



EUROPE

- CHILDREN AND FAMILIES
- EDUCATION AND THE ARTS
- ENERGY AND ENVIRONMENT
- HEALTH AND HEALTH CARE
- INFRASTRUCTURE AND TRANSPORTATION
- INTERNATIONAL AFFAIRS
- LAW AND BUSINESS
- NATIONAL SECURITY
- POPULATION AND AGING
- PUBLIC SAFETY
- SCIENCE AND TECHNOLOGY
- TERRORISM AND HOMELAND SECURITY

The RAND Corporation is a nonprofit institution that helps improve policy and decisionmaking through research and analysis.

This electronic document was made available from www.rand.org as a public service of the RAND Corporation.

Skip all front matter: [Jump to Page 1](#) ▼

Support RAND

[Browse Reports & Bookstore](#)

[Make a charitable contribution](#)

For More Information

Visit RAND at www.rand.org

Explore [RAND Europe](#)

View [document details](#)

Limited Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law as indicated in a notice appearing later in this work. This electronic representation of RAND intellectual property is provided for non-commercial use only. Unauthorized posting of RAND electronic documents to a non-RAND Web site is prohibited. RAND electronic documents are protected under copyright law. Permission is required from RAND to reproduce, or reuse in another form, any of our research documents for commercial use. For information on reprint and linking permissions, please see [RAND Permissions](#).

This report is part of the RAND Corporation research report series. RAND reports present research findings and objective analysis that address the challenges facing the public and private sectors. All RAND reports undergo rigorous peer review to ensure high standards for research quality and objectivity.



The Cost of Non-Europe in the Single Market

I - Free Movement of Goods

STUDY

EPRS | European Parliamentary Research Service

European Added Value Unit
September 2014 – PE 536.353

The Cost of Non-Europe in the Single Market (‘Cecchini Revisited’)

In May 2013 the European Parliament's Committee on Internal Market and Consumer Policy (IMCO) requested a Cost of Non-Europe Report in the field of the European Single Market. Cost of Non-Europe Reports are intended to evaluate the possibilities for economic or other gains and/or the realisation of a ‘public good’ through common action at EU level in specific policy areas and sectors.

In response to IMCO's request, the European Added Value Unit of the European Parliamentary Research Service (EPRS) has produced this Cost of Non-Europe Report, which seeks to analyse the costs for citizens, businesses and relevant stake-holders of remaining gaps and barriers in the Single Market, building on, and updating, the 1988 Cecchini Report which quantified its potential benefits.

In addition to a general paper bringing together the research findings as a whole, the exercise comprises five studies commissioned from outside experts on specific dimensions of the subject, which are published as separate documents:

I Free Movement of Goods

Study by RAND Europe

This study uses an econometric model to estimate the potential benefits of removing existing barriers to foreign direct investment and non-tariff trade barriers within the European Union. The removal of existing trade barriers could boost total intra-EU merchandise exports up to 7 per cent in the long-term. These effects will vary by Member State, and by sector of the internal market.

II Single Market for Services

Study by CEPS

This study attempts to take stock of the remaining gaps or deficits in intra-EU market access obligations in services, and the related deficits in the proper functioning of the internal market for services. It also tries to identify the quantitative and qualitative economic gains of overcoming the costs of non-Europe of the remaining fragmentation, insofar as the EU can address such deficits.

III Digital Single Market

Study by GHK

This study analyses the gaps in the European digital single market legislation which prevent attaining the benefits of a fully functioning e-commerce single market. It provides a qualitative appreciation of the existing legislation,

identifying gaps where further legislative action at European level could be beneficial and quantifying the direct costs of failure to legislate and the potential broader economic impact of closing the gaps.

IV Public Procurement and Concessions

Study by Europe Economics

One of the key benefits of the Single Market was expected to arise in the context of public procurement. This study updates the analysis presented in the Cecchini Report, estimates the value of savings to the public purse that have been achieved to date through European legislation on public procurement, and discusses the extent to which future savings might be achieved (in particular following approval of the proposals for new public procurement directives in January 2014).

V Consumer *acquis*

Study by GHK

This study analyses the gaps in European consumer legislation. It provides a qualitative appreciation of the existing legislation, identifying areas where further EU legislative action could be beneficial, and provides tentative estimates of the costs of failure to legislate. It is not intended as comprehensive quantification, but rather as a 'snap shot' of some benefits which could be attained through completion of the consumer *acquis*.

The Cost of Non-Europe in the Single Market

- I -

Free Movement of Goods

**Study
by RAND Europe**

Abstract

Cost of Non-Europe Reports identify the possibilities for economic or other gains and/or the realisation of a 'public good' through common action at EU level in specific policy areas and sectors. This Cost of Non-Europe Report seeks to analyse the costs for citizens, businesses and relevant stake-holders of remaining gaps and barriers in the European Single Market, building on and updating the 1988 Cecchini Report, which quantified its potential benefits.

This particular study - the first in a series - uses an econometric model to estimate the potential benefits of removing existing barriers to foreign direct investment and non-tariff trade barriers within the European Union. The removal of existing trade barriers could boost total intra-EU merchandise exports up to 7 per cent in the long-term. These effects will vary by Member State, and by sector of the internal market.

AUTHORS

This study has been written by **Marco Hafner, Enora Robin** and **Stijn Hoorens** of **RAND Europe** at the request of the European Added Value (EAV) Unit of the Directorate for Impact Assessment and European Added Value, within the Directorate-General for Parliamentary Research Services (DG EPRS) of the General Secretariat of the European Parliament.

RESPONSIBLE ADMINISTRATOR

Zsolt Pataki, European Added Value Unit

To contact the Unit, please e-mail eava-secretariat@ep.europa.eu

This document is available on the Internet at: www.europarl.europa.eu/thinktank

LINGUISTIC VERSIONS

Original: EN

DISCLAIMER

The content of this document is the sole responsibility of the author and any opinions expressed therein do not necessarily represent the official position of the European Parliament. It is addressed to the Members and staff of the EP for their parliamentary work. Reproduction and translation for non-commercial purposes are authorised, provided the source is acknowledged and the European Parliament is given prior notice and sent a copy.

Manuscript completed in June 2014. Brussels © European Union, 2014.

PE 536.353

ISBN: 978-92-823-5545-9

DOI: 10.2861/5772

CAT: QA-02-14-330-EN-N

Contents

Figures and tables	6
Executive summary	7
Acknowledgements	10
Abbreviations	11
Chapter 1. Introduction	13
I. A study on the potential benefits of further economic integration in the EU	13
II. Objectives and scope of this paper	14
III. Research approach.....	15
IV. Caveats and limitations.....	16
V. Structure of this paper.....	17
Chapter 2. Current state of play of the internal market	18
I. Current European legal framework	18
II. Gaps and barriers in the implementation of the internal market and associated costs	20
Chapter 3. A quantitative estimation of the untapped economic potential	25
I. An approach to estimating trade effects of existing barriers to trade	25
II. Predicting the Internal Market's untapped potential	39
Chapter 4. The untapped potential at sector level: two case studies	45
I. Construction materials sector.....	45
II. Medical devices case study.....	53
III. Key findings from the Construction Products and Medical Devices industry	61
Chapter 5. Conclusions and discussion	62
References	68
Appendix A: Countries included in the econometric analysis	73
Appendix B: Econometric results Gravity Model	74
Appendix C: Classification of Medical Devices	75
Appendix D: Imputation Missing Country Values OECD PMR Indicator	76

Figures and tables

Tables

Table 1: Milestones creation single market and general SM Regulation.....	19
Table 2: Overview Content OECD Product Market Regulation Indicators	32
Table 3: Descriptive Statistics Variables used in Econometric Gravity Model	35
Table 4: Econometric Results Gravity Model	38
Table 5: Untapped Potential Internal Market - Predicted Effects Trade EU-28.....	42
Table 6: Untapped Potential Internal Market (Barriers to FDI) - Predicted Effects EU-28 Member State Level.....	43
Table 7: Untapped Potential Internal Market (Non-Tariff Barriers) - Predicted Effects EU-28 Member State Level	44
Table 8: Legal framework for construction materials	48
Table 9: Summary of EU regulations affecting the construction products sector	49
Table 10: Ex-Post Evaluation Trade Effect change from CPD to CPR	53
Table 11: Current EU legislation impacting the Medical Device Industry	57
Table 12: Summary of case study findings	61
Table 13: Summary of Findings	62

Figures

Figure 1: EU-28 Merchandise Trade Volumes and Share Internal Market	26
Figure 2: Non-Tariff Barriers to Trade: EU-28 Member States (OECD PMR Indicator).....	33
Figure 3: Top 5 exporters in the construction materials industry (expressed as a percentage of the total exports in the sector, 2013)	46
Figure 4: Top 5 exporters in the medical device industry (expressed as a percentage of the total exports in the sector, 2013)	55
Figure 5: Untapped Potential Internal Market EU-28 – Free Movement of Goods	63
Figure 6: Untapped Potential Internal Market – Change Merchandise Exports	65
Figure 7: Untapped Potential Internal Market – Share GDP.....	66

Executive summary

The European internal market was formally created in 1993 after the implementation of the Single Market Act. It allows the free circulation of people, capital, services and goods. Between 1986 and 1992, more than 280 pieces of legislation were passed to facilitate the opening up of national markets: in several fields, a common EU framework was adopted, which reduced some of the costs associated with export for EU companies. By the time of its 20th anniversary at the end of 2012, the single market consisted of 27 countries, and over 500 million people.

While studies have estimated that the single market contributed to the creation of wealth and jobs in the EU by allowing greater competition and boosting trade between Member States, concerns have been formulated in regard to its 'incomplete implementation'. Differences in national legal systems for instance can be considered as barriers to trade as they represent an additional cost for firms willing to sell their products in different countries. If unaddressed, these barriers create an untapped potential for the internal market.

Sources of untapped potential for the internal market

We identified three types of barriers to the internal market that may potentially be addressed by policy interventions. First of all, there have been delays in the adoption of harmonised rules (directives or regulations) in Member States' national legal frameworks. Secondly, infringements of internal market regulations may hamper further integration. These infringements are mostly due to the incorrect application of EU legislative documents by Member States. Thirdly, despite regulations to facilitate international transactions, studies suggest market fragmentation can also be due to national and regional tastes and preferences: the existence of home bias. Inherited norms, cultural preferences as well as differences in economic and political organisational systems partly explain remaining difficulties in reaching full harmonisation and subsequent economic integration in Europe.

These barriers may apply more or less to specific markets, types of activities or firms. For example, some economic activities tend to be much more localised than others, especially when characterised by a dense network of Small and Medium Enterprises (SMEs).

Investigating and quantifying barriers to the free movement of goods

In this research paper we analyse the current state of play of the European free movement of goods and try to quantify untapped potential due to a lack of full integration for the EU economy as a whole.

To this end, we conducted an econometric analysis to estimate the potential benefits of more integration (lower trade barriers), using an econometric model which analyses the correlation between Gross Domestic Product (GDP), location and trade barriers (as independent variables) and bilateral trade flows (as the dependent variable) to

investigate the potential benefits of lower trade barriers for trade flows, growth and job creation. Furthermore, in order to delineate sector-specific gaps and barriers hindering full economic integration that are harder to quantify, we look into two specific sectors of the European economy, the construction materials sector and the medical devices sectors. As part of these case studies we reviewed the implementation of internal market regulation in these sectors, and conducted a number of interviews to identify the perception of barriers among different stakeholders.

Doing so, we acknowledge that the study does not take full account of the direct and indirect costs of removing the barriers to trade in the internal market. These costs - such as those borne by firms to comply with internal market regulation - need to be considered when conducting a full assessment of the effects of further economic integration.

Modelling the effects of removing barriers in the internal market

More than two decades after the introduction of the internal market, there are still various factors that inhibit integration of international markets and free trade. Aside from natural barriers such as geographic distance or language, some non-tariff barriers (NTBs) are created as a result of policies in areas such as regulation or state aid. Other factors may be explicit barriers to trade and investment, such as those related to foreign direct investment (FDI) that pose restrictions on foreign acquisition of equity in public and private firms.

With the focus on the free movement of goods, this analysis seeks to investigate the trade distortion effects of existing barriers to trade and the potential economic benefits - the untapped economic potential - that could accrue with the removal thereof. Using a so-called gravity model, we predicted how much larger intra-EU trade volumes would be, if existing barriers to trade within the internal market are removed.

Results suggest the untapped potential of the internal market could be between €183 billion and €269 billion in the long-term.

The study defined three scenarios assuming an incremental degree of economic integration. Under these different scenarios, our results suggest that the total value of merchandise exports between EU Member States would increase by between €183 billion (90% confidence interval: €88bn - €432bn) to €269 billion (90% confidence interval: €115bn - €433bn) in the long-term if barriers to FDI and NTBs within the internal market were removed. The amount of €269 billion follows the most optimistic scenario, which assumes that the barriers to FDI and NTBs in the internal market were reduced to zero. This amount should be considered as upper bound estimates as it is unlikely that all barriers will ever be completely removed. And in practice, this would not happen overnight, which is why the estimate should be interpreted as the potential benefits that accrues in the longer term.

These findings suggest that even though the internal market for goods is at a relatively advanced stage, there remains an untapped potential of the internal market in the longer term.

Based on other studies we anticipate the potential for the internal market for services to be higher. Services generate about 70 per cent of value added in the European economy, but their share in intra-EU trade is only 20 per cent. Nevertheless, our predicted effects take into account only static effects of increased trade activity. They do not include or quantify further dynamic equilibrium welfare effects, for instance induced by induced innovation, embodied in trade creation.

The effects are not uniform across Member States however. The results suggest that removal of barriers to FDI may lead to an increase of intra-EU exports in the Baltic States and Slovenia by almost 4 per cent. Similarly, the Baltic States and Croatia are among the Member States that would benefit most from the removal of NTBs. Neither will these benefits distribute evenly across firms. Smaller firms will more likely benefit from the removal of NTBs as the burden of compliance with various regulatory requirements in the importing Member State is bigger than for larger firms.

The benefits will vary by economic sector in the internal market

We analysed two manufacturing sectors in more detail to provide further insights into market-specific barriers to market integration and associated costs perceived by different stakeholders: the construction materials and medical devices sectors. Both sectors are characterised by a relatively high concentration of SMEs, which partly explains why new EU regulation is often perceived as a burden by economic operators.

Interviewees from the two sectors highlighted the fact that the harmonisation of existing rules was not yet fully implemented across Member States and that market fragmentation was still a major issue for firms. The existence of home bias sector in the construction materials sector may explain the localisation of economic activities within national borders in this sector.

Furthermore, stakeholders in the construction materials sector suggest that complexity of existing regulations deters economic operators from doing business in other countries and represents additional costs for them. A quantitative estimation for the construction sector shows that the transition from a directive to a regulation for harmonised products in Europe can have a small but significantly positive effect on trade between Member States. Industry representatives in both sectors seem to favour the replacement of current Directives by regulation. However, additional EU regulation may also lead to delays in market access.

Finally, our findings suggest there are a range of contextual factors that may represent barriers to the free movement of goods in the internal market. In the medical devices sector, for instance, differences in national healthcare systems can inhibit economic operators to access markets in other EU Member States.

Acknowledgements

The authors wish to thank a number of people for their suggestions and comments on earlier versions of this document. First of all, we are grateful to Mr Zsolt Pataki, Thomas Zandstra and Joseph Dunne Parliamentary Research Service of the European Parliament for their guidance and suggestions. Furthermore, Anders Gronbech Jorgensen, Julija Varnaite and Bozica Matic at the Committee for Internal Market and Consumer Protection (IMCO) of the European Parliament provided useful context for the study and suggested potential interviewees. A number of other experts at the European Commission offered their advice and provided useful contacts and suggestions, including: Simeon Chenev (DG ENTR), Tapani Mikkeli (DG ENTR) and Bernhard Schneider (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety).

We express our gratitude to all interviewees who kindly agreed to participate in this study and donated their time and insights. Those who provided consent to being acknowledged are listed in the annex of this report.

We are also grateful to a number of experts who reviewed and commented on the modelling approach in this study. They include: Jonathan Cave (RAND Europe), Alessandro Malchiodi (DG MARKT), and Alex Armand (University College London).

We thank Katharina Brecht for copy-editing the report and Emma Harte for excellent research assistance. Finally, would like to thank Jan Moens (Van Dijk Management Consultants) and Fay Dunkerley (RAND Europe), who peer reviewed this document as part of RAND's quality assurance process and provided useful comments and feedback on its earlier versions.

Abbreviations

BEPA	Bureau of European Policy Advisors
BRIC	Brazil, Russia, India and China
CPD	Construction Products Directive
CPR	Construction Products Regulation
DOTS	Direction of Trade Statistics
ECOFIN	Economic and Financial Affairs Council
EEA	European Economic Area
EEC	European Economic Community
ENVI	Environment, Public Health and Food Safety
EPC	Economic Policy Committee
EPO	European Patent Office
ETA	European Technical Assessment
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GMM	Generalised Methods of Moments
hEN	Harmonised European Standard
HO Model	Heckscher-Ohlin Model
HTA	Health Technology Assessment
IMF	International Monetary Fund
IV	Instrumental Variable
MDD	Medical Device Directive
MDEG	Medical Device Expert Group
MDR	Medical Device Regulation
MHRA	Medicines and Healthcare Products Regulatory Agency
MTR	Multilateral Trade Resistance
NAFTA	North American Free Trade Organisation
NB	Notified Body
NTBs	Non-Tariff Barriers
OECD	Organisation for Economic Cooperation and Development
OLS	Ordinary Least Squares
PMR	Product Market Regulation
PPML	Poisson Pseudo-Maximum Likelihood
SAE	Serious Adverse Event
SEA	Single European Act
SMEs	Small and Medium Enterprises
TAFTA	Transatlantic Free Trade Area
US	United States
WEF	World Economic Forum
WTO	World Trade Organisation

Chapter 1. Introduction

I. A study on the potential benefits of further economic integration in the EU

The European integration process was motivated by political but also economic concerns. The removal of barriers to trade between EU Member States is based on the premise that economic integration reduces firms' market power and increases productivity via the removal of non-tariff barriers. As a consequence, it was expected to promote intra-European trade, increase competition, create more jobs and make Europe more attractive to foreign direct investment (FDI). The principle of enabling goods, alongside with people and capital, to move freely in Europe was mentioned for the first time in the Rome Treaty of 1957. In 1985, the European Commission's White Paper on the Internal Market set out a series of actions aiming to remove physical, technical and fiscal barriers to trade in order to merge fragmented national markets to create a single European market by the year 1992 (European Commission, 1985). Shortly thereafter, Paolo Cecchini, then the deputy director for internal markets and industrial affairs at the Commission was asked to investigate and quantify the so-called "cost of non-Europe", defined as the untapped potential of the single market due to its incomplete implementation.

The Cecchini report (Cecchini et al., 1988) was published in 1988, and provided an estimate of the benefits which Europe had yet to reap. The report argued that the potential economic gain was as large as ECU 200 billion (equivalent to €200 billion),¹ and would add about 5 per cent to the European Community's GDP – potentially even up to 6.5 per cent (Cecchini et al., 1988). The single market (now internal market) was formally created in 1993, allowing the free circulation of people, capital, and goods. Between 1986 and 1992, more than 280 pieces of legislation were passed to facilitate the opening up of national markets: in several fields, a common EU framework was adopted, which reduced some of the costs associated with export for EU companies. It is estimated that this has contributed to the creation of 2.5 million jobs since 1993, and has created more than €800 billion in terms of wealth between 1993 and 2003 (EC, 2003).

Although the single market has allowed greater competition and boosted trade between Member States, concerns have been formulated in regard to its incomplete implementation to date. Some economic operators and experts have highlighted that technical difficulties remain, especially when it comes to public procurement throughout the EU for certain types of services, notably telecoms, which remain fragmented into national rather than truly pan-European markets (Pelkmans & Correia De Brito, 2012).

As a result, the European Commission has sought to further stimulate the single market through the "Single Market Act" in April 2011 and the "Single Market Act II" in October 2012, building on the recommendations formulated in the Monti report (2010). The Single Market Act II identifies 12 levers to favour growth in the market, for example better

¹ European Currency Unit (ECU) was the unit of account of the European Community before being replaced by the euro on 1 January 1999, at parity.

access to capital for small and medium enterprises (SMEs, i.e. those with fewer than 50 employees), mutual recognition of professional qualifications, harmonised intellectual property rights, harmonised products and services standardisation system, etc. (EC, 2012).

In addition, several studies such as the report “Untapping the potential of the Single Market” (London Economics and PWC, 2013) – commissioned by the European Commission’s Bureau of European Policy Advisors (BEPA) – have sought to build on Cecchini’s seminal work and identify gaps in the completion of the Single Market as well as recommending further actions to fully exploit the potential of the internal market. In this paper, we build on these findings.

II. Objectives and scope of this paper

The European Parliament has commissioned a series of papers on the so-called costs of non-Europe, a term coined in the Cecchini report. The concept assumes that the “absence of common action at European level may mean that, in a specific sector, there is an efficiency loss to the overall economy and/or that a collective public good that might otherwise exist is not being realised” (European Parliament, 2014). The objective of the present research paper is to analyse the current state of play of the European free movement of goods and to quantify costs due to a lack of full integration, drawing special attention to two sectors of the European economy: the construction materials sector and the medical devices sectors.

Building on existing quantitative and qualitative evidence, this study seeks to:

1. Quantify potential economic benefits if existing barriers in the internal market (including barriers to FDI and non-tariff barriers) would be removed;
2. Investigate and analyse ways in which the single market can be given the opportunity to develop its full potential;
3. Identify benefits that can be expected from the completion of the single market in the field of free movement of goods for citizens, employees and businesses.

While we have made the assumptions, limitations, potential caveats (see Section IV) and the resulting uncertainty explicit in this paper, it should be highlighted that the timespan and resources available for this study were very limited. The study was conducted over the course of two months, which restricted the extent of the analysis, which in turn affected, for instance, the choice of the quantitative approach or the number of stakeholders to be consulted.

Furthermore, the paper focuses primarily on the potential benefits of further economic integration. Analysing the untapped potential of the internal market implies there is no detailed consideration of the direct or indirect costs of further economic integration. For instance, further implementation of internal market regulation will lead to compliance costs for firms, which will vary between firms. This should be taken into consideration when interpreting the results of this study. When conducting a full assessment of the costs and benefits of further economic integration of the internal market in the EU, direct and indirect costs and benefits should be taken into account.

III. Research approach

In order to address the research questions formulated above, the approach of this paper was divided into four strands:

- Firstly, we reviewed the available academic and grey literature through structured online bibliographic searches in databases. To ensure a wide coverage of the available academic literature, different online academic databases were used to collect descriptive information on the current state of play of the EU and national internal market legislation with particular reference to the free movement of goods. The objectives of this task included: identifying existing gaps and barriers to full economic integration; mapping relevant stakeholders for the two specific sectors that are analysed in detail in the case studies; and collecting information about the economic structure of these specific sectors as well as the untapped potential for different economic actors within these sectors.
- Secondly, we investigate the potential benefits of lower trade barriers for trade flows, growth and job creation using an econometric model (Gravity Model) which analyses the correlation between GDP, location and trade barriers (as independent variables) and bilateral trade flows (as the dependent variable).
- Thirdly, two case studies focusing on selected relevant manufacturing sectors (construction material and medical devices) were developed to illustrate the current situation regarding the cost of non-Europe on specific sectors. The case studies aimed to identify the sector-specific gaps and barriers that hinder full economic integration; identify the economic impact of such barriers on various stakeholders within the sector; evaluate the significance of these effects. To this end we reviewed sector-specific literature and policy documents. Furthermore, fifteen interviews in total were conducted with stakeholders, such as industry associations, to build on their expertise and delineate (perceived) remaining trade barriers. Contributions of interviewees have been made anonymous through the report.
- Finally, in a case study on the construction materials sector, we used the change from the Construction Products Directive (CPD) to Construction Products Regulation (CPR) as a quasi-experiment to evaluate ex-post the trade effect of an increased economic integration within a specific sector, compared to the existing state of play under a directive. This analysis is not available for the medical devices sector, as the opportunity of conducting this quasi-experiment only arose for the construction material sector when the introduction of the CPR was implemented in Member States in July 2013.

The two case studies were selected based on the following criteria: 1) the potential existence of gaps in Member State legislation and implementation of the internal market on the basis of the findings in the literature and insights from key informants; 2) the significance of these sectors in their contribution to the EU economy as a whole; and 3) the expected availability of data and documentation that may help answering the research questions. As suggested in the terms of reference for this research paper, the construction material sector satisfies these selection criteria and was therefore selected as a first case study. After consulting the literature and a number of key informants, the medical devices sector was selected as the second case study.

IV. Caveats and limitations

As mentioned above, the aim of the current study was not to conduct a full cost-benefit analysis. The research questions set out in the terms of reference focus a priori on quantifying the benefits of further economic integration. For instance, further implementation of internal market regulation will lead to compliance costs for firms, which will be higher for some than for others. While in Chapter 4 we report that various sector-specific stakeholder groups have highlighted that the costs of removing the remaining trade barriers in the internal market are not insignificant, these costs have not been systematically estimated.

While it is unlikely that these costs will outweigh the aggregate economic benefits of further integration, there is little doubt that the economic returns will not be equally distributed across the EU economy. For some types of economic actors – for example those that primarily operate locally – the net economic returns may be limited. When interpreting the results of this analysis, it should be noted that behind these aggregate effects, there will be net winners and losers.

Studies like these are usually only as reliable as the assumptions upon which they are based. Even when focusing exclusively on economic benefits from European integration, as pointed out by Campos et al. (2014), there are difficulties in assessing these because of endogeneity, omitted variables, measurement errors and causality concerns. The latter is particularly relevant as the construction of credible counterfactual scenarios to the internal market have so far proved difficult.

In our quantitative approach, there are several limitations to the use of the Gravity Model vis-à-vis other approaches. For example, unlike a computable general equilibrium (CGE) model, our model only covers the static effects of policy levers on bilateral trade and does not take into account any multiplier effects that account for indirect consequences of a more efficient allocation of resources or increased competition, such as induced innovation. These dynamic effects have further implications for GDP growth than a static boost in trade flows only. These disadvantages are discussed in more detail in Chapter 3. Alternatives to the Gravity Model however, were considered infeasible given the resources and timeframe available for this study.

Aside from multiplier effects there are also monetary or non-monetary externalities to expanding intra-EU trade that are not taken into account in this study. These may include increased traffic congestion or environmental damage. When conducting a full assessment of the costs and benefits of further economic integration of the internal market in the EU, these externalities should be considered.

While it is difficult to strictly separate the free movement of goods from the other three pillars of the internal market – capital, people, and services – as they are strongly intertwined. For instance, trade in goods may benefit from further integration of the postal services market.

V. Structure of this paper

The paper is structured as follows. Chapter 2 will provide a general overview of the current state of play of the internal market with particular reference to the free movement of goods in the EU, identifying the main gaps and barriers to the completion of the Single Market and associated costs. Chapter 3 presents an estimation of potential economic gains driven from the removal of barriers to trade in the internal market. Chapter 4 will illustrate our conclusions regarding the untapped potential of the single market by looking at two manufacturing sectors: the construction products sector and the medical devices sector. Finally, Chapter 5 outlines the conclusions of the report and a discussion of a hypothetical scenario of complete removal of barriers.

Chapter 2. Current state of play of the internal market

The Single Market framework is one of the EU's policy levers to foster economic growth and job creation. Despite progress in the free movement of goods over the past decades, intra-EU cross-border activity has stagnated while trade flows from emerging countries, including China, Brazil or India, have increased (Baldwin, 2011; De Castro, 2012). The working assumption in the literature is that the remaining fragmentation in the internal market prevents the EU from fulfilling its full growth potential (European Parliament, 2014). The difference between the current benefits of the internal market and the potential benefits under a best case scenario of full implementation is sometimes referred to as "the cost of non-Europe" (London Economics and PWC, 2013). Several factors have been identified as inhibiting the full implementation of the internal market. For instance, the diversity of national product market regulations has been suggested as a key obstacle to a more effective economic integration (Europe Economics, 2013). This section aims to provide a brief overview of the existing literature to describe the current Single Market legislation and to identify remaining gaps and barriers hindering the completion of the internal market.

I. Current European legal framework

Since its early developments, the European project has been motivated by the potential economic gains from a deeper integration (EC White Paper, 1985):

1. Reduce costs borne by economic operators and costumers through the abolition of border formalities and the harmonisation of national regulations: harmonisation of production and quality standards enables products to be marketed more easily and cheaply within the EU;
2. Realise economies of scale through opening up European firms' access to a bigger market and optimise production processes through the relocation of economic activities;
3. Stimulate competition by reducing/suppressing entry barriers, resulting in lower costs for consumers and price convergence across Europe;
4. Give consumers access to a larger variety of goods and services at cheaper prices;
5. Facilitate labour force mobility across the continent and give them access to a wider range of job opportunities; and
6. Reduce transaction costs through the liberalisation of capital flows and greater financial integration.

Table 1: Milestones creation single market and general SM Regulation

1957: Treaty of Rome and creation of the European Economic Community (EEC).
1968: Creation of the European Customs Union.
1970: Deadline for creation of the common market to further deepen the European Economic Integration.
1985: Publication of the European Commission White Paper which proposes 300 measures for reducing internal trade barriers and introduces a principle of mutual recognition as a way to avoid systematic European legislation.
1987: The Single European Act (SEA) is signed by EU Member States and presents several steps towards the creation of a single European market by the end of 1992.
1988: The Cecchini Report provides a seminal assessment of the untapped potential of the Single Market and its economic impact so far.
1993: Over 90% of the objectives agreed in the SEA have been achieved, but efforts still need to be made to reach the full potential of the internal market.
1997: Action Plan for the Single Market, including a series of 62 actions with precise deadlines and a six-monthly monitoring of progress.
1999: Publication of the Strategy for Europe's Internal Market - a five-year plan of targeted measures with an additional review and further measures in 2003.
2000/01: E-Commerce and Copyright Directives.
2002: Introduction of the Euro, a mode of payment to replace national currencies. 17 countries (12 countries in 2002) are currently using the euro as their currency and, as a result, belong to the Eurozone.
2006: Adoption of the Services Directive which aims to reduce barriers in the sector and to lower the regulatory burden.
2012: Publication of the Single Market Act II to further develop the internal market and exploit its untapped potential as an engine for growth focusing on 12 dimensions: 1) a single market for venture capital; 2) a modern system for the recognition of professional qualifications; 3) establishing a unitary patent system; 4) faster, easier and cheaper solutions to disputes between consumers and traders; 5) a more efficient European standardisation system also covering services; 6) reinforcing the single market's energy and transport backbone; 7) making the cross border use of electronic identification, authentication and signature easier; 8) introducing European social entrepreneurs funds; 9) energy taxation supporting environmental objectives; 10) ensuring social cohesion; 11) simpler accounting requirements for companies; 12) making public procurement more efficient, flexible and user friendly

Source: ec.europa.eu

As a result, the last five decades have been marked by on-going efforts to remove existing barriers to trade. Most results have been achieved regarding the removal of physical barriers to trade (customs posts, passports, immigration controls and occasional search of vehicles) with the launch of the Single European Market in 1986 (Single European Act,

1986) and its progressive implementation since then, to facilitate the free movement of goods through the reduction of custom barriers as well as associated administrative costs. Attention has also been paid to technical barriers to trade through the harmonisation of fragmented national legislations and the creation of European standards for products and services (Pelkmans, 2012). Such initiatives are aiming to enhance the free movement of goods and services by reducing the costs related to the existence of different national legislations – especially quality, health and safety regulations – which might also deter economic operators, especially SMEs to access new markets or develop new businesses in other Member States. Hence, the harmonisation approach has been at the very heart of EU actions through the creation of common rules (regulation, directives) or through encouraging the mutual recognition (White Paper EC, 1985) of quality standards developed in other EU countries by Member States to facilitate the free movement of products and services. Table 1 above summarizes the key milestones related to the creation and the implementation of the single market.

II. Gaps and barriers in the implementation of the internal market and associated costs

As stressed in section I, physical barriers have been almost entirely removed within the EU and the implementation of the single market up until now has brought significant economic benefits (Cecchini et al., 1988; EC, 2013). Yet, these benefits have been less than anticipated and some of them have not yet fully materialised (EC, 2012). Several elements can explain the lack of full implementation of the Single Market. The following sections provide a brief overview of the main barriers to the full implementation of EU Single Market rules.

Delays in the implementation of harmonised rules in key sectors

Differences in legal systems can be considered as barriers to trade as they represent an additional cost for firms willing to sell their products in different countries, for instance the cost of compliance with diverse national legal, financial and fiscal regulations (Turrini & Van Ypersele, 2006). The implementation of harmonised rules for trade within the EU aims to remove such barriers to trade. Thus, delays in the transposition, hence implementation, of harmonised rules (directives or regulations) can explain the delays in reaping the anticipated economic benefits of the internal market. The Internal Market Scoreboard (2013) offers a detailed overview of the current state of play within the EU regarding the implementation of existing Internal Market EU laws (of all kinds), explaining delays in the creation of a Single Market for goods and services. It provides detailed information on a) the transposition deficit of internal market directives into national law;² and b) the infringement proceedings for incorrect transposition or application of single market rules (non-compliance with EU regulation). These two elements help map areas where further integration is still expected.

² The transposition deficit is captured through the percentage of directives with a transposition deadline of 31 October 2012 that were not transposed in national laws by 11 November 2012 (Internal Market Scoreboard, 2013).

a) Delays associated with the late transposition of EU rules

Since 2012, the average transposition deficit in Member States has fallen below the 1 per cent limit agreed by the European Council, reaching 0.6 per cent, which was the best result registered since the creation of the Internal Market Scoreboard. Besides, the number of Member States and EEA (European Economic Area) countries falling below this 1 per cent target has risen from 163 in 1997 to 23 in 2013. The average compliance to internal market legislation deficit of 0.6% is now approaching the 0.5 per cent target agreed by the Member States. However, there are still considerable delays in transposition, and these might postpone the effective implementation of the Single Market regulation as well. On average, a delay of ten months is observed between the directives' transposition deadline and its actual transposition in national laws in the EU. Delays in transposition can be due to different language factors such as: translation problem of existing directives; difficulties in interpreting EU directives; imprecise/loosely specified definition in legislative documents (e.g. economic operators, economic sectors, product definition); or weakness in administrative capacity in some Member States (Pelkmans, 2012). According to the 30th Report on monitoring the application of EU Law (EC, 2012), procedures for late transposition of the Directive on the energy performance of buildings⁴ have been launched against 24 Member States. This is important in the light of the negative impact heterogeneous regulations can have on behaviour of companies, as mentioned above. Especially the uncertainty and administrative burden associated with differences in national regulations are key barriers to trade as they tend to increase transaction costs for firms and prevent them from trading their goods in several national markets (Epstein, 2012).

b) Delays associated with Member States infringements to EU laws

The reported number of infringements of existing EU internal market legislation, which can be captured through the number of infringement proceedings, also continues to decrease gradually. According to the Scoreboard (2013), these infringements to EU laws are mostly due to the incorrect application of EU legislative documents in about two-third of the cases rather than to late application of European directives (in about one-third of the cases). Besides, infringements have been principally observed in the field of environmental regulation, taxation (especially indirect taxation) and public procurement. For instance, between 2006 and 2010, only 3.4 per cent of public tenders were awarded to foreign bidders. This indirectly affects the free movement of goods, as different taxation regimes, different environmental standards or discriminatory practice in the awarding of public procurement contracts might impede or prevent firms from doing business in some European countries. Furthermore, some companies, especially in sectors characterised by a high presence of SMEs, have to face additional administrative costs in order to comply with European single market rules (e.g. products regulation, environmental regulation, or taxation). European legislation often adds to existing national regulation – and thus delays the full implementation of internal market

³ There were 15 Member States in 1997 but the EEA also includes Switzerland, Norway, Iceland and Liechtenstein.

⁴ Directive 2010/31/EU

regulation. A recent report by Vetter (2013) estimated that the administrative burden represents additional cost for firms equal to 3.5 per cent of the EU GDP. In 2006, the EC found that a 25 per cent reduction in the administrative burden on companies could deliver an additional growth of 1.4 per cent of EU GDP. Additional administrative burden can also be caused by the tendency of some Member States to use the implementation of directives to add requirements to their national legal framework (whereas such additional requirements are not specified in the directive) and/or to combine the transposition of the directive with the revision of related legislation – the so-called “gold plating” (Pelkmans et al., 2012).

According to a recent study conducted by Copenhagen Economics (2010), the opportunity cost of the lack of single market is estimated to reach 4 per cent of the European GDP. Similarly, they find that the lack of implementation of EU rules in the areas of tax, services, goods and public procurement is reducing the expected economic gains from deeper economic integration by 1/3 approximately, which equals 0.8 per cent of the EU GDP. They also estimate that, if implemented properly, the Single Market Act actions might result in a 1 per cent – or even higher – increase in total EU GDP.

The existence of home bias effects hindering the full implementation of the Single Market

In 1991, Geroski (1991) reported that the EC, by focusing on the removal of barriers to trade, might overlook an important factor that prevents firms from operating on a European scale. According to him, market fragmentation remains mostly due to national and regional tastes and preferences. The existence of a so-called home bias, which refers to the propensity of economic agents to trade within their national border rather than with foreign partners, has been widely acknowledged in the literature and assessed in different national contexts (Hillberry, 2002; Mc Callum, 1995; Wei, 1996; Neven & Roller, 1991; Wolf, 2000).

This effect may partly explain existing difficulties to fully exploit the potential driven by the European economic integration. Empirical studies accounting for the existence of home bias and quantifying their effect on trade have shown that the EU, given its historical, cultural and political fragmentation, is particularly subject to this (Balta & Delgado, 2009; Pacchioli, 2011). Inherited norms, cultural preferences as well as differences in economic and political organisational systems explain in part remaining difficulties in reaching full harmonisation and subsequent economic integration in Europe. Cultural norms and routines and linguistic difference might for instance prevent domestic firms to perform transactions in foreign countries.

The 1985 Commission White Paper already noted the potential existence of such a bias towards the selection of national contractors in public procurement. Over the following years several studies found empirical evidence for this phenomenon (e.g. Head & Mayer, 2000; Trionfetti, 2000). Some economic activities tend to be much more localised than others, especially when characterised by a dense network representative of SMEs. It has been shown that wholesale companies in the construction materials sector are typically small themselves and operate within 80km radius (London Economics and PwC, 2013).

This concentration is even higher in the manufacturing sector (such as manufacturing of construction materials) than in wholesale and construction.

Inherited bureaucratic procedures (“red tape”) also require time to disappear, or if not, at least to change. In a comparative study aiming to quantify home bias in US and EU markets, Pacchioli (2011) finds that while any random chosen State in the US tends to exchange 2.63 times more within its own borders, this figure rises up to 7.46 for an EU Member State. The home-bias is thus much higher in the EU than in the US, despite the adoption of a single currency in most of its Member States, on-going efforts to strengthen financial integration and the abolition of physical barriers.

Chapter 3. A quantitative estimation of the untapped economic potential

In this chapter we quantify the potential effects of removing remaining trade barriers in the internal market, focussing explicitly on the free movement of goods. As discussed in previous sections, there are still essential barriers to trade that are hindering the full implementation of the internal market, including lack of harmonisation, different treatment of foreign suppliers with regard to taxation and other technical barriers to trade. The chapter is structured as follows: Firstly, we identify barriers to trade and measure the trade distortion effects of existing barriers; secondly, we predict the potential economic effects for the 28 EU Member States of the removal thereof.

I. An approach to estimating trade effects of existing barriers to trade

1. Existing Barriers to Trade

With the establishment of the World Trade Organisation (WTO), the establishment of the customs union between members of the European Economic Community and the completion of further international trade agreements, such as the North American Free Trade Area (NAFTA) and the pending Transatlantic Free Trade Area (TAFTA) between the US and the EU, globally tariffs in trade have gradually disappeared over the last decades. Instead, the factors that inhibit integration of international markets and free trade are not directly related to tariffs. Natural barriers, such as the distance between trading partners and geographical factors (oceans, mountains), or language differences can represent such factors (Anderson & van Wincoop, 2004). More importantly, in addition to this, non-tariff barriers can be created as a result of policies in areas such as regulation or state aid. In what follows we will refer to policy-induced barriers to trade that are not tariffs as “non-tariff barriers” (NTBs).

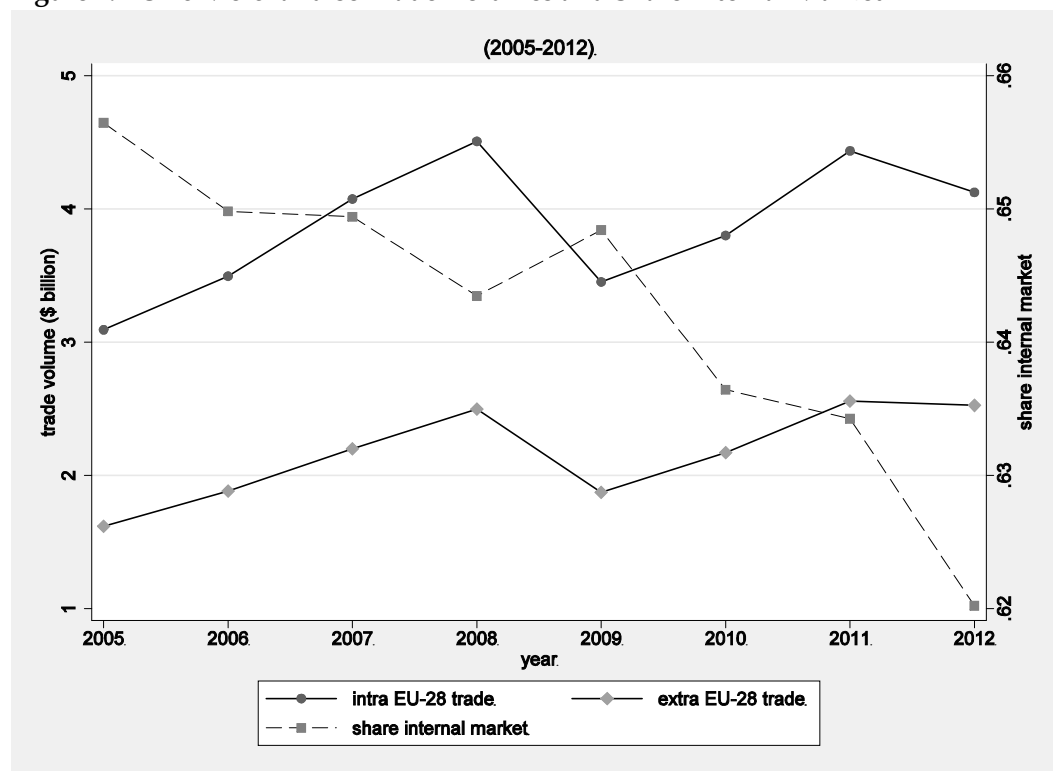
With the existence of NTBs trade is constrained within free trade areas even in the absence of tariffs. For instance, an export subsidy to a domestic producer has a similar trade distorting effect as a tariff on imported products, because the subsidy indirectly protects domestic producers from foreign competition (Krugman et al., 2011). A product standard or an environmental regulation requiring products to be manufactured as made domestically and therefore restricting access of foreign product standards effectively hinders trade. In essence, within the global system of free trade, policy makers are tempted to protect domestic producers, who are no longer protected by tariffs, and instead induce policies that impose NTBs.

Regarding the free movement for goods, market integration within the internal market reached an advanced stage, compared to, for instance, trade in services. Nevertheless, fifteen years after the “completion of the Single Market”, multiple barriers and regulatory obstacles continue to hinder cross-border trade within the EU (Monti, 2010). Even so, the Commission claim that technical barriers and other non-tariff barriers to the free

movement of goods in the EU are still widespread (European Commission, 2012a). In some areas of the EU regulatory burden is still high: the OECD Index for Product Market Regulation indicates that since 1998, European countries have made major progress in deregulating their product markets and increased competition (see Vetter, 2013, and Figure 2). Nevertheless, within the EU differences in national product market regulation still exist, which suggests potential for improvement and a lack of a “best practice” principle among the Member States (Vetter, 2013).

In light of the emergence of new key global players such as Brazil, Russia, India and China (BRIC countries), every analysis on the internal market with regard to trade needs to be conducted within the global context. Between 1999 and 2012, intra-EU trade increased by 87 per cent, while in the same period trade with non-EU countries or extra-EU trade, rose by 144 per cent (Europe Economics, 2013). Additionally, the internal market share of total merchandise trade declined from about 66 per cent in 2005 to 62 per cent in 2012. While overall EU trade flows plummeted in the aftermath of the economic crisis in 2009, the internal market share increased slightly between 2008 and 2009, but dropped again thereafter (Figure 1).

Figure 1: EU-28 Merchandise Trade Volumes and Share Internal Market



Source: IMF DOTS database, based on own calculations (values in current US Dollars).

With the focus on the free movement of goods, this analysis seeks to investigate the trade distortion effects of existing barriers to trade and the potential economic benefits of the removal thereof. In order to estimate the untapped potential of the internal market, we use an augmented gravity model of trade combining data on global merchandise trade

and product market regulation data provided by the OECD. In detail, we use estimated parameters from the gravity model to predict how much larger intra-EU trade volumes would be, if existing barriers to trade within the internal market are removed.

2. Theoretical Motivation of the Gravity Model

The gravity model is the workhorse model of the trade literature and has been used in numerous research papers and articles (see Anderson, 2011, and Shepherd, 2012, for an overview). The model is of particular interest for policy research, as it allows accounting for trade impacts of various trade-related policies, such as direct tariffs or “behind-the-border” regulatory barriers to trade. The gravity model has certain advantages; it follows a straightforward intuition, it is empirically implementable and is built on a micro-economic theoretical structure (see Anderson & van Wincoop, 2004; Bergstrand, 1985; 1989; Chaney, 2008; Eaton & Kortum, 2002; Helpman et al., 2008).

The first attempt for a basic structural form of the theoretical foundation of the model goes back to Anderson (1979), which establishes a model where goods are differentiated by country of origin and consumers have defined preferences over a variety of differentiated products.⁵ For the sake of simplification, trade costs in the Anderson (1979) model are modelled as so-called “iceberg” costs, which are proportional to the goods shipped, with the assumption that only a fraction of the good shipped will arrive at its destination. The implications of the model are as follows: each country consumes at least some of every good from each trading partner country, independent of the price of the good, and in equilibrium all goods are traded for each country. Consequently, GDP reflects the sum of domestic and foreign demand for the unique good the country produces. Also, larger countries export and import more than smaller countries. Intuitively, larger countries tend to spend larger amounts on imports because they have larger incomes and they also tend to attract larger shares of other countries’ spending as they produce a wider range of products.

Subsequent research has shown that prominent trade models, either based on the Ricardian model (relying on differences in technology between countries to explain trade patterns), the Heckscher-Ohlin (HO) model (relying on differences in factor endowments between countries as basis for trade) or the Krugman model (relying on economies of scale) can be mapped into a gravity-type model. For instance, Bergstrand (1989) highlights that a gravity model can be derived from a Krugman-type trade model with monopolistic competition, where identical countries trade differentiated goods because consumers have a preference for variety⁶. In contrast to the Anderson (1979) model, the approach by Bergstrand (1989) overcomes the unrealistic feature that goods are

⁵ Model assumptions based on Armington (1969). Armington introduced the assumption that final products traded internationally are differentiated on the basis of the location of production. In essence, he assumes that in any country every industry produces only one product which is distinct from the product of the same industry in any other country.

⁶ Reflecting preferences established by Dixit and Stiglitz (1977) where consumers gain higher utility both from consuming more of a given product variety and consuming a wider bundle of different varieties.

differentiated by location of production. Countries specialise in the production of different sets of goods (driven by a set of firms within a country specialising in particular products). Another model that recently gained attention in the trade literature is the model by Eaton and Kortum (2002), which derives a gravity-type model from a Ricardian model, while Deardorff (1998) derives a gravity-type model from the traditional HO model.

Whereas the literature reveals that a gravity-type model can be virtually derived from any traditional trade model, recent studies on the theoretical foundation of the gravity model have focussed on basing the specifications and variables applied in the gravity equation on sound economic theory. The seminal work with respect to this is the model by Anderson and van Wincoop (2004). Their theoretical model shows that bilateral trade flows are determined by relative trade costs, rather than solely by absolute trade costs. Their gravity equation takes the following form:

$$X_{ij} = \frac{Y_i Y_j}{Y} \left(\frac{\tau_{ij}}{K_i P_j} \right)^{1-\sigma} \quad (1)$$

$$K_i = \sum_{j=1}^C \left\{ \frac{\tau_{ij}}{P_j} \right\}^{1-\sigma} \frac{Y_j}{Y} \quad (1a)$$

$$P_j = \sum_{i=1}^C \left\{ \frac{\tau_{ij}}{K_i} \right\}^{1-\sigma} \frac{Y_i}{Y} \quad (1b)$$

Where X_{ij} represents exports from country i to country j , Y_i is the GDP of country i , Y_j is the GDP of country j , Y is world's total GDP, σ represents elasticity of substitution between product varieties, and τ_{ij} are trade costs that accrue from sending products abroad. K_i and P_j represent outward and inward multilateral resistance, which capture the fact that exports from country i to country j , and vice versa, depend on trade costs across all possible export and import markets (relative trade costs).

Note that trade flows between countries are determined not only by the absolute size of the barriers to trade between countries i and j , but also by multilateral trade resistance (MTR) which refers to the barriers which country i and country j face in their trade with all their trading partners (including internal trade). For instance, trade between Germany and Spain depends on how costly it is for each country to trade with the other relative to the costs involved for each of them in trading with other countries. Therefore, for instance a reduction in a bilateral trade barrier between Germany and a third country such as Belgium would reduce Germany's multilateral trade resistance. Even though the bilateral trade barrier between Germany and Spain is not affected, the fall in Germany's multilateral trade resistance induced by the decline in the bilateral trade barrier with Belgium would lead to a diversion of trade away from Germany-Spain to bilateral trade towards Germany-Belgium. In essence, the rationale for including MTR is that, *ceteris paribus*, two countries that are surrounded by other large trading countries (i.e. the Netherlands and Belgium by France and Germany) will trade less between each other

than if they were only surrounded by mountains or oceans (i.e. New Zealand trading with Australia).

Given its multiplicative nature, the gravity equation outlined in (1) is transformed by taking the logarithms obtaining a log-linear form illustrated as follows:

$$\log X_{ij} = \log Y_i + \log Y_j - \log Y + (1 - \sigma)[\log \tau_{ij} - \log K_i - \log P_j] \quad (2)$$

Due to a lack of direct measures of trade costs, τ_{ij} is usually specified empirically as a function of observable variables that are seen as directly correlated to trade costs. In the literature a log-linear specification is often applied as follows (Mayer & Zignago, 2011):

$$\log \tau_{ij} = \delta_1 \log distance_{ij} + \delta_2 contig_{ij} + \delta_3 comlang_{ij} + \delta_4 colony_{ij} \quad (3)$$

Where *distance* is the geographical distance between countries *i* and *j*, *contig* is an indicator variable equal to one if countries share a common land border, *comlang* is an indicator variable equal to one if country pairs share the same language, and *colony* is an indicator variable equal to one if countries *i* and *j* were in a colonial relationship. These factors reflect the hypotheses that transport costs are increasing with distance and are lower for neighbouring countries. Indicators for common language or colonial history are related to information costs with regard to trade, where search costs are presumably lower for trade between countries whose culture and business practices are known to each other.⁷ Empirically, all these factors have been found to be significant drivers of bilateral trade.

3. Empirical Methodology and Data

We estimate the parameters of a gravity model that captures the trade patterns of the 28 EU Member States and their principal trading partners. The parameters of this model are then subsequently used in a second step to generate a prediction of what benefits in terms of increased trade flows would accrue for the Member States, if trade barriers within the internal market would be completely removed.

Following the structural model outlined in equations (1)-(3), important implications for the empirical estimation have to be considered. For instance, the multilateral resistance terms are not directly observable, due to a lack of data for all price indices. A variety of estimation approaches exist to take this into account (see for instance Head 2003; Rose & van Wincoop, 2001). For this analysis we follow the approach by Baier and Bergstrand (2009) who provide a way to account for inward and outward multilateral resistance, allowing to estimate the theoretical gravity model that also includes policy variables that

⁷ For instance, firms in countries with a common language or with similar cultural background are more likely to have better information about each other and understand better each other's business practices than firms operating in different environments.

vary by exporter or importer, rather than only bilaterally.⁸ Basically, the approach builds on a first order Taylor approximation which takes into account the multilateral resistance terms following the model below:

$$\log X_{ij} = \log Y_i + \log Y_j - \log Y + (1 - \sigma)[\log \tau_{ij}^*] \quad (4)$$

$$\log \tau_{ij}^* = \log \tau_{ij} - \sum_{j=1}^N \theta_j \log \tau_{ij} - \sum_{i=1}^N \theta_i \log \tau_{ij} + \sum_{i=1}^N \sum_{j=1}^N \theta_i \theta_j \log \tau_{ij} \quad (4a)$$

$$\theta_j = \frac{Y_j}{Y} \quad (4b)$$

Note that Baier and Bergstrand (2009) suggest using simple averages rather than GDP weights θ_j . Equation (4) reflects the baseline gravity model, relating bilateral trade flows with GDP from both, exporting and importing country, and trade costs. We will estimate equation (4), but in addition, we augment the gravity model in our analysis with policy indicators representing the regulatory stringency R in country i and j and its effects on bilateral exports. For simplicity reasons, we have omitted time indexes so far. However, all variables in equation (4) can vary over time. In what follows we introduce time t as a further dimension. The econometric model used here can be illustrated as follows:

$$\log X_{ijt} = \beta_0 + \beta_1 \log GDP_{it} + \beta_2 \log GDP_{jt} + \beta_3 \log \tau_{ij} + \beta_4 R_{it} + \beta_5 R_{jt} + \gamma_t + \epsilon_{ijt} \quad (5)$$

X_{ijt} represents total export flows between country i and j at time t . We use data for annual bilateral trade flows between any pair of countries from the *IMF Direction of Trade Statistics (DOTS)* database, whose main advantage is its comprehensive coverage. Annual bilateral trade flows from 1948 to present are available for almost all countries and the vast majority of countries engaged in world trade are included. GDP data come from the *World Bank Development Indicator* database⁹.

Data for transportation cost τ_{ij} , as outlined in equation (3), have been extracted from the *CEPII Geodist* dataset (Mayer & Zignago, 2011). Geographical distance was defined as the distance (*logdistance*) between the capital cities of the exporting country and the destination country, using the great circle formula for cities' and longitude. Dummy variables indicating whether the two countries are contiguous (*contig*), share a common language (*comlang*), or have ever been in a colonial relationship (*colony*) are also included. Note that there are two common language dummies available, the first one reflecting whether two countries share a common official language, and the other one set to one if a language is spoken by at least 9 per cent of the population in both countries. For this analysis we only use the former indicator.

To measure a country's regulatory stringency and to track reform progress, the OECD developed an economy-wide indicator set of product market regulations, which is

⁸ Note that an alternative approach would be to estimate fixed exporter and importer effects in the model. However, this would not allow to include policy indicators that only vary by exporter or importer as those would be (almost) perfectly collinear with the fixed effects (Shepherd, 2012).

⁹ See: <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>

regularly updated every five years since 1998. The indicators have become an essential element of the OECD policy surveillance to engage with regulatory practices and the investigation for the link thereof on economic performance (Wölfl et al., 2009). We built on the updated set of indicators of product market regulation based on this *International Regulation* database (PMR) to estimate the effect of regulatory stringency on trade flows using the vintages of 2008 and 2013. The set of PMR indicators aims to measure the degree to which policy settings inhibit or promote competition by measuring the incidence of regulatory barriers on competition via legal and administrative burdens to start-ups, via state control of business operations and protection of incumbents, and also the incidence on foreign trade and investment. The numerical indicators represent stringency of regulatory policy in the specific areas on a scale from 0 to 6: with zero representing an absence of regulatory trade barriers and 6 representing the most restrictive regime. The PMR indicators have been used in the past to assess the effects of product market regulation on trade flows (Kox & Lejour, 2006). In essence, the PMR indicators reflect the nature and extent of regulatory barriers to competition (Nicoletti et al., 2000). For the sake of simplification we transform the indicator values to lie in a range from 0 to 1 in what follows¹⁰. Table 2 provides a detailed overview on the content of the separate sub-categories of the indicator used in our analysis.

For the purpose of our analysis we mainly focus on the sub-categories that directly affect trade in goods: barriers to trade and investment, including the non-tariff barriers imposed by the different treatment of foreign suppliers (i.e. with regard to taxation) and the lack of mutual recognition and harmonisation of standards. However, we also include the policy areas state control and barriers to entrepreneurship in our analysis as they are potential inhibitors of international trade in goods as well.

It should be noted that the publicly available PMR database includes only data for 22 of the 28 EU Member States (not included are Romania, Lithuania, Malta, Cyprus, Latvia and Croatia). However, we imputed data for the missing countries using recent OECD publications (OECD 2014). See Annex D for a description of the imputation procedure.

Pelkmans (2010) argues that one drawback of the PMR indicators is the fact that they do not capture other types of regulation, such as environmental regulation. To control for environmental regulatory stringency in our regression analysis, we use a publicly available index created by the World Economic Forum (WEF). In their Executive Opinion Surveys, entrepreneurs (between 8,000 to 10,000 respondents) compare countries on a Likert Scale (1 = lowest level of environmental stringency to 7 = highest level of stringency).

¹⁰ Calculated by dividing achieved country score by the total maximum score (which is 6).

Table 2: Overview Content OECD Product Market Regulation Indicators

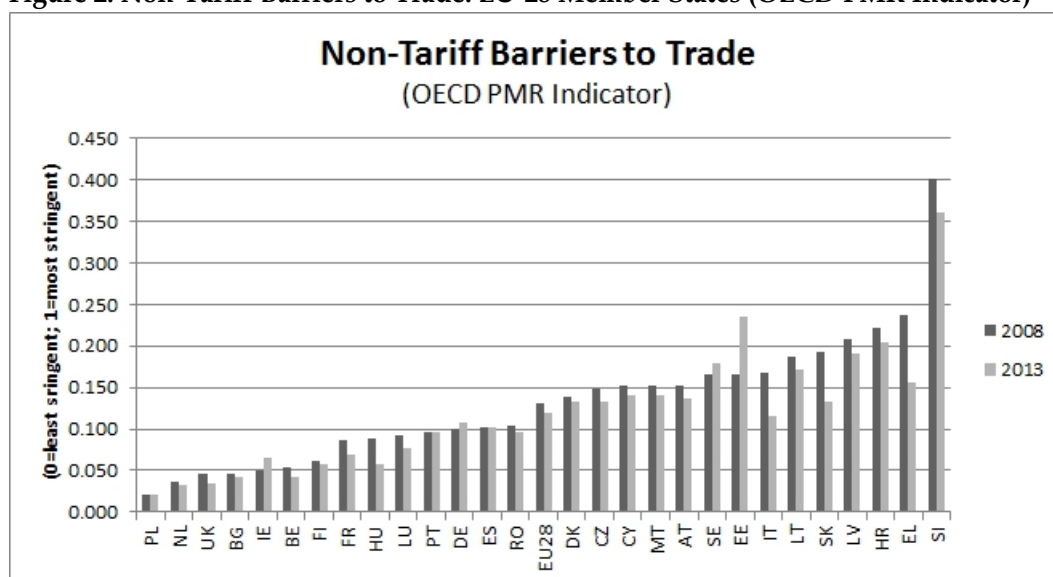
<i>Overview OECD Product Market Regulation Indicators (PMR)</i>	
Barriers to Trade and Investment (Barriers to FDI, Tariffs and NTBs)	<ol style="list-style-type: none"> 1. Barriers to FDI: measures restrictions on foreign acquisition of equity in public and private firms 2. Tariffs: reflects average most-favoured-nation tariffs, computed from product data on tariffs 3. Non-tariff barriers to trade: <i>Differential treatment of foreign suppliers:</i> Extent to which foreign suppliers are treated less favourably regarding taxes or eligibility to subsidies than domestic suppliers <i>Barriers to trade facilitation:</i> lack of mutual recognition or harmonisation of standards. <i>Discriminatory procedures:</i> reflects extent of discrimination against foreign firms.
State Control	<p><i>Public Ownership:</i> various indicators on the control over business enterprises</p> <p><i>Involvement in business operations:</i> measuring direct control (e.g. special voting rights) in privately-owned enterprises or price controls in competitive sectors, such as retail, road freight, railways or air transport)</p>
Barriers to entrepreneurship	<p><i>Regulatory and administrative opacity:</i> reflects the use of "one-stop shops" and "silence is consent" rules for getting information</p> <p><i>Administrative burdens start-ups:</i> measures the extent of administrative burdens on the creation of corporations or sole proprietor firms</p> <p><i>Barriers to competition:</i> measures exempt of legal barriers or antitrust.</p>

Sample Selection

For this analysis, we built a panel dataset by merging all the different data sources together and pooling all observations for the years 2007 and 2012. This means that we relate the OECD regulation data for the years of 2008 and 2013 with 2007 and 2012 accordingly. Therefore, we include in equation (5) γ_t , which represents a year indicator for the year 2012. ϵ_{ijt} represents a disturbance term capturing unobserved effects.

As illustrated in Figure 1, international trade flows plummeted in 2009 in the aftermath of the economic crisis, but recuperated afterwards and reached pre-crisis levels in 2011. Therefore we do not expect the economic crisis to confound our approach by using the pooled years 2007 and 2012. Overall, as we include the EU-28 Member States plus their most important trading partners, the data set includes 46 countries (including the BRIC countries). A full list of countries can be found in Appendix B.

Figure 2: Non-Tariff Barriers to Trade: EU-28 Member States (OECD PMR Indicator)



Source: OECD PMR database (2014)

Limitations of the Model

A major limitation of gravity models is their narrow focus on trade volumes and inability to generate predictions on the specific directions of trade or any distributional aspects that may arise on the more disaggregated level. The empirical gravity model has the drawback of a partial equilibrium model. Compared to CGE models, which provide explicit links between changing production and consumption patterns and changes in trade, the gravity model can only identify the comparative static effects of policy levers on bilateral trade, keeping all other factors constant. In essence, the model does not explicitly take into account that supply and demand for goods, services and production factors are balanced. It further inhibits the determination of how firms and households respond to changes in incentives, such as changes in trade costs. The only metric we directly observe in applying the empirical gravity model outlined in equation (5) are changes in patterns of trade volumes. Due to its aggregated level of analysis we cannot directly estimate wider employment effects or benefits to particular stakeholder groups, including SMEs and consumers.

In what follows, it is important to note that the presented results from the empirical model show associations between trade barriers (as proxy for trade costs) and bilateral trade rather than causal relationships. Trade barriers may be endogenous variables. The causal direction is from the establishment of trade barriers (i.e. NTBs) to the manifestation of trade flows. However, in some situations the causality may be reverse: when barriers are raised or removed as a consequence of trade flows.

Furthermore, there might be other variables that influence trade flows and trade barriers simultaneously, but that are not captured within the empirical model. We mitigate this issue by controlling for as many control variables as possible and also control for the so

called 'multilateral resistance' terms. In general, there is no easy solution to the problem of endogeneity. One solution could be to use an instrumental variable (IV) approach. Usually, the problem with IV techniques is to find suitable instruments that are correlated with the trade barrier but not with bilateral trade. Unfortunately, there is no perfect solution to this problem. One could consider using the Generalised Method of Moments (GMM) estimation where lagged levels of the barrier are used as instruments for current levels and vice versa. Nevertheless, GMM estimates are very sensitive to the number of lags used. Given the fact we could include only one lag, we concluded GMM is not suitable for our approach. If we plausibly assume that any additional confounding factor in the unobservable term affects the trade barriers in the same direction as the trade flow, then our estimates would represent upper bounds of the real effect.

4. Empirical Results

Descriptive Statistics

Table 3 shows descriptive statistics for the main variables used in the econometric model. For the sake of simplicity we report mean values for EU-28 countries and the 18 other countries ("rest") included in the sample. Table 3 reveals that EU-28 countries are on average slightly more likely to share the same language as the other countries and are more likely adjacent to their trading partner country.

It requires little explanation that the model results suggest that within the EU-28, tariffs no longer play an important role regarding regulatory stringency (mean value is zero). This stems from the internal market framework but also from the fact that EU Member States are members of the WTO. The other countries are more restricted with regard to Foreign Direct Investments (FDI) and also with regard to NTBs.

However, as the estimates suggest, on average, the EU-28 countries still have room for improvement with regard to the removal of non-tariff barriers such as lack of mutual recognition, or lack of harmonisation of standards (mean value 0.12). We also observe substantial barriers to entrepreneurship (mean value 0.35) for the EU-28.

Comparing one of the main sub-indicators reflecting non-tariff barriers to trade, we observe that in general regulatory stringency is declining. Figure 2 illustrates that almost all EU-28 Member States decreased regulatory stringency from 2008 to 2013¹¹.

Econometric Results

In a first stage, the parameters of the gravity model in equation (5) were estimated with Ordinary Least Squares (OLS), accounting for the correlation of the error terms within groups by clustering. Failure to account for clustering could result in understated

¹¹ Please note that values for Croatia, Latvia, Lithuania, Malta, Cyprus and Romania have been imputed. Data for Poland is according to the OECD not completed yet and likely subject to future updates. Therefore, these estimates should be considered with caution.

standard errors (Moulton, 1990). For example, errors are likely correlated by country pair in the gravity model. Therefore, it is important to allow for clustering by country. We cluster by distance, as this separately identifies each country pair independent of the direction of trade. A further potential issue that could arise is due to the fact that some trade flows are zero. Due to the log specification, these values are not included in the OLS regression and therefore the model is truncated. In our sample we identify only 32 bilateral trade flows with value zero. Nevertheless, we will perform a robustness check. Following the approach by Silva and Tenreyro (2006), we apply as well the Poisson Pseudo Maximum-Likelihood (PPML) estimator that allows for zero values by estimating the gravity equation in levels.

Table 3: Descriptive Statistics Variables used in Econometric Gravity Model

Variable	EU-28	Rest	Total	Source
Log Exports	19.87 (2.55)	19.91 (2.54)	19.90 (2.54)	IMF DOTS trade database
<i>Demand</i>				
log GDP	26.01 (1.59)	27.04 (1.65)	26.57 (1.7)	World Bank Development Indicator database
<i>Transportation Cost</i>				
log distance	7.56 (0.52)	7.88 (0.61)	7.74 (0.59)	CEPII Geodist dataset
contig	0.06 (0.27)	0.04 (0.14)	0.05 (0.21)	
comlang	0.08 (0.19)	0.06 (0.24)	0.07 (0.22)	
colony	0.03 (0.17)	0.04 (0.18)	0.03 (0.17)	
<i>Regulatory Stringency</i>				
barriers to FDI	0.07 (0.04)	0.14 (0.11)	0.11 (0.1)	OECD PMR database
tariff barriers	0 (0)	0.12 (0.19)	0.07 (0.16)	
non-tariff barriers	0.12 (0.08)	0.18 (0.12)	0.15 (0.1)	
state control	0.06 (0.01)	0.07 (0.02)	0.07 (0.02)	
barriers to entrepr.	0.35 (0.09)	0.37 (0.14)	0.36 (0.12)	WEF Executive Opinion Survey
environmental	0.73 (0.12)	0.69 (0.12)	0.7 (0.12)	

Notes: standard deviations in parentheses. Data pooled for the years 2007 and 2012.

Rather than only augmenting the model with barriers related to trade and investment, we include all sub-categories of product market regulation (including barriers to entrepreneurship and state control). As these sub-indicators may have independent effects on trade flows, and at the same time may be correlated with barriers to FDI or NTBs, we want to explicitly estimate the ceteris paribus effect of each potential barrier to trade on bilateral trade flows. Furthermore, not including an important factor would result in an omitted variable bias. Following the critique of Pelkmans (2010), we also control for environmental regulatory stringency when estimating our parameters of interest. Furthermore, in order to mitigate measurement error, and therefore attenuation bias, our baseline regression only included countries for which we have direct data available regarding regulatory stringency, excluding Croatia, Latvia, Lithuania, Malta, Cyprus and Romania. However, we also conduct the same analysis using imputed regulatory stringency measures for these countries without substantial change of the parameters.¹² The results thereof can be found in Appendix C.

The estimated results are reported in Table 3. Specifications (1) and (2) depict the gravity model, in which only the GDP and transportation costs variables are included. The significant parameters take their expected signs for both OLS and PPML: GDP incomes are significantly positively associated with trade volume, whereas the elasticity differs in magnitude for the exporting country i and for the importing country j . The distance effect is also significant. The larger the distance between trading partners, the smaller the level of trade flows are. For both, OLS and PPML distance is a trade deterrent, albeit the elasticity is smaller for the PPML estimate.

Colonial ties between trading partners have a positive effect on the aggregated trade flows between the countries, while a common language also has a positive effect on bilateral trade. However, the effect only plays for the OLS estimates.

Specifications (3) and (4) show the estimated parameters including the regulatory stringency variables. The signs of the estimates do not differ between OLS or PPML. With regard to the trade effects of barriers to trade and investment, both, high barriers to FDI in the exporting country i and the importing country j have a strong negative effect. Note that the trade data are only used at an aggregated level, and hence are not sufficient to distinguish bilateral flows in final or intermediate goods. If FDI was associated with trade in intermediate goods, where firms set up intermediaries in other countries to achieve lower costs of production factors such as lower wages (i.e. off-shoring), then we would expect that barriers to investment in both countries have a trade distorting effect.

Tariff barriers do have a significant trade distortion effect. The higher the tariffs set by the country of destination, the lower the level of exports. However, as Table 3 illustrates, this result shows that tariff barriers negatively affect extra-EU trade, since tariff barriers no longer apply within the EU-28.

¹² In line with expected attenuation bias, key parameters are slightly smaller.

Interestingly, NTBs are prevalent and do have a significant effect on exports. We observe a small positive association between the exporting country's non-tariff barriers and bilateral exports in goods. However, the effect is not significant. As expected, higher NTBs in the importing country j hinder the bilateral export flow of goods, where a 0.01 increase of regulatory stringency¹³ reflects a decrease of exports by about 0.64 percentage points. As expected, NTBs seem to be significant trade deterrent.

State control in the exporting and the importing country is positively associated with trade in goods. Hence, public ownership of companies and public involvement in business seem to foster export activity. Recent studies by Aghion et al. (2011) and Stöllinger and Holzner (2013) found similar effects. This can be explained, for instance, by the fact that state supported companies (e.g. in the aircraft industry) are dominant players in the international market. State aid on the sectoral level is seen as a primary objective of the EU's industrial policy strategy (European Commission, 2010a, 2010b, 2012a) and is based on the view that exports reflect international competitiveness. The aggregated data do not allow us to explicitly identify industries where natural monopolies or other market failures can arise, and hence are therefore more likely to be state-owned. In essence, due to this data limitation it is not straightforward to assess the explicit driving factors behind the trade effects of state control, and a more in-depth analysis and delineation of this matter is beyond the scope of this analysis. Nevertheless, it is important to include state control in the econometric model specification in order to reduce omitted variable bias. However, state control does not seem to be a relevant factor for predict the internal market's untapped potential.

Barriers to entrepreneurship potentially affect bilateral trade flows in goods. If the regulatory burden is high, it may deter the creation of new companies that potentially trade goods across borders. There are hints to a negative association between barriers to entrepreneurship and bilateral trade. However, the effect is not significant, neither for the exporting country, nor the importing country.

In summary, we find two factors whose removal has potential to create additional intra-EU trade: existing barriers to FDI and NTBs. Note that we expect a higher potential of a removal of NTBs due to the fact that barriers are currently more prevalent than barriers for FDI (see Table 3). In the following section we will predict the potential trade growth and the economic effects of the removal of these barriers on the EU-28 and Member State level.

¹³ Reflects a 0.01 increase in the PMR sub-indicator which is bound between 0 and 1.

Table 4: Econometric Results Gravity Model

Estimation Method	(1)	(2)	(3)	(4)
Dependent Variable	OLS	PPML	OLS	PPML
	log exports	exports	log exports	exports
log GDP country i	0.8162*** (0.022)	0.6155*** (0.031)	0.9395*** (0.022)	0.7246*** (0.039)
log GDP country j	0.7689*** (0.021)	0.6424*** (0.035)	0.9176*** (0.022)	0.7529*** (0.038)
log distance	-1.1371*** (0.099)	-0.4564*** (0.072)	-1.1715*** (0.075)	-0.5984*** (0.078)
contig	0.2803 (0.254)	1.0626*** (0.186)	0.1510 (0.217)	0.8728*** (0.231)
comlang	0.3709* (0.195)	-0.0981 (0.204)	0.3744** (0.161)	-0.1468 (0.219)
colony	0.4225* (0.236)	-0.0765 (0.194)	0.4244* (0.236)	-0.1098 (0.177)
barriers to FDI country i			-0.6142*** (0.064)	-0.1485** (0.075)
barriers to FDI country j			-0.6532*** (0.053)	-0.4016*** (0.069)
tariff barriers country i			-1.0570*** (0.236)	-0.6828** (0.332)
tariff barriers country j			-1.4924*** (0.227)	-0.8622*** (0.247)
non-tariff barriers country i			-0.2863 (0.324)	-0.7676 (0.530)
non-tariff barriers country j			-0.6381** (0.317)	-1.3489*** (0.457)
state control country i			0.5534*** (0.073)	0.3455*** (0.132)
state control country j			0.4850*** (0.069)	0.2759** (0.122)
barriers to entrepr. country i			-0.3098 (0.310)	0.5341 (0.355)
barriers to entrepr. country j			-0.3930 (0.270)	0.4749 (0.335)
Observations	3,101	3,120	3,101	3,120
Country Pairs	1560	1560	1560	1560
R-squared	0.6749		0.7487	

Notes: ***p < 0.01, **p < 0.05, *p < 0.10; clustered standard errors (distance) in parentheses. All specifications include a constant, a time dummy for the year 2012, plus controls for environmental regulatory stringency and a dummy whether trading partners share same currency. We use STATA command *vif* to test for multicollinearity.

II. Predicting the Internal Market's untapped potential

1. Predicted effects of the removal of trade barriers

The second stage of the analysis is to predict the trade creation for the EU-28 following a removal of existing barriers to FDI and NTBs in the internal market¹⁴. Using the parameter values from the estimated model (Table 4, specification (3)) and the prevalent trade barriers in 2013, we estimate the “untapped potential” of the internal market for the EU-28. Essentially, we predict the additional exports and their corresponding share among annual export levels, plus their share of GDP for each Member State individually and the EU-28 as a whole under three different scenarios as follows:

- Scenario 1: “The Full Monti”. This assumes that existing barriers to FDI and NTBs will be fully removed, represented by the incremental bilateral trade that occurs if the PMR indicator for NTBs and barriers to FDI are set to zero.
- Scenario 2: . “Follow the Leader”. Barriers to FDI and NTBs will converge to the smallest level of regulatory stringency represented by the PMR indicators. In essence, this scenario assumes that the PMR level of Member States with the lowest barriers represents a natural lower bound of regulatory stringency that cannot be overcome.
- Scenario 3: “The Gang of Five”. Barriers to FDI and NTBs will converge to the mean value of the five countries with the lowest regulatory stringency with regard to FDI and NTBs. As the previous scenario, this scenario assumes that there is some natural lower bound level of regulatory stringency.

Note that all the predicted estimates under the three scenarios outlined above reflect the total potential gains that would accrue now, if the barriers with regard to FDI and NTBs were removed with immediate effect.

Table 5 reports the predicted economic effects for the EU-28 as a whole. Albeit our analysis was conducted with care, our predicted effects are still exposed to uncertainty. We therefore include for each predicted value a 90 per cent confidence interval.¹⁵ Under scenario 1, we predict that the total incremental amount of intra-EU-28 exports that would accrue with the removal of barriers to FDI is around €98 billion, whereas exports added with the removal of NTBs are around €171 billion.¹⁶ These estimates show the potential additional intra-EU exports (in addition to the 2012 annual trade volumes) with all barriers to FDI and NTBs removed (holding all else equal), effected immediately at the beginning of 2013. However, we expect that they will only be gradually removed over time, so that the estimates represent a long term effect. With respect to 2012 annual export volumes for the EU-28, the expected rise in exports within the internal market is 2.56 per cent for the removal of FDI barriers and 4.44 per cent for the removal of NTBs

¹⁴ Internal market is defined as the EU-28 plus Switzerland, Norway and Iceland.

¹⁵ A 90% confidence interval states the predicted value will lie with 90% probability in the posed interval.

¹⁶ Note that IMF trade data is in US Dollars. We use a weighted average exchange rate (0.779) for the year 2012 to convert Dollars into Euros (www.oanda.com).

respectively. This corresponds with GDP shares of 0.59 and 1.03 per cent on the EU-28's GDP in 2012, respectively. Under scenario 2 and scenario 3, the overall gains with regard to incremental trade would be lower. The total incremental amount of intra-EU-28 exports accruing with the removal of barriers to FDI either around €91 billion (scenario 2) or €81 billion (scenario 3). Exports added with the removal of NTBs are around €129 billion (scenario 2) and €103 billion (scenario 3) respectively. It is important to stress that the gravity model only allows us to detect comparative static partial equilibrium effects with regard to bilateral trade and its corresponding share on GDP. This is not a full GDP effect, as it assumes that all other factors are held constant (i.e. total expenditure) in light of lower trade costs with the removal of the trade barrier. The gravity model is not able to catch further general equilibrium effects, including wider consequences of trade creation, such as induced innovation, which have further implications on GDP growth than a static boost in trade flows only.

Tables 6 and 7 report the breakdown of the economic benefits that accrue due to the removal of trade barriers for each of the EU-28 Member States under each of the three scenarios. Table 6 shows that with the removal of barriers to FDI, especially Eastern European countries, such as Estonia, Lithuania, Slovenia and Latvia, would increase their relative exports in the internal market (around 3.80 per cent). A similar conclusion can be drawn regarding the removal of NTBs. The results suggest that Croatia, Estonia, Lithuania and Latvia are among the countries that gain most in terms of export growth in the internal market. It is not surprising that these countries would increase their trade potential most, as their initial regulatory stringency is well above the EU average.

2. Employment creation, benefits for SMEs and consumers

As highlighted in previous sections, the gravity model of trade is a convenient tool to quantify changes in bilateral trade flows by changes in policy indicators. However, due to its aggregated level and partial equilibrium nature, one drawback of the model is that we cannot directly estimate effects on employment, benefits for SMEs and consumers. Nevertheless, we can conduct some inference from the model's results about potential effects on job creation and stakeholder groups.

Using the predicted employment measure by Sousa et al. (2012) of 16.7 workers employed in the EU per million Euros of extra-EU exports and assuming that the same holds for intra-EU trade, we would expect that, based on our predicted incremental exports from Table 5, a removal of barriers to FDI would, *ceteris paribus*, increase employment by 1.6 billion jobs (98689×16.7). For the EU-28, the removal of NTBs would increase employment in the internal market by 2.8 billion jobs (171441×16.7) in total. In essence, the removal of barriers to FDI and NTBs could boost EU-28 job creation by about 2 per cent of total EU employment in 2013¹⁷.

Trade theory predicts that only larger firms engage in foreign direct investment (Helpman et al. 2004). Therefore, we expect that a removal of barriers to FDI would

¹⁷ According to Eurostat total employment in 2013 is 212,320 (in 1000).

benefit larger firms disproportionately as it enables them to set up intermediaries or buy equity across border.

We expect SMEs to primarily benefit from the removal of NTBs. The reason for this is that exporting firms, before being able to sell one single product, would first need to incur fixed costs of complying with regulatory requirements in the destination country. Here such up-front costs can be a prohibitive barrier for entering export markets, in particular for SMEs. If all EU Member States applied the same regulatory framework, then complying with this effort would be a one-off effort for the firm. Once the fixed costs have been incurred, it would allow the firm to reap economies of scale by expanding in other EU Member States.

If EU Member States had different regulatory legislation in place, different and additional compliance effort would be needed for firms that are willing to operate across borders. For each specific country, new fixed costs would occur that cannot be spread over larger scale cross-border production. Different regulatory requirements between countries constitute a trade barrier and restrict the scope for intra-EU economies of scale in complying with regulations. These costs are usually for legal and other assistance and independent of firm size, leading to the fact that the entry-detering effect will be strongest for SMEs.

We expect EU consumers to benefit from a wider variety of supply available for their consumption in line with increased bilateral trade flows. Furthermore, rising trade flow increases competitive pressure on domestic producers of goods and leads to lower prices for given products.

3. Potential costs of the removal of trade barriers and trade creation

The previous sections confirmed the existence of an untapped potential of the internal market with regard to the free movement of goods. The gains from the removal of trade barriers are trade creation, which potentially give rise to specific benefits for Member States in the form of growth, as well as potentially better market access for firms, job creation for employees and more products available at lower prices for costumers. However, even though aggregate welfare for the EU economy is expected to grow when trade distortions are reduced, the model described above does not take into account distributional effects - not everyone will gain. For instance, better market access for foreign firms from other Member States could increase competition for domestic firms and could cause a decrease in demand for a product. Recent economic findings show that firms in industries with increased competition from abroad are more likely to go out of business (Bernard & Jensen, 2007). This could disproportionately affect smaller less productive firms with less financial power to respond to an increased competition. Employees in such firms would find themselves out of work if foreign competition forces their employer to cut back or even close down.

Furthermore, a removal of NTBs could impose additional costs to firms. For instance, efforts for further harmonisation in product market legislations may incur administrative costs to provide information to government authorities or to meet aims of the regulation

(i.e., adoption of new technologies to facilitate information sharing). Furthermore, such a modification may increase search costs for firms, at least in the short run, if they have to consult market authorities providing information on internal market access rules. It is important to note that these costs of compliance with internal market regulation will be higher for some firms than for others and that they could pose additional costs on firms that operate domestically only.

Overall, these costs are difficult to quantify, but empirical evidence over the last decades reveals that it is unlikely that these costs will outweigh the economic benefits of removal of trade barriers on aggregate for the EU as a whole. Nevertheless, there is little doubt that the economic returns will be unequally distributed across the EU economy as some types of economic actors will less likely profit from more trade than others.

Table 5: Untapped Potential Internal Market - Predicted Effects Trade EU-28

Exports (Million Euros)	Predicted Value	90% CI	Change (in %)	90% CI	Share GDP (in %)	90% CI
Scenario 1: "The Full Monti"						
<i>removal of:</i>						
FDI barriers	98,689	[85,173; 112,269]	2.56%	[2.21%, 2.91%]	0.59%	[0.51%, 0.67%]
non-tariff barriers	171,441	[29,989; 321,315]	4.44%	[0.78%; 8.32%]	1.03%	[0.18%; 1.93%]
Scenario 2: "follow the leader"						
<i>removal of:</i>						
FDI barriers	91,371	[78,863; 103,931]	2.37%	[2.04%, 2.69%]	0.55%	[0.47%, 0.62%]
non-tariff barriers	129,512	[22,730; 241,922]	3.35%	[0.58%; 6.27%]	0.78%	[0.14%; 1.45%]
Scenario 3: "the gang of five"						
<i>removal of:</i>						
FDI barriers	81,010	[69,930; 108,129]	2.10%	[1.80%, 2.38%]	0.49%	[0.42%, 0.55%]
non-tariff barriers	102,566	[18,022; 326,595]	2.66%	[0.47%; 4.95%]	0.61%	[0.11%; 1.15%]

Table 6: Untapped Potential Internal Market (Barriers to FDI) - Predicted Effects EU-28 Member State Level

Scenario	Predicted Value (Million Euros)			Change (in %)			Share GDP (in %)		
	1	2	3	1	2	3	1	2	3
AUT	2,648	2,413	2,080	2.73%	2.49%	2.14%	0.86%	0.78%	0.68%
BEL	7,945	7,336	6,473	3.17%	2.93%	2.59%	2.11%	1.95%	1.72%
BGR	382	352	310	3.09%	2.85%	2.50%	0.96%	0.89%	0.78%
CYP*	19	17	15	2.98%	2.73%	2.39%	0.11%	0.10%	0.09%
CZE	3,133	2,885	2,534	3.07%	2.83%	2.48%	2.05%	1.89%	1.66%
DEU	26,422	24,755	22,395	3.88%	3.64%	3.29%	0.99%	0.93%	0.84%
DNK	1,947	1,806	1,605	3.35%	3.11%	2.76%	0.79%	0.74%	0.65%
ESP	5,297	4,934	4,420	3.57%	3.32%	2.98%	0.51%	0.48%	0.43%
EST	336	315	285	3.90%	3.65%	3.30%	1.93%	1.80%	1.63%
FIN	1,075	994	881	3.26%	3.01%	2.67%	0.56%	0.52%	0.46%
FRA	7,183	6,516	5,571	2.60%	2.36%	2.02%	0.35%	0.32%	0.27%
GBR	5,778	5,307	4,641	2.98%	2.74%	2.40%	0.30%	0.28%	0.24%
GRC	441	411	369	3.60%	3.36%	3.01%	0.23%	0.21%	0.19%
HRV*	168	155	136	3.04%	2.80%	2.45%	0.37%	0.34%	0.29%
HUN	1,993	1,840	1,623	3.17%	2.93%	2.58%	2.05%	1.90%	1.67%
IRL	1,972	1,828	1,624	3.34%	3.10%	2.75%	1.20%	1.11%	0.99%
ITA	8,524	7,950	7,137	3.63%	3.38%	3.04%	0.54%	0.51%	0.45%
LTU*	547	512	462	3.80%	3.56%	3.21%	1.66%	1.55%	1.40%
LUX	416	386	344	3.41%	3.17%	2.82%	0.97%	0.90%	0.80%
LVA*	269	251	226	3.72%	3.48%	3.13%	1.22%	1.14%	1.02%
MLT*	43	40	36	3.41%	3.17%	2.82%	0.64%	0.59%	0.53%
NLD	11,955	10,990	9,623	3.01%	2.77%	2.42%	1.99%	1.83%	1.60%
POL	3,174	2,900	2,514	2.82%	2.58%	2.23%	0.83%	0.76%	0.66%
PRT	911	833	723	2.83%	2.59%	2.25%	0.55%	0.50%	0.44%
ROM*	996	918	807	3.10%	2.86%	2.51%	0.66%	0.61%	0.54%
SVK	1,583	1,453	1,268	2.94%	2.70%	2.36%	2.23%	2.05%	1.79%
SVN	717	670	604	3.75%	3.51%	3.16%	2.03%	1.90%	1.71%
SWE	2,954	2,732	2,418	3.25%	3.00%	2.66%	0.72%	0.67%	0.59%

Notes: Entries for countries denoted with * should be considered with caution as prediction is based on imputed values for regulatory stringency regarding barriers to FDI and NTBs.

Table 7: Untapped Potential Internal Market (Non-Tariff Barriers) - Predicted Effects EU-28 Member State Level

Scenario	Predicted Value (Million Euros)			Change (in %)			Share GDP (in %)		
	1	2	3	1	2	3	1	2	3
AUT	6,595	5,227	4,348	6.80%	5.39%	4.48%	2.14%	1.70%	1.41%
BEL	12,904	9,427	7,193	5.15%	3.77%	2.87%	3.43%	2.50%	1.91%
BGR	863	688	576	6.97%	5.56%	4.65%	2.17%	1.73%	1.45%
CYP*	49	40	34	7.61%	6.18%	5.27%	0.27%	0.22%	0.19%
CZE	6,450	5,018	4,098	6.32%	4.92%	4.02%	4.21%	3.28%	2.68%
DEU	35,883	26,426	20,348	5.27%	3.88%	2.99%	1.34%	0.99%	0.76%
DNK	3,971	3,152	2,625	6.84%	5.43%	4.52%	1.62%	1.28%	1.07%
ESP	8,059	5,993	4,664	5.43%	4.04%	3.14%	0.78%	0.58%	0.45%
EST	710	587	508	8.24%	6.81%	5.89%	4.07%	3.37%	2.91%
FIN	2,379	1,912	1,612	7.21%	5.80%	4.89%	1.23%	0.99%	0.84%
FRA	15,472	11,626	9,154	5.61%	4.22%	3.32%	0.76%	0.57%	0.45%
GBR	10,275	7,580	5,849	5.30%	3.91%	3.02%	0.53%	0.39%	0.30%
GRC	778	606	496	6.35%	4.95%	4.05%	0.40%	0.31%	0.26%
HRV*	537	456	405	9.68%	8.23%	7.30%	1.16%	0.99%	0.88%
HUN	4,347	3,459	2,889	6.91%	5.50%	4.59%	4.48%	3.56%	2.98%
IRL	2,408	1,597	1,077	4.08%	2.71%	1.83%	1.47%	0.97%	0.66%
ITA	13,646	10,364	8,254	5.81%	4.41%	3.51%	0.87%	0.66%	0.53%
LTU*	1,131	926	794	7.86%	6.43%	5.52%	3.43%	2.81%	2.41%
LUX	633	464	355	5.19%	3.80%	2.91%	1.47%	1.08%	0.83%
LVA*	663	559	492	9.19%	7.74%	6.82%	3.00%	2.53%	2.23%
MLT*	71	53	42	5.59%	4.19%	3.30%	1.04%	0.78%	0.62%
NLD	22,359	16,817	13,256	5.63%	4.23%	3.34%	3.72%	2.80%	2.21%
POL	7,553	5,966	4,946	6.71%	5.30%	4.39%	1.98%	1.56%	1.30%
PRT	1,853	1,403	1,114	5.76%	4.36%	3.46%	1.12%	0.85%	0.67%
ROM*	1,958	1,508	1,219	6.10%	4.70%	3.80%	1.30%	1.00%	0.81%
SVK	3,432	2,676	2,191	6.38%	4.98%	4.07%	4.83%	3.77%	3.09%
SVN	1,383	1,113	939	7.24%	5.83%	4.92%	3.92%	3.16%	2.66%
SWE	5,325	4,052	3,234	5.85%	4.45%	3.55%	1.30%	0.99%	0.79%

Notes: Entries for countries denoted with * should be considered with caution as prediction is based on imputed values for regulatory stringency regarding barriers to FDI and NTBs.

Chapter 4. The untapped potential at sector level: two case studies

This section aims to provide further insights into the costs of gaps and obstacles in the implementation of the legislation of the free movement of goods, looking at two specific sectors, namely the construction material sector and the medical devices sector. Drawing on the knowledge and expertise of a number of stakeholders and experts in each of these sectors, we conducted eight interviews (five for the construction materials sector and three for the medical devices sector). The case study analysis presented in this chapter has the following aims: 1) establish the sector-specific gaps and barriers that hinder full economic integration (e.g. product regulation); 2) identify the sector-specific stakeholders and; 3) derive the (perceived) costs imposed on them due to incomplete adoption or implementation of internal market regulation.

I. Construction materials sector

This first case study focuses on the construction materials industry. Interviewees suggest that the challenges faced by this sector as regard to Single Market objectives have been poorly documented. We aim to fill this gap by providing further insights on the main issues faced by companies in this sector. The construction products sector covers a wide range of activities that relate to production of intermediary goods used in the construction sector. The European Construction Products Regulation ((EU) No 305/2011) stipulates that:

construction product means any product or kit which is produced and placed on the market for incorporation in a permanent manner in construction works or parts thereof and the performance of which has an effect on the performance of the construction works with respect to the basic requirements for construction works (art 2.1).

It essentially refers to: the provision of raw materials (extractive industries) for construction; the transformation of raw materials for the production of cement, lime, plaster, concrete, bricks, tiles, chemicals for construction, but also the manufacture of structural metal products, carpentry and joinery. It is part of the wider construction sector, which also includes the production of construction services: onsite building; professional construction services and real estate activities (Ecorys, 2011). The provision of construction services is beyond the scope of this study.¹⁸ Yet, it is worth noting that these sectors are intrinsically related to each other, especially when looking at EU laws and their impact on trade flows within each subsector. For example, EU environmental regulations such as emission reduction and building energy performance objectives strongly impact both the construction materials industry and the supply of construction work (i.e. buildings and civil engineering works).

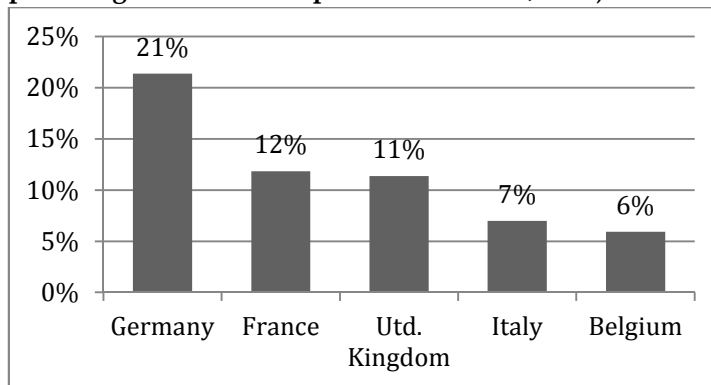
¹⁸ According to the NACE Rev.2 classification scheme (European Standard for industrial classification)

Economic relevance

a) Size of the sector

According to the European Construction Industry Federation, the construction sector as a whole represents 10 per cent of the European GDP and employs 16 million people in the EU-28.¹⁹ Within this wider sector, the construction materials sector is characterized by a diverse and a highly fragmented range of activities and represents more than 3 per cent of the European GDP (EC, 2011). Indeed, the sector is mostly composed by SMEs, with on average 6 enterprises for 10,000 citizens in the EU27 in 2007,²⁰ and has only very few large construction companies (e.g. Saint Gobain, Lafarge Group, HeidelbergCement). Key players in the construction materials sector principally include Germany, France, the UK and Italy as illustrated by Figure 3 below.

Figure 3: Top 5 exporters in the construction materials industry (expressed as a percentage of the total exports in the sector, 2013)



Source: EU COMEXT data (2013)

In addition, the sector is characterized by its relatively low propensity to trade outside of national borders, as only 8 per cent of construction products were exported in the EU27 in 2007 (Eurostat COMEXT, cited in: Ecorys, 2011). This was further corroborated by our interviewees, who highlighted the fact that most of the trade in the construction materials sector occurs within national (if not regional) borders. Similarly, in a 2000 study, Head and Mayer concluded that some intermediate goods industries such as cement or wooden products were subject to the highest border effects, as transport of these kinds of products quickly becomes uneconomical with the distance (Head & Mayer, 2000).

b) Innovation in the sector

The construction materials sector (and the construction sector as a whole) has been severely hit by the 2008 crisis. However, as described above, the materials sector remains central to the EU economy. In addition, current environmental challenges, the increasing global demand for construction products (especially in emerging economies) and rising competition from emerging countries (China, India, Brazil) make it crucial for European

¹⁹ European Construction Industry Federation

²⁰ Eurostat SBS

businesses to develop innovative products at affordable prices to ensure building security and environmental performance and remain sustainably competitive at the global scale (EC, 2009). One pressing issue is the production of large volumes of non-recyclable waste by the construction sector (Ecorys, 2011). These challenges also represent opportunities to reinvigorate the sector going forward.

c) Current challenges and opportunities in the sector

These elements raise questions about the sector's ability to remain competitive and to get access to new opportunities on global markets on the one hand, as stated by several interviewees. On the other hand, some interviewees explained that the lack of competitive pressure within European borders also questions the ability of the European construction materials industry to reduce its environmental footprint and limit its energy and raw materials consumption through the creation of innovative (renewable or energy efficient) construction materials.²¹ Demand for sustainable construction products and materials accelerated as urbanisation rates have increased and environmental issues are more pressing at the global scale, especially in emerging countries (European Commission, 2010). Indeed, in the EU, buildings generate 35 per cent of all greenhouse gas emissions and they are responsible for 42 per cent of total energy consumption (SCI-Network, 2012). The 2007 EC Lead Market Initiative has encouraged the development of sustainable and innovative products in the construction industry (among five other areas), mostly focusing on heating installations, air-quality systems, etc.²²

European legislation linked to the sector

Construction materials are subject to a complex regulatory framework. According to our interviewees, EU rules tend to add quality and safety requirements to existing national legislation for product quality. Moreover, some national regulations add to EU requirements. The complexity is also due to the wide variety of products that compose the sector. The Construction Product Regulation ((EU) No 305/2011 (CPR)) was adopted by the European Parliament in 2011 and entered into force in July 2013. The regulation is a revised version of the 1988 Construction Products Directive (86/106/EEC, (CPD)) and sets out a more constraining framework regarding the quality and safety standards for harmonised products.

Seven basic requirements are listed in the new regulation:

1. Mechanical resistance and stability;
2. Safety in case of fire;
3. Hygiene, health and the environment;
4. Safety and accessibility in use;
5. Protection against noise;
6. Energy saving and heat retention;
7. Sustainable use of natural resources.

²¹ In the cement industry, for instance, energy costs represent up to 40 per cent of the total product cost (ECORYS PWS, 2011).

²² See: http://ec.europa.eu/enterprise/sectors/construction/competitiveness/index_en.htm

It also sets out the rules regarding CE marking (the label obtained when the product has passed all assessment procedures successfully) and regarding the submission of a declaration of performance prior the placement of the product on the market. These requirements are mandatory for all harmonised products and for products which are in line with the requirements set out in a European Technical Assessment (ETA). Not all products – especially new products or innovative ones – are harmonised and may voluntarily apply to CE marking through ETAs. However, if a product is not covered by a Harmonised European Standard (hEN) or an ETA, then the manufacturer cannot apply to CE marking under the CPR. Those products are subject to the mutual recognition principle according to which goods that are legally sold in a Member State shall also be recognised and then authorised in other Member States. Table 8 below offers a brief summary of different types of products and their status with regard to EU harmonisation.

Table 8: Legal framework for construction materials

Type of Product	Regime
Harmonised	Sector specific directives and regulations
Non harmonised	National product safety rules under the “Mutual Recognition Regulation” Article 34-36 TFUE
	Become a harmonised product on a voluntary basis by applying to CE marking through European Technical Assessment (ETA).

Source: EC, 2013 (SWD on Product Safety and Market Surveillance package)

In addition, the construction materials sector is subject to regulations applicable to the construction sector as a whole (e.g. Eurocodes, CE marking), but also to health and safety regulations applying to a wider range of industrial products such as REACH (the 2006 Regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals). Table 9 below offers a summary of horizontal regulations²³ and sector specific regulations that impact construction products manufacturers.

²³ The term “horizontal regulations” refers to EU rules that are applicable to a wide range of activities and products, hence not only targeting construction products.

Table 9: Summary of EU regulations affecting the construction products sector

Sector specific legislation applying to the whole sector or some segments of the sector
<p><u>Construction Products Directive, 89/106/EEC:</u> Provides a “common technical language”, offering uniform methods for assessing the performance of construction products with regard to quality and safety objectives.</p> <p><u>Construction Products Regulation (CPR), Regulation (EU) No 305/2011:</u> makes CE marking rules compulsory to all products covered by a harmonised European standard (hEN) or European Technical Assessment (ETA). It also sets up the framework for e-supply declaration of performance.</p> <p><u>European regulations and standards concerning energy savings and building materials:</u> standards developed by technical committees of CEN and CENELEC (European Committee for Standardisation) – brings together national standardisation bodies of 33 European countries.</p>
Horizontal regulations impacting the construction materials sector
<p><u>Chemical Products:</u> REACH Regulation (EC) n°1907/2006 which sets out the safety and quality standards of chemical products to ensure the protection of human health and the environment. It applies to all chemical products (not only industrial) and makes it compulsory for companies to demonstrate how the substance they sell can be safely used and to communicate adequate risk management measures for the users.</p> <p><u>Energy Efficiency of buildings:</u> The Energy Performance of Buildings Directive (Directive 2010/31/EU) and the Regulation (EU) No 244/2012 adding to Directive 2010/31/EU by providing a harmonised methodology framework for calculating cost optimal levels of minimum energy performance requirements for buildings and building elements.</p> <p><u>EU eco-labels:</u> some construction products enter the scope of EU eco-labelling.²⁴</p> <p><u>Eco-design:</u> Directive 2009/125/EC establishing a framework for the setting of ecodesign requirements for energy-related products (Ecodesign).</p> <p><u>Late payments:</u> Directive 2011/7/EU on late payment: combat late payment of commercial transactions.</p> <p><u>Public procurement:</u> Directive 2004/18/EC covers public works contracts, public supply contracts and public service contracts.</p> <p><u>Workers Protection:</u> Directive 89/391/EEC on measures to improve safety and health at work.</p> <p><u>Intellectual property rights:</u> Directive 98/71EC, i.e. the directive on design protection– exclusive rights to design; and Directive 2004/48/EC, i.e. the IPR enforcement directive (IPRED) – action against counterfeiting and piracy.</p> <p><u>Waste Framework Directive:</u> Directive 2008/98/EC on waste and repealing Directive 2006/12/EC of the European Parliament and of the Council, hazardous waste Directive 91/689/EEC, and the Waste Oils Directive 75/439/EEC. It provides a general framework for waste management requirements in the EU.</p>

This current state of play has been presented as a major problem by several of our interviewees, as frequent revisions and the lack of coherence between EU and national regulations are seen to create confusion and represent additional transaction costs for firms that have to comply with both European and national legislation.

²⁴ For a complete list, see: <http://ec.europa.eu/ecat/>

Identification of sector-specific gaps and obstacles

a) The existence of home bias explains the localisation of economic activities within national borders

As mentioned above, the construction materials sector is characterised by a high number of SMEs. And economic exchanges tend to be highly localised and confined within national borders (Head & Mayer, 2000), a point that was also stressed by our interviewees. They also highlighted the importance of cultural norms and traditions in shaping economic exchanges given the (small) size of the firms composing each segment of the sector, which explains this clear bias towards national and, even more so, local markets.

In addition to that, linguistic fragmentation within the EU was also presented as a barrier to trade by several interviewees, especially when some products are subject to market approvals for which application forms are not translated into English. These linguistic barriers and cultural differences are generally presented as “acceptable barriers” by the interviewees who explain that such obstacles will be hard to remove in the EU, adding that economic operators have no choice but to accommodate with them.

According to our interviewees in the construction materials sector (representatives from the industry and from Notified Bodies), the lack of harmonisation of existing regulations, as well as the lack of clarity and continuity of existing EU rules (due to frequent revisions) still remain the main issues. They tend to see scope for more intervention at the EU level in that domain, as a harmonisation of standards by EU bodies would probably also help solve linguistic issues, since compliance forms and documentation would be released in all EU languages.

b) The complexity of existing regulations deters economic operators from doing business in other countries and represents additional costs for them

The first EU-wide study regarding the construction sector was conducted by BIPE and the Euroconstruct Group as part of the Cecchini report in 1988. This study presented a list of key barriers to the free movement of construction products in Europe, among which the lack of EU-wide standard for products and the fragmentation of national regulations. However, the report was rather optimistic regarding the EU’s ability to solve these issues in the short run.

The same barriers are also being mentioned by our key informants when asked about the main obstacles to trade in other European Member States. As stressed in the previous section, construction products manufacturers had to face increasingly constraining EU regulations over the past few years. When asked about the benefits or disadvantages of such legislative developments, several interviewees expressed concerns towards the duplication – and even multiplication – of products quality and safety requirements. Most of them recognise the potential positive impact of setting up standards at the EU level through the CPR, but they remain sceptical regarding their implementation so far. Certain elements have been presented as hindering the free movement of goods in the sector and causing additional costs for economic operators. However, these operators

recognise that harmonisation is in theory preferable, but they also highlight the inadequacy of existing EU legal instruments.. These instruments are often imposed on top of already existing national regulation, hence inducing duplications and causing extra costs for companies (additional administrative requirements, operation costs if the company wishes to develop its activities in several countries).

Indeed, all our interviewees highlighted the cumulative compliance costs with EU certification (i.e. CE marking for harmonised products) and national certification. The costs of compliance with CE marking can vary greatly according to one of the Notified Bodies we interviewed, depending on: the certification procedures applying to the product; the level of support needed to prepare the requested administrative documentation; the number of conformity assessments that have to be carried out; and whether the company can proceed to in-house testing or not.

Furthermore, some countries have additional requirements for placing products on their markets. For instance, one of the interviewees referred to the case of foreign firms aiming to enter the French market for construction products. They face additional national labelling requirements regarding the emissions of volatile organic compounds for certain construction product groups, but also regarding the compliance with the national legislation on environmental product declarations for construction products.

The same interviewee estimates that the cost of compliance to national requirements can range from €5,000 to €25,000 per product and denoted this high cost of compliance for manufacturers who have a large product portfolio. In addition, the procedure to apply for additional national labelling can take between three months and one year in some countries, causing delays of entry on new markets and potentially deterring firms to carry out activities in other Member States.

One of the interviewees pointed to the lack of clarity and continuity of existing regulatory frameworks as a source of additional costs, especially for SMEs that rarely have the in-house capacity to deal with and adapt to legal requirements. They hence have to hire experts in EU legislation in order to ensure adherence to all the legal requirements.

Several interviewees stressed that regulatory constraints also impact the pace of innovation in the sector, as some innovative products, for which there are no hENs (yet), will not be sold abroad. They argue that this is due to the additional costs caused by their certification and introduction to more stringent markets, such as France or Germany. This effect may also have negative effects on the sectors' competitiveness outside of the EU, while the most dynamic markets for construction products (as well as the construction sector as a whole) are located in rapidly growing emerging countries.

However, standards and certifications lack harmonisation across Member States, and the interviewees recognise that more actions should be taken at the EU level. Yet, EU driven actions would only be effective, if on the one hand, they managed to actually harmonise/replace existing national regulations and easily understood by all the economic operators composing the sector, especially SMEs, and, on the other hand, if they remained stable over time.

Box 1: The move from Directive to Regulation - Trade effects

The CPD did not explicitly harmonise national regulations, and Member States as well as public and private sector procurers were free to set their own requirements on their products. As mentioned in previous sections, this led to a revision of the CPD and the introduction of the CPR in 2011 (fully implemented in Member States in July 2013).

We use the change from the CPD to the CPR as a quasi-experiment to evaluate ex-post the trade effect of the regulation, compared to the existing state of play under a directive, where Member States still have leeway for different implementation of the regulatory framework. We apply a differences-in-differences estimator that exploits data on treatment and control group before the treatment to quantify the difference between treatment and control group and then compares this with the difference after the treatment (Angrist & Pischke, 2009). In essence, we compare overall trade in construction materials before and after the establishment of the regulation on the 1 July 2013. Albeit the regulation was adopted in 2011, only after the 1 July 2013 the regulatory framework was fully binding for companies selling construction products in the Internal Market. Our aim is to test whether the introduction of the CPR had a significant effect on trade in the construction material sector. It is worth noting that, because of this very recent regulatory change, the timeframe of analysis is short – less than a year. In this analysis, the “treatment group” are harmonised products and the “control group” are non-harmonised products in the construction sector, whereby harmonised products are exposed to the CPR and non-harmonised products are not.

We draw on quarterly Comext product-level (CN8) data provided by Eurostat which includes construction product trade flows between any given pair of EU-28 Member States. To conduct the analysis, we pool data for two time periods, November/December 2012 and November/December 2013 for two reasons: 1) we want to have the most recent data available (December 2013) after the establishment of the CPR, as the potential uptake of trade after implementation may have taken a while; 2) we aim to compare the same point in time before and after the establishment of the CPR in order to mitigate any potential seasonal time effects. Obviously, November and December may seem less relevant for a seasonal sector such as construction, but given that construction activity in winter is rather low, our estimate would then represent a lower bound of the effect. At baseline, we run the following model by OLS:

$$\log X_{ijp} = \beta_0 + \beta_1 \text{harm}_p + \beta_2 \text{post}_t + \beta_3 \text{harm}_p * \text{post}_t + \beta_4 \log \tau_{ij} + \gamma_{ij} + \theta_p + \epsilon_{ijt} \quad (7)$$

X_{ijp} represents total export flows between country i and j at the CN8 product level p , harm_i is an indicator taking the value 1 if the product is harmonised or not. We draw on the information about harmonised from the CPR document; post_t is an indicator taking the value 1 in the post-establishment period, and $\log \tau_{ij}$ represents transportation cost τ_{ij} between trading partners based on the *CEPII Geodist* dataset as outlined in chapter 3 and the log GDP of exporting and importing country. We also include exporter and importer

Table 10: Ex-Post Evaluation Trade Effect change from CPD to CPR

Dependent variable: log exports construction materials

harm _p	0.5269*** (90% CI: 0.47-0.58) (0.034)
post _t	0.0423*** (90% CI: 0.02-0.06) (0.013)
harm _p * post _t	0.0305* (90% CI: 0.01-0.06) (0.023)
Observations	146237
R-squared	0.3703

Notes: ***p < 0.01, **p < 0.05, *p < 0.10; clustered standard errors (distance) in parentheses. Regression includes exporter and importer fixed effects, product fixed effects and a set of control variables for transportation costs and exporter and importer GDP. Post_t is an indicator taking the value one if the trade flow was in November/December 2013 or not.

The approach outlined in equation (7) compares harmonised and non-harmonised products before and after the establishment of the CPR. The interaction effect $harm_{pp} * post_t$ compares harmonised products before and after CPR and therefore, the parameter of interest is β_3 : If $\beta_3 > 0$, then we observe a trade creation effect of the establishment of the CPR for harmonised construction materials. If $\beta_3 < 0$, the CPR has had a trade distortion effect compared to the CPD (in the short-run) for harmonised products.

Table 9 reports the estimated parameters from equation (7). We observe a small uplift in trade in harmonised construction materials due to the establishment of the CPR. However, the effect size is 0.0305 (significant at the 10%-level), which states that trade in harmonised construction materials increased by about 3 per cent after establishment of the CPR in the short run (from July to December). Given the fact that SMEs play a dominant role in the construction materials sector, we expect that the uplift in trade is at least partially related to increasing trading behaviour of SMEs.

II. Medical devices case study

This second case study focuses on the economic integration of the medical device industry in Europe. This sector encompasses a wide range of manufacturing goods that aid in the diagnosis, treatment, prevention, examination and monitoring of patients but have no chemically impact on the body, unlike pharmaceutical products. There are currently approximately 500,000 medical technologies available to healthcare professionals on the European market (Eucomed, 2013). These technological advances have contributed to improved healthcare provision in the diagnosis and treatment of diseases (Sorenson et al., 2013). For the scope of this study, we will use the definition that is presented in the EU Medical Devices Directives (Directive 93/42) which states that medical devices are:

Any instrument, apparatus, appliance, software, material or other article, whether used alone or in combination, including the software intended by its manufacturer to be used specifically for diagnostic and/or therapeutic purposes and necessary for its proper application, intended by the manufacturer to be used for human beings. Devices are to be used for the purpose of:

- *Diagnosis, prevention, monitoring, treatment or alleviation of disease*
- *Diagnosis, monitoring, treatment, alleviation of or compensation for an injury or handicap*
- *Investigation, replacement or modification of the anatomy or of a physiological process*
- *Control of conception*

This includes devices that do not achieve its principal intended action in or on the human body by pharmacological, immunological or metabolic means, but which may be assisted in its function by such means.(Directive 2007/47/EC)

Examples of medical devices include both high technology and low technology products: pacemakers, prosthetics, cosmetic implants, condoms, hospital beds, pregnancy tests, syringes, reagents, calibrators, control materials, specimen receptacles, software, and related instruments or apparatuses or other articles (Study Group 1 of the Global Harmonisation Task Force, 2007).²⁵ More than 20,000 generic groups of medical technologies fall within the 16 categories of products as defined by the Global Medical Devices Nomenclature Agency (Eucomed, 2013)²⁶. As a result, the medical devices sector is extremely heterogeneous, especially as medical devices can be used across a wide range of therapeutic areas – but mostly in orthopaedics, cardiology and gastroenterology (Ecorys, 2011). This case study identifies existing gaps and obstacles in/to the implementation of the single market for the industry, and tries to identify the cost and benefits of further action at the EU level to facilitate the free movement of goods in the sector.

Economic relevance

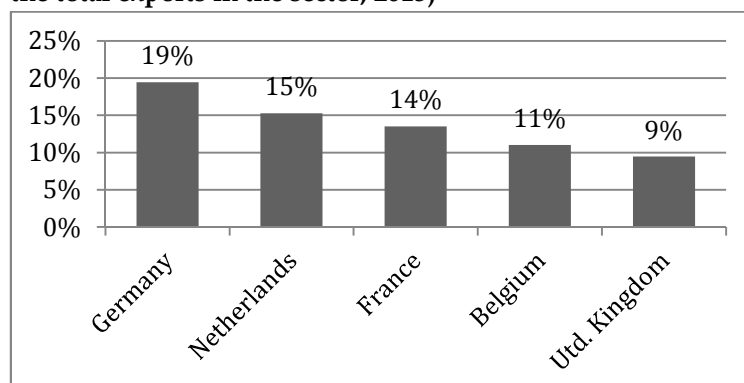
a) Size of the sector

The European medical device industry supplies a 100 billion EUR market and employs approximately 575, 000 people, representing 25 per cent of the worldwide market, and following the US which remain the worldwide leader with 45 per cent of the global market (Ecorys, 2011). The sector worldwide has been extremely dynamic over the last four years, with an average yearly growth of 10 per cent (Eucomed, 2012). Key players in Europe are Germany (€22.8 billion sales in 2009) and France (€19 billion in 2009) as shown in Figure 4.

²⁵ Available at: <http://www.imdrf.org/docs/ghhf/archived/sg1/technical-docs/ghhf-sg1-n045r12-in-vitro-diagnostic-classification-070209.pdf>

²⁶ For an exhaustive list of the 16 categories of products, see Appendix C.

Figure 4: Top 5 exporters in the medical device industry (expressed as a percentage of the total exports in the sector, 2013)



Source: EU COMEXT data (2013)

SMEs represent 80 per cent of the firms operating in the sector (EC, 2011). As a result, the medical technology industry appears to be rather fragmented although some segments of the sector may be highly concentrated. Manufacturers of medical devices tend to export a lot outside of national and EU borders. The EU medical technology trade balance was positive in 2012 (+€15.5 billion). Main trade partners include the US (41% in 2012), Japan (10% in 2012) and China (0.5% in 2012).

b) Innovation in the sector

Moreover, the medical technology sector is highly innovative, representing the highest number of patent applications in 2013 according to the EPO. It is also more innovative than other health technology fields such as biotechnology and pharmaceuticals (EPO, 2012). Products usually have short lifecycles, 18 to 24 months according to Eucomed (2012), and the Medical technology industry's representative body at the EU level. Measured by the number of patent applications at the EPO, EU countries tend to perform well with about 40 per cent of the total number in 2012.

c) Current challenges and opportunities in the sector

In the long run, the market is believed to further expand given the continuous growth of ageing population in developed countries. In Europe, the population is expected to reach 517 million in 2060, with almost one third of EU citizens aged 65 or over (17% in 2013) This sharp increase in the proportion of older people is primarily driven by a continuously rising the life expectancy in Europe, projected to increase from 76.7 years in 2010 to 84.6 in 2060 for men and from 82.5 to 89.1 for women (EC, 2012).

The financial cost related to this will have a strong impact on the sustainability of European social security and health systems, since the old aged dependency ratio²⁷ is expected to reach 52.2 per cent (26% in 2012). Back in 2009, the Economic and Financial Affairs Council (ECOFIN).

²⁷ The old-aged dependency ratio is defined as the ratio of people aged 65 or above relative to those aged 15-64 (AWG, 2012).

ECOFIN Council asked the Economic Policy Committee (EPC) to provide more detailed figures about age projections to help Member States anticipate any substantial rise in health expenditures and take appropriate responsive measures to guarantee the sustainability of their welfare systems, since age-related public expenditures (such as pensions, long-term care²⁸ and healthcare) are projected to rise by 4.1 per cent of GDP by 2060 (AWG, 2012).

In the meantime, several factors such as increasing financial pressure on healthcare systems, rising ageing population, alongside with an increase in chronic diseases such as cancer, diabetes, heart diseases, which requires constant care, observation and supervision, are thought to lead to an increased demand for medical devices at cheaper prices (EC, 2012). However, medical technologies are often presented as expensive and several analysts often underline their impact on rising healthcare expenditures (OECD, 2011; Sorenson et al., 2013) – especially when using high technology medical devices (Bryan et al., 2000).

In a 2013 communication, Eucomed estimates that spending on medical technology accounts for about 7.5% of the total health care expenditures in Europe.²⁹ Hence, responding to this increased demand for medical technology, while at the same time ensuring the financial sustainability of healthcare systems, will compel the industry to develop innovative and at the same time cost saving products. Ensuring the free movement of goods in the EU will facilitate consumers' access to affordable products while stimulating competition and innovation among economic operators within the sector. As a result, the identification of existing gaps and obstacles in the completion of the Single Market for this specific sector will help us understand what actions could be taken at the EU level to guarantee equality of access to high quality products at fair prices and a more cost-effective healthcare delivery across Europe for European citizens.

Legislation linked to the sector

The current legislative landscape is mostly governed by the three medical devices directives that set out a series of safety and quality requirements for these products. Table 11 below provides an overview of the current requirements of the three directives and other EU legislation impacting the medical devices industry. Manufacturers have to comply with these requirements to obtain CE marking for their products and to be able to sell them throughout Europe.³⁰ Requirements are stricter depending on the risk associated with each type of medical device – in practice, it is compulsory for manufacturers to determine the classification of their product³¹ according to a list of criteria that is presented in the Directive (Donawa & Gray, 2012).

²⁸ The OECD (OECD, 2005) has defined long-term care as “a cross-cutting policy issue that brings together a range of services for persons who are dependent on help with basic activities of daily living over an extended period of time”

²⁹ Eucomed uses data from WHO, Eurostat, EFPIA, EDMA and data from the industry.

³⁰ <http://ec.europa.eu/enterprise/policies/european-standards/harmonised-standards/>

³¹ There are four types of medical device, each type corresponding to a specific set of control before the product can be authorized on the European market: class I (lowest risk), class IIa (lower intermediate risk), class IIb (higher intermediate risk), class III (highest risk; Annex IX of the 93/42/EEC Medical Devices Directive)

Notified Bodies (national or international organisations designated by Member States Competent Authorities) are in charge of allowing (or not) CE marking on medical devices. These Notified Bodies review the technical information on safety and performance provided by the manufacturers, and, in case of conformity, give permission to affix a CE mark to the product and deliver a certificate of compliance. However, once a CE mark is granted, products may have to be assessed further to make sure they comply with additional national quality and safety requirements. Furthermore, in 2010, the European Commission published new clinical guidelines for post-marketisation surveillance: medical device manufacturers have to report any serious device adverse event (SAE) to competent national authorities in which the clinical investigation is being performed.³²

Table 11: Current EU legislation impacting the Medical Device Industry

Sector specific legislation applying to the whole sector or some segments of the sector
<p>Implantable medical devices: Council Directive of 20 June 1990 on the approximation of the laws of the Member States relating to active implantable medical devices (90/385/EEC)</p> <p>Medical devices: Council Directive 93/42/EEC of 14 June 1993 concerning medical devices</p> <p>In vitro diagnostic medical devices: Directive 98/79/EC of the European Parliament and of the Council of 27 October 1998 on <i>in vitro</i> diagnostic medical devices</p> <p>Directive 2007/47/EC of the European Parliament and of the Council of 5 September 2007 amending the Council Directive of 20 June 1990 on the approximation of the laws of the Member States relating to active implantable medical devices (90/385/EEC), Council Directive 93/42/EEC of 14 June 1993 concerning medical devices and Directive 98/79/EC of the European Parliament and of the Council of 27 October 1998 on <i>in vitro</i> diagnostic medical devices. This directive introduces additional requirement for clinical data as a proof of products' safety and efficacy. In contrast to previous directives, it also explicitly states that companies have to document their post-marketisation strategy. The submission of post marketisation surveillance plan is compulsory to obtain CE marking.</p> <p>European Guidance documents for medical devices: series of documents published on the European Commission's website aiming to promote common guidelines for manufacturers and notified bodies with regard to conformity assessment procedures.³³ These guidelines are used to facilitate a common understanding of existing legislation on different issues: "scope, field of application, definition"; "essential requirements"; "classification of medical devices"; "conformity assessment procedure"; "notified bodies"; "market surveillance"; transitional period"; "in vitro diagnosis"; "other guidance".</p>
Horizontal legislation also applying to other sectors
<p>Chemical Products: REACH Regulation (EC) n°1907/2006 which sets out the safety and quality standards of chemical products to ensure the protection of human health and the environment. It applies to all chemical products (not only industrial ones) and makes it compulsory for companies to demonstrate how the substance they sell can be safely used and to communicate adequate risk management measures for the users.</p>

³² Annex 7 of the AIMDD and Annex X of the MDD

³³ http://ec.europa.eu/health/medical-devices/documents/guidelines/index_en.htm

In 2008, the European Commission in collaboration with representatives from Member States, National Regulatory Agencies and representatives from the industry started to envisage a revision of the existing legal framework. Recent scandals regarding the quality and safety of medical devices – the most recent one being the Poly Implant Prosthesis (PIP) silicone breast implants early 2012 – have led to the development and implementation of a stricter regulatory framework at the EU level to ensure patient safety and restore public confidence in medical technologies (Donawa & Gray, 2012). Within a few weeks of the PIP scandal in October 2012, the European Commission published new standards on European regulation explaining how Member States should control and supervise Notified Bodies for the certification of products and their authorisation on the European market. It also led to the publication of a Commission Regulation explaining how Notified Bodies should undertake their product reviews and evaluation, stating that they should make it more rigorous.

On-going discussions involving the European Environment, Public Health and Food Safety (ENVI) Committee of the European Parliament and other relevant stakeholders represented in the Medical Device Expert Group (MDEG)³⁴ are investigating the possible replacement of the current directives by a regulation, which would be directly applicable in each Member State and limit the risk of divergent interpretation of existing legislation. It would thus reinforce the harmonisation of current requirements for product safety and approval. Besides, according to the new document, more products would fall under EU regulation (e.g. devices for “aesthetic purpose”). The first draft of the new Medical Device Regulation (MDR) was presented at the EU Parliament in October 2013 and a legislative resolution on the EC’s proposal for a regulation on medical device was adopted by the Parliament on April 2, 2014. However, the final legislation is not expected to be adopted by the European Council before 2015.

Identification of sector-specific gaps and obstacles

As discussed above, the medical devices industry is heterogeneous and represents a high potential for growth and innovation, especially in a context of an ageing population and increasing healthcare expenditure in Europe. Existing gaps in and obstacles in the implementation of the single market are numerous and principally related to differences in healthcare systems and the limitations of the current regulatory landscape.

a) The existence of gaps in the application of EU Directives

As stated by our interviewees, there is a clear fragmentation in Europe regarding national market entry requirements. In principle, the procedure for every Notified Body (CE marking) is the same across Europe, as stated by existing EU Directives and Guidance

³⁴ The MDEG is a working-group of Member States, industry representatives, standardisation bodies, national/international notified bodies representatives and relevant EU institutions working in the area of medical devices. They are regularly discussing issues regarding the implementation or modification of existing legal framework.

(MEDDEV) published on the EC's website.³⁵ In practice, interviewees suggest that, in some Member States, Notified Bodies do not have enough qualified people to guarantee a thorough application of EU regulations. As a result, national criteria for quality and safety might vary from Member State to Member States. One of the Notified Bodies we interviewed gave the example of a manufacturer applying for CE marking and market approval for a Class III device (high risk device). It appeared that the product still had to be tested further and more clinical data were needed to grant CE marking. The manufacturer went to another notified body in a different country, received the CE marking and could place the product on the market within a short period of time. In theory, all notified bodies have to follow the same rules, but there is competition between NBs (as there are around 60 of them operating in Europe).

Some Member States have introduced national requirements in addition to the Medical Device Directive requirements for CE marking. In the UK for instance, there is an initiative called Beyond Compliance whereby orthopaedic implant manufacturers subject their devices to a further assessment by a panel of orthopaedic surgeons or representing orthopaedic surgeons before usage. Although voluntary, such systems might represent an additional financial burden for manufacturers if all the firms in their segment adhere to it – then obtaining approval for additional conformity tests might become a competitive advantage in some segment of activity. In that sense, current discussions regarding the transition from a Directive to a Regulation seems to be positively evaluated by our interviewees, as a regulation would be more constraining for Member States and would mitigate the risk of divergent interpretation. Hence regulations would pave the way to more harmonised and coherent national legal frameworks for medical devices safety requirements and market approval.

b) Differences in national healthcare systems might represent a barrier to market entry

Going beyond the impact and limitations of the current legislative framework, differences in existing health systems – and especially reimbursement systems – were identified as a barrier to market entry by our interviewees. Indeed, given the existing conditions for reimbursement, some products might never access national markets as they are too expensive for hospitals or clinicians to buy and use as reimbursement policies might influence the providers' use of medical devices, as stated by some interviewees. Subsequently, some innovative products might not be used by practitioners as there are still considerable disparities in reimbursement policy across Europe, even though we can observe an increased use of DRG-type schemes³⁶ to pay for hospital care

³⁵ Guideline documents are freely accessible here: http://ec.europa.eu/health/medical-devices/documents/guidelines/index_en.htm

³⁶ Diagnosis Related Groups are used to classify hospitals' patients based on information about principal diagnosis, treatment procedures, demographic characteristics (gender and age), presence of complications and discharge status. The hospital is then paid a flat sum to treat the patient according to her/his diagnosis. The sum takes into account differences in the cost of treatment of each patient according to their medical condition.

(Kimberly et al., 2008) and health technology assessment (HTA) procedures for innovative technologies.

c) Additional EU regulation may lead to delays in market access

There is an increasing pressure on Notified Bodies to process a growing number of applications for CE marking and market approval. For instance in 2008, one of these Notified Bodies, BSi,³⁷ employed 32 experts. Six years on, there are 77 experts employed that respond to the rising number of application from the medical devices sector. BSi operates with public funding; however, this has decreased over time, while being is faced with higher demand from the industry. For instance, in 2003, the UK-based Medicines and Healthcare Products Regulatory Agency (MHRA) funding was £12 million for MD, but has now dropped to £8 million.

In its current form, the new MDR states that Notified Bodies should invest in the development of in-house clinical staff for product testing. Our interviewee explained that the additional procedures, that need to obtain CE marking introduced by the 2007 directive, added administrative burden to manufacturers. Manufacturers of high risk devices are required to supply new evidence of product safety and efficacy. They are no longer authorized to prove the similarity of their product to other products that are already on the market and to present clinical trial data from previous studies. They now have to conduct separate clinical trials for their products, which represents an additional cost. Our interviewee estimates that the implementation of tougher post-marketisation assessments might amount to an additional cost of 10 – 20per cent for manufacturers.

In a recent position paper, Eucomed (2013) used self-reported data from sector representatives to quantify the financial impact of tougher EU standards on SMEs activities. According to this report, the introduction of the scrutiny procedure (art. 44) to the proposed regulation (draft of the Medical Device Regulation) might represent a €2.5 billion additional cost for SMEs operating in the sector. This procedure authorizes Member state authorities to ask for additional conformity tests for Class III products after they have been approved by Notified Bodies. The report further suggests that the introduction of a centralized pre-market authorisation system would lead to additional requirements which would represent a €17.5 billion additional cost for SMEs producing innovative devices (bringing yearly at least one Class III product on the market).

In summary, the implementation of stricter EU requirements represents an additional cost for manufacturers and leads to increasing volumes of applications for market approval and CE marking. This could result in significant delays in placing the products on the market. As a result, the positive effects of additional EU legislations on the harmonisation of existing laws might be mitigated if new EU laws are add complexity to the existing system. This was stressed by Eucomed (2014) in a recently published position paper on the Parliament's resolution and in which the association expressed concerns regarding the complexity of the new scrutiny procedure.

³⁷ Notified Body operating in several European countries

III. Key findings from the Construction Products and Medical Devices industry

As stated above, the two case studies aimed to provide further insights regarding remaining barriers to market integration and their perceived associated costs in two distinct manufacturing sectors. This section provides a brief overview of the main conclusions drawn from the above case studies (summarized in Table 12 below). Both the construction materials and medical devices sectors are characterised by a very high proportion of SMEs, which partly explains why additional or new EU regulation is often perceived as a burden by economic operators. Indeed, especially small businesses have less in-house capacity to deal with additional regulatory requirements on top of already existing national regulations. Interviewees from the two sectors highlighted the fact that the harmonisation of existing rules has not yet been fully implemented across Member States and that market fragmentation was still a major issue for firms. However, our estimations for the construction sector shows that the transition from a directive to a regulation for harmonised products in Europe had a small positive impact on trade across Member States. Similarly, representatives from the medical devices industry have expressed positive opinions about the replacement of the current Medical Devices Directive by a regulation.

Table 12: Summary of case study findings

Level of Analysis	Descriptive statistics	Key Barriers	Associated costs and benefits
Construction Materials Sector	3% of EU GDP	Home bias	Cost of compliance to national requirements can range from €5000 to €25000
	Key exporters: Germany, France, the UK, Italy, Belgium	Complexity of legislation	Trade in harmonised construction materials increased by 0.044 percentage points after establishment of CPR in the short-run.
Medical Device Sector	€100 Billion Market	Gaps in application of legislation	Implementation of tougher post-marketisation assessments may impose a cost of 10%-20%
	80% of SMEs	Delay market access caused by additional EU Regulation causes	Additional conformity for Class III products after approval by notified bodies may represent a €2.5 bn cost for SMEs.
	Key exporters: Germany, The Netherland, France, the UK, Belgium	Differences in national healthcare systems represent a barrier to market entry	

Chapter 5. Conclusions and discussion

This study sought to investigate the current state of play of the European free movement of goods with the intention to quantify the untapped potential thereof due to a lack of full integration for the EU economy. To this end, we conducted an econometric analysis to estimate the potential benefits of more integration (lower trade barriers), using an econometric model which analyses the correlation between GDP, location and trade barriers (as independent variables) and bilateral trade flows (as the dependent variable) to investigate the potential benefits of lower trade barriers for trade flows, growth and job creation. With the focus on the free movement of goods, we analysed the trade distortion effects of existing barriers to trade and the potential economic benefits that could accrue with the removal thereof. Using a so-called gravity model, we predicted how much larger intra-EU merchandise trade volumes would be, if existing barriers to trade within the internal market were removed. Furthermore, in order to delineate sector-specific gaps and barriers hindering full economic integration that are harder to quantify, we looked into two specific sectors of the European economy, the construction materials sector and the medical devices sectors. Table 13 provides a simplified synopsis of the study's key findings focusing on the barriers to further economic integration in the internal market and the potential economic effects of removing them.

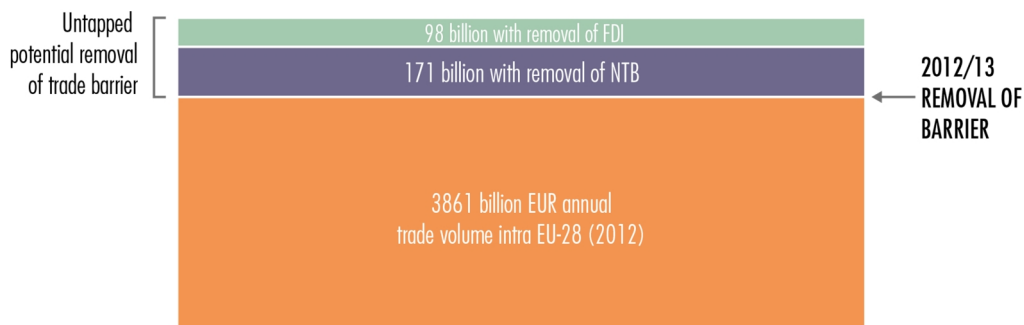
Table 13: Summary of Findings

Level of Analysis	Key Barriers	Associated Economic Effects
Member State	Barriers to FDI	Removal of barrier potentially increase total intra-EU merchandise exports of EU-28 Member States between €81bn - €98bn (varies by scenario). Expected gains mainly for larger firms.
	Non-Tariff Barriers	Removal of barrier potentially increase total intra-EU merchandise exports of EU-28 Member States by €103bn - €171bn (varies by scenario). Expected gains mainly for smaller firms.
Construction Materials Sector	Home bias	Cost of compliance to national requirements can range from €5000 to €25000
	Complexity of legislation	Trade in harmonised construction materials increased by 0.044 percentage points after establishment of CPR in the short-run.
Medical Device Sector	Gaps in application of legislation	Implementation of tougher post-marketisation assessments may impose a cost of 10%-20%
	Delay market access caused by additional EU Regulation causes	Additional conformity for Class III products after approval by notified bodies may represent a €2.5bn cost for SMEs.

As part of these case studies we reviewed the implementation of internal market regulation in these sectors, and conducted a number of interviews to identify the perception of barriers among different stakeholders. Table 13 summarises our findings.

Our findings confirm that more than twenty years after the establishment of the internal market, barriers and regulatory obstacles continue to hinder the free movement of goods in the EU. Our quantitative assessment at the Member State level identified two main barriers of trade: barriers to FDI and non-tariff barriers (including lack of harmonised rules and differential treatment of foreign suppliers). Under three different scenarios, we estimate that the removal of these trade barriers has an intra-EU trade creation potential of about a value between €183 billion (90% confidence interval: €88bn - €432bn) to €269 billion (90% confidence interval: €115bn - €433bn). It is worth to note that this trade boost represents the potential additional intra-EU exports (in addition to the 2012 annual trade volumes) with all barriers to FDI and NTBs removed with immediate effect at the beginning of 2013. Figure 5 provides a simplified (non-scaled) illustration of the existing intra-EU trade and additional effects of removing these barriers under the “Full Monti” scenario.³⁸

Figure 5: Untapped Potential Internal Market EU-28 – Free Movement of Goods



Note: The trade effects of removing the barriers to FDI and NTBs under the “Full Monti” scenario are visually exaggerated for the purpose of illustration.

These effects should be considered as upper bound estimates as it is unlikely that all barriers will ever be completely removed. The boost in EU trade as a consequence further implementation of the internal market may also go at the expense of trade with third countries, such as the United States. Due to this diversion effect, the net trade effect for all EU Member States collectively will therefore likely amount to a figure lower than €269 billion.

Moreover, in practice, removal of these trade barriers would not happen overnight. They would only be gradually removed over time, and therefore the estimates should be interpreted as the potential benefit that accrues in the longer term.

³⁸ Removal of all existing trade barriers (see section II-5 for further details).

The predicted effects take into account only static effects of increased trade activity. They do not include or quantify further dynamic equilibrium welfare effects embodied in trade creation. Such welfare effects include the effects of better access to firms in foreign markets (exploiting economies of scale), lower consumer prices or dynamic gains with respect to innovation. Also note that the gravity model approach is unable to define the exact time period over which these benefits would occur. Finally, as these estimates are only as robust as the assumptions underpinning them, the results are subject to considerable uncertainty, which is why we would encourage using the 90 per cent confidence interval as upper and lower bound estimates.

How do our results add up or compare to previous approaches estimating the untapped potential of the internal market? A recent review by the European Parliament European Added Value Unit (EAVA 2014) concluded that the efficiency gains from the delivery and completion of the internal market for consumers and citizens of €235 billion per year over the longer term, corresponding to 1.8 per cent of long-term GDP. The numbers include potential benefits occurring from better cross-border provision of services, better consumer protection, greater cross-border public procurement and improved surveillance of the product market. Albeit relatively smaller in size, our estimated efficiency gains stemming from the removal of trade barriers in the internal market with regard to merchandise trade can be considered as a complementary gain to the €235 billion estimated by the EAVA (2014) report.

A study by London Economics and PWC (2013) analysed the untapped potential of the internal market based six key sectors (according to economic relevance). Similar to our results, they estimate an untapped potential from the completion of the Single Market in these sectors of 1.6 per cent of EU GDP over the longer term.³⁹

Using a general equilibrium model, Decreux (2012) predicts that a substantial reduction of the remaining trade barriers in the internal market would boost long term EU GDP by 4.7 per cent. The study takes into account trade in services as well as in goods. In comparison with our estimates, which are limited to trade in goods, these results suggest that the barriers to the free movement of goods in the internal market are lower than those for the free movement of services. Hence, the untapped potential of the internal market for services seems to be larger than that of goods. This is further emphasised by the fact that services generate about 70 per cent of value added in the European economy, but their share in intra-EU trade is only 20 per cent (Vetter, 2013). Besides, Kox and Lejour (2006) estimate that the reduction of the regulatory divergence across Europe with regard to services could boost trade in commercial services by 30 to 62 per cent. They also show that intra-EU direct investments in services could increase by 18 to 36 per cent, and up to 130 per cent if the lack of harmonisation in regulations would be completely eliminated.

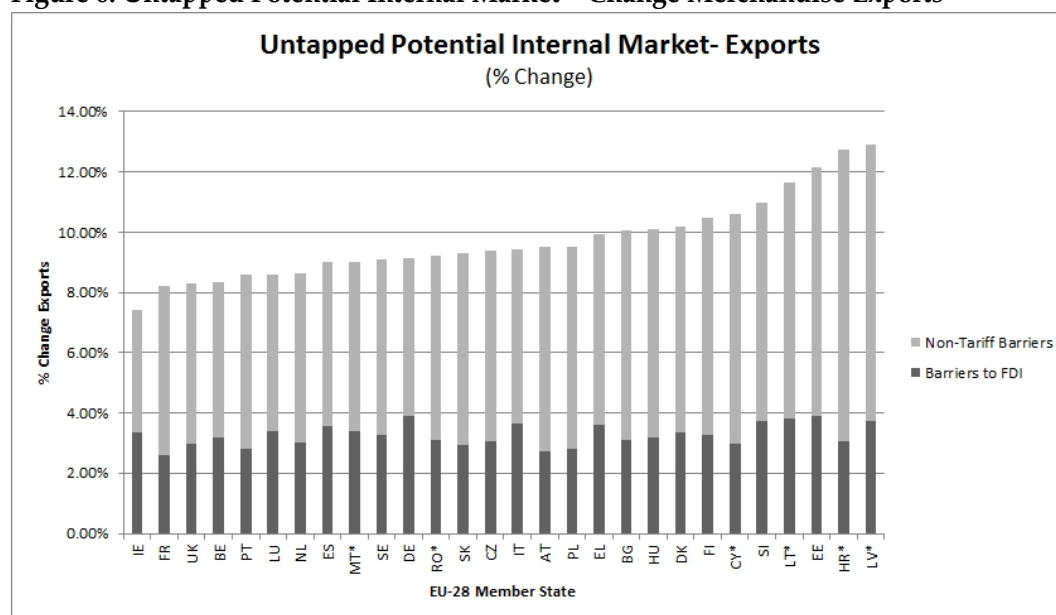
Our results also show that the estimated effects of reducing trade barriers are not uniform across Member States. Especially relatively new Member States such as Estonia, Croatia,

³⁹ Six key sectors include business services, accommodation, logistics, wholesale trade and construction.

Lithuania, Slovenia and Latvia, have the potential to increase their relative merchandise exports in the internal market by more than 10 per cent, mainly driven by the removal of NTBs, whereas the effects from the removal of barriers to FDI are smaller in size (see Figure 6). With regard to GDP, again a number of Eastern European Member States would more likely benefit from the removal of NTBs, where countries such as Hungary, Slovakia and the Czech Republic may boost their merchandise exports corresponding to over 6 per cent of their national GDP (see Figure 7).

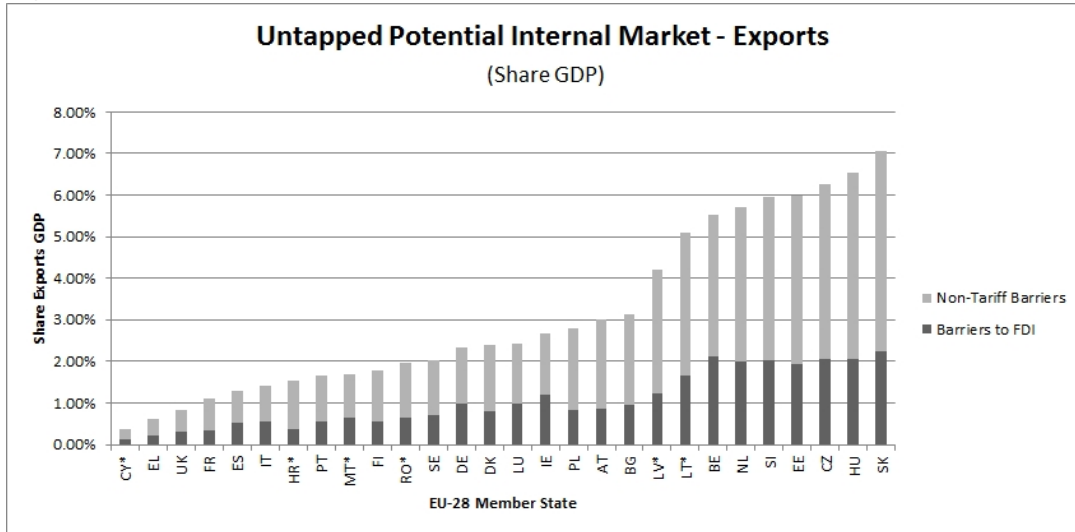
We acknowledge that the study does not take full account of the direct and indirect costs of removing the barriers to trade in the internal market. In order to highlight the untapped potential of the internal market it is vital to discuss the potential effects on stakeholders, including companies, employees and consumers. These costs, such as those borne by firms to comply with internal market regulation, need to be considered when conducting a full assessment of the effects of further economic integration. In our quantitative analysis we were not able to address the costs of removing the trade barriers, but our sector case studies provided some indications. We expect that the removal of barriers to FDI will especially benefit larger firms. Larger firms are more likely engaging in FDI and therefore will increase the propensity to invest abroad disproportionately for larger, higher productive firms. In contrast, we expect that the removal of NTBs would more likely benefit SMEs due to a better harmonisation of product regulations across the EU. As exporting activity for firms is associated with fixed costs of complying with regulatory requirements in the destination country, a harmonised regulatory framework would decrease costs for SMEs and foster their cross-border trade. Nevertheless, it is important to note that these costs of compliance with internal market regulation will vary between firms, especially for firms that operate predominantly on the domestic market, as they cannot spread the fixed costs over a higher scale of production or sales.

Figure 6: Untapped Potential Internal Market - Change Merchandise Exports



Source: Own calculations

Figure 7: Untapped Potential Internal Market – Share GDP



Source: Own calculations

Furthermore, we anticipate that the removal of barriers to trade would have a positive employment effect within the EU. Using existing employment measures with regard to exports, we estimate that the removal of barriers to FDI and NTBs potentially increases total employment by about 2.12 per cent of total EU employment. But it is important to bear in mind that these impacts on employment are based on strong assumptions, namely that extra-EU trade employment effects are similar to intra-EU employment effects. Finally, trade creation with the internal market will increase the overall diversity of products available for consumers in a particular country, potentially at lower prices and therefore especially creating benefits for consumers.

Focussing on the sector level, our findings from two sectorial case studies (i.e. the construction material sector and the medical device sector), confirm the existence of barriers to the functioning of the internal market. Both sectors are characterised by a relatively high concentration of SMEs, which partly explains why new EU regulation is often perceived as a burden by economic operators.

Based on interviews with key stakeholders in both sectors, we confirmed that the harmonisation of existing rules has not yet been fully implemented across EU Member States and that market fragmentation is still a major issue for firms. Furthermore, our results suggest that complexity of existing product market regulations and a lack of harmonisation deter economic operators from doing business in other countries and represents additional costs for them. Benefiting from the opportunity of a change from a directive to a regulation in the construction materials sector, we conducted a quasi-experiment that estimated a small but significantly positive effect on merchandise trade between Member States for harmonised products, compared to non-harmonised products. Even though the analysis took into account only a short time period after the implementation of the regulation, the findings confirm the fact that a lack of harmonisation creates trade distortion. In essence, industry representatives in both sectors seem to favour the replacement of current directives by regulation. However, it

should be noted that additional EU regulation may also lead to delays in market access. Interestingly, in line with findings by Pacchioli (2011), our study highlights the existence of home bias in the internal market, especially in the construction material sector.⁴⁰

Overall, we found an untapped potential between €183 billion and €270 billion in the longer term even though the internal market for goods is at a relatively advanced stage already. Based on other studies, we anticipate the potential for the internal market for services to be even higher. Apart from barriers to FDI and NTBs, our study identified so called 'home bias' as a potential barrier to trade. Further implementation of and adherence to public procurement rules and market penetration of B-to-C and B-to-B e-commerce services in the internal market could decrease information costs for consumers and therefore remove the home bias and boost cross-border trade in the longer run.

⁴⁰ Due to a lack of extensive product differentiation and relatively high transport costs.

References

- Age Working Group (2012): *The 2012 Ageing Report: Economic and budgetary projections for the 27 EU Member States (2010 – 2060)*, European Commission, Directorate-General for Economic and Financial Affairs, as of June 4, 2014: http://ec.europa.eu/economy_finance/publications/european_economy/2012/pdf/ee-2012-2_en.pdf
- Aghion, P., J. Boulanger & E. Cohen (2011): "Rethinking Industrial Policy", *Bruegel Policy Brief*, 2011-04.
- Anderson, J. (1979): "A Theoretical Foundation of the Gravity Equation", *The American Economic Review*, 69(1): 106-116.
- Anderson, J. (2011): "The Gravity Model," *NBER Working Paper* 16576.
- Anderson, J., & E. van Wincoop (2004): "Trade Costs", *Journal of Economic Literature*, 42: 691-751.
- Angrist, Joshua D., & Jörn-Steffen Pischke (2009): "Mostly Harmless Econometrics: An Empiricists Companion". Princeton: Princeton University Press.
- Armington, P. S. (1969): "A Theory of Demand for Products Distinguished by Place of Production," *IMF Staff Papers*, 16 (1): 159-178.
- Baier, S., & J. Bergstrand (2009): "Bonus vetus OLS: A simple method for approximating international trade-cost effects using the gravity equation," *Journal of International Economics*, 77: 77-85.
- Baldwin, R. (2011): "21st Century Regionalism: Filling the Gap between 21st Century Trade and 20th Century Trade Rules", *WTO Staff Working Paper*, No. ERSD-2011-08.
- Balta, N., & J. Delgado (2009): "Home bias and market integration in the EU," *CESifo Economic Studies*, 55(1): 110-144.
- Bergstrand, J. H. (1985): "The gravity equation in international trade: some microeconomic foundations and empirical evidence", *The Review of Economics and Statistics* 67(3): 474-81.
- Bergstrand, J. H. (1989), "The generalized gravity equation, monopolistic competition and the factor-proportions theory in international trade", *The Review of Economics and Statistics* 71(1): 143-53.
- Bernard, A. & J. Jensen (2007): "Firm Structure, Multinationals, and Manufacturing Plant Deaths", *The Review of Economics and Statistics*, 89(2): 193-204.
- BIPE (1988): "Le cout de la non-europe pour les produits de construction, " *Report for the EEC*.
- Bryan S., M. Buxton M., & E. Brenna E (2000): "Estimating the Impact of a Diffuse Technology on the Running Costs of a Hospital. A Case-Study of a Picture Archiving and Communication System", *International Journal of Technology Assessment in Health Care*, 16(3): 787-798.

- Campos, N., F. Coriceli, & L. Moreti (2014), "Economic Growth and Political Integration: Estimating the Benefits from Membership in the European Union using the Synthetic Counterfactuals Method." April 2014, IZA Discussion Paper No 8162, as of July 2014 <http://ftp.iza.org/dp8162.pdf>
- Cecchini, P., M. Catinat, & A. Jacquemin (1988), "The European Challenge 1992: The benefits of a Single Market. Aldershot: Wildwood House
- Chaney, T. (2008), "Distorted gravity: the intensive and extensive margins of international trade", *American Economic Review* 98: 1707-21.
- Copenhagen Economics (2010): *The economic impact of a European Digital Single Market*, study commissioned by the European Policy Centre, as of March 2014 http://www.epc.eu/dsm/2/Study_by_Copenhagen.pdf.
- De Castro, T. (2012). EU-BRIC trade assessment: Introversion, complementarity and RCA. *Scientia et Societas* (8)3: 68-80.
- Deardorff, A. (1998): "Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?", in *The Regionalization of the World Economy*, edited by J. Frankel.
- Decreux, Y. (2012): "Completing the Single Market II", in *Twenty Years on: The UK and the Future of the Single Market, 2012*, HM Government and Centre for Economic Policy Research (CEPR).
- Dixit, A. K., & J. E. Stiglitz (1977): "Monopolistic Competition and Optimum Product Diversity," *American Economic Review*, 67(3): 297-308.
- Donawa, M., & R. Gray (2012): "The breast implant scandal and European medical device regulation", *European Industrial Pharmacy* 12: pp 4 - 6
- Eaton, J. and Kortum, S. (2002), "Technology, geography and trade", *Econometrica*, 70: 1741-79.
- EAVA (2014): *Mapping the Cost of Non-Europe, 2014-2019*, European Parliamentary Research Service study.
- ECORYS (2011): *Sector competitiveness studies - Sustainable competitiveness of the construction sector*, ECORYS SCS Group, the Netherlands. Draft Final Report.
- Eucomed (2013): "Medical Technology - Key Facts and Figures", *Eucomed Publications*.
- Eucomed (2014): "The revision of the EU Medical Devices Directives", *Eucomed Publications*.
- Europe Economics (2013): *Optimal Integration in the Single Market: A synoptic Review*, Europe Economics Report for BIS.
- European Commission (2003): "The Macroeconomic Effects of the Single Market Programme after 10 years", as of March 28, 2014: http://europa.eu.int/comm/internal_market/10years/background_en.htm.
- European Commission (2010a): *An Integrated Industrial Policy for the Globalisation era. Putting Competitiveness and Sustainability at Centre Stage*, COM(2010)614.
- European Commission (2010b): *Europe 2020. A Strategy for Smart, Sustainable and Inclusive Growth*, COM(2010) 2020 final.
- European Commission, (2011): *Sectoral Innovation Watch: construction sector*, Final Sector Report.

- European Commission (2012a): *A Stronger European Industry for Growth and Economic Recovery*. Industrial Policy Communication Update.
- European Commission (2012): *2012 Ageing Report*, Prepared by DG ECFIN, as of June 4, 2014: http://ec.europa.eu/economy_finance/articles/structural_reforms/2012-05-15_ageing_report_en.htm
- European Commission, (2013): *Internal Market Scoreboard 26*, as of June 4, 2014: http://ec.europa.eu/internal_market/score/docs/score26_en.pdf
- European Commission (2014a): "Construction Sector Competitiveness", *Enterprise and Industry*, as of June 4, 2014: http://ec.europa.eu/enterprise/sectors/construction/competitiveness/index_en.htm
- European Commission (2014b): "Harmonised standards", *Enterprise and Industry*, as of June 4, 2014: <http://ec.europa.eu/enterprise/policies/european-standards/harmonised-standards/>
- European Commission (2014c): "Le catalogue Écolabel", *Environment*, as of June 4, 2014: <http://ec.europa.eu/ecat/>
- European Commission (2014d): "Medical Devices: Guidance MEDDEVs", *Public Health*, as of June 4, 2014: http://ec.europa.eu/health/medical-devices/documents/guidelines/index_en.htm
- European Parliament and the European Council (2007): "Directive 2007/47/EC of the European Parliament and of the Council of 5 September 2007 amending Council Directive 90/385/EEC on the approximation of the laws of the Member States relating to active implantable medical devices, Council Directive 93/42/EEC concerning medical devices and Directive 98/8/EC concerning the placing of biocidal products on the market", *Official Journal of the European Union*, as of June 4, 2014: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:247:0021:0055:en:PDF>
- European Parliament and the European Council (2010): "Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the energy performance of buildings (recast)", L 153/13, *Official Journal of the European Union*, as of June 4, 2014: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:153:0013:0035:EN:PDF>
- Geroski, P. (1991): "1992 and European Industrial Structure," in *The Economics of the Single European Act*, edited by G. MacKenzie & A. J. Venables, London: Macmillan.
- Head, K. (2003): "Gravity for beginners", mimeo, University of British Columbia.
- Head, K., & T. Mayer (2000): "Non-Europe: the magnitude and causes of market fragmentation in the EU," *Weltwirtschaftliches Archiv*, 136(2) 284-314.
- Helpman, E., M. Melitz, & Y. Rubinstein (2008), "Trading partners and trade volumes", *Quarterly Journal of Economics* 123: 441-87.
- Helpman, E., M. Melitz, & S. Yeaple (2004): "Export versus FDI with Heterogeneous Firms", *American Economic Review*, 94(1): 300-316.
- Hillberry, R., H., (2002): "Aggregation bias, compositional change, and the border effect," *Canadian Journal of Economics/Revue canadienne d'économique*, 35(3): 517-530.

- Kox, H. & A. Lejour (2006): "The Effects of the Services Directive on Intra-Eu Trade and FDI", *Revue économique*, 57: 747-769.
- Kimberly, J., R., de Pourville, G., & T. D'Aunno (2008): *The globalisation of Managerial Innovation in Healthcare*, Cambridge: Cambridge University Press.
- Krugman, P., M. Obstfeld, & M. Melitz (2011): "International Economics", Pearson Global Edition.
- London Economics and PWC (2013): "The Cost of Non-Europe: the untapped potential of the European Single Market", April 2013.
- Mayer, T., & S. Zignago (2011): "Notes on CEPII's distances measures (GeoDist)", *CEPII Working Paper 2011-25*.
- McCallum, J., (1995): "National borders matter: Canada-US regional trade patterns", *The American Economic Review*, 85(3): 615-623.
- Monti, M. (2010): "A new strategy for the single market." *Report to the President of the European Commission José Manuel Barroso*, May 10, available at: http://ec.europa.eu/bepa/pdf/monti_report_final_10_05_2010_en.pdf
- Moulton, B. R. (1990): "An Illustration of a Pitfall in Estimating the Effects of Aggregate Variables on Micro Units", *The Review of Economics and Statistics*, 72: 334-338.
- Neven, D., J., & L.-H. Roller (1991): "European integration and trade flows", *European Economic Review*, 35(6): 1295-1309.
- Nicoletti, G., S. Scarpetta, & O. Boylaud (2000): "Summary Indicators of Product Market Regulation with an Extension to Employment Protection Legislation". *OECD Economic Department Working Paper no 226*.
- OANDA (2014): as of June 4, 2014: www.oanda.com
- OECD (2011): *Health at a Glance 2011*, *OECD Indicators*, OECD Publishing.
- OECD (2014): *Reducing regulatory barriers to competition: Progress since 2008 and scope for further reform*, Paris: OECD.
- OECD (2005): *Long-term Care for Older People*, Paris: OECD.
- Pacchioli, C., (2011): *Is the EU Internal Market Suffering from an Integration Deficit?: Estimating the 'home-bias Effect'*. Centre for European Policy Studies.
- Pelkmans, J., (2012): "The Economics of Single Market Regulation." *Bruges European Economic Policy Briefings* 25.
- Pelkmans, J., (2010): "Product Market Reforms in EU Countries: Are the methodology and evidence sufficiently robust?", *CEPS Working Document*, No. 332/July 2010.
- Pelkmans, J. & A. Correia De Brito (2012): *Enforcement in the EU single market*, Centre for European Policy Studies, Brussels.
- Rose, A. & E., van Wincoop (2001): "National Money as a barrier to international trade: the real case for currency union", *American Economic Review* 91(2): 386-90.
- Scoreboard (2013): European Commission-Internal Market Directorate General, 2013, Internal Market Scoreboard No. 26, Brussels, as of June 2014, http://europa.eu.int/comm/internal_market/score/

- Shepherd, B. (2012): "The Gravity Model of International Trade - A User Guide", *ARTNeT Gravity Modeling Initiative*.
- Silva Santos, J.M.C. & S. Tenreyro (2006): "The Log of Gravity", *The Review of Economics and Statistics*, 88(4): 641-658.
- Sorenson C, M. Drummond, & B. Bhuiyan Khan (2013) Medical technology as a key driver of rising health expenditure: disentangling the relationship. *Clinicoecon Outcomes Res.*5, 223-234.
- Sousa, N., J. M. Rueda-Cantuche, I. Arto, & V. Andreoni (2012): "Extra - EU Exports and Employment", European Commission, Chief Economist Note.
- Stöllinger, R., & M. Holzner (2013): "State Aid and Export Competitiveness in the EU", *WIIW Working Paper 106*.
- Study Group 1 of the Global Harmonisation Task Force (2007) XXX. August 2014, Available at: <http://www.imdrf.org/docs/ghtf/archived/sg1/technical-docs/ghtf-sg1-n045r12-in-vitro-diagnostic-classification-070209.pdf>
- World Bank (2014): "Data: GDP (current US\$)", as of June 4, 2014, <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD>
- Trionfetti, F., (2000): "Discriminatory public procurement and international trade," *The World Economy*, 23(1): 57-76.
- Turrini, A., & T. Van Ypersele(2006): *Legal costs as barriers to trade*, Centre for Economic Policy Research.
- Vetter, S., (2013): *The Single Market 20 years on: Achievements, unfulfilled expectations and further potential*, EU Monitor - European Integration, DB Research.
- Wei, S.-J., (1996): *Intra-national versus International Trade: How Stubborn Are Nations in Global Integration?* NBER Working Paper 5531, April.
- WHO, (2012): *Promoting access to medical technologies and innovation: intersection between public health, intellectual property and health*, WTO, WIPO and WHO report.
- Wolf, H. C. (2000): "Intranational home bias in trade," *Review of Economics and Statistics*, 83(4): 555-563.
- Wölfl, A., I. Wanner, T. Kozluk & G. Nicoletti (2009): "Ten Years of Product Market Reform in OECD Countries - Insights from a Revised PMR Indicator", *Economics Department Working Papers*, No. 695

Appendix A: Countries included in the econometric analysis

The following list reports the countries included in our econometric analysis outlined in chapter 3:

Country Name	
Australia	Iceland
Austria	Israel
Belgium	Italy
Bulgaria	Japan
Brazil	Korea, Republic of
Canada	Lithuania
Switzerland	Luxembourg
Chile	Latvia
China, P.R.: Mainland	Mexico
Cyprus	Malta
Czech Republic	Netherlands
Germany	Norway
Denmark	New Zealand
Spain	Poland
Estonia	Portugal
Finland	Romania
France	Russian Federation
United Kingdom	Slovak Republic
Greece	Slovenia
Croatia	Sweden
Hungary	Turkey
India	United States
Ireland	South Africa

Appendix B: Econometric results Gravity Model

Table A-1: Econometric Results Gravity Model (Using Imputed Observations)

Estimation Method Dependent Variable	(1)	(2)	(3)	(4)
	OLS log exports	PPML exports	OLS log exports	PPML exports
log GDP country i	0.9079*** (0.014)	0.6220*** (0.023)	0.9561*** (0.014)	0.7295*** (0.031)
log GDP country j	0.7183*** (0.013)	0.6358*** (0.025)	0.8192*** (0.014)	0.7437*** (0.029)
log distance	-1.3566*** (0.053)	-0.4649*** (0.039)	-1.3383*** (0.043)	-0.6063*** (0.045)
contig	0.1947 (0.134)	1.0638*** (0.105)	0.2085 (0.132)	0.8786*** (0.125)
comlang	0.2113* (0.112)	-0.1041 (0.113)	0.2264** (0.099)	-0.1581 (0.122)
colony	0.4322*** (0.141)	-0.0462 (0.104)	0.4349*** (0.140)	-0.0730 (0.094)
barriers to FDI country i			-0.6453*** (0.047)	-0.1554** (0.066)
barriers to FDI country j			-0.5642*** (0.043)	-0.3999*** (0.061)
tariff barriers country i			-0.9143*** (0.176)	-0.6578*** (0.254)
tariff barriers country j			-1.4619*** (0.187)	-0.8521*** (0.179)
non-tariff barriers country i			-0.0009 (0.237)	-0.7366 (0.450)
non-tariff barriers country j			-0.4316* (0.232)	-1.2915*** (0.364)
state control country i			0.5467*** (0.052)	0.3645*** (0.097)
state control country j			0.2169*** (0.050)	0.2566*** (0.083)
barriers to entrepr. country i			-0.0081 (0.224)	0.4707 (0.295)
barriers to entrepr. country j			-0.3621 (0.230)	0.4714 (0.365)
Observations	4,108	4,140	4,108	4,140
Country Pairs	2070	2070	2070	2070
R-squared	0.6971		0.7543	

Notes: ***p < 0.01, **p < 0.05, *p < 0.10; clustered standard errors (distance) in parentheses. All specifications include a constant, a time dummy for the year 2012, plus controls for environmental regulatory stringency and a dummy whether trading partners share same currency. We use STATA command *vif* to test for multicollinearity.

Appendix C: Classification of Medical Devices

- 1 **Active implantable devices**
- 2 Anaesthetic and respiratory devices
- 3 Dental Devices
- 4 Electro mechanical devices
- 5 Hospital hardware
- 6 In vitro diagnosis devices
- 7 Non-active implantable devices
- 8 Ophthalmic and optical devices
- 9 Reusable devices
- 10 Single-use devices
- 11 Assistive products for persons with disability
- 12 Diagnostic and therapeutic radiation devices
- 13 Complementary therapy devices
- 14 Biologically derived devices
- 15 Healthcare facility products and adaptations
- 16 Laboratory equipment

Appendix D: Imputation Missing Country Values OECD PMR Indicator

As not for every EU-28 Member State the OECD PMR Database includes a full list of regulatory stringency indicators broken down by the sub-categories Barriers to trade and investment, state control and barriers to entrepreneurship, we had to impute a few values. For 5 countries, including Lithuania, Latvia, Malta, Croatia and Romania we only had values available for one year, either for 2013 or 2008. Therefore, we imputed the missing PMR values assuming that the policy stringency in this countries change with a similar pace as the average for similar smaller EU-28 countries. In the case of Cyprus, there is no PMR indicator available and we assumed that Cyprus as a smaller country with an island characteristic will have the same regulatory stringency such as Malta. However, due to the imputed nature of some of the values for these countries, interpretation of country predictions should be taken with caution.

Cost of Non-Europe Reports identify the possibilities for economic or other gains and/or the realisation of a 'public good' through common action at EU level in specific policy areas and sectors. This Cost of Non-Europe Report seeks to analyse the costs for citizens, businesses and relevant stake-holders of remaining gaps and barriers in the European Single Market, building on and updating the 1988 Cecchini Report, which quantified its potential benefits.

This particular study - the first in a series - uses an econometric model to estimate the potential benefits of removing existing barriers to foreign direct investment and non-tariff trade barriers within the European Union. The removal of existing trade barriers could boost total intra-EU merchandise exports up to 7 per cent in the long-term. These effects will vary by Member State, and by sector of the internal market.

This is a publication of the European Added Value Unit
EPRS | European Parliamentary Research Service
European Parliament



PE 536.353
ISBN: 978-92-823-5545-9
DOI: 10.2861/5772
CAT: QA-02-14-330-EN-N