companies to sell goods and services to states and cities. Europe wants to get rid of this 'Buy American' clause.

PRISM

PRISM is a program used by the American National Security Agency (NSA) since 2007 in order to obtain information of users of big internet services like Gmail, Facebook, Outlook and others (The Verge, 2013). In this way America can request data on specific people. Via PRISM a lot of EU prominents have been bugged. In June 2013 these practices have been revealed which led to fierce protests and allegations of illegal wiretapping which threw a shadow over the relations between the EU and US. Several EU prominents have expressed their displeasure. They declared that these allegations could put the potential trade deal between the EU and US at risk as the mutual trust is essential between trade partners and the trade agreements require respect of rights.

Genetically modified organisms (GMOs)

The US are the biggest producer of genetically-modified agricultural products, while the EU regulatory regime is conservative in allowing this produce: the EU knows far more stringent regulations for the cultivation and trade of GMOs than the US (García-Legaz & Quinlan, 2013). Since 1992 transgenic food requires no special regulation in US as there is no scientific evidence of being harmful for health or environment.

At the same time, the EU employs the precautionary principle: transgenic food is regulated in a more restrictive manner because it is not scientifically proved that is it *not* dangerous for health. Transgenic food must be approved by expert committees in the EU. This is based on the idea that GMOs give scientific uncertainty and thus represent a potential danger that might happen in the future. For the EU, this is the justification for using the precautionary principle to carry out an extensive preliminary assessment of GMOs before they are approved for entry into the common

market. According to US, this is a way to protect the own agriculture. Though according to the EU, risks must be avoided and the health of citizens has to be assured.

Protection of geographical indications (GIs)

"Geographical indications are names of places which are used to call certain products for its particular quality, reputation or other characteristic because they come from that place" (Berden, Francois, Thelle, Wymenga, & Tamminen, 2009). Examples in The Netherlands are 'Goudse Kaas' and 'Haagse Hopjes'. The EU has a more stringent protection of GIs than the US as EU regulation requires that GIs from other countries can only be registered in the EU when the exporting country protects GI in the same manner as the EU does (Matthews, 2014). In addition, there was discussion if new brand names that may cause confusion with pre-existing brand names should be allowed. For example Budweiser and Czech names that in translation mean the same. That's why the EU's protection of GIs is a form of discrimination according to the US. US allege these EU regulations interfere the WTO Agreement on Trade-Related Aspects of Intellectual Property (TRIPS) by shortcoming to handle imports the same way as domestic products. The EU has been reprimanded and brought its protection of GIs in line with the WTO decision in March 2006 (Congressional Research Service, 2008).

Although the EU has adjusted its practices, a lot of suspiciousness is still present. The opinion of the US is that current GIs regulations of the WTO are sufficient, while the EU continues to push for expanded GI protection of products.

In the negotiations for free trade between the EU and the US this issue gives tensions for both parties.

Hormone-treated beef

"In January 1998, the Appellate Body (AB) of the WTO determined that the EU had violated the WTO's Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) by prohibiting imports of US meats and other products which contained growth-promoting hormones" (Congressional Research Service, 2008). The EU should have conducted an assessment of the risks to consumer before they imposed a ban. The EU did not act upon this WTO ruling: EU did not abolish the hormone ban. Therefore US called WTO authorization to impose restrictive tariffs on imports from the EU worth $116.8 million annually. In October 2003, the Scientific Committee on Veterinary Measures of the EU promulgated that for five of the six hormones in question the risks to consumers are not sufficiently determinable and that only one of the six hormones in question should be regarded carcinogenic. This scientific study meant that the EU had now conducted an assessment of risks to consumers and therefore the EU's prohibition on hormone-treated meat was

justified and US punitive duties should be lifted. The US did not agree with the findings of the EU Scientific Committee. That's why the EU went to WTO: the EU requested WTO to determine if the US were in violation of WTO rules by maintaining the prohibitive tariffs while the EU's findings show that hormone-treated beef can be harmful.

Due to the complexity of the research only in the end of 2007 WTO came with its ruling. Conclusion was that EU's ban on hormone-treated beef did not comply with the SPS Agreement as a more objective risk assessment in a reasonable period of time should have been conducted. Moreover, according to the WTO US did not comply with WTO dispute settlement rules and producers which decide if US sanctions were still warranted.

In October 2008 the result of the final panel report was made public: "the US are allowed to keep its prohibitive tariffs on such EU products as Roquefort cheese, goose liver, fruit juices, mustard and pork products and the EU is allowed to keep its ban on hormone-treated beef" (Congressional Research Service, 2010).

False competition in the aerospace sector

A sensible NTM between EU and US are the claims and counter claims regarding government support for the aviation industry. According to the US, EU member states have given massive subsidies to help in the development, production and marketing of Airbus (Ahearn, 2006). In addition, EU member states would have provided other forms of support to gain an unfair competitive advantage as equity infusions and debt rollovers (USTR, 2000).

"Counter-claims of the EU were that Boeing producers have benefitted from huge indirect governmental subsidies like military and space contracts and government-sponsored aerospace research and development" (Burger, 1999).

In March 2010 the WTO ruled that Airbus was unfairly subsidized by European governments (USA Today, 2010). In September 2010 WTO determined that US had paid Boeing unfairly in such manner, that it broke WTO rules and should be withdrawn (Reuters, 2010). In May 2011 WTO found that the US defense budget and NASA research grants could not be used as means to subsidize the civilian aerospace industry. Also the WTO partly recanted its verdict that European governments gave unfair subsidies, as the support was not aimed at boosting exports and some forms of public-private partnership could continue.

Meanwhile this issue is still ongoing with a lot of claims and counter-claims that the counterpart would not comply with the WTO regulations.

Maritime sector

For the maritime sector the US Jones Act constitutes the most dominant negotiating issue (Schaake, 2013). The Jones Act is formally called the US Merchant Marine Act 1920 and protects the US maritime industry from competition in order to boost the American shipbuilding and transport industry (The Free Library, 2013). Moreover the Act raises costs for other industries and it keeps foreign ships from helping when maritime disasters in the US happen. Competition is restricted as waterborne shipping between US ports have to be carried out by vessels built, owned, registered and operated by Americans. Therefore European shipbuilders and repairers have been effectively excluded from selling vessels to be used in American coastal waters. Openness in the US maritime sector will give the European shipbuilding industry a new market. Representatives of the EU shipping industry have convinced the EU negotiators to emphasize the importance of at least a relaxation of the Jones Act as the EU and the US have similar labor, environmental and state aid laws. Furthermore the US security interests would not be threatened by the relaxation of the Jones Act for EU firms.

Financial regulations

In 2002 the financial market's regulatory dialogue between the US and the EU began (Congressional Research Service, 2008). The enacted issues of that time are still ongoing but more narrowly focused. The financial crisis emphasized the need for strengthened financial regulation. Nowadays the discussion about financial regulations focuses on harmonizing accounting standards and opening European financial services markets to US firms.

The EU makes use of the International Financial Reporting Standard (IFRS) as accounting system while US make use of the Generally Accepted Accounting Principles (GAAP). GAAP is based on rules, while IFRS is based on principles, making it more flexible. For stakeholders and international companies these different systems are aggravating. The EU and the US are still in discussion about accounting standards.

In September 2006 the US and the EU signed an agreement to open European markets to US services companies including financial services. Notwithstanding the European Commission had to sue 24 member states for not implementing a financial services directive which should open the financial services markets to both the US and EU member states. Without this directive US firms have to comply with 27 sets of laws and regulation instead of one European set which is much too expensive and devious. This issue is still ongoing.

While the US and the EU both widely agree that market access problems traditionally hidden in free trade arrangements would be the subject of TTIP obligations, they have divergent views regarding how to deal with these differences in developing regulatory policies in each market (Institute for International Economics, 2013). Issue is how TTIP could influence the still not implemented European financial reforms and the introduction of new US rules following to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 or other potential US regulatory initiatives (Palmer, 2013). The Dodd-Frank Act is a construction of federal regulations, primarily concerning financial institutions. It passed the Senate in 2010 and was a response to the financial crisis in 2008. The Dodd-Frank Act's aim is to reduce risk in the US financial system and is very valuable to US democrats. However, US republicans want to get rid of Dodd-Frank as soon as possible.

Both parties consider reduction of unnecessary transaction costs for financial institutions as very important, but they differ over what *necessary* includes. The EU is convinced that for TTIP to fully bring economic benefits, financial services must be included. However, US are concerned that lower restrictions will be used in TTIP than adopted in the 2010 Dodd-Frank Act, which will re-open the discussions on the Dodd-Frank bill.

Chapter 3: The different ways of alignment of NTMs

From literature review, we can point out the following ways for regulatory alignment: mutual recognition agreements (MRAs), harmonization, equivalence, elimination and bringing the problem to the private sector. Each way will be elaborated in a subchapter, the following subjects will be discussed: (1) definition of the way of alignment, (2) implementation (how it works), (3) requirements regarding the commitment, (4) risks and opportunities. Legal perspective of each way of alignment is particularly taken into account.

3.1. | Mutual recognition agreements

3.1.1 Definition

Mutual recognition agreements (MRAs) are international agreements when two or more countries agree to recognize some aspect of the other's regulatory regime as being interchangeable with their own. Conformity assessment is the process of determining if a product meets the specified requirements, this is performed by conformity assessment bodies (CABs) of the countries that are parties to the agreement (Veggeland & Elvestad, 2004). A MRA sets out the process to implement, evaluate, monitor and maintain mutual recognition. Regulatory coherence forms a part of MRAs as MRAs aim to remove unnecessary overlap of regulation.

3.1.2 Implementation

The MRA process has two phases. Phase I is a mutual recognition of test reports, which means that products that have been tested by an MRA partner will not require re-testing in the country of the other party to the agreement. Phase II is a mutual recognition of certification, which means that products that have been certified by an MRA partner do not need a re-certification in the country of the other party to the agreement (iDA, 2014). In both phases the parties recognize each other's ability to perform their regulatory testing and /or certification. Conformity assessment bodies (CABs) are an essential stakeholder in this process as they assess and certify products in specified sectors (European Commission , 2013). The designation of CABs forms a core function in the operation of the MRA and will be done by each party to the agreement. This designation enables CABs to conduct assessments on products to be placed on the market in the country of the party to the agreement (European Commission, 2001). In the designation dossier the specific requirements that need to be checked for the CABs are stated, especially the evidence of the knowledge by the applicant body of the applicable third country legislation/regulations and all other relevant documentation needed to

perform certification as indicated in the legislation. Both parties have to maintain a list of their technical regulations for both phases, using international standards as a basis. The MRA obliges parties to recognize each other's CABs and to accept the results of their work.

3.1.3 Requirements regarding the commitment

Three stakeholders are involved in the concept of MRAs:

1. The existing exporters in a country which already acquire product approval in the countries they trade with. They are unlikely to be affected by the introduction of an MRA.
2. New firms which haven't exported to a foreign country yet. The introduction of an MRA in that foreign country might cause a wish to enter the export markets.
3. The conformity assessment bodies in a country that assess the compliance of the products to the standards of a foreign country.

For MRAs, the biggest commitment has to be brought by the CABs. These bodies need to meet specific requirements to apply and receive the CAB status from the European Commission or National Institute of Standards and Technology (NIST) (European Commission, 2013). Moreover the CABs are the bodies which have to do the testing and certification work. Once this work is done, parties can make use of the results while CABs have to take care of the maintenance of the MRAs.

3.1.4 Opportunities and risks

Opportunities

MRAs reduce inspection and transaction costs for both consumers and producers. Consumers don't need to check product specifications in every buying process as all products have a certain quality. A producer's time to access a market will be shortened as requirements have to be checked only once (TACD, 2001). For consumers this is beneficial as they can benefit from a wide variety of new products earlier, as market access is shorter and producers are less willing to renounce to enter the market (TACD, 2001).

MRAs increase transparency and thus reduce uncertainty (Schroder, 2011). Once products have been tested and certified they will have access to other markets without the need to comply with any additional administrative process. This way MRAs increase comparability of the system and protect intellectual property rights. Moreover, MRAs increase the reliability and predictability of the trade system. Employment and economic activity are expected to rise, and prices are expected to fall due to economies of scale and a decrease in transaction and inspection costs.

Hereby the flexibility of MRAs brings a certain kind of freedom; interpreting the minimum standards stricter is also possible.

MRA is attractive for countries in which the regulatory differences among jurisdictions are modest and do not implicate highly sensitive issues, and where levels of development and income are comparable.

Risks

A risk of MRAs is the transfer of regulatory authority and duties from national regulatory agencies to foreign entities. These foreign entities may operate under different cultural values and standards, rules of transparency and liability. In addition, when parties choose to privatize CABs, private companies are much more likely to neglect safety for money than domestic regulatory agencies. This can mean that alignment may happen outside the context that guarantees public participation (TACD, 2001). One of the requirements is to be set up a special institution in order to negotiate and maintain MRAs, which needs a comprehensive infrastructure and resources. MRAs require evaluations of the equivalence of regulatory systems or the competence of CABs before the delegation of responsibilities can take place. This takes a lot of time and money.

The loss of domestic regulatory control in crucial public health and safety matters will lead to reductions in the level of health, safety and environmental protection which leads to public anxiety. Consumers do not know who to blame for unhealthy products.

Another anxiety is that regulators may be locked into an inflexible regulatory system that makes it complicated to introduce innovations and changes (Ordem dos Enfermeiros, 2009).

Therefore, risk is that one of the parties decides to change the product requirements while the other party does not agree to it. This means that the MRA will not apply any longer and that the MRA has to be updated on a regular basis (Schroder, 2011). Moreover, it is hard to determine which standards are covered by the MRA and which are not. This can lead to confusion (Daverveldt, 2013).

3.2 | Harmonization

3.2.1 Definition

The ISO Guide 2 (ISO/IEC, 1996) defines harmonization of standards as ‘standards on the same subject approved by different standardizing bodies, that establish interchangeability of products, processes and services, or mutual understanding of test results or information provided according to these standards’ (World Trade Organization, 2014). It goes onto say that ‘the term ‘equivalent’ standards is sometimes used to cover the same concept as harmonized standards’. However, harmonization and equivalence are not the same. Harmonization takes two different standards and procedures and reforms them into one, while equivalence allows two differing standards to remain the same but treats them as if they were the same because they produce the same results (TACD,

2001). Regulatory coherence forms a part of harmonization as harmonization aims to remove unnecessary overlap of regulation.

3.2.2 Implementation

There are three types of harmonization that have been defined in theory (TACD, 2001). First, it is an upward harmonization, which means that the country with the lower standards has to upgrade its standards to equal them to the standards of the other country. Another possibility is that the countries draft a completely new standard at a higher level.

Second, it is a downward harmonization which means that the country with the higher standards alleviates its standards in order to equal the lower standards of the other country. Third, it is a compromise harmonization, which means "that the countries negotiate new standards at an intermediate level" (TACD, 2001). Countries could also harmonize their standards via agreements or via ISO-standards.

3.2.3 Requirements regarding the commitment

As differing standards have to be brought to one standard, commitment for harmonization is high (Veggeland & Elvestad, 2004). National Standard Bodies have to negotiate a lot in order to find one standard which is in accordance with both countries. First of all, both parties have to negotiate about the standards. Then they have to adjust their standards and processes. This is especially the case when one of the parties is has the highest number of necessary adjustments commitment which can be very tough and costly.

3.2.4 Opportunities and risks

Opportunities

Harmonization brings a great certainty for stakeholders because results and processes of production are clear (Australian Government, 2009). Products are exactly the same which makes products better substitutes. Consequently consumer confidence are higher as standards are clear; consumers can trust on the quality of products. Due to harmonization of standards, economies of scale and an efficient allocation of resources may arise. This makes transaction costs lower for both consumers and producers.

Risks

The negotiation costs of harmonization may be very high, especially when a country lacks the expertise to participate fully in the setting of international standards or when it lacks bargaining power (Australian Government, 2009). Because of this, the new standards can be more burdensome for stakeholders than the previous ones . Consequently, the gains from harmonization will not be

equally distributed among participating countries.

Harmonization limits the freedom of MRAs because harmonization policy objective and technical requirements need to be set. Besides, harmonization reduces the number of varieties in a market as requirements are very specific.

3.3 | Equivalence

3.3.1 Definition

For equivalence, changing standards or procedures don't need to be identical as long as they produce the same or similar results (TACD, 2001). Equivalence is very result-oriented, while harmonization is also process-oriented. For harmonization the procedure and standards must be identical, while for equivalence the results must be 'close enough'.

3.3.2 Implementation

Countries can keep their own standards if they decide that all of their standards have the same results. However, this is an unlikely scenario. That's why National Standard Bodies of both countries have to negotiate which standards and procedures are covered by the equivalence agreements. As 'close enough results' is quite a vague criterion, a lot of research must be carried out on the exact results of a standard or procedure. After listing the results of all procedures and standards of both parties, the equivalence agreements can be defined. Often terms like 'resulting in at least the same level of consumer protection' or 'sufficiently comparable' are used. In other cases the standard must be articulated in the form of a list of criteria against which a system or procedure can be assessed.

3.3.3 Requirements regarding commitment

A lot of work has to be done through (by) the National Standard Bodies as they need to negotiate the coverage of the equivalence agreements. As results are not always quantitatively measurable definitions in the equivalence, agreements must be set very precisely and with care. Commitment is lower than for harmonization, as countries may maintain distinct national regulatory measures, as long as the regulatory goals are similar (Veggeland & Elvestad, 2004).

3.3.4 Opportunities and Risks

Opportunities

Equivalence agreements give more freedom in national rules and in the production process which will encourage producers to be competitive and innovative (Sasha & Crucefix, 2004). Equivalence

allows for regulatory autonomy of the parties and a greater number of different products due to less strict product requirements. Producers often consider their products safer than products of other producers which allows for quality differences in products and can therefore set different prices for different quality products.

Risks

Equivalence agreements allow for two differing standards at the same time which are considered to be as two alternatives. When one of the standards is significantly lower, this lower standard will subvert the higher standard. When Country A has a higher standard than Country B, Country B becomes an alternative route to Country A's standard. In this case Country B serves as a 'back door' to the stricter market of Country A. In this way the 'back door' bypasses Country A's protections. This back door effect is very undesirable for standards regarding safety, health and environment.

Because of the back door effect products are removed from direct regulation and oversight by consumers in the importing country. Regulatory functions are displaced to foreign regulators and private bodies, which undermines the democratic principles of citizens' access to regulatory affairs. Their right to participate in decisions concerning the regulation of products they consume will be limited.

Another flaw of equivalence comes from the vague terms in the formulation of criteria for equivalence. Equivalence is not easily determined and if the criteria are not sufficiently specific, standards regarding safety, health and environment will be undermined and goals will not be met.

Furthermore, equivalence of standards discourages governments to improve the level of protection provided by a standard once it has been regarded as 'equivalent' to a corresponding foreign standard. When authorities face the risk of disrupting the equivalence determination upon which an equivalence agreement depends, authorities are not likely to consider improving a standard. Thus, equivalence can impede a certain level of technological development that follows standard improvements.

3.4 | Elimination of NTMs

3.4.1 Definition

Elimination of NTMs implies a total removal of all present NTMs between the countries.

3.4.2 Implementation

Non-tariff measures between the countries will be abolished; a free trade market exists without any non-tariff obstacles or requirements to conform to.

3.4.3 Requirements regarding the commitment

Little commitment is required for elimination of NTMs. Authorities will lay down their standardization tasks and let the free trade market run its course.

3.4.4 Opportunities and Risks

Opportunities

Eliminating NTMs will bring a free trade market without any non-tariff obstacle or requirement to conform to. Disregarding the tariffs, the market will be functioning in an optimal way. With elimination of NTMs every product can be exported or imported between the countries. Negotiations about product requirements and standard checks are no longer necessary, which saves a lot of costs. Besides the variety of products will grow as limitations on products types do not longer exist.

Risks

Without any standards to comply to, producers are free to set their own quality standards. As a result, consumers and producers can't rely on a certain quality when they buy a product. Standards foster the production of health, safety and environment because they ensure the quality of goods. Without standards, there is no guarantee that private companies will produce the needed quality of goods. Therefore, it is hard to compare products with each other when measures do not exist.

3.5 | Let the private sector solve the problem

3.5.1 Definition

Letting private sector solve the problem means bringing the problem of standardization to private companies instead of public authorities taking effort to align NTMs.

3.5.2 Implementation

Incompatibilities can be solved by private companies when government makes them aware of the problem and the benefits they will face as a result of the incompatibilities elimination (reducing costs and expanding sales). Companies may eliminate incompatibilities through choosing to make their products compatible with those of the industry leader or through engaging in merger. The

private sector may also undertake cooperative efforts to develop compatibility standards, for example, through creation of standard-setting entities within their product sector.

3.5.3 Requirements regarding commitment

Authorities can lay down their standardization tasks and let the free market run its course. However, they will encourage the private companies to align the NTMs themselves and make them aware of their position and responsibilities.

3.5.4 Opportunities and risks

Opportunities

By giving the problem to private companies public authorities can save a lot of money. By privatizing standardization there occurs a shift of responsibilities. Private companies consider standardization from a different point of view, which may give a refreshing sight on alignment of NTMs.

Risks

Private companies may not feel responsible to align NTMs and to conform to national standards when public authorities do not longer check them. Public standards bodies foster the production of health, safety and environment because they ensure the quality of goods. Without public standards bodies, there is no guarantee that private companies will meet the necessary quality requirements.

Chapter 4: The economic impact of the various ways of alignment

4.1 | Conceptual framework and methodology

In this chapter we will calculate the economic impact of the different ways of alignment discussed in the previous chapter. The economic impact will be based on the Global Simulation Model (GSIM) of two theses written before under the supervision of Dr Berden.[1] These theses concern the economic impact of alignment of AEO and C-TPAT and the equivalence agreement in organic food. Effects on trade and welfare are estimated using a Partial Equilibrium (PE) model with Ad Valorem tariff Equivalents (AVE) for data input. The regulatory AVEs before and after alignment are estimated using a direct cost method with data from surveys and reports. The GSIM has been used to simulate the scenarios of regulatory alignment.

4.1.1 The Global Simulation (GSIM) model

In order to assess the economic impact of alignment of NTMs the Global Simulation Model (GSIM) is a commonly used method. The GSIM is developed by Francois and Hall and is a partial equilibrium model on industry level, but with a global scope (Francois & Hall, 2003). Originally, the GSIM was designed to analyze tariff and antidumping policy. Nowadays the model is very practical for an assessment of the effects of alignment of NTMs as the model gives a relatively fast and transparent analysis of the alignment effects while a minimum of data is required. Namely, the only set of required data are the data of bilateral trade flows of the countries in the sample, the initial tariff equivalents, the final tariff equivalents and the elasticities of composite demand, industry supply and substitution. However, partial equilibrium models do not take into account all the factors present in general equilibrium models – especially income effects and interactions between sectors, so it does have its limitations in case of analyzing an effect that has clear economy-wide implications or analyzing a big shock.

GSIM reduces the set of possible solutions by determining the level of world prices that clear the world market. Consequently, the model must be solved backwards for national results.
Some assumptions have to be made in order to use the model. First of all, we assume that there is a national product differentiation which means that the product made in nation A is slightly different from the product made in nation B. Secondly, we adopt that the elasticity of substitution is equal constant over the products from different countries. So despite the slightly different products, the elasticity of substitution is the same for every product. For the elasticity of demand this is also the

[1] Lisanne Winde – Organic equivalence between the United States and European Union: A study on the impact on welfare, trade flows and prices of organic food
MEL Group – The impact of the mutual recognition agreement on AEO and C-TPAT

case. Lastly, we adopt that import supply is also featured by constant supply elasticities. The basic structure of the model is as follows: first of all the own- and cross-price elasticities are developed; then these terms are comprised in the global supply and demand functions and in the market clearing conditions. With these conditions the equilibrium price is determined and so the change in the consumer and producer surplus is calculated.

When calculating the values for elasticities, Francois and Hall (2003) assume that within each importing country the import demand within a product category of goods from another country is a function of industry prices and the total expenditure on the category. Or, if we put formally:

(1) $$M_{(i,v),r} = f(P_{(i,v),r}, P_{(i,v),r\neq s,} y_{(i,v)})$$

In this function M represents the imports for good *i* into country *v* from country *r.* $P_{(i,v),r}$ represents the internal price of good *i* from country *r* in country *v*, $P_{(i,v),r\neq s}$ is the price of other varieties of good *i,* this other varieties come from the assumption of product differentiation and $y_{(i,v)}$ is the total expenditure on imports of good *i* in country *v*. Consequently, this equation is differentiated, the Slutsky decomposition of partial demand is applied and the zero homogeneity property of Hicksian demand is applied. The Slutsky decomposition shows that the change in demand due to a change in the price consists of both an income effect and a substitution effect. Zero homogeneity means that if the independent variables change, the dependent variable does not change. The cross-price elasticity and the own-price demand elasticity are derived.

Cross-price elasticity:

(2) $$N_{(i,v),(r,s)} = \theta_{(i,v),s} (E_m + E_s)$$

Own-price demand elasticity:

(3) $$N_{(i,v),(r,r)} = \theta_{(i,v),r} E_m - \left(1 - \theta_{(i,v),r}\right) E_s$$

In these equations $\theta_{(i,v),s}$ is the expenditure share of good *i* in country *v* from country *r*, E_m is the aggregate import demand elasticity $\left(1 - \theta_{(i,v),r}\right)$ is the expenditure share on all others goods and E_s is the elasticity of substitution. The cross-price elasticity represents the percentage change in demand of good *i* as a result of an one percentage change in the price of goods from region *s.* The own-price demand elasticity represents the percentage change in the quantity of the demand of good *i* as a result of an one percent change in the price good *i.*

Then, we define the demand for national product varieties and the national supply functions as the full market clearing conditions are indispensable in this model. The market clearing condition states

that demand is equal to supply, meaning that the market is in equilibrium. In order to come to this condition, the export price which is received by the exporter on the world market and the international price for this good can be linked since the external price plus the tariff is the internal price, or more formally:

(4) $$P_{(i,v),r} = T_{(i,v),r}\, P_{i,r}\, *$$

In the model, the export supply of good *i* to the world market is defined as a function of the world price, denoted by P*:

(5) $$X_{i,r} = f(P_{i,r}\, *)$$

Now the imports from the world market (1), the exports to the world market (5) and the link between the internal and external price (4) are defined. When this equations are differentiated the proportional changes are found.

In order to have one function for the imports on the world markets, the proportional change in the internal price and both the cross-price elasticity and own-price demand elasticity are substituted into the proportional change equation for the imports. Now that the proportional change equation for the imports is clear, the global market clearing condition for each export variety can be defined. The global market is clear when supply equals demand. This means that the proportional change in exports has to equal the proportional change in imports, or more formally:

(10) $$\widehat{M}_{i,r} = \widehat{X}_{i,r}$$

$\rightarrow$ $$E_{x(i,r)}\widehat{P}_{i,r}\, * = \sum_v N_{(i,v),(r,r)}\widehat{P}_{(i,v),r} + \sum_v \sum_{s \neq r} N_{(i,v),(r,s)}\widehat{P}_{(i,v),s}$$

This market clearing condition means that the proportional change in exports due to the price on the world market must be equal to the proportional change in imports, which depends on the sum of the own-price elasticity times the proportional change in the internal price of variety *r* plus the sum of the cross price elasticity times the proportional change in the internal price of all other varieties than *r*. This equation must hold because there has to be an equilibrium in the global market. If the change in exports is larger than the change in imports, or vice versa supply is no longer equal to demand and there is no equilibrium on the world market.

Equation (10) is the core equation for the GSIM model. Then the excel solver is used to solve for this equation and find the equilibrium price for the world market. Once this price is found, the model can also calculate the other values of the model, like changes in the consumer and producer surplus, the change in tariff quantities and the change in traded values.

The producer surplus is calculated with the following equation:

(11) $$\Delta PS_{(i,r)} = R^0_{(i,r)} \cdot \hat{P}_{i,r} * + {}^1\!/_2 \cdot R^0_{(i,r)} \cdot \hat{P}_{i,r} * \cdot \hat{X}_{i,r}$$

Which can be rewritten to:

$$\Delta PS_{(i,r)} = (R^0_{(i,r)} \cdot \hat{P}_{i,r} *) \cdot \left(1 + \frac{E_{x,(i,r)} \cdot \hat{P}_{i,r*}}{2}\right)$$

In this equation $R^0_{(i,r)}$ represents the revenues of export of goods before the change in the tariff, i.e. the benchmark revenue, the $\hat{P}_{i,r} *$ is added because the benchmark revenue is valued at world prices. As one can recall the producer surplus is always a triangle in the graphical representation, that explains the ${}^1\!/_2$. The last term in the equation is the elasticity of export supply times the world price.

Next the consumer surplus can be calculated with the equation:

(15) $$\Delta CS_{(i,v)} = \left(\sum_r R^0_{(i,v),r} \cdot T^0_{(i,v),r}\right) \cdot ({}^1\!/_2 E_{m,(i,v)} \hat{P}_{(i,v)}{}^2 \cdot sign\left(\hat{P}_{(i,v)}\right) - \hat{P}_{(i,v)})$$

Where $\hat{P}_{(i,v)} = \sum_r \theta_{(i,v),r} \hat{P}_r * + \hat{T}_{(i,v),r}$

In this equation the consumer surplus is measured with respect to the composite import demand curve. In this case $P_{(i,v)}$ represents the price for the composite imports, and the initial quantity and expenditure is represented by $R^0_{(i,v),r} \cdot T^0_{(i,v),r}$. This is because the price for the composite good is set at 1. Just as in the equation for producer surplus we see the ${}^1\!/_2$, because of the triangular representation and again we find an elasticity, this time the elastic of aggregate import demand, represented by $E_{m,(i,v)}$. The proportional change in the price depends on the summation of the demand expenditure share times the change in the world price plus the change in the tariff.

When the change in the producer surplus, the consumer surplus and the tariff equivalents revenues are combined, the total welfare change due to the change in trade policy becomes clear.

4.1.2 Methodology

The thesis writers did not focus on the *different* ways of alignment; instead they focused on the calculation of the most likely economic impact of the alignment. Therefore, first of all we will determine which way of alignment has unconsciously been used by the thesis writer in order to assess the economic impact of the alignment. The way of alignment will be derived from the matrices used in the GSIM and from the assumptions made in the thesis text.

Then we will determine for which factors used in the GSIM the ways of alignment differ. Per way of alignment we will assess these factors on the basis of macro-economic information. With these factors we will calculate the economic impact for two ways of alignment per thesis. These two ways we will choose on the basis of documentation and logical reasoning.

This method we will use for all of the three theses. In the end of the chapter we will analyze all the theses and combine the analysis into one integral answer.

4.2 | GSIM analyses

In the table below one can see the ways of alignment we will analyze per thesis.

Table 4.1 – *Overview of applied ways of alignment for each of the theses.*

		Theses	
		Organic food	AEO-CTPAT
Ways of alignment	MRA	X	X
	Harmonization		
	Upward	X	
	Downward		
	Equivalence		X
	Elimination of NTMs		
	Private sector		

For the organic equivalence thesis we analyze MRA and upward equivalence. We have chosen for MRA as the author claims to use this way in her GSIM, but according to me some adjustments have to be made in order to be able to make the right analyses. Furthermore we analyze upward equivalence, in order to check if this way of alignment gives a different economic impact than MRA. The alignment of food measures is a sensible discussion point, therefore we think that upward harmonization is a suitable way in this case. Harmonization gives more control over the production process which creates a consumer protection mechanisms due to the rules established by the country with the strictest regulatory regime. Therefore we think it is worthwhile to calculate its economic impact.

For the AEO-CTPAT thesis we will recalculate the economic effect of MRA as well. The authors claim to use this way of alignment in their GSIM but that is something we will analyse deeper. After that we will calculate the economic impact of equivalence. As AEO and C-TPAT are results-oriented in order to ensure safety, we assume equivalence will be an adequate way of alignment.

4.2.1 Thesis 1: Organic equivalence between the United States and the European Union: A study on the impact on welfare, trade flows and prices of organic food

Way of alignment used in GSIM

The author of this thesis consciously used MRA as way of alignment in her GSIM because it was what she was analyzing: the MRA leading to alignment on organic food. This can mainly be derived from the following text in her thesis:

'The main point of this agreement is that the US and the EU have reviewed each other's organic systems for organic agriculture products produced and handled in accordance with the regulations of the region and have decided that this system is equivalent to their own system.'[2]

On the basis of MRA, the author made calculations of the impact of alignment of organic regulations between the EU and the US. In her thesis she describes the back door effect of the MRA. The EU has a broader scale for organic equivalence with the US than the US has with the EU. The US limit the scope of the organic equivalence agreement to organic products certified under the EU organic system and either grown, produced or where final processing or packaging occurs in the EU. On the other hand the EU has a broader system by acknowledging all products that have been grown in the US or that have been imported into the US in accordance with the US legislation. This means firms from third countries can now import their organic products into the EU without much extra costs if they were already importing products into the US. For third countries it will be easier and cheaper to obtain an US certificate and export products to the US and then supply the EU market via the US, than obtaining an EU certificate, grow, process or package food in the EU and then supply the US via the EU, since building and maintaining a factory in the EU contains extra costs and above all extra risks.

Following this scenario, MRA will cause lower prices due to lower transaction costs and higher competition as the market grows. As third countries will use the US as 'back door' for the EU market, trade from third countries to the US on the one hand and trade from the US to the EU on the other hand should increase.

Table 4.2 – *Percentage change in trade quantities, conservative scenario.*
BRC = Brazil, Russia, China
ROW = Rest of the world

	Destination			
	EU	US	BRC	ROW

[2] Lisanne Winde - Organic equivalence between the United States and European Union: A study on the impact on welfare, trade flows and prices of organic food

Origin	EU	-0.03	0.09	0.05	0.04
	US	2.67	0.00	-0.15	-0.15
	BRC	0.02	0.02	0.01	0.01
	ROW	-0.06	-0.01	0.01	0.01

Table 4.1 shows the percentage change in trade quantities, caused by the MRA. First of all we can see that the trade between the EU and the US has increased. This can be explained by the reduction of non-tariff measures because of the MRA. One can also see that the biggest increase in trade quantities took place in the export from the US to the EU (2.67%). A reasonable explanation is the introduction of the MRA which opens the EU market for US companies and which brings the backdoor effect giving third countries the opportunity to expand their market to the EU via the US.

As cost reductions due to MRA are lower for the EU than for the US (following the calculations by the author) EU companies have a competitive disadvantage with respect to the US companies. Trade between EU countries has decreased and the percentage increase in trade quantities is lower for the export from the EU to the US than for the export from the US to the EU. The competition disadvantage makes the export to the US unattractive for EU companies. Therefore EU companies try to sell their products in third countries, which explains the increase in the percentage change in trade quantities for export from the EU countries to third countries. As US companies have broadened their market to the EU, export to third countries has decreased.

As third countries have to share the European market with the US since the introduction of the MRA, export from third countries to the EU has decreased. In this situation third countries will choose to export to the EU via the US due to financial advantages. However, export from third countries to the US has barely increased (a 0,01% decrease for export from the rest of the world and a 0,02% increase for export from BRC countries) while the backdoor effect would lead us to expect it to increase substantially. This is not what we witness in the GSIM results of the organic equivalence thesis, which leads us to conclude that either the barrier effects are different, the cost effects are not passed on to third parties, or some assumptions regarding MRA effects are not fully translated into the GSIM experiment. In Therefore we will calculate the effect of MRA again.

Methodology

First of all we will recalculate the economic effect of an MRA, after that we will calculate the economic effect of upward harmonization. For upward harmonization standards, procedures and results of the product need to be identical (TACD, 2001). We compare MRA to upward

harmonization because this thesis concerns food and it has direct consequence for human health. This could mean that no government would ever agree to lower food standards – hence the only way to go is up. This means that the country with the lower standards, procedures and results has to upgrade its standards so that they are equal to the standards of the other country. While the EU and the US maintain quite similar standards (for the scope included in the equivalence agreement), we still believe that US standards should be upgraded in order to reach EU standards. Generally, US focuses on cost-benefit analyses when analyzing food safety standards while EU works on a more precautionary basis (CAP Reform, 2014). Furthermore, we can roughly say US tend to regulate the end product in order to accomplish its food safety purposes, while EU tends to regulate the entire production process. For example, staff working in a US organic farm does not need to have the basic knowledge and skills to work there, while the EU maintains its own staff rules. In addition, EU maintains only one organic level of 95%, while US maintain organic levels starting at 70%. EU farmers should work on separate lands or in separate buildings when they produce both organic and non-organic food.

For our calculations, we will use the basic information provided in the organic equivalence thesis. We will use the cost reductions of the conservative scenario in this thesis, as they seem the most realistic. First of all, as the conservative scenario has more modest costs, which gives less extreme outcomes. Secondly, I assume firms in California are on average larger than in other states (Vallianatos, 2012). Therefore the average gross value can be lowered with 10%.

Mutual Recognition Agreements

Mutual recognition agreements (MRAs) are international agreements by which two or more countries agree to recognize (some aspect of) the other's regulatory regime as being interchangeable with their own. The MRA process has two phases. Phase I is the mutual recognition of test reports, which means that products that have been tested by an MRA partner will not require re-testing in the country of the other party to the agreement. Phase II is the mutual recognition of certification, which means that products that have been certified by a MRA partner do not need a re-certification in the country of the other party to the agreement (iDA, 2014). In both phases the parties recognize each others ability to perform regulatory testing and /or certification.

Cost savings in the US

Certification costs

As a result of an MRA, firms need only one certification to sell products in their own market and on the market of the other region. We assume US firms choose the US label as long as this label is

cheaper to obtain and maintain than the EU one. The organic certificate now costs US firms $730 per year, which is $3,285,000 per year for all US firms.[3]

Administrative burden

In the framework of the MRA US firms need to keep track of changes of only one system and need to conform to only one system of standards. Therefore they do not need to make a distinction between each type of activity, but only make a distinction between crops and livestock. Besides US firms do not need to take the use of nonorganic substances into account and do not need to prove the specific knowledge of the staff. Lastly, now US firms have to find only one certifying agent which will do one inspection, fill in one application form and afterwards check one certificate.

The table below provides an overview of the estimation of the working days necessary before and after MRA.

Table 4.3 – *Working days per task in the US before and after MRA*

Category	**Number of days per year**	
	Before	**After**
Reduce duplicate requirements	30	15
Distinction each type of organic	10	10
Different systems for each kind of activity	7	4
Use of allowed nonorganic substances	10	4
Set up a handling plan	5	5
Provide information on knowledge of staff	2	0
Gathering firm information and apply for certification	2.5	1.5
Find a certifying agent	5	3
Total	**71.5**	**42.5**

The average labour costs per hour in the US are $35, so the total costs for the administrative burden are $11,900.[4] For the US as a whole this is $53,550,000.[5]

Labeling costs

After MRA US firms need only one system of labeling instead of two. Therefore the costs will be half of the costs before MRA, which is $19.04 million.

[3] $730 × 4500 firms = $3,285,000
[4] $35 × 8 hours a day × 42.5 hours = $11,900
[5] $11,900 × 4500 firms = $53,550,000

General export costs

The general export costs contain the costs of preparation and packaging, handling, transport, time for processing the certificate, time at the customs, insurance, cost of capital and tariffs.

The time for processing the certificate is the first cost that will change due to MRA. The time will be shorter as electronic import certificates will increase the speed of obtaining such a certificate. We assume the processing the certificate will now take seven days. With the APR of 11%, the costs are $20.

The time at the customs will decrease as well, as with MRA controls are less necessary in a lot of cases. We assume this will drop from 3.5 days to 2.5 days. With the APR of 11% this will be $7.50. As US will export 36,030 containers to the EU in a year[6], the total export costs per year can be calculated.

Table 4.4 – *General export costs before and after MRA in the US*

Category of costs	**Before**	**MRA**
Preparation and packaging	$900	$900
Handling	$500	$500
Transport	$1,050	$1,050
Time for processing certificate	$28.5	$20
Time at customs	$10	$7.5
Insurance	$200	$200
Cost of capital	$132	$132
Tariffs	$439	$439
Costs per container	**$3,259.5**	**$3,248.5**
Total export costs per year	**$117,439,785**	**$117,043,455**

Total costs in the US

In the table below you can find the total costs in the US, before and after MRA.

[6] According to the United Nations Commodity Trade Statistics Database, the US exports more than $9 billion of food to the EU, of which 4% is organic. The value of one container (TEU) is $10,000.

Table 4.5 – *Total costs before and after MRA in the US, in 1000*

Category of costs	Before	After MRA
Organic certification	**$9,540**	**$3,285**
Administrative Burden	**$90,090**	**$53,550**
Reduce duplicate requirements	*$37,800*	*$18,900*
Distinction each type of organic	*$12,600*	*$12,600*
Different systems for each kind of activity	*$8,820*	*$5,040*
Use of allowed nonorganic substances	*$12,600*	*$5,040*
Set up a handling plan	*$6,300*	*$6,300*
Provide information on knowledge of staff	*$2,520*	*$0*
Gathering firm information and apply for certification	*$3,150*	*$1,890*
Find a certifying agent	*$6,300*	*$3,780*
Labeling costs	**$38,080**	**$19,040**
General export costs	**$117,439.785**	**$117,043.455**
Preparation and packaging	*$32,427*	*$32,427*
Handling	*$18,015*	*$18,015*
Transport	*$37,832*	*$37,831*
Time for processing certificate	*$1,025*	*$720.6*
Time at customs	*$360*	*$270.225*
Insurance	*$7,206*	*$7,206*
Cost of capital	*$4,756*	*$4,756*
Tariffs	*$15,817*	*$15,817*
Total	**$255,149.785**	**$192,918.455**

So in the US the cost savings are 24.4%.[7] The share of organic food of the total food market is 4%, so this comes down to 1%.

[7] ($192,918.455 - $255,149.785) / $255,149.785 = -24.39%

Cost savings in the EU

Certification costs

After MRA the EU firms only need one certificate. We assume that in principle firms will choose the cheapest of the two systems, but also that it is costly to change the whole system. That is why we focus on EU firms staying on the EU system but getting rid of regulatory overlap because of the MRA. The costs of the organic certificate now costs $1,043 per year, which is $1,408,050 for all the EU firms per year.[8]

Administrative burden

After MRA the EU firms need to conform to only one organic system, which means they have to keep track of changes of only one system and that they have to adjust the production according to that system of regulations. Therefore the EU firms do not need to make a distinction between the percentages of organic food in their food. The EU firms have to take into account only the EU rules about allowed nonorganic substances and do not have to deliver a handling plan. Moreover, only one certifying agent has to be found.

Table 4.6 – *Working days per task before and after MRA in the EU*

Category	**Number of days per year**	
	Before	**MRA**
Reduce duplicate requirements	30	15
Distinction each type of organic	10	5
Different systems for each kind of activity	7	5
Use of allowed nonorganic substances	10	4
Set up a handling plan	5	0
Provide information on knowledge of staff	2	1
Gathering firm information and apply for certification	2.5	1.5
Find a certifying agent	5	3
Total	**71.5**	**34.5**

[8] 1350 firms × $1,043 = $1,408,050

In the EU, the average labor costs per hour are still $23, meaning the administrative burden per firm is $5,612. Since there are approximately 1350 firms in the EU, the total administrative burden is $7,576,200.

Labeling costs

The last category of savings in the specific costs are the labeling costs. Firms need only one system of labeling in order to meet the organic requirements. The total costs after the MRA will be half of the costs before the MRA, which is $12.25 million.

General export costs

The cost savings for the EU will be the same as for the US, as both countries have to make the same adjustments to incorporate the MRA.

The time for processing the certificate is the first cost that will change due to MRA. The time will be shorter as electronic import certificates will increase the speed of obtaining such a certificate. We assume the processing the certificate will take seven days. With the APR of 11%, the costs are $20.

The time at the customs will decrease as well, as with MRA controls are less necessary in a lot of cases. We assume this will drop from 3.5 days to 2.5 days. With the APR of 11% this will be $7.50. In a year the EU will export almost 684,000 containers with organic food.

Table 4.7 – *General export costs before and after MRA in the EU*

Category of costs	**Before**	**MRA**
Preparation and packaging	$900	$900
Handling	$500	$500
Transport	$1,050	$1,050
Time for processing certificate	$28.5	$20
Time at customs	$10	$7.5
Insurance	$200	$200
Cost of capital	$132	$132
Tariffs	$439	$439
Costs per container	**$3,259.5**	**$3248.5**
Total export costs per year	**$2,229,498,000**	**$2,221,974,000**

Total costs in the EU

In the table below you can find the total costs in the EU, before and after MRA.

Table 4.8 – *Total costs before and after MRA in the EU, in $1000*

Category of costs	Before	After conservative
Organic certification	**$2,882**	**$1,408.05**
Administrative Burden	**$17,760.6**	**$8,569.8**
Reduce duplicate requirements	*$7,452*	*$3,726*
Distinction each type of organic	*$2,484*	*$1,242*
Different systems for each kind of activity	*$1,739*	*$1,242*
Use of allowed nonorganic substances	*$2,484*	*$993.6*
Set up a handling plan	*$1,242*	*$0*
Provide information on knowledge of staff	*$497*	*$248.4*
Gathering firm information and apply for certification	*$621*	*$372.6*
Find a certifying agent	*$1,242*	*$745.2*
Labeling costs	**$24,499**	**$12,250**
General export costs	**$2,229,498**	**$2,221,974**
Preparation and packaging	*$615,600*	*$615,600*
Handling	*$342,000*	*$342,000*
Transport	*$718,200*	*$718,200*
Time for processing certificate	*$19,494*	*$13,680*
Time at customs	*$6,840*	*$5,130*
Insurance	*$136,800*	*$136,800*
Cost of capital	*$90,288*	*$90,288*
Tariffs	*$300,276*	*$300,276*
Total	**$2,274,639.6**	**$2,244,201.85**

So in the EU the cost savings are 1,3%. The share of organic food of the total food market is 1.9%, so this comes down to 0,03%. This cost savings percentage is tremendously lower than the US cost savings percentage.

Cost savings in BRC

Certification costs

The EU has a broader scale for organic equivalence with the US than the US with the EU. We assume it will be much easier and cheaper for BRC firms to obtain an US certificate and export products to the US and then supply the EU market via the US, than obtaining an EU certificate, grow, process or package food in the EU and then supply the US via the EU, since building and maintaining a factory in the EU contains extra costs and above all extra risks. Therefore the average certification costs per firm of $1,575 will decline to $819 after MRA.

Administrative burden

As mentioned before, the US has a broader scale for organic equivalence with the US than the US with the EU. Therefore we assume BRC firms will choose the US certificate and export products to the US and then supply the EU via the US. In this way a BRC firm does not need to build a factory in the EU.

As BRC countries now only need to obtain the US certificate, the administrative burden cost savings for BRC countries will be the same as for US firms.

Table 4.9 – *Working days per task in the BRC countries, before and after MRA*

Category	**Number of days per year**	
	Before	**After MRA**
Reduce duplicate requirements	30	15
Distinction each type of organic	10	10
Different systems for each kind of activity	7	4
Use of allowed nonorganic substances	10	4
Set up a handling plan	5	5
Provide information on knowledge of staff	2	0
Gathering firm information and apply for certification	2.5	1.5
Find a certifying agent	5	3
Total	**71.5**	**42.5**

The total administrative burden in the BRC countries per year per firm is $2,210. For all BRC countries this is $221,000.

Labeling costs

The labeling costs for all BRC firms before MRA are $3.715 million. The total costs after MRA will be half of the costs, since one labeling system can be abandoned, which counts to $1.857 million.

General export costs

The time for processing a certificate will decline, with the same reasons and days as used in the US and the EU analysis. The time for processing a certificate is 7 days after MRA. With an APR of 11% this makes $20. The time at the customs will decline to $23.

In the table below you can find the general export costs in BRC countries before and after MRA. As the BRC exports more than 28,500 containers per year the total costs per year are shown as well.

Table 4.10 – *General export costs in the BRC countries before and after MRA*

Category of costs	Before	MRA
Preparation and packaging	$900	$900
Handling	$500	$500
Transport	$1,520	$1,520
Time for processing certificate	$28.5	$20
Time at customs	$28	$23
Insurance	$200	$200
Cost of capital	$132	$132
Tariffs	$380	$380
Costs per container	**$3,688.5**	**$3,675**
Total export costs per year	**$105,122,250**	**$104,737,500**

Total costs in the BRC

In the table below you can find the total costs in the BRC, before and after MRA.

Table 4.11 - *Total overview export costs in the BRC countries, in $1000*

Category of costs	Before	After MRA
Organic certification	**$157.5**	**$81.9**
Administrative Burden	**$371.8**	**$221**
Reduce duplicate requirements	*$156*	*$78*
Distinction each type of organic	*$52*	*$52*
Different systems for each kind of activity	*$36.4*	*$26*
Use of allowed nonorganic substances	*$52*	*$26*
Set up a handling plan	*$26*	*$26*
Provide information on knowledge of staff	*$10.4*	*$0*
Gathering firm information and apply for certification	*$13*	*$8*
Find a certifying agent	*$26*	*$16*
Labeling costs	**$3,715**	**$1,857**
General export costs	**$105,122.25**	**$104,737.5**
Preparation and packaging	*$25,650*	*$25,650*
Handling	*$14,250*	*$14,250*
Transport	*$43,320*	*$43,320*
Time for processing certificate	*$812.25*	*$570*
Time at customs	*$798*	*$655.5*
Insurance	*$5,700*	*$5,700*
Cost of capital	*$3,762*	*$3,762*
Tariffs	*$10,830*	*$10,830*
Total	**$109,366.55**	**$106,897.4**

For BRC countries the cost savings percentage is 2.3%. Corrected with the share of organic food of 0.93% this is 0.02%.

Cost savings in the rest of the world

It is quite difficult to calculate the exact cost savings in the rest of the world. That is why we assume the rest of the world will have the same cost savings percentage as the BRC countries have. This is a remarkable point regarding the organic equivalence thesis, where the rest of the world will not have any cost savings.

Final tariff equivalents

By subtracting the cost savings percentages we can find the final tariff equivalents. See the tables below.

Table 4.12 - *Cost savings percentages*

US	0.9756%
EU	0.0254%
BRC	0.0215%
ROW	0.0215%

Table 4.13 – *Total initial tariff equivalents*

	EU	US	BRC	Rest of world
EU	1.2945	1.7864	1.7220	1.5527
US	1.6129	1.2540	1.8933	1.8234
BRC	1.5064	2.0026	1.8845	1.5681
Rest of world	1.7097	2.0863	2.0859	1.6727

Table 4.14 – *Final tariff equivalents after MRA*

	EU	US	BRC	Rest of world
EU	1.2945	1.7862	1.7220	1.5527
US	1.6035	1.2540	1.8933	1.8234
BRC	1.5062	2.0024	1.8845	1.5681
Rest of world	1.7094	2.0860	2.0859	1.6727

Elasticities

The last data necessary for the GSIM, are the composite demand elasticity, the industry supply elasticity and the elasticity of substitution. For a more accurate methodology and results, the actual elasticities for the food sector should be derived. Since these elasticities are not available, we will

hold on to the values of Francois and Hall, which is widely accepted in academic literature. Therefore the composite demand elasticity is set at -1.25 and the industry supply elasticity is 1.5. The substitution elasticity is set at 5.

Results and analysis

Effect on trade flows

The tables below provide an overview of the percentage change in trade quantities as a result of MRA and the change in trade at world price. The numbers in bold are the trade values at world prices after the organic equivalence agreement, above are the trade values before the agreement.

Table 4.15 - *Percentage change in trade quantities*

	EU	US	BRC	ROW
EU	-0.04	0.05	0.06	0.06
US	2.66	0.00	-0.15	-0.15
BRC	-0.04	0.00	0.01	0.01
ROW	-0.01	0.01	0.01	0.01

Table 4.16 - *Trade in world prices, before and after MRA, in million dollars*

	EU	US	BRC	ROW
EU	\$344,242.50 **\$344,077.70**	\$15,591.50 **\$15,598.40**	\$16,758.70 **\$16,767.80**	\$85,610.48 **\$85,657.00**
US	\$9,007.60 **\$9,250.60**	\$0.00 **\$0.00**	\$15,483.50 **\$15,465.50**	\$101,738.27 **\$101,620.00**
BRC	\$21,020.50 **\$21,013.10**	\$9.794,90 **\$9,795.30**	\$22,141,50 **\$22,144.10**	\$89,128.34 **\$89,139.00**
ROW	\$101,957.27 **\$101,950.50**	\$86,548.23 **\$86,560.30**	\$67,609.22 **\$67,614.30**	\$789,221.31 **\$789,283.50**

The first remarkable thing of MRA is that the trade of food within the EU decreases by \$164.8 million, which is 0,04%. An explanation for this might be that countries in the EU can now export their products with the same ease to the US as to other countries within the EU, while this used to take much more effort before the agreement. But export from the EU to the US has only increased

by $6.9 million, which is 0.05%. Although this is a relatively large increase, this increase is only a small share of the decrease in intra EU trade. It's more likely that the decrease in trade of food comes from the increase in competition on the European food market. The US has the largest cost savings, while the savings for the EU are minor. This has an effect on the trade of food. The export of food from the US to the EU increased by almost $243 million, which is an increase of 2.66%. Due to this extra competition from the US, the countries in the EU can export less of their products into the EU. Since the firms are still trying to maximize their profit they will search for other markets to sell their organic food. So it might be that the increased export from the EU to the US is not a direct result of the cost savings of the organic equivalence agreement, but a direct effect of the extra competition and therefore an indirect effect of the agreement. This may also explain the increase in export from the EU to the BRC countries of $9.1 million, an increase of 0.06% and an increase to the rest of the world of $46.52 million, which is 0.06%.

Now that the US have increased the export of food to the EU by a large amount, the export to the BRC countries as well as to the rest of the world has decreased by $18 million and $118.27 million respectively. So this can be explained by the shift in markets. For the BRC countries, the export from the BRC countries to the US has increased by $0.4 million, which can't barely be seen as an increase. But the export to the EU has decreased by $7.4 million, which is 0.04%. The export within BRC and to the rest of world also increased. Again this may be the result of the increased competition from the US in the EU. BRC countries may not manage to compete with the EU and the US on the EU and US market, as they have such high cost savings. Therefore BRC countries choose to trade with other BRC countries or the rest of the world. This is a possible case as intra trade in BRC and ROW increased 0,01% and trade between BRC and ROW increased 0,01%. The MRA has caused a shift in trade patterns.

The rest of the world has a 0,01% decrease in export to the EU, which can be declared by increased competition on the EU market. The 0,01% increase in ROW export to the US may indicate a slight backdoor effect.

However, due to very high cost savings in the US, the backdoor effect we expected (a remarkable increase in BRC and ROW export to US) did not take place. The US has a great competitive advantage with which it can repulse other parties on the EU and US market.

Conclusion is that the organic equivalence agreement resulted in a trade advantage for the US and the EU, with the strongest effect for the US on the EU market. As a result of this, third countries have less export opportunities to the US and the EU, with the strongest effect again for the EU market

Effect on prices and output

In the table below the effects of MRA on prices and output are depicted.

Table 4.17 – *Effects on prices and output*

	Change in overall consumer prices	Change in output	Producer price for home good
EU	-0.02%	-0.01%	-0.01%
US	-0.01%	0.05%	0.03%
BRC	0.01%	0.00%	0.00%
Rest of world	0.01%	0.00%	0.00%

The MRA is an agreement between the EU and the US and aligns the existing NTMs between the countries. This way trade is easier and cheaper. These cost savings will be calculated in the consumer prices. So the consumer prices in the EU and the US have been decreased. The increase of competition on the EU market brings lower consumer prices in the EU. This is the reason for the lower EU output and the lower producer price as well. Due to a large supply in the EU market, the EU will produce less and the food prices will decrease.

Prices in the US only decreased a bit. This decrease can be declared by the increased import from the EU and ROW. The US output increased 0,05% as US producers export more to the EU. Since MRA US producers got a better price for goods, which will be caused by the high cost savings.

Prices and output in BRC countries and the rest of the world have barely changed. This is because the US and the EU will have more trade with each other due to MRA and consequently the BRC countries and the rest of the world choose each other for trade partners. In this way BRC and ROW prices and output will be less affected by the MRA.

Effect on welfare

In the table below the producer surplus, the consumer surplus and the net welfare effect have been depicted. The net welfare effect is the sum of the producer and consumer surplus.

Table 4.18 – *Welfare effects, in $ million*

	Producer surplus	Consumer surplus	Net welfare effect
EU	-$40.9	$147.9	$107.0
US	$42.7	$28.5	$71.1
BRC	$2.5	-$12.0	-$9.5
Rest of world	$29.1	-$90.1	-$61.0
Total	$33.4	$74.3	$107.6

We can see the producer surplus in the EU decreases. This is a consequence of the increased competition on the EU market through cheaper US imports. Prices are lower while the supply has increased. Consequently, sales are lower and the producers have lower profits.

However, the consumer surplus in the EU market exploded. Due to the cost savings and higher imports of cheaper US organic food, prices decreased while supply increased. This benefits the welfare of consumers in the EU. In terms of welfare, the EU is the largest winner of the MRA.

The US is the second largest winner of the MRA. Here the producers mainly benefit, their surplus increased by $42.7 million. This may be caused by the increased export to the EU and the higher prices for producers. The EU producer surplus decrease can be equalized by the US producer surplus increase. The consumer surplus did increase as well, with $28.5 million. However, consumer surplus is much lower than in the EU and as, compared to the EU, consumer prices only decreased little and supply only increased a bit due to MRA.

Third countries have a small producer surplus as costs are lower while output is higher. The US export to these countries decreased, which makes the competition lower. Consumer's welfare will decrease. Reason may be the decreased US export and the higher consumer prices. The increased producer surplus does not compensate for the decreased consumer surplus, which makes the net welfare effect negative.

Upward harmonization

Harmonization aligns different standards in two or more jurisdictions by requiring both parties to follow the same regulations (Osborne, 2002). In this way firms do not need to comply with different sets of regulations any longer. Upward harmonization means that the country with the lower standards has to upgrade its standards to equal the standards of the other country. While the EU

and the US maintain quite the same standards (for the scope included in the equivalence agreement), US standards should be upgraded in order to reach the EU standards.

Cost savings in the US

Certification costs

MRA is known for its recognition of the results of conformity assessments performed by conformity assessment bodies (CABs) of the countries that are parties to the agreement. For harmonization this is not required. Therefore we assume US firms still need two certifications in order to sell products in their own market and on the EU market, after implementation of harmonization. US firms will choose the US label, as they probably produce in US and will only expand their market after success on their own market. The organic certificate costs US firms $2,120 per year, which is $9,540,000 per year for all US firms.[9]

Administrative burden

After upward equivalence US firms only need to keep track of changes of one system and only need to conform to one system of standards: the standards system of the EU.

First of all US firms need to know which upward requirements they should meet and should adapt these requirements in the production process before they can start the organic production. This process will be quite time-consuming, that is why we estimate 25 days for 'reduce duplicate requirements'.

Due to the upward harmonization US firms need to make a distinction between each type of activity, and do not need to make a distinction between crops and livestock. Besides US firms need to take into account the use of nonorganic substances and need to prove the specific knowledge of the staff. They do not need to set up a handling plan. US firms have to find a certifying agent in the EU and the US, who will do an inspection, fill in an application form and afterwards check the certificates.

The table below provides an overview of the estimation of the working days necessary before and after upward harmonization.

[9] $2,120 × 4500 firms = $9,540,000

Table 4.19 – *Working days per task in the US before and after upward harmonization*

Category	Number of days per year		
	Before	**After**	**MRA**
Reduce duplicate requirements	30	25	15
Distinction each type of organic	10	0	10
Different systems for each kind of activity	7	7	4
Use of allowed nonorganic substances	10	10	4
Set up a handling plan	5	0	5
Provide information on knowledge of staff	2	2	0
Gathering firm information and apply for certification	2.5	2.5	1.5
Find a certifying agent	5	5	3
Total	**71.5**	**51.5**	**42.5**

The average labour costs per hour in the US are $35, so the total costs for the administrative burden are $14,420.[10] For the US as a whole this is $64,890,000.[11]

Labeling costs

The last phase in the production process is labeling the products. Again the rules between the US and the EU are different, since products in the EU need the EU logo and US products need a US logo on the label. we assume that after upward harmonization US firms need only one system of labeling instead of two. Therefore the costs will be half of the costs before upward harmonization, which constitutes $19.04 million.

General export costs

The general export costs contain the costs of preparation and packaging, handling, transport, time for processing the certificate, time at the customs, insurance, cost of capital and tariffs.

The time for processing the certificate is the first cost that will change due to upward harmonization. The time will be shorter as electronic import certificates will increase the speed of obtaining such a certificate. We assume the costs for processing the certificate are now $22. These costs are higher than they are for MRA, as the CAB of the counterparty is not automatically recognized with upward harmonization, and thus the certification approval process takes (somewhat) longer.

[10] $35 × 8 hours a day × 46.5 hours = $14,420
[11] $14,420 × 4500 firms = $64,890,000

The time at the customs will decrease as well, as with upward harmonization controls are less necessary in a lot of cases. We assume this will be $8. These costs are higher than they are for MRA, as with MRA products are more easily recognized as 'permitted' than with upward harmonization. As US will export 36,030 containers to the EU in a year[12], the total export costs per year can be calculated.

Table 4.20 – *General export costs before and after upward harmonization in the US*

Category of costs	**Before**	**After**	**MRA**
Preparation and packaging	$900	$900	$900
Handling	$500	$500	$500
Transport	$1,050	$1,050	$1,050
Time for processing certificate	$28.5	$22	$20
Time at customs	$10	$8	$7.5
Insurance	$200	$200	$200
Cost of capital	$132	$132	$132
Tariffs	$439	$439	$439
Costs per container	**$3,259.5**	**$3251**	**$3,248.5**
Total export costs per year	**$117,439,785**	**$117,133,530**	**$117,043,455**

Total costs in the US

In the table below you can find the total costs in the US, before and after MRA.

[12] According to the United Nations Commodity Trade Statistics Database, the US exports more than $9 billion of food to the EU, of which 4% is organic. The value of one container (TEU) is $10,000.

Table 4.21 – *Total costs before and after upward harmonization in the US, in 1000*

Category of costs	Before	After
Organic certification	**$9,540**	**$9,540**
Administrative Burden	**$90,090**	**$64,890**
Reduce duplicate requirements	*$37,800*	*$31,500*
Distinction each type of organic	*$12,600*	*$0*
Different systems for each kind of activity	*$8,820*	*$8,820*
Use of allowed nonorganic substances	*$12,600*	*$12,600*
Set up a handling plan	*$6,300*	*$0*
Provide information on knowledge of staff	*$2,520*	*$2,520*
Gathering firm information and apply for certification	*$3,150*	*$3,150*
Find a certifying agent	*$6,300*	*$6,300*
Labeling costs	**$38,080**	**$19,040**
General export costs	**$117,439.785**	**$117,133.530**
Preparation and packaging	*$32,427*	*$32,427*
Handling	*$18,015*	*$18,015*
Transport	*$37,832*	*$37,831*
Time for processing certificate	*$1,025*	*$792.66*
Time at customs	*$360*	*$288.240*
Insurance	*$7,206*	*$7,206*
Cost of capital	*$4,756*	*$4,756*
Tariffs	*$15,817*	*$15,817*
Total	**$255,149.785**	**$210,603.53**

So in the US the cost savings are 17.5%.[13] The share of organic food of the total food market is 4%, so this comes down to 0.7%.

Cost savings in the EU

Certification costs

Because in harmonization parties do not recognize the results of conformity assessments performed by conformity assessment bodies (CABs) of the other party to the agreement, EU firms still need two certificates. Costs for these certificates are $2,882,000 for all EU firms per year.

[13] ($204,303.53 - $255,149.785) / $204,303.53 = -24.8876%

Administrative burden

After upward harmonization EU firms need to keep track of changes of only one system and need to conform to only one system of standards: the standards system of the EU.

First of all, EU firms need to know which upward requirements they should meet and adapt these requirements in the production process before they can start the organic production. This process will not be time-consuming for the EU as it already conforms to these standards. That is why we estimate it will take 10 days for 'reduce duplicate requirements'.

Due to the upward harmonization EU firms need to make a distinction between each type of activity, and do not need to make a distinction between crops and livestock. Next to this, EU firms need to take into account the use of non-organic substances and need to prove the specific knowledge of the staff. This way they do not need to set up a handling plan any longer. Lastly, EU firms have to find a certifying agent in the EU and the US who will do an inspection, fill in an application form and check the certificates afterwards.

The table below provides an overview of the estimation of the working days necessary before and after upward harmonization.

Table 4.22 – *Working days per task in the EU before and after upward harmonization*

Category	**Number of days per year**		
	Before	**After**	**MRA**
Reduce duplicate requirements	30	10	15
Distinction each type of organic	10	0	5
Different systems for each kind of activity	7	7	5
Use of allowed nonorganic substances	10	10	4
Set up a handling plan	5	0	0
Provide information on knowledge of staff	2	2	1
Gathering firm information and apply for certification	2.5	2.5	1.5
Find a certifying agent	5	5	3
Total	**71.5**	**36.5**	**34.5**

In the EU, the average labor costs per hour are still $23, meaning the administrative burden per firm is $6,716. [14] Since there are approximately 1350 firms in the EU, the total administrative burden is $9,066,600.[15]

Labeling costs

The last phase in the production process is labeling the products, again the rules between the US and the EU are different (see paragraph on labeling costs in the cost savings in the US). The same assumption applies here as in the case of cost savings in the US – that the costs will be half of the costs before upward harmonization, which is $12.25 million.

General export costs

The time for processing the certificate is the first cost that will change due to upward harmonization. The time will be shorter as electronic import certificates will increase the speed of obtaining such a certificate. We assume the costs for processing the certificate are now $22.

The time at the customs will decrease as well, as with upward harmonization controls are less necessary in a lot of cases. We assume this will be $8. These costs are higher than they are for MRA, as with MRA products are more easily recognized as 'permitted' than with upward harmonization.

In a year the EU will export almost 684,000 containers with organic food.

Table 4.23 – *General export costs before and after upward equivalence in the US*

Category of costs	**Before**	**After**	**MRA**
Preparation and packaging	$900	$900	$900
Handling	$500	$500	$500
Transport	$1,050	$1,050	$1,050
Time for processing certificate	$28.5	$22	$20
Time at customs	$10	$8	$7.5
Insurance	$200	$200	$200
Cost of capital	$132	$132	$132
Tariffs	$439	$439	$439
Costs per container	**$3,259.5**	**$3251**	**$3,248.5**
Total export costs per year	**$2,229,498,000**	**$2,223,684,000**	**$2,221,974,000**

[14] $23 × 8 hours a day × 36.5 hours = $6,716
[15] $6,716 × 4500 firms = $9,066,600

Total costs in the EU

In the table below you can find the total costs in the EU before and after upward harmonization.

Table 4.24 – *Total costs before and after upward harmonization in the EU, in 1000*

Category of costs	Before	After
Organic certification	**$2,882**	**$2,882**
Administrative Burden	**$17,760.6**	**$9,066.6**
Reduce duplicate requirements	*$7,452*	*$2,484*
Distinction each type of organic	*$2,484*	*$0*
Different systems for each kind of activity	*$1,738.8*	*$1,738.8*
Use of allowed nonorganic substances	*$2,484*	*$2,484*
Set up a handling plan	*$1,242*	*$0*
Provide information on knowledge of staff	*$496.8*	*$496.8*
Gathering firm information and apply for certification	*$621*	*$621*
Find a certifying agent	*$1,242*	*$1,242*
Labeling costs	**$24,499**	**$12,250**
General export costs	**$2,229,498**	**$2,223,684**
Preparation and packaging	*$615,600*	*$615,600*
Handling	*$342,000*	*$342,000*
Transport	*$718,200*	*$718,200*
Time for processing certificate	*$19,494*	*$15,048*
Time at customs	*$6,840*	*$5,472*
Insurance	*$136,800*	*$136,800*
Cost of capital	*$90,288*	*$90,288*
Tariffs	*$300,276*	*$300,276*
Total	**$2,274,639.6**	**$2,247,882.6**

So in the EU the cost savings are 1,19%. The share of organic food of the total food market is 1.9%, so this comes down to 0,02%. This cost savings percentage is much lower than the US cost savings percentage. This can be declared by the fact that EU labor costs are lower than US labor costs. Therefore, EU costs consist for a big part of general costs and these costs did not change that much.

With upward harmonization, the EU and US cost savings percentages are closer to each other than with MRA. This is a consequence of the fact that US has to adapt its production process more than the EU.

Cost savings in BRC

Certification costs

After upward harmonization, BRC countries still need two certificates. The certification costs are $1,575 per firm, which means $157,500 for all BRC firms.

Administrative burden

After upward harmonization BRC firms only need to keep track of changes of the EU standards system and only need to conform to this system of standards.

First of all, BRC firms need to know which upward requirements they should meet and should adapt these requirements in the production process before they can start the organic production. This process will be very time-consuming as the standards of BRC countries will be much lower than the standards of the EU, that is why we estimate 27 days for 'reduce duplicate requirements'.

Due to the upward harmonization BRC firms need to make a distinction between each type of activity, and do not need to make a distinction between crops and livestock. Besides BRC firms need to take into account the use of nonorganic substances and need to prove the specific knowledge of the staff. Moreover, they do not need to set up a handling plan. Lastly, BRC firms have to find a certifying agent in the EU and the US, which will do an inspection, fill in an application form and afterwards check the certificates.

The table below provides an overview of the estimation of the working days necessary before and after upward harmonization.

Table 4.25 – *Working days per task in the BRC countries, before and after upward harmonization*

Category	Number of days per year		
	Before	**After**	**MRA**
Reduce duplicate requirements	30	27	15
Distinction each type of organic	10	0	10
Different systems for each kind of activity	7	7	4
Use of allowed nonorganic substances	10	10	4
Set up a handling plan	5	0	5
Provide information on knowledge of staff	2	2	0
Gathering firm information and apply for certification	2.5	2.5	1.5
Find a certifying agent	5	5	3
Total	**71.5**	**53.5**	**42.5**

The total administrative burden in the BRC countries per year per firm is $2,782.[16] For all BRC countries this is $278,200.[17]

Labeling costs

We assume the EU and the US agree to have one label for organic food, which is obtainable for BRC firms as well. The labeling costs before upward harmonization for all BRC firms are $3.715 million. The total costs after MRA will be half of the costs before, since one labeling system can be abandoned, which is $1.857 million.

General export costs

The time for processing a certificate will decline as only one standard has to be checked. The time for processing a certificate is $22. The time at the customs will decline to $26, as with these standards upgrade checks should be stricter.

In the table below you can find the general export costs in BRC countries before and after upward harmonization. As the BRC exports more than 28,500 containers per year the total costs per year are shown as well.

[16] 53.5 hours × 8 hours × $6.5 = $2,782
[17] $2,782 × 100 firms = $278,200

Table 4.26 – *General export costs in the BRC countries before and after upward harmonization*

Category of costs	Before	After	MRA
Preparation and packaging	$900	$900	$900
Handling	$500	$500	$500
Transport	$1,520	$1,520	$1,520
Time for processing certificate	$28.5	$22	$20
Time at customs	$28	$26	$23
Insurance	$200	$200	$200
Cost of capital	$132	$132	$132
Tariffs	$380	$380	$380
Costs per container	**$3,688.5**	**$3,680**	**$3,675**
Total export costs per year	**$105,122,250**	**$104,880,000**	**$104,737,500**

Total costs in the BRC

In the table below you can find the total costs in the BRC, before and after upward harmonization.

Table 4.27 - *Total overview export costs in the BRC countries, in $1000*

Category of costs	Before	After
Organic certification	**$157.5**	**$157.5**
Administrative Burden	**$371.8**	**$278.2**
Reduce duplicate requirements	*$156*	*$140.4*
Distinction each type of organic	*$52*	*$0*
Different systems for each kind of activity	*$36.4*	*$36.4*
Use of allowed nonorganic substances	*$52*	*$52*
Set up a handling plan	*$26*	*$0*
Provide information on knowledge of staff	*$10.4*	*$10.4*
Gathering firm information and apply for certification	*$13*	*$13*
Find a certifying agent	*$26*	*$26*
Labeling costs	**$3,715**	**$1,857**
General export costs	**$105,122.25**	**$104,880**
Preparation and packaging	*$25,650*	*$25,650*
Handling	*$14,250*	*$14,250*
Transport	*$43,320*	*$43,320*
Time for processing certificate	*$812.25*	*$627*
Time at customs	*$798*	*$741*

Insurance	*$5,700*	*$5,700*
Cost of capital	*$3,762*	*$3,762*
Tariffs	*$10,830*	*$10,830*
Total	**$109,366.55**	**$106,897.4**

For BRC countries the cost savings percentage is 2,2577%. Corrected with the share of organic food of 0.93% this is 0.0210%. Compared to MRA, the cost savings percentage is lower. This may be declared by the fact BRC countries have to make more production adjustment and still need to have two certificates.

Cost savings in the rest of the world

It is quite complicated to calculate the exact cost savings in the rest of the world. That is why we assume the rest of the world will have the same cost savings percentage as the BRC countries have. This is a remarkable point regarding the organic equivalence thesis, where the rest of the world will not have any cost savings.

Final tariff equivalents

By subtracting the cost savings percentages we can find the final tariff equivalents. See the tables below.

The cost savings percentages were as follows:

Table 4.28 - *Cost savings percentages*

US	0,6984%
EU	0,0226%
BRC	0.0210%
ROW	0.0210%

Table 4.29 – *Total initial tariff equivalents*

	EU	US	BRC	Rest of world
EU	1.2945	1.7864	1.7220	1.5527
US	1.6129	1.2540	1.8933	1.8234
BRC	1.5064	2.0026	1.8845	1.5681
Rest of world	1.7097	2.0863	2.0859	1.6727

Table 4.30 – *Final tariff equivalents after upward harmonization*

	EU	US	BRC	Rest of world
EU	1.2945	1.7862	1.7220	1.5527
US	1.6059	1.2540	1.8933	1.8234
BRC	1.5062	2.0024	1.8845	1.5681
Rest of world	1.7094	2.0861	2.0859	1.6727

Elasticities

The last data necessary for the GSIM, are the composite demand elasticity, the industry supply elasticity and the elasticity of substitution. For a more accurate methodology and results, the actual elasticities for the food sector should be derived. Since these elasticities are not available, we will hold on to the values of Francois and Hall, which is widely accepted in academic literature. Therefore the composite demand elasticity is set at -1.25 and the industry supply elasticity is 1.5. The substitution elasticity is set at 6, while normally this is 5. A substitution elasticity of 6 implies that a 1 percent change in relative prices leads to a 6 per cent change in the ratio of exports.[18] High values are appropriate for more homogeneous goods. With upward harmonization, goods are more homogeneous and that is why we consider this value more appropriate.

Results and analysis

Effect on trade flows

The tables below provide an overview of the percentage change in trade quantities and the change in trade at world price, as a result of upward equivalence. The numbers in bold are the trade values at world prices after the organic equivalence agreement, above are the trade values before the agreement.

[18] Vanzetti, D., Cordóba, S.F. & Chau, V. *Banana Split: How EU Policies Divide Global Producers.* 2005, page 7.

Table 4.31 - *Percentage change in trade quantities*

	EU	US	BRC	ROW
EU	-0.04	0.07	0.07	0.07
US	2.36	0.00	-0.14	-0.14
BRC	-0.03	0.02	0.01	0.01
ROW	0.00	0.00	0.00	0.00

Table 4.32 - *Trade in world prices, before and after upward harmonization, in million dollars*

	EU	US	BRC	ROW
EU	\$344,242.50 **\$344,076.70**	\$15,591.50 **\$15,601.80**	\$16,758.70 **\$16,768.70**	\$85,610.48 **\$85,662.30**
US	\$9,007.60 **\$9,222.40**	\$0.00 **\$0.00**	\$15,483.50 **\$15,466.10**	\$101,738.27 **\$101,624.20**
BRC	\$21,020.50 **\$21,013.80**	\$9.794,90 **\$9,796.70**	\$22,141,50 **\$22,143.70**	\$89,128.34 **\$89,137.70**
ROW	\$101,957.27 **\$101,961.10**	\$86,548.23 **\$86,550.90**	\$67,609.22 **\$67,613.60**	\$789,221.31 **\$789,277.50**

The EU intra trade has decreased \$165.8 million, which is 0.04%, slightly more than the decrease with MRA. This may be the consequence of the increased US export to the EU and thus the competition on the EU market.

The EU export to the US has increased, probably by cost savings due to the upward harmonization, but may also be the consequence of the higher supply on the EU market. The EU exports more to the US than it did with MRA, as the cost savings percentages are closer to each other now than with MRA. This may be the same reason for the fact that the EU exports more to BRC and ROW now than with MRA. Competition on the EU market has become that high, that EU firms export to BRC and the rest of the world now.

The US export in to the EU has increased by 2,36%, which is a lot but less than with MRA. US export into the EU has decreased due to the upward harmonization which makes it easier to trade. The US were the biggest cost saver, the country with the biggest benefits, thus the US will increase its export the most.

The US export to BRC and the rest of the world has decreased by 0,14%. A reason to this can be that the US focuses on the EU market and thus decreases its sales in BRC countries and the rest of the world.

The BRC export to the EU has decreased by 0.03%, probably because the competition in the EU market has increased and BRC can't compete with the US on the EU market.
US export to the EU increased a lot while EU export to US only increased a bit. Probably the BRC countries caught its chance and increased its export to the US by 0.02%. Actually we expected the BRC export to the US to decrease, as they would not be able to achieve the high EU standards.
As the trade between the EU and the US increased, the intra BRC trade and the trade between BRC and the rest of the world increased slightly. Thus a slight shift in trade patterns has been caused by upward harmonization.

Effect on prices and output

In the table below the effects of upward harmonization on prices and output are depicted.

Table 4.33 – *Effects on prices and output*

	Change in overall consumer prices	Change in output	Producer price for home good
EU	-0.02%	-0.01%	-0.01%
US	-0.01%	0.04%	0.03%
BRC	0.00%	0.00%	0.00%
Rest of world	0.00%	0.00%	0.00%

From this table we can see that the effects of upward harmonization are similar to the effects of MRA, but more modest. A reason for this may be the cost differences which are closer to each other with upward harmonization.

Upward harmonization makes trade between the EU and the US easier and therefore cheaper. These cost savings will be calculated in the consumer prices. Consumer prices in the EU and the US have decreased. The increase of competition on the EU market brings lower consumer prices in the EU than in the US. This is the reason for the lower EU output as well as the lower producer price. Due to a large supply in the EU market, the EU will produce less and the food prices will decrease.

Prices in the US decreased only marginally. This decrease can be declared by the increased import from the EU and ROW. The US output increased by 0,04% as US producers export more to the EU

now. Since upward harmonization US producers got a better price for goods, which will be caused by the high cost savings.

Prices and output in BRC countries and the rest of the world have barely changed. This is because the US and the EU will have more trade with each other due to upward harmonization and consequently the BRC countries and the rest of the world will choose each other as trade partners. In this way BRC and ROW prices and output will be less affected by the upward harmonization.

Effect on welfare

In the table below the producer surplus, the consumer surplus and the net welfare effect have been depicted. The net welfare effect is the sum of the producer and consumer surplus.

Table 4.34 – *Welfare effects, in $ million*

	Producer surplus	Consumer surplus	Net welfare effect
EU	-$37.5	$124.4	$86.9
US	$33.3	$20	$53.3
BRC	$2.7	-$9.8	-$7.1
Rest of world	$26.9	-$74.8	-$47.9
Total	$25.4	$59.8	$85.2

Welfare effects caused by MRA and upward harmonization are quite similar. However, compared to the welfare effect of MRA, the welfare effects with upward harmonization are more modest. This may be the consequence of the more modest cost savings percentages.

We can see the producer surplus in the EU decreases. This is a consequence of the increased competition on the EU market. Prices are lower while the supply increased. Consequently, sales are lower and therefore the producers have lower profits.

However, the consumer surplus in the EU market exploded. Due to the cost savings and higher competition in the EU, prices decreased while supply increased. This benefits the welfare of consumers in the EU. In terms of welfare, the EU is the largest winner of the upward harmonization.

The US is the second largest winner of the upward harmonization. Here the producers mainly benefit, their surplus increased by $33.3 million. This may be caused by the increased export to the EU and the higher prices for producers. The consumer surplus did increase as well, by $20 million.

However, consumer surplus is much lower than in the EU because, compared to the EU, consumer prices decreased only slightly and supply increased marginally due to upward harmonization.

Third countries have a small producer surplus as costs are lower while output is higher. As a result, the US exports to these countries will decrease which makes the competition lower. Consumers' welfare will decrease as well. Reason for this may be the decreased US export and higher consumer prices. The increased producers' surplus does not compensate for the decreased consumer surplus, which makes the net welfare effect negative.

4.2.2 Thesis 2: The economics of the mutual recognition agreement on AEO and C-TPAT

Way of alignment used in GSIM

The authors have calculated the economic effect of MRA in the maritime industry (MEL Group, 2012). After the 9-11 attacks in September 2001, legislators considered maritime containers risky because of danger of a terrorist attack. That is why public-private partnership initiatives have been developed. The US based Customs Trade Partnership against Terrorism (C-TPAT) and its European equivalent Authorized Economic Operator (AEO) are semi-governmental organizations that look for the participation from international commercial trading companies. When these companies meet the minimum security requirements set by the system, they get benefits such as reduced custom checks. In November 2011, the Transatlantic Economic Council (TEC) endorsed the text of the Mutual Recognition Decision providing for mutual recognition between the US C-TPAT and the EU's AEO trade partnership programs.

The authors claim to use mutual recognition in its GSIM because that is what was done in aligning C-TPAT and AEO. However, in my view they have not fully applied the mutual recognition. Namely, they assumed constant the effect for the rest of the world, which is necessary for an adequate answer. When a third country meets the standards of one of the contract parties, they can ship more easily to the other party as well. That is why, we will recalculate the effect of MRA, from our point of view. The authors do not make a difference between BRC countries and the rest of the world because it was not the focus of their thesis, so we will not do it either.

Methodology

First of all, we will recalculate the economic effect of MRA, after that we will calculate the economic effect of equivalence. For equivalence, differing standards or procedures don't need to be identical as long as they produce the same or similar results (TACD, 2001). Equivalence is very result-oriented, while harmonization is more process-oriented.

For my calculations we will use the information provided in author's original report.

MRA

Cost savings in the EU and the US

According to me, cost savings in the EU and the US have been calculated by the authors in an accurate way. The authors distinguish four different types of costs. The first one is the opportunity costs of capital, as capital is saved in shipped containers and may be employed elsewhere. Secondly, there are gate costs, which may be lower with MRA as containers only need to be checked once. These costs may be lower because efficiency will increase due to lower levels of uncertainty and a better cooperation between governments and private sector. The third type of costs are the maintenance costs, which may be lower with MRA because trading companies need to comply with only one system of regulations instead of two. The last costs type is the safety stock, which may be lower with MRA due to reduced lead time as a retailers needs less safety stock to meet demand during waiting times for the new stock.

Author's findings are depicted in the tables below.

Table 4.35 – US cost savings after MRA

Category of costs	Before	After	Cost savings
Opportunity costs	$1,671,452.05	$626,794.52	$1,044,657.53
Gate costs	$40,000,000.00	$20,000,000.00	$20,000,000.00
Implementation / maintenance costs	$90,625,000.00	$79,910,714.29	$10,714,285.71
Safety stock	$13,928,767.12	$5,223,287.67	$8,705,479.45
Total	**$146,225,219.18**	**$105,760,796.48**	**$40,464,422.70**

The cost saving percentage for US is 27.67%[19], this comes down to 0.03% when we take into account the market share.

[19] $40.464.422,70 / $146.225.219,18 = 0.27672670

Table 4.36 – EU cost savings after MRA

Category of costs	Before	After	Cost savings
Opportunity costs	$5,616,078.90	$292,504.11	$5,323,574.79
Gate costs	$134.400.000,00	$11,200,000.00	$123.200.000,00
Implementation/maintenance costs	$78.125.000,00	$69.196.428,57	$8.928.571,43
Safety stock	$46.800.657,53	$5.850.082,19	$40.950.575,34
Total	**$264.941.736,44**	**$86.539.014,87**	**$178.403.721,57**

The cost savings percentage for the EU is 67.34%[20], this comes down to 0.078% when we take into account the market share. As we can see the EU cost savings are much higher than US cost savings. This is partly because the initial costs for the EU were much higher but especially because opportunity and gate costs in the EU are much lower after the MRA.

With these cost savings the authors calculated the final tariff equivalents which resulted in the outcomes presented below:

Table 4.37 - *Percentage change in trade quantities after MRA*

	EU	US	ROW
EU	0.00	0.05	-0.01
US	0.13	0.00	-0.02
ROW	-0.01	0.00	0.00

As we can see, the only notable change in trade quantities is the trade between the EU and the US – it has increased. We expect more change in this outcome when the tariffs for the rest of the world have been applied in the GSIM.

[20] $178.402.721,57 / $264.941.736,44 = 0.76336587

Table 4.38 – *Welfare effects, in $ million*

	Producer surplus	Consumer surplus	Net welfare effect
US	$45.5	$198.5	$244.0
EU	$121.5	$74.0	$195.5
ROW	-$29.3	-$107.1	-$136.4
Total	$137.7	$165.4	$303.1

As we can see the US consumer surplus is enormous, which may be the consequence of high cost savings in the EU. The high cost savings in the EU make it attractive to produce and export to the US. This way the high cost savings in the EU make it cheaper to export to the US, which pushes the sales and thus the EU producer surplus. We expect these outcomes to be different when the tariffs for the rest of the world have been applied in the GSIM. That is why we will analyze the results completely after it has been adjusted in the model.

Cost savings in ROW

Trade companies from the rest of the world can trade more easily with the EU and the US because once they have a certificate now, they can trade with both parties. The authors have not taken into account the cost savings for trade companies in the rest of the world because they assumed AEO C-TPAT alignment would only apply to EU or US firms. If we let go of this assumption, we find out that we miss a lot of data about the costs and the market share, which makes it hard to calculate the percentage cost savings. Therefore we will estimate the cost savings percentage, based on the data we know from the EU and the US.

We expect the cost savings percentage for the rest of the world to be lower than the cost savings percentage for the EU and the US. Reason for this is that the EU and the US sign the MRA and thus it is assumable that the primary focus of these parties is minimizing their own costs. However, trade companies from the rest of the world will trade a lot with the EU and the US, so the market share will be quite high. That is why we assume the cost savings percentage for the rest of the world will be somewhat less than US cost savings percentage. We choose that the initial tariff equivalents for the rest of the world will be deducted with a cost savings percentage of 0.03% from the final tariff equivalents.

This way we will come to the following tariff equivalents:

Table 4.39 - Cost savings percentages

US	0.03175%
EU	0.07815%
ROW	0.02900%

Table 4.40 – *Total initial tariff equivalents*

	US	EU	ROW
US	1.0000	1.0007	1.0007
EU	1.0011	1.0000	1.0007
ROW	1.0012	1.0008	1.0007

Table 4.41 – *Final tariff equivalents after MRA*

	US	EU	ROW
US	1.0000	1.0004	1.0007
EU	1.0003	1.0000	1.0007
ROW	1.0009	1.0005	1.0007

Elasticities

The last data necessary for the GSIM, are the composite demand elasticity, the industry supply elasticity and the elasticity of substitution. For a more accurate methodology and results, the actual elasticities for the food sector should be derived. Since these elasticities are not available, we will hold on to the values of Francois and Hall, which are widely accepted in academic literature. So the composite demand elasticity is set at -1.25 and the industry supply elasticity is set at 1.5. The substitution elasticity is set at 2 (as we assume MEL group chose this number deliberately).

Results and analysis

Effect on trade flows

The tables below provide an overview of the percentage change in trade quantities as a result of MRA and the change in trade at world price. In table 4.43, the numbers in bold are the trade values at world prices after the organic equivalence agreement, above are the trade values before the agreement.

Table 4.42 - *Percentage change in trade quantities*

	US	EU	ROW
US	0.00	0.04	0.00
EU	0.11	0.00	-0.02
ROW	0.03	0.03	0.00

Table 4.43 - *Trade in world prices, before and after MRA, in million dollars*

	US	EU	ROW
US	\$0.00 **\$0.00**	\$254,200.00 **\$254,302.39**	\$870,890.02 **\$870,883.58**
EU	\$284,704.00 **\$285,051.00**	\$0.00 **\$0.00**	\$981,111.22 **\$981,049.10**
ROW	\$1,307,708.04 **\$1,308,096.28**	\$1,419,943.98 **\$1,420,444.02**	\$8,857,394.00 **\$8,857,367.17**

The EU has the largest cost savings, while the savings for the US are minor. This has an effect on trade. The export from the EU to the US increased by \$347 million, which is an increase of 0.11%. An explanation for this might be that countries in the EU can now export their products with the same ease to the US as to other countries within the EU, while this used to take much more effort before the agreement. The EU's cost savings are the highest, so producers will benefit the most, which is reflected in the increased sales to the US. As shipping to the US has become relatively cheaper than shipping to the rest of the world, the EU trade to the rest of the world decreased by 0.02%. There is a trade shift for the EU export: the EU exports more to the US and thus less to the rest of the world.

The increased EU export to the US has caused more competition on the US market. Together with the costs benefits of MRA, this forms a reason US export to the EU increased by 0.04%. US export to the rest of the world did not change, which may be explained with the barely increased US output while US export to the EU increased.

Export from the rest of the world to the US and the EU both increased by 0.03%. Namely, the MRA benefits not only the parties to the agreement, but the rest of the world as well. The rest of the world can have easier access to the EU/US market as now it needs only one certificate to serve both parties.

By adding the cost savings percentage for the rest of the world to the GSIM, the percentage change in trade quantities changed. The percentage change in trade quantities for trade between the EU and the US became less due to the ROW cost savings. The rest of the world will increase its export to the EU and the US, to the detriment of the trade between the contracting parties. The rest of the world is in this position as with MRA it can trade with the EU and the US easier. The percentage change in the EU export to the rest of the world is not longer negative, as the EU faces more competition on its market.

Effect on prices and output

In the table below the effects of MRA on prices and output are depicted.

Table 4.44 – *Effects on prices and output*

	Change in overall consumer prices	Change in output	Producer price for home good
US	-0.03%	0.01%	0.00%
EU	-0.03%	0.01%	0.01%
Rest of world	0.00%	0.00%	0.00%

We have seen the competition on the US market has increased most as the EU and the ROW export to the US increased. This is reflected in the US consumer price: due to the increased competition consumer prices decreased by 0.03%. The same counts for the EU, but in a less heavy way: the EU consumer prices decreased by 0.03%. As competition on the ROW market decreased, ROW consumer prices slightly increased by 0.0036%. Overall, all countries increased their export, this is reflected in the increased output in the countries. The EU had the highest trade increase, thus EU's output is the highest as well. Because sales increased, producer prices increased as well. Producers can save a lot of costs now, as trade barriers have been abandoned.

As the rest of the world is not party to the agreement and thus had relatively less cost savings than the US and the EU, prices and output are less affected by the MRA than they are for the US and the EU.

Effect on welfare

In the table below the producer surplus, the consumer surplus and the net welfare effect have been depicted. The net welfare effect is the sum of the producer and consumer surplus.

Table 4.45 – *Welfare effects, in $ million*

	Producer surplus	Consumer surplus	Net welfare effect
US	$38.38	$537.28	$575.66
EU	$113.95	$441.63	$555.59
ROW	$344.58	-$381.76	-$37.18
Total	$496.91	$597.15	$1094.07

After the implementation of ROW cost savings, the welfare effects have exploded. The net welfare effect is more than three times higher than it was before implementation of the ROW cost savings.

US consumer surplus is $537.28 million after MRA, which is the consequence of the high cost savings in the EU and BRC, causing high exports to the US. US consumers encounter more supply and lower prices, exactly what they want. The EU consumer surplus increased as well, because for them the same thing counts: supply increased and prices decreased. However, these changes are less heavy than they are for the US, so the US consumer surplus is higher than the EU consumer surplus.

Consumers in the rest of the world face higher prices while lower supply. Therefore consumer surplus in the rest of the world is negative. These high prices and lower supply are caused by high ROW exports and low ROW imports.

However, ROW has the highest producer surplus as producers encounter higher consumer prices, slightly higher output and 0.06% higher exports due to their cost savings following from the MRA. The US and EU producer surplus are positive as well, but relatively not very high. The US producer surplus is $38.38 million, which is quite low. Cause is the lower consumer prices and barely higher producer prices and output, due to high competition on the US market. The EU producer surplus is $113.95 million, caused by increased producer prices and increased sales. The producers in the EU have bigger benefits than the US producers, as the EU cost savings are higher.

Equivalence

For equivalence, differing standards or procedures don't need to be identical as long as they produce the same or similar results (TACD, 2001). Equivalence is very result-oriented, while harmonization is also process-oriented. For harmonization the procedure and standards must be identical, while for equivalence the results must be 'close enough' to get similar results.

Equivalence seems a good way of alignment to me as AEO and C-TPAT are semi-governmental organizations that look for the participation from international commercial trading companies. When these companies meet the minimum security requirements set by the system, they get benefits such as reduced custom checks. These minimum security requirements are result-oriented, it does not matter how you reach them, as long as you can ascertain the security. Therefore we want to calculate the economic effect of this way of alignment.

Cost savings in US

The cost savings in the US can be split up in the opportunity costs, gate costs, implementation costs and safety stock costs. On the basis of these types of costs we will calculate the cost savings as a result of equivalence.

Opportunity costs

The opportunity costs are calculated by means of multiplying the interest rate by the value of customs check. The value of customs check can be calculated by multiplying the total value of import by the customs check and the days at the customs as a share per year.

We estimate the opportunity costs for equivalence higher than for MRA, as a customs check will be held more often with equivalence. Reason for this is that equivalence is very results-oriented and parties do not recognize the standards body of the other party, which makes it necessary to have more customs checks. Therefore we set customs check at value 0.014.

Table 4.46 – *Calculation value of customs check in US*

	Total Value of Import (EU)	Customs check	Day at customs
Before alignment	$254,200,000,000.00	0.02	4.00
MRA	$254,200,000,000.00	0.01	3.00
Equivalence	$254,200,000,000.00	0.014	3.00

Table 4.47 – *Calculation opportunity costs in US*

	Value of customs checks	Interest rate	Opportunity costs
Before alignment	$55,715,068.49[21]	0.03	$1,671,452.05
MRA	$20,893,150.68[22]	0.03	$626,794.52
Equivalence	$29,250,410.96[23]	0.03	$877,512.33

Gate costs

The gate costs can be calculated by multiplying the costs of security check per TEU with the number of containers to be checked. The number of containers to be checked can be determined by multiplying the container trade flow with the customs check.

The number of containers checked will be 35,000. This is more than with MRA as equivalence brings on standard level and CABs of other parties are not recognized. This makes it necessary to be stricter at the gate.

Table 4.48 – *Calculation number of containers to be checked in US*

	Container Trade Flow (TEU)	Customs check	Number of containers checked
Before alignment	$2,500,000.00	0.02	50,000
MRA	$2,500,000.00	0.01	25,000
Equivalence	$2,500,000.00	0.014	35,000

Table 4.49 – *Calculation gate costs in US*

	Number of containers checked	Costs of security check per TEU	Gate costs
Before alignment	50,000	$800.00	$40,000,000.00
MRA	25,000	$800.00	$20,000,000.00
Equivalence	35,000	$800.00	$28,000,000.00

Implementation / maintenance costs

Through alignment trading companies only need to comply with one instead of two regulation systems. Therefore trading companies may save money with MRA and equivalence.

The costs on maintenance and implementation before alignment can be calculated as follows:

[21] $254,200,000,000.00 × 0.02 × (4/365 days) = $55,715,068.49
[22] $254,200,000,000.00 × 0.01 × (3/365 days) = $20,893,150.68
[23] $254,200,000,000.00 × 0.014 × (3/365 days) = $29,250,410.96

(US Implementation costs C-TPAT × US Participants EU)/5 + (US Maintaining costs C-TPAT × US Participants EU) + (EU Participants US × EU Implementation costs C-TPAT/5) + (EU Maintaining costs C-TPAT × EU Participants US)

With this formula the authors came to implementation costs à $90,625,000.00 before MRA.

The costs on maintenance and implementation after MRA can be calculated as follows:

(US Implementation costs AEO × US Participants EU)/5 + (US Maintaining costs AEO × US Participants EU) + (EU Participants US × EU Implementation costs C-TPAT/5) + (EU Maintaining costs C-TPAT × Participants US)

With this formula the authors came to implementation costs à $79,910,714.29 after MRA.

With equivalence there will be one standard that has to be reached. This will probably mean implementation costs are higher than with MRA, as the standard level would not just be recognized but should be adjusted to reach the standard. Therefore we assume all implementation costs to be 20% higher than with MRA.

Thus the costs on maintenance and implementation after equivalence can be calculated as follows:

((US Implementation costs AEO × 1.2) × US Participants EU)/5 + (US Maintaining costs AEO × US Participants EU) + (EU Participants US × (EU Implementation costs C-TPAT × 1.2)/5) + (EU Maintaining costs C-TPAT × Participants US)

When we fill in this formula we come to the following:

((25,714.29 × 1.2) × 5000)/5 + (7,714.29 × 5,000) + (1,250 × (17,500 × 1.2)/5) + (9,000 × 1,250)

With this formula we come to implementation costs à 85,928,598.00 after equivalence.

Table 4.50 – *Implementation / maintenance costs in US*

	Implementation / maintenance costs
Before alignment	$90,625,000.00
MRA	$79,910,714.29
Equivalence	$85,928,598.00

Safety stock costs

The safety stock costs are determined by a myriad of factors, that is why we will only focus here on the factors that will change due to equivalence. The factors that we change are the number of delays

and the percentage of container checked. We expect somewhat more delays at the customs as checks will be more specific. Namely, with equivalence one specific standard level must be reached, while with MRA CABs from the other party are recognized and it is not necessary that the parties reach a certain standard level. The percentage of checked containers will be slightly higher for the same reason.

Table 4.51 – *Calculation safety stock costs in US*

	Delays	Percentage of container checked	Safety stock costs
Before alignment	4.00	0.02	$13,928,767.12
MRA	3.00	0.01	$5,223,287.67
Equivalence	3.20	0.014	$7,800,109.59

Total costs in the US

In the table below you can find the total costs in the US, before and after equivalence.

Table 4.52 – *Total costs before and after equivalence in the US*

Category of costs	Before	After
Opportunity costs	$1,671,452.05	$877,512.33
Gate costs	$40,000,000.00	$28,000,000.00
Implementation / maintenance costs	$90,625,000.00	$85.928.598,00
Safety stock costs	$13,928,767.12	$7,800,109.59
Total	**$146,225,219.18**	**$122,606,219.92**

The cost savings percentage for US is 16.15%[24], this comes down to 0.02% when we take into account the market share of 0.11%.

[24] ($122,606,219.92 - $146,225,219.18) / $146,225,219.18 = 0.1615

Cost savings in the EU

The cost savings in the US can be split up in the opportunity costs, gate costs, implementation costs and safety stock costs. On the basis of these types of costs we will calculate the cost savings as a result of equivalence.

Opportunity costs

The opportunity costs are calculated by multiplying the interest rate with the value of customs check. The value of customs check can be calculated by multiplying the total value of import with the customs check and the days at the customs as a share per year.

We estimate the opportunity costs for equivalence to be higher than for MRA, as a customs check will be held more often with equivalence. Reason for this is that equivalence is very results-oriented and parties do not recognize the standards body of the other party, which makes it necessary to have more customs checks. Therefore we set customs check at value 0.010.

Table 4.53 – *Calculation value of customs check in the EU*

	Total Value of Import (EU)	Customs check	Day at customs
Before alignment	$284,704,000,000.00	0.060	4.00
MRA	$284,704,000,000.00	0.005	3.00
Equivalence	$284,704,000,000.00	0.010	3.00

Table 4.54 – *Calculation opportunity costs in the EU*

	Value of customs checks	Interest rate	Opportunity costs
Before alignment	$187,202,630.14[25]	0.030	$5,616,078.90
MRA	$11,700,164.38[26]	0.025	$292,504.11
Equivalence	$23,400,328.77[27]	0.025	$585,008.22

Gate costs

The gate costs can be calculated by multiplying the costs of security check per TEU with the number of containers to be checked. The number of containers to be checked can be determined by multiplying the container trade flow with the customs check.

[25] $284,704,000,000.00 × 0.060 × (4/365 days) = $187,202,630.14
[26] $284,704,000,000.00 × 0.005 × (3/365 days) = $11,700,164.38
[27] $284,704,000,000.00 × 0.010 × (3/365 days) = $23,400,328.77

The number of containers checked will be 20,000. This is more than with MRA as equivalence brings on standard level and CABs of other parties are not recognized. This makes it necessary to be stricter at the gate.

Table 4.55 – *Calculation number of containers to be checked in the EU*

	Container Trade Flow (TEU)	Customs check	Number of containers checked
Before alignment	$2,800,000.00	0.06	168,000
MRA	$2,800,000.00	0.005	14,000
Equivalence	$2,800,000.00	0.010	20,000

Table 4.56 – *Calculation gate costs in the EU*

	Number of containers checked	Costs of security check per TEU	Gate costs
Before alignment	168,000	$800.00	$134,400,000.00
MRA	14,000	$800.00	$11,200,000.00
Equivalence	20,000	$800.00	$16,000,000.00

Implementation / maintenance costs

Through alignment trading companies need to comply with only one instead of two regulation systems. Therefore trading companies may save money with MRA and equivalence.

The costs on maintenance and implementation before alignment can be calculated as follows:

(EU Implementation costs C-TPAT × EU Participants EU)/5 + (EU Maintaining costs C-TPAT × EU Participants EU) + (EU Participants US × EU Implementation costs C-TPAT/5) + (EU Maintaining costs C-TPAT × EU Participants US)

With this formula the authors came to implementation costs à $78.125.000,00 before MRA.

The costs on maintenance and implementation after MRA can be calculated as follows:

(EU Implementation costs AEO × EU Participants EU)/5 + (EU Maintaining costs AEO × EU Participants EU) + (EU Participants US × EU Implementation costs C-TPAT/5) + (EU Maintaining costs C-TPAT × EU Participants US)

With this formula the authors came to implementation costs à $69,196,428.57 after MRA.

With equivalence there will be one standard that has to be reached. This will probably mean implementation costs are higher than with MRA, as the standard level would not just be recognized but should be adjusted to reach the standard. Therefore we assume all implementation costs to be 20% higher than with MRA.

Thus the costs on maintenance and implementation after equivalence can be calculated as follows:

((EU Implementation costs AEO × 1.2) × EU Participants EU)/5 + (EU Maintaining costs AEO × EU Participants EU) + (EU Participants US × (EU Implementation costs C-TPAT × 1.2)/5) + (EU Maintaining costs C-TPAT × EU Participants US)

When we fill in this formula we come to the following:

((15,000 × 1.2) × 5,000)/5 + (7,714.29 × 5,000) + (1,250 × (17,500 × 1.2)/5) + (9,000 × 1,250)

With this formula we come to implementation costs à 73,071,450.00 after equivalence.

Table 4.57 – *Implementation / maintenance costs in the EU*

	Implementation / maintenance costs
Before alignment	$78,125,000.00
MRA	$69,196,428.57
Equivalence	$73,071,450.00

Safety stock costs

The safety stock costs are determined by a myriad of factors, that is why we will only focus here on the factors that will change due to equivalence. The factors that we change are the number of delays and the percentage of container checked. We expect somewhat more delays at the customs as checks will be more specific. Namely, with equivalence one specific standard level there must be reached while with MRA CABs from the other party are recognized and parties are not obliged to reach a certain standard level. The percentage of checked containers will be slightly higher for the same reason.

Table 4.58 – *Calculation safety stock costs in the EU*

	Delays	Percentage of container checked	Safety stock costs
Before alignment	4.00	0.06	$46,800,657.53
MRA	3.00	0.01	$5,850,082.19
Equivalence	3.20	0.016	$9,984,140.27

Total costs in the EU

In the table below you can find the total costs in the EU, before and after equivalence.

Table 4.59 – *Total costs before and after equivalence in the EU*

Category of costs	Before	After
Opportunity costs	$5,616,078.90	$585,008.22
Gate costs	$134,400,000.00	$16,000,000.00
Implementation / maintenance costs	$78,125,000.00	$73,071,450.00
Safety stock costs	$46,800,657.53	$9,984,140.27
Total	**$246,941,736.44**	**$99,640,598.49**

The cost savings percentage for the EU is 59.65%[28], this comes down to 0.07% when we take into account the market share of 0.11%.

Cost savings in ROW

Trade companies from the rest of the world can trade more easily with the EU and the US because they have to comply with only one standard when they want to trade with them. The authors have not taken into account the cost savings for trade companies in the rest of the world. Therefore we miss a lot of data about the costs and the market share, which makes it hard to calculate the percentage cost savings. Therefore we will estimate the cost savings percentage, based on the data we know from the EU and the US.

We expect the cost savings percentage for the rest of the world to be lower than the cost savings percentage for the EU and the US. Reason for this is that the EU and the US sign the MRA and thus it is possible to assume that they will have the cost savings of it. In addition, trade companies from the ROW still need two certificates as parties only recognize each other's CABs with MRA. Trade companies from the rest of the world will trade a lot with the EU and the US, so the market share will be quite high. That is why we assume the cost savings percentage for the rest of the world is will be somewhat less than US cost savings percentage. We choose the initial tariff equivalents for the rest of the world will be deducted with 0.012% cost savings percentage to the final tariff equivalents.

In this way we will come to the following tariff equivalents:

[28] ($99,640,598.49 - $246,941,736.44) / $246,941,736.44 = 0.5965

Table 4.60 - Cost savings percentages

US	0.01852%
EU	0.06925%
ROW	0.01200%

Table 4.61 – *Total initial tariff equivalents*

	US	EU	ROW
US	1.0000	1.0007	1.0007
EU	1.0011	1.0000	1.0007
ROW	1.0012	1.0008	1.0007

Table 4.62 – *Final tariff equivalents after equivalence*

	US	EU	ROW
US	1.0000	1.0005	1.0007
EU	1.0004	1.0000	1.0007
ROW	1.0011	1.0007	1.0007

Elasticities

The last data necessary for the GSIM, are the composite demand elasticity, the industry supply elasticity and the elasticity of substitution. For a more accurate methodology and results, the actual elasticities for the food sector should be derived. Since these elasticities are not available, we will hold on to the values of Francois and Hall, which is widely accepted in academic literature. Therefore the composite demand elasticity is set at -1.25 and the industry supply elasticity is 1.5. The substitution elasticity is set at 2.5 as with equivalence, products become more substitute than with MRA.

Results and analysis

Effect on trade flows

The tables below provide an overview of the percentage change in trade quantities as a result of MRA and the change in trade at world price. The numbers in bold are the trade values at world prices after the organic equivalence agreement, above are the trade values before the agreement.

Table 4.63 - *Percentage change in trade quantities*

	US	EU	ROW
US	0.00	0.03	0.00
EU	0.13	0.00	-0.02
ROW	0.00	0.01	0.00

Table 4.64 - *Trade in world prices, before and after eqivalence, in million dollars*

	US	EU	ROW
US	\$0.00 **\$0.00**	\$254,200.00 **\$254,271.79**	\$870,890.02 **\$870,881.13**
EU	\$284,704.00 **\$285,088.55**	\$0.00 **\$0.00**	\$981,111.22 **\$981,004.77**
ROW	\$1,307,708.04 **\$1,307,755.92**	\$1,419,943.98 **\$1,420,138.63**	\$8,857,394.00 **\$8,857,459.36**

As the EU still has the highest cost savings and the rest of the world the lowest, trade effects are similar to the trade effects with MRA. However, with equivalence the ROW export has decreased 0.05% with respect to MRA and US export to the EU has decreased 0.01% with respect to MRA.

As the EU has the largest cost savings, the export from the EU to the US increased by \$384.55 million, which is an increase of 0.13%. An explanation for this might be that countries in the EU can now export their products with the same ease to the US as to other countries within the EU, while this used to take much more effort before the agreement. The EU's cost savings are the highest, so producers will benefit the most when exporting, which is reflected in the increased sales to US. As shipping to the US has become relatively cheaper than shipping to the rest of the world, EU trade to

the rest of the world decreased by 0.02%. There is a trade shift for EU export: EU exports more to US and thus less to the rest of the world.

The increased EU export to US has caused more competition on the US market. Together with the costs benefits of MRA, this forms a reason US export to the EU increased by 0.03%. US export to the rest of the world did not change, which may be explained with the barely increased US output while US export to the EU increased. US export to the EU has decreased with respect to MRA as cost savings are smaller. MRA makes it easier for producers to export as they do not need to change their standards. With equivalence, producers need to change their standards and therefore they are hampered to trade. This is reflected in the decreased change in output with respect to MRA (see further).

Export from the rest of the world to the EU increased by 0.01%. Namely, the MRA not only benefits the parties to the agreement, but the rest of the world as well. The rest of the world can have easier access to the EU/US market as it only needs to comply with one regulatory system to serve both parties. As cost savings are less with equivalence than with MRA due to the fact that trade companies still need two certificates, ROW producers are less stimulated to export. Therefore ROW export to the US and the EU is now less than with MRA.

Effect on prices and output

In the table below the effects on prices and output are depicted.

Table 4.65 – *Effects on prices and output*

	Change in overall consumer prices	Change in output	Producer price for home good
US	-0.02%	0.00%	0.00%
EU	-0.01%	0.01%	0.01%
Rest of world	0.00%	0.00%	0.00%

We have seen the competition on the US market has increased the most as the EU and ROW export to the US increased. This is reflected in the US consumer price: due to the increased competition consumer prices decreased by 0.02%, the highest consumer price decrease. The same counts for the EU, but in a less heavy way: the EU consumer prices decreased by 0.01%. As competition on the ROW market decreased, ROW consumer prices slightly increased by 0.0019%. Overall, all countries increased their export, this is reflected in the increased output in the countries. The EU had the highest trade increase, thus EU's output is the highest as well. Because sales increased, producer

prices increased as well. Producers can save a lot of costs now, as trade barriers have been abandoned.

As the rest of the world is not party to the agreement and thus had relatively less cost savings than the US and the EU, prices and output are less affected by the MRA than they are for the US and the EU.

Effect on welfare

In the table below the producer surplus, the consumer surplus and the net welfare effect have been depicted. The net welfare effect is the sum of the producer and consumer surplus.

Table 4.66 – *Welfare effects, in $ million*

	Producer surplus	Consumer surplus	Net welfare effect
US	$25.16	$315.18	$340.33
EU	$111.24	$196.69	$307.93
ROW	$123.16	-$200.00	-$76.84
Total	$259.56	$311.87	$571.42

With equivalence the total net welfare effect has been halved with respect to MRA.

US consumer surplus is $315.18 million now, which is the consequence of the high cost savings in the EU and BRC, causing high exports to US. US consumers encounter more supply and lower prices, exactly what they want. The EU consumer surplus increased as well, as for them the same thing counts: supply increased and prices decreased. However, these changes are less heavy than they are for the US, so the US consumer surplus is higher than the EU consumer surplus.

Consumers in the rest of the world face higher prices while lower supply. Therefore consumer surplus in the rest of the world is negative (-$200.00 million). These higher prices and lower supply are caused due to high ROW exports and lower ROW imports.

However, ROW has the highest producer surplus as producers encounter higher consumer prices, slightly higher output and slightly higher exports due to their cost savings following from the equivalence. The US and EU producer surplus are positive as well, but relatively not very high. US producer surplus is $25.16 million, which is quite low. Cause is the lower consumer prices and barely higher producer prices and output, due to high competition on the US market. The EU producer

surplus is $111.24 million, caused by increased producer prices and increased sales. The producers in the EU have bigger benefits than the US producers, as the EU cost savings are higher.

Thus, with respect to MRA the welfare effects with equivalence are similar, though less extreme. Reason may be that cost savings with equivalence are less than with MRA and thus the welfare effects are more moderate than with MRA.

4.3 | Sensitivity analysis

A sensitivity analysis is used to analyze the impact on the output of a formula when independent variables are changed. It gives the possibility to predict the outcome of a decision when key predictions turn to be different. With the sensitivity analysis we can determine the robustness of a calculation.

In this research we made different assumptions, for example regarding elasticities and costs determination. Therefore we will run the GSIM again, with different elasticities and costs assumptions, in order to analyze if the change of elasticities and costs has a big impact on the outcomes.

4.3.1 Substitution elasticities

When analyzing the organic equivalence thesis, we assumed substitution elasticity would increase with upward harmonization as products become more similar. Therefore the elasticity changed from 5 to 6. The GSIM for upward harmonization will be run two times more: one time with value 5 for substitution elasticity and one time with value 7 for substitution elasticity. By comparing the results for the percentage change in trade quantities and the effects on prices and output can be determined if the change in elasticity has a dangerously high impact on the outcomes.

Table 4.67 – *Overview percentage change in trade quantities with different substitution elasticities*

	EU			US			BRC			ROW		
Elast.	5	6	7	5	6	7	5	6	7	5	6	7
EU	-0.03	-0.04	-0.05	0.06	0.07	0.09	0.05	0.07	0.09	0.05	0.07	0.09
US	1.98	2.36	2.74	0.00	0.00	0.00	-0.11	-0.14	-0.17	-0.11	-0.14	-0.17
BRC	-0.02	-0.03	-0.05	0.02	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.01
ROW	0.01	0.00	-0.01	0.00	0.00	-0.01	0.00	0.00	0.01	0.00	0.00	0.01

Table 4.68 – *Overview effects on prices and output with different substitution elasticities*

	Consumer prices			Change in output			Producer prices		
Elast.	5	6	7	5	6	7	5	6	7
EU	-0.018	-0.019	-0.019	-0.011	-0.012	-0.013	-0.007	-0.008	-0.009
US	-0.009	-0.009	-0.009	0.038	0.040	0.041	0.025	0.026	0.027
BRC	0.004	0.004	0.004	0.003	0.003	0.003	0.002	0.002	0.002
ROW	0.004	0.004	0.004	0.004	0.004	0.004	0.002	0.003	0.003

From these tables we can derive that differences in elasticities do change the outcomes, but not so extremely that outcomes become inconceivable. Especially the change in the effects on prices and output barely changes with different elasticities. However, the US export to the EU, BRC and ROW change significantly with the different types of elasticities. As long as the outcomes are not too extreme, different elasticities do not form a problem. However, when a GSIM has very high or low outcomes, outcomes can differ extremely when the wrong substitution elasticity is used.

4.3.2 Costs determination

When analyzing authors's report, we assumed ROW cost savings percentage to be 0.029% as we did not have adequate information to calculate the cost savings percentage. The GSIM for MRA will be run two times more: one time with cost savings percentage 0.025%, one time with 0.029% and one time with 0.033%. By comparing the results for the percentage change in trade quantities and the effects on prices and output can be determined if the change in costs determination has a dangerously high impact on the outcomes.

Table 4.69 – *Overview percentage change in trade quantities with different cost savings percentages*

	US			EU			ROW		
%.	0.025	0.029	0.033	0.025	0.029	0.033	0.025	0.029	0.033
US	0.00	0.00	0.00	0.04	0.04	0.03	0.00	0.00	0.00
EU	0.11	0.11	0.11	0.00	0.00	0.00	-0.02	-0.02	-0.01
ROW	0.02	0.03	0.03	0.03	0.03	0.04	0.00	0.00	0.00

Table 4.70 – *Overview effects on prices and output with different cost savings percentages*

	Consumer prices			Change in output			Producer prices		
%	0.025	0.029	0.033	0.025	0.029	0.033	0.025	0.029	0.033
US	-0.031	-0.034	-0.037	0.005	0.005	0.005	0.004	0.003	0.003
EU	-0.023	-0.026	-0.029	0.014	0.014	0.013	0.009	0.009	0.009
ROW	0.003	0.004	0.004	0.004	0.005	0.005	0.003	0.003	0.003

From the tables above we can conclude the same as we did for substitution elasticities. Different cost savings percentage do not cause different effects (positive or negative). However, extreme outcomes can change a lot when a cost savings percentage turns out to be different. Thus as long as there are no extreme outcomes, we can trust the calculations are not too sensible for changes.

Chapter 5: The optimal way of alignment depending on the different types of divergences in certain circumstances

The economic effect of a measure is an important element of political decision-making. However, it is not the only element that makes part of a political decision. That's why the optimal way of alignment depending on different points of view will be discussed below.

5.1 | Maximizing GDP

Gross Domestic Product (GDP) is the market value of the goods and services produced in a country during one year. The GDP can be calculated by summing all expenditures in the country.

The optimal way for maximizing GDP is the elimination of all non-tariff measures, as a free market exists without any non-tariff obstacles or requirements to conform to. Disregarding the tariffs, the market will be in optimal form. With elimination of NTMs every product can be exported or imported between the countries. Negotiations about product requirements and standard checks are no longer necessary, which saves a lot of costs and barriers.
Besides the variety of products will grow as limitations on products types do not longer exist.

However, without any standards to comply to, producers are free to set their own quality standards. Consequently consumers and producers can't rely on a certain quality when they buy a product. Standards foster the production of health, safety and environment because they ensure the quality of goods. Without standards, there is no guarantee that private companies will produce the needed quality of goods. Therefore, it is hard to compare products with each other when measures do not exist.

As elimination of NTMs is undesirable, the second best option will be mutual recognition or harmonization. Theoretical literature does not provide a clear answer which of these two options is better (Orefice, Piermartini, & Rocha, 2012).

For some reasons harmonization is recognized to enhance trade more than mutual recognition. First of all, harmonization reduces home-bias, which is the general preference for domestically-produces goods, as products are better substitutes than in a mutual recognition framework (WTO, 2012). Secondly, harmonization increases compatibility between complementary goods, which reduces market segmentation and supports the functioning of markets. When production chains are important, common standards improve firms' ability to interchange components and thus reduce costs and increase flexibility (Orefice, Piermartini, & Rocha, 2012).

Thirdly, common standards as meant in harmonization bring a higher consumer confidence about the quality of imported products and lower the information costs faced by consumers.

However, harmonization reduces the number of varieties in the market (for example upward harmonization reduces lower-quality products) which would hamper trade in a love for variety market (Orefice, Piermartini, & Rocha, 2012).

Consequently, whether MRA or harmonization is more trade-fostering depends on the sector and the scope of the alignment. Roughly we can say that when love for variety is essential in the countries or when implementation costs to a new (harmonized) technology are high, mutual recognition should be expected to enhance trade more than harmonization (Orefice, Piermartini, & Rocha, 2012).

5.2 | Optimal consumer protection

The optimal way of alignment for the highest protection of the consumer is upward harmonization. This means that the country with the lower standards has to upgrade its standards to equalise the standards to the other country. Another possibility is that the countries draft a completely new standard at a higher level. This way of alignment is better than upward equivalence as the production process will be harmonized as well. However, the possible pitfall is that the country with the lower standards will only commit to the upward harmonization when the other country promises not to raise their standards any further or, if they commit not to insist on further rounds of upward harmonization (Neumayer, 2001). So the upward harmonization of standards might only be achievable at the expense of excluding or at least making more difficult further upward harmonization, which hampers further development.

Mutual recognition is not a good option to protect the consumer as it causes a loss of domestic regulatory control in crucial public health and safety matters (TACD, 2001). It is feared that consumers do not know where to go to with their product complaints and that regulators may be locked into an inflexible regulatory system that makes it complicated to introduce innovations and changes.

Hence, equivalence is not a good solution for consumer protection as countries will not know in which way the product results have been achieved in the other country and where they can go to when product problems appear. Moreover there is a risk for a backdoor effect: when one of the standards is significantly lower, this lower standard will subvert the higher standard. When Country A has a higher standard than Country B, Country B becomes an alternative route to Country A's

standard. In this case Country B serves as a 'back door' to the stricter market of Country A. In this way the 'back door' bypasses Country A's protections.

5.3 | Easiest implementation

The easiest way of implementation (for the government) is to let the private sector solve the whole NTM problem. Companies may eliminate incompatibilities through choosing to make their products compatible with those of the industry leader or through engaging in merger. The private sector may also undertake cooperative efforts to develop compatibility standards, for example, through the creation of standards-setting entities within their product sector.

Authorities can lay down their standardization tasks and let the free market run its course. However, it will be their responsibility to encourage the private companies to align the NTMs themselves and make them aware of their position and responsibilities.

Private companies consider standardization from a different point of view, which may give a refreshing sight on alignment of NTMs. However, private companies may not feel responsible to align NTMs and to conform to national standards when public authorities do not longer check them. Public standards bodies foster the production of health, safety and environment because they ensure the quality of goods. Without public standards bodies, there is no guarantee that private companies will produce the needed quality of goods. That is why I consider this way of alignment undesirable.

Bringing two standards to one new standard (harmonization) takes a lot of time, that is why full harmonization is barely possible (Veggeland & Elvestad, 2004). The same counts for equivalence: the assessment to determine equivalence can be technically complex and when requirements are reconsidered, a new determination is likely to be needed (Courville & Crucefix, 2004). However, according to NEN, harmonization or equivalence is a better option than MRA because practice shows that it is often too difficult to determine the scope of MRA (Daverveldt, 2013).

5.4 | Political feasibility

Alignment of NTMs can be politically infeasible when the current political system is not willing to carry out the alignment or renders the alignment infeasible. Especially alignment of sensible subjects, see paragraph 2.3.2, can be counterworked by political infeasibility.

The best way to align sensible NTMs will be upward harmonization which presumes the use of the highest quality standards. However, one of the parties may consider the harmonization costs too high. Full upward harmonization may probably be infeasible as certain subjects will still be too sensible to harmonize (Veggeland & Elvestad, 2004).

Elimination of NTMs and bringing the problem to the private sector will be politically infeasible, as political parties would consider these options too irresponsible. I expect the EU to be more inclined to this point of view because the US practices free market more than the EU.

Chapter 6: Recommendations

Alignment of NTMs have positive economic effects for economic welfare, whatever way of alignment is chosen. Therefore we recommend the EU and the US to keep the negotiation process and bridge cultural, social and economic differences by being open minded in case of sensible negotiation issues.

It is difficult to recommend a certain way of alignment, as the optimal way of alignment depends on the circumstances. However, upward harmonization can be very practical when a party wants to guarantee its own standard level. MRA is recommended when the economic effect is very important, when there is trust between the parties and when the standards of the parties are quite similar.

In any case, it is vital to take into account the social and practical issues. Some ways of alignment are socially undesirable, giving the problem to the private sector or the abrupt elimination of all NTMs. MRA can be too hard to implement as it may be too complicated to determine the scope of the agreement. In case of such difficulties, negotiators should always keep in mind that regulatory systems are there for a purpose and should not be seen as trade barriers only. In such cases, it may be much better to focus on regulatory coherence between systems, without adjusting the levels of consumer protection.

From the analysis described in chapter four we can see that the calculations suggest that alignment can have a negative economic impact on non-contracting parties; this depends on the spill-over effects that we assume. The net welfare effect in the rest of the world turns out to be negative after the alignment if spill-over effects are too small.

Finally, careful treatment of mathematical analyses is essential before making real-life decisions. Further research in this topic and the results of the calculations is recommended.

Chapter 7: Conclusions

In the last two decades the cooperation between the EU and the US regarding the alignment of NTMs has intensified. With the start of the TTIP negotiations the intention to cooperate accelerated. Both parties are willing to align NTMs – according to the High Level Working Group on Jobs and Growth, because the benefits for growth, trade and jobs are clear. However, due to cultural differences the organization of standardization bodies differ and some sensible negotiating issues exist, which hinders negotiations.

Although both parties consider alignment valuable, there are different ways to achieve this, with each of them having its own implementation, benefits and risks. These differences are partly reflected in the analyses of the economic impact of these ways of alignment.

Economic effects of alignment can be calculated with the help of a GSIM model. Although these effects are heavily dependent on the circumstances like the trade sector and sensibility of products, some general lines can be deducted from my research.

First of all, the country with the highest cost savings will have the highest export, and therefore the highest output, producer price and producer surplus. The country that chooses to make an alignment with this country will have highest competition on the market because of the increase in import. Due to this competition, consumer prices as well as output tend to decrease. Consequently there is a high consumer surplus but a low producer surplus.

Third countries, the countries that do not join the alignment contract, will face less export to their country if alignment between EU and US does not spill-over. The contract parties can have an easier access to each others' markets which will result in decrease of their exports to the rest of the world. If spill-overs are small, imports in the rest of the world decrease, prices increase and as a result of that consumer surplus tends to decrease. This negative consumer surplus will not be compensated by a positive producer surplus, which makes the net welfare effect for non-contracting parties negative. Alignment will cause a shift in trade: contract parties will trade more with each other and the non-contract parties will trade more with each other.

Comparing MRA, upward harmonization and equivalence, MRA causes the highest net welfare effect. The reason for this being the highest cost savings with MRA. Upward harmonization and equivalence can also bring positive net welfare effects, but these welfare effects are more modest as costs differences between the countries are smaller. However, upward harmonization can be very practical when a party wants to guarantee its own standard level. MRA is recommended when the

economic effect is very important, when there is trust between the parties and when the standards of the parties are quite similar. Equivalence is a good option when parties focus on a good end product, while the way this product has been produced is no discussion point.

Final note for contemplation

A competent economist realizes it is not all about economics, but instead economics is only part of what drives choices in society. What is considered to be the most optimal decision from the economic perspective, can be the worst decision from the consumer or political perspective. Therefore social aspects need to be taken into account when determining which ways of alignment to choose and even whether to align at all. Paradoxically, the best analyses are constrained by their economics focus only.

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