The performance of the Single Market for goods after 25 years

Final Report

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Table of Content

1. INTRODUCTION 1

1.1. Background and motivation 1

1.2. Main objectives and structure of the report 2

2. SINGLE MARKET COMPLIANCE 4

2.1. Data and indicators on harmonised and non-harmonised industries 7

2.2. Single Market compliance indicators 8

2.2.1. Transposition 8

2.2.2. Infringement proceedings 10

2.2.3. Compliance indicators from the SOLVIT database 11

2.2.4. TRIS – comments and detailed opinions on national notifications 15

2.2.5. Compliance indicators in comparison 17

3. SINGLE MARKET EFFECTS ON GOODS TRADE AND WELFARE 19

3.1. A structural gravity model for estimating Single Market effects 20

3.1.1. A panel data structural gravity model 20

3.1.2. Empirical specification 21

3.1.3. Data sources 23

3.1.4. Descriptive statistics 28

3.1.5. Estimation results on heterogenous Single Market effects 29

3.1.6. General equilibrium Single Market effects on intra-EU trade 36

3.2. Untapped trade and welfare potentials related to incomplete harmonisation and regulatory compliance 40

3.2.1. Modified gravity model for a deeper look at the Single Market trade effects 41

3.2.2. Counterfactual scenarios and empirical implementation 42

3.2.3. Counterfactual results: direct trade effects of industry harmonisation and Single Market compliance 43

3.2.4. Counterfactual results: general equilibrium effects on intra-EU trade and trade with third countries 52

3.2.5. Counterfactual results: welfare effects from perfect compliance and full harmonisation 60

3.2.6. Summary 63

4. THE SINGLE MARKET, TRADE, COMPETITION AND PRODUCTIVITY 66

4.1. Theoretical and empirical background 66

4.2. Data and descriptive analysis 69

4.2.1. Data and summary statistics 69

4.2.2. The evolution of competition levels over time 71

4.2.3. Trade, competition and productivity: correlation analysis 75

4.3. Econometric analysis 78

4.3.1. Model specifications 78

4.3.2. Results 79

4.4. Single Market compliance – counterfactual competition and productivity potentials 90

4.4.1. Counterfactual competition and productivity effects with full legal harmonisation and full compliance with the Single Market – intra-EU trade potentials 91

4.4.2. Counterfactual competition and productivity effects with full legal harmonisation and full compliance with the Single Market – extra-EU trade potentials 96

4.5. Summary of key findings and policy implications 101

5. THE QUALITY OF THE SINGLE MARKET LEGAL FRAMEWORK AS A SOURCE OF COMPARATIVE ADVANTAGE AND DETERMINANT OF INTERNATIONAL PRODUCTION CHOICES IN EU COUNTRIES 103

5.1. The quality of the Single Market legal framework as a source of comparative advantage and specialisation in contract-intensive industries 104

5.1.1. Research objectives and methodology 104
5.1.2. Data and measurement 105
5.1.3. Results of the econometric analysis 107
5.1.4. Sensitivity analysis 110
5.1.5. Endogeneity 114

5.2. The quality of the Single Market legal framework as a determinant of international production choices in EU countries 115

5.2.1. Research objectives and methodology 115
5.2.2. Descriptive analysis 117
5.2.3. Results of the econometric analysis 117

5.3. Summary of key findings and policy implications 125

6. SPECIAL TOPIC: THE IMPACT OF CHANGES IN THE QUALITY OF INSTITUTIONS THROUGH EU MEMBERSHIP: EVIDENCE FROM THE EU ACCESSION OF COUNTRIES IN CENTRAL AND EASTERN EUROPE 127

6.1. Introduction 127

6.1.1. The impact of the Community Acquis on the quality of institutions 127
6.1.2. EU accession and market concentration 129
6.1.3. EU accession and total factor productivity 132
6.1.4. Summary and policy conclusions 134

7. SUMMARY OF RESULTS AND CONCLUSIONS 136

7.1. Key findings 136
7.2. Overall conclusions 141

8. APPENDIX A: PRE-ACCESSION TRADE EFFECTS IN ACCESSION COUNTRIES 145

9. APPENDIX B 147

10. REFERENCES 185

List of Tables

Table 2.1: Data sources and Internal Market compliance indicators 6
Table 2.2: Goods in the harmonisation/non-harmonisation field within industries 7
Table 2.3: Correlation between Single Market compliance indicators, 2004-2014.....18
Table 3.1: Aggregation of ISIC rev.3 and ISIC rev.4 26
Table 3.2: Evolution of Single Market trade effects – summary of results 35
Table 3.3: Single Market general equilibrium intra-EU trade effects by industry (average Single Market effect in %) 37
Table 3.4: Single Market general equilibrium intra-EU trade effects: 20 highest and lowest country-industry effects excluding coke and refined petroleum products (average Single Market effect in %) 39
Table 3.5: Counterfactual scenarios 43
Table 3.6: Single Market intra-EU trade potentials of counterfactual policy scenarios across industries (changes in %) 53
Table 3.7: Single Market intra-EU trade potentials of counterfactual policy scenarios across member states (changes in %) 54
Table 3.8a: Single Market intra-EU trade potentials of counterfactual policy scenarios: 10 highest and lowest country-industry effects (changes in %).....55
Table 3.8b: Single Market intra-EU trade potentials of counterfactual policy scenarios: 10 highest country-industry effects excluding coke and refined petroleum products (changes in %) 56
Table 3.9: Single Market trade diversion potentials of counterfactual policy scenarios across industries (changes in %) 57
Table 3.10: Single Market trade diversion potentials of counterfactual policy scenarios across member states (changes in %) 58
Table 3.11: Single Market trade diversion potentials of counterfactual policy scenarios: 10 smallest and highest country-industry effects (changes in %).....59
Table 3.12: Single Market welfare potentials of counterfactual policy scenarios across member states (changes in %).....61
Table 3.13: Single Market welfare potentials of counterfactual policy scenarios across member states (changes in %).....62
Table 3.14: Single Market welfare potentials of counterfactual policy scenarios: 10 highest and lowest country-industry effects (changes in %).....63
Table 4.1: Summary statistics for HHI by industry, 2002-2014 70
Table 4.2: Summary statistics for CR10 by industry, 2002-2014 70
Table 4.3: The evolution of market concentration over time, CR10 74
Table 4.4: The evolution of market concentration over time, HHI 74
Table 4.5a: Patterns of the evolution of competition levels by industry over time 75
Table 4.5b: Trade, competition and productivity, all imports, all sectors, IV estimates 80
Table 4.6: Trade, competition and productivity, intra-EU imports, all sectors 80
Table 4.7: Trade, competition and productivity, extra-EU imports, all sectors 81
Table 4.8: Trade, competition and productivity, all imports, industry-specific effects, CR10, IV estimates 83
Table 4.9: Trade, competition and productivity, intra-EU imports, industry-specific effects, CR10, IV estimates 84
Table 4.10: Trade, competition and productivity, extra-EU imports, industry-specific effects, CR10, IV estimates 85
Table 4.11: Trade, competition and productivity, all imports, industry-specific effects, HHI, IV estimates 86

Table 4.12: Trade, competition and productivity, intra-EU imports, industry-specific effects, HHI, IV estimates 87
Table 4.13: Trade, competition and productivity, extra-EU imports, industry-specific effects, HHI, IV estimates 88
Table 4.14a: Industry-specific patterns of trade, competition and productivity effects – summary of results 89
Table 4.14b: Patterns of industry-specific trade, competition and productivity links – summary of results 90
Table 4.15: Single Market competition effects of counterfactual policy scenarios across industries – intra-EU trade potentials, % change 92
Table 4.16: Single Market productivity effects of counterfactual policy scenarios across industries – intra-EU trade potentials, % change 92
Table 4.17: Single Market competition effects of counterfactual policy scenarios across member states – intra-EU trade potentials, % change 93
Table 4.18: Single Market productivity effects of counterfactual policy scenarios across member states – intra-EU trade potentials, % change 93
Table 4.19: Single Market competition effects of counterfactual policy scenarios: 10 highest and lowest country-industry effects – intra-EU trade potentials, % change 94
Table 4.20: Single Market productivity effects of counterfactual policy scenarios: 10 highest and lowest country-industry effects – intra-EU trade potentials, % change 95
Table 4.21: Single Market competition effects of counterfactual policy scenarios across industries – trade diversion potentials, % change 97
Table 4.22: Single Market productivity effects of counterfactual policy scenarios across industries – trade diversion potentials, % change 97
Table 4.23: Single Market competition effects of counterfactual policy scenarios across member states – trade diversion potentials, % change 98
Table 4.24: Single Market productivity effects of counterfactual policy scenarios across member states – trade diversion potentials, % change 98
Table 4.25: Single Market competition effects of counterfactual policy scenarios: 10 highest and lowest country-industry effects – trade diversion potentials, % change 99
Table 4.26: Single Market productivity effects of counterfactual policy scenarios: 10 highest and lowest country-industry effects – trade diversion potentials, % change 100
Table 5.1: Ranking of manufacturing industries by institutional intensity 106
Table 5.2: Determinants of comparative advantage – baseline model, OLS estimates 108
Table 5.3: Determinants of comparative advantage – augmented model, OLS estimates 109
Table 5.4: Counterfactual increase in export specialisation in contract-intensive industries in the case of maximum institutional quality (Rule of Law Index), country-specific effects 109
Table 5.5: Counterfactual increase in export specialisation in contract-intensive industries in the case of maximum quality of the SM legal framework (no infringement cases), country-specific effects 110
Table 5.6: Determinants of comparative advantage – alternative measure of judicial quality, baseline model, OLS estimates 111
Table 5.7: Counterfactual export specialisation in contract-intensive industries with the best performance for judicial quality (Rule of Law Rank), country-specific effects 111
Table 5.8: Determinants of comparative advantage – alternative measure of the quality of the SM legal framework, baseline OLS estimates 112
Table 5.9: Counterfactual export specialisation in contract-intensive industries with full transposition of the SM legislation, country-specific effects 112
Table 5.10: Determinants of comparative advantage – additional co-variates, OLS estimates 113

Table 5.11: Determinants of comparative advantage – additional co-variates, OLS estimates .. 113
Table 5.12: EU countries classified by the origin of their law 114
Table 5.13: Determinants of comparative advantage, baseline IV estimates 115
Table 5.14: The distribution of parent companies and the intensity of integrated inputs - manufacturing firms 117
Table 5.15: Determinants of vertical integration, institutional quality measured by the transposition of the SM legislation, LPM estimates 119
Table 5.16: Determinants of vertical integration, institutional quality measured by the ratio of infringement proceedings 2007/2014, LPM estimates 120
Table 5.17: Determinants of vertical integration, institutional quality measured by the absolute reduction of pending infringement proceedings, LPM estimates 121
Table 5.18: Determinants of vertical integration, institutional quality measured by the transposition of the SM legislation, two steps estimation 122
Table 5.19: Determinants of vertical integration, institutional quality measured by the ratio of pending infringement proceedings 2007/2014, two steps estimation 123
Table 5.20: Determinants of vertical integration, institutional quality measured by the absolute reduction of pending infringement proceedings, two steps estimation 124
Table 6.1: Regulatory quality across EU membership status 129
Table 6.2: Predicted marginal probabilities of market structure across membership status 131
Table B3.1: General equilibrium intra-EU trade effects of the Single Market across member states and industries (changes in %) 151
Table B3.2: Single Market potential intra-EU trade effects of counterfactual policy scenarios across member states and industries - transposition indicator (changes in %) 152
Table B3.3: Single Market potential intra-EU trade effects of counterfactual policy scenarios across member states and industries - infringements indicator (changes in %) 153
Table B3.4: Single Market potential intra-EU trade effects of counterfactual policy scenarios across member states and industries - SOLVIT misapplication indicator (changes in %) 154
Table B3.5: Single Market potential intra-EU trade effects of counterfactual policy scenarios across member states and industries - SOLVIT solution indicator (changes in %) .. 155
Table B3.6: Single Market potential intra-EU trade effects of counterfactual policy scenarios across member states and industries - TRIS indicator (changes in %) 156
Table B3.7: Single Market potential trade division effects of counterfactual policy scenarios across member states and industries - transposition indicator (changes in %) 157
Table B3.8: Single Market potential trade division effects of counterfactual policy scenarios across member states and industries - infringements indicator (changes in %) 158
Table B3.9: Single Market potential trade division effects of counterfactual policy scenarios across member states and industries - SOLVIT misapplication indicator (changes in %) 159
Table B3.10: Single Market potential trade division effects of counterfactual policy scenarios across member states and industries - SOLVIT solution indicator (changes in %) .. 160
Table B3.11: Single Market potential trade division effects of counterfactual policy scenarios across member states and industries - TRIS indicator (changes in %) 161
Table B3.12: Single Market potential welfare effects of counterfactual policy scenarios across member states and industries - transposition indicator (changes in %) 162
Table B3.13: Single Market potential welfare effects of counterfactual policy scenarios across member states and industries - infringements indicator (changes in %) 163
Table B3.14: Single Market potential welfare effects of counterfactual policy scenarios across member states and industries – SOLVIT misapplication indicator (changes in %) .. 164
Table B3.15: Single Market potential welfare effects of counterfactual policy scenarios across member states and industries – SOLVIT solution indicator (changes in %) 165
Table B3.16: Single Market potential welfare effects of counterfactual policy scenarios across member states and industries - TRIS indicator (changes in %) 166

Table B4.1: CompNet – coverage by country, sector and year 167
Table B4.2: Summary statistics for mark-ups by industry, 2002-2014 167
Table B4.3: Summary statistics for price-cost margin by industry, 2002-2014 167
Table B4.4: Summary statistics of variables, 2002-2014 168
Table B4.5: Single Market competition effects of counterfactual policy scenarios across member states and industries, transposition - intra-EU trade potentials, % change 169
Table B4.6: Single Market productivity effects of counterfactual policy scenarios across member states and industries, transposition - intra-EU trade potentials, % change 170
Table B4.7: Single Market competition effects of counterfactual policy scenarios across member states and industries, infringements - intra-EU trade potentials, % change 171
Table B4.8: Single Market productivity effects of counterfactual policy scenarios across member states and industries, infringements - intra-EU trade potentials, % change 172
Table B4.9: Single Market competition effects of counterfactual policy scenarios across member states and industries, TRIS - intra-EU trade potentials, % change 173
Table B4.10: Single Market productivity effects of counterfactual policy scenarios across member states and industries, TRIS - intra-EU trade potentials, % change 174
Table B4.11: Single Market competition effects of counterfactual policy scenarios across member states and industries, SOLVIT - intra-EU trade potentials, % change..... 175
Table B4.12: Single Market productivity effects of counterfactual policy scenarios across member states and industries, SOLVIT - intra-EU trade potentials, % change..... 176
Table B4.13: Single Market competition effects of counterfactual policy scenarios across member states and industries, transposition- trade diversion potentials, % change 177
Table B4.14: Single Market productivity effects of counterfactual policy scenarios across member states and industries, transposition- trade diversion potentials, % change 178
Table B4.15: Single Market competition effects of counterfactual policy scenarios across member states and industries, infringements – trade diversion potentials, % change 179
Table B4.16: Single Market productivity effects of counterfactual policy scenarios across member states and industries, infringements- trade diversion potentials, % change 180
Table B4.17: Single Market competition effects of counterfactual policy scenarios across member states and industries, TRIS - trade diversion potentials, % change 181
Table B4.18: Single Market productivity effects of counterfactual policy scenarios across member states and industries, TRIS - trade diversion potentials, % change 182
Table B4.19: Single Market competition effects of counterfactual policy scenarios across member states and industries, SOLVIT - trade diversion potentials, % change..... 183
Table B4.20: Single Market productivity effects of counterfactual policy scenarios across member states and industries, SOLVIT – trade diversion potentials, % change 184

List of Figures

Figure 2.1: Transposition by member states, 2004-2014 9
Figure 2.2: Development of transposition by membership status, 2004-2014..... 9
Figure 2.3: Infringement indicator by member states, 2004-2014 10
Figure 2.4: Development of the infringement indicator by membership status, 2004-2014 11
Figure 2.5: SOLVIT business cases by problem area, 2004 - 2014 12
Figure 2.6: SOLVIT misapplication indicator by member states, 2004 - 2014 13
Figure 2.7: Development of the SOLVIT misapplication indicator by membership status, 2004-2014 13
Figure 2.8: SOLVIT solution indicator by member states, 2004 - 2014 14
Figure 2.9: Development of the SOLVIT solution indicator by membership status, 2004-2014 14
Figure 2.10: Average number of TRIS notifications by member states, 2004-2014 16
Figure 2.11: TRIS indicator on comments and detailed opinions by member states, 2004 - 2014 16
Figure 2.12: Development of the TRIS indicator on comments and DOs by membership status, 2004-2014 17
Figure 2.13: Single Market compliance indicators in comparison, 2004-2014 17
Figure 3.1: Observed changes of within-Single Market trade 28
Figure 3.2: Evolution of Single Market trade impacts: participation effect 30
Figure 3.3: Evolution of Single Market trade impacts: membership and accession effects 32
Figure 3.4: Evolution of Single Market trade effects: heterogenous accession effects 34
Figure 3.5: Single Market trade potentials of full harmonisation 45
Figure 3.6: Single Market joint trade potentials of full transposition directives and full harmonisation 46
Figure 3.7: Single Market joint trade potentials of zero misapplication cases in SOLVIT and full harmonisation 48
Figure 3.8: Single Market joint trade potentials of solved missapplication cases in SOLVIT and full harmonisation 49
Figure 3.9: Single Market joint trade potentials of no Commission statements on national regulations in TRIS and full harmonisation 50
Figure 3.10: Single Market: joint trade potentials of no infringements and full harmonisation 51
Figure 4.1: HHI and CR10 by industry over time, 2002-2014 71
Figure 4.2: HHI and CR10 by country over time, 2002-2014 72
Figure 4.3: Market concentration (CR10) and trade (intra-EU and extra-EU imports) by industry 76
Figure 4.4: Market concentration (HHI) and trade (intra-EU and extra-EU imports) by industry 77
Figure 4.5: Labour productivity and market concentration by industry 78
Figure 6.1: Firm-level TFP distributions across membership status 133
Figure 6.2: Firm-level capital-labour-ratio distributions across membership status 133
Figure A3.1: The impact of the Single Market: 4-year pre-accession effects for new member states 146
Figure B2.1: Development of transposition by member states, 2003-2014 147
Figure B2.2: Development of the infringement indicator by member states, 2004-2014 148
Figure B2.3: Development of the SOLVIT misapplication indicator by member states, 2004-2014 149
Figure B2.4: Development of the TRIS indicator on comments and DOs by member states, 2004-2014 150

1. INTRODUCTION

1.1. Background and motivation

In 2018 the Single Market celebrated its 25th anniversary. While its gradual implementation brought substantial progress to the integration of the markets of members, the Single Market is still incomplete (European Commission, 2018; Braconier and Pisu, 2013)[1]. Incorrect, incomplete or late transposition and application of EU-harmonised rules, fragmented regulation and inconsistencies between EU and national laws, incomplete administrative co-operation and lack of information about rights and their application in practice were identified as the main reasons to explain the lack of full implementation of the Single Market.

Furthermore, while the Single Market for goods is often considered well advanced and operational compared to the Single Market for services, recent analyses have provided evidence on important remaining shortcomings of the Single Market for goods (Rytz et al., 2015; EPRS, 2016; European Commission 2015B, 2016, 2017A, 2017B, 2017C, 2017D). These findings fed into the "Goods package" presented by the European Commission in December 2017 (European Commission, 2017E). The package represents part of the Commission's strategy to further improve the performance of the European Single Market by monitoring areas where there remains potential to improve its functioning and where further benefits are most likely to be drawn. It contains two legislative proposals. The first aims to strengthen compliance and the enforcement of Union harmonisation legislation on products (European Commission, 2017F), in addition to specifically addressing weaknesses related to market surveillance, especially the lack of uniformity in approach to market surveillance and cooperation mechanisms. The second aims at reinforcing the mutual recognition of goods (European Commission, 2017G), which ensures that products not subject to EU-wide regulation can, in principle, move freely within the Single Market. It addresses the main shortcomings to the functioning of mutual recognition, including a lack of fast and easy remedies for challenging the decisions of authorities denying market access, unclear scope with respect to the products covered by the principle and difficulties of businesses in demonstrating that their product was lawfully sold in another member state (precondition for obtaining mutual recognition).

Incomplete implementation of the Single Market leaves untapped potential for economic growth, efficiency improvements and job creation. Nearly all Single Market impact studies reveal major economic gains in terms of welfare, employment and trade, but also that the anticipated economic gains have not yet fully materialised.

The empirical quantification of economic gains accruing from the formation of the internal market has a long history. The Cecchini report (Cecchini et al., 1988) was the very first assessment and provided an ambitious ex-ante analysis of the anticipated effects of the Single Market Programme (SMP) by assessing the "Costs of non-Europe", comparing the potential benefits of a complete elimination of obstacles to trade across the Single Market to the current state (or no action). In the period right after the implementation date of the Single Market in 1993, numerous ex-ante studies using partial or general equilibrium models emerged. These have been surveyed by Baldwin and Venables (1995). In the absence of any reliable information regarding the real level of barriers to intra-EU trade at that time, intra-EU trade costs were (somewhat arbitrarily) set at 2.5% across all sectors. In light of the more recent evidence (Ilzkovitz et al., 2007; Pacchioli, 2011; Braconier and Pisu, 2013) on intra-EU barriers, this largely underestimated the real level of barriers to trade, even within the goods sector.

In the Single Market Review (European Commission, 1997), the Commission issued an early ex-post evaluation of the benefits of the Single Market, bringing together findings from numerous background studies on the impact and effectiveness of the Internal Market. While these

[1] Most important milestones in the realisation of the European Single Market include: European Commission White Paper on the Internal market 1985 (European Commission, 1985). Official launch of the Single Market Programme with the Single European Act (1986) which was completed at January 1, 1993. Adoption of the" Single Market Act I" in April 2011 and the "Single Market Act II" in October 2012. These focused on 12 priority areas building on recommendations of the Monti report (Monti, 2010). Presentation of Single Market Strategy (European Commission, 2015A) in 2015. As part of this strategy and supported by recent evidence on still considerable shortcomings in the Single Market for goods the "Goods package" was presented on December 19, 2017 to address remaining weaknesses in the Single Market for goods.

assessments helped to pinpoint target areas for further attention and raised awareness of the benefits of the Single Market, the period effectively under investigation was far too short to provide a full vision of the impact of the Single Market. In addition, with much of the data referring to 1994, the accession of Austria, Sweden and Finland in 1995 and all further accessions of the Central and Eastern European countries from 2004 onwards, which brought considerable qualitative changes for the Single Market, were not covered by the analysis. While some EU enlargement effects were covered, the same is practically true for an assessment of economic impacts in 2003 (European Commission, 2003) and again in 2007 covering the period 1992-2006 (European Commission, 2007). Furthermore, in the advent of EU enlargements, notably the EU Eastern enlargement, the focus of ex-ante studies shifted to the benefits member states can accrue from accession.

More recent studies focus on the ex-post re-assessments of the "Cost of non-Europe", either arising from the lack of the completion of the Single Market or from Brexit. These are ex-post exercises in that they look back at the level of integration already achieved and quantify the opportunity costs of eliminating achieved integration efforts or of leaving the Union (Oberhofer and Pfaffermayr, 2017; Mayer et al., 2018). Mayer et al. (2018) estimate welfare gains from EU trade integration of 4.4% for the average European country. They also found significant larger gains for small open economies and that Eastern European countries have been the major benefiters of the integration process so far. A study from 2013, examining the untapped potential of the Single Market, identified six service industries as priority areas where further integration within the Single Market was likely to make the most significant contribution to productivity growth (London Economics and PwC, 2013).

Virtually all reports are either ex-ante or ex-post re-assessments of the "Costs of non-Europe" in the tradition of the very first analysis of gains from achievements of the SMP in the Cecchini report, in which deeper internal integration was supposed to deliver benefits from increased trade, thereby generating efficiency gains through economies of scale as well as increased specialisation according to comparative advantage. Furthermore, the pro-competitive effects of market opening were expected to lower prices to the advantage of consumers on the one hand and to reduce monopoly rents, giving firms greater incentives to achieve productivity gains through innovation, on the other.

This study will in a first part also follow this tradition and analyse these relationships to assess the performance of the Single Markets, in addition to identifying further potentials in terms of trade, welfare and competition, as well as associated productivity gains. It will add to the existing literature by applying Single Market regulatory and Single Market compliance indicators to reveal important policy-related shortcomings in the functioning of the Single Market that also formed the basis for the recent reform initiatives of key Single Market policies in the "Goods package" of December 2017. The degree of unexploited benefits that remain to be achieved from further integration of goods markets by addressing these remaining weaknesses is still unexplored – notably at the level of individual sectors and countries - and will be assessed in this study while directly linked to trade, welfare, competition and productivity.

The second part of the study will go beyond the analysis of originally expected Single Market benefits in the Cecchini tradition and focus on integration effects related to institutional and regulatory factors in shaping comparative advantages and intra-EU production linkages via international (intra-firm) vertical integration or outsourcing. It will provide measures of the performance of the Single Market in dimensions not foreseen by the initial Single Market project, and which follow from newer theoretical insights in fields such as new institutional economics (Nunn and Trefler, 2013) or theories based on incomplete contracts (Grossman and Hart, 1986; Antràs and Chor, 2013; Antràs and Yeaple, 2013).

1.2. Main objectives and structure of the report

The main objective of this study is twofold. First, it intends to analyse the current state of the European free movement of goods and to assess untapped potentials in terms of EU trade (intra-EU trade as well as trade with third countries), welfare, competition and productivity due to weaknesses in compliance to Single Market rules. It will provide new evidence on the economic gains from accession to and membership in the Single Market for goods. Second, the study aims to also look beyond "traditionally expected" Single Market effects on goods trade creation, product market competition and productivity, that are less readily anticipated and related to improvements

of institutional quality: specialisation patterns and firms' organisational choices for intra-EU production linkages (vertical integration via foreign direct investments, FDI, or outsourcing).

Guided by these two main objectives, the study will:

- explore untapped Single Market potentials in goods trade, competition as well as productivity due to remaining policy-related shortcomings as measured by regulatory and compliance indicators;
- use new insights from theory to analyse the impact of the quality of institutions and incomplete contracts in shaping comparative advantages and intra-EU production linkages, and thus provide measures of the performance of the Single Market in dimensions not foreseen by the initial Single Market project;
- explore and differentiate between the impacts and benefits from accession to and membership in the Single Market;
- disaggregate the analysis to the industry/member state level to identify industry, country as well as industry-country combinations with the highest untapped potentials.

The study starts with a discussion of Single Market regulations and various dimensions of compliance with Single Market rules in chapter 2. It reviews the main policy tools and mechanisms implemented to realise the principle of free movement of goods within the Internal Market and presents the main policy indicators to be implemented in the analysis of the study. It also provides a first descriptive analysis of the state of harmonisation by industry and of compliance with Single Market rules by member states.

Chapter 3 provides an analysis of the potential benefits of lower intra-EU trade barriers for trade flows and welfare using a structural gravity approach. It proceeds in several steps. First, results from estimations of the structural (panel data) gravity trade model will serve as a benchmark of realised Single Market trade between member states by industry. In a next step, Single Market effects identified in the baseline specification will be related to indicators revealing the degree of harmonisation by industry, as well as compliance, transposition and implementation of Single Market rules. The exercise will reveal to what extent integration deficits (remaining border effects) are related to the incomplete application of Single Market rules. These baseline results will then be compared to a counterfactual scenario of full harmonisation and perfect compliance for each of the selected policy indicators. This last step will provide evidence of untapped potentials in intra-EU trade. Most importantly, on the basis of the applied structural gravity approach chapter 3 is able to present general equilibrium intra-EU trade effects (taking account of second-round effects such as trade diversion and income effects), extra-EU trade effects as well as overall welfare effects.

Chapter 4 complements the analysis on goods trade and welfare in chapter 3 by providing evidence on competition and productivity potentials corresponding to the counterfactual trade potentials for each regulatory and compliance indicator by country and industry. It summarises the main findings in the literature on the effect of trade liberalisation on prices, competition and productivity and presents the evolution of concentration measures by industry. Econometric analysis identifies the responsiveness of competition and productivity to intra-EU and extra-EU imports and builds the basis for estimates on the impact of Single Market trade potentials derived from scenarios of full harmonisation and full compliance with Single Market rules.

As noted above, chapters 3 and 4 provide evidence related to the more traditionally expected benefits of the SMP and the differences in the degree of realisation for individual industries and countries. Chapters 5 and 6 will analyse less anticipated effects that follow from new insights in economic theory. More specifically, chapter 5 will build on insights of new theories emphasising the role of institutions and legal frameworks and quantify the impact of Single Market compliance on fostering comparative advantage and specialisation in industries where contracts and their enforcement play a significant role. Chapter 5 will also quantify the role of the Single Market legal framework as a determinant of intra-EU production linkages via intra-firm vertical integration or cross-border outsourcing of production stages. Complementing the analysis on regulatory change and quality, chapter 6 will review interrelated research on the impact of EU accession on improving the quality of institutions in Central and Eastern European countries and the subsequent effects on market structures and productivity distributions. Finally, a summary of findings and conclusions including policy implications will be provided.

2. SINGLE MARKET COMPLIANCE

EU-wide legislation for goods and the adoption of harmonised standards as well as the application of the mutual recognition principle are two main policy tools with which to realise the principle of free movement of goods within the Internal Market. Accordingly, harmonised goods are those in which products are covered by EU-wide legislation by setting common requirements with respect to health, safety and environmental protection. Most harmonised products are subject to common standards or are required to have the same technical specifications. Non-harmonised industries are those where the above-mentioned common standards and technical specifications do not apply, and national rules may apply. The free movement of these goods is based on the principle of mutual recognition. The principle facilitates market access of products legally produced or sold in other EU member states, even when the product does not fully comply with the technical rules of the member state of destination. The importing member state can disregard this principle only under strictly defined circumstances, such as for the protection of public safety, health and the environment, and must guarantee that the measures are proportionate and the least trade-restrictive.

Recent analyses provide evidence on important remaining shortcomings of the Single Market for goods (Rytz et al., 2015; European Commission, 2015B, 2016, 2017A, 2017B, 2017C, 2017D; EPRS, 2016), which preclude the realisation of its full potential and shift the focus to reforms of mechanisms to strengthen compliance and the enforcement of EU Internal Market harmonisation legislation and policy tools in place. The major policy question is how these mechanisms can be made to work effectively. In this respect, the Single Market for goods is yet facing major challenges, both in terms of legal enforcement barriers related to the adoption and transposition of EU directives into domestic law and in terms of administrative barriers referring to the practical execution of EU Internal Market rules. Late or incorrect transposition of EU directives creates barriers to the free movement of goods when national authorities refuse market access due to non-compliance with local laws as a result of late or incorrect implementation of EU rules. Administrative barriers arise from the misapplication of EU directives, inappropriate testing, certification, accreditation or the introduction of non-compliant standards. They could also stem from insufficient or absent market surveillance when non-compliant products – often more competitive as a result of by-passing costly safety or environmental provisions – enter the market to the competitive disadvantage of EU law-compliant goods. At the same time, the practical implementation of the mutual recognition principle in the non-harmonised field is often hampered by legal uncertainty, administrative burdens and a lack of awareness, both on the part of the companies and on the part of the member state authorities. Also, there are difficulties in agreeing on common product standards and failures to open up public procurement markets.

The Commission continuously developed new ways to enhance implementation as well as compliance with EU law. This considerably expanded the range of mechanisms with which to realise enforcement and correct for bad enforcements, in addition to introducing measures reducing transaction and information costs for business. Over time the focus shifted from formal infringement procedures enforced by the Courts to non-legislative instruments (pre-infringement and preventive initiatives, Pelkmans and Correia de Brito, 2012). In this process individual member states as well as better cooperation between administrations or between the member states and the Commission have become more central to the mechanisms. At the same time, stakeholders (including enterprises and consumers) have been empowered to challenge administrations where their rights are being infringed.

These mechanisms include the Single Market Scoreboard, SOLVIT, EU Pilot, RAPEX, the mutual recognition Regulation 764/2008/EC[2], reforms in EU harmonisation legislation with the adoption of

[2] The old approach to harmonisation legislation involved extensive product-by-product or even component-by-component legislation and was implemented by means of detailed directives (chemicals, motor vehicles, pharmaceuticals, food). Beginning in the mid-1980s the "new approach" adopted a simpler and more flexible approach towards harmonisation/standardisation resulting in directives that contain essential public interest requirements with which products must comply, leaving the definition of detailed technical requirements with standards and at the same time leaving greater leeway to manufacturers on technical solutions to meet standards and to demonstrate product compliance with the relevant legislation. The "new approach" was itself reformed in 2008 with the adoption of the New Legislative Framework (NLF) to enhance the effectiveness in the fields of market surveillance with the adoption of Regulation (EC) No 765/2008.

the New Legislative Framework including Regulation 765/2008/EC[3] to enhance effectiveness of market surveillance and preventing new technical barriers via the Directive 2015/1535/EC procedure. Most recently, the Commission proposed the "Goods package" as part of the Commission's strategy to further improve the performance of the Single Market, addressing further weaknesses related to market surveillance and mutual recognition. It contains two legislative proposals. The first aims to strengthen the compliance and enforcement of Union harmonisation legislation on products (European Commission, 2017F) and specifically addresses weaknesses related to market surveillance, especially the lack of uniformity in approach to market surveillance and cooperation mechanisms. The second aims at reinforcing the mutual recognition of goods (European Commission, 2017G), which ensures that products not subject to EU-wide regulation can, in principle, move freely within the Single Market. It addresses the main shortcomings to the functioning of mutual recognition including lack of fast and easy remedies for challenging the decisions of authorities denying market access, unclear scope with respect to the products covered by the principle and difficulties of business in demonstrating that their product was lawfully sold in another member state (precondition for obtaining mutual recognition).

The present study will – for the first time – directly link untapped potentials in terms of welfare, goods trade, competition and productivity to issues related to compliance with Single Market rules in its various dimensions. To this end, the study relies on several sources of information, including the Single Market Scoreboard that records the transposition and application of Internal Market directives, and is published on a regular basis twice a year. It has become a crucial source of insight into the proper functioning of the Single Market, especially in terms of legal enforcement. SOLVIT is an online problem-solving network created in 2002 and is an instrument by which EU member states work together to solve cross-border disputes caused by the misapplication of Internal Market law by public authorities. Furthermore, under Directive 2015/1535/EC the Commission receives compulsory notifications from the member states of all national draft laws containing technical regulations. The notified national draft laws are reviewed, in order to enable the Commission as well as the member states to detect potential (new) technical barriers or other (new) regulatory barriers to intra-EU cross-border trade, in which case the issuing member state has to amend the draft. All relevant notifications are assessable through the Technical Regulations Information System (TRIS database).

Based on these data sources, indicators distinguishing between different aspects of Single Market compliance are constructed. An overview of the data and indicators to be considered as well as their respective interpretation and the relevant aspect of Single Market compliance/type of barrier is presented in Table 2.1. Each of the data sources and indicators will be discussed in more detail in the subchapters below.

The study uses Single Market Scoreboard data on transposition deficit and infringements, to signal legal enforcement barriers. Data on resolved and unresolved cases in SOLVIT is taken to reveal administrative misapplications of Single Market rules, while notifications under the directive on technical regulation (Directive 2015/1535/EC) in the TRIS signal the potential for new technical barriers to cross-border trade.

Furthermore, due to the different time coverage of the various databases also used with respect to data on the various outcome variables to be studied (production, trade, mark-ups, productivity as well as vertical integration), the analysis with respect to Single Market compliance indicators is restricted to the most common coverage across all indicators which is the ten-year period from 2004 to 2014. This will mostly imply a loss of earlier years, but also some of the most recent years. At the same time, data referring to accession countries in the various data sources is always only available from the year of accession or for later years.

[3] Regulation 764/2008 has decisively changed the EU regime for mutual recognition. First, it demands member states to maintain Single Contact Points for free information for business and reference to the competent authorities, to raise awareness of the mutual recognition principle and its application, to make clear the product categories and to provide solutions within given deadlines where problems are encountered. Second, if mutual recognition is incorrectly applied, the burden-of-proof was reversed to be on the member state.

Table 2.1: Data sources and Internal Market compliance indicators

Data source	Data retrieved	Time coverage	Indicator	Formula	Compliance aspect/ type of barrier
DG Internal Market, Industry, Entrepreneurship and SMEs	List of non-harmonised goods	-	Share of harmonised goods at the disaggregated level within each manufacturing sector		Harmonisation from a legal perspective
Single Market Scoreboard	Transposition deficit (TD)	1997-2017	Share of directives transposed to national legislation	Transposition= 1-TD	Legal enforcement
	Infringement proceedings (IP)	2003-2017	Number of pending infringement proceedings normalised by the maximum number of infringements across countries and years (IP_max)	Infringements= 1 -(IP/IP_max)	Legal enforcement; misapplications of EU directives
SOLVIT	Number of business cases received by the lead centre (Solv)	2002-2017	Frequency of concerns related to misapplications normalised by the maximum amount of cases across countries and years (Solv_max)	SOLVIT misapp.=1-(Solv/Solv_max)	Misapplication of Internal Market rules by public administration; market surveillance effort
	Number of resolved business cases by lead centre (Resolved)	2002-2017	Share of resolved SOLVIT cases in total cases	SOLVIT solution=Resolved/Solv	Misapplication of Internal Market rules by public administration; market surveillance effort
TRIS	Number of detailed opinions and comments received (Docomm)	1995-2017	Number of detailed opinions and comments issued by the Commission normalised by the number of most opinions and comments across countries and years (Docomm_max)	Docomm= 0.5*(Comments) + 1*(DO) TRIS=1-(Docomm/Docomm_max)	Prevention of technical barriers Compliancy of legislators in original draft laws

Source: WIFO compilation.
Note: All data was retrieved October 2018-January 2019.

2.1. Data and indicators on harmonised and non-harmonised industries

As outlined before, EU-wide legislation for goods and the adoption of harmonised standards, as well as the application of the mutual recognition principle, are the main policy tools with which to realise the principle of free movement of goods within the Internal Market. To take account of these differences at the sector level, the study builds on a classification of industry goods according to these different approaches to distinguish between differing degrees of harmonisation in manufacturing industries.

Table 2.2: Goods in the harmonisation/non-harmonisation field within industries

		Non-harmo-nised	Harmo-nised
WIOD sectors		Percentage shares	
C10-C12	Manufacture of food products, beverages and tobacco products	0.3	99.7
C13-C15	Manufacture of textiles, wearing apparel and leather products	0.2	99.8
C16	Manufacture of wood and of products of wood and cork	9.6	90.4
C17-18	Pulp, Paper, Paper, Printing, Publishing	6.8	93.2
C19	Manufacture of coke and refined petroleum products	13.4	86.6
C20-21	Chemicals and chemical products	2.6	97.4
C22	Manufacture of rubber and plastic products	2.6	97.4
C23	Manufacture of other non-metallic mineral products	11.1	88.9
C24-25	Basic and fabricated metals	5.6	94.4
C26-27	Manufacture of computer, electronic, electrical, optical products	0.3	99.7
C28_C33	Manufacture of machinery and equipment nec.	2.0	98.0
C29-30	Transport equipment	2.9	97.1
C31-32	Manufacture of furniture; other manufacturing	11.7	88.3
NACE 2-digit			
10	Manufacture of food products	0.3	99.7
11	Manufacture of beverages	0.0	100.0
12	Manufacture of tobacco products	6.3	93.8
13	Manufacture of textiles	0.0	100.0
14	Manufacture of wearing apparel	0.0	100.0
15	Manufacture of leather and related products	1.2	98.8
16	Manufacture of wood and of products of wood and cork	9.6	90.4
17	Manufacture of paper and paper products	2.7	97.3
18	Printing and reproduction of recorded media	0.0	100.0
19	Manufacture of coke and refined petroleum products	13.4	86.6
20	Manufacture of chemicals and chemical products	2.9	97.1
21	Manufacture of basic pharmaceutical products and preparations	0.0	100.0
22	Manufacture of rubber and plastic products	2.6	97.4
23	Manufacture of other non-metallic mineral products	11.1	88.9
24	Manufacture of basic metals	4.5	95.5
25	Manufacture of fabricated metal products	7.4	92.6
26	Manufacture of computer, electronic and optical products	0.5	99.5
27	Manufacture of electrical equipment	0.0	100.0
28	Manufacture of machinery and equipment nec.	2.0	98.0
29	Manufacture of motor vehicles, trailers and semi-trailers	0.0	100.0
30	Manufacture of other transport equipment	5.8	94.2
31	Manufacture of furniture	0.0	100.0
32	Other manufacturing	13.5	86.5
Manufacturing		2.6	97.4

Source: European Commission, WIFO calculations.

Specifically, the classification into non-harmonised versus harmonised industries in this study is based on an indicative list of goods not subject to Community harmonisation legislation, i.e. in the non-harmonised field. The list is provided by the Commission (DG Internal Market, Industry,

Entrepreneurship and SMEs) and downloadable from the Internet.[4] Goods not listed are partly under EU regulation, while it is still possible that mutual recognition applies to aspects of "harmonised" goods where member states retain some discretion. Thus, a product not listed is not necessarily fully harmonised, but one can assume that common objectives were established. Goods in the respective Commission list of non-harmonised products are classified according to the Combined Nomenclature (CN) at the 8-digit level, which can be directly converted to the NACE 6-digit nomenclature. We then aggregate to NACE 2-digit and the WIOD-sector classification applied in the gravity model, respectively, and derive "degrees of harmonisation" representing the share of non-harmonised/harmonised goods at the disaggregated level within each of the industries from a legal perspective.[5]

The results are presented in Table 2.2 at the level of the WIOD-aggregated industries used in some parts of the study (chapter 3 and 4) as well as at the more detailed NACE 2-digit level in the lower panel. It reveals that the portion of goods covered by common EU rules is very high across industries. Thus, harmonisation legislation covers the majority of goods within manufacturing industries. At the NACE 2-digit level, beverages, textiles, wearing apparel, recording media, pharmaceuticals, electrical equipment, motor vehicles and furniture are fully covered by Community harmonisation legislation.

2.2. Single Market compliance indicators

2.2.1. *Transposition*

The Single Market Scoreboard records on transposition and application of Internal Market EU law. Member states have the primary responsibility for transposing Community directives into domestic legislation and for ensuring correct implementation. The Scoreboard indicators report important differences between member states in terms of speed and efficiency of transposition. By focusing on inter-member state comparisons, peer pressure has positively contributed to improving the transposition and enforcement of law over the years (Pelkmans et al., 2014).

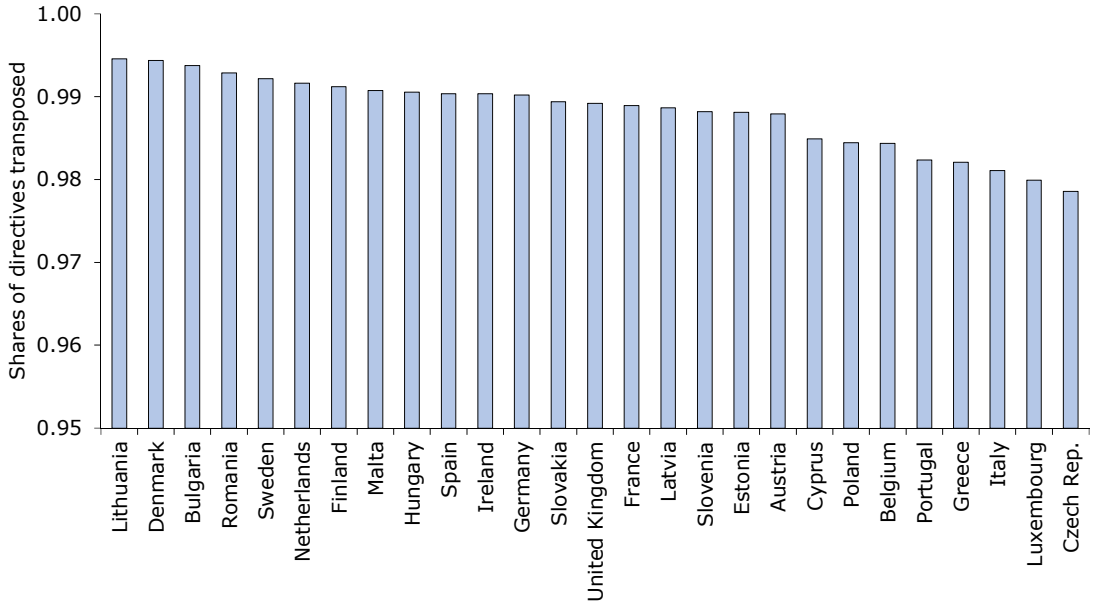
The study uses the Single Market Scoreboard's records on transposition deficit, which is defined as the percentage share of Internal Market directives not yet notified or implemented by member states in the total number of directives, which should have been notified by the deadline. The Commission sets a target on the transposition deficit, which has become stricter over time. The target of the transposition deficit was first set at 1.5% (Stockholm European Council of 2001), was then lowered to 1% and in 2011 was proposed to change to 0.5% (Commission Single Market Act 2011). To simplify the interpretation of the indicator in the analyses of this study, we redefine this measure as the share of directives transposed to national legislation. A value of one would thus correspond to full compliance with Single Market regulation signalling a country's strong commitment to fostering the functioning of the Common European Market. One limiting factor of the indicator is that the focus lies solely on directives (and their transposition), regulations are not counted. Furthermore, it needs to be stressed that this indicator focuses on process-legal compliance only, while Single Market fragmentation may even exist in a scenario of perfect transposition.

Figure 2.1 presents period averages of the transposition indicator for each of the EU member states, except Croatia, for which no data on transposition was available. Overall this picture reveals high transposition rates and little variation by country with the indicator fluctuating between 0.99 and 0.98. Within these bounds the best performing countries with respect to transposition averaged across time include the three accession countries Lithuania, Bulgaria and Romania as well as Denmark and Sweden. The worst performing countries are the Czech Republic, Luxembourg, Italy, Greece and Portugal.

[4] http://ec.europa.eu/growth/single-market/goods/free-movement-sectors/mutual-recognition/products-list_en.

[5] Robustness checks by calculating the degree of harmonisation based on production figures at the detailed product level produce the same results and dispel concerns that the different granularity of NACE sectors with respect to the number of goods distinguished could be a source of possible bias. Preference is given to the harmonisation indicator based on the number of goods within a sector as weights based on production figures might suffer from endogeneity to trade.

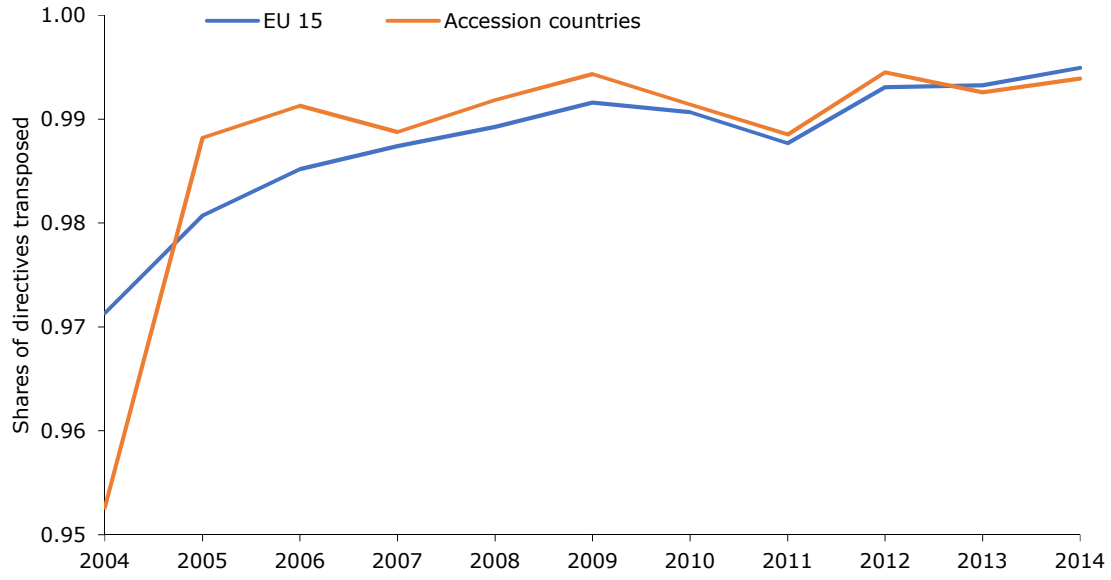
Figure 2.1: Transposition by member states, 2004-2014



Source: Single Market Scoreboard, WIFO calculations.

While variation by country is limited, there has been a clear trend of improvement of transposition efforts over time in both the EU15 and accession countries, with most favourable changes in the first part of the period considered (2004 to 2009). Figure 2.2 shows a distinct pattern of a very strong improvement in the first year after accession for a number of accession countries and generally higher transposition rates than the average EU15 country in subsequent years. Figure B2.1 in the appendix presents growth patterns at the more detailed country level. The Czech Republic, Latvia, Slovakia, Malta and Estonia are the accession countries improving considerably from the first to the second year of accession and to a somewhat smaller extent this is also true for Cyprus and Slovenia. Among the EU15 countries the catch up in transposition was most significant for Greece, Italy, Belgium, France and Portugal.

Figure 2.2: Development of transposition by membership status, 2004-2014



Source: Single Market Scoreboard, WIFO calculations.

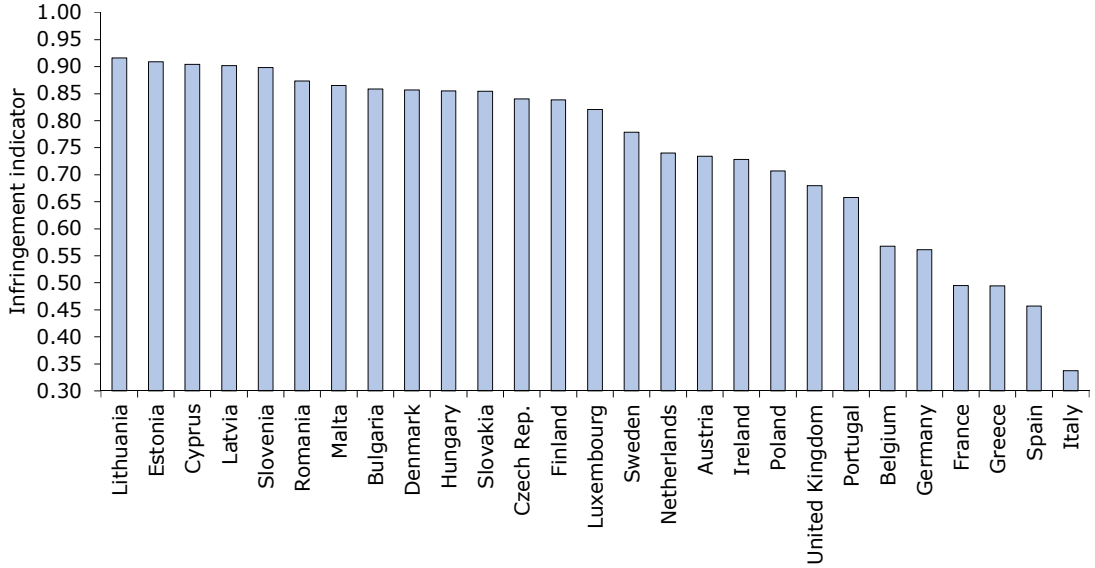
2.2.2. *Infringement proceedings*

The Single Market Scoreboard also records data on the number of pending infringement procedures, and in contrast to the transposition indicator reveals cases of wrong or bad applications as well as cases of incorrect transposition. The infringement procedure itself is part of the mechanisms set out in the Treaty on the Functioning of the EU (TFEU) to ensure compliance with EU law and is initiated by the Commission on its own initiative or in response to a complaint of a member state. Infringement procedures start with an informal and then formal letter of notice to the member state, in the process of which many member states rectify the situation and the procedure is stopped at this early stage. If the state continues to infringe on EU law, the EU delivers a reasoned opinion and decides on whether to send proceedings to the EU Court of Justice (CJEU). In practice, only a small fraction of cases is actually referred to the CJEU. At the same time, infringement procedures reflect only part of Internal Market problems as pre-infringement and preventive initiatives (such as e.g. SOLVIT) have gained in importance. In that sense, the number of pending infringement procedures may serve as an indicator of more severe violations against EU law and where controversies are harder to solve.

We calculate the infringement indicator by taking the number of pending infringements and normalising by the country with the highest amount of counted infringements in a specific year. To better align the interpretation of the indicator with that of the other indicators used, we redefine the measure in such a way that a higher value of the indicator would signal fewer infringement procedures. Thus, a maximum value of 1 would indicate a situation of no infringements in a respective country and year.

Figure 2.3 presents period averages of the infringement indicator for each of the EU member states. Again, Croatia is excluded due to missing data. With the exception of Poland, the results reveal the least relative occurrence of infringement proceedings in the accession countries. The indicator exhibits more variation among the EU15 countries with most infringements evolving in Italy, Spain, Greece and France.

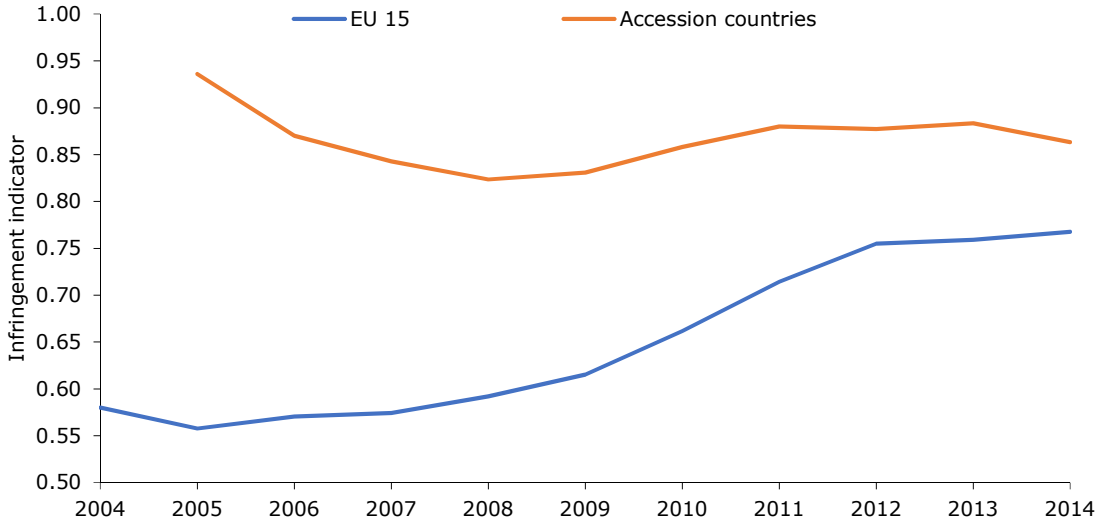
Figure 2.3: Infringement indicator by member states, 2004-2014



Source: Single Market Scoreboard, WIFO calculations.
Notes: A higher value of the indicator signals fewer infringement procedures.

Figure 2.4 confirms the relative strong position of the accession countries with respect to this indicator but also a clear trend towards improvement of the infringement indicator among the EU15 countries throughout the period. Figure B2.2 in the appendix reveals that highest total increase took place in Italy, Spain, France, Germany and Greece. The indicator has been relatively stable over the period for the accession countries, worsening slightly in the first years following accession.

Figure 2.4: Development of the infringement indicator by membership status, 2004-2014



Source: Single Market Scoreboard, WIFO calculations.
Notes: A higher value of the indicator signals fewer infringement procedures.

2.2.3. *Compliance indicators from the SOLVIT database*

SOLVIT was introduced in 2002 to solve cross-border problems related to misapplications of Internal Market rules by public authorities.[6] SOLVIT centres handle complaints by citizens and businesses, having been established in each EU member state as well as in Norway, Iceland and Liechtenstein and cooperating directly with each other. In practice, complaints are placed at the so-called home-centre, which verifies whether the problem involves the application of Internal Market rules, has a cross-border dimension, and is concerned with a dispute between a citizen or business and a national public administration. After review, the case is entered into the database and forwarded to the lead centre (centre of the member state in which the problem occurred). Cases should be resolved within 10 weeks. The complainant can only challenge a final solution through recourse to legal proceedings.

The SOLVIT database reports resolved as well as unresolved cases. Unresolved cases point to particular problems that need to be addressed to improve the functioning of the Single Market. This study selects complaints from businesses only, to better match the core research questions of the analyses to follow. The number of such business cases has been much lower in comparison to citizen cases – in 2017 SOLVIT data records 76 cases originating from businesses out of a total of 2,079. Within business complaints SOLVIT is more likely to attract cases from small and medium-sized enterprises (SME).[7]

SOLVIT involves cases related to both the harmonised and non-harmonised areas. However, with the data at hand it is not possible to implement a disaggregation according to this criterion in the empirical analyses. In general, complaints from businesses refer to problems related to lack/inappropriate transposition of EU law, national rules conflicting with EU law, the existence of different national standards, no notification of national technical standards to the European Commission, the imposition of different or extra testing and certification requirements as well as clarifications. In the SOLVIT database, the data is organised along policy and problem areas and allows to distinguish between cases relating to the free movement of goods and services from

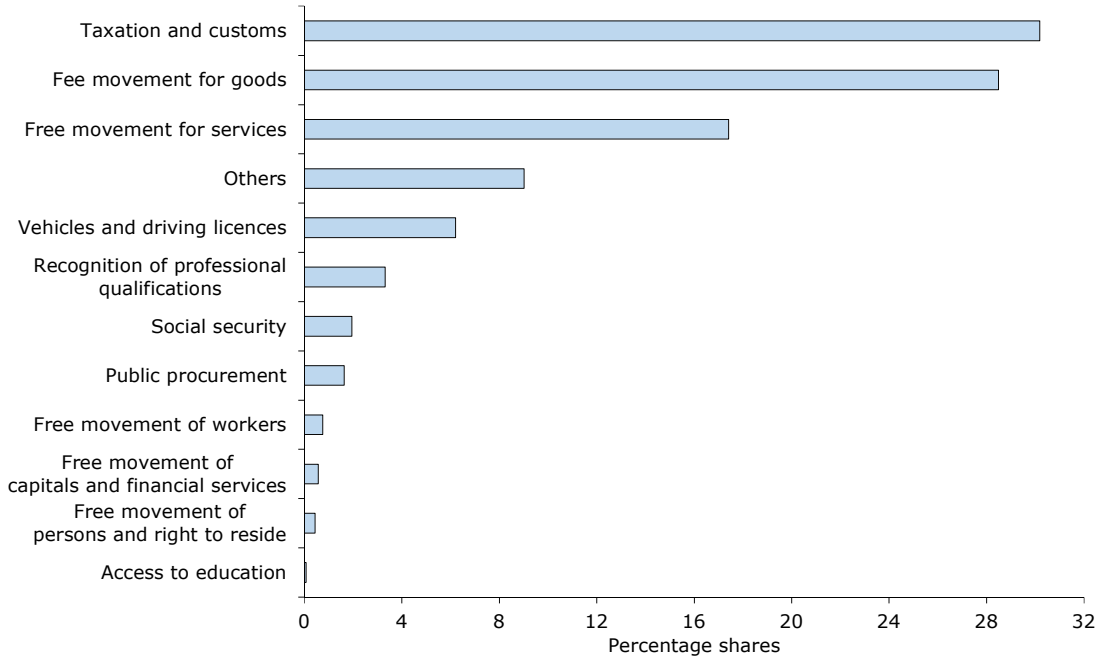
[6] Thus, B2B cases as well as B2C cases are excluded.

[7] The smaller amount of business cases has been explained with higher complexity of such cases and the preference – especially of larger firms – to resort to own lawyers and more formal channels as well as those firms' widespread – but ungrounded - doubts that SOLVIT, as a governmental organisation, is really independent (Pelkmans and Correia de Brito, 2012).

other areas such as taxation and customs, the free movement of workers or problems related to social security benefits and others.

With respect to the business cases reported from 2004 to 2014, Figure 2.5 reveals that 28.5% concerned the free movement of goods, 17.4% the free movement of services and 30.2% taxation and customs (mostly problems related to value added tax).[8] This information by problem area may be used to define a SOLVIT based indicator in a narrow sense by only including cases referring to the free movement of goods problem area. A broader definition would include cases across all problem areas such as the free movement of services, taxation issues or public procurement issues. The analyses in this study will apply the broad definition throughout, as the number of business cases by year and importing member state are too small to make the narrow definition applicable in the empirical analysis.

Figure 2.5: SOLVIT business cases by problem area, 2004 - 2014



Source: SOLVIT database, WIFO calculations.

Indicators calculated from SOLVIT data focus on cases received by the lead centre and are therefore importer (destination country)-specific. The number of cases received by lead centres reveals the frequency of misapplications of EU Internal Market rules by public administrations and signals potential barriers for business in the respective countries. Throughout, we exclude complaints not passing verification or transferred to other systems from the total number of SOLVIT cases. Again, we normalise the total number of misapplication cases of each country by the maximum amount of cases across countries and years and then redefine the indicator in such a way that a higher value of the indicator would signal a lower frequency of misapplications. A value of 1 would indicate a situation of no SOLVIT misapplication cases in a respective country and year.

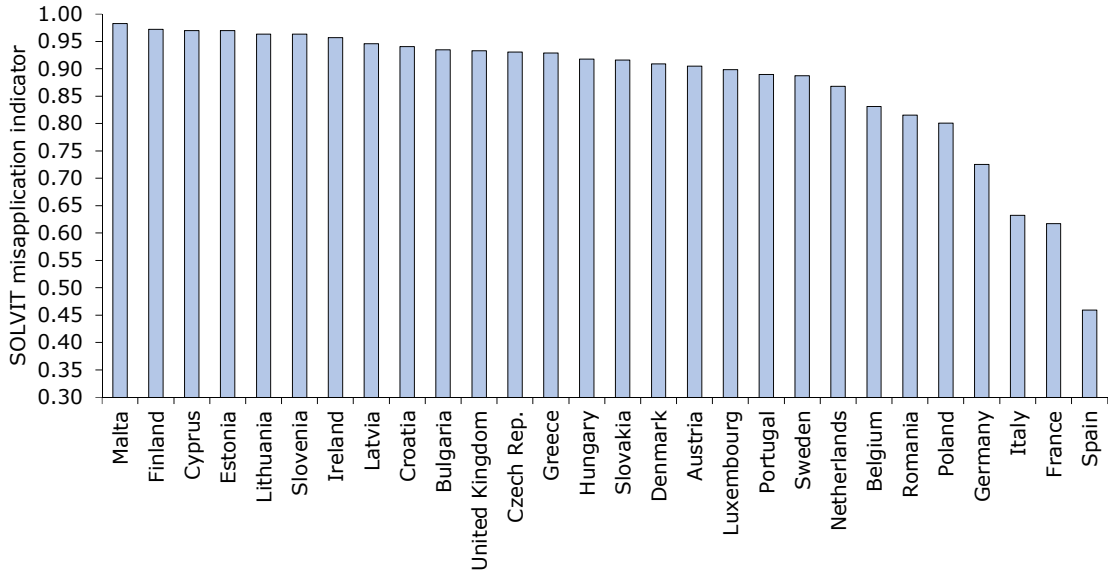
Figure 2.6 presents the respective SOLVIT misapplication indicator by member states averaged over the period 2004 to 2014. Spain, France, Italy and Germany are revealed as markets where cross-border problems due to misapplications of EU law most frequently occur. However, the number of business cases by member states must be interpreted carefully, as it does not necessarily indicate that potential barriers due to misapplications by public authorities are more widespread in these countries. It could simply reflect that due to their market size there are more opportunities for companies to have experienced obstacles, as more companies export to these markets. However, the econometric analysis will be able to control for those differences in levels. Note also that this indicator might lend to a second interpretation, as a low number of

[8] The relatively small share of problems related to cross-border service deliveries as compared to goods trade can be explained by the close relation to the other problems differentiated in the list such as free movement of workers or the recognition of professional qualifications, vehicles and driving licences.

misapplication cases in SOLVIT could also signal less market surveillance effort and a generally lower awareness on the part of business and the national public authorities.

As has been found for the transposition and infringement indicators above, the results on the SOLVIT misapplication indicator reveal a higher compliance of accession countries than for the group of EU15 members. At the individual country level Romania and Poland are an exception (Figure B2.3 in the appendix).

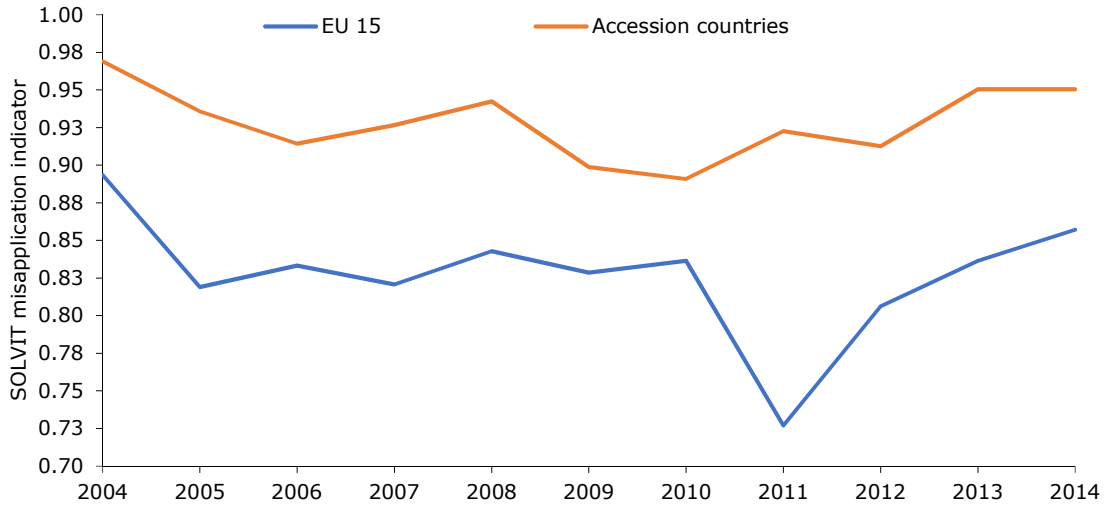
Figure 2.6: SOLVIT misapplication indicator by member states, 2004 - 2014



Source: SOLVIT database, WIFO calculations.
Notes: A higher value of the indicator signals a lower frequency of misapplications.

Figure 2.7 depicts the indicator's movement over time, distinguishing the group of accession and EU15 countries and confirming the latter finding, but suggesting that compliance has deteriorated in the first years following accession and improved since 2010. EU15 compliance according to the misapplication SOLVIT indicator has been relatively stable for the EU15, but deteriorated sharply in a number of EU15 countries in 2011. At the detailed country level, we find that Spain, Italy and France exhibit a stronger year-to-year variation in the frequency of misapplication cases than do other countries (Figure A2.3 in appendix).

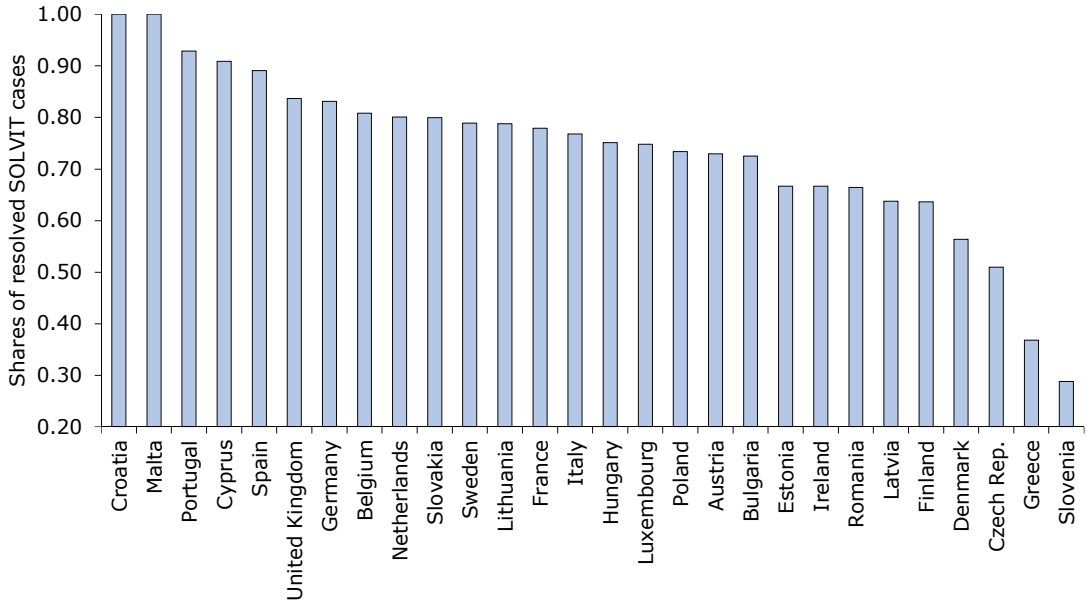
Figure 2.7: Development of the SOLVIT misapplication indicator by membership status, 2004-2014



Source: SOLVIT database, WIFO calculations.
Notes: A higher value of the indicator signals a lower frequency of misapplications.

A second indicator retrieved from SOLVIT data focuses on solved cases and is calculated as the share of resolved cases in total cases (*SOLVIT* solution indicator). It includes resolved cases – i.e. prevented barriers as well as non-complaints and is meant to signal the effectivity of the SOLVIT mechanism in solving cross-border problems of doing business and preventing barriers in different member states. As with the first SOLVIT indicator a high number of non-complaints might also be due to less market surveillance effort.

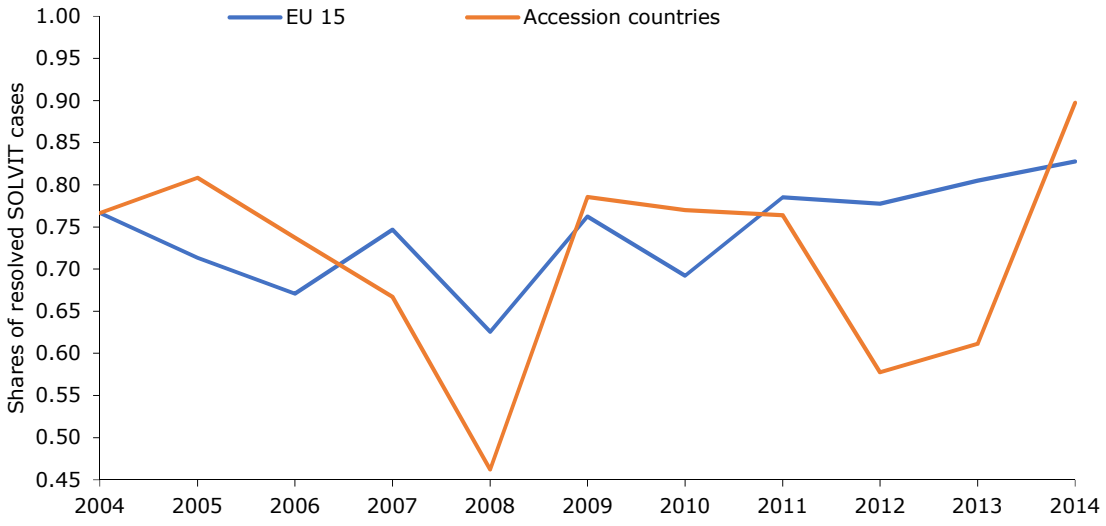
Figure 2.8: SOLVIT solution indicator by member states, 2004 - 2014



Source: SOLVIT database, WIFO calculations.

Figure 2.8 presents the SOLVIT solution indicator of solved cases by member state, averaged over the period 2004-2014. Slovenia and Greece are the two countries with the lowest share of resolved cases well under 50% and are the most difficult markets in this respect, followed by the Czech Republic, Denmark, Finland and Latvia. In contrast to the results for the other compliance indicators used, the SOLVIT solution indicator does not exhibit a distinct level difference between accession and EU15 countries. As for the growth pattern, the amplitude of the changes is higher for the group of accession countries (Figure 2.9).

Figure 2.9: Development of the SOLVIT solution indicator by membership status, 2004-2014



Source: SOLVIT database, WIFO calculations.

2.2.4. *TRIS – comments and detailed opinions on national notifications*

TRIS (Technical Regulations Information System) publishes compulsory notifications from member states on all national draft laws concerning technical regulations of goods (and parts of information services). The notification procedure is specified under Directive 2015/1535/EC on technical regulations (based on earlier versions of 83/189/EC, 98/34/EC and 98/48/EC).[9] Basically, notification is compulsory for all new technical regulations and refers to goods in both the non-harmonised and harmonised fields.[10]

Notification of a draft technical regulation triggers a 3-month standstill period during which the Commission as well as the member states examine whether the proposed regulation stands in conflict with Single Market rules and constitutes potential (new) technical barriers to intra-EU cross-border trade, and they respond accordingly by either issuing comments or detailed opinions (DOs). Comments mainly concern clarifications on the draft rule's interpretation or provide advice or comparisons with solutions elsewhere. The member state concerned must take the comments into account as far as possible and can adopt the new technical regulation after the 3-month standstill period. DOs more directly refer to potential barriers and once issued result in an extension of the standstill period to 6 months. The member state concerned must take into account the detailed opinion and reply to it, explaining the actions it intends to take in response. The Commission can also block a draft technical regulation and extend the standstill period to 12 or 18 months if it concerns a matter that the Commission intends to cover in directives, regulations, decisions or Council positions.

As such, comments usually concern minor points and interpretational difficulties of new regulations, while DOs are a more direct signal of potential new technical barriers. Furthermore, the Commission is more rigorous in and follows a more systematic approach to issuing comments and DOs. For these reasons, the TRIS indicator calculated takes into account comments and DOs issued by the Commission only, ignoring those issued by other member states, in addition to taking into account the difference between comments and DOs.

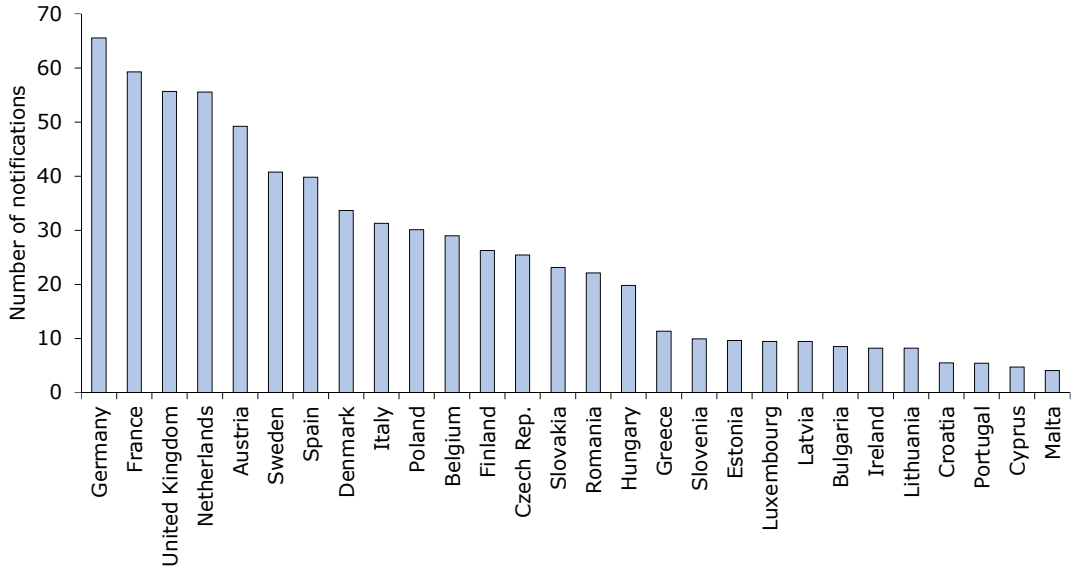
More specifically, based on the discussion with the Commission, the TRIS indicator is based on a weighted sum of Commission comments and DOs by notifying country and year, and by weighting comments with a value of 0.5 and DOs by a value of 1. To simplify interpretation and increase the comparability of this TRIS indicator to the other compliance indicators applied in the analyses to follow, the respective sum of comments and DOs is normalised by the maximum amount of comments and DOs across countries and years. The indicator is then redefined in such a manner that a higher value of the indicator signals a lower frequency of comments and DOs issued by the Commission and a value of 1 would indicate a situation of full compliance, in which the Commission has no need to issue any comment or DO and thus does not identify any potential barrier. Note that there are two possible ways to interpret this indicator: On the one hand, notifications with a low number of (or no) comments and DOs could be interpreted as signalling a lower potential for cross-border technical barriers. On the other hand, if the TRIS mechanism is working effectively in specific member states, it may effectively detect new barriers and solve many problems outlined in comments and DOs and the proposed indicator would then signal the prevention of technical barriers. Given the exact definition of the indicator, a higher value (fewer comments and DOs) would then signal less prevention of barriers.

Looking first at the data on total notifications for the period 2004 to 2014 reveals that an average of 26 new regulations were notified per year and member state. The total number of notifications in the TRIS between 2004 and 2014 amounted to 7,569. All these figures indicate high regulatory activity in areas remaining under national regulatory autonomy. Figure 2.10 presents average TRIS notifications by member states over the period 2004 to 2014 and shows considerable differences across member states' regulatory activity. Germany, France, the UK, the Netherlands and Austria were the most active over the period considered, with a mean number of notifications per year between 66 and 49.

[9] https://eur-lex.europa.eu/legal-content/DE/TXT/?uri=CELEX%3A32015L1535.

[10] According to judgements of the Court of Justice non-notification leads to an unenforceability of any adopted national rules ("CIA-Security" judgement). Similarly, non-compliance with respect to the standstill period (too early adoption), can also render inapplicability of falsely adopted technical rules by national courts ("Unilever" judgement).

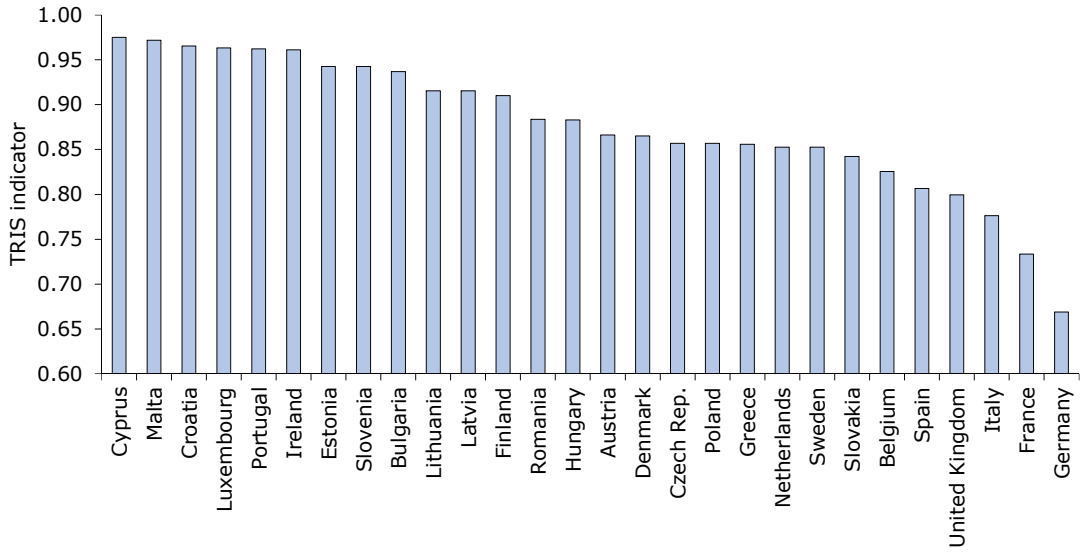
Figure 2.10: Average number of TRIS notifications by member states, 2004-2014



Source: TRIS database, WIFO calculations.

Figure 2.11 presents the TRIS indicator on comments and DOs by member states averaged over the period 2004 to 2014. Germany, France, Italy, the UK and Spain attracted the most comments and DOs from the Commission, as they are also among the countries with the highest regulatory activity and thus higher potential for cross-border technical barriers. Level differences related to different sizes of member states will be controlled for in the econometric analyses to follow.

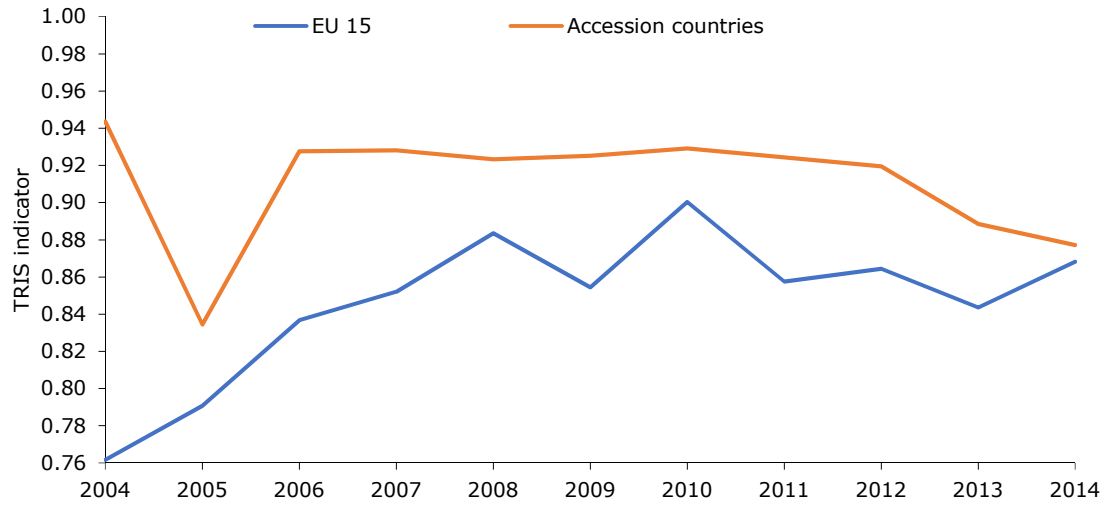
Figure 2.11: TRIS indicator on comments and detailed opinions by member states, 2004 - 2014



Source: TRIS database, WIFO calculations.
Notes: A higher value of the indicator signals a lower frequency of comments and DOs issued by the Commission.

Accession countries generally attract fewer comments and DOs than do EU15 countries. Within the group of accession countries, this is particularly true for smaller countries and countries with low regulatory activity. This result also clearly emerges from Figure 2.12. However, the TRIS indicator has significantly increased for the EU15, mostly in the first years of the considered period up to 2008. At the detailed country level, this trend is clearly driven by developments in Germany, Greece and the UK (Figure B2.4 in the appendix). Considering the group of accession countries, we see that the indicator deteriorated in 2005, the first year following accession, but that it was rather stable in consecutive years with some deterioration towards the end.

Figure 2.12: Development of the TRIS indicator on comments and DOs by membership status, 2004-2014



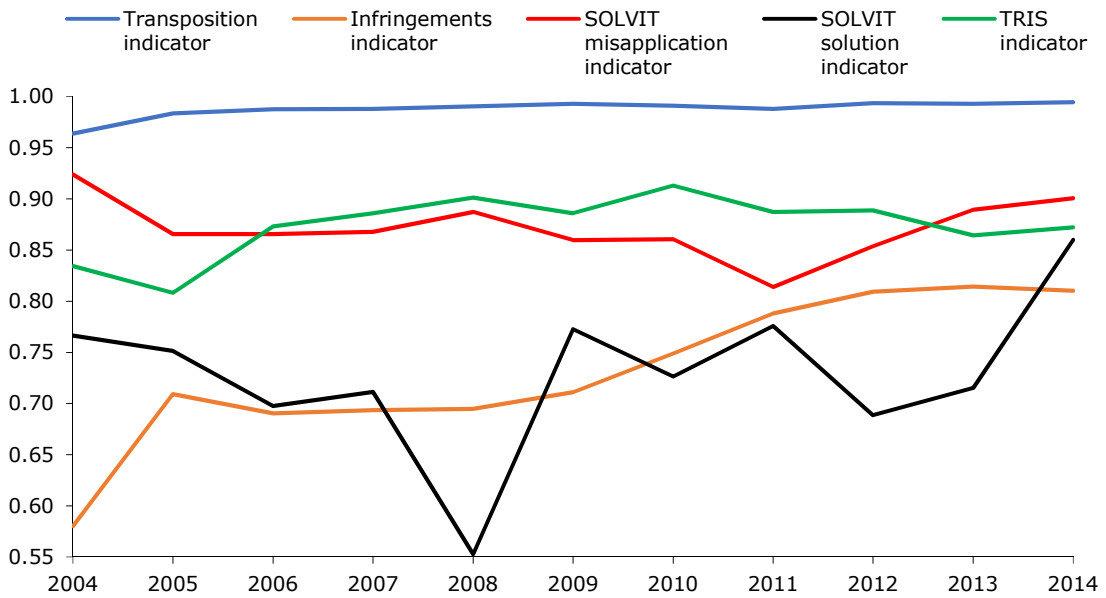
Source: TRIS database, WIFO calculations.
Notes: A higher value of the indicator signals a lower frequency of comments and DOs issued by the Commission.

2.2.5. *Compliance indicators in comparison*

Figure 2.13 provides a comparison of different Single Market compliance indicators. All indicators have been defined to reveal an increasing degree of compliance with respect to different aspects they cover as their values approach a value of 1. In this respect, the indicator on transposition of EU directives to national law already reaches very high levels while there are clearly more potentials for improvement in terms of reducing infringement proceedings and increasing the number of solved cross-border disagreements within the SOLVIT system.

The various compliance indicators also reveal different variability in growth patterns over the period considered, with the SOLVIT solution indicator being the most volatile. The infringement indicator on the other hand exhibits the most explicit trend of improvement over time, indicating a reduction in infringement cases across Europe. The details in the preceding subchapters have shown that this is mostly driven by the catching up of EU15 countries.

Figure 2.13: Single Market compliance indicators in comparison, 2004-2014



Source: Single Market Scoreboard, SOLVIT and TRIS database, WIFO calculations.

Table 2.3 reveals simple correlation coefficients between different compliance indicators. While these are generally high between transposition, infringement proceedings, TRIS comments and detailed opinions as well as SOLVIT misapplication cases, infringement proceedings exhibit the strongest correlation with the other indicators. This is in line with expectations, as countries with a lower frequency of misapplication cases in SOLVIT, higher transposition rates and lower numbers of comments and DOs issued with respect to new technical regulations are also less prone to infringement proceedings. The correlation pattern also signals that complaints of businesses in SOLVIT more often seem to refer to technical standards (correlation with TRIS indicator) and less often to a lack or inappropriate transposition. On the other hand, the SOLVIT barrier prevention indicator is not correlated with either transposition, infringements or TRIS comments and DOs, and it only weakly and negatively correlates with the number of SOLVIT misapplications. In our setting the latter negative correlation means that countries with a high number of misapplication cases also tend to have a higher share of solved cases. Although this simple correlation is relatively weak, this could be interpreted as a sign of greater market surveillance effort in the respective countries, generating more cases but also solving more cases.

Table 2.3: Correlation between Single Market compliance indicators, 2004-2014

	SOLVIT misapplication indicator	SOLVIT solution indicator	Transposition indicator	Infringements indicator	TRIS indicator
SOLVIT misapplication indicator	1.0000				
SOLVIT solution indicator	-0.1112	1.0000			
Transposition indicator	-0.0245	-0.0147	1.0000		
Infringements indicator	0.5265	-0.0061	0.4423	1.0000	
TRIS indicator	0.3257	-0.0217	0.2267	0.4515	1.0000

Source: Single Market Scoreboard, SOLVIT and TRIS database, WIFO calculations.

3. SINGLE MARKET EFFECTS ON GOODS TRADE AND WELFARE

This chapter provides an analysis of the realised and potential benefits of lower Single Market induced intra-EU trade barriers for trade flows using a structural gravity approach. It proceeds in several steps. First, a benchmark (panel data) structural gravity trade model is developed to assess the performance of the Single Market in terms of (realised) trade between member states by industry. This will provide first insights into the evolution of intra-EU "border effects" in the period considered (1995 to 2014) as well as possible heterogenous Single Market effects stemming from accession or membership. In addition to direct (or first-round) Single Market trade effects the analysis will derive general equilibrium effects, taking into account all possible indirect effects such as trade reallocations following the implementation of the Single Market or income effects. This first step is taken in chapter 3.1. Second, border effects identified in the benchmark model are related to indicators revealing the degree of harmonisation by sector, as well as to compliance, transposition and implementation of Single Market rules that were selected and discussed in the previous chapter 2. The benchmark gravity model is modified, accordingly, and the estimation results reveal to what extent integration deficits (remaining border effects) are related to incomplete harmonisation legislation and compliance with Single Market rules. Third, these baseline results are compared to counterfactual results of a scenario of full harmonisation and perfect compliance for each of the selected policy indicators. This last step will provide evidence of untapped potentials in (direct or first-round) intra-EU trade. Next, and most importantly, untapped potentials with respect to general equilibrium intra-EU trade, extra-EU trade as well as overall welfare effects will be derived. The analysis on untapped potentials of Single Market integration due to deficits in Single Market harmonisation legislation and compliance with Single Market rules is presented in chapter 3.2.

The proposed gravity model, which will be discussed more formally below, takes recent debates within the academic and policy-orientated international economics community into account (see, e.g., WTO, 2012; Yotov et al., 2016). The distinguishing factor of a structural gravity model compared to traditional gravity models is that it is applied in a theory-consistent way and at the same time takes into account important challenges for consistent estimation. In its structural representation, the gravity model is particularly useful for counterfactual analysis, such as, e.g., the quantification of the effects of Single Market integration. Within this structural framework, the empirical analysis also includes domestic trade flows within countries. With this additional data at hand, changes in cross-border trade will be estimated relative to the evolution of almost frictionless domestic trade. The formation of the Single Market, for example, can be assumed to reduce trade costs for cross-border trade while not directly affecting domestic trade costs. As a consequence, relative trade costs for cross-border trade in the Single Market would decline, making this a more attractive alternative as compared to solely trading domestically.

Furthermore, the standard gravity variables such as, e.g., common language and most importantly GDP (as a measure for the economic size of the trading partners) are captured by the inclusion of many fixed effects, which are either country-pair-specific (e.g., common language), exporter-time-specific (GDP of the exporting economy) or importer-time-specific (GDP of the importing economy). The choice for using a fixed-effects approach can be motivated on two grounds.

First, the fixed effects capture all sources for country-pair, exporter-time and importer-time differences in the observed bilateral trade flows. As compared to only including some bilateral and country-time characteristics, the fixed effects make sure that we are not running in an omitted-variable bias which could be the result of missing out important determinants for cross-border trade.

Second, standard theoretical gravity models show that exporter and importer fixed effects allow to consistently control for the so-called multilateral resistance terms. The latter capture the "remoteness" of the trading country-pair and account for relative trade costs. Similarly to the discussion from above, the choice for a particular destination economy not only depends not on the absolute trade costs necessary for exporting to this country, but also on the alternative trade costs for exports to all other countries in the world. In the recent international economics literature, the inclusion of exporter-time and importer-time fixed effects is standard for coping with this issue in a most accurate manner. In fact, WTO (2012) denotes the non-inclusion of these fixed effects as "gold medal mistake" when applying gravity models, because the parameters associated with trade policy indicators (such as e.g., Single Market membership and participation) are correlated with the relative trade costs measure and thus would be biased due to an omitted variables problem.

3.1. A structural gravity model for estimating Single Market effects

3.1.1. *A panel data structural gravity model*

In this subchapter we set up a panel data gravity model for bilateral goods trade which serves as a benchmark for identifying expected trade flows induced by the accession of new EU members and for the EU15 countries that already joined the EU Single Market in 1995.[11] The proposed econometric model extends the structural panel data approach suggested by Oberhofer and Pfaffermayr (2017) and proposes a specification of the panel gravity model, which is able to identify the causal effects of accession to and membership in the Single Market. The degree of integration at the industry level is identified by border effects within the EU, which are given by the relative size of domestic (within- country) trade to cross-border-but-intra-EU trade. This identification strategy is viable if within-country trade flows are observed. Moreover, the model assumes that trade barriers between any two countries will have an impact on cross-border trade. In contrast, within-country trade flows are fully determined by country-pair fixed effects and the multilateral resistance terms.

In particular, the applied empirical approach is consistent with standard trade theory as proposed by e.g., Anderson and van Wincoop (2003) and extends this model formulation to panel data for trade flows in industry k from country i to country j at time t. Formally, the structural gravity equation is based on the Armington assumption with goods differentiated by origin country (and, depending on the theoretical foundations, also by firms). For a generic industry it can generally be written as (supressing the industry index k):

$$s_{ijt} = t_{ijt}^{1-\sigma} \kappa_{it} \, \Pi_{it}^{\sigma-1} \mathrm{P}_{jt}^{\sigma-1} \theta_{jt} e^{\mu_{ij}} \eta_{ijt} \coloneqq e^{z'_{ijt}\alpha + \beta_{it(\alpha,\mu)} + \gamma_{jt(\alpha,\mu)} + \mu_{ij}} \eta_{ijt}. \qquad (3.1)$$

For a given industry, $s_{ijt} = \frac{X_{ijt}}{Y_{t,W}}$ where X_{ijt} denotes the bilateral trade flows from country i to country j at year t. All trade flows are normalised by total annual world expenditures for goods traded within each industry, which is denoted by $Y_{t,W}$ such that $\sum_{i=1}^{C} \sum_{j=1}^{C} s_{ijt} = 1$ (see also e.g., Allen et al., 2018). Domestic trade flows from country i to country i also enter the empirical analysis. The time-varying trade frictions which are modelled as $t_{ijt}^{1-\sigma} = z'_{ijt}\alpha$ will be most relevant for the analysis of Single Market trade effects. The bilateral fixed effects μ_{ij} capture unobserved but time-invariant bilateral trade frictions relevant for country-pairs (e.g. exports from China to/from the US).

$\Pi_{\mathrm{it}}^{\sigma-1}$ stands for outward multilateral resistance capturing the impact of factory gate prices on bilateral trade flows. $\mathrm{P}_{jt}^{\sigma-1}$ denotes the price index of goods sold in a county and is referred to as inward multilateral resistance. Thereby, σ is the price elasticity of demand. The inward and outward multilateral resistance terms lack bilateral variation and may be absorbed by fixed exporter-time and importer-time effects for estimation. However, for the prediction of counterfactual policy changes one has to take into account that these terms adjust endogenously due to induced changes in relative prices.

The inward and outward multilateral resistance terms enter the model in normalised form as $e^{\beta_{it(\alpha,\mu)}} = \kappa_{it} \, \Pi_{it}^{\sigma-1}$ and $e^{\gamma_{jt(\alpha,\mu)}} = \theta_{jt} \, \mathrm{P}_{jt}^{\sigma-1}$ and depend on the vector of time-varying trade barriers z'_{ijt} with the corresponding vector of parameters α, as well as on time-invariant factors μ_{ij} and on the number of countries in the sample. These multilateral resistance terms capture the "remoteness" of two trading economies. Trade between two countries depends on their relative trade costs, which are determined by their other possibilities for trade. To provide an example, relative trade costs for a country-pair will be relatively small when these are neighbouring economies on an island that is separated from the rest of the world by an ocean. In such a situation, one would expect these economies to trade a relatively large amount of goods.

[11] The group of the EU15 economies contains Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, United Kingdom, Portugal, Sweden and Spain. The group of accession countries include the Czech Republic, Cyprus, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia from 2004 onwards. In 2007 Bulgaria and Romania joins our sample as accession economies and finally Croatia is considered a member state from 2013 onwards.

κ_{it} and θ_{jt} refer to the share of a country in total world production and its expenditures relative to total world income, respectively. In case of $\theta_{jt} > \kappa_{it}$, the country of interest runs a trade deficit in the considered industry. For estimation purposes, both production and expenditures are assumed to be exogenously determined, while for the general equilibrium analysis, the model allows them to endogenously adjust as a response to counterfactual changes in barriers to trade.

The error term is denoted by η_{ijt}, which is allowed to be heteroskedastic or (even more) arbitrarily correlated in all three dimensions which are exporter-time, importer-time and country-pairs (Egger and Tarlea, 2015). The error term enters the model in a multiplicative way and we assume exogenous trade barrier indicators such that $E[\eta_{ijt}|z_{ijt}] = 1.$

3.1.2. *Empirical specification*

The empirical specification of Equation (3.1) takes into account the fact that domestic trade flows are also included and specifies the determinants of (bilateral) international trade relative to domestic trade flows. This approach has been suggested by e.g., Yotov (2012), Bergstrand et al. (2015), Heid et al (2015), and has also been proposed as a valuable strategy for identifying the potential trade effects of Brexit by Oberhofer and Pfaffermayr (2017).

When specifying the impact of the Single Market for within-EU bilateral trade flows, we apply a step-wise procedure. To start with, we will estimate the average impact of membership in the Single Market for the industries in the participating economies. This approach is the most restrictive way of modelling Single Market effects, since it assumes homogenous effects for participation and accession. In a second step, we explicitly allow for differences between membership and accession by separately investigating the Single Market effects for trade between the 15 initial participants of the Single Market and the trade with and between the new member states joining the Single Market from 2004 onwards. In a last step, we further split-up the accession effect into the trade effect for bilateral trade flows between the new member states and the Single Market effect for trade flows between new and old members.

The resulting baseline estimation equation for a generic industry reads as:

$$s_{ijt} = \exp\left(\sum_{l=1}^{19} \alpha_l \; B_{ij} t_l + \sum_{l=20}^{38} \alpha_l \, B_{ij} \log(dist_{ij}) \, t_{l-19} + \; \alpha_{39} B_{ij} RTA_{ijt} \; + \; \alpha_{40} B_{ij} EURO_{ijt} + \sum_{l=41}^{59} \alpha_l \; B_{ij} \, \mathrm{EU_{ij}} \, t_{l-40} \; + \mu_{ij} + \; \beta_{it} + \; \gamma_{jt}\right) + \eta_{ijt}, \qquad (3.2)$$

where η_{ijt} is the (heteroscedastic) error term and B_{ij} is an indicator variable which takes on a value of one for cross-border trade flows and zero otherwise. As a consequence, and in line with standard trade theory, the levels of the domestic trade flows are fully explained by the bilateral fixed effects (μ_{ij}) and the inward (β_{it}) and outward (γ_{jt}) multilateral resistance terms. The latter are modelled via exporter-time and importer-time fixed effects. The parameter values attached to the α's in Equation (3.2) capture changes in bilateral trade flows relative to domestic trade over time arising from changes in cross-border barriers to trade.

For the first set of the variables, the border dummy is interacted with time dummies which take on a value of one whenever $t = l$ and are zero otherwise. The resulting 19 parameter estimates measure the changes in bilateral trade flows relative to domestic trade for the years from 1996 to 2014 and for country-pairs which are contiguous but are not running a joint regional trade agreement (bilateral free trade agreement or customs union) and do not participate in the European Single Market. In other words, these estimates capture the substitution of domestic trade by foreign trade for (two) neighbouring countries which do not share any trade facilitation agreement beyond the multilateral WTO regulation. In terms of the expected effects of these control variables, we would expect the first 19 α's to be positive in case of decreasing negative border effects. The interaction terms of B_{ij} with the year dummies capture general secular globalisation trends, which would suggest that domestic trade is increasingly substituted by imports. Here it is important to once more emphasize that the level of the negative border effect is fully absorbed by bilateral fixed effects and thus we can only explicitly study changes in cross-border barriers for trade over time.

The impact of geographic distance for international trade flows is accounted for by the inclusion of the second set of variables. Here, we additionally interact the border-time interaction with the logarithm of the bilateral distance between the two trading economies. The second set of variables thus aims at capturing differences in trade costs due to geographical location, which might be relevant for the substitution of domestic trade by foreign competitors. Theoretical reasoning suggests that trade costs increase with geographical distance, leading to a reduction of competitiveness for goods produced in remote economies. As a consequence, trade shares between more distant countries should, ceteris paribus, be smaller.

Additionally, and following the literature on the impact of trade policy measures for bilateral trade, we control for the existence of regional trade agreements and estimate a contemporaneous average effect captured by α_{39}. This trade policy indicator is again interacted with the border dummy in order to investigate how strongly bilateral trade flows between two economies which share a common trade agreement are affected by such an agreement. It seems reasonable to assume that the formation of preferential trade agreements will increase trade between the participating countries, and thus α_{39} most likely will be positive.

The last control variable to be included which is also interacted with the border dummy is an indicator variable $EURO_{ij}$ which takes on a value of one if both trading partners are Euro area member states and zero otherwise. This covariate guarantees that the Single Market effects estimated in the three different specifications are not contaminated by potential trade-enhancing effects of the introduction of the Euro as a common currency. α_{40} picks up the corresponding partial effect of the Euro introduction for bilateral trade between participating economies.[12]

The parameters of most interest in the baseline specification are the ones that indicate participation in the European Single Market. In this specification we include a dummy variable, denoted by $\mathrm{EU}_{\mathrm{ij}}$ which is equal to one if both trading partners are members of the European Union and zero otherwise. From 1995 onwards, EU membership is tied to the participation in the European Single Market and therefore the parameter estimates associated with the interaction term between EU_{ij}, B_{ij} and time capture the evolution of the average Single Market effect over time. Accordingly, we obtain 19 different parameter estimates for the years from 1996 to 2014. From 1996 to 2003, these parameters are identified based on bilateral trade flows between the 15 old member states which joined the Single Market in 1995. From 2004 onwards, the parameters in addition reflect changes in bilateral trade between the 10 (later 12 and 13) new EU member states as well as between old (new) and new (old) EU countries. By the end of the sample period, the $\mathrm{EU}_{\mathrm{ij}}$ takes on a value of one whenever both trading partners are among the group of the 28 EU member states. In this regard, the results based on the specification and for the years from 2004 onwards need to be interpreted as changes in the averages of the membership and accession effects that the Single Market might induce. The level effects of Single Market participation are also fully captured by the included fixed effects and thus the parameter estimates report on how the trade effects evolve over time. Overall, Equation (3.2) highlights that we estimate 59 parameter values for each industry besides the full set of dummy variables, which capture the country-pair fixed effects and the inward and outward multilateral resistance terms. For the analysis of the time-varying impact of Single Market membership we hold everything else constant, and in this subchapter simply plot the parameter estimates.

The second proposed specification which is given by Equation (3.3) allows to separate Single Market membership and accession effects by splitting up the total $\mathrm{EU}_{\mathrm{ij}}$ dummy variable, accordingly. For this purpose, the regression equation includes two different sets of variables containing interaction terms of the border dummy variable, time and two separate indicators for Single Market membership and accession, respectively. First, the interaction terms of the border with the time dummies are additionally interacted with $\mathrm{SM}_{\mathrm{ij}}$ which is an indicator variable taking on a value of one only if both trading partners have participated in the Single Market already from the year 1995 onwards and zero otherwise. For each industry, the associated parameters thus capture the average relative changes in bilateral trade flows between the 15 initial EU member states. The time-varying changes of Single Market membership can thus be estimated for the whole sample period from 1996 to 2014. The level effects for the year 1995 are fully captured by the fixed effects

[12] Alternatively, we also additionally interacted the Euro area membership indicator with the time-fixed effects in order to uncover potential time-specific Euro area trade effects. However, neither the contemporaneous nor any of the time-specific effects are statistically significant in our estimations and therefore we decided to apply the more parsimonious specification which only includes a contemporaneous effect.

as discussed above and thus remain unidentified. The corresponding parameter estimates thus capture the changes in the trade effects stemming solely from Single Market membership.

The second relevant indicator variable is labelled as $\mathrm{ASM_{ij}}$ and again is interacted with both border and time. From 2004 onwards, $\mathrm{ASM_{ij}}$ takes on a value of one whenever a trading partner is a new member state of the EU and the other country is also a participant in the European Single Market.[13] As a consequence the parameter estimates associated with these interaction terms reflect (i) changes in bilateral trade flows between any two new member states, (ii) imports of new member states from the EU15 economies and (iii) exports from the new member states to the EU15. As such the parameter estimate not only uncovers the direct trade effects of EU accession for the new member states but also incorporates the enlargement effects for the original member states. As a consequence, these parameters can be interpreted as the changes in the overall accession effect stemming from the Eastern EU enlargement for all EU member states.

$$s_{ijt} = \exp\left(\sum_{l=1}^{19} \alpha_l \; B_{ij} t_l + \sum_{l=20}^{38} \alpha_l \; B_{ij} \log(dist_{ij}) \; t_{l-1} \; + \; \alpha_{39} B_{ij} RTA_{ijt} \; + \; \alpha_{40} B_{ij} EURO_{ijt} + \sum_{l=4}^{59} \alpha_l \; B_{ij} \; \mathrm{SM_{ij}} \; t_{l-40} + \sum_{l=60}^{70} \alpha_l \; B_{ij} \; \mathrm{ASM_{ij}} \; t_{l-59} \; + \mu_{ij} + \; \beta_{it} + \; \gamma_{jt}\right) + \eta_{ijt}, \tag{3.3}$$

The last specification for the estimation of the main results further investigates potentially heterogeneous accession effects by splitting up the $\mathrm{ASM_{ij}}$ indicator into two indicator variables which are denoted by $\mathrm{WASM_{ij}}$ and $\mathrm{BASM_{ij}}$ respectively. $\mathrm{WASM_{ij}}$ takes on a value of one for trade flows in case both trading partners *i* and *j* are among the group of new accession economies and these countries already joined the EU. Accordingly, the parameter estimates associated with the interaction of $\mathrm{WASM_{ij}}$ with the border dummy and time capture the evolution of the Single Market trade effect for trade flows between the new member states. By contrast, $\mathrm{BASM_{ij}}$ takes on a value of one if either the importing or exporting economy is a new member state and the other trading partner belongs to the group of the EU15, and zero otherwise. A similar reasoning to that of the $\mathrm{WASM_{ij}}$ interaction term thus suggests that the $\mathrm{BASM_{ij}}$ interaction with border and time captures the changes in the average Single Market effect for trade flows between the new and the old EU member economies. The resulting specification can formally be written as following:

$$s_{ijt} = \exp\left(\sum_{l=1}^{19} \alpha_l \; B_{ij} t_l + \sum_{l=20}^{38} \alpha_l \; B_{ij} \log(dist_{ij}) \; t_{l-19} + \; \alpha_{39} B_{ij} RTA_{ijt} \; + \; \alpha_{40} B_{ij} EURO_{ijt} + \sum_{l=41}^{59} \alpha_l \; B_{ij} \; \mathrm{SM_{ij}} \; t_{l-40} + \sum_{l=60}^{70} \alpha_l \; B_{ij} \; \mathrm{WASM_{ij}} \; t_{l-59} \; + \sum_{l=71}^{81} \alpha_l \; B_{ij} \; \mathrm{BASM_{ij}} \; t_{l-70} + \mu_{ij} + \; \beta_{it} + \; \gamma_{jt}\right) + \eta_{ijt}, \tag{3.4}$$

Equations (3.2) to (3.4) are all estimated with the routinely applied Poisson Pseudo Maximum Likelihood (PPML) estimator as suggested by Santos Silva and Tenreyro (2006), using Tom Zylkin's ppml_panel_sg command provided in Stata (see also Larch et al., 2018). The therein offered estimator accounts for heteroscedasticity and is very suitable for balanced panel data such as trade data retrieved from the World Input-Output Tables.

3.1.3. *Data sources*

There are only very few data sources available which also include the necessary information on domestic trade flows, especially at a disaggregated sectoral level. The sectoral level of the data source is necessary in order to study potentially heterogeneous Single Market effects across different goods (and services) sectors. Most of the routinely used data sources for studying

[13] For bilateral trade relationships Bulgaria and Romania $\mathrm{ASM_{ij}}$ takes on a value of one from 2007 onwards. Croatia joins the Single Market in 2013.

bilateral trade flows include detailed information on bilateral trade flows at a disaggregated sectoral level and many countries, but commonly tend to miss the information on domestic production and trade which is pivotal for being able to estimate Equations (3.2) to (3.4).

The World Input-Output Tables constitute a remarkable exception as they not only allow for an industrial breakdown but also include the necessary information on domestic production and trade. Furthermore, they are publicly available via the homepage of the World Input-Output Database (WIOD) project (http://www.wiod.org).[14] Data gathered from the WIOD have already been used to study the trade and welfare effects of trade policy measures (see, e.g., Dhingra et al., 2017; Brakman et al., 2018).

Trade data from the WIOD are perfectly suited for the proposed gravity model, as these allow to differentiate between domestic and bilateral cross-border trade flows and the data are further available at a relatively detailed industry level.[15] A drawback of the WIOD database is its relatively small country coverage and, as a consequence, the identification of the trade effects of custom unions and free trade agreements is relatively difficult (Oberhofer and Pfaffermayr, 2017). For the analysis of the impact of the Single Market for goods, this does not constitute a serious setback as we are primarily interested in the evolution of bilateral trade flows and border effects among the Single Market participants and these countries are all included in the WIOD database. Furthermore, the number of non-EU member states in the WIOD database turns out to be sufficient to estimate differential effects for the evolution of bilateral trade within and outside the Single Market.[16]

Another and more important drawback of the WIOD database is its relatively short-time coverage of its different versions. In the most recent version of the WIOD (released in 2016), data is available for the time span capturing the years from 2000 to 2014. The previous version (released in 2013) includes the years from 1995 to 2011. Unfortunately, these two versions are not perfectly compatible with each other due to changes in the sectoral classification applied, as well as an increasing country coverage. A comprehensive analysis of the trade effects of the Single Market (at least) needs to account for all years starting from 1995. Generally, it would be preferable to also have data on pre-Single Market years, but none of the WIOD versions delivers data for the years prior to 1995. In order to maximize the available number of years, both versions of the WIOD database need to be combined. However, the changes in the industrial classification used cause some issues regarding the across-version comparability of the data, and a reasonable concordance scheme therefore needs to be applied. Table 3.1 documents the applied concordance table which merges data from ISIC rev. 3 and rev. 4 classifications with each other. Since the focus of this analysis is mainly on the impact of the Single Market for goods trade, Table 3.1 reports the concordance scheme for manufacturing industries and total services. The latter serve as a comparison group only and will not be disaggregated in this study.

The leftmost column of Table 3.1 reports the resulting final industrial classification applied while the other columns show the sectorial classification based on "International Standard Industrial Classification of All Economic Activities" (ISIC) rev. 3 and rev. 4 nomenclature, respectively. To give an example, for the finally constructed manufacturing industry "Textiles, wearing apparel and leather products" we use the data from the 2013 release for the years 1995 to 1999 based on the ISIC rev.3 classification. For the years from 2000 onwards, we use the 2016 release of the WIOD and aggregate the trade and production data from the ISIC rev. 3 sectors "Textiles and Textile Products" and "Leather, Leather and Footwear" in order to construct comparable data for the same industrial classification.

After combining the two versions of the WIOD database, the resulting database provides the necessary data for a time period spanning 1995 to 2014. From 1995 to 2000 the data includes information on the EU27 plus 13 non-EU member states. From 2000 onwards, all EU28 economies and 15 other countries can be included in the empirical analysis.[17] Based on the resulting industry breakdown from the two different versions of the WIOD, 13 manufacturing industries are available

[14] An illustration of the WIOD database is offered in e.g., Timmer et al. (2015).

[15] The WIOD database provides the highest industry detail in its 2016 release, offering disaggregated data for 20 manufacturing industries. Other datasets, such as the OECD Trade in Value Added database (TiVA) distinguish between 16 manufacturing industries.

[16] Besides the current 28 EU member states, the 2016 release of WIOD includes the following countries: Australia, Brazil, Canada, China, India, Indonesia, Japan, Mexico, Norway, Russia, South Korea, Switzerland, Taiwan, Turkey and the United States of America.

[17] The WIOD release from 2016 additionally includes Croatia, Norway and Switzerland.

for studying the trade and welfare effects of the Single Market for goods. Total trade in construction and services are also considered in the empirical analysis.

Furthermore, the WIOD data is augmented by data on EU accession and membership and on bilateral free trade agreements (FTAs) stemming from the widely used Regional Trade Agreements Database built by Mario Larch (see, e.g., Egger and Larch, 2008). These two variables are integrated into the regional trade agreement indicator, which takes on a value of one whenever the country-pairs have either an FTA in force or form a customs union and zero otherwise. EU membership and accession are modelled separately, as discussed above. Data on geographic distance is retrieved from Mayer and Zignago (2011).

Table 3.1: Aggregation of ISIC rev.3 and ISIC rev.4

ISIC agg.		ISIC rev.3		ISIC rev.4	
Agriculture and mining					
A	Agriculture, Hunting, Forestry and Fishing	AtB	Agriculture, Hunting, Forestry and Fishing	A01	Crop and animal production, hunting and related service activities
				A02	Forestry and logging
				A03	Fishing and aquaculture
B	Mining and quarrying	C	Mining and Quarrying	B	Mining and quarrying
Manufacturing					
C10-C12	Manufacture of food products, beverages and tobacco products	15t16	Food, Beverages and Tobacco	C10-C12	Manufacture of food products, beverages and tobacco products
C13-C15	Manufacture of textiles, wearing apparel and leather products	17t18	Textiles and Textile Products	C13-C15	Manufacture of textiles, wearing apparel and leather products
		19	Leather, Leather and Footwear		
C16	Manufacture of wood and of products of wood and cork	20	Wood and Products of Wood and Cork	C16	Manufacture of wood and of products of wood and cork
C17-18	Pulp, paper, printing, publishing	21t22	Pulp, Paper, Paper, Printing and Publishing	C17	Manufacture of paper and paper products
				C18	Printing and reproduction of recorded media
				J58	Publishing activities
C19	Manufacture of coke and refined petroleum products	23	Coke, Refined Petroleum and Nuclear Fuel	C19	Manufacture of coke and refined petroleum products
C20-21	Manufacture of chemicals and chemical products	24	Chemicals and Chemical Products	C20	Manufacture of chemicals and chemical products
				C21	Manufacture of basic pharmaceutical products, pharmaceutical preparations
C22	Manufacture of rubber and plastic products	25	Rubber and Plastics	C22	Manufacture of rubber and plastic products
C23	Manufacture of other non-metallic mineral products	26	Other Non-Metallic Mineral	C23	Manufacture of other non-metallic mineral products
C24-25	Basic and fabricated metals	27t28	Basic Metals and Fabricated Metal	C24	Manufacture of basic metals
				C25	Manufacture of fabricated metal products, except machinery and equipment
C26-27	Manufacture of computer, electronic, electrical and optical products	30t33	Electrical and Optical Equipment	C26	Manufacture of computer, electronic and optical products
				C27	Manufacture of electrical equipment
C28_C33	Manufacture of machinery and equipment nec., repair and installation	29	Machinery, nec	C28	Manufacture of machinery and equipment nec.
				C33	Repair and installation of machinery and equipment
C29-30	Transport equipment	34t35	Transport Equipment	C29	Manufacture of motor vehicles, trailers and semi-trailers
				C30	Manufacture of other transport equipment
C31-32	Manufacture of furniture; other manufacturing	36t37	Manufacturing, nec; Recycling	C31_C32	Manufacture of furniture; other manufacturing
Gas and water					
D35-E36	Electricity, gas and water supply	E	Electricity, Gas and Water Supply	D35	Electricity, gas, steam and air conditioning supply
				E36	Water collection, treatment and supply
Services					
F	Construction	F	Construction	F	Construction
G45	Wholesale and retail trade, repair of motor vehicles, motorcycles	50	Sale, Maintenance and Repair of Motor Vehicles and Motorcycles	G45	Wholesale and retail trade and repair of motor vehicles and motorcycles
G46	Wholesale trade, except of motor vehicles, motorcycles	51	Wholesale Trade and Commission Trade	G46	Wholesale trade, except of motor vehicles, motorcycles

Table 3.1/continued

ISIC agg.		ISIC rev.3		ISIC rev.4	
G47	Retail trade, except of motor vehicles and motorcycles	52	Retail Trade, Repair of Household Goods	G47	Retail trade, except of motor vehicles and motorcycles
H49-52	Transport	60	Inland Transport	H49	Land transport and transport via pipelines
		61	Water Transport	H50	Water transport
		62	Air Transport	H51	Air transport
		63	Other Supporting and Auxiliary Transport Act.; Activities of Travel Agencies	H52	Warehousing and support activities for transportation
H53-J61	Post and Telecommunications	64	Post and Telecommunications	H53	Postal and courier activities
				J61	Telecommunications
I	Accommodation and food service activities	H	Hotels and Restaurants	I	Accommodation and food service activities
K64-66	Financial intermediation	J	Financial Intermediation	K64	Financial service activities, except insurance and pension funding
				K65	Insurance, reinsurance and pension funding, except compulsory social security
				K66	Activities auxiliary to financial services and insurance activities
L68	Real estate activities	70	Real Estate Activities	L68	Real estate activities
J62-63-M-N	Business services	71t74	Renting of M&E and Other Business Activities	J62_J63	Computer programming, consultancy, related activ.; information service activ.
				M69_M70	Legal, account. activ., activ. of head offices; management consultancy activ.
				M71	Architectural and engineering activities; technical testing and analysis
				M72	Scientific research and development
				M73	Advertising and market research
				M74_M75	Other professional, scientific and technical activities; veterinary activities
				N	Administrative and support service activities
O84	Public administration and defence; compulsory social security	L	Public Admin and Defence; Compulsory Social Security	O84	Public administration and defence; compulsory social security
P85	Education	M	Education	P85	Education
Q	Human health and social work activities	N	Health and Social Work	Q	Human health and social work activities
R_S_T_U	Other service activities	O	Other Community, Social and Personal Services	E37-E39	Sewerage; waste collection, waste management services
		P	Private Households with Employed Persons	J59_J60	Motion picture, video and television programme production, sound recording and music publishing activities; programming and broadcasting activities
				R_S	Other service activities
				T	Activities of households as employers
				U	Activities of extraterritorial organisations and bodies

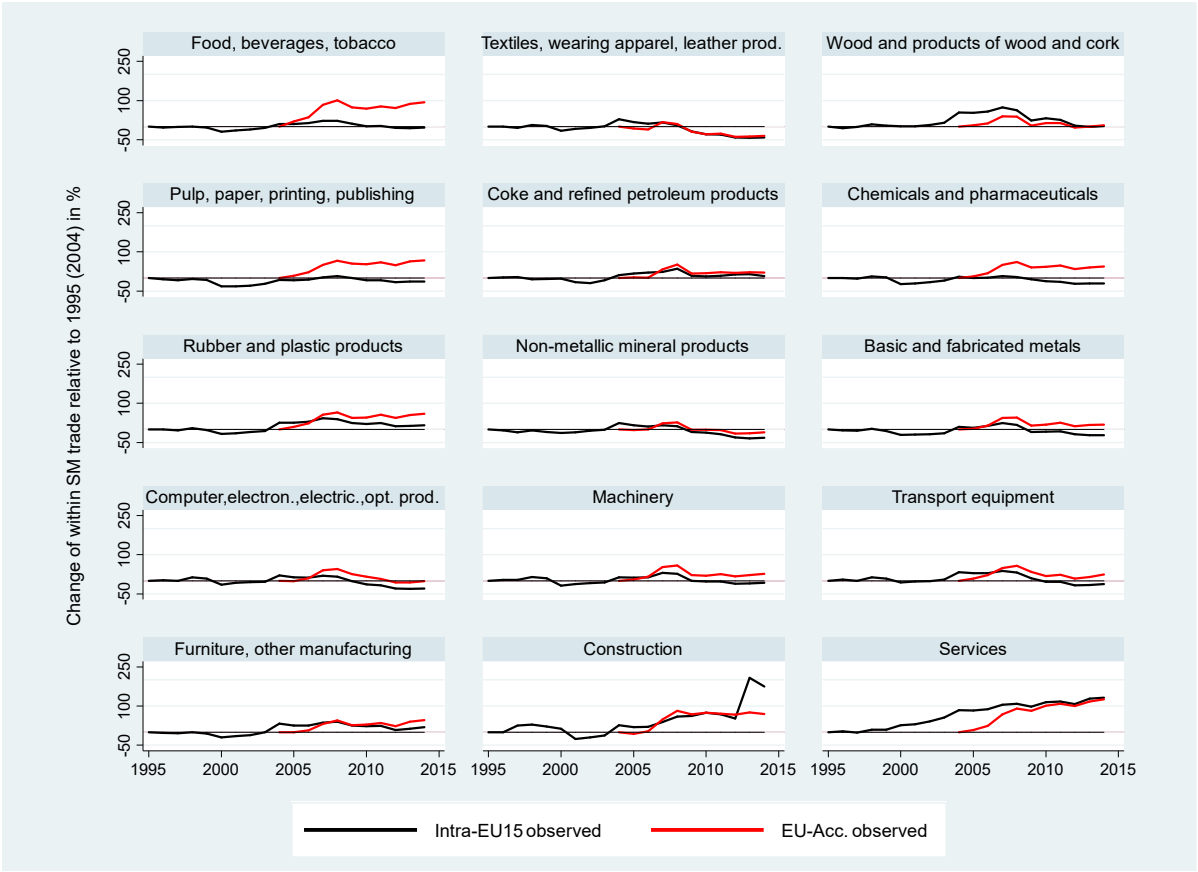
Source: WIOD database (release 2013, 2016), WIFO compilation.

3.1.4. *Descriptive statistics*

This subchapter discusses descriptive statistics based on the data at hand and reports findings from the estimation of the model specifications discussed in Equations (3.2) to (3.4). The main purpose of this analysis is to investigate whether Single Market membership and accession induce heterogeneous effects, not only across industries but also for different EU member groups. With this we aim to identify the proper empirical specification of the gravity model which will later on be used to study the impact of compliance with the Single Market for its functioning.

Figure 3.1 descriptively displays the evolution of within-Single Market cross-border trade for 13 manufacturing industries, construction and services for the years 1995 to 2014. The black lines refer to the shares of cross-border trade among EU15 economies and are normalised to one for the year 1995. The red lines correspond to trade flows where at least one country is an accession economy in 2004, while the trading partner is either also a new EU member state or from the group of EU15 economies. The red line is thus normalised to one for 2004. This figure thus corresponds to the second specification applied, which is outlined in Equation (3.3) and should provide a first indication on whether membership and accession effects might be different.

Figure 3.1: Observed changes of within-Single Market trade



Source: WIFO calculations.

For bilateral trade between the EU15 economies, Figure 3.1 does not allow to draw a clear-cut picture. In some industries, such as "Wood and products of wood and cork", trade increases in the middle of the observed time period but moves back to its initial total share as time approaches the year 2014. For construction and service industries, the descriptive graphs point to a still ongoing relative increase in trade among the EU15 member states, while for "Chemicals and pharmaceuticals", "Basic and fabricated metals", "Transport equipment" and "Pulp, paper, printing, publishing" the trade share among EU15 economies declined below its 1995 level over the last observed years. Focusing on the Single Market effects for trade between EU15 member states and relying only on simple descriptive statistics for trade shares suggests the following: first, the impact of the Single Market seems to be heterogeneous across manufacturing industries and thus an industry-level analysis is pivotal for providing a comprehensive picture of the Single Market trade effects within the European Union; second, the changes in trade between the initial member

states seem moderate at best and, for some industries, the relative trade relationships between the EU15 economies are even declining.

At least some parts in this latter development of within-EU15 trade can be ascribed to positive "trade diversion" stemming from the accession of ten new member states from 2004 onwards. Recall that the red line measures the aggregated trade share between country groups containing the accession economies as well as bilateral trade flows between new and old EU member states. Moreover, as indicated by the red lines, the accession of new member states in general tends to increase the bilateral trade flow shares between both the group of new members and the accession economies. The largest quantitative effects are observed for the "Food, beverages, tobacco" industries, construction and services trade. By contrast, for "Wood and products of wood and cork" and "Coke and refined petroleum products" the formation of and the accession of the Single Market do not seem to structurally change the relative importance of within-EU trade as compared to trade with third countries and the share of domestically consumed production. Most importantly, however, the simple trade share statistics depicted in Figure 3.1 show that the evolution of cross-border trade within the Single Market seems to have been heterogeneous, which further motivates separate structural analyses based on gravity models for bilateral trade.

3.1.5. *Estimation results on heterogenous Single Market effects*

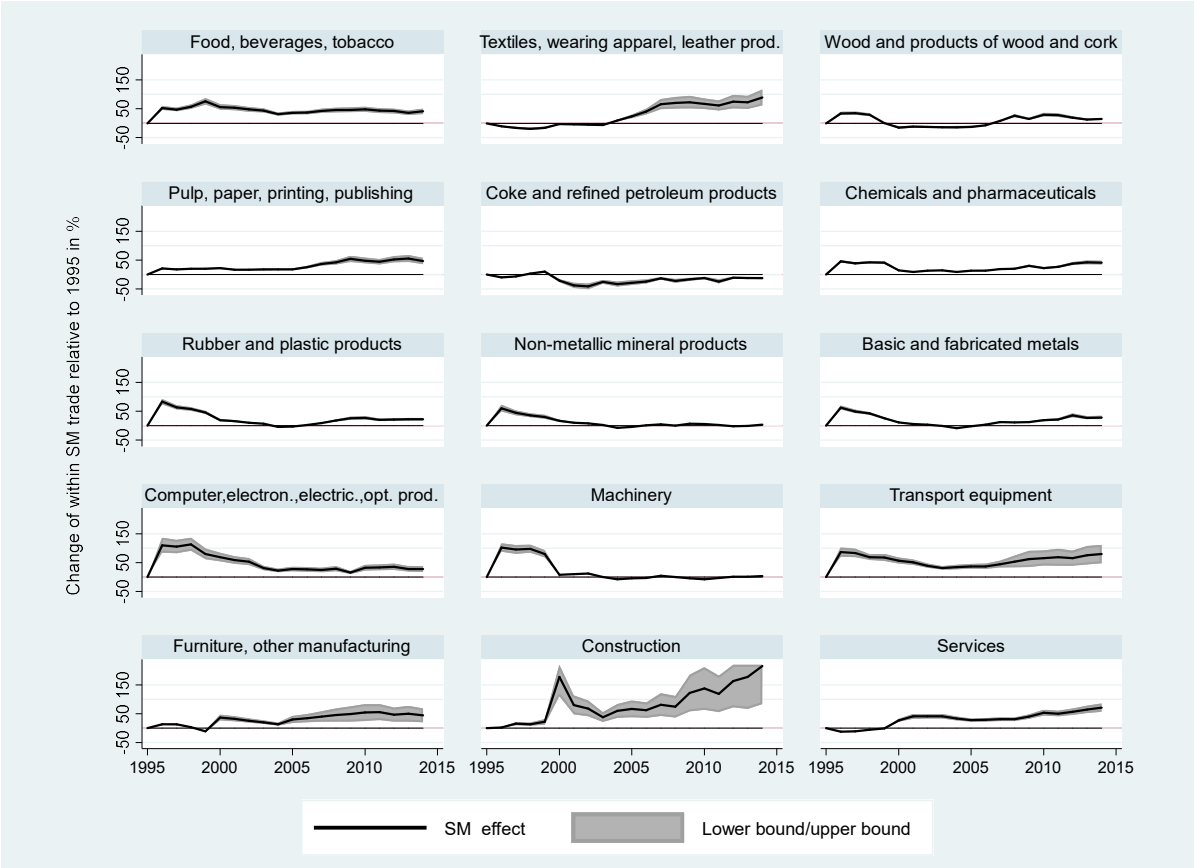
Figures 3.2 to 3.4 report the estimation results based on the WIOD data discussed above and on the model specifications documented in Equations (3.2) to (3.4). They represent the direct trade effects resulting from the performance of the Single Market so far and are obtained by comparing baseline results – i.e. results from EU integration as realised – with estimates for a counterfactual scenario of no Single Market membership or accession. The sample period contains the years 1995 to 2014 and combines both waves of WIOD releases.

Figure 3.2 reports results for the most restrictive model specification from Equation (3.2). Since our main interest focuses on the effects of the Single Market, the results corresponding to all control variables are not plotted. This specification implicitly assumes that Single Market participation and membership effects are homogenous which allows to only estimate one average Single Market effect per year. The black lines depicted in Figure 3.2 report the parameter estimates associated with the interaction term between border, time and EU membership as discussed in Equation (3.2) and reveal the evolution of Single Market trade effects over time with respect to the base year 1995. The shaded area represents the 95%-confidence interval for the estimates. Equation (3.2) is separately estimated for 13 manufacturing industries, the construction sector and total services. The parameter estimates capture the direct trade effects of the Single Market, but do not take any type of general equilibrium effects into account. These effects will be incorporated in chapter 3.1.6.

The resulting 15 subgraphs to a large extent document positive Single Market membership trade effects for the considered industries. With the exception of the construction industry, the effects are also estimated rather precisely, as indicated by very narrow confidence bands. Nevertheless, the parameter estimates reveal some heterogeneity across industries, documenting the importance of separate analyses for the individual industries. To start with the most counterintuitive results, for the "Coke and refined petroleum products" the annual parameter estimates, on average, suggest a negative impact of EU membership for bilateral trade flows between a random trade pair consisting of two member countries. Furthermore, this effect is not constant over time and becomes less dampening in the aftermath of the EU accession of Eastern European economies. The "Wood and products of wood and cork" industry constitutes the second industry which exhibited dampening EU membership trade effects. For this industry, the decreasing effects are mainly feasible in the middle of the sample period, but before and afterwards the Single Market contributed to increasing bilateral trade flows among member states.

Another group of industries shows relatively large and positive trade-enhancing EU membership effects which gradually phased out over the course of the sample period and became zero or relatively small by 2014. Such an evolution is visible for "Non-metallic mineral products", "Machinery", and to some extent for the production of "Rubber and plastic products" and for "Basic and fabricated metals". For the latter two industries, the Single Market effect, as depicted by EU membership, is still positive at the end of the sample period, but larger gains in terms of bilateral trade flows are materialised immediately in the aftermath of the formation of the Single Market. However, the "Chemicals and pharmaceuticals" exhibit a similar trend over time, the overall Single Market effects remain positive throughout, suggesting a positive but time-varying contribution of EU membership for bilateral trade flows in this sector.

Figure 3.2: Evolution of Single Market trade impacts: participation effect



Source: WIFO calculations.

For another five of the 15 reported industries, we are also able to empirically identify a comparable picture regarding the evolution of the EU membership effects over time. This group contains the "Food, beverages, tobacco", "Pulp, paper, printing, publishing", "Transport equipment", "Computer and electronical equipment" and "Furniture and other manufacturing" industries. The former three, in particular, are clearly characterised by positive parameter estimates stemming from Single Market membership and participation, which are rather constant over time. At the beginning of the sample period a strong increase in within-EU cross-border trade can be observed, which then remains almost constant over time. The Single Market thus seems to promote trade flows between EU member states in a rather constant manner. For the "Computer and electronical equipment" industry the effect diminishes over time but still remains at a relatively large level at the end of the sample period. In the "Furniture and other manufacturing" industry the positive EU membership and Single Market effect becomes visible with some time lag, but after the year 2000 remains relatively constant until the end of the sample period.

The last group of industries can be characterised by positive Single Market trade effects, which accelerate over time. Among this group, only the "Textiles, wearing apparel and leather production" would classify as a classical manufacturing industry. The other two sectors are construction and services. For the textiles industry we either observe small and negative or zero trade effects until 2004 and a rapid increase in the values of the parameter estimates thereafter. This suggests that for this industry the accession of the new member states is pivotal for observing a positive trade gain induced by the Single Market. The positive trade effect for service industries is already materialised from 1999 onwards, suggesting that this effect might capture both membership and accession effects. For the construction sector, the parameter estimates suggest a large single increase in the positive effect in 2000 followed by a steadier increase form 2004 until 2014.

The results for the latter group of industries, but also for those which experience trend changes around the years between 2003 and 2005, motivate a more finely-grained econometric analysis which separates Single Market membership effects from the ones stemming from the accession to the Single Market via the European Eastern enlargement. Hence, we apply the gravity model

specification proposed in Equation (3.3), which splits up the EU effect into two different Single Market effects.

For the interpretation of the parameter estimates reported in Figure 3.3 it is important to briefly highlight how these relate to the ones from Figure 3.2. The estimation results based on Equation (3.2) follow from a poolability assumption, which requires the effects for Single Market membership and accession to be the same. If this assumption is violated, the parameter estimates from Figure 3.2 might be biased and would differ from the ones reported for the estimation of Equation (3.3). Furthermore, since all covariates included in our model are interacted with the border dummy (and in most cases also with time), the correlation between the variables of most interest and all additional control variables will be non-zero by construction. As a consequence, the inclusion of more variables might also substantially affect the parameter estimates for the control variables, such as geographical distance and the free trade agreement indicator, which are not reported in the Figures.[18] As will become clear from a discussion of the results reported in Figure 3.3, this is indeed the case, implying that the consecutive findings are more reliable compared to the ones following from Figure 3.2.

In Figure 3.3, the reported black lines depict the parameter estimates for the triple interaction term of Single Market membership with the border effect and time, while the red lines correspond to the respective interaction term with Single Market accession. The lines are drawn in such a way that they inform about the direct changes in trade shares based on the parameter estimates. The grey and red dashed areas bound the corresponding confidence intervals. Again, the results do not incorporate any general equilibrium effects and thus need to be interpreted as the direct partial effect stemming from the European Single Market, reflecting the evolution of membership and accession effects over time. In the following discussion, we start by focusing on the effects for EU membership, which correspond to Single Market-induced changes in bilateral cross-border trade flows for trade among the EU15 economies only and are revealed by the back lines and grey confidence intervals in the figure. The changes in the effects for the years 1996 to 2003 reflect the magnitude of the bias in the estimates reported in Figure 3.2, which are due to the restrictive poolability assumption and the omission of the accession indicator.

In general, the black lines and grey confidence bands reported in Figure 3.3 point to relatively minor or even dampening Single Market effects on bilateral trade between the EU15 economies for most of the (manufacturing) industries considered during the period 1995 to 2014. The "Pulp, paper, printing and publishing", "Food, beverages and tobacco" and "chemical and pharmaceutical" industries, for example, show some Single Market effects over time, but the share of bilateral trade within the group of the EU15 economies is almost identical for the years 1995 and 2014, respectively. This is illustrated by black lines, which are close to zero over the whole sample period from 1996 to 2014.[19]

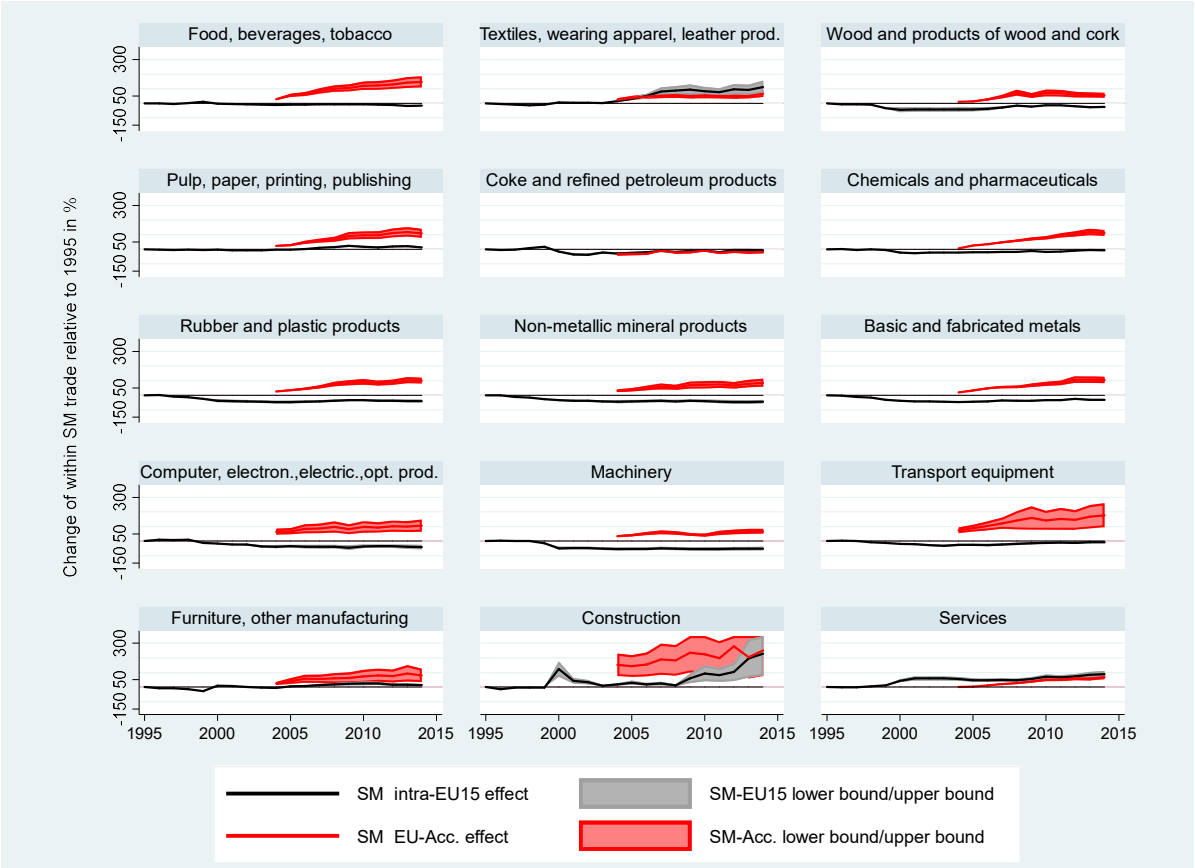
A second group of industries exhibits diminishing within-EU15 Single Market trade effects over time that phase out at the end of the sample period. This is true for the "Wood, and products of wood and cork", "Coke and refined petroleum products" and the "Transport equipment" industries. For all of these, the dampening direct Single Market participation effect is largest in the middle of our sample period and seems to arrive at a turning point at the time the enlargement of the EU and the Single Market took place.

For four industries, we obtain estimation results that are in line with the theoretical expectations. In particular, the Single Market exhibited positive trade effects for bilateral trade among the EU15 economies for the "Textiles, wearing apparel, leather production", "Furniture and other manufacturing", "Construction" and "Services" industries. A close inspection of the parameter estimates for these industries reveals that the positive effects, for the most part, have been realised in the aftermath of the accession of the new member states in the course of the EU Eastern enlargement, pointing to a potential complementarity of membership and accession effects.

[18] The parameter estimates for all control variables are reported in the SMCL files which are provided to the European Commission as supplementary material to this report.

[19] Recall, that in the gravity model specified the level effects for 1995 are absorbed by the sum of all the included fixed effects. All reported results thus start with the year 1996.

Figure 3.3: Evolution of Single Market trade impacts: membership and accession effects



Source: WIFO calculations.

However, in five manufacturing industries, including "Rubber and plastic products", "Non-metallic mineral products", "Basic and fabricated metals", "Computer and electronical equipment" and "Machinery" we identify dampening Single Market effects throughout (almost) the whole sample period, with this effect remaining constant or even accelerating over time. This would imply that, ceteris paribus, relative trade – measured in terms of export shares – between any two EU15 economies declines more (or has grown less) compared to trade between a country-pair in which at least one of the trading partners has not been part of the European Single Market from 1995 onwards. This rather unexpected finding for some industries might be explained in two ways: First, the EU15 economies were rather strongly integrated with each other already prior to the official launch of the Single Market and thus, at least in some industries, the gains from reduced trade costs might have already been exploited prior to the available sample period. Second, since the Single Market indicator variable only takes on a value of one for bilateral trade among the EU15 economies, these estimates ignore the effects stemming from the accession of the new member states. For a given EU15 economy, the overall Single Market effect from 2004 onwards might still be positive whenever the changes in bilateral trade with new member states outweighs the reduction in relative trade with other EU15 member countries. Hence, we continue with the discussion on the Single Market trade effects stemming from accession.

These are presented by the red lines and red dashed areas in Figure 3.2. More specifically, they inform about the impact of accession to the Single Market for both groups containing the new and old member states. As discussed above, the depicted parameter estimates capture both the trade effects of Single Market accession for bilateral trade between new member states and between the new and old EU members. This allows to quantify overall within-Single Market trade effects attributable to the joining of a larger group of countries.

With the exception of the "Coke and refined petroleum products", the red lines commonly suggest positive and quantitatively relatively large positive Single Market trade effects stemming from the accession of new members. This effect reflects enhanced trade between accession countries and EU15 economies, but also among the accession countries themselves. In almost all cases the positive accession effects are able to outweigh the dampening membership effects for the intra-

EU15 trade. However, the corresponding confidence bands also reveal that the accession effects are estimated less precisely. Nevertheless, the overall findings indicate that the European Single Market induces a positive overall trade effect among its participants. In terms of the observed time patterns of the estimates, the increasing effects from EU accession over time reach their observable maximums in either 2013 or 2014 for most of the considered industries. This suggests that the Single Market effects evolve dynamically over time and thus we might expect to see additional positive trade effects in the years to come. Interestingly, for services trade the accession effect is smaller compared to the membership effect for the EU15 economies. Since services trade has only recently been put more into policy focus, this again suggests that most of the Single Market effects for goods trade have already been exploited prior to 1995. Trade in services only accelerated in a later time period due to initiatives aiming at decreased costs for services trade.

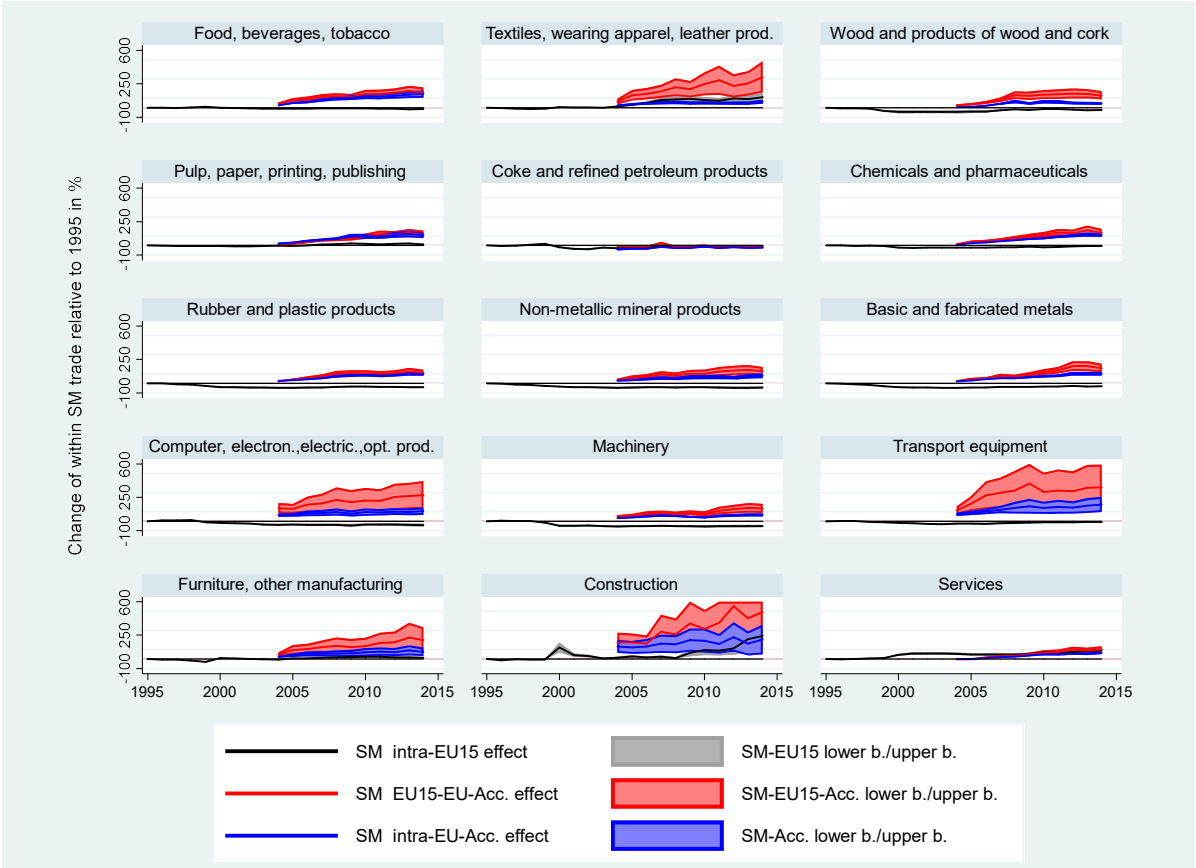
To summarise, the results reported in Figure 3.3 suggest relevant changes in the membership effects for the EU15 after 1995, when abolishing the poolability assumption for membership and accession effects. Based on this observation, the more parsimonious empirical specification displayed in Equation (3.1) does not seem to represent a meaningful approach for investigating the trade and welfare effects of the Single Market. This assessment is supported by the reported large positive gains for all members stemming from the enlargement of the Single Market in 2004, as indicated by the parameter estimates for the accession effects. In a next step and in order to obtain a reasonable empirical specification, we assess the accuracy of Equation (3.3) by comparing the estimates of this specification with the ones from an even more finely-grained model setup.

As discussed, the accession effects identified can be explained by either a change in trade flows between the accession economies and/or changes in the trade relationships between the new and old member states. Equation (3.4) allows to separate these effects by splitting the overall accession effect into an effect for bilateral trade of country-pairs containing two new member states and an effect for trade between the new and old member states.

The first observation which becomes visible from Figure 3.4 is that the black line denoting the Single Market membership effects for the EU15 economies and the corresponding grey confidence intervals remain virtually unchanged by splitting-up the accession effect into the trade effects for bilateral trade between new with new members and new with old member states. This suggests that the results discussed in Figure 3.3 might serve very well as a baseline for further analysis.

The red lines and confidence bands depicted in Figure 3.4 correspond to the trade effects between the accession countries and the EU15, while the blue line and blue dashed areas report the Single Market effects for bilateral trade flows between the accession economies. For eight out of the 13 considered manufacturing industries, the differences in the Single Market effects for these different bilateral trade flows are very moderate or almost zero. These industries include "Food, beverages, tobacco", "Pulp, paper, printing, publishing", "Rubber and plastic products", "Coke and refined petroleum products", "Chemicals and pharmaceuticals", "Basic and fabricated metals", "Non-metallic mineral products" and "Machinery". In addition to this, for trade in services the difference in the growth pattern of Single Market trade of and with the accession economies is also only of minor importance.

Figure 3.4: Evolution of Single Market trade effects: heterogenous accession effects



Source: WIFO calculations.

For the remaining six industries we do observe some differences in the effects. In particular, in all of these industries, the effects for bilateral trade flows between new and old member states are larger compared to the Single Market trade effects for trade among the group of accession economies. However, in most cases the confidence intervals overlap each other so that we cannot rule out a homogenous trade effect stemming from the different trade relationships. In general, the finding suggests that the EU15 economies substantially benefited from EU enlargement in terms of fostering their trade relationships with the new members. Hence, parts of the negative effects visible for trade among the EU15 economies might simply be attributable to trade diversion from trade among the EU15 to increased trade with the Eastern European members. However, the blue lines also demonstrate positive and substantial trade effects for bilateral trade among the new members, which points to overall large and positive trade effects for the accession economies. The estimation results summarised in appendix A reveal 4-year pre-accession effects for accession countries for five industries including "Textiles, wearing apparel and leather production", "Computer and electronical equipment", "Transport equipment", "Furniture and other manufacturing industries" and to some extent "Machinery". The "Construction" sector is also characterised by positive pre-accession effects; however it is somewhat more volatile over time.

Table 3.2: Evolution of Single Market trade effects – summary of results

		Membership and accession effects				
		Positive and accelerating intra-EU15 effects/strong stimulus from EU15-Acc. bilateral trade effects	**Diminishing intra-EU15 effects/ strong stimulus from accession**	**Diminishing intra-EU15 effects/ partially compensating effects from accession**	**Diminishing intra-EU15 effects/weak stimulus from accession**	**Decreasing intra-EU15 effects/no positive stimulus from accession**
Overall pattern	**Positive and accelerating effects**	* Textiles, wearing apparel, leather products * Construction * Services * Furniture, oth. manufact.				
	Stable positive effects		* Food, beverages, tobacco * Pulp, paper, print., publishing * Computer, electronic., electric. and optical products * Transport equipment			
	Large positive beginning of period effects			* Chemicals and pharmaceuticals * Rubber and plastic products * Non-metallic mineral products * Basic and fabricated metals * Machinery		
	Negative/partly negative effects				* Wood, wood and cork products	
						* Coke, refined petroleum prod.

Source: WIFO calculations.

Table 3.2 summarises the main findings of this chapter by classifying industries into 5 distinctive groups according to the identified different growth patterns of within-Single Market trade. The first group of industries exhibits positive and accelerating Single Market trade effects over the period that derive from a combination of positive and accelerating intra-EU15 trade effects with strong increasing bilateral trade between EU15 and accession countries in the aftermath of the 2004 accession. "Textiles, wearing apparel and leather production" the "Construction" and the "Services" and the "Furniture and other manufacturing" are the industries belonging to this group. Acceleration of intra-EU15 trade after accession rounds may indicate important vertical linkages between the EU15 and accession countries that increase the competitiveness of the products in the EU15 economies. For the second group of industries, intra-EU15 trade effects have either dampened or partly dampened over the period considered, but they have been highly overcompensated by a strong stimulus from accession rounds that resulted in an overall very stable growth pattern induced by the Single Market. This has been the case for "Food, beverages, tobacco", "Pulp, paper, printing, publishing", "Computer and electronical equipment", and "Transport equipment". In the "Computer and electronical equipment" as well as the "Transport equipment" industries the positive accession effects were mainly due to increasing bilateral trade between the EU15 and accession countries. The next group of industries is characterised by large positive initial Single Market-induced trade growth patterns which diminished over time, mainly due to dampening growth contributions of intra-EU trade effects that have been counterbalanced by positive growth contributions from the several accession rounds. This holds for "Chemicals and pharmaceuticals", "Rubber and plastic products", "Non-metallic mineral products", "Basic and fabricated metals" and "Machinery". Finally, in the "Wood and products of wood and cork" industry, trade effects stemming from the accession of new members have not been strong enough to compensate for the dampening growth impacts of intra-EU15 trade. The "Coke and refined petroleum products" industry has generated dampening Single Market trade growth effects throughout.

Furthermore, the evidence documented in Figures 3.2 to 3.4, also leads one to conclude that the specification discussed in Equation (3.3) with the corresponding estimation results reported in Figure 3.3 will form the most useful gravity model specification for the follow-up empirical analysis, which will, in addition, account for general equilibrium effects forming the basis for various counterfactual policy analyses. The most parsimonious specification which pools all Single Market effects together is clearly mis-specified and would not allow to separate the heterogeneous EU Single Market membership and accession effects from each other. The specification suggested by Equation (3.4) is relatively complex and, comparing the findings from Figures 3.3 and 3.4, it becomes obvious that for most of the manufacturing industries it does not add a lot of additional insights. Since the manufacturing industries are at the centre of this study and additional data on the degree of harmonisation within these industries and compliance with the Single Market rules is mainly available for these industries, we prefer to apply the simpler specification in the proceeding analysis. This specification allows to accurately distinguish between membership and accession effects when quantifying general equilibrium effects based on conducted counterfactual policy analyses.

3.1.6. *General equilibrium Single Market effects on intra-EU trade*

While the analysis so far has given important insights into the evolution of realised Single Market membership and accession effects over the period 1995 to 2014, we now move on to present the related general equilibrium trade effects. Furthermore, to facilitate the interpretation and presentation of the results and to provide a more comprehensive picture, we further aggregate trade effects at the industry or industry-country dimension over time and structure the presentation along the lines of the resulting pattern of Single Market trade effects revealed in the previous subchapter.

The presented general equilibrium results take into account direct effects of EU integration as well as indirect Single Market ("second-round") trade impacts stemming from changes in income and relative trade costs. Formally, the latter are captured by the fixed effects that account for relative trade costs (the multilateral resistance terms) and incomes in the specified model (subchapter 3.1.2). Taking into account Single Market-induced changes in the multilateral resistance terms specified in the gravity model will provide overall general equilibrium trade effects from the Single Market for goods.

Theoretically, there are different potential sources for (likely opposing) general equilibrium effects that need to be considered. First and foremost, the formation of the Single Market might induce non-negligible trade diversion effects in the sense that increased trade within the Common Market

might come at the cost of a decline in imports from non-participating third countries. This lies in the nature of the Single Market, but might induce some trade-diversion-related inefficiencies. Put differently, Single Market members might trade more with each other only due to the elimination of trade barriers and might substitute otherwise more efficient trade with third countries only for this reason.

Another prominent channel for general equilibrium effects stems from income effects resulting from changes in trade with other Common Market members. Increased trade within the Single Market can be expected to generate positive income (and growth) effects for the member states and accession economies due to an increase in production for serving the new markets, which can now be supplied with goods in an almost frictionless manner due to Common Market regulation. This additional income in turn will be spent on both domestically produced and imported goods. This further contributes to an increase in bilateral trade flows within the Single Market but also for imports from third countries. The latter effect might be able to counterbalance the negative trade diversion effects discussed above.

Taking a general equilibrium perspective on trade theory, one needs to apply a model which additionally accounts for changes in the multilateral resistance terms of the specified gravity model and allows incomes to endogenously adjust to the trade flows estimated for the counterfactual scenarios of full legal harmonisation and perfect compliance. This report accounts for these general equilibrium effects within the structural gravity framework by applying the approach suggested in Yotov et al. (2016), which is termed the "full endowment general equilibrium effects" model. One limitation of this approach which should be mentioned is that, by relying on sectoral estimates in our approach and by basing the general equilibrium effects on a simple endowment economy, we need to assume constant industry shares in total production. Consequently, the production factors are assumed to be immobile across industries, and the reported effects need to be considered as lower bound estimates for the total effects stemming from the counterfactual scenarios.

Table 3.3: Single Market general equilibrium intra-EU trade effects by industry (average Single Market effect in %)

Evolution of Single Market effects	Industries	EU15	Accession countries	Total
Positive and accelerating intra-EU15 effects/ strong stimulus from EU15-EU-Acc. bilateral trade effects	Textiles, wearing app., leather p.	26.53	31.86	26.75
	Furniture, other manufacturing	13.18	36.54	14.27
Diminishing intra-EU15 effects/strong stimulus from accession	Transport equipment	16.38	84.95	20.41
	Food, beverages, tobacco	14.92	64.72	17.94
	Pulp, paper, printing, publishing	14.70	43.82	16.02
	Comp., electron., electric., opt. p.	4.11	72.02	8.48
Diminishing intra-EU15 effects/partially compensating effects from accession	Chemicals and pharmaceuticals	8.22	47.40	10.17
	Rubber and plastic products	-0.41	53.33	4.02
	Basic and fabricated metals	-0.30	54.18	2.59
	Machinery	-1.32	38.22	0.96
	Non-metallic mineral products	-2.16	49.53	0.87
Diminishing intra-EU15 effects/weak stimulus from accession	Wood, products of wood and cork	-0.97	35.15	1.51
Decreasing intra-EU15 effects/no positive stimulus from accession	Coke, refined petroleum products	-10.57	-14.07	-10.77
	Total	6.53	47.54	8.88

Source: WIFO calculations.
Notes: Average general equilibrium import effects from intra-EU trade in % of the counterfactual scenario of no Single Market.

Table 3.3. reports general equilibrium trade effects on intra-EU trade separately for EU15 and for accession countries by industry. Thereby, within-Single Market trade of EU15 and accession countries captures the overall effects for imports induced by Single Market integration, accounting for both the membership effects and accession effects identified in the previous chapter. As such, the reported figures for the EU15 members include intra-EU15 trade effects as well as induced bilateral trade between the EU15 and accession countries (i.e. imports of EU15 countries from accession countries). Results for the accession countries include trade between accession countries as well as induced trade between accession and EU15 countries (i.e. imports of accession countries from EU15 countries). The figures reveal Single Market trade effects based on a comparison of predictions from a counterfactual scenario of non-membership and non-accession with predictions from baseline estimates (realised Single Market-induced trade flows) over the period 1995 to 2014 for each industry. The bottom of the Table presents the total average effects over time, which are calculated as weighted averages of the trade effects of each industry in each member state and year. The weights are based on trade flows from the baseline scenario.

We find that the Single Market for goods induced an additional effect on Single Market trade by about 9% on average. Table 3.3 confirms the highly heterogeneous effects across country groups and industries and underscores the fact that Single Market-induced trade has mostly been driven by the accession of new members over the period 1995 to 2014. Accordingly, the trade effect on accession countries' imports of 47.5% clearly outweighs the effect for the EU15 member states' imports of 6.5%.

Furthermore, Table 3.3 groups industries according to the observed growth patterns summarised in Table 3.2 in the previous subchapter and shows that the largest Single Market trade effects are found in industries which benefited most from trade between the EU15 and accession countries. Accordingly, Single Market effects are highest in "Textiles, wearing apparel and leather", "Transport equipment", "Food, beverages, tobacco", "Pulp, paper, printing, publishing", "Furniture and other manufacturing industries". These correspond to the industries with the highest Single Market impact on the EU15 countries and – since the results reflect EU15 imports – are well in line with the expected competitiveness of accession countries in industries characterised by relatively higher intensities of low-skilled labour or the importance of vertical linkages such as in the transport industry. Similarly to EU15 Single Market trade effects, the "Transport equipment" and "Food, beverages, tobacco" industries reveal the largest growth rates in accession countries. However, in addition, strong growth effects are revealed for the "Computer and electronical equipment", "Basic and fabricated metals" as well as "Rubber and plastic products" industries. From these, the "Transport equipment", "Food, beverages, tobacco" and "Computer and electronical equipment" industries substantially benefited from bilateral trade effects between EU15 and accession countries.

As stated before, the weak overall Single Market effect for the EU15 countries partly reflects the fact that integration effects already materialised prior to the implementation of the Single Market Programme and/or prior to 1995, the start-year of the period analysed. To some extent this result also mirrors trade diversion from intra-EU15 trade towards trade with accession countries. Weak and partly diminishing membership trade effects driven by intra-EU15 imports are counterbalanced in all but one industry by positive stimuli from EU enlargement starting in 2004.

Finally, taking into account overall (direct and indirect) Single Market effects we still find clear and persistent dampening effects on trade in the "Coke and refined petroleum products" industry on the internal EU market. A more detailed view at the industry and country levels reveals that this finding is widespread across European member states, encompassing the EU15 as well as accession countries (see Table B3.1). Explanations for these clear and persistent adverse trade effects in the industry "Coke and refined petroleum products" are related to the sector's specific characteristics resulting from structural imbalances that are due to shifts in EU internal demand for petroleum products, increased global competition and directives and regulations with direct or indirect impacts on operations and the investment needs of the sector.[20] More specifically and against the backdrop of lower demand for gasoline and fuel oil and structural shifts in demand, the EU "Coke and refined petroleum product" industry has been characterised by the excess production of gasoline and insufficient supply of other products such as jet fuel, kerosene, diesel and heating oil. Extra-EU trade serves as a mechanism to correct for the imbalance, at the same time that refined products markets have changed from being mostly local to becoming more and more global. Furthermore,

[20] Including among others for example, EU Emission Trading System, Energy Efficiency Directive, Air Quality Directive or the Renewable Energy and the Energy Tax Directives.

while many EU-internal directives and regulations are an important source of benefits in terms of environmental goals and energy security (e.g. Renewable Energy Directive), they have partly also led to a loss of international competitiveness through increasing energy costs and compliance costs for the industry, reducing its competitiveness relative to other regions (Lukach et al., 2015).

To give a more detailed view, aside from the specific results for the "Coke and refined petroleum industry", Table 3.4 summarises the industry-country combinations with the 20 highest and lowest Single Market trade effects on imports excluding coke and refined petroleum products. In line with the finding at the industry level, "Transport equipment" in accession countries is identified as the industry with the highest trade effects. The overall largest Single Market impact in this industry resulted in the most recent acceding country Croatia (112.7%) being followed by Romania and Bulgaria (98.3% and 96.9%, respectively). At the low end of realised Single Market trade effects – again ignoring the highly adverse effects of the "Coke and refined petroleum products" industry – we find EU15 countries in the "Non-metallic mineral products", "Wood and product of woods" as well as in the "Basic and fabricated metals" industries. Germany ranks prominently within the Top-10 countries of highest dampening Single Market effects including the "Machinery" industry. These results suggest that the overall findings are driven by a pronounced redirection of trade dynamics from EU15 towards accession countries, as Germany is both an important provider of technology and an important partner in vertically linked production chains in the Central European production area. A detailed presentation of the Single Market trade effects for all country-industry combinations is given in Table B3.1 in the appendix.

Table 3.4: Single Market general equilibrium intra-EU trade effects: 20 highest and lowest country-industry effects excluding coke and refined petroleum products (average Single Market effect in %)

Highest effects				Lowest effects		
Croatia	Transport equipment	112.66		Greece	Non-metallic mineral products	-0.78
Croatia	Food, beverages, tobacco	98.32		France	Wood, prod. of wood and cork	-0.83
Romania	Transport equipment	96.92		Italy	Basic and fabricated metals	-0.83
Bulgaria	Transport equipment	92.97		Sweden	Non-metallic mineral products	-0.83
Croatia	Comp., electro., electric., opt. p.	86.44		Portugal	Non-metallic mineral products	-0.84
Czech Rep.	Transport equipment	84.87		Italy	Rubber and plastic products	-0.87
Malta	Transport equipment	84.29		Netherlands	Non-metallic mineral products	-0.89
Poland	Transport equipment	84.19		Austria	Non-metallic mineral products	-0.93
Cyprus	Transport equipment	83.71		Belgium	Non-metallic mineral products	-0.99
Slovakia	Transport equipment	83.18		Italy	Wood, prod. of wood and cork	-1.54
Croatia	Basic and fabricated metals	81.72		Germany	Basic and fabricated metals	-1.65
Estonia	Transport equipment	81.43		Germany	Wood, prod. of wood and cork	-1.69
Hungary	Transport equipment	81.42		United Kingdom	Non-metallic mineral products	-1.73
Slovenia	Transport equipment	81.34		Italy	Machinery	-1.86
Latvia	Transport equipment	81.27		France	Non-metallic mineral products	-2.10
Lithuania	Transport equipment	81.18		Spain	Non-metallic mineral products	-2.18
Croatia	Chemicals and pharmaceuticals	80.42		Germany	Rubber and plastic products	-2.19
Bulgaria	Comp., electro., electric., opt. p.	76.85		Italy	Non-metallic mineral products	-3.04
Romania	Comp., electro., electric., opt. p.	76.71		Germany	Non-metallic mineral products	-3.16
Romania	Food, beverages, tobacco	75.71		Germany	Machinery	-5.60

Source: WIFO calculations.
Notes: Average general equilibrium import effects from intra-EU trade in % of the counterfactual scenario of no Single Market.

3.2. Untapped trade and welfare potentials related to incomplete harmonisation and regulatory compliance

In this subchapter the border effects so far identified by the baseline gravity model will be related to indicators, revealing the degree of harmonisation legislation and compliance with Single Market rules described in chapter 2. To this end, the tailor-made gravity model specified in Equation (3.3) of subchapter 3.1.2 is modified and augmented by Single Market compliance indicators and will reveal to what extent integration deficits (remaining border effects) are related to incomplete harmonisation at the industry level, as well as the incomplete application and enforcement of Single Market rules across countries. Based on this, we identify untapped potentials of trade and welfare by applying counterfactual analysis using the different indicators on compliance and harmonisation and comparing the baseline estimates of the gravity model with a counterfactual scenario of full compliance and/or harmonisation.

In line with the selected policy indicators in chapter 2, the analysis first makes use of an indicator capturing the share of goods in each industry, which is harmonised from a legal point of view. As discussed in more detail in chapter 2, the Single Market regulations are not equally binding across different manufacturing industries. The production and sale of goods within the manufacturing industries investigated might either be governed by common rules across the whole EU (harmonisation legislation) or may come under national regulation only. Whenever the production of goods is regulated by common standards or these goods need to have the same technical specifications, the concerned industries are classified as harmonised, while production under national regulations is the case for non-harmonised industries. For the latter type of goods, the EU requires the national legislator to notify the respective standards to limit barriers to trade for these non-harmonised goods and to apply the mutual recognition principle.

From a policy point of view, the countries' compliance with requirements stipulated in horizontal pieces of Single Market legislation and the quality of enforcement of sectoral legislation is of major interest in this study. For this reason, the degree of harmonisation legislation of industries is combined with a number of indicators covering different but also interrelated aspects of Single Market compliance of the individual member states. Based on the selection made in chapter 2 these include indicators signalling legal enforcement barriers such as the degree of correct and timely transposition of EU directives into national laws, or the number of infringement proceedings related to misapplications of EU law. Misapplications of Internal Market rules directly related to cross-border problems of doing business are measured by the number of misapplications reported to SOLVIT and an indicator reflecting the solving capacity of the SOLVIT mechanism in preventing cross-border barriers rooted in misapplications of rules by national authorities. Last not least, indicators based on TRIS signalling the potential of new technical barriers by draft regulations at the EU national level are used. The TRIS database reports on notifications of new technical regulations as well as related comments and detailed opinions in case of regulations with a potential to create new barriers. A detailed description of all indicators as well as a descriptive analysis of each is provided in chapter 2.

The mentioned indicators are either only available at the industry (sector harmonisation indicator) or country level of disaggregation (all Single Market compliance indicators) and the gravity model needs to be adapted, accordingly. Most importantly, for the econometric analysis we pool together all industries and estimate the trade effects based on the variation of the respective indicators across industries or countries. In a first step, we estimate the trade and welfare effects stemming from differing degrees of harmonisation across manufacturing industries and apply the indicator capturing the share of goods in each sector, which is harmonised from a legal point of view. All other counterfactual scenarios applied in the analyses then jointly assume full legal harmonisation of goods production and trade together with perfect compliance with the rules of the Single Market. The results of the counterfactual analysis will highlight the largest untapped potentials by industry, country as well as industry-country combinations. Furthermore, the results for different compliance indicators applied will be presented in a comparative manner to provide guidance on which of the different dimensions of compliance covered by the different indicators are the most effective.

The modified empirical specification of the gravity model to take account of the policy and compliance variables as well as the econometrics are discussed in more detail in subchapter 3.2.1. Subchapter 3.2.2 outlines the empirical implementation of the model and discusses applied counterfactual scenarios. The presentation of results from the counterfactual analyses starts with a discussion of (partial equilibrium, first-round) direct trade effects in subchapter 3.2.3, while

subchapter 3.2.4 presents general equilibrium effects revealing overall trade effects for intra-EU trade as well as EU trade with third countries. The latter indicates the possible trade diversion effects of Single Market compliance. Finally, subchapter 3.2.5 highlights effects on welfare and subchapter 3.2.6 concludes.

3.2.1. *Modified gravity model for a deeper look at the Single Market trade effects*

The econometric approach discussed in detail in subchapter 3.1 serves as a starting point for a deeper look at the trade and welfare effects stemming from the formation of and the accession to the European Single Market for goods. To incorporate the effects of cross-industry or cross-county-time variation in Single Market legislation (i.e., the degree of product harmonisation within industries in legal terms) and compliance with the Single Market (e.g., the degree of transposition of EU legislation) we adapt the gravity model accordingly and apply the following modified version of Equation (3.3): [21]

$$
\begin{aligned}
s_{ijkt} = \exp\Bigg(& \sum_{l=1}^{19} \alpha_l \; B_{ij} t_l + \sum_{l=20}^{38} \alpha_l B_{ij} \log\left(dist_{ij}\right) t_{l-19} + \; \alpha_{39} B_{ij} RTA_{ijt} \; + \; \alpha_{40} B_{ij} EURO_{ijt} \\
& + \sum_{l=41}^{59} \alpha_l \; B_{ijk} \, \mathrm{SM_{ijk}} \, t_{l-40} \\
& + \sum_{l=60}^{78} \alpha_l \; B_{ij} \, \mathrm{SM_{ij}} \, HARMON_k \, t_{l-59} + \sum_{l=79}^{97} \alpha_l \; B_{ij} \, \mathrm{SM_{ij}} \, HARMON_k \, COMPLIANCE_j \, t_{l-78} \\
& + \sum_{l=98}^{108} \alpha_l \; B_{ij} \, \mathrm{ASM_{ij}} \, t_{l-97} + \sum_{l=109}^{119} \alpha_l \; B_{ij} \, \mathrm{ASM_{ij}} HARMON_k \, t_{l-108} \\
& + \sum_{l=120}^{130} \alpha_l \; B_{ij} \, \mathrm{ASM_{ij}} \, HARMON_k \, COMPLIANCE_j \, t_{l-11} \quad + \mu_{ijk} + \beta_{ikt} + \gamma_{jkt} \Bigg) \\
& + \eta_{ijkt}
\end{aligned}
\tag{3.5}
$$

There are three important differences of this specification, as compared to the models estimated in subchapter 3.1.

First, the individual industry data need to be pooled together, which adds industry indicator *k* to all variables included in the preferred Equation (3.3). s_{ijkt} now measures exports from country *i* to country *j* in industry *k* at year *t* normalised by total world production in industry *k* at year *t.* Pooling has the important consequence that the inward and outward multilateral resistance terms are now not only exporter and importer time-specific but also vary across industries within the exporter and importer countries. This is an important property as it allows to estimate general equilibrium effects based on counterfactual policy scenarios due to the theory-consistent consideration of heterogeneous inward and outward multilateral resistances at the relevant industry level of disaggregation. In a similar vein, the bilateral time-constant fixed effects are also industry-specific, accounting for unobservable time-invariant barriers for trade individually relevant for the different industries under empirical investigation.

Second, we extend the model to include the harmonisation indicator at the industry level and additionally add it to the border-time Single Market membership and accession interaction terms to estimate the impact of the degree of legal harmonisation within industries on within-Single Market bilateral trade flows. In this way, we are not just estimating pooled effects for Single Market membership and accession effects, but the overall effects also depend on the degree of harmonisation as reflected by the additional interaction terms reading as $\sum_{l=60}^{78} \alpha_l \; B_{ij} \, \mathrm{SM}_{ij} \, HARMON_k \, t_{l-59}$ and $\sum_{l=109}^{119} \alpha_l \; B_{ij} \, \mathrm{ASM}_{ij} HARMON_k \, t_{l-108}$, respectively. The

[21] The reported specification assumes that the compliance indicator would be available for the whole sample period lasting from 1995 to 2014. In case data are only available for a limited time span, the sample period is reduced accordingly and the number of parameters to be estimated also shrinks.

harmonisation indicator varies across industries and, consequently, the effects of Single Market membership and accession are heterogeneous based on differences in the degree of harmonisation.

Third, in modelling the trade effects of varying degrees of compliance of the member states with Single Market regulation we further extend the empirical gravity model to take into account the selected Single Market indicators and add $COMPLIANCE_j$ as a measure for compliance with Single Market regulation of the importing country j. Furthermore, two more sets of interaction terms which read as $\sum_{l=79}^{97} \alpha_l \; B_{ij} \; \mathrm{SM_{ij}} \; HARMON_k \; COMPLIANC_j \; t_{l-78}$ and $\sum_{l=120}^{130} \alpha_l \; B_{ij} \; \mathrm{ASM_{ij}} \; HARMON_k \; COMPLIANCE_j \; t_{l-119}$ are added, respectively. In this way, heterogenous effects of legal harmonisation due to differences in a country's compliance with the Single Market can be identified. Note that, despite pooling data across industries, the extended specification allows to estimate industry-specific parameters and to also calculate industry-specific counterfactuals. This is possible by including the industry-specific or country-specific policy variables which are interacted with our main sets of explanatory variables capturing the Single Market membership and accession effects which re-introduce industry and country variation.[22] Furthermore, the parameters associated with these quadruple interaction terms allow to estimate the effects of differences in compliance with Single Market regulation across countries separately for EU membership and accession. The remaining variables included in this specification are the same as discussed above.

3.2.2. *Counterfactual scenarios and empirical implementation*

The counterfactual analysis based on the gravity model specification outlined in the previous subchapter applies the indicator on the degree of harmonisation legislation across industries as well as five different compliance indicators derived in chapter 2: transposition, infringement proceedings, SOLVIT misapplication cases, SOLVIT solution indicator and TRIS comments and DOs. Based on the discussion there, we implement different counterfactual scenarios summarised in Table 3.5.

In a first scenario, trade and welfare effects are estimated by assuming that all industries are fully covered by EU harmonisation legislation ("full harmonisation"). All other counterfactual scenarios applied in the analyses then jointly assume full legal harmonisation of goods production and trade together with perfect compliance with the rules of the Single Market. Full compliance needs to be defined in different ways depending on the compliance indicator applied. With respect to transposition, full compliance is given in a scenario of complete (100%) transposition of EU directives into national law. The counterfactual scenario with respect to infringement proceedings assumes unnecessity of such proceedings, as all member states transpose EU directives correctly and do not misapply any of the rules. The counterfactual situation regarding the SOLVIT misapplication indicator assumes that there are no misapplication cases of Single Market rules by national authorities. Note that a scenario of a lack of misapplications might be due either to a non-existence of misapplications (in which case the effect is positive) or due to less effective detection/surveillance of such cases, including lower awareness on the part of business or the national authorities (negative effect). The same holds for the applied counterfactual scenario of the SOLVIT solution indicator which assumes that all complaints are solved. As for the TRIS indicator on the amount of Commission comments and DOs, the counterfactual situation assumes that no comments or DOs are necessary with respect to new draft technical regulations. Again, a scenario of zero comments and DOs could mean that national legislators preclude cross-border barriers right away, rendering comments or DOs unnecessary (positive effect), or that comments and DOs turn out to be an effective tool to prevent potential barriers and the scenario of "no comments or DOs" would have a negative effect.

[22] Pooling data across industries without adding these parameters would result in estimates of average effects across all industries, thus restricting the parameter to be the same across all considered manufacturing industries.

Table 3.5: Counterfactual scenarios

Indicator	Counterfactual scenario	Expected sign of effects/interpretation
Harmonisation	All industries are fully covered by harmonisation legislation	+ full EU-wide harmonisation of legislation in all industries
Transposition	Full transposition of Single Market directives into national legislation	+ timely transposition; directives notified or implemented by a given deadline
Infringements	No cases of infringement proceedings	+ correct transposition and lack of misapplications of EU law
SOLVIT misapplications	No cases of misapplications of Internal Market rules by public administrations	+ lack of misapplications
		- less effective detection and surveillance; lower awareness
SOLVIT solutions	All business cases of incorrect application of Single Market rules received by the lead centre resolved	+ effective solution capacity of SOLVIT
		- less effective detection and surveillance; lower awareness
TRIS comments and DOs	No cases of Commission comments or detailed opinions (DOs) on draft technical national regulations	+ compliance of national legislators in avoiding cross-border barriers in technical regulations right away
		- comments and DOs are effective in preventing technical barriers

Source: WIFO compilation.

In the empirical analysis, the gravity model specified is estimated for each of the indicators separately. This allows to keep the model tractable and can also be justified by the relatively strong correlation of the individual indicators (see chapter 2). Furthermore, this approach enables us to provide quantitative estimates for changes in compliance for each of the different compliance dimensions and to compare the effects across different indicators. Equipped with these numbers, this report provides a discussion on different trade potentials stemming from the alternative dimensions of compliance to foster the functioning of the Single Market for goods. The general equilibrium effects of trade as well as welfare effects will also be estimated for the five different empirical specifications and will provide detailed results at the detailed country-industry level of disaggregation.

The sample is restricted to the years 2004 to 2014 for comparability reasons. Some of the indicators such as e.g., the transposition of EU legislation would be available for earlier years (in this case of 1997 onwards), but to highlight the relative importance of the various dimensions of compliance we restrict the sample period to the same time period. Furthermore, the analysis puts a focus on manufacturing industries and presents results on the 13 manufacturing industries due to data limitations for the other sectors. For service industries, the Single Market is not binding in this regard, and thus no data on the degree of compliance is available. Excluding the services sector from the sample can further be motivated by the different patterns estimated for membership and accession effects for the services industries and by the fact that Single Market regulation mainly applies to the goods market. For the construction sector no data on the degree of harmonisation is available.

3.2.3. *Counterfactual results: direct trade effects of industry harmonisation and Single Market compliance*

As a first step, this subchapter presents results on direct (first-round) trade effects. More specifically, we identify untapped potentials of trade by applying counterfactual analysis using the different indicators on compliance and harmonisation and comparing the baseline estimation of the gravity model Equation (3.5) with a counterfactual scenario of full compliance/harmonisation. The presentation of results in this subchapter mainly focuses on the evolution of trade effects over time. The following points are important to the interpretation of results:

- The counterfactual scenario estimates capture direct partial effects for intra-EU trade and thus do not yet take into account general equilibrium effects (such as trade diversion effects or income effects from increased trade).
- The resulting parameters and direct trade effects from the counterfactual scenario are to be interpreted as changes in the induced effects of Single Market compliance over time relative to the first year (2004). Level effects are fully absorbed by the fixed effects in the specified gravity model. However, the latter will be taken into account of in the general equilibrium analysis to follow in consecutive analytical steps.
- The resulting direct trade effects reflect potentials of changing the harmonisation at the industry level as well as the compliance variables to full harmonisation and compliance by industry and country.

For each of the indicators, the results will be presented in figures that depict time-specific results within the respective industries and measure the additional time-specific impact of counterfactual scenarios assumed. Black lines summarise the results for (average) bilateral intra-EU15 trade flows and the red lines report the estimation results for trade of the accession economies with each other as well as bilateral trade between accession countries and the EU15 economies. Furthermore, for the assessment of counterfactual policy changes, we plot confidence bands for the estimated effects. These bands cover the 95% interval of the potential direct trade effects induced by the assumed (counterfactual) policy change. The grey band reveals the uncertainty in the trade effects related to intra-EU15 trade while the red band is associated with the accession effect for trade among the group of new member states as well as for trade relationships between old and new members. The smaller the bound, the higher the statistical significance of the reported results.

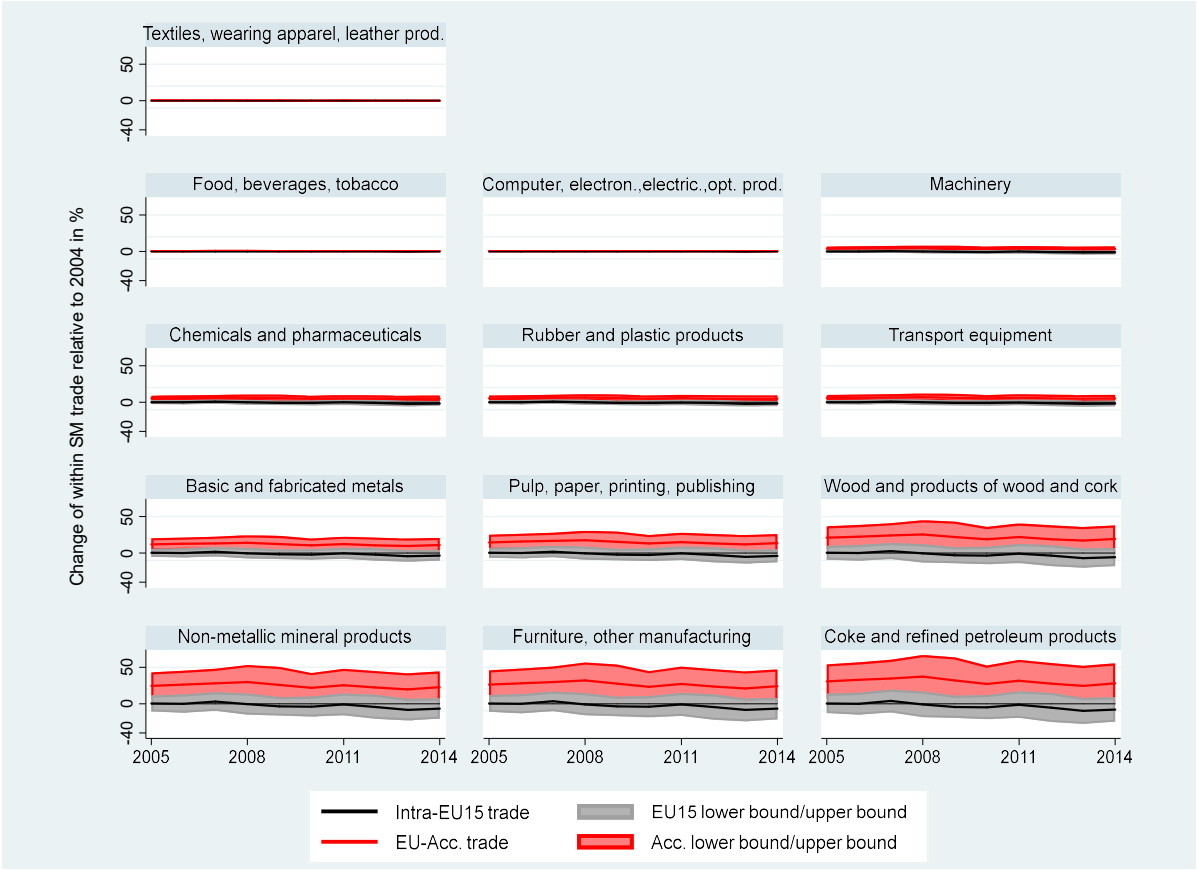
Direct trade effects of full industry harmonisation

As a first step, we estimate Equation (3.5) and discuss the estimation results for the potential direct trade effects stemming from a deepening of harmonisation of EU regulation within the Single Market. Figure 3.5 presents the calculated counterfactual (first-round) trade effects by setting the harmonisation indicator to 1 (i.e., full legal harmonisation) for all industries included in our analysis (13 manufacturing industries available in the WIOD database). They are based on estimating Equation (3.5), leaving out compliance indicators and the relevant interaction terms. In this way, the first counterfactual scenario analysis informs about the untapped potential trade gains stemming from the full harmonisation of all goods and product standards within the Single Market and offers insight into the consequences of shifting some more legislation from the member states to the EU level.

For three manufacturing industries, the estimation results are zero throughout. This is the case for "Food, beverages and tobacco", "Textiles, wearing apparel and leather production" and "Computer and electronical equipment". These three manufacturing industries are characterised by full harmonisation in the data which are used to construct the harmonisation indicator (subchapter 2.1). Therefore, all potential direct trade gains from legal harmonisation are already exploited and the counterfactual and ("in-sample") baseline estimates for bilateral trade flows are the same in our model.

For four additional manufacturing industries we only estimate very moderate potential trade gains from further legal harmonisation of goods traded within industries. This is the case for "Chemicals and pharmaceuticals", "Rubber and plastic products", "Machinery" and "Transport equipment". For all these industries, the dynamic harmonisation gains for trade between the initial EU15 member states are almost fully exploited, as indicated by the close-to-zero black lines. Regarding trade among and with the accession countries, as indicated by the red line, we do find slightly larger positive effects which point to some dynamic gains that could be materialised. The latter effects are also statistically different from zero, as indicated by the red confidence bands, while the effects for trade between the initial Single Market participants are indeed statistically not different from zero. These findings are in line with our discussion from above, which suggests that the Single Market can be especially favourable for trade relationships of and with the new member states. Here it is important to remember that the level effects of harmonisation are absorbed in the fixed effects and hence the general equilibrium effects could still be sizable. From Figure 3.5 we can only read that the effects do not vary strongly over time for the EU15.

Figure 3.5: Single Market trade potentials of full harmonisation



Source: WIFO calculations.
Notes: Industries are ordered by degree of harmonisation (Table 2.2 in chapter 2). Accession trade (EU-Acc. trade) includes bilateral trade among accession countries as well as trade between the EU15 and accession countries.

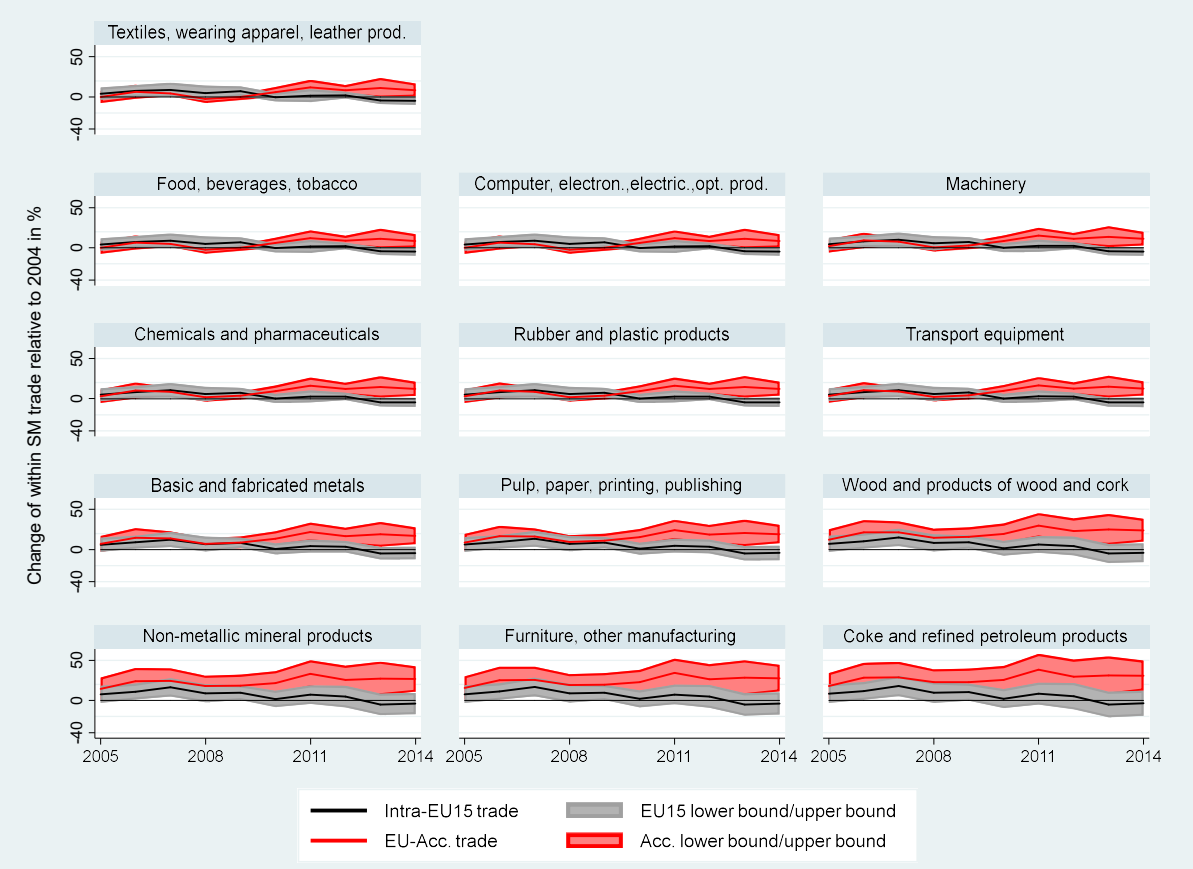
The remaining set of manufacturing industries exhibits the largest potentials for increased bilateral trade flows, which could be unlocked by further harmonisation of goods legislation. This group includes "Wood and products of wood and cork", "Pulp, paper and publishing", "Coke and refined petroleum products", "Non-metallic mineral products", "Furniture and other manufacturing goods" and "Basic and fabricated metals". Within these industries we also estimate some positive trade growth effects from harmonisation for trade among the EU15 economies especially for early years, which approach zero towards the end of the sample period. However, the relatively broad grey confidence intervals point towards substantial uncertainty of the results and imply that there are no effects for trade between the initial member states. On the other hand, the red lines indicate relatively large potential dynamic gains for trade flows among the group of accession economies and for trade between the new members and the initial EU15 member states. These effects are quantitatively relevant and persistent over time, which suggests that, at least for the six industries just mentioned, policy efforts that intend to further harmonise the production of goods could contribute to a "completion" of the Single Market by materialising gains from trade for the participating economies of the European Single Market. The confidence intervals for these effects are again relatively large, but still indicate that the effects are well above zero for all years as early as 2004 onwards. This allows us to conclude that the pure increase in the degree of harmonisation of goods produced would have the potential to increase within Single Market trade flows in these respective industries.

A change in the degree of legal harmonisation would be a policy decision to be taken at the European level and would (only) change the regulatory framework relevant for the production and trade of goods within the Single Market. Obviously, such a policy implementation would only have limited effects in case the member states refuse to comply with the imposed changes. Hence, it seems relevant to study the interaction between legal regulation (in terms of the degree of harmonisation) and the compliance of the member states with existing Single Market regulation. As a next step, we will explicitly study this interrelationship and will provide estimates for overall unexploited potentials for trade within the Single Market for goods stemming from incomplete harmonisation and compliance with the Single Market rules. This will be done step by step for each of the five selected compliance indicators.

Direct trade effects of full transposition of EU regulation

The transposition compliance indictor measures the share of transposed Single Market regulation into national laws. As usual the black (red) lines graphed in Figure 3.6 report on the potential trade effects for changes in (average) bilateral trade among the EU15 economies (trade among the accession economies and between the EU15 and accession countries). The corresponding 95%-confidence intervals are indicated by the grey and red shaded areas. The counterfactual scenario assumes that 100% of the EU directives are transposed into national legislation by every importing member and accession state, respectively, together with the full harmonisation of all goods to be produced. Only for the three industries "Food, beverages and tobacco", "Textiles, wearing apparel and leather production" and "Computer and electronical equipment" which are already characterised by full harmonisation the figure reports the sole impact of full compliance with Single Market regulation as indicated by 100% transposition of EU regulations, while for the remaining 10 industries the total trade effects capture a combination of both the compliance and harmonisation effects.

Figure 3.6: Single Market joint trade potentials of full transposition directives and full harmonisation



Source: WIFO calculations.
Notes: Industries are ordered by degree of harmonisation (Table 2.2 in chapter 2). Accession trade (EU-Acc. trade) includes bilateral trade among accession countries as well as trade between the EU15 and accession countries.

As indicated by the grey and red confidence bounds, a sole increase in compliance in terms of transposition of EU regulation would not have very strong time-varying effects for Single Market trade over time in the industries already fully harmonised. Especially for trade within the group of EU15 economies the grey confidence bounds always overlap with the zero-line, implying that we cannot reject a zero-growth effect of full transposition of EU regulation into national legislation for these three industries.

Adding the second dimension of the counterfactual policy scenario which combines perfect compliance with the full harmonisation of goods production in the remaining industries does not add much additional insight for the potential direct dynamic trade effects stemming from this counterfactual scenario. In most cases, the best estimates are somewhat larger, especially for trade with and within the group of accession economies, but the corresponding confidence intervals

are also inflated to a substantial degree. This suggests that additionally accounting for importer-specific variation in the transposition of EU regulation adds substantial uncertainty to the estimated trade growth effects for intra-EU15 trade. On the other hand, the point estimates for trade with and between accession economies point to a positive direction and are statistically significant for most of the considered manufacturing industries. From this finding, we may conclude that the time-varying direct trade effects of perfect transposition of EU regulations might be limited for intra-EU15 trade but relevant for trade within and with the group of accession economies. Note again that these estimates do not account for any general equilibrium effects which might still occur, especially due to potential level effects which are absorbed by the fixed effects. Hence, it will be important to consider general equilibrium impacts of transposition of EU regulations (subchapter 3.2.4)

Direct trade effects in a scenario of zero misapplication cases in SOLVIT

The SOLVIT database records the number of cases in which either individual customers or firms file a complaint against an importing member state. These complaints provide information on misapplications of Single Market rules by public authorities. As discussed in chapter 2, complaints issued by businesses are the most relevant for the analysis of this study.

In our first counterfactual analysis using data from SOLVIT, we apply the SOLVIT misapplication indicator. It measures the overall number of concerns raised by exporters from different countries regarding the tendency of an importing country to misapply Single Market regulation. In the counterfactual analysis we set the number of complaints put forward against an importing member state to zero, which would imply that all member states would not be suspected to misapply any EU Single Market regulations for trade-restricting purposes. In line with our discussion from above, we jointly implement this counterfactual, together with a scenario in which goods production would be fully harmonised. The results are reported in Figure 3.7. Again, since full harmonisation is already achieved in the "Food, beverages and tobacco", "Textiles, wearing apparel and leather production" and "Computer and electronical equipment" industries, the reported results for these industries are only driven by the counterfactual value assumed for the SOLVIT misapplication indicator.

The estimated time-varying trade potentials for these industries are relatively small (Figure 3.7). In contrast to results of the other indicators, full elimination of any misapplication cases would not have larger impacts for trade related to EU accession at the beginning of the sample period. The estimates are very similar for intra-EU15 trade and trade involving accession economies, and only by the end of the sample period do they begin to diverge, while statistically not different from zero. As for most direct trade effects reported, these findings suggest relatively time-constant trade effects stemming from a counterfactual situation of zero misapplication complaints.

For the rest of the manufacturing industries considered, the counterfactual elimination of misapplication cases in combination with the full harmonisation of goods production results in statistically significant estimates. The quantitatively largest trade-growth-enhancing effects are estimated for "Non-metallic mineral products", "Coke and refined petroleum products" and "Furniture and other manufacturing", which reach their maximum around 2009. For these industries we identify slightly statistically significant counterfactual scenario estimates reported for some of the effects for the early years. Furthermore, for five industries the confidence bounds for trade related to accession economies are always above zero, indicating additional effects for trade over time, which would be induced by a lack of misapplications of Single Market rules. Reducing the number of misapplication cases (recorded in SOLVIT) would indeed contribute to a reduction in trade frictions within the Single Market, with lasting direct trade effects not only for the overall level but also for growth in trade flows. The overall assessment is again relegated to the analysis of general equilibrium effects.

Figure 3.7: Single Market joint trade potentials of zero misapplication cases in SOLVIT and full harmonisation

Source: WIFO calculations.
Notes: Industries are ordered by degree of harmonisation (Table 2.2 in chapter 2). Accession trade (EU-Acc. trade) includes bilateral trade among accession countries as well as trade between the EU15 and accession countries.

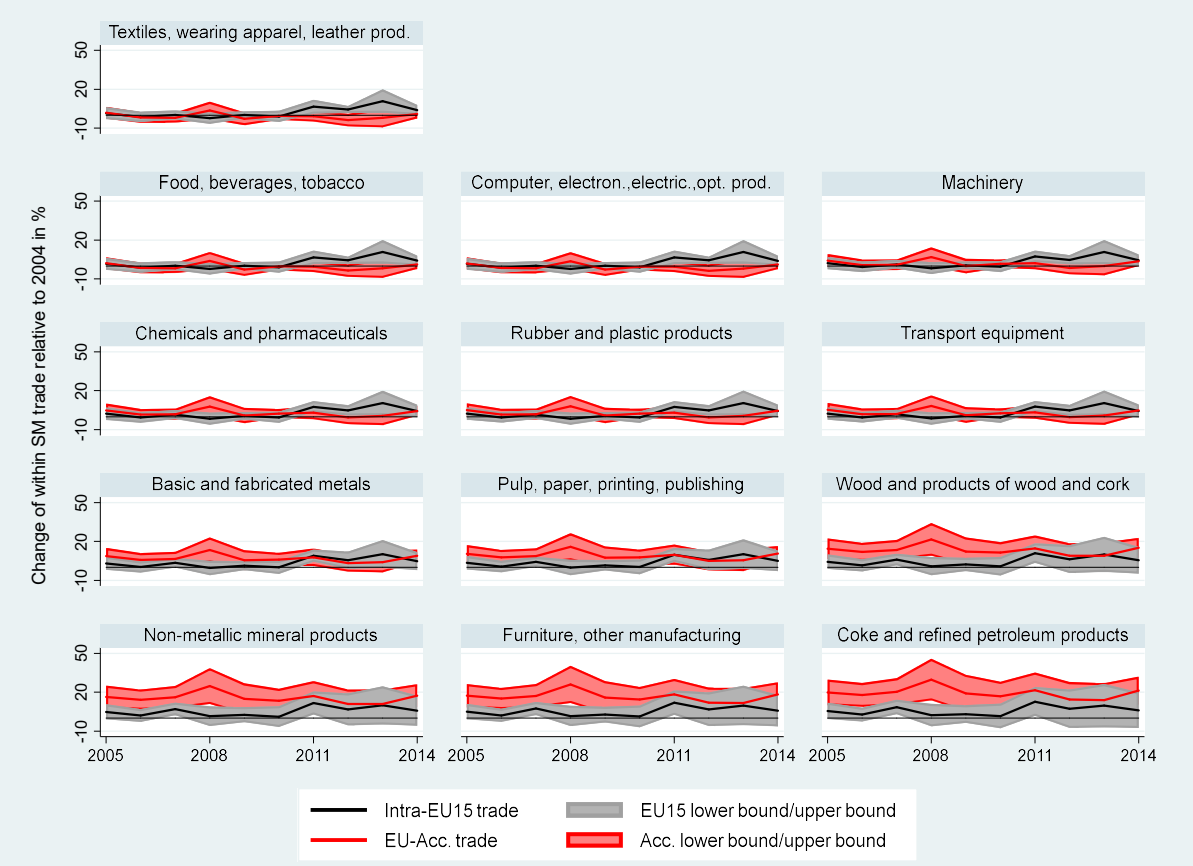
Direct trade effects of solving all misapplication cases in SOLVIT (SOLVIT solution indicator)

The next counterfactual scenario applies a measure that is also based on information provided in the SOLVIT database but goes beyond the pure number of misapplication cases filed by business against an importing Single Market member state. As discussed in chapter 2, the SOLVIT database also offers information on the number of misapplication complaints which were successfully solved within the same calendar year. The constructed SOLVIT solution indicator measures the share of solved cases in the overall number of complaints against an importing country. It signals the complaints-solving-capacity of an accused importing country, while a low value could also indicate less surveillance effort or less awareness of SOLVIT by business. The proposed counterfactual scenario assumes that all the member states would be able to solve all complaints within the same year. The estimation results based on this scenario are reported in Figure 3.8 and are again combined with the full legal harmonisation scenario. Accordingly, the results for "Food, beverages and tobacco", "Textiles, wearing apparel and leather production" and "Computer and electronical equipment" reflect the sole impact of a 100% solving success of the complaints put forward by firms. For all other industries, the effect of a full harmonisation of goods production adds to the estimates.

For the three industries which are already fully covered by EU harmonisation legislation, the time-varying effect of perfect complaints-solving-capacities seems to be limited. The annual parameter estimates are statistically not different from zero throughout, as indicated by the confidence bands. Interestingly, however, the point estimates suggest that the potential from solving a larger share of business complaints due to misapplication of the Single Market rules are larger for intra-EU15 trade, especially in the second half of the sample period. For the remaining other industries, we mainly identify a different picture. Especially for "Wood and products of wood and cork", "Coke and refined petroleum products", "Non-metallic mineral products", "Pulp, paper, printing and publishing", "Basic and fabricated metals" and "Furniture and other manufacturing" are the

estimated effects larger for trade with and among EU accession economies, and only for this group are the effects are statistically different from zero. Around the year 2008 the estimated additional trade gains from this counterfactual are the largest. Across industries, trade involving accession economies would benefit most from increased abilities to solve misapplication complaints successful in the industries "Furniture and other manufacturing", "Coke and refined petroleum products" and "Non-metallic mineral products".

Figure 3.8: Single Market joint trade potentials of solved missapplication cases in SOLVIT and full harmonisation



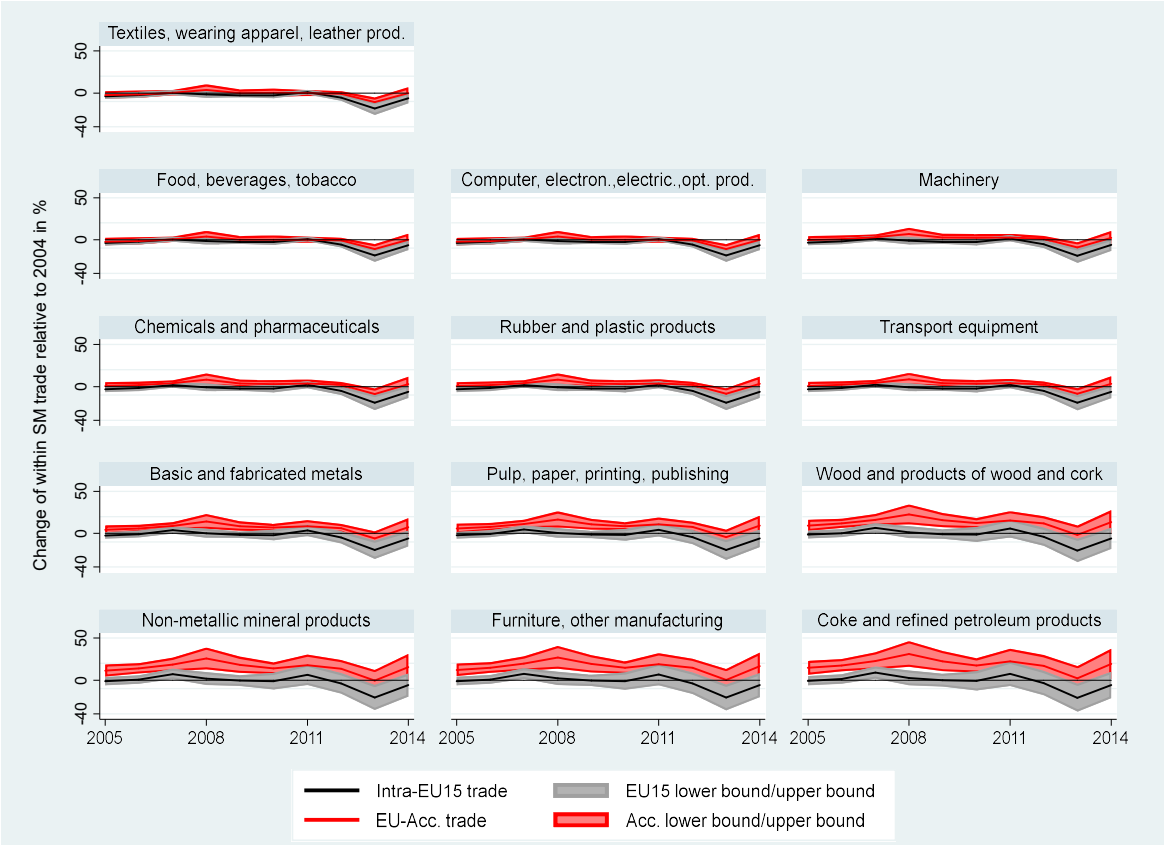
Source: WIFO calculations.
Notes: Industries are ordered by degree of harmonisation (Table 2.2 in chapter 2). Accession trade (EU-Acc. trade) includes bilateral trade among accession countries as well as trade between the EU15 and accession countries.

To briefly summarise, the estimates suggest that both reducing the need for issuing complaints and a more successful solving of such business cases indeed has the potential to contribute to the completion of the Single Market. The estimates suggest that dynamic trade effects could be materialised, implying that not only the level but also the growth of trade flows within the Single Market could be increased. In terms of direct trade effects and their evolution over time, the trade relationships within and with the group of accession economies could benefit the most from a reduction in SOLVIT misapplications and a higher SOLVIT solution rate.

Direct trade effects from reducing the number of European Commission comments and detailed opinions on national notifications in TRIS

As discussed in detail in chapter 2, the European Commission and the other member states can issue comments or detailed opinions on compulsory notifications of new technical regulations whenever there is a belief that the new draft regulation might induce a technical barrier for trade. The amount of comments and DOs issued by the Commission are reflected in the TRIS indicator applied and reflect the potential for trade barriers in a specific importing EU country. The counterfactual scenario assumes that there is no need for the European Commission to issue any comments or DOs on draft national regulations. This would be the case whenever the member states do not issue such national regulations at all or these regulations would be designed in such a way that the European Commission does not identify any potential for a trade barrier resulting from the corresponding regulation.

Figure 3.9: Single Market joint trade potentials of no Commission statements on national regulations in TRIS and full harmonisation



Source: WIFO calculations.
Notes: Industries are ordered by degree of harmonisation (Table 2.2 in chapter 2). Accession trade (EU-Acc. trade) includes bilateral trade among accession countries as well as trade between the EU15 and accession countries.

The estimation results reported in Figure 3.9 again combine the impact of this counterfactual scenario with full harmonisation of EU legislation. The black lines and grey areas again depict the changes in Single Market trade over time for intra-EU15 trade, while the red line and confidence bounds correspond to the effects for trade growth with and within the group of accession economies. For the already fully harmonised industries the effects only capture the time-varying effects based on full compliance regarding national regulations while for the other 10 manufacturing industries we again obtain a combined effect.

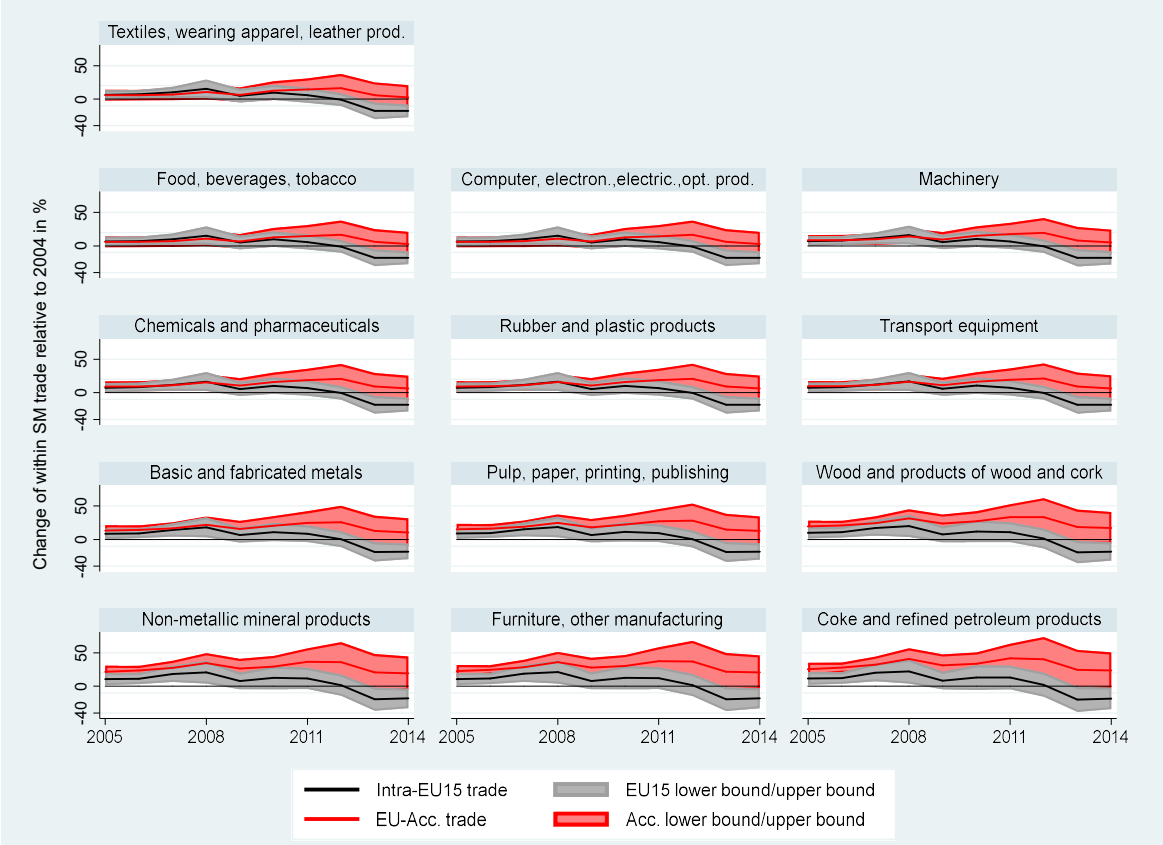
Starting with industries already fully harmonised ("Food, beverages and tobacco", "Textiles, wearing apparel and leather production" and "Computer and electronical equipment"), we find that effects are again relatively minor and statistically not different from zero. Therefore, as to these industries, we do not find evidence for a time-specific import growth contribution in a counterfactual situation in which none of the new technical regulations would result in EU comments or DOs. This again does not necessarily imply the non-existence of any level or aggregated effects to which we will turn in our general equilibrium analysis.

With regard to the other industries, we do observe more heterogeneity in the trade-enhancing effects over time, which are statistically significant for trade with accession economies and for the years from 2007 to 2009. Towards the end of the sample period, this increase vanishes over time, indicating that the effectiveness of such a combined policy change reduces gradually. Note again that the zero effects do not imply that there are no trade effects. They merely tell us that there are no additional trade-enhancing effects for the corresponding years. Again, and in line with most of the previous discussion, the additional gains for trade within the group of EU15 economies seems to also be fully exploited for such a counterfactual policy implementation, as indicated by the confidence intervals which overlap with the zero effect throughout.

Direct trade effects of eliminating the need for infringement procedures

The last considered indicator captures the number of infringement procedures issued against a member state. This indicator again only varies over the importing country. Figure 3.10 depicts the estimation results based on a counterfactual scenario for which we assume that not a single infringement procedure would need to be issued in any member state and all goods would be produced under fully harmonised regulation. Building on the discussion in chapter 2, it is again worth noting that infringement procedures are typically only issued in the case of more sever violations of Single Market rules and when other preventive mechanisms have not taken effect. This indicator might thus capture the most obvious and visible barriers for trade within the Single Market stemming from the incorrect transposition and misapplications of EU law.

Figure 3.10: Single Market: joint trade potentials of no infringements and full harmonisation



Source: WIFO calculations.
Notes: Industries are ordered by degree of harmonisation (Table 2.2 in chapter 2). Accession trade (EU-Acc. trade) includes bilateral trade among accession countries as well as trade between the EU15 and accession countries.

The estimation results for this counterfactual scenario are in line with previous ones. For the three industries that are already characterised by full harmonisation, the confidence bounds suggest only moderate time-specific variation in the trade effects over time. The effects for trade with and within accession economies seem to be larger, but also not statistically different from zero.

For the remaining 10 industries, the estimates of the time-varying effects tend to be larger in magnitude, but the confidence intervals have also widened. For some industries, the estimates for intra-EU15 trade as well as trade involving accession economies are statically different from zero for the first years of the covered sample period. This would suggest that being able to avoid infringement procedures has increasing effects for the considered import flows over time, which can be realised on top of any level effects. By the end of the sample period, the effectiveness of eliminating infringement procedures tends to decrease, as indicated by the declining and sometimes negative point estimates for intra-EU15 trade. However, these estimates are never statistically different from zero. From this we can conclude that reducing the need for infringement cases moderates additional effects over time on top of any level effects. The general equilibrium analysis discussed below will allow to assess the potential overall effects in more detail.

3.2.4. *Counterfactual results: general equilibrium effects on intra-EU trade and trade with third countries*

The counterfactual scenario estimates from the gravity models applied and presented in the previous subchapter 3.2.3 assuming full legal harmonisation together with full compliance based on the alternative compliance measures so far only capture direct partial effects ignoring (second-round) general equilibrium effects. As discussed in chapter 3.1.6, this can only provide an incomplete picture and, to arrive at overall results, trade diversion effects as trade potentially reallocates towards the Internal Market at the cost of extra-EU trade or trade-induced income effects are important sources for indirect effects on the evolution of trade that need to be taken into account. The analysis in this chapter again accounts for these general equilibrium effects by applying the approach suggested in Yotov et al. (2016), which is termed the "full endowment general equilibrium effects" model.

The general equilibrium results discussed below are based on the estimates which combine the full legal harmonisation scenario with perfect compliance for the variables discussed in chapter 2 and were already applied in the partial equilibrium analysis of subchapter 3.2.3. We thus provide general equilibrium effects for the transposition of EU legislation, the number of recorded misapplication complaints (SOLVIT misapplications), the share of solved misapplication cases (SOLVIT solution indicator), the number of opinions and comments issued by the European Commission on national regulations (TRIS indicator) and the number of infringement procedures initiated. All these indicators are importer-specific and thus our counterfactuals measure how full harmonisation and joint compliance of all EU Single Market members would change imports within the Single Market.

To present the results in a compact and clear way, we proceed as in chapter 3.1.6 and calculate overall trade effects for each industry and country by aggregating the level-specific and time-specific effects (reported in the Figures above) into one overall measure. The resulting effects will further be aggregated either at the industry or country dimension, allowing to identify the most affected manufacturing industries and countries, respectively. In addition to this and for all considered counterfactual scenarios, we provide a list of the 10 country-industry combinations with the highest and lowest expected general equilibrium trade effects. In terms of outcomes of interest, we report our findings for within-Single Market trade and imports from third countries. Furthermore, all effects are separately reported for the EU15 initial Single Market members and the accession economies. Note that, contrary to the presentation of results in the previous chapter, effects for EU15 countries not only include intra-EU15 trade, but also imports from accession countries. Effects for accession countries include trade between accession economies and imports from the EU15. Within the Single Market, trade captures the overall effects for imports stemming from perfect compliance within Single Market regulation together with the full harmonisation of all legislation for the production and trade of goods. The trade effects for imports from third countries aim at providing empirical evidence on the magnitude of trade diversion effects, which could materialize in the case of a completion of the European Single Market for goods.

In the following, we discuss the findings from the applied general equilibrium model and compare the overall trade effects for different counterfactual scenarios which assume perfect compliance with Single Market regulation and full harmonisation of production within the Single Market. We first discuss the overall potential for intra-EU trade effects and continue by presenting results on the trade of EU countries with third countries.

Counterfactual general equilibrium results on intra-EU trade: perfect compliance and full harmonisation

Table 3.6 reports the potential aggregated trade effects from the alternative full compliance with the Single Market scenarios for the 13 considered industries and separately for the 15 initial member states and trade of accession economies. The reported figures can be interpreted as potential long-run import effects and always assume full compliance with the Single Market regulations. The reported numbers are percentage changes in imports based on a comparison of the counterfactual predictions with the baseline estimates. As such, these numbers can be interpreted as potential changes in Single Market trade stemming from full compliance. The bottom of the Table presents the total effects, which are calculated as weighted averages for the trade effects of each industry in each single member state. The weights are based on trade flows from the baseline scenario.

Starting the discussion with the overall effects, the estimates suggest that, for trade within the whole Single Market, perfect compliance with the proposed regulation would indeed boost trade flows. All reported figures are positive, but the different compliance dimensions seem to matter in a heterogenous fashion. The largest trade potentials are identified for a counterfactual scenario in which no infringement proceedings would have to be initiated. Overall, if the Single Market could work without infringements, Single Market trade for the EU15 countries would increase by 7.45%. Single Market trade of the accession economies would gain by an even greater magnitude, amounting to 8.61%. These effects are followed by the effects for full transposition of EU legislation and by a reduction for the need to issue misapplication complaints, as recorded in the SOLVIT database. The capability to solve such cases more successfully would also induce positive, but smaller trade effects, while a full elimination of the need to issue comments or opinions on national regulations would have the smallest impact on within-Single Market trade. For EU15 trade within the EU, the effect of the TRIS indicator is close to zero, but would be negative for 8 out of 13 manufacturing industries. For the accession economies, the overall positive effect would be larger amounting to 3.85%, but our model also suggest trade-reducing effects for three industries. As discussed earlier (subchapter 3.2.2) trade reducing effects of the counterfactual change in the TRIS indicator suggest that comments and DOs are an effective tool with which to prevent barriers to trade, and any reduction in the Commission reactions as implied by the assumed counterfactual scenario would produce detrimental effects. In general, the Single Market trade effect for the group of the accession countries is larger throughout, pointing to higher potentials for trade.

Table 3.6: Single Market intra-EU trade potentials of counterfactual policy scenarios across industries (changes in %)

	Transposition indicator		Infringements indicator		SOLVIT misapplication indicator		SOLVIT solution indicator		TRIS indicator	
	EU15	Acc. count.	EU15	Acc. count.	EU15	Acc. count.	EU15	Acc. count.	EU15	Acc. count.
Text., wear. app., leath. prod.	2.47	4.65	5.75	4.34	1.82	1.47	0.49	-0.91	-2.79	-0.62
Food, beverages, tobacco	1.98	4.16	4.93	3.84	1.63	1.42	0.40	-0.67	-2.12	-0.20
Comp., electro., electric.,opt. p.	2.25	4.56	5.37	4.63	1.74	1.50	0.54	-0.79	-2.66	-0.78
Machinery	2.55	4.51	5.18	4.06	2.18	2.12	0.99	0.50	-1.22	0.90
Chemicals, pharmaceuticals	3.45	6.43	6.72	6.48	2.98	3.56	1.59	1.29	-1.19	1.56
Rubber, plastic products	3.05	6.04	6.01	6.03	2.69	3.32	1.49	1.17	-1.25	1.60
Transport equipment	3.21	6.08	6.07	5.94	2.75	3.35	1.62	1.32	-1.16	1.58
Basic, fabricated metals	4.96	9.41	8.14	9.58	4.45	6.33	3.10	3.98	-0.01	4.25
Pulp, paper, print., publ.	4.90	9.06	7.67	9.07	4.44	6.42	3.31	4.32	0.96	4.75
Wood, prod. of wood, cork	6.19	12.11	8.61	12.34	5.49	9.22	4.64	6.99	1.68	7.23
Non-metallic min. prod.	7.43	14.48	10.24	15.00	6.66	11.12	5.64	8.75	2.39	8.86
Furniture, other manufacturing	7.16	13.15	9.93	13.39	6.63	10.44	5.49	8.26	2.88	8.64
Coke, refined petrol. prod.	10.63	19.16	14.33	20.22	9.98	15.90	8.43	13.10	5.19	13.09
Total	4.55	8.58	7.45	8.61	4.04	5.73	2.86	3.56	0.10	3.85

Source: WIFO calculations.
Notes: Average general equilibrium import effects from EU trade with the EU15 and the accession countries in percent of the baseline scenario. Industries are ordered by the degree of harmonisation (Table 2.2 in chapter 2). Counterfactual scenarios are summarised in Table 3.5 in subchapter 3.2.2. They assume full transposition, no infringement cases, no misapplications of Single Market rules according to SOLVIT, full solution of incorrect applications according to SOLVIT, no European Commission comments or detailed opinions within TRIS.

Furthermore, Table 3.6 clearly documents heterogenous trade potentials stemming from full compliance across the 13 manufacturing industries under investigation. The largest overall trade potentials from full compliance could be materialised within the "Coke and production of refined petroleum products" industry. For this industry, the identified additional trade potentials vary between 5.19% for the EU15 and the elimination of a need for reactions of the European Commission to new technical regulations and 20.22% for the accession economies, in the case that no infringement cases need to be initiated. However, this result must be interpreted against the background of the sector's specific characteristics reviewed in chapter 3.1.6. Furthermore, Table 3.6 suggests that "Wood and production of wood and cork", "Non-metallic mineral products" and "Furniture and other manufacturing goods" exhibit the highest trade potentials, which could be materialised in case of increased compliance of the member states with Single Market rules.

By contrast, for the three industries which are already characterised by 100% harmonisation of the production of goods, the potential trade gains from increased compliance are relatively moderated (food, textiles and computers). This is particularly visible for the "Food, beverages and tobacco" industry, where for the EU15 the trade potentials are well below 2% in most cases. The infringements indicator builds the only exception where full compliance could boost EU15 Single Market imports by almost 5% in the long run. This last finding adds to the evidence provided above: that the need for infringement procedures is particularly harmful for trade within the Single

Market. Finally, the results for the TRIS procedure again indicate that the mechanism seems to be an efficient tool for avoiding the creation of new trade barriers within the Single Market for these industries. Counterfactually assuming that the Commission issues no comments or DOs would have trade-reducing effects for some key industries. including EU15 imports of "Chemicals and pharmaceuticals" or "Rubber and plastic products".

Table 3.7: Single Market intra-EU trade potentials of counterfactual policy scenarios across member states (changes in %)

	Transposition indicator	Infringements indicator	SOLVIT misapplication indicator	SOLVIT solution indicator	TRIS indicator
Austria	5.10	4.81	2.96	2.91	1.53
Belgium	6.01	8.20	2.79	2.49	0.86
Germany	4.19	7.33	4.06	2.69	-1.46
Denmark	2.90	2.68	2.78	2.89	0.22
Spain	4.25	9.13	6.29	2.67	-0.11
Finland	4.13	3.17	2.23	3.16	1.88
France	4.00	8.16	4.66	2.44	0.59
Great Britain	4.31	5.59	2.22	3.68	0.77
Greece	5.17	8.65	3.03	3.25	1.31
Ireland	3.78	5.07	2.51	3.44	2.50
Italy	6.01	10.57	5.06	3.00	-0.88
Luxembourg	5.64	3.58	2.86	3.27	1.25
Netherlands	4.02	5.12	3.73	2.64	1.73
Portugal	5.62	6.14	2.81	2.58	2.17
Sweden	3.45	4.17	2.83	2.68	1.70
Bulgaria	8.60	8.20	5.42	4.47	4.85
Cyprus	10.14	6.41	5.05	4.48	5.47
Czech Rep.	7.78	7.28	4.74	2.85	3.79
Estonia	7.09	6.36	5.03	4.01	4.85
Croatia	.	.	3.78	3.71	5.29
Hungary	7.27	6.65	4.36	3.27	2.31
Lithuania	7.14	6.12	5.10	3.78	4.24
Latvia	7.40	6.55	5.45	4.22	5.19
Malta	5.93	7.22	4.68	4.92	5.35
Poland	10.02	11.54	6.99	3.82	4.33
Romania	8.91	7.41	6.50	3.66	3.98
Slovakia	6.01	6.93	4.96	3.64	1.72
Slovenia	9.44	5.88	4.44	2.59	4.21
EU15	4.55	7.45	4.04	2.86	0.10
Accession countries	8.58	8.61	5.73	3.56	3.85

Source: WIFO calculations.
Notes: Average general equilibrium import effects from EU trade with the EU15 and the accession countries in percent of the baseline scenario. Counterfactual scenarios are summarised in Table 3.5 in subchapter 3.2.2. They assume full transposition, no infringement cases, no misapplications of Single Market rules according to SOLVIT, full solution of incorrect applications according to SOLVIT, no European Commission comments or detailed opinions within TRIS.

In a next step, we move to the trade potentials for the different member states of the Single Market. As already pointed out, trade effects across industries are largest for accession economies as a group, but of course also hold at the individual country level (Table 3.7). Furthermore, the general picture regarding the relative size of the effects of the different compliance indicators identified across industries also holds for the country level. The elimination of the need to initiate infringement procedures would induce the largest potential trade gains, followed by the timely transposition of EU legislation into national law. A reduction of misapplication cases, as recorded in the SOLVIT database, and increased SOLVIT problem-solving capacities would also add to an increase in Single Market imports, while reducing the number of comments and opinions from the European Commission within the TRIS would again have only relatively moderate effects. For some countries including Germany, Italy and Spain, the effect would be negative – again lending to an interpretation of the TRIS mechanism as an effective tool with which to prevent barriers, as discussed above.

The breakdown of the potential trade effects of better compliance by countries reveals some heterogeneity across countries, but in general all accession economies would benefit by a relatively larger magnitude. Across most indicators, Poland would lead the list of benefiting members. In case of a full transposition of EU legislation by all member states, Poland's imports could gain by more than 10% in the long run. The elimination of the need to issue infringement proceedings would have an even larger effect, amounting to 11.5%. Bulgaria, Slovenia and Slovakia would also be among the most strongly benefiting importing EU accession economies. Focusing on the initial EU15 member states, Italy shows the largest import potential stemming from better compliance with Single Market regulation, with this effect being particularly large for the infringement

counterfactual scenario. Accordingly, Italy's imports of manufacturing goods could in the long run be increased by more than 10.5% in a situation of zero infringements. For the other large EU member states such as Germany, France, the United Kingdom and Spain, the general equilibrium framework also identifies economically sizable import effects. The least benefiting initial member states would be Denmark with identified import potentials below 3% across all different compliance indicators.

Table 3.8a: Single Market intra-EU trade potentials of counterfactual policy scenarios: 10 highest and lowest country-industry effects (changes in %)

Highest potential				Lowest potential		
Transposition indicator						
Poland	Coke, refin. petrol. prod.	20.45		Sweden	Comp., electro. electr., opt. p.	1.17
Romania	Coke, refin. petrol. prod.	20.44		Denmark	Machinery	1.06
Slovenia	Coke, refin. petrol. prod.	19.73		Sweden	Text., wear. app., leath. prod.	1.03
Bulgaria	Coke, refin. petrol. prod.	19.61		Ireland	Food, beverages, tobacco	1.01
Cyprus	Coke, refin. petrol. prod.	19.32		Malta	Text., wear. app., leath. prod.	0.98
Czech Rep.	Coke, refin. petrol. prod.	18.41		Sweden	Food, beverages, tobacco	0.83
Hungary	Coke, refin. petrol. prod.	18.14		Malta	Food, beverages, tobacco	0.81
Estonia	Coke, refin. petrol. prod.	16.69		Denmark	Comp., electro. electr., opt. p.	0.68
Lithuania	Coke, refin. petrol. prod.	16.64		Denmark	Text., wear. app., leath. prod.	0.55
Latvia	Coke, refin. petrol. prod.	16.44		Denmark	Food, beverages, tobacco	0.43
Infringements indicator						
Poland	Coke, refin. petrol. prod.	23.16		Cyprus	Food, beverages, tobacco	0.80
Bulgaria	Coke, refin. petrol. prod.	19.78		Estonia	Food, beverages, tobacco	0.79
Romania	Coke, refin. petrol. prod.	19.45		Luxembourg	Food, beverages, tobacco	0.68
Czech Rep.	Coke, refin. petrol. prod.	18.81		Denmark	Comp., electro. electr., opt. p.	0.64
Hungary	Coke, refin. petrol. prod.	18.52		Denmark	Machinery	0.61
Slovakia	Coke, refin. petrol. prod.	18.34		Finland	Text., wear. app., leath. prod.	0.54
Malta	Coke, refin. petrol. prod.	17.82		Lithuania	Food, beverages, tobacco	0.43
Poland	Non-metallic min. prod.	17.65		Finland	Food, beverages, tobacco	0.29
Italy	Coke, refin. petrol. prod.	17.55		Denmark	Text., wear. app., leath. prod.	0.27
Slovenia	Coke, refin. petrol. prod.	16.90		Denmark	Food, beverages, tobacco	0.05
SOLVIT misapplication indicator						
Romania	Coke, refin. petrol. prod.	17.52		Ireland	Food, beverages, tobacco	-0.21
Poland	Coke, refin. petrol. prod.	17.03		United Kingdom	Text., wear. app., leath. prod.	-0.21
Bulgaria	Coke, refin. petrol. prod.	15.86		United Kingdom	Food, beverages, tobacco	-0.21
Slovakia	Coke, refin. petrol. prod.	15.01		Finland	Comp., electro. electr., opt. p.	-0.24
Czech Rep.	Coke, refin. petrol. prod.	14.86		Malta	Text., wear. app., leath. prod.	-0.28
Hungary	Coke, refin. petrol. prod.	14.76		Malta	Food, beverages, tobacco	-0.30
Lithuania	Coke, refin. petrol. prod.	14.26		Croatia	Comp., electro. electr., opt. p.	-0.36
Estonia	Coke, refin. petrol. prod.	14.25		Finland	Text., wear. app., leath. prod.	-0.40
Slovenia	Coke, refin. petrol. prod.	14.22		Finland	Food, beverages, tobacco	-0.42
Latvia	Coke, refin. petrol. prod.	14.17		Croatia	Text., wear. app., leath. prod.	-0.46
SOLVIT solution indicator						
Bulgaria	Coke, refin. petrol. prod.	14.44		Estonia	Text., wear. app., leath. prod.	-1.01
Romania	Coke, refin. petrol. prod.	14.05		Lithuania	Food, beverages, tobacco	-1.13
Malta	Coke, refin. petrol. prod.	13.71		Czech Rep.	Food, beverages, tobacco	-1.16
Slovakia	Coke, refin. petrol. prod.	13.09		Lithuania	Comp., electro. electr., opt. p.	-1.27
Poland	Coke, refin. petrol. prod.	13.08		Czech Rep.	Comp., electro. electr., opt. p.	-1.29
Hungary	Coke, refin. petrol. prod.	13.05		Lithuania	Text., wear. app., leath. prod.	-1.40
Estonia	Coke, refin. petrol. prod.	12.73		Czech Rep.	Text., wear. app., leath. prod.	-1.43
Cyprus	Coke, refin. petrol. prod.	12.72		Slovenia	Food, beverages, tobacco	-1.57
Croatia	Coke, refin. petrol. prod.	12.52		Slovenia	Comp., electro. electr., opt. p.	-1.75
Lithuania	Coke, refin. petrol. prod.	12.41		Slovenia	Text., wear. app., leath. prod.	-1.91
TRIS indicator						
Bulgaria	Coke, refin. petrol. prod.	14.63		Germany	Transport equipment	-2.81
Romania	Coke, refin. petrol. prod.	14.16		Slovakia	Text., wear. app., leath. prod.	-2.90
Malta	Coke, refin. petrol. prod.	13.92		Spain	Comp., electro. electr., opt. p.	-2.96
Cyprus	Coke, refin. petrol. prod.	13.52		Spain	Text., wear. app., leath. prod.	-3.10
Poland	Coke, refin. petrol. prod.	13.38		Italy	Food, beverages, tobacco	-3.12
Estonia	Coke, refin. petrol. prod.	13.37		Germany	Food, beverages, tobacco	-3.62
Slovenia	Coke, refin. petrol. prod.	13.26		Italy	Comp., electro. electr., opt. p.	-3.78
Latvia	Coke, refin. petrol. prod.	13.18		Italy	Text., wear. app., leath. prod.	-4.12
Czech Rep.	Coke, refin. petrol. prod.	13.10		Germany	Text., wear. app., leath. prod.	-4.32
Croatia	Coke, refin. petrol. prod.	12.98		Germany	Comp., electro. electr., opt. p.	-4.40

Source: WIFO calculations.
Notes: Average general equilibrium import effects from EU trade with the EU15 and the accession countries in percent of the baseline scenario. Counterfactual scenarios are summarised in Table 3.5 in subchapter 3.2.2. They assume full transposition, no infringement cases, no misapplications of Single Market rules according to SOLVIT, full solution of incorrect applications according to SOLVIT, no European Commission comments or detailed opinions within TRIS.

In Table 3.8a we combine both views and report on the country-industry combinations with the 10 highest and lowest trade potentials for each of the five different counterfactual scenarios for full compliance. This aims at highlighting exceptional cases, in terms of both potential gains and non-gains from policies trying to foster compliance with the Single Market. A summary of trade potentials for all country-industry combinations is provided in Tables B3.2 – B3.6 in the Appendix.

Not very surprisingly, the 10 highest trade potentials for all counterfactual scenarios are identified for the "Coke and refined petroleum products" industry. Furthermore, and also in line with all of the previous findings, the Top-10 countries in terms of trade potentials are EU accession economies throughout. This finding again suggests that the new member states would benefit the most from ongoing initiatives aiming at completing the European Single Market. The overall largest potential gain could be materialised in the Polish "Coke and refined petroleum products" industry, with an increase in long-run imports amounting to around 23% which could be exploited in the infringement counterfactual scenario.

Table 3.8b: Single Market intra-EU trade potentials of counterfactual policy scenarios: 10 highest country-industry effects excluding coke and refined petroleum products (changes in %)

Transposition indicator				Infringements indicator		
Poland	Non-metallic min. prod.	15.67		Poland	Non-metallic min. prod.	16.81
Romania	Non-metallic min. prod.	15.65		Poland	Furniture, other manu.	16.50
Slovenia	Non-metallic min. prod.	15.09		Poland	Wood, prod. of wood, cork	16.40
Cyprus	Non-metallic min. prod.	15.04		Bulgaria	Non-metallic min. prod.	16.27
Bulgaria	Non-metallic min. prod.	14.80		Romania	Non-metallic min. prod.	16.03
Poland	Furniture, other manu.	14.39		Czech Rep.	Non-metallic min. prod.	15.96
Romania	Furniture, other manu.	13.74		Hungary	Non-metallic min. prod.	15.31
Slovenia	Furniture, other manu.	13.72		Italy	Furniture, other manu.	15.17
Cyprus	Furniture, other manu.	13.68		Slovakia	Non-metallic min. prod.	15.14
Poland	Wood, prod. of wood, cork	13.56		Italy	Non-metallic min. prod.	14.86
SOLVIT misapplication indicator				SOLVIT solution indicator		
Romania	Non-metallic min. prod.	13.90		Croatia	Non-metallic min. prod.	12.38
Poland	Non-metallic min. prod.	13.76		Bulgaria	Non-metallic min. prod.	12.36
Poland	Furniture, other manu.	12.65		Romania	Non-metallic min. prod.	11.80
Romania	Furniture, other manu.	12.34		Malta	Non-metallic min. prod.	10.57
Bulgaria	Non-metallic min. prod.	12.31		Bulgaria	Furniture, other manu.	9.87
Romania	Wood, prod. of wood, cork	12.09		Malta	Furniture, other manu.	9.53
Poland	Wood, prod. of wood, cork	11.53		Cyprus	Non-metallic min. prod.	9.42
Croatia	Non-metallic min. prod.	11.42		Poland	Non-metallic min. prod.	9.36
Slovakia	Non-metallic min. prod.	11.05		Croatia	Furniture, other manu.	8.99
Czech Rep.	Non-metallic min. prod.	11.05		Slovakia	Non-metallic min. prod.	8.90
TRIS indicator						
Croatia	Non-metallic min. prod.	12.67				
Croatia	Furniture, other manu.	11.81				
Bulgaria	Non-metallic min. prod.	11.04				
Cyprus	Non-metallic min. prod.	10.84				
Malta	Non-metallic min. prod.	10.28				
Romania	Non-metallic min. prod.	10.05				
Bulgaria	Furniture, other manu.	9.66				
Croatia	Wood, prod. of wood, cork	9.62				
Cyprus	Furniture, other manu.	9.61				
Latvia	Non-metallic min. prod.	9.45				

Source: WIFO calculations.
Notes: Average general equilibrium import effects from EU trade with the EU15 and the accession countries in percent of the baseline scenario. Counterfactual scenarios are summarised in Table 3.5 in subchapter 3.2.2. They assume full transposition, no infringement cases, no misapplications of Single Market rules according to SOLVIT, full solution of incorrect applications according to SOLVIT, no European Commission comments or detailed opinions within TRIS.

As already stated in Chapter 3.1.6, the "Coke and refined petroleum products" industry represents a very special case and the results must be interpreted in light of these characteristic features. Leaving aside the results for this specific industry, the 10 highest trade potentials across different scenarios are found for "Non-metallic mineral production" as well as for "Wood and production of wood and cork" and "Furniture and other manufacturing goods" (Table 3.8b). In line with previous findings, the Top-10 countries are again dominated by the accession countries. The overall largest gain could be materialised in Poland in all three of these industries with potential increases in imports of about 17% in the infringement scenario. As soon as all member states would fully comply with Single Market regulation at least such that no infringement procedures would need to be initiated, these gains could potentially be materialised. Poland would also be among the most benefiting economies if all Single Market member states were to fully transpose all necessary EU regulations into national laws. Romania and Slovenia rank second and third but very closely behind Poland in these industries.

Focusing on the country-industry combinations with the smallest import potentials from the counterfactual scenarios in Table 3.8a, the picture is much more diverse, both in terms of the country coverage and the industries. In general, the industries with relatively small potentials are the ones with either full harmonisation already in place or with degrees of harmonisation that are close to 100%. This is not very surprising, as for these industries the counterfactual effects are (solely) driven by the impacts of compliance, while for industries with comparably low levels of

harmonisation the full harmonisation effect adds to the overall one. The group of countries ranking in the Top-10 in terms of lowest import potentials are dominated by EU15 member states but for some indicators the accession economies also seem to exhibit relatively small import potentials. Among these countries are Malta, Cyprus, Lithuania, Croatia and Lithuania.

Interestingly, for the scenario in which misapplication complaints are solved more effectively (SOLVIT solution indicator), only the accession economies are among the 10 country-industry combinations with the lowest trade potentials. An overall assessment suggests that, for the transposition and infringement counterfactual scenarios, the estimated import potentials are positive throughout, while for all other compliance indicators imports would decline at least for the Bottom-10 country-industry combinations. As discussed before, trade-reducing effects signal that a low number of misapplication indicators for these combinations might reflect less effective detection or low awareness of the mechanism on the part of business or national authorities.

Counterfactual general equilibrium results on EU trade with third countries ("trade diversion"): perfect compliance and full harmonisation

By focusing on the effects of the Single Market on EU trade with third countries, this subchapter reveals potential trade diversion effects that could be implied by full harmonisation within the Single Market and by better compliance of the member states with the rules of the Common Market. Imports from third countries could be diverted to member states only due to the nature of the Single Market, but not due to more efficient production within the Single Market. In studying potential trade diversion effects, this subchapter analyses the changes in imports of Single Market member states from third countries outside the Single Market. In line with the discussion from above, the next three tables assess the changes in imports across industries and countries and provides a Top-10 and Bottom-10 list for country-industry combinations.

Table 3.9: Single Market trade diversion potentials of counterfactual policy scenarios across industries (changes in %)

	Transposition indicator		Infringements indicator		SOLVIT misapplication indicator		SOLVIT solution indicator		TRIS indicator	
	EU15	Acc. count.	EU15	Acc. count.	EU15	Acc. count.	EU15	Acc. count.	EU15	Acc. count.
Text., wear. app., leath. prod.	-0.32	-0.89	-0.74	-0.97	-0.36	-0.37	-0.13	0.14	0.37	0.06
Food, beverages, tobacco	-0.39	-1.49	-0.85	-1.69	-0.44	-0.66	-0.23	0.22	0.65	-0.05
Comp., electro. electr.,opt. p.	-0.30	-0.95	-0.71	-1.09	-0.34	-0.40	-0.14	0.15	0.39	0.07
Machinery	-0.49	-2.74	-0.92	-3.04	-0.51	-1.58	-0.36	-0.44	0.69	-0.79
Chemicals, pharmaceuticals	-0.48	-2.20	-0.87	-2.50	-0.50	-1.40	-0.33	-0.54	0.50	-0.73
Rubber, plastic products	-0.54	-2.32	-1.06	-2.55	-0.57	-1.45	-0.36	-0.57	0.48	-0.79
Transport equipment	-0.55	-2.52	-1.05	-2.76	-0.57	-1.62	-0.36	-0.70	0.45	-0.87
Basic, fabricated metals	-0.65	-2.98	-1.12	-3.22	-0.69	-2.20	-0.46	-1.43	0.27	-1.57
Pulp, paper, print., publ.	-0.74	-4.30	-1.11	-4.77	-0.72	-3.31	-0.64	-2.20	0.33	-2.55
Wood, prod. of wood, cork	-1.11	-4.61	-1.73	-4.89	-1.13	-3.81	-0.85	-2.95	-0.07	-3.14
Non-metallic min. prod.	-1.09	-4.85	-1.71	-5.16	-1.18	-4.08	-0.84	-3.29	-0.12	-3.42
Furniture, other manufacturing	-1.11	-6.00	-1.59	-6.50	-1.11	-5.02	-0.94	-3.96	-0.03	-4.24
Coke, refin. petrol. prod.	-1.03	-4.80	-1.44	-5.24	-1.04	-4.14	-0.85	-3.37	-0.14	-3.45
Total	-0.68	-3.13	-1.15	-3.42	-0.71	-2.31	-0.51	-1.46	0.29	-1.66

Source: WIFO calculations.
Notes: Average general equilibrium import effects from the EU15 and accession countries trade with extra-EU countries in percent of the baseline scenario. Industries are ordered by the degree of harmonisation (Table 2.2 in chapter 2). Counterfactual scenarios are summarised in Table 3.5 in subchapter 3.2.2. They assume full transposition, no infringement cases, no misapplications of Single Market rules according to SOLVIT, full solution of incorrect applications according to SOLVIT, no European Commission comments or detailed opinions within TRIS.

Table 3.9 provides the estimation results for changes of imports from third countries across industries and separately for imports of the EU15 economies and accession economies. The identified changes in imports from the rest of the world are well in line with standard trade theory, which predicts that increased economic integration of some countries goes hand in hand with decreased imports from non-participating third countries. The proposed counterfactual scenarios all assume an increase in integration by fostering compliance with Single Market regulation together with the full harmonisation of production within the Single Market for goods. As compared to intra-EU trade effects, the reduction in imports from third countries is smaller. This is a first indication for an overall positive effect for the Single Market member states, as the total net trade effect will be positive. Furthermore, the additional incomes generated by the more efficient allocation of production within the Single Market are also partially used for imports from third countries, which dampens the negative export effects for these economies. In terms of relative magnitudes for the

EU15 and accession countries, the trade diversion effects are also very similar to the patterns revealed in the analysis of trade-creating effects for intra-EU trade flows. First, the negative effects are larger for third-country trade with the accession economies and relatively moderate for exports to EU15 destinations. Second, the trade diversion effects are largest for the "Non-metallic mineral production" and the "Coke and the production of refined petroleum products" industries. Third, "reverse trade diversion" is observable in the counterfactuals for the share of solved misapplication complaints cases in SOLVIT and for the comments and opinions issued from the European Commission with respect to draft regulations within the TRIS. Increasing compliance based on these two indicators would result in more imports from third countries in some industries, and this would be accompanied by a decrease in trade among Single Market member states. This would be the case for e.g. "Food, beverages and tobacco" imports in accession countries for the SOLVIT solution scenario and for transport equipment imports for EU15 economies for the TRIS comments and DOs counterfactual situation.

Table 3.10: Single Market trade diversion potentials of counterfactual policy scenarios across member states (changes in %)

	Transposition indicator	Infringements indicator	SOLVIT misapplication indicator	SOLVIT solution indicator	TRIS indicator
Austria	-0.81	-0.87	-0.48	-0.49	0.03
Belgium	-0.96	-1.30	-0.45	-0.43	0.26
Germany	-0.46	-0.98	-0.66	-0.36	0.36
Denmark	-0.45	-0.37	-0.50	-0.80	0.22
Spain	-0.64	-1.52	-1.52	-0.43	0.42
Finland	-0.68	-0.49	-0.25	-1.19	-0.19
France	-0.64	-1.29	-0.91	-0.44	0.36
United Kingdom	-0.63	-0.85	-0.18	-0.80	0.21
Greece	-1.34	-1.41	-0.46	-1.11	-0.09
Ireland	-0.77	-0.88	-0.37	-0.96	-0.29
Italy	-0.90	-1.66	-0.77	-0.46	0.51
Luxembourg	-1.50	-0.55	-0.46	-0.90	-0.08
Netherlands	-0.60	-0.81	-0.87	-0.26	0.00
Portugal	-1.37	-1.03	-0.46	-0.36	-0.23
Sweden	-0.69	-0.63	-0.38	-0.62	0.04
Bulgaria	-2.88	-3.11	-2.03	-1.74	-1.88
Cyprus	-3.64	-2.77	-2.11	-1.89	-2.20
Czech Rep.	-3.20	-3.02	-2.02	-1.31	-1.67
Estonia	-2.87	-2.74	-2.14	-1.80	-2.04
Croatia	.	.	-1.31	-1.09	-1.65
Hungary	-2.72	-2.80	-1.87	-1.33	-1.29
Lithuania	-2.69	-2.64	-2.09	-1.62	-1.91
Latvia	-2.99	-2.90	-2.43	-1.89	-2.21
Malta	-2.43	-3.01	-1.88	-1.87	-2.04
Poland	-3.49	-4.39	-2.77	-1.51	-1.74
Romania	-2.98	-2.85	-2.43	-1.48	-1.68
Slovakia	-2.44	-2.89	-2.11	-1.49	-1.12
Slovenia	-3.35	-2.54	-1.88	-1.28	-1.75
EU15	-0.68	-1.15	-0.71	-0.51	0.29
Accession countries	-3.13	-3.42	-2.31	-1.46	-1.66

Source: WIFO calculations.
Notes: Average general equilibrium import effects from the EU15 and accession countries' trade with extra-EU countries in percent of the baseline scenario. Counterfactual scenarios are summarised in Table 3.5 in subchapter 3.2.2. They assume full transposition, no infringement cases, no misapplications of Single Market rules according to SOLVIT, full solution of incorrect applications according to SOLVIT, no European Commission comments or detailed opinions within TRIS.

Table 3.10 presents trade diversion effects by member states. In line with the findings at the industry level, the effects for imports from third countries are again negative across most of the considered counterfactual scenarios and for the individual member states. The reduction in trade from non-Single Market participants is larger for the accession economies where Poland, Slovenia and Bulgaria are among the group of countries experiencing the largest declines in the imports from third countries. However, the estimated import effects are sometimes heterogenous across the different scenarios. In line with the findings on the Single Market trade effects, the largest reductions in imports from third countries are identified in the case of full transposition of EU regulations into national regulations and the elimination of a need for initiating infringement procedures.

For the EU15 economies, the overall import trade diversion effects are very moderate and, in most cases, somewhere between -0.51% and -1.15%. For long-run impacts of policy changes, these

diversion effects are extremely small and point to the fact that the EU15 economies are already very well integrated with each other. Reverse trade effects are also only estimated for EU15 economies and could only be materialised by reducing the number of comments and opinions on national regulations issued by the European Commission within the TRIS. This finding again suggests that comments and opinions are effective in preventing new trade barriers within the Single Market in EU15 countries. Counterfactually assuming fewer comments and DOs would then create new barriers, which would reduce the relative costs of imports from third countries –and thus we would expect more imports from outside the Single Market under such circumstances.

Table 3.11: Single Market trade diversion potentials of counterfactual policy scenarios: 10 smallest and highest country-industry effects (changes in %)

Smallest diversion			Highest diversion		
Transposition indicator					
Denmark	Food, beverages, tobacco	-0.06	Slovakia	Furniture, other manu.	-5.30
Denmark	Text., wear. app., leath. prod.	-0.07	Estonia	Furniture, other manu.	-5.43
Denmark	Comp., electro. electr.,opt. p.	-0.09	Latvia	Furniture, other manu.	-5.46
Germany	Comp., electro. electr.,opt. p.	-0.16	Hungary	Furniture, other manu.	-5.83
Netherlands	Text., wear. app., leath. prod.	-0.19	Bulgaria	Furniture, other manu.	-5.96
Denmark	Machinery	-0.19	Czech Rep.	Furniture, other manu.	-6.09
Netherlands	Comp., electro. electr.,opt. p.	-0.20	Romania	Furniture, other manu.	-6.16
Germany	Text., wear. app., leath. prod.	-0.20	Poland	Furniture, other manu.	-6.18
Netherlands	Food, beverages, tobacco	-0.21	Slovenia	Furniture, other manu.	-6.38
Germany	Food, beverages, tobacco	-0.22	Cyprus	Furniture, other manu.	-6.39
Infringements indicator					
Denmark	Food, beverages, tobacco	0.08	Poland	Wood, prod. of wood, cork	-5.77
Denmark	Machinery	0.01	Poland	Coke, refin. petrol. prod.	-5.83
Finland	Food, beverages, tobacco	-0.03	Poland	Non-metallic min. prod.	-5.87
Denmark	Text., wear. app., leath. prod.	-0.04	Slovakia	Furniture, other manu.	-6.02
Denmark	Comp., electro. electr.,opt. p.	-0.07	Malta	Furniture, other manu.	-6.03
Luxembourg	Food, beverages, tobacco	-0.09	Hungary	Furniture, other manu.	-6.11
Finland	Text., wear. app., leath. prod.	-0.11	Romania	Furniture, other manu.	-6.14
Finland	Machinery	-0.12	Czech Rep.	Furniture, other manu.	-6.15
Finland	Comp., electro. electr.,opt. p.	-0.13	Bulgaria	Furniture, other manu.	-6.33
Luxembourg	Text., wear. app., leath. prod.	-0.15	Poland	Furniture, other manu.	-7.29
SOLVIT misapplication indicator					
United Kingdom	Food, beverages, tobacco	0.18	Estonia	Furniture, other manu.	-4.59
Finland	Food, beverages, tobacco	0.18	Cyprus	Furniture, other manu.	-4.60
United Kingdom	Machinery	0.12	Slovenia	Furniture, other manu.	-4.66
Finland	Machinery	0.10	Latvia	Furniture, other manu.	-4.78
Finland	Text., wear. app., leath. prod.	0.09	Czech Rep.	Furniture, other manu.	-4.79
United Kingdom	Text., wear. app., leath. prod.	0.09	Hungary	Furniture, other manu.	-4.81
Finland	Comp., electro. electr.,opt. p.	0.07	Slovakia	Furniture, other manu.	-4.88
United Kingdom	Comp., electro. electr.,opt. p.	0.06	Bulgaria	Furniture, other manu.	-4.89
Malta	Food, beverages, tobacco	0.06	Poland	Furniture, other manu.	-5.30
Malta	Text., wear. app., leath. prod.	0.06	Romania	Furniture, other manu.	-5.43
SOLVIT solution indicator					
Slovenia	Food, beverages, tobacco	0.47	Lithuania	Furniture, other manu.	-3.87
Lithuania	Food, beverages, tobacco	0.38	Czech Rep.	Furniture, other manu.	-3.87
Czech Rep.	Food, beverages, tobacco	0.36	Estonia	Furniture, other manu.	-4.07
Slovenia	Comp., electro. electr.,opt. p.	0.30	Latvia	Furniture, other manu.	-4.07
Slovenia	Text., wear. app., leath. prod.	0.27	Slovakia	Furniture, other manu.	-4.08
Lithuania	Text., wear. app., leath. prod.	0.25	Hungary	Furniture, other manu.	-4.09
Poland	Food, beverages, tobacco	0.25	Romania	Furniture, other manu.	-4.18
Lithuania	Comp., electro. electr.,opt. p.	0.24	Cyprus	Furniture, other manu.	-4.20
Czech Rep.	Text., wear. app., leath. prod.	0.22	Malta	Furniture, other manu.	-4.38
Czech Rep.	Comp., electro. electr.,opt. p.	0.22	Bulgaria	Furniture, other manu.	-4.38
TRIS indicator					
Italy	Machinery	1.05	Croatia	Furniture, other manu.	-4.16
Spain	Machinery	0.97	Lithuania	Furniture, other manu.	-4.22
Italy	Food, beverages, tobacco	0.94	Czech Rep.	Furniture, other manu.	-4.32
Italy	Transport equipment	0.84	Estonia	Furniture, other manu.	-4.40
Germany	Food, beverages, tobacco	0.78	Slovenia	Furniture, other manu.	-4.43
Italy	Chemicals, pharmaceuticals	0.78	Latvia	Furniture, other manu.	-4.49
France	Machinery	0.77	Romania	Furniture, other manu.	-4.50
Spain	Food, beverages, tobacco	0.74	Cyprus	Furniture, other manu.	-4.61
Belgium	Machinery	0.72	Malta	Furniture, other manu.	-4.62
Italy	Rubber, plastic products	0.72	Bulgaria	Furniture, other manu.	-4.66

Source: WIFO calculations.
Notes: Average general equilibrium import effects from the EU15 and accession countries' trade with extra-EU countries in percent of the baseline scenario. Counterfactual scenarios are summarised in Table 3.5 in subchapter 3.2.2. They assume full transposition, no infringement cases, no misapplications of Single Market rules according to SOLVIT, full solution of incorrect applications according to SOLVIT, no European Commission comments or detailed opinions within TRIS.

Table 3.11 combines the findings from both dimensions of aggregation and lists the largest and smallest trade diversion effects for combinations of countries and industries. The left panel reports the smallest trade diversion effects, also including potential "reverse trade diversion" while the

right panel shows the largest potential trade effects. The largest trade diversion effects are reported for accession economies, while positive and reverse trade effects are more likely to occur for EU15 member countries. In terms of the largest declines in imports, the "Furniture and other manufacturing" industry now dominates the picture. In four out of the five counterfactual scenarios considered, the Top-10 list solely contains this industry. The largest decline in imports is recorded for the Polish "Furniture and other manufacturing" industry under the infringement counterfactual. In case of no initiated infringement procedures within the whole Single Market, the imports of goods in Poland and in this industry would amount to about -7.3%. This is followed by the decline in imports in the same industry in Cyprus in the case of full transposition of EU legislation, directly followed by a drop in Slovenia's imports of "Furniture and other manufacturing goods". For the latter country-industry combination, the decline in imports would amount to6.33%.

Looking at the smallest 10 trade diversion effects at the country-industry level of disaggregation, we find trade diversion effects throughout only for the transposition counterfactual scenario. This implies that a full transposition of EU legislation would, in any case, reduce imports from third countries. For all other compliance scenarios considered, at least some but mostly small "reverse trade diversion" effects can be observed. This effect would be largest for Italy and its imports of "Machinery" in case of the TRIS comments and DOs scenario. In general, in a comparison across indicators, positive trade diversion effects are the largest with respect to the TRIS counterfactual in EU15 countries. This finding underpins our previous conclusion that comments and DOs issued by the European Commission successfully avoid the introduction of new trade barriers in the EU15. In the absence of such reactions from the Commission, trade barriers might be implemented, which in turn reduce the relative costs of imports from third countries, increasing the imported quantities. As discussed before, positive trade diversion effects with respect to the SOLVIT indicators need to be interpreted as signalling less surveillance effort in the respective industry-country combinations. Again, trade potentials for all country-industry combinations are given in Tables B3.7 – B3.11 in the appendix.

3.2.5. *Counterfactual results: welfare effects from perfect compliance and full harmonisation*

For an overall assessment of the economic effects of better compliance with Single Market regulation, we calculate welfare effects by applying the approach suggested by Costinot and Rodríguez-Clare (2014). This measure is based on a heterogenous goods framework and exploits the assumed elasticities of substitution between goods for calculating the welfare gains stemming from a substitution of relatively more expensive domestic production by cheaper imports, which are generated by the mechanisms governing the European Single Market for goods. The resulting welfare effects can be interpreted as relative changes in real incomes. This measure can thus be interpreted as an estimate for the overall (long-run) income effects resulting from a full completion of the European Single Market for goods, which might be helpful for prioritising actions in this field of European economic policy making.

The magnitude of this effect crucially depends on the elasticity of substitution. In this application, we estimate the proposed general equilibrium model at the industry level, and we therefore also need elasticities of substitution at this level of disaggregation. Economically, it is not very plausible that these elasticities are homogenous across industries. For this reason, we scanned the economic literature on substitution elasticities and took the mean estimates from table 3.5a in Imbs and Mejan (2017) to calculate the below-reported welfare effects.

Table 3.12 reports the long-run welfare effects across industries and separately for the EU15 member states and the accession economies. Typically, the welfare effects obtained from a monopolistic competition framework are proportional to the general equilibrium import effects presented in the previous chapter. However, since the elasticities of substitution vary across industries, the quantitative findings from the welfare analysis might deviate from the results for the general equilibrium trade effects.

In line with almost all findings reported previously, the identified welfare effects are always larger for the group of accession economies. This again confirms the view that especially the new member states could benefit from better compliance of all member states with the regulation of the Single Market for goods. Furthermore, the largest total positive welfare effects are identified for the infringement and transposition counterfactual scenarios, respectively. Concentrating on these two scenarios, the welfare effects are particularly large for "Non-metallic mineral products, "Pulp, paper and printing" and "Wood and products of wood and cork". For the accession economies, both full transposition of EU legislation into national law and a dramatic decrease in the need to initiate

infringement procedures could in the long run increase real income in the just-mentioned industries in the accession economies by a magnitude of 2% to 3%. The effect might not sound very sizeable but, given that these effects can be materialised by extending harmonisation legislation for production together with compliance with Single Market regulations, the effects are economically relevant. Accepting the rules of the Single Market and complying with these should not be very costly and, therefore, these economic gains could be materialised based on only little effort.

Positive welfare effects would also be induced by a reduction of issued misapplication complaints, as recorded in the SOLVIT database. The total effect across all industries in the accession economies amounts to about 1.1% and real incomes on the EU15 economies could also be increased by about 0.3%. For remaining counterfactual scenarios, we only identify relatively moderate effects. A situation in which no Commission comments and DOs are issued on national draft regulations in the TRIS would be welfare-reducing for 10 out of 13 industries in the EU15 economies. The positive welfare effects for the accession economies are in total also rather small. As already discussed above, the reactions of the European Commission on national regulations seem to be effective in avoiding new barriers for trade; therefore, abolishing this practice would be welfare-reducing for most of the EU15 economies and to some extent in the accession economies.

Table 3.12: Single Market welfare potentials of counterfactual policy scenarios across member states (changes in %)

	Transposition indicator		Infringements indicator		SOLVIT misapplication indicator		SOLVIT solution indicator		TRIS indicator	
	EU15	Acc. count.	EU15	Acc. count.	EU15	Acc. count.	EU15	Acc. count.	EU15	Acc. count.
Text., wear. app., leath. prod.	0.08	0.21	0.16	0.45	0.08	0.17	0.03	-0.02	-0.09	-0.03
Food, beverages, tobacco	0.21	0.69	0.42	1.45	0.22	0.55	0.10	-0.06	-0.35	-0.08
Comp., electro. electr.,opt. p.	0.08	0.22	0.16	0.45	0.08	0.17	0.03	-0.02	-0.10	-0.04
Machinery	0.15	0.68	0.27	1.17	0.15	0.55	0.09	0.14	-0.20	0.12
Chemicals, pharmaceuticals	0.22	0.89	0.38	1.50	0.22	0.74	0.14	0.25	-0.23	0.22
Rubber, plastic products	0.25	0.89	0.43	1.50	0.24	0.75	0.15	0.25	-0.21	0.22
Transport equipment	0.11	0.48	0.20	0.78	0.12	0.41	0.07	0.15	-0.09	0.13
Basic, fabricated metals	0.28	1.10	0.45	1.64	0.28	0.98	0.18	0.55	-0.11	0.51
Pulp, paper, print., publ.	0.44	2.11	0.63	3.06	0.41	1.86	0.36	1.13	-0.19	1.10
Wood, prod. of wood, cork	0.54	1.95	0.80	2.63	0.54	1.81	0.40	1.26	0.03	1.23
Non-metallic min. prod.	0.66	2.46	0.99	3.28	0.71	2.35	0.49	1.68	0.09	1.64
Furniture, other manufacturing.	0.40	1.86	0.54	2.47	0.39	1.71	0.33	1.24	0.00	1.22
Coke, refin. petrol. prod.	0.36	1.49	0.48	1.94	0.35	1.38	0.29	1.04	0.05	1.01
Total	0.28	1.26	0.44	1.86	0.28	1.13	0.20	0.65	-0.12	0.62

Source: WIFO calculations.
Notes: Aggregated welfare effects in percent of the baseline scenario. Industries are ordered by the degree of harmonisation (Table 2.2 in chapter 2). Counterfactual scenarios are summarised in Table 3.5 in subchapter 3.2.2. They assume full transposition, no infringement cases, no misapplications of Single Market rules according to SOLVIT, full solution of incorrect applications according to SOLVIT, no European Commission comments or detailed opinions within TRIS.

In Table 3.13 we summarise the welfare effects by member states and (as usual) across the different counterfactual scenarios. As already mentioned above, the counterfactually assuming no cases of comments and opinions from European Commission on national regulations within the TRIS would induce a real income loss in all EU15 member states. The effects are not very large in economic terms but underscore the important role of the TRIS mechanism. The largest welfare gains would stem from a situation in which infringements become unnecessary.

Furthermore, and throughout the different counterfactual scenarios investigated, the positive real income effects can be expected to be larger for the accession economies. This finding is in line with the discussion on the time-varying trade effects from subchapter 3.2.3 and on the long-run general equilibrium trade effects discussed in subchapter 3.2.4. The most profiting accession economies would be Cyprus, Estonia, Latvia and Poland. Long-run real incomes could increase by 1.4% to 2.3% in these economies, if all member states perfectly comply in terms of the legal transposition of EU legislation into national laws or when no infringement procedures would need to be initiated. In these counterfactual scenarios, the welfare gains for any accession economy are always close to 1% or above, which indicates sizable potentials for these new member states. For the EU15 economies, the effects are quantitatively smaller, ranging between 0.3% and 0.6%. Effects across all scenarios are positive throughout. In EU countries, the scenario related to the TRIS indicator presents the only exception. Overall, this implies that better compliance with Single Market regulation would not imply a zero-sum game, but would rather have the potential to induce a Pareto improvement, at least for the Single Market member states. These welfare gains might come with some costs for third countries, but should be rather low in magnitude given the relatively small trade diversion effects.

Table 3.13: Single Market welfare potentials of counterfactual policy scenarios across member states (changes in %)

	Transposition indicator	Infringements indicator	SOLVIT misapplication indicator	SOLVIT solution indicator	TRIS indicator
Austria	0.42	0.53	0.35	0.29	-0.03
Belgium	0.39	0.54	0.29	0.24	-0.11
Germany	0.23	0.37	0.24	0.16	-0.12
Denmark	0.28	0.36	0.28	0.30	-0.14
Spain	0.34	0.59	0.47	0.24	-0.13
Finland	0.40	0.46	0.30	0.44	-0.01
France	0.30	0.49	0.33	0.20	-0.15
United Kingdom	0.32	0.44	0.23	0.30	-0.12
Greece	0.50	0.61	0.33	0.39	-0.03
Ireland	0.37	0.48	0.29	0.35	-0.01
Italy	0.32	0.51	0.29	0.20	-0.13
Luxembourg	0.58	0.51	0.37	0.38	-0.01
Netherlands	0.31	0.44	0.35	0.19	-0.08
Portugal	0.43	0.46	0.28	0.20	-0.01
Sweden	0.38	0.47	0.31	0.30	-0.05
Bulgaria	1.16	1.66	0.97	0.68	0.67
Cyprus	1.84	2.26	1.54	1.11	1.09
Czech Rep.	1.12	1.55	0.94	0.54	0.54
Estonia	1.64	2.16	1.51	1.12	1.09
Croatia	.	.	0.48	0.48	0.21
Hungary	0.87	1.30	0.76	0.43	0.36
Lithuania	1.40	1.89	1.30	0.91	0.89
Latvia	1.72	2.27	1.62	1.17	1.17
Malta	1.09	1.69	1.02	0.74	0.70
Poland	1.37	2.06	1.25	0.71	0.68
Romania	1.13	1.58	1.00	0.57	0.58
Slovakia	0.96	1.46	0.93	0.57	0.45
Slovenia	1.26	1.60	1.00	0.60	0.62
EU15	0.28	0.44	0.28	0.20	-0.12
Accession countries	1.26	1.86	1.13	0.65	0.62

Source: WIFO calculations.
Notes: Aggregated welfare effects in percent of the baseline scenario. Counterfactual scenarios are summarised in Table 3.5 in subchapter 3.2.2. They assume full transposition, no infringement cases, no misapplications of Single Market rules according to SOLVIT, full solution of incorrect applications according to SOLVIT, no European Commission comments or detailed opinions within TRIS.

In Table 3.14 we combine the industry and country perspectives on the potential welfare effects and report the 10 highest and smallest potentials for welfare gains stemming from the five counterfactual scenarios. In line with our previous discussion, the estimated welfare effects are always largest for the transposition and infringement scenarios, confirming the view that all individual industries and member states would benefit from better compliance with the Single Market rules with respect to these aspects. For the SOLVIT misapplication scenario our model suggests dampening welfare effects only for two country-industry combinations. This would be the case for "Textiles, wearing apparel and leather production" and "Computer and electronical equipment" in Croatia. However, these effects only amount to -0.01% which is negligible. For the last two counterfactual scenarios, the potential negative welfare effects would be somewhat larger. With respect to the TRIS indicator, the finding again underscores the role of TRIS in preventing barriers in the individual country-industry combinations. With regard to the SOLVIT indicators, the adverse welfare results point to the need to increase efforts to enhance the awareness of business to intensify reporting to the system at least for the indicated country-industry combinations.

Overall, the largest welfare gains are estimated for accession economies and the "Non-metallic mineral production". The overall largest long-run gains could be materialised in Poland in a scenario of no cases of infringement proceedings. In this scenario, Poland is followed by Malta, Hungary, and the Czech Republic but all Top-10 listed countries would experience a long-run welfare gain above 3%. Welfare gains would also stem from a full transposition of EU regulation into national laws and point to the potential of mere process-legal compliance. For the 10 listed accession economies, the welfare gains in this scenario are always above 2.3%. A reduction in initiated misapplication complaints as well as more efficient complaint-handling capacities could also induce some economically meaningful welfare gains. The smallest potentials stem from a reduction of comments and opinions issued by the European Commission. Detailed results for all country-industry combinations are presented in Tables B3.12 – B3.16 in the Appendix.

Table 3.14: Single Market welfare potentials of counterfactual policy scenarios: 10 highest and lowest country-industry effects (changes in %)

Highest potential				Lowest potential		
Transposition indicator						
Cyprus	Non-metallic min. prod.	2.57		Sweden	Comp., electro. electr.,opt. p.	0.08
Slovenia	Non-metallic min. prod.	2.56		Finland	Comp., electro. electr.,opt. p.	0.08
Czech Rep.	Non-metallic min. prod.	2.52		Spain	Text., wear. app., leath. prod.	0.08
Poland	Non-metallic min. prod.	2.46		Netherlands	Text., wear. app., leath. prod.	0.08
Hungary	Non-metallic min. prod.	2.45		Germany	Text., wear. app., leath. prod.	0.08
Estonia	Non-metallic min. prod.	2.40		Netherlands	Comp., electro. electr.,opt. p.	0.08
Latvia	Non-metallic min. prod.	2.40		Italy	Text., wear. app., leath. prod.	0.07
Slovakia	Non-metallic min. prod.	2.36		Denmark	Text., wear. app., leath. prod.	0.07
Lithuania	Non-metallic min. prod.	2.35		Germany	Comp., electro. electr.,opt. p.	0.07
Romania	Non-metallic min. prod.	2.35		Denmark	Comp., electro. electr.,opt. p.	0.07
Infringements indicator						
Poland	Non-metallic min. prod.	3.36		Germany	Comp., electro. electr.,opt. p.	0.15
Malta	Non-metallic min. prod.	3.17		Netherlands	Comp., electro. electr.,opt. p.	0.14
Hungary	Non-metallic min. prod.	3.15		Sweden	Text., wear. app., leath. prod.	0.14
Czech Rep.	Non-metallic min. prod.	3.15		Luxembourg	Text., wear. app., leath. prod.	0.13
Slovakia	Non-metallic min. prod.	3.15		Sweden	Comp., electro. electr.,opt. p.	0.13
Poland	Pulp, paper, print., publ.	3.14		Finland	Text., wear. app., leath. prod.	0.13
Slovenia	Non-metallic min. prod.	3.06		Luxembourg	Comp., electro. electr.,opt. p.	0.12
Latvia	Non-metallic min. prod.	3.06		Denmark	Text., wear. app., leath. prod.	0.12
Estonia	Non-metallic min. prod.	3.06		Finland	Comp., electro. electr.,opt. p.	0.11
Cyprus	Non-metallic min. prod.	3.05		Denmark	Comp., electro. electr.,opt. p.	0.11
SOLVIT misapplication indicator						
Poland	Non-metallic min. prod.	2.39		Sweden	Comp., electro. electr.,opt. p.	0.06
Slovakia	Non-metallic min. prod.	2.34		Ireland	Comp., electro. electr.,opt. p.	0.05
Latvia	Non-metallic min. prod.	2.33		United Kingdom	Text., wear. app., leath. prod.	0.05
Hungary	Non-metallic min. prod.	2.31		Finland	Text., wear. app., leath. prod.	0.05
Czech Rep.	Non-metallic min. prod.	2.30		United Kingdom	Comp., electro. electr.,opt. p.	0.05
Estonia	Non-metallic min. prod.	2.29		Finland	Comp., electro. electr.,opt. p.	0.05
Slovenia	Non-metallic min. prod.	2.29		Latvia	Coke, refin. petrol. prod.	0.04
Cyprus	Non-metallic min. prod.	2.28		Croatia	Food, beverages, tobacco	0.00
Lithuania	Non-metallic min. prod.	2.27		Croatia	Text., wear. app., leath. prod.	-0.01
Malta	Non-metallic min. prod.	2.26		Croatia	Comp., electro. electr.,opt. p.	-0.01
SOLVIT solution indicator						
Malta	Non-metallic min. prod.	1.82		Romania	Food, beverages, tobacco	-0.04
Cyprus	Non-metallic min. prod.	1.79		Estonia	Food, beverages, tobacco	-0.05
Estonia	Non-metallic min. prod.	1.78		Slovakia	Food, beverages, tobacco	-0.05
Latvia	Non-metallic min. prod.	1.77		Hungary	Food, beverages, tobacco	-0.05
Slovakia	Non-metallic min. prod.	1.76		Latvia	Food, beverages, tobacco	-0.05
Hungary	Non-metallic min. prod.	1.75		Poland	Food, beverages, tobacco	-0.06
Lithuania	Non-metallic min. prod.	1.73		Czech Rep.	Food, beverages, tobacco	-0.08
Slovenia	Non-metallic min. prod.	1.72		Lithuania	Food, beverages, tobacco	-0.09
Czech Rep.	Non-metallic min. prod.	1.71		Slovenia	Food, beverages, tobacco	-0.11
Bulgaria	Non-metallic min. prod.	1.69		Latvia	Coke, refin. petrol. prod.	-0.29
TRIS indicator						
Malta	Non-metallic min. prod.	1.76		Netherlands	Food, beverages, tobacco	-0.29
Cyprus	Non-metallic min. prod.	1.76		Sweden	Food, beverages, tobacco	-0.31
Latvia	Non-metallic min. prod.	1.74		Austria	Food, beverages, tobacco	-0.31
Estonia	Non-metallic min. prod.	1.73		United Kingdom	Food, beverages, tobacco	-0.32
Slovenia	Non-metallic min. prod.	1.72		France	Food, beverages, tobacco	-0.33
Lithuania	Non-metallic min. prod.	1.70		Denmark	Food, beverages, tobacco	-0.36
Bulgaria	Non-metallic min. prod.	1.69		Germany	Food, beverages, tobacco	-0.36
Czech Rep.	Non-metallic min. prod.	1.69		Spain	Food, beverages, tobacco	-0.36
Romania	Non-metallic min. prod.	1.66		Belgium	Food, beverages, tobacco	-0.37
Hungary	Non-metallic min. prod.	1.65		Italy	Food, beverages, tobacco	-0.40

Source: WIFO calculations.
Notes: Aggregated welfare effects in percent of the baseline scenario. Counterfactual scenarios are summarised in Table 3.5 in subchapter 3.2.2. They assume full transposition, no infringement cases, no misapplications of Single Market rules according to SOLVIT, full solution of incorrect applications according to SOLVIT, no European Commission comments or detailed opinions within TRIS.

3.2.6. *Summary*

This subchapter documents that the proposed gravity model and the general equilibrium framework applied allow to study the role of imperfect compliance with Single Market regulation for trade within the Single Market and the welfare of the Single Market member states. The findings documented in this report point to somehow heterogeneous effects of non-compliance. Nevertheless, the report is also able to identify some general and rather robust findings.

Firstly, manufacturing goods trade with and within the group of accession economies would benefit the most from increased compliance with Single Market regulation. In addition to this, an extension of the EU-wide harmonisation legislation of goods production would also contribute to a better

completion of the Single Market in terms of within-Single Market trade. Based on our estimates, Poland would hold the highest import potential in the case that all member states comply with Single Market regulation.

Secondly, the EU15 member states would also benefit from better compliance with Single Market regulation, but to a smaller extent than the accession economies. This points to the fact that the EU15 members are already very strongly integrated and most of the potentials stemming from the Single Market for goods are already exploited in trade relationships among this group of members.

Thirdly, when concentrating on different manufacturing industries, large not-yet-exploited trade potentials are identified for "Coke and production of refined petroleum products". This industry was identified as an industry with dampening Single Market trade effects so far. This has been related to specific characteristics of the "Coke and production of refined petroleum products" which include specific regulations and massive industry-restructuring dynamics observed over the sample period (see subchapter 3.1.6). Other industries with high trade potentials include "Wood and production of wood and cork", "Non-metallic mineral products" and "Furniture and other manufacturing goods". These effects are again most pronounced for imports of the accession economies. EU15 trade could gain the most in the "Chemicals and pharmaceuticals" and the "Rubber and plastic products" industries. By contrast, other industries that are already characterised by a large coverage of harmonisation legislation of goods production exhibit only relatively moderate unexploded trade potentials from more compliance with Single Market regulations. Among this group of industries are "Food, beverages and tobacco", "Textiles, wearing apparel and leather production" and "Computer and electronical equipment".

This chapter studied different dimensions of compliance with Single Market regulation. For this purpose, we made use of indicator variables that are available and typically record some form of potential non-compliance with regulation governing the Common Market. Unfortunately, these indicators are, in general, only available at the country level of disaggregation. Accordingly, the gravity model accounts for the information on non-compliance, such that it models importer-country-specific potential barriers for trade. Furthermore, some of these variables are only available from the year 2004 onwards, restricting the comparative analysis to the years 2004 to 2014. For a more precise assessment of the trade frictions induced by non-compliance with Single Market regulation, more detailed information at the country-industry level would be preferable and a longer time span of available data would also be beneficial.

Nevertheless, the gravity model analysis and the general equilibrium approach carried-out in this chapter already allow to highlight economically sizable within-Single Market trade and welfare effects. In particular, the results from two counterfactual (policy) scenarios highlight the potential for more trade among Single Market member states, which would be accompanied by economically sizeable welfare gains for the importing economies. These two scenarios assess the trade and welfare consequences of i) full transposition of all EU regulations into national law which point to the importance of mere process-legal compliance and ii) the unnecessity of infringement procedures against any member state which would signal correct transposition as well as a lack of misapplications of law. Under these two scenarios, intra-Single Market trade would substantially increase with the accession economies being the most benefiting importing member states. In most of these scenarios Poland would gain the most, followed by, e.g., Bulgaria, Slovenia, Slovakia and the Baltic member states. In these two counterfactual scenarios, the EU15 member states which have participated in the Single Market since its foundation would benefit less in terms of bilateral trade flows within this group, but would also experience positive import and welfare effects. However, they would additionally benefit as exporting economies trading with the accession member states.

The other three counterfactual scenarios also indicate positive trade and welfare effects, but the outcomes are more heterogeneous. As for the SOLVIT indicators, positive welfare and trade effects are associated with a lower number of misapplications as well as a higher share of solved misapplication cases. The analysis finds only some smaller negative welfare effects for some country-industry combinations with respect to both SOLVIT indicators, which at least for these combinations signal that detection and awareness of the mechanism should be improved. The counterfactual scenario which assumes that there are no cases of Commission comments and opinions on national draft regulations in the TRIS identified adverse trade and welfare effects for a large number of member states. Accordingly, imports of EU15 economies would decline while the positive trade gains for imports of accession economies are relatively small. This would be accompanied by a welfare loss for all EU15 member states. This finding clearly suggests that the practice of the possibility to report comments and opinions on national regulations is able to avoid

the establishment of new trade barriers within the Common Market and, therefore, contributes to completion of the Single Market for goods.

Coming back to the transposition and infringement counterfactual scenarios, our results suggest the possibility for Pareto improvements within the Single Market. The estimates indicate positive welfare effects for all industries and all member countries within the Single Market. This would come with some costs for third countries, which would experience some decline in their exports to Single Market member states. However, these trade diversion effects are relatively moderate and would be more than offset by trade among the Single Market participants.

Since the proposed counterfactual scenarios assume "perfect" compliance with Single Market regulation, the Pareto improvements could only be realised when policy coordination across member states would be able to increase joint compliance efforts. This fact leaves us with a game-theoretical problem, as each member state might face some incentives to deviate from the joint and coordinated efficient equilibrium. Whenever all other member states fully comply with the Single Market, the exporting member state would benefit in terms of increased exports but could find it profitable to engage in non-complying behaviour to shelter its industry from increased import competition. Hence, there is need to think about mechanisms which result in better compliance of the Single Market for all participants including the EU15 members and the accession economies. From a political economy point of view, this is certainly a difficult task, which might also be able to explain the observed non-compliance with selected issues of the Single Market by different member states.

4. THE SINGLE MARKET, TRADE, COMPETITION AND PRODUCTIVITY

This chapter examines benefits of the Single Market other than trade. More specifically, this chapter focuses on assessing the untapped competition and productivity benefits linked to the Single Market-induced trade effects estimated in chapter 3. The chapter is structured as follows. It begins with a summary of the relevant theoretical and empirical literature on the effects of trade liberalisation on prices, competition and productivity, which will guide the empirical analysis in the next stages (subchapter 4.1). The next subchapter (subchapter 4.2) presents and describes the data and summary statistics of competition and productivity measures by industry over time. In particular, the evolution of competition measures by industry identifies industries with different patterns over time – more specifically, industries with increasing, decreasing and unchanged competition levels. Further, correlations between trade, competition and productivity by industry provide a first indication of different patterns of structural links between these performance outcomes across industries. In the following subchapter (subchapter 4.3), an econometric analysis identifies the responsiveness of competition and productivity to intra-EU and extra-EU trade across all countries and industries and by industry across all countries. On the basis of these results and the estimated trade potentials in the scenario of full legal harmonisation and full compliance with the Single Market presented in chapter 3, counterfactual competition and productivity effects by industry, by country and by country-industry are obtained and discussed (subchapter 4.4). Finally, the last subchapter (subchapter 4.5) discusses these results in connection with the findings reported in chapter 3 and draws implications for policies in the context of the performance of the Single Market for goods; directions for future research are also proposed.

4.1. Theoretical and empirical background

The analysis in this chapter is based on insights from the recent theoretical and empirical literature on international trade with monopolistic competition and firm heterogeneity (Melitz and Ottaviano, 2008; Arkolakis et al., 2012; Behrens et al., 2014; De Loecker et al., 2016; De Loecker et al., 2018a, 2018b; Arkolakis et al., 2019). The key theoretical prediction of these models is that falling trade barriers lead to a more efficient allocation of resources, increased competition, lower marginal costs and higher productivity. However, firm heterogeneity implies that lower marginal costs may not be fully passed through to prices as firms increase their mark-ups. As a result, in the short run, as prices decline less than marginal costs, producers benefit more than consumers. However, in the long run consumers benefit from more product variety due to innovation, since higher mark-ups allow firms to innovate and introduce new products. A key feature of these models is variable mark-ups across firms within industries and across markets. The results of these new models suggest that welfare gains from trade liberalisation tend to be smaller than those obtained with models with constant mark-ups (Krugman, 1980; Eaton and Kortum, 2002; Melitz, 2003). The reason for this differential in welfare gains is that in models with constant mark-ups the pass-through of reductions in trade costs due to falling trade barriers to prices is complete (Arkolakis et al., 2012). Arkolakis et al. (2019) find that accounting for variable mark-ups in trade models reduces the gains from trade liberalisation compared to those predicted assuming constant mark-ups by up to 14%. Below, we review the main features and findings of this class of trade models with heterogeneous firms and variable mark-ups. This literature provides useful insights and evidence that helps to better understand the gap between expected and realised benefits of the Single Market.

Melitz and Ottaviano (2008) develop a model of trade with firm heterogeneity and endogenous monopolistic competition across markets in terms of the number and average productivity of competing firms. This modelling framework is then used to analyse the responsiveness of industry marks-ups, productivity and product variety to different trade liberalisation policies. The main prediction of the model is that larger, more integrated markets have higher aggregate productivity, more product variety and lower average mark-ups. The main channels through which these effects come about are the toughness of competition – the number and average productivity of competing firms – and the selection of heterogeneous producers into domestic and export markets. The model also shows that while trade liberalisation has pro-competitive effects in the short run due to increased import competition (with a fixed number of firms and productivity distribution given neither entry nor exit of incumbent firms), in the long run these effects may be reversed due to free firm entry and changes in the relative pattern of firm entry (entry in the bigger market becomes relatively more attractive). However, the model also shows that in the long run increased firm entry reinforces the pro-competitive effect of trade liberalisation and thus the liberalising countries also gain in the long run. In contrast to previous models with constant mark-ups

(Krugman, 1980; Eaton and Kortum, 2002; Melitz, 2003), the Melitz and Ottaviano (2008) model can account for variable mark-ups, which adjust depending on consumer demand and market structure. Other models with variable mark-ups include Bernard et al. (2003), Atkeson and Burstein (2008), Goldberg and Verboven (2005), Arkolakis et al. (2019), Mayer et al. (2014) and De Loecker et al. (2016).

Behrens et al. (2014) develop a general equilibrium model with heterogeneous firms and monopolistic competition, where they also consider the income effects of demand. Their model predicts that a larger market tends to have higher wages, higher productivity, greater consumption variety and lower mark-ups. Consistent with the Melitz and Ottaviano (2008) results, they find that trade liberalisation induces tougher competition, driving out less productive firms. Mark-ups in the domestic market are lower and consumers tend to have more choices in terms of product variety. Importantly, they further distinguish domestic competition from global competition for exporters. The model suggests that exporters may behave differently on the domestic market and the global market. As the trade cost declines due to trade liberalisation, the export cut-off of exporters falls, so that the shares of exporters go up. As a result, exporters may be able to charge lower mark-ups in the domestic market but higher mark-ups in foreign markets where they export. Moreover, the mark-ups of exporters may also diverge, due to their positions in exporting and the share of exporting over their total sales. Hence, the heterogeneity among firms increases. In addition, the model predicts that trade liberalisation would induce the convergence of wages, productivities and mark-ups between two economies which were asymmetric ex-ante.

Bellone et al. (2014) augment the Melitz and Ottaviano (2008) model with relative product quality where firms can choose the quality of their products. The effect of trade on competition is more complex as it does not only directly affect the cut-off of productivity, but also affects firms' decision on product quality. As a result of vertical product differentiation, the model predicts that the most productive firms will upgrade the quality of their products, whereas the least productive firms will lower the quality of their products. They also show the possibility that exporters charge different mark-ups between domestic and foreign markets. As import pressure from global competition may drive up product quality if domestic firms are relatively more productive than their foreign competitors, they argue that exporting firms may be able to obtain higher mark-ups in foreign markets in return.

De Loecker et al. (2016) examine the responsiveness of prices, mark-ups and marginal costs to falling tariffs for manufactured products following trade reforms. The empirical analysis is based on the 1991 episode of trade liberalisation in India. The key results of the analysis are obtained with variable mark-ups estimated by product at the firm level. The authors find that prices have declined during the trade reform in India (on average by 18%) but by much less compared to the reductions of marginal costs (on average by 31%). The marginal costs reductions have been found to be driven by lower tariffs for imported inputs. This incomplete pass-through of lower marginal costs into prices in many sectors is generated by variable mark-ups. Prices do not fall by as much as the reduction of marginal costs because firms offset the cost declines by raising mark-ups. While the analysis cannot identify which factors generate variable mark-ups, the results suggest that variable mark-ups are key to understanding the welfare consequences of trade liberalisation. The results of this analysis indicate that trade reforms benefited producers relatively more than consumers in the short run. However, consumer gains could be potentially large in the long run via two channels: (i) improved product quality and (ii) dynamic gains linked to the introduction of new products financed by lower tariffs for imported inputs and related profits.

In parallel with theoretical advances, recent empirical evidence has also contributed to a better understanding of the links between trade liberalisation, competition and productivity in the context of firm heterogeneity. Using theoretical insights from the Melitz and Ottaviano (2008) model, Chen et al. (2009) examine the impact of trade openness on prices, competition and productivity in EU countries. The analysis is based on industry data from seven EU countries over the period 1989-1999. Their empirical approach links international differences in openness to trade and firm dynamics to international differences in inflation rates, productivity growth and mark-ups (price-cost margins) changes. They find evidence of pro-competitive effects of trade openness on prices, productivity and profit margins in the short run. More specifically, their results indicate that in the short run trade openness reduces prices and mark-ups and increases productivity. In contrast, in the long run, these effects appear to be not significant and even reversed. This evidence is consistent with the predictions of the Melitz and Ottaviano (2008) model.

More evidence is uncovered using firm-level data from a single country. Similarly to Chen et al. (2009), using data from French manufacturing firms, Bellone et al. (2014) find that import penetration, domestic market size and competition lead to lower mark-ups. They also find that

firms that export to further destinations tend to have higher mark-ups, which might be related to higher product quality. In the context of the adoption of the euro, which was expected to reduce trade costs between the euro area countries, Guillou and Nesta (2017) find that increasing competition due to reduced trade costs lowers the mark-ups of all firms, whereas exporters to the euro area may actually benefit from it as they are more productive than their competitors from outside the euro area.

Using a reform in Portugal that substantially reduces entry time and cost, Félix and Maggi (2019) find that firms with higher productivity expand their size (employment) much more quickly than their less productive competitors. This evidence suggests a heterogeneous responsiveness of firms to reforms. Altomonte et al. (2018) provide evidence showing that heterogeneity in firms' access to finance may also partly explain the dispersion of mark-ups. More interestingly and linked to our research in this chapter is the heterogeneity in the firms' choices in allocating labour and capital shares, which affect the firms' productivity. Some evidence is found using data from Germany's manufacturing industry (Mertens, 2019). The author finds that firms' market power in the output market and the labour market are increasing and firms are transiting towards less labour-intensive productions. Following this, we would expect the heterogeneity in firms' productivity to be correlated with their labour share and capital share.

A growing literature on productivity and competition has documented rising mark-ups and market concentration in the EU and US. Bajgar et al. (2019) find increasing market concentration in ten EU countries and in North America for both manufacturing and non-financial services using firm-level data. To measure market concentration, they use both the Herfindahl-Hirschman Index (HHI) and the market share of top firms (CR4, 8 and 20) motivated by the data structure and consistency over time. In addition, they also consider different definitions of firms and whether the parent firm and its subsidiaries should be integrated, which affects the measurement of concentration. They provide a detailed discussion of the pros and cons of such choices. However, this analysis provides evidence on overall market concentration at the aggregated level (Europe and North America).

De Loecker et al. (2018b) find that mark-ups in the US have increased since 1980 from 21% above marginal cost to 61% recently. They further argue that the increase in mark-ups is mainly due to firms in the upper tail of the mark-ups distribution. A similar trend of increasing mark-ups and firm heterogeneity are uncovered by Calligaris et al. (2018), analysing 26 countries over the period 2001 to 2014. In the case of Belgium, De Loecker et al. (2018a) find that aggregate mark-ups increased between 1985 and 1995 and decreased afterwards when controlling for the reallocation of market shares. As for manufacturing, the within-firm change of mark-ups keeps increasing until 2015. Interestingly, Gradzewicz and Muck (2019) document a declining trend in mark-ups in Poland. They find that mean mark-ups fell by 18.6% between 2002 and 2016. They argue that this may be due to the fact that Polish exporting companies are integrated in intermediate stages in global value chains, which tend to have lower mark-ups than firms in the beginning or final stages (Timmer et al., 2014; Ye et al., 2015).

Another issue emerging in the literature is the link between market concentration and mark-ups. Barkai (2016) finds a positive correlation between mark-ups and market concentration in the US. However, using CompNet data, Salas et al. (2018) do not find a significant link between them in four EU countries (France, Germany, Italy and Spain).

In summary, the recent theoretical and empirical literature suggests heterogeneous effects of trade liberalisation on competition and productivity across firms and between industries. This heterogeneity of effects implies smaller welfare gains from trade than initially expected based on the trade literature with representative firms and constant mark-ups. On the basis of the main insights from the literature discussed above, the following hypotheses could be tested in the context of the Single Market:

- the Single Market has reduced trade costs which in turn have led to a more efficient allocation of resources and lower marginal costs;
- given firm heterogeneity and variable mark-ups, lower marginal costs have not been fully passed through to prices;
- mark-ups and productivity have adjusted following the Single Market-induced reduction of trade costs;
- the responsiveness of mark-ups and productivity to falling trade barriers has been heterogeneous across firms, industries and countries;

- the Single Market benefits related to pro-competitive effects of falling trade barriers may be higher in the short run than in the long run, given changes in the relative pattern of firm entry.

A full testing of these hypotheses requires firm-level data. While these data would be available under controlled access for a number of EU countries, an analysis using firm-level data is beyond the resources available for this study. Using industry-level indicators obtained by aggregating firm-level data available from the CompNet dataset combined with trade data by industry from the WIOD dataset, the next subchapters provide evidence for EU economies underlined by some of these hypotheses. More specifically, this evidence uncovers:

- heterogeneous patterns and trends of competition levels across industries and countries;
- heterogeneous responsiveness of competition and productivity to trade integration across industries and countries;
- heterogeneous untapped benefits from the Single Market in terms of competition and productivity across industries and countries.

4.2. Data and descriptive analysis

This subchapter describes the data used in the analysis and discusses summary statistics of competition measures. A particular focus of the descriptive analysis lies on the evolution of competition levels over time and on correlations between trade, competition and productivity. These descriptive statistics provide useful information on trends and patterns of competition across industries and on structural links between trade, competition and productivity.

4.2.1. *Data and summary statistics*

The empirical analysis in this chapter uses information from two datasets: CompNet and WIOD.

The CompNet dataset includes micro-aggregated indicators at the industry level (2-digit NACE rev. 2) obtained by summarising firm-level data (firms with 20+ employees). The data is available for 18 EU countries[23] and 24 manufacturing industries (2-digit NACE rev. 2: 10-33). Table B4.1 in the appendix shows the country and time coverage of the CompNet dataset.

Data on trade flows by country, industry and year is taken from the two combined WIOD datasets over the 1995-2014 period, as discussed in chapter 3. The data used in this analysis is available for 13 manufacturing industries for 28 EU countries over the period 2002-2014.

Competition levels are measured by two indices widely used in the literature: (i) the Herfindahl-Hirschman Index (HHI) at industry level and (ii) the concentration ratio of the Top-10 firms in an industry (CR10). The first index measures market structure, i.e. the competition level of the overall industry, taking into account the composition and distribution of the market shares of all firms. The second index takes into account the importance of the largest firms in an industry. Other competition measures used in the literature are mark-ups and price-cost margins. While information on these competition measures is available in the CompNet dataset, summary statistics and further descriptive analysis suggested that the estimates of mark-ups appear to be affected by measurement error (summary statistics are shown in Tables B4.2 and B4.3 in the appendix). Given these concerns related to the reliability of estimated mark-ups, the empirical analysis in this chapter uses the two measures of competition mentioned above, calculated on the basis of firms' market shares within each industry. This approach with respect to the choice of competition measures has been used in the recent related empirical literature (see for example Bajgar et al., 2019).

Table 4.1 presents summary statistics of the Herfindahl-Hirschman Index (HHI) by industry across the EU countries included in the CompNet dataset. The HHI measures the market concentration of an industry within a given country. The values shown in the table are sorted by the mean HHI in

[23] Belgium, Czech Republic, Germany, Spain, Finland, France, Croatia, Hungary, Italy, Lithuania, Netherlands, Poland, Portugal, Romania, Slovenia, Sweden and Slovakia.

descending order. On average, the HHI of an industry over the analysed period, 2002-2014, is 5.3%. The average minimum value is 0.1% and the average maximum value is 57.3%. "Coke and refined petroleum products" has the largest average market concentration level (32%), followed by "Transport equipment" (11.7%) and "Computer, electronic, electrical and optical products" (11.6%). "Rubber and plastic products" has the lowest market concentration (1.6%).

Table 4.1: Summary statistics for HHI by industry, 2002-2014

Manufacturing industry	Obs.	Mean	Sd	Min	Max
19: Coke and refined petroleum products	19	0.320	0.090	0.248	0.532
29-30: Transport equipment	186	0.117	0.114	0.007	0.573
26-27: Computer, electronic, electrical and optical products	158	0.116	0.107	0.007	0.478
20-21: Chemicals and pharmaceuticals	149	0.075	0.057	0.007	0.242
13-15: Textiles, wearing apparel, leather products	187	0.071	0.082	0.002	0.367
17-18: Pulp, paper, printing, publishing	184	0.054	0.052	0.004	0.204
31-32: Furniture, other manufacturing	207	0.038	0.039	0.002	0.246
10-12: Food, beverages, tobacco	174	0.035	0.046	0.003	0.309
16: Wood and products of wood and cork	170	0.031	0.028	0.003	0.165
23: Non-metallic mineral products	158	0.029	0.038	0.005	0.397
24-25: Basic and fabricated metals	191	0.028	0.043	0.001	0.205
28-33: Machinery	206	0.024	0.021	0.001	0.112
22: Rubber and plastic products	136	0.016	0.018	0.002	0.117
All industries average	2,106	0.053	0.070	0.001	0.573

Source: ESRI calculations based on data from CompNet.

Table 4.2 presents summary statistics of the CR10 by industry across the EU countries included in the analysed sample. The CR10 index measures the market share of the Top-10 manufacturing firms in an industry in a given country. The values shown in the table are sorted by the mean CR10 in descending order. The average index values range from 2% to 99%. The average CR10 index of an industry is 0.45 indicating that the Top-10 manufacturing firms of an industry have 45% market share on average. "Coke and refined petroleum products" has the highest market concentration. The Top-10 firms in that industry account on average for 98% of the market size (measured by turnover). The next industries with the highest market concentration are: "Computer, electronic, electrical and optical products" and "Transport equipment". "Rubber and plastic products" has the lowest market concentration (28%).

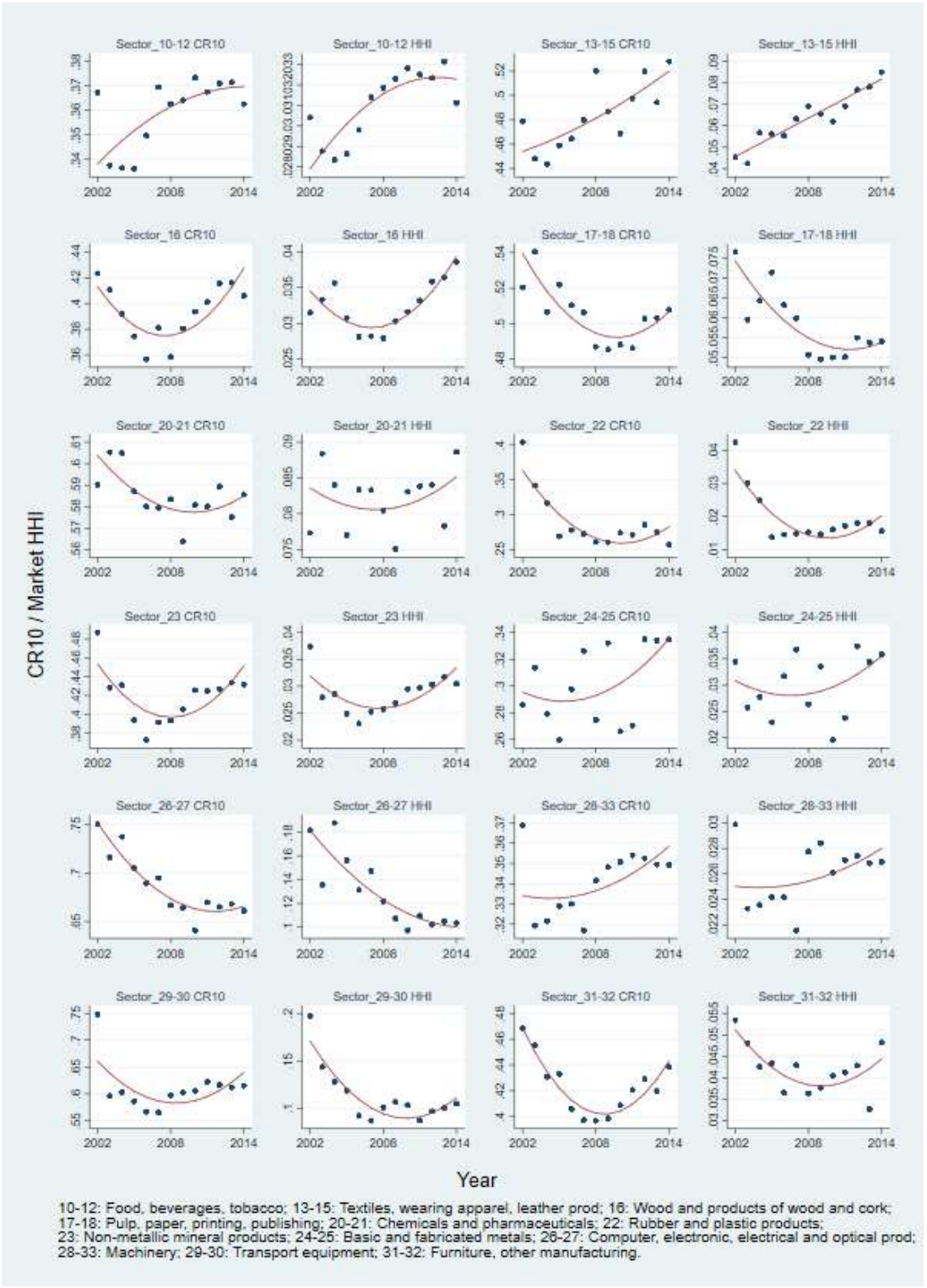
Table 4.2: Summary statistics for CR10 by industry, 2002-2014

Manufacturing industry	Obs.	Mean	Sd	Min	Max
19: Coke and refined petroleum products	6	0.98	0.01	0.96	0.99
26-27: Computer, electronic, electrical and optical products	145	0.68	0.15	0.27	0.95
29-30: Transport equipment	154	0.61	0.22	0.12	0.96
20-21: Chemicals and pharmaceuticals	135	0.58	0.20	0.16	0.88
17-18: Pulp, paper, printing, publishing	171	0.50	0.24	0.13	0.92
13-15: Textiles, wearing apparel, leather products	147	0.48	0.25	0.06	0.93
23: Non-metallic mineral products	133	0.42	0.13	0.16	0.65
31-32: Furniture, other manufacturing	184	0.42	0.18	0.06	0.73
16: Wood and products of wood and cork	157	0.39	0.15	0.09	0.70
10-12: Food, beverages, tobacco	146	0.36	0.18	0.09	0.70
28-33: Machinery	183	0.34	0.18	0.05	0.72
24-25: Basic and fabricated metals	178	0.30	0.25	0.02	0.89
22: Rubber and plastic products	113	0.28	0.13	0.06	0.65
All industries average	1,852	0.45	0.23	0.02	0.99

Source: ESRI calculations based on data from CompNet.

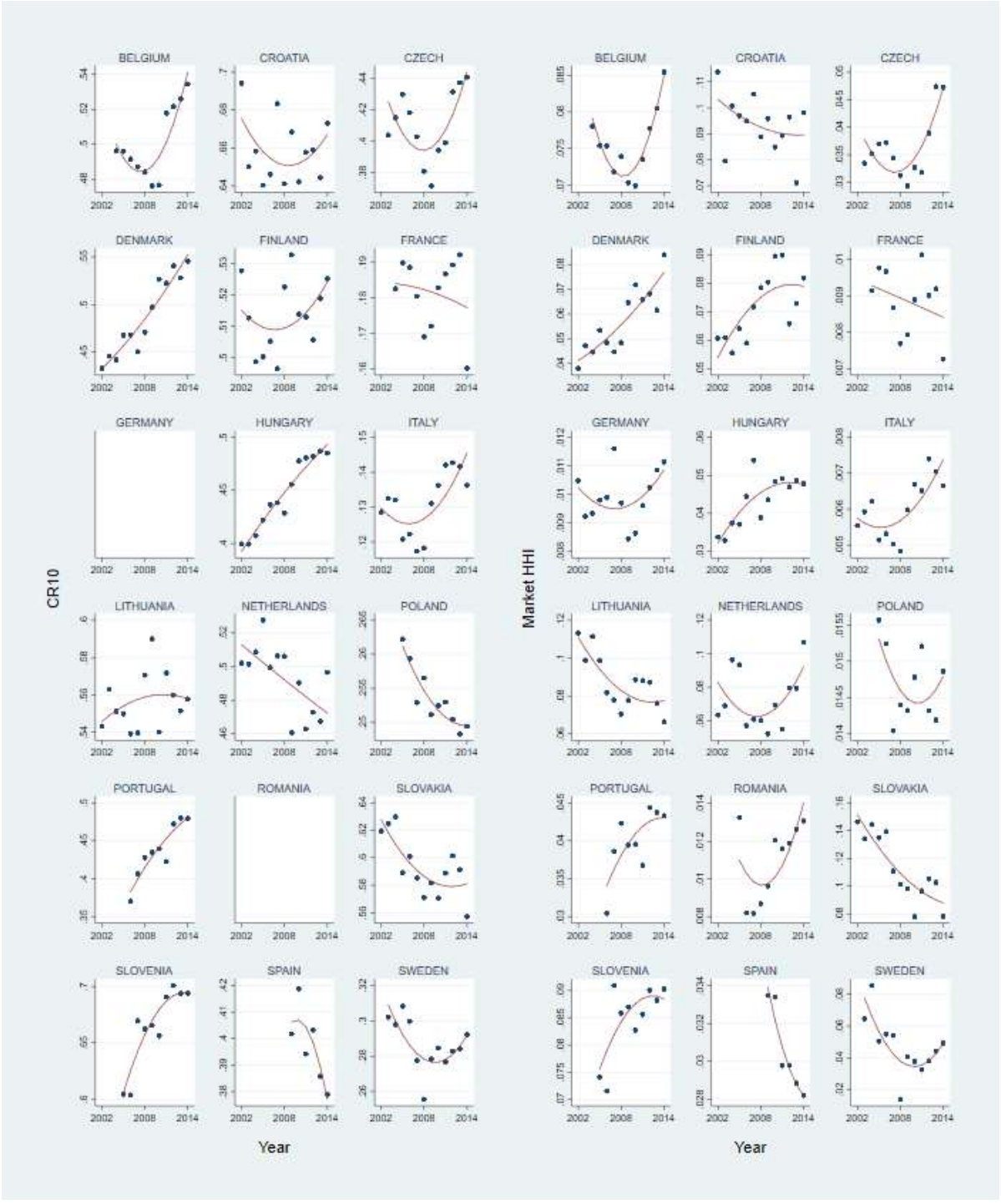
As shown in Tables 4.1 ad 4.2, there are only a few observations for "Coke and refined petroleum products". Given that these are insufficient for econometric analysis, this industry is not included in the further analysis.

Figure 4.1: HHI and CR10 by industry over time, 2002-2014



Source: ESRI calculations based on data from CompNet.
Notes: The plots are constructed using the same country-industry-year coverage for both competition measures.

Figure 4.2: HHI and CR10 by country over time, 2002-2014



Source: ESRI elaboration based on data from CompNet.
Notes: The data on CR10 for Germany and Romania is not available.

4.2.2. *The evolution of competition levels over time*

Figure 4.1 plots the average HHI and CR10 across countries over time for each industry. The red line is the fitted line. Overall, the trends for these competition measures are similar.[24]

The figure shows that market concentration has increased in recent years in many industries. For example, market concentration has increased since 2002 in "Food, beverages, tobacco", "Textiles, wearing apparel, leather products" and in "Machinery". In some other industries, market concentration has a "U-shape" evolution where market concentration declined before 2008 but started to rise afterwards. This is the case for the following industries: "Wood and products of wood and cork", "Pulp, paper, printing, publishing", "Chemicals and pharmaceuticals", "Non-metallic mineral products" and "Furniture, other manufacturing". Two industries have experienced declining market concentration: "Computer, electronic, electrical and optical products" and "Transport equipment".

Figure 4.2 plots the average HHI and CR10 across industries over time for each country. The red line is the fitted line. The pattern of market concentration appears to be mixed. The industry share of the 10 top firms (CR10) has increased for some countries (for example, Denmark, Hungary, Portugal and Slovenia), whereas in the case of some other countries it has declined (Netherlands, Poland, Slovakia and Spain). Factors explaining this pattern may be country-specific. On the other hand, the market concentration index HHI also shows country-specific patterns. Again, Denmark, Portugal and Slovenia show a consistent increase of HHI, while HHI has decreased in Slovakia and Spain. The evolution pattern over time in the case of other countries is not clear.

To explore the evolution of these competition measures over time in a more formal way, we regress market concentration on time and time squared (to allow for non-linear time effects) and control for country fixed effects. The analysis is carried out for all industries and countries by pooling the data across industries and countries, as well as by industry. Results are shown in Tables 4.3 and 4.4. In these regressions, to take account of the scale of estimated coefficients, we transform the time variable as follows: Time = (year-2001)/100. In addition, we control for joint country-industry fixed effects (column 2). For industries that show a "U-shape" or inverted "U", we also calculate the turning point in time, which is rounded to the nearest year.

Overall, the market concentration of the Top-10 firms has persistently increased since 2004, whereas HHI decreased before 2008 but has risen since. As expected, the trend of market concentration differs across industries and between HHI and CR10. The regression results confirm the "U-shape" of market concentration over time for both the HHI and CR10 in "Transport equipment". The turning point in the case of the CR10 is between 2006 and 2008, while the one for HHI is about one year later, between 2007 and 2010. This pattern suggests that the market share of top firms tends to respond more quickly to external shocks; their reactions may lead to further changes in the domestic market structure, hence affecting smaller firms in the industry. This seems to imply that top firms are more active players in the market than are smaller firms, which is intuitive. Given the fact that top firms engage more in international trade, this preliminary evidence suggests that using CR10 in the further empirical analysis may be an appropriate measure for examining the links between trade, competition and productivity.

Table 4.5a summarises the evolution patterns of the competition measures analysed above: the CR10 and HHI for each industry based on the regression results reported in Tables 4.3 and 4.4. One interesting finding is that the concentration of top firms has increased persistently since 2004 or at least shows a "U-shape" for most industries. Other industries tend to have a flat trend of CR10 and no industry has a declining CR10. On the other hand, the evolution of HHI suggests a different pattern. Only a few industries experienced a persistent increase in the HHI. While many industries tend to have a higher HHI in later years ("U-shape"), there are also many industries with a decreasing or flat trend of the HHI. These results suggest a significant heterogeneity between industries in terms of the evolution of their competition levels over time.

[24] The plots are constructed using the same country-industry-year coverage for both competition measures. While the HHI data is available for all countries, the data coverage for the CR10 is more limited across the three dimensions with no data for Germany and Romania.

Table 4.3: The evolution of market concentration over time, CR10

Dep. V.: CR10	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Sector	All	All	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32
Time	-0.253	-0.193	1.180***	0.907**	-1.162**	-0.800*	0.717	-0.871	-0.811**	-0.400	-0.882*	1.238**	-1.379*	-0.577
	(0.393)	(0.155)	(0.345)	(0.452)	(0.501)	(0.473)	(0.524)	(0.757)	(0.323)	(0.299)	(0.511)	(0.496)	(0.708)	(0.513)
Time sq.	3.374	3.035***	-5.817***	1.419	10.736***	5.729*	-2.576	5.208	7.888***	2.195	4.477	-4.411	8.418*	6.559**
	(2.606)	(0.981)	(2.147)	(3.000)	(3.173)	(3.194)	(3.305)	(4.477)	(2.193)	(1.860)	(3.383)	(3.093)	(4.549)	(3.129)
Constant	0.438***	0.260***	0.216***	0.804***	0.655***	0.526***	0.389***	0.378***	0.399***	0.218***	0.769***	0.487***	0.982***	0.401***
	(0.024)	(0.007)	(0.014)	(0.016)	(0.020)	(0.017)	(0.024)	(0.029)	(0.013)	(0.011)	(0.020)	(0.019)	(0.028)	(0.019)
Turning Year			2011		2006	2008			2006				2009	
N	1,846	1,846	146	147	157	171	135	113	133	178	145	183	154	184
R2	0.677	0.964	0.977	0.976	0.934	0.964	0.964	0.897	0.953	0.988	0.913	0.951	0.912	0.953
Fixed effect	C,S	C+S	C	C	C	C	C	C	C	C	C	C	C	C

Source: ESRI estimates.
Notes: Time=(year-2001)/100. Fixed effect "C" refers to the country fixed effect and "C+S" refers to country-industry fixed effects. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.4: The evolution of market concentration over time, HHI

Dep. V.: HHI	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Sector	All	All	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32
Time	-0.246	-0.225**	-0.117	0.066	-0.255***	-0.277*	0.577***	-0.337*	-0.694*	-0.109	-0.228	0.126	-1.474**	-0.029
	(0.164)	(0.106)	(0.301)	(0.332)	(0.090)	(0.158)	(0.190)	(0.181)	(0.353)	(0.114)	(0.763)	(0.084)	(0.666)	(0.239)
Time sq.	1.678	1.571**	-0.356	3.209	2.176***	1.325	-2.446**	2.040*	3.726**	0.663	-0.184	-0.423	8.296**	0.705
	(1.045)	(0.660)	(2.005)	(2.385)	(0.648)	(1.040)	(1.230)	(1.046)	(1.845)	(0.644)	(4.597)	(0.513)	(4.124)	(1.608)
Constant	0.068***	0.042***	0.047***	0.250***	0.119***	0.061***	0.022***	0.031***	0.053***	0.012***	0.117***	0.047***	0.206***	0.024***
	(0.009)	(0.004)	(0.011)	(0.012)	(0.007)	(0.006)	(0.007)	(0.007)	(0.015)	(0.004)	(0.029)	(0.003)	(0.025)	(0.008)
Turning Year		2008			2007		2013	2009	2010				2010	
N	2,106	2,106	174	187	170	184	149	136	158	191	158	206	186	207
R2	0.419	0.800	0.451	0.820	0.913	0.916	0.908	0.739	0.346	0.970	0.712	0.902	0.751	0.722
Fixed effect	C,S	C+S	C	C	C	C	C	C	C	C	C	C	C	C

Source: ESRI estimates.
Notes: Time=(year-2001)/100. Fixed effect "C" refers to the country fixed effect and "C+S" refers to country-industry fixed effects. Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.5a: Patterns of the evolution of competition levels by industry over time

Trend shape	CR10	HHI
Increasing	10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather prod; 20-21: Chemicals and pharmaceuticals; 28-33: Machinery; 31-32: Furniture, other manufacturing.	13-15: Textiles, wearing apparel, leather prod; 28-33: Machinery.
"U-shape"	16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 23: Non-metallic mineral products; 29-30: Transport equipment.	16: Wood and products of wood and cork; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 29-30: Transport equipment.
Decreasing		10-12: Food, beverages, tobacco; 17-18: Pulp, paper, printing, publishing;
Flat	22: Rubber and plastic products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical prod.	24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical prod; 31-32: Furniture, other manufacturing.

Source: ESRI elaboration based on data from CompNet.

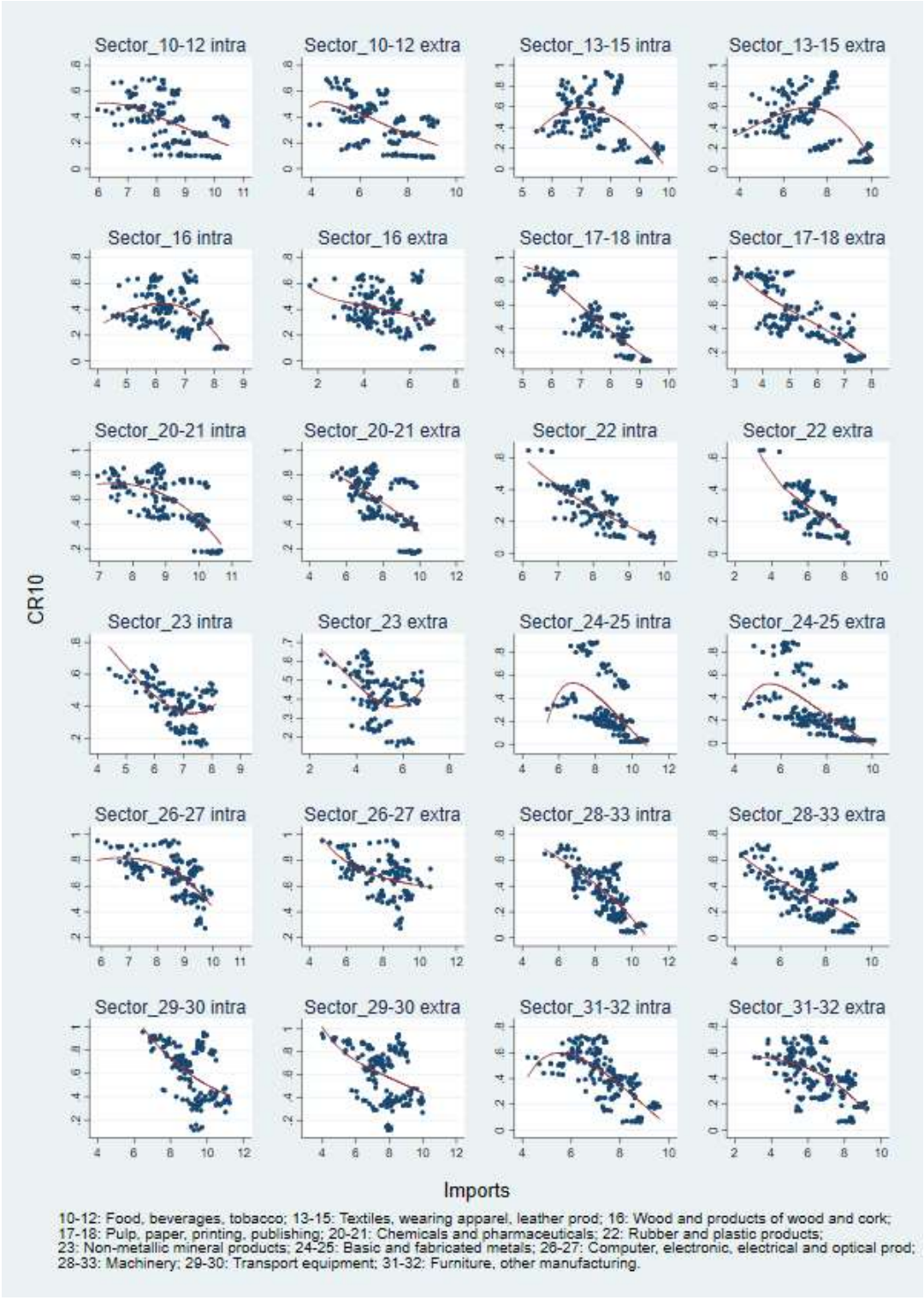
4.2.3. *Trade, competition and productivity: correlation analysis*

In Figures 4.3 and 4.4, the market concentration measures, CR10 and HHI, are respectively plotted against intra-EU imports (in log) and extra-EU imports (in log) by industry. The red line is the fitted line. Figure 4.3 shows that market concentration, as measured with the CR10 index is negatively associated with imports suggesting a pro-competition effect of trade openness. This result also holds for market concentration, as measured by the HHI (Figure 4.4).

Figure 4.5 plots labour productivity (in log) against CR10 and HHI by industry. The red line is the fitted line. Overall, market concentration and productivity are negatively correlated: higher concentration (lower competition) is associated with lower productivity. However, in "Textiles, wearing apparel, leather products" market concentration appears to be positively associated with productivity.

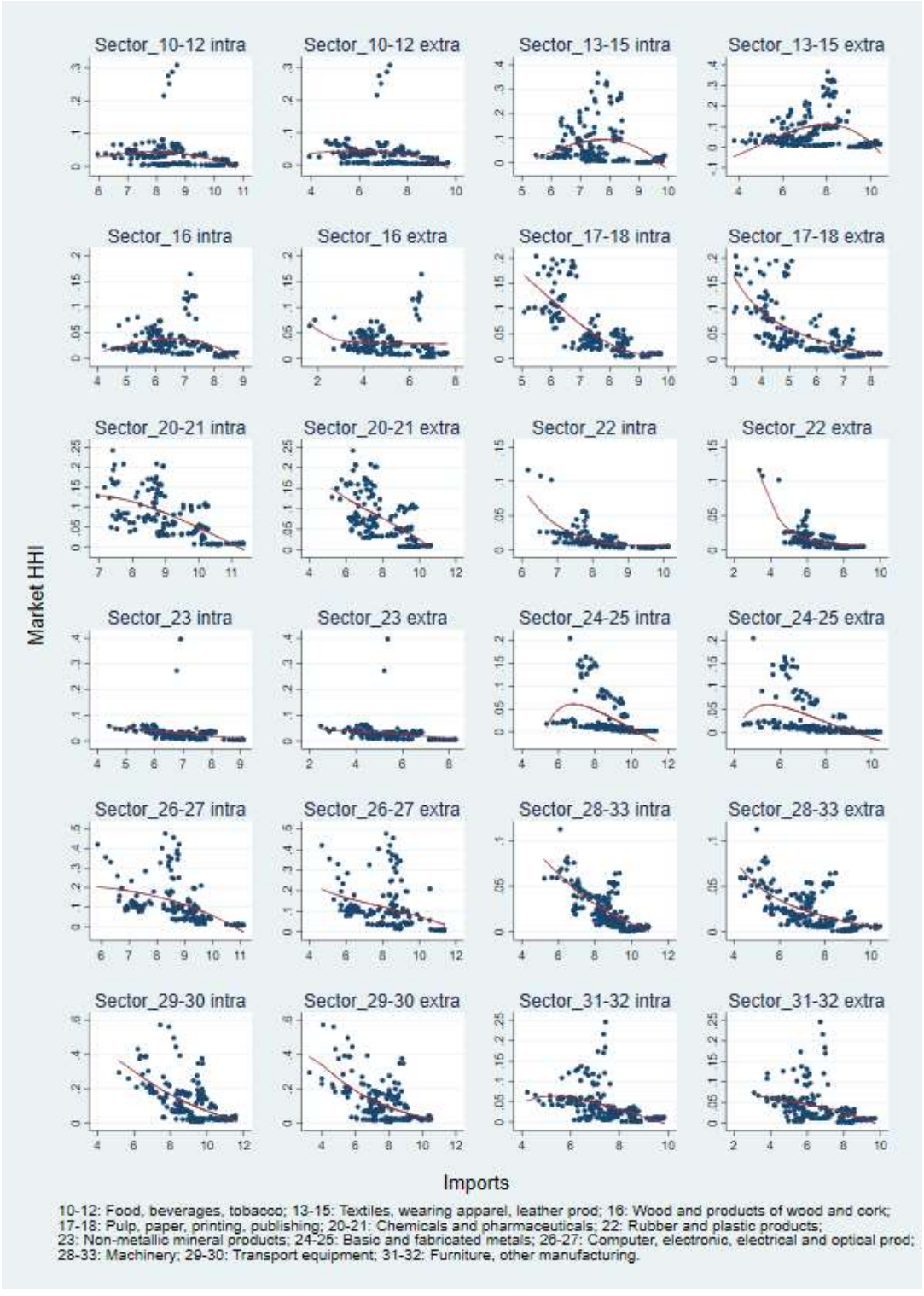
This descriptive analysis supports some of the hypotheses derived from the theoretical and empirical literature in relation to the heterogeneity of the pro-competitive effects of trade. While this evidence is indicative of these effects, in the next subchapter we further examine the links between trade, competition and productivity using multivariate econometric analysis to account for unobserved factors and potential endogeneity in the relationships of interest.

Figure 4.3: Market concentration (CR10) and trade (intra-EU and extra-EU imports) by industry



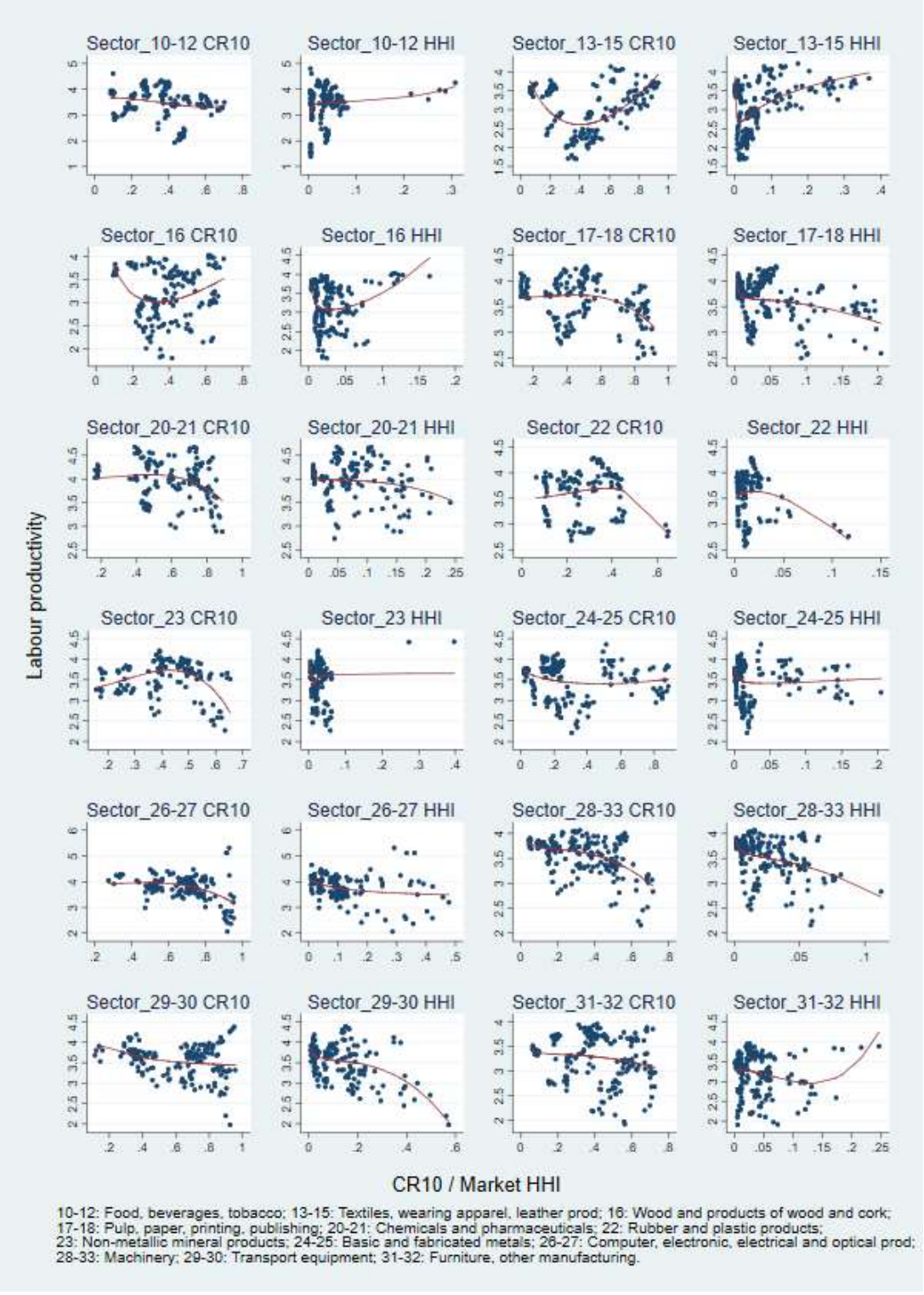
Source: ESRI elaboration based on data from CompNet.

Figure 4.4: Market concentration (HHI) and trade (intra-EU and extra-EU imports) by industry



Source: ESRI elaboration based on data from CompNet.

Figure 4.5: Labour productivity and market concentration by industry



Source: ESRI elaboration based on data from CompNet

4.3. Econometric analysis

4.3.1. *Model specifications*

The econometric analysis in this chapter examines the responsiveness of competition and productivity to trade integration following on from the theoretical and empirical literature discussed in subchapter 4.1. These estimates will be further used in the next subchapter (4.4), in order to examine the counterfactual competition and productivity effects in the scenario of full legal

harmonisation and full compliance with the Single Market. To this purpose, we estimate a two-stage instrumental variables model. The main Equation (4.2) relates productivity to competition and other factors that have been found to affect productivity (employment, capital intensity, labour intensity, export sales intensity). In addition, we include country (C_k), industry (I_i) and year (T_t) fixed effects to capture unobserved heterogeneity. Given that competition is likely to be affected by many unobserved factors, we instrument competition with import flows and the size of domestic markets (Equation 4.1). The two-step model is specified as follows:

First stage: $$COMP_{ikt} = \beta_0 + \beta_1 lnImport_{ikt} + \beta_2 lnDomSize_{ikt} + \gamma\Pi_{ikt} + C_k + I_i + T_t + \epsilon_{ikt} \quad (4.1)$$

Second stage: $$lnPROD_{ikt} = \alpha_0 + \alpha_1 \widehat{COMP}_{ikt} + \theta\Pi_{ikt} + C_k + I_i + T_t + \varepsilon_{ikt} \quad (4.2)$$

where i, k, t are industry, country and year indicators and $\alpha, \beta, \gamma, \theta$ are coefficients to be estimated. $COMP_{ikt}$ is market concentration in industry i, country k, year t. $PROD_{ikt}$ denotes labour productivity. Following Chen et al. (2009), the size of domestic markets, $DomSize_{ikt}$ is included in the first stage as an additional instrument for competition.[25] The control variables Π_{ikt} (employment, capital intensity, labour intensity, export sales intensity) are included in both stages. Table B4.4 in the appendix shows summary statistics for the explanatory variables used in the econometric analysis.

4.3.2. *Results*

This subchapter presents the results of our econometric analysis based on the model specifications described above. Tables 4.5-4.13 report estimates of the two-stage instrumental variables model described by Equations (4.1) and (4.2). Tables 4.5-4.7 present average effects obtained by pooling the data across all countries and industries over the analysed period, 2002-2014. The remaining tables, 4.8-4.13 show industry-specific estimates. The results in both sets of tables are obtained with total imports, intra-EU and extra-EU imports and with the two measures of market concentration, CR10 and HHI, respectively.

Table 4.5b presents productivity and competition estimates obtained with total imports as an instrument for competition in the first stage. All regressions include country-, sector- and year-specific fixed effects. Robust standard errors are reported. Column 1 shows the results of the second stage IV regression, where labour productivity (in log) is the dependent variable and CR10 is the independent variable of interest. Its coefficient gives the semi-elasticity of labour productivity with respect to market concentration. In this column, the coefficient for CR10 is -0.217, negative and significantly different from zero. It suggests that an increase in CR10 by one unit is associated with a decline in labour productivity by 21.7%. Given that the average CR10 is 0.45, this result implies that when CR10 increases by 0.1, labour productivity decreases by around 2.17%. The second column reports the results obtained with HHI as the competition measure.

Estimated effects of other variables are worth noting. For example, the average employment of an industry has positive effects on labour productivity, which indicates that larger firms have on average higher labour productivity. Moreover, higher capital intensity is associated with higher labour productivity, while higher labour intensity is associated with lower labour productivity. These results are consistent with existing evidence on productivity.

Comparing the results shown in Tables 4.5-4.7, while the effects of total imports and intra-EU imports on market concentration and productivity are significant, the corresponding impact of extra-EU trade is not significant.

[25] Due to data limitations, we do not distinguish between long-run and short-run effects. We also assume the effect of market size on productivity is through the toughness of competition, as in the model by Melitz and Ottaviano (2008).

Table 4.5b: Trade, competition and productivity, all imports, all sectors, IV estimates

	(1)	(2)	(3)	(4)
	Second stage		First stage	
Dep. Var.:	Labour productivity (in log)		CR10	HHI
Total import (in log)			-0.042***	-0.025***
			(0.012)	(0.004)
Domestic market (in log)			-0.082***	-0.010***
			(0.007)	(0.003)
HHI		-1.749***		
		(0.589)		
CR10	-0.217**			
	(0.106)			
Export/turnover	-1.483	13.453***	4.058	4.186***
	(5.602)	(3.879)	(3.523)	(0.693)
Avg. employment (in log)	0.187***	0.136***	0.191***	0.022***
	(0.025)	(0.028)	(0.020)	(0.007)
Avg. capital/turnover	0.106**	0.114**	0.032	0.004
	(0.041)	(0.057)	(0.024)	(0.012)
Avg. labour cost/turnover	-2.115***	-2.159***	-0.567***	-0.156***
	(0.098)	(0.121)	(0.057)	(0.024)
Constant	4.535***	4.773***	1.773***	0.452***
	(0.117)	(0.132)	(0.141)	(0.064)
N	1,598	1,799	1,598	1,799
R2	0.891	0.868	0.748	0.530
Under-identification F-stat	173.2	47.57		
Under-identification p-value	0	0		
Over-identification F-stat	23.13	7.342		
Over-identification p-value	0	0.007		
F-stat of exclusive variables	112	26.57		

Source: ESRI estimates.
Notes: All regressions include country-, sector- and year-specific fixed effects. Robust standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 4.6: Trade, competition and productivity, intra-EU imports, all sectors

	(1)	(2)	(3)	(4)
	Second stage		First stage	
Dep. Var.:	Labour productivity (in log)		CR10	HHI
Intra-EU import (in log)			-0.053***	-0.034***
			(0.013)	(0.004)
Domestic market (in log)			-0.080***	-0.009***
			(0.006)	(0.003)
HHI		-1.061**		
		(0.465)		
CR10	-0.191*			
	(0.104)			
Export/turnover	-2.016	9.756***	4.031	4.209***
	(5.586)	(3.002)	(3.483)	(0.681)
Avg. employment (in log)	0.184***	0.127***	0.194***	0.025***
	(0.025)	(0.026)	(0.020)	(0.007)
Avg. capital/turnover	0.104**	0.107**	0.037	0.007
	(0.041)	(0.052)	(0.024)	(0.012)
Avg. labour cost/turnover	-2.101***	-2.057***	-0.551***	-0.146***
	(0.097)	(0.114)	(0.056)	(0.024)
Constant	4.528***	4.711***	1.808***	0.481***
	(0.117)	(0.122)	(0.140)	(0.062)
N	1,598	1,799	1,598	1,799
R2	0.892	0.881	0.749	0.539
Under-identification F-stat	174.3	62.29		
Under-identification p-value	0	0		
Over-identification F-stat	10.32	0.785		
Over-identification p-value	0.001	0.375		
F-stat of exclusive variables	114.3	37.51		

Source: ESRI estimates.
Notes: All regressions include country-, sector- and year-specific fixed effects. Robust standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 4.7: Trade, competition and productivity, extra-EU imports, all sectors

	(1)	(2)	(3)	(4)
	Second stage		First stage	
Dep. Var.:	Labour productivity (in log)		CR10	HHI
Extra-EU import (in log)			-0.004	-0.004
			(0.008)	(0.003)
Domestic market (in log)			-0.089***	-0.014***
			(0.007)	(0.003)
HHI		-1.246*		
		(0.680)		
CR10	-0.109			
	(0.106)			
Export/turnover	-3.685	10.747***	1.853	3.898***
	(5.494)	(4.121)	(3.661)	(0.652)
Avg. employment (in log)	0.175***	0.129***	0.189***	0.021***
	(0.025)	(0.026)	(0.020)	(0.007)
Avg. capital/turnover	0.097**	0.109**	0.021	0.001
	(0.040)	(0.054)	(0.024)	(0.012)
Avg. labour cost/turnover	-2.058***	-2.084***	-0.560***	-0.153***
	(0.098)	(0.121)	(0.057)	(0.025)
Constant	4.505***	4.728***	1.568***	0.328***
	(0.118)	(0.133)	(0.124)	(0.055)
N	1,598	1,799	1,598	1,799
R2	0.895	0.878	0.746	0.521
Under-identification F-stat	168.9	30.73		
Under-identification p-value	0	0		
Over-identification F-stat	28.06	24.68		
Over-identification p-value	0	0		
F-stat of exclusive variables	105.3	16.13		

Source: ESRI estimates.
Notes: All regressions include country-, sector- and year-specific fixed effects. Robust standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Tables 4.8-4.13 present industry-specific estimates of the links between trade, competition and productivity. Tables 4.8-4.10 report estimates obtained with CR10 as the measure for market concentration, while Tables 4.11-4.13 show the results obtained with the HHI. All regressions include country-specific and year-specific fixed effects, and standard errors are reported in parentheses.

Taken together, these results indicate a heterogenous responsiveness of competition to trade integration across industries. Further, the results also show industry-specific patterns of the productivity responsiveness to competition.

Looking at intra-EU trade effects on competition, Tables 4.9 and 4.12 show that in most industries, higher intra-EU imports are associated with more competition. There appears to be no significant link in the cases of "Food, beverages, tobacco", "Basic and fabricated metals", "Textiles, wearing apparel, leather products" (when competition is measured with the CR10); "Non-metallic mineral products" and "Transport equipment" (when competition is measured with the HHI). The pro-competition effects of higher intra-EU trade are linked to productivity gains in most industries while in the two industries "Basic and fabricated metals" and "Machinery" higher competition is associated with lower productivity. Further, higher competition induced by higher intra-EU trade has no effect on productivity in "Rubber and plastic products", "Computer, electronic, electrical and optical products" and "Textiles, wearing apparel, leather products" (when competition is measured with the HHI).

In the case of extra-EU trade effects, higher imports by EU countries from third countries are associated with pro-competitive effects in a smaller number of industries: "Wood and products of wood and cork", "Pulp, paper, printing, publishing", "Rubber and plastic products", "Machinery", "Chemicals and pharmaceuticals" (competition measured with the CR10) and "Food, beverages, tobacco" (competition measured with the HHI). Higher imports from third countries appear to reduce competition in "Non-metallic mineral products" (competition measured with the HHI) and "Basic and fabricated metals" (competition measured with the CR10). No significant effects are found for the rest of the industries. The pro-competitive effects of higher extra-EU imports are translated into higher productivity in "Machinery" while a higher concentration of the Top-10 firms in "Basic and fabricated metals" is linked to higher productivity.

Bringing all these results together, Tables 4.14a and 4.14b show a number of industry-specific patterns that emerge from the econometric analysis of trade, competition and productivity effects across industries. On the basis of this summary of results[26], the following industry groups are identified:

- *Higher intra-EU trade associated with more competition and higher productivity:* "Chemicals and pharmaceuticals", "Furniture, other manufacturing", "Wood and products of wood and cork", "Pulp, paper, printing, publishing", "Non-metallic mineral products", "Transport equipment"
- *Higher intra-EU trade associated with more competition and lower productivity:* "Machinery"
- *Higher intra-EU trade associated with more competition and no productivity change:* "Rubber and plastic products", "Computer, electronic, electrical and optical products"
- *Higher intra-EU trade associated with no change in competition and productivity:* "Food, beverages, tobacco"
- *Higher intra-EU trade associated with no change in competition and higher productivity:* "Textiles, wearing apparel, leather products"
- *Higher extra-EU trade associated with more competition and higher productivity:* "Wood and products of wood and cork", "Chemicals and pharmaceuticals"
- *Higher extra-EU trade associated with more competition and lower productivity:* "Machinery"
- *Higher extra-EU trade associated with more competition and no productivity change:* "Pulp, paper, printing, publishing", "Rubber and plastic products"
- *Higher intra-EU trade associated with no change in competition and higher productivity:* "Textiles, wearing apparel, leather products", "Transport equipment.
- *Higher extra-EU trade associated with no change in competition and productivity:* "Food, beverages, tobacco", "Furniture, other manufacturing", "Non-metallic mineral products", "Computer, electronic, electrical and optical products" and "Basic and fabricated metals"

Taken together, the results of this econometric analysis indicate heterogeneous effects of trade integration on competition and productivity across industries. These heterogenous effects are likely to be generated by variable mark-ups across firms between industries, as suggested by the literature reviewed in subchapter 4.1. As discussed above, variable mark-ups are key to understanding the incomplete pass-through of falling trade costs on prices and productivity across firms and between industries. While due to given data limitations the underlying factors of these patterns cannot be uncovered at this stage, this evidence is useful to better understanding the gap between the expected and realised benefits of the Single Market.

In the next subchapter, the estimated industry-specific elasticities of competition and productivity are combined with the trade potentials estimated in chapter 3 to obtain counterfactual competition and productivity potentials in the case of the scenario of full harmonisation of the legislation with respect to goods and joint full compliance with the Single Market across all EU countries.

[26] The results obtained with the HHI and CR10 are similar given that the two competition measures are highly correlated. Where the results differ, the grouping of industries in the above taxonomy is based on the results obtained with the CR10.

Table 4.8: Trade, competition and productivity, all imports, industry-specific effects, CR10, IV estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sector	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32
Second stage: Dep. Var.: Labour productivity (in log)												
CR10	-0.017	-3.039**	-3.084***	-3.525***	-1.051*	0.079	-1.947*	6.224***	-0.533	1.429***	-3.843***	-3.582***
	(2.215)	(1.317)	(0.881)	(1.000)	(0.570)	(0.353)	(1.131)	(2.050)	(2.116)	(0.415)	(1.201)	(1.096)
Export/turnover	-132.698	-74.817*	-259.691	109.766***	-41.170	-284.316***	-202.652	-59.439	14.359	-237.951**	74.754	-184.033***
	(82.768)	(42.092)	(213.273)	(33.970)	(46.948)	(55.109)	(158.353)	(75.283)	(75.624)	(109.235)	(50.524)	(69.908)
Avg. employment (in log)	-0.116	0.281	0.484**	0.561***	-0.080	0.086	-0.205*	-0.409*	0.379*	-0.071	0.706***	0.352**
	(0.258)	(0.217)	(0.239)	(0.198)	(0.132)	(0.060)	(0.107)	(0.248)	(0.197)	(0.105)	(0.240)	(0.153)
Avg. capital/turnover	0.482**	-0.014	0.785**	-0.029	0.473*	0.637***	0.098	0.514**	-0.679	-0.341*	-0.090	-0.121
	(0.231)	(0.156)	(0.308)	(0.077)	(0.246)	(0.211)	(0.264)	(0.203)	(1.368)	(0.206)	(0.302)	(0.232)
Avg. labour cost/turnover	-0.079	-1.241***	-1.842***	-2.343***	-1.989***	0.052	-0.780**	-1.524***	-1.355**	-2.502***	-1.246*	-0.928
	(0.417)	(0.369)	(0.514)	(0.435)	(0.373)	(0.286)	(0.363)	(0.501)	(0.628)	(0.401)	(0.732)	(0.589)
Constant	4.388***	6.099***	5.246***	5.118***	6.350***	3.559***	5.916***	5.296***	3.847*	5.329***	5.094***	4.484***
	(1.533)	(0.899)	(0.770)	(0.629)	(0.753)	(0.383)	(0.647)	(0.714)	(1.988)	(0.442)	(1.054)	(0.689)
First stage: Dep. Var.: CR10												
Total import (in log)	-0.018	0.012	-0.129***	-0.135***	-0.104***	-0.306***	-0.090***	0.043**	-0.085*	-0.121***	-0.147***	-0.123***
	(0.018)	(0.029)	(0.029)	(0.028)	(0.031)	(0.052)	(0.024)	(0.019)	(0.043)	(0.029)	(0.050)	(0.028)
Domestic market (in log)	0.085***	-0.073***	0.014	0.051**	0.192***	0.136***	0.022	0.026	0.061**	0.222***	0.018	0.064**
	(0.029)	(0.028)	(0.039)	(0.025)	(0.023)	(0.033)	(0.028)	(0.017)	(0.030)	(0.024)	(0.037)	(0.027)
Export/turnover	-7.350	-37.174***	-24.131	43.356***	31.808***	158.904***	56.849	23.093*	-11.649	86.883***	33.560**	27.140
	(11.034)	(11.161)	(56.060)	(5.957)	(11.938)	(39.944)	(48.559)	(11.929)	(11.400)	(31.378)	(13.219)	(21.291)
Avg. employment (in log)	-0.126***	0.110**	0.168***	0.116***	-0.021	0.068**	-0.010	0.115***	-0.016	0.065**	0.167***	0.034
	(0.031)	(0.046)	(0.041)	(0.030)	(0.028)	(0.031)	(0.025)	(0.021)	(0.038)	(0.026)	(0.046)	(0.031)
Avg. capital/turnover	-0.056*	0.044	0.137**	-0.009	0.128***	-0.154*	0.134***	-0.060**	0.625***	0.150***	-0.103	0.006
	(0.031)	(0.043)	(0.060)	(0.015)	(0.050)	(0.088)	(0.038)	(0.027)	(0.139)	(0.050)	(0.078)	(0.049)
Avg. labour cost/turnover	-0.063	-0.149	-0.338***	-0.165**	0.114	-0.151	-0.057	0.016	-0.005	0.429***	0.025	0.168
	(0.060)	(0.113)	(0.108)	(0.082)	(0.085)	(0.124)	(0.087)	(0.073)	(0.131)	(0.097)	(0.190)	(0.124)
Constant	-0.566	1.677***	0.971	0.399	-1.975***	0.437	0.724*	-1.081***	0.510	-2.613***	0.993*	0.120
	(0.487)	(0.569)	(0.595)	(0.314)	(0.407)	(0.394)	(0.421)	(0.324)	(0.496)	(0.363)	(0.577)	(0.337)
Statistics												
N	140	133	132	146	113	102	106	157	111	168	127	163
First stage R2	0.982	0.981	0.960	0.983	0.982	0.960	0.974	0.991	0.947	0.974	0.933	0.963
Second stage R2	0.931	0.964	0.931	0.854	0.910	0.982	0.954	0.838	0.800	0.896	0.528	0.869
Under-iden. P-value	0.017	0.035	0	0	0	0	0.001	0.004	0.076	0	0.006	0.000
Over-iden. P-value	0.001	0.003	0.730	0.294	0.035	0.327	0.001	0.136	0	0	0.058	0
F-stat exclusive	3.386	2.713	10.26	10.04	25.57	12.53	5.575	4.730	1.967	33.65	4.166	7.689

Source: ESRI estimates.
Notes: All regressions include country- and year-specific fixed effects. Standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01. 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.9: Trade, competition and productivity, intra-EU imports, industry-specific effects, CR10, IV estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sector	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32
Second stage: Dep. Var.: Labour productivity (in log)												
CR10	0.305	-1.966**	-3.489***	-5.240***	-1.113*	-0.128	-2.317**	6.328***	0.567	1.578***	-3.653***	-2.727***
	(2.244)	(1.002)	(0.993)	(1.690)	(0.582)	(0.459)	(1.133)	(2.302)	(2.028)	(0.429)	(1.100)	(0.861)
Export/turnover	-123.320	-52.766	-315.800	162.036***	-43.111	-271.677***	-202.403	-60.820	51.322	-233.046**	69.040	-180.691***
	(83.453)	(33.230)	(232.915)	(55.154)	(47.229)	(58.386)	(161.319)	(77.291)	(72.764)	(112.012)	(47.330)	(60.015)
Avg. employment (in log)	-0.089	0.148	0.553**	0.791***	-0.081	0.086	-0.204*	-0.419	0.419**	-0.084	0.678***	0.302**
	(0.260)	(0.170)	(0.262)	(0.296)	(0.133)	(0.061)	(0.109)	(0.270)	(0.194)	(0.108)	(0.225)	(0.129)
Avg. capital/turnover	0.499**	-0.052	0.852**	-0.040	0.481*	0.539**	0.166	0.518**	-1.301	-0.369*	-0.073	-0.078
	(0.231)	(0.125)	(0.334)	(0.101)	(0.248)	(0.253)	(0.266)	(0.210)	(1.322)	(0.211)	(0.288)	(0.198)
Avg. labour cost/turnover	-0.059	-1.174***	-1.969***	-2.591***	-2.001***	-0.054	-0.780**	-1.515***	-1.299**	-2.566***	-1.266*	-1.022**
	(0.418)	(0.298)	(0.560)	(0.592)	(0.375)	(0.325)	(0.370)	(0.513)	(0.621)	(0.411)	(0.700)	(0.504)
Constant	4.194***	5.549***	5.382***	5.252***	6.388***	3.718***	6.048***	5.309***	2.914	5.350***	5.107***	4.419***
	(1.549)	(0.704)	(0.834)	(0.830)	(0.759)	(0.445)	(0.655)	(0.732)	(1.917)	(0.454)	(1.009)	(0.591)
First stage: Dep. Var.: CR10												
Intra-EU import (in log)	-0.015	0.026	-0.120***	-0.100***	-0.084***	-0.246***	-0.091***	0.029	-0.086**	-0.118***	-0.147***	-0.125***
	(0.017)	(0.024)	(0.028)	(0.028)	(0.029)	(0.057)	(0.024)	(0.018)	(0.042)	(0.029)	(0.047)	(0.026)
Domestic market (in log)	0.085***	-0.075***	-0.002	0.033	0.190***	0.108***	0.024	0.031*	0.042	0.221***	0.018	0.055**
	(0.030)	(0.028)	(0.038)	(0.026)	(0.024)	(0.035)	(0.028)	(0.017)	(0.026)	(0.025)	(0.037)	(0.025)
Export/turnover	-7.106	-37.548***	-39.726	39.056***	31.593***	145.006***	63.085	26.051**	-20.030**	85.669***	33.992***	21.464
	(11.066)	(11.019)	(55.749)	(6.181)	(12.118)	(43.332)	(49.017)	(11.851)	(9.811)	(31.461)	(13.096)	(20.415)
Avg. employment (in log)	-0.124***	0.113***	0.182***	0.133***	-0.029	0.057*	-0.001	0.113***	-0.021	0.073***	0.162***	0.032
	(0.030)	(0.043)	(0.042)	(0.030)	(0.028)	(0.034)	(0.024)	(0.021)	(0.037)	(0.026)	(0.046)	(0.031)
Avg. capital/turnover	-0.056*	0.045	0.124**	-0.009	0.133***	-0.246***	0.135***	-0.055**	0.584***	0.142***	-0.083	-0.018
	(0.031)	(0.042)	(0.061)	(0.016)	(0.050)	(0.090)	(0.038)	(0.028)	(0.139)	(0.051)	(0.079)	(0.047)
Avg. labour cost/turnover	-0.062	-0.155	-0.368***	-0.167**	0.088	-0.261**	-0.059	0.005	0.011	0.455***	-0.011	0.159
	(0.060)	(0.108)	(0.108)	(0.085)	(0.084)	(0.129)	(0.087)	(0.073)	(0.131)	(0.096)	(0.189)	(0.122)
Constant	-0.605	1.596***	1.080*	0.325	-2.106***	0.489	0.663	-1.014***	0.827	-2.700***	1.010*	0.175
	(0.482)	(0.538)	(0.597)	(0.327)	(0.406)	(0.420)	(0.421)	(0.323)	(0.549)	(0.361)	(0.574)	(0.333)
Statistics												
N	140	133	132	146	113	102	106	157	111	168	127	163
First stage R2	0.982	0.981	0.960	0.982	0.982	0.955	0.975	0.991	0.947	0.973	0.933	0.963
Second stage R2	0.931	0.976	0.921	0.748	0.909	0.982	0.952	0.835	0.804	0.890	0.567	0.903
Under-iden. P-value	0.018	0.022	0	0.001	0	0.000	0.001	0.011	0.064	0	0.004	0
Over-iden. P-value	0.001	0	0.932	0.664	0.040	0.333	0.002	0.060	0	0	0.041	0
F-stat exclusive	3.299	3.089	9.150	5.656	24.18	6.700	5.798	3.781	2.109	33	4.594	9.412

Source: ESRI estimates.
Notes: All regressions include country- and year-specific fixed effects. Standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01. 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.10: Trade, competition and productivity, extra-EU imports, industry-specific effects, CR10, IV estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sector	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32
Second stage: Dep. Var.: Labour productivity (in log)												
CR10	2.697	-2.456**	-3.111**	0.004	-1.166**	0.035	-2.751	3.099***	13.240	1.975***	-6.655*	-12.834
	(2.553)	(1.109)	(1.303)	(0.475)	(0.578)	(0.307)	(2.224)	(1.181)	(10.374)	(0.488)	(3.556)	(10.688)
Export/turnover	-53.571	-62.837*	-263.485	2.243	-44.762	-281.621***	-202.111	-18.142	477.135	-219.916*	159.252	-220.186
	(93.206)	(36.582)	(251.877)	(17.054)	(47.314)	(54.128)	(166.279)	(53.155)	(356.452)	(120.339)	(122.084)	(205.953)
Avg. employment (in log)	0.115	0.209	0.488*	0.088	-0.083	0.086	-0.202*	-0.101	0.883	-0.117	1.118*	0.894
	(0.289)	(0.187)	(0.290)	(0.108)	(0.133)	(0.060)	(0.112)	(0.156)	(0.646)	(0.117)	(0.589)	(0.743)
Avg. capital/turnover	0.623**	-0.035	0.790**	-0.006	0.488**	0.616***	0.247	0.376***	-8.470	-0.443*	-0.344	-0.584
	(0.254)	(0.138)	(0.347)	(0.046)	(0.248)	(0.194)	(0.446)	(0.141)	(6.173)	(0.229)	(0.570)	(0.842)
Avg. labour cost/turnover	0.090	-1.204***	-1.851***	-1.833***	-2.011***	0.030	-0.781**	-1.783***	-0.654	-2.737***	-0.950	0.087
	(0.455)	(0.327)	(0.596)	(0.256)	(0.376)	(0.272)	(0.381)	(0.355)	(1.863)	(0.447)	(1.260)	(2.037)
Constant	2.747	5.800***	5.255***	4.845***	6.420***	3.593***	6.203***	4.922***	-7.837	5.408***	4.907***	5.189**
	(1.742)	(0.776)	(0.838)	(0.376)	(0.760)	(0.359)	(0.954)	(0.505)	(9.141)	(0.487)	(1.771)	(2.139)
First stage: Dep. Var.: CR10												
Extra-EU import (in log)	-0.000	0.016	-0.035**	-0.089***	-0.097***	-0.148***	-0.027	0.049***	-0.015	-0.040**	-0.027	-0.025
	(0.012)	(0.017)	(0.015)	(0.013)	(0.031)	(0.021)	(0.016)	(0.014)	(0.028)	(0.016)	(0.027)	(0.021)
Domestic market (in log)	0.080***	-0.075***	-0.036	0.016	0.184***	0.099***	-0.018	0.025	0.041	0.186***	-0.034	0.012
	(0.029)	(0.028)	(0.040)	(0.019)	(0.023)	(0.026)	(0.027)	(0.016)	(0.031)	(0.022)	(0.034)	(0.027)
Export/turnover	-7.972	-38.511***	-123.115**	36.911***	33.169***	122.053***	-12.464	16.879	-19.574	70.036**	20.246	0.908
	(11.169)	(11.179)	(52.920)	(4.759)	(12.133)	(35.267)	(46.060)	(11.875)	(12.124)	(31.872)	(12.704)	(22.063)
Avg. employment (in log)	-0.117***	0.128***	0.139***	0.053*	-0.006	0.052*	-0.017	0.122***	-0.032	0.065**	0.177***	0.053
	(0.031)	(0.049)	(0.044)	(0.031)	(0.029)	(0.028)	(0.029)	(0.021)	(0.038)	(0.028)	(0.047)	(0.033)
Avg. capital/turnover	-0.054*	0.054	0.191***	-0.008	0.117**	-0.111	0.166***	-0.052**	0.623***	0.175***	-0.150*	-0.023
	(0.031)	(0.044)	(0.066)	(0.014)	(0.050)	(0.082)	(0.039)	(0.025)	(0.145)	(0.052)	(0.080)	(0.055)
Avg. labour cost/turnover	-0.059	-0.178	-0.395***	-0.129*	0.136	-0.147	-0.040	0.040	-0.020	0.453***	0.048	0.105
	(0.061)	(0.115)	(0.113)	(0.078)	(0.088)	(0.114)	(0.091)	(0.071)	(0.137)	(0.101)	(0.199)	(0.129)
Constant	-0.670	1.638***	1.222*	0.649**	-2.113***	-0.403	0.887**	-1.079***	0.253	-2.808***	0.691	0.089
	(0.501)	(0.529)	(0.639)	(0.298)	(0.403)	(0.403)	(0.442)	(0.312)	(0.493)	(0.369)	(0.587)	(0.361)
Statistics												
N	140	133	132	146	113	102	106	157	111	168	127	163
First stage R2	0.982	0.981	0.956	0.985	0.982	0.964	0.972	0.992	0.945	0.972	0.928	0.959
Second stage R2	0.919	0.972	0.931	0.947	0.908	0.982	0.949	0.915	-0.670	0.874	-0.315	-0.093
Under-iden. P-value	0.027	0.024	0.006	0	0	0	0.148	0.000	0.410	0	0.196	0.469
Over-iden. P-value	0.011	0.004	0.683	0.001	0.086	0.328	0.001	0.705	0.107	0	0.533	0.190
F-stat exclusive	2.972	3.031	4.267	17.86	24.89	18.64	1.442	7.804	0.662	27.84	1.251	0.610

Source: ESRI estimates.
Notes: All regressions include country- and year-specific fixed effects. Standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01. 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.11: Trade, competition and productivity, all imports, industry-specific effects, HHI, IV estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sector	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32
Second stage: Dep. Var.: Labour productivity (in log)												
HHI	-5.915***	-0.674	-22.224**	-5.388***	-2.523*	-0.695	-0.884	38.504	-17.501	10.125***	-24.502	-14.637**
	(2.144)	(1.553)	(9.119)	(2.072)	(1.491)	(1.253)	(1.283)	(23.412)	(10.924)	(1.987)	(21.710)	(6.842)
Export/turnover	28.325***	7.100	-353.745	24.458*	-37.935	-270.179***	497.864	232.412	65.657	-187.147*	112.942	-111.298
	(9.079)	(17.092)	(364.452)	(14.650)	(46.138)	(55.040)	(328.026)	(165.502)	(90.569)	(100.429)	(153.774)	(124.882)
Avg. employment (in log)	-0.178*	-0.065	0.376	0.295***	0.078	0.127**	0.095	-0.030	-0.640	-0.105	0.532	0.494*
	(0.094)	(0.157)	(0.347)	(0.091)	(0.083)	(0.054)	(0.107)	(0.271)	(0.526)	(0.098)	(0.531)	(0.290)
Avg. capital/turnover	0.221	-0.187*	0.422	-0.023	0.269	0.469***	-0.007	1.600*	1.752	-0.426**	3.918	0.069
	(0.156)	(0.111)	(0.282)	(0.054)	(0.218)	(0.167)	(0.111)	(0.849)	(2.532)	(0.173)	(3.286)	(0.393)
Avg. labour cost/turnover	-1.575***	-1.053***	-0.641	-1.171***	-1.696***	-0.393*	-1.671***	-1.799**	0.007	-2.394***	-3.254	1.281
	(0.297)	(0.264)	(0.570)	(0.353)	(0.328)	(0.232)	(0.525)	(0.761)	(1.835)	(0.348)	(2.308)	(1.129)
Constant	5.799***	4.566***	5.380***	3.883***	5.216***	3.814***	4.390***	3.907***	7.298***	5.596***	6.028**	1.117
	(0.445)	(0.361)	(1.147)	(0.428)	(0.468)	(0.320)	(0.525)	(1.046)	(2.293)	(0.427)	(2.775)	(1.719)
First stage: Dep. Var.: Market HHI												
Total import (in log)	-0.006	-0.028**	-0.017**	-0.028***	-0.033**	-0.085***	0.009	0.005	-0.060*	-0.024***	-0.008	-0.033**
	(0.006)	(0.013)	(0.007)	(0.009)	(0.016)	(0.012)	(0.021)	(0.005)	(0.036)	(0.004)	(0.020)	(0.014)
Domestic market (in log)	-0.036***	-0.026***	-0.003	0.018***	0.072***	0.036***	-0.092***	0.005	0.005	0.044***	-0.011	0.005
	(0.004)	(0.008)	(0.009)	(0.004)	(0.012)	(0.008)	(0.022)	(0.005)	(0.016)	(0.003)	(0.014)	(0.009)
Export/turnover	1.791***	6.059***	-17.668	8.877***	13.233**	20.210**	95.751**	-3.258	6.501	16.844***	3.658	6.893
	(0.260)	(1.499)	(12.386)	(1.475)	(6.002)	(10.006)	(41.721)	(3.305)	(7.788)	(4.374)	(4.356)	(11.106)
Avg. employment (in log)	-0.007	0.069***	0.022**	0.051***	0.004	-0.001	0.028*	0.009*	-0.031	0.013***	0.021	0.031**
	(0.005)	(0.017)	(0.009)	(0.009)	(0.009)	(0.006)	(0.016)	(0.005)	(0.025)	(0.004)	(0.018)	(0.014)
Avg. capital/turnover	-0.016**	-0.019	0.010	-0.006	0.021	-0.019	0.018	-0.036***	0.170*	0.014**	0.138***	-0.013
	(0.008)	(0.017)	(0.009)	(0.005)	(0.023)	(0.018)	(0.018)	(0.007)	(0.097)	(0.007)	(0.028)	(0.023)
Avg. labour cost/turnover	-0.077***	-0.076*	-0.021	0.085***	0.108***	0.016	-0.293***	0.010	0.083	0.049***	-0.102	0.096*
	(0.015)	(0.042)	(0.021)	(0.030)	(0.039)	(0.027)	(0.060)	(0.020)	(0.090)	(0.014)	(0.083)	(0.052)
Constant	0.785***	0.670***	0.213	-0.277***	-1.004***	0.128	1.455***	-0.135	0.566	-0.534***	0.302	0.007
	(0.095)	(0.181)	(0.135)	(0.096)	(0.197)	(0.098)	(0.323)	(0.089)	(0.389)	(0.054)	(0.266)	(0.161)
Statistics												
N	157	164	145	159	126	117	122	170	124	183	155	177
First stage R2	0.963	0.964	0.935	0.943	0.941	0.866	0.799	0.977	0.817	0.955	0.871	0.739
Second stage R2	0.896	0.974	0.830	0.911	0.898	0.978	0.925	0.539	-1.431	0.896	-2.503	0.465
Under-iden. p-value	0	0.000	0.008	0	0	0	0	0.218	0.245	0	0.545	0.063
Over-iden. p-value	0.004	0.016	0.861	0	0.047	0.276	0.147	0.300	0.545	0	0.817	0.111
F-stat exclusive	37.39	6.772	4.040	9.052	15.15	18.82	8.304	1.241	1.080	63.94	0.482	2.296

Source: ESRI estimates.
Notes: All regressions include country- and year-specific fixed effects. Standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01. 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.12: Trade, competition and productivity, intra-EU imports, industry-specific effects, HHI, IV estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sector	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32
Second stage: Dep. Var.: Labour productivity (in log)												
HHI	-5.634***	0.367	-27.254**	-4.895**	-2.482*	-1.216	-1.101	38.143*	-11.503	10.300***	-22.592	-11.558**
	(2.138)	(1.613)	(11.982)	(2.309)	(1.483)	(1.478)	(1.311)	(21.333)	(7.659)	(1.975)	(18.151)	(4.880)
Export/turnover	27.159***	-4.178	-501.588	22.240	-37.472	-271.411***	546.459	230.553	46.426	-186.187*	101.547	-125.508
	(9.050)	(17.739)	(453.850)	(15.091)	(46.041)	(55.547)	(334.871)	(157.230)	(63.074)	(100.791)	(132.515)	(101.913)
Avg. employment (in log)	-0.179*	-0.150	0.493	0.281***	0.078	0.116**	0.102	-0.027	-0.413	-0.108	0.503	0.409*
	(0.093)	(0.162)	(0.423)	(0.095)	(0.083)	(0.057)	(0.109)	(0.261)	(0.368)	(0.099)	(0.472)	(0.225)
Avg. capital/turnover	0.218	-0.167	0.477	-0.020	0.269	0.422**	-0.003	1.587**	0.768	-0.428**	3.634	0.145
	(0.155)	(0.114)	(0.332)	(0.053)	(0.218)	(0.182)	(0.113)	(0.782)	(1.768)	(0.173)	(2.759)	(0.316)
Avg. labour cost/turnover	-1.569***	-0.984***	-0.699	-1.216***	-1.697***	-0.426*	-1.735***	-1.800**	-0.519	-2.402***	-3.130	0.925
	(0.295)	(0.271)	(0.664)	(0.358)	(0.328)	(0.239)	(0.535)	(0.754)	(1.279)	(0.350)	(2.054)	(0.870)
Constant	5.790***	4.588***	5.651***	3.944***	5.216***	3.899***	4.387***	3.910***	6.526***	5.604***	5.961**	1.669
	(0.442)	(0.369)	(1.364)	(0.438)	(0.467)	(0.347)	(0.534)	(1.033)	(1.600)	(0.429)	(2.540)	(1.322)
First stage: Dep. Var.: Market HHI												
Intra-EU import (in log)	-0.003	-0.022**	-0.013**	-0.020**	-0.031**	-0.076***	-0.003	0.006	-0.063*	-0.025***	-0.012	-0.037***
	(0.006)	(0.011)	(0.006)	(0.009)	(0.014)	(0.013)	(0.021)	(0.005)	(0.038)	(0.004)	(0.019)	(0.014)
Domestic market (in log)	-0.036***	-0.028***	-0.006	0.017***	0.073***	0.030***	-0.086***	0.005	0.001	0.044***	-0.010	0.005
	(0.004)	(0.008)	(0.009)	(0.004)	(0.012)	(0.009)	(0.022)	(0.005)	(0.015)	(0.003)	(0.014)	(0.009)
Export/turnover	1.796***	5.713***	-22.293*	8.455***	13.615**	18.243*	106.856**	-3.211	3.339	17.269***	3.898	6.518
	(0.260)	(1.500)	(12.300)	(1.513)	(6.026)	(10.759)	(42.101)	(3.258)	(7.241)	(4.343)	(4.360)	(10.942)
Avg. employment (in log)	-0.007	0.077***	0.023**	0.051***	0.003	-0.004	0.027*	0.009*	-0.036	0.015***	0.021	0.030**
	(0.005)	(0.016)	(0.010)	(0.009)	(0.009)	(0.006)	(0.016)	(0.005)	(0.024)	(0.004)	(0.018)	(0.014)
Avg. capital/turnover	-0.016**	-0.019	0.008	-0.006	0.021	-0.031*	0.015	-0.037***	0.160*	0.012*	0.139***	-0.015
	(0.008)	(0.017)	(0.009)	(0.005)	(0.023)	(0.018)	(0.018)	(0.007)	(0.097)	(0.007)	(0.028)	(0.023)
Avg. labour cost/turnover	-0.077***	-0.087**	-0.025	0.086***	0.102***	-0.002	-0.297***	0.011	0.091	0.053***	-0.105	0.099*
	(0.015)	(0.041)	(0.021)	(0.031)	(0.038)	(0.029)	(0.060)	(0.020)	(0.090)	(0.014)	(0.083)	(0.051)
Constant	0.755***	0.612***	0.235*	-0.335***	-1.044***	0.147	1.433***	-0.136	0.663	-0.548***	0.324	0.013
	(0.092)	(0.168)	(0.136)	(0.095)	(0.193)	(0.103)	(0.326)	(0.088)	(0.423)	(0.053)	(0.264)	(0.159)
Statistics												
N	157	164	145	159	126	117	122	170	124	183	155	177
First stage R2	0.962	0.964	0.934	0.941	0.941	0.850	0.799	0.977	0.817	0.956	0.871	0.742
Second stage R2	0.898	0.973	0.771	0.917	0.898	0.977	0.922	0.546	-0.176	0.895	-1.974	0.638
Under-iden. P-value	0	0.001	0.0232	0.001	0	0	0	0.165	0.250	0	0.478	0.025
Over-iden. P-value	0.003	0.172	0.805	0	0.044	0.307	0.141	0.399	0.302	0	0.995	0.042
F-stat exclusive	36.93	6.534	3.095	6.613	15.30	12.34	8.231	1.475	1.063	66.32	0.586	3.088

Source: ESRI estimates.
Notes: All regressions include country- and year-specific fixed effects. Standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01. 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.13: Trade, competition and productivity, extra-EU imports, industry-specific effects, HHI, IV estimates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sector	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32
Second stage: Dep. Var.: Labour productivity (in log)												
HHI	-6.092***	0.565	-17.337**	-0.258	-3.279**	-1.375	-0.303	18.527	-18.130	12.485***	-15.765	-36.193
	(2.118)	(1.845)	(8.447)	(1.143)	(1.615)	(1.099)	(1.154)	(15.492)	(12.589)	(2.278)	(13.619)	(36.833)
Export/turnover	29.054***	-6.329	-210.104	1.394	-46.512	-271.789***	367.791	129.623	67.676	-174.189	60.830	-11.838
	(8.975)	(20.221)	(325.498)	(10.407)	(48.014)	(55.695)	(299.480)	(103.943)	(95.236)	(106.201)	(97.165)	(326.160)
Avg. employment (in log)	-0.178*	-0.166	0.262	0.146**	0.082	0.113**	0.074	0.116	-0.663	-0.146	0.397	1.092
	(0.094)	(0.178)	(0.305)	(0.064)	(0.086)	(0.053)	(0.101)	(0.168)	(0.583)	(0.105)	(0.338)	(1.139)
Avg. capital/turnover	0.223	-0.163	0.369	0.011	0.285	0.407**	-0.019	0.917*	1.855	-0.460**	2.620	-0.463
	(0.157)	(0.116)	(0.243)	(0.043)	(0.226)	(0.159)	(0.106)	(0.555)	(2.771)	(0.183)	(2.064)	(1.222)
Avg. labour cost/turnover	-1.578***	-0.971***	-0.584	-1.642***	-1.692***	-0.437*	-1.499***	-1.882***	0.062	-2.499***	-2.684*	3.771
	(0.298)	(0.279)	(0.487)	(0.260)	(0.339)	(0.231)	(0.487)	(0.448)	(1.958)	(0.370)	(1.470)	(4.643)
Constant	5.804***	4.593***	5.116***	4.519***	5.215***	3.925***	4.399***	4.111***	7.379***	5.705***	5.723***	-2.748
	(0.446)	(0.372)	(0.994)	(0.309)	(0.484)	(0.307)	(0.503)	(0.619)	(2.475)	(0.453)	(1.781)	(7.164)
First stage: Dep. Var.: Market HHI												
Extra-EU import (in log)	-0.009**	-0.005	-0.007**	-0.029***	-0.015	-0.042***	0.023*	-0.001	-0.032	-0.007***	0.005	-0.009
	(0.004)	(0.007)	(0.003)	(0.004)	(0.015)	(0.005)	(0.012)	(0.004)	(0.022)	(0.002)	(0.012)	(0.010)
Domestic market (in log)	-0.036***	-0.027***	-0.006	0.013***	0.065***	0.025***	-0.094***	0.007	0.003	0.037***	-0.015	-0.001
	(0.004)	(0.008)	(0.009)	(0.004)	(0.011)	(0.006)	(0.019)	(0.005)	(0.016)	(0.003)	(0.013)	(0.009)
Export/turnover	1.782***	5.893***	-24.146**	8.174***	11.902*	9.914	88.176**	-2.231	5.934	13.574***	3.206	2.834
	(0.257)	(1.516)	(11.410)	(1.282)	(6.123)	(8.680)	(37.087)	(3.381)	(7.805)	(4.598)	(4.286)	(11.174)
Avg. employment (in log)	-0.009*	0.082***	0.017*	0.035***	0.005	-0.004	0.036**	0.009*	-0.035	0.014***	0.023	0.027*
	(0.005)	(0.018)	(0.010)	(0.008)	(0.009)	(0.005)	(0.016)	(0.005)	(0.024)	(0.004)	(0.018)	(0.014)
Avg. capital/turnover	-0.014*	-0.019	0.013	-0.006	0.020	-0.008	0.020	-0.033***	0.175*	0.015**	0.141***	-0.019
	(0.008)	(0.017)	(0.009)	(0.005)	(0.023)	(0.016)	(0.018)	(0.007)	(0.098)	(0.007)	(0.028)	(0.025)
Avg. labour cost/turnover	-0.078***	-0.099**	-0.022	0.097***	0.100**	0.006	-0.283***	0.004	0.056	0.053***	-0.099	0.106*
	(0.015)	(0.042)	(0.022)	(0.028)	(0.041)	(0.024)	(0.060)	(0.020)	(0.091)	(0.015)	(0.082)	(0.054)
Constant	0.806***	0.458***	0.210	-0.177**	-1.075***	-0.102	1.387***	-0.111	0.347	-0.587***	0.249	-0.094
	(0.084)	(0.153)	(0.138)	(0.088)	(0.196)	(0.098)	(0.319)	(0.087)	(0.344)	(0.056)	(0.250)	(0.156)
Statistics												
N	157	164	145	159	126	117	122	170	124	183	155	177
First stage R2	0.963	0.963	0.934	0.952	0.939	0.885	0.804	0.977	0.817	0.949	0.871	0.733
Second stage R2	0.895	0.972	0.876	0.943	0.891	0.977	0.931	0.841	-1.593	0.884	-0.447	-1.838
Under-iden. P-value	0	0.003	0.017	0	0	0	0	0.301	0.323	0	0.529	0.602
Over-iden. P-value	0.072	0.003	0.457	0.065	0.264	0.321	0.089	0.122	0.564	0	0.245	0.649
F-stat exclusive	39.47	4.957	3.382	22.63	13.44	29.30	9.678	0.975	0.864	48	0.506	0.410

Source: ESRI estimates.
Notes: All regressions include country- and year-specific fixed effects. Standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01. 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.14a: Industry-specific patterns of trade, competition and productivity effects – summary of results

Industry	Concentration Measurement	Intra-EU Trade-Competition	Intra-EU Trade Competition-Productivity	Extra-EU Trade-Competition	Extra-EU Trade Competition - Productivity
10-12: Food, beverages, tobacco	CR10	0	0	0	0
	HHI	0	+	+	+
13-15: Textiles, wearing apparel, leather prod	CR10	0	+	0	+
	HHI	+	0	0	0
16: Wood and products of wood and cork	CR10	+	+	+	+
	HHI	+	+	+	+
17-18: Pulp, paper, printing, publishing	CR10	+	+	+	0
	HHI	+	+	+	0
20-21: Chemicals and pharmaceuticals	CR10	+	+	+	+
	HHI	+	+	0	+
22: Rubber and plastic products	CR10	+	0	+	0
	HHI	+	0	+	0
23: Non-metallic mineral products	CR10	+	+	0	0
	HHI	0	0	-	0
24-25: Basic and fabricated metals	CR10	0	-	-	-
	HHI	0	-	0	0
26-27: Computer, electronic, electrical and optical prod	CR10	+	0	0	0
	HHI	+	0	0	0
28-33: Machinery	CR10	+	-	+	-
	HHI	+	-	+	-
29-30: Transport equipment	CR10	+	+	0	+
	HHI	0	0	0	0
31-32: Furniture, other manufacturing	CR10	+	+	0	0
	HHI	+	+	0	0

Source: ESRI calculations.
Notes: +, -, 0 denote significant positive, significant negative and no significant effects, respectively.

Table 4.14b: Patterns of industry-specific trade, competition and productivity links – summary of results

CR10		Competition-Productivity			CR10		Competition-Productivity		
Intra-EU Trade		Positive	Negative	Insignificant	Extra-EU Trade		Positive	Negative	Insignificant
Trade–Competition	Positive	16 17-18 20-21 23 29-30 31-32	28-33	22 26-27	Trade–Competition	Positive	16 20-21	28-33	17-18 22
	Negative					Negative		24-25	
	Insignificant	13-15	24-25	10-12		Insignificant	13-15 29-30		10-12 23 26-27 31-32
HHI		Competition-Productivity			HHI		Competition-Productivity		
Intra-EU Trade		Positive	Negative	Insignificant	Extra-EU Trade		Positive	Negative	Insignificant
Trade–Competition	Positive	16 17-18 20-21 31-32	28-33	13-15 22 26-27	Trade–Competition	Positive	10-12 16	28-33	17-18 22
	Negative					Negative			23
	Insignificant	10-12	24-25	23 29-30		Insignificant	20-21		13-15 24-25 26-27 29-30 31-32

Source: ESRI calculations.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

4.4. Single Market compliance – counterfactual competition and productivity potentials

This subchapter discusses the estimated competition and productivity potentials corresponding to the counterfactual trade potentials by country-industry reported in chapter 3 (subchapter 3.2.4). The counterfactual potentials are general equilibrium effects estimated in the case of full harmonisation of the legislation with respect to goods within manufacturing industries and full compliance with the Single Market legislation. Full compliance with the Single Market is measured by the following indicators:

- Transposition: full transposition of the Single Market legislation into national legislation
- Infringements: no cases of infringement proceedings
- TRIS: no cases of comments or detailed opinions on draft technical regulations
- SOLVIT: all business cases of incorrect application of the Single Market legislation received by the lead centre resolved

A detailed discussion of these indicators measuring compliance with the Single Market is provided in chapter 2 while a comprehensive discussion of the scenario of full compliance with the Single Market and the corresponding counterfactual trade potential effects are discussed in chapter 3. This chapter combines these results with the estimates obtained in subchapter 4.3 and examines the corresponding untapped competition and productive benefits of the Single Market across industries and countries.

The counterfactual potential competition effects by country-industry (% change) are obtained as follows:

$$Potential\,\Delta\,COMP_{ik} = \frac{dlnCOMP_i}{dlnTRADE_i} * Potential\,\Delta\,TRADE_{ik} \quad (4.3)$$

The industry-specific elasticities of competition with respect to trade (intra-EU and extra-EU imports) across EU countries are the estimates reported in Tables 4.9-4.10.

The counterfactual potential productivity effects (% change) are obtained as follows:

$$Potential\,\Delta\,PROD_{ik} = \frac{dlnPROD_i}{dlnCOMP_i} * Potential\,\Delta\,COMP_{ik} \quad (4.4)$$

The industry-specific elasticities of productivity with respect to competition across EU countries are the estimates reported in Tables 4.9-4.10.

The estimated counterfactual competition and productivity potentials are discussed in subchapters 4.5.1 and 4.5.2 below. The detailed estimates are shown in Tables B4.5-B4.20 in the appendix. All these counterfactual effects indicate changes under the scenario of full legal harmonisation and joint compliance of all EU countries with the Single Market measured by the above-mentioned indicators.

4.4.1. *Counterfactual competition and productivity effects with full legal harmonisation and full compliance with the Single Market – intra-EU trade potentials*

Industry-specific effects

Tables 4.15 and 4.16 show the estimated counterfactual competition and productivity effects for the scenario of full harmonisation of the legislation with respect to goods within manufacturing industries and full compliance with the Single Market legislation by industry for all countries and broken down by the groups of advanced EU15 and the accession countries. The numbers represent percentage changes in competition and productivity levels in the long run corresponding to the counterfactual trade potentials discussed in subchapter 3.2.4. Overall, the untapped competition and productivity potentials are larger for the latter group of EU countries. Focusing on productivity potentials across the four indicators of compliance with the Single Market legislation, the largest are associated with a correct transposition of the Single Market legislation into national law: productivity would increase by 1.17% across all industries and all countries with larger productivity gains for the accession countries, 1.25%. The next biggest productivity potential is associated with a full transposition of the Single Market legislation: 0.76% across all EU countries, 1.22% for accession countries and 0.66% for the EU15. Counterfactual potential effects are heterogenous across industries with the largest productivity potentials in three industries: "Pulp, paper, printing, publishing", "Wood and products of wood and cork", "Furniture, other manufacturing". The productivity potentials associated with full harmonisation and full compliance with the Single Market would be only marginal in "Chemicals and pharmaceuticals" and "Rubber and plastic products".

Country-specific effects

Tables 4.17 and 4.18 report the potential competition and productivity effects related to full compliance with the Single Market legislation by EU member states. The figures indicate that larger potential imports from other EU countries are associated with more competition and productivity gains. The greatest effects would come through no cases of infringement procedures. Italy and Spain would have the biggest potential productivity gains in this case: 1.77% and 1.69%, respectively. Looking at the figures for full transposition of the SM legislation, Slovenia would have the largest potential productivity gain, 1.57%, followed by Poland and Hungary, with 1.33% and 1.11% potential productivity gains, respectively. Most of these results are in line with the overall pattern of larger potentials for competition and productivity for accession countries.

Table 4.15: Single Market competition effects of counterfactual policy scenarios across industries – intra-EU trade potentials, % change

Industry	Transposition			Infringements			TRIS			SOLVIT		
	All countries	EU15	Accession	All countries	EU15	Accession	All countries	EU15	Accession	All countries	EU15	Accession
10-12	-0.04	-0.03	-0.06	-0.07	-0.08	-0.05	0.02	0.03	0.01	0.00	0.00	0.01
13-15	0.07	0.06	0.12	0.14	0.15	0.13	-0.05	-0.06	-0.02	0.00	0.01	-0.02
16	-0.85	-0.69	-1.44	-1.03	-0.91	-1.46	-0.42	-0.30	-0.84	-0.59	-0.52	-0.83
17-18	-0.57	-0.50	-0.90	-0.83	-0.81	-0.92	-0.19	-0.13	-0.46	-0.33	-0.31	-0.43
20-21	-0.38	-0.33	-0.57	-0.60	-0.60	-0.59	0.04	0.08	-0.14	-0.12	-0.12	-0.10
22	-0.90	-0.67	-1.45	-1.47	-1.44	-1.54	0.02	0.15	-0.32	-0.29	-0.30	-0.29
23	-0.87	-0.65	-1.31	-0.94	-0.73	-1.36	-0.49	-0.32	-0.81	-0.59	-0.49	-0.79
24-25	0.17	0.14	0.27	0.25	0.24	0.28	0.04	0.01	0.12	0.09	0.08	0.11
26-27	-0.24	-0.17	-0.41	-0.39	-0.37	-0.46	0.13	0.16	0.05	0.00	-0.03	0.08
28-33	-0.34	-0.29	-0.53	-0.59	-0.62	-0.49	0.04	0.08	-0.09	-0.09	-0.10	-0.06
29-30	-0.54	-0.47	-0.88	-0.95	-0.96	-0.89	0.05	0.11	-0.21	-0.20	-0.20	-0.19
31-32	-0.98	-0.88	-1.61	-1.30	-1.25	-1.64	-0.50	-0.41	-1.05	-0.71	-0.65	-1.01
Total	-0.33	-0.28	-0.53	-0.53	-0.52	-0.54	0.00	0.04	-0.14	-0.12	-0.12	-0.12

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.16: Single Market productivity effects of counterfactual policy scenarios across industries – intra-EU trade potentials, % change

Industry	Transposition			Infringements			TRIS			SOLVIT		
	All countries	EU15	Accession	All countries	EU15	Accession	All countries	EU15	Accession	All countries	EU15	Accession
10-12	-0.01	-0.01	-0.02	-0.02	-0.02	-0.02	0.01	0.01	0.00	0.00	0.00	0.00
13-15	-0.14	-0.12	-0.23	-0.28	-0.29	-0.25	0.11	0.12	0.04	0.00	-0.01	0.05
16	2.97	2.41	5.01	3.58	3.16	5.10	1.47	1.04	2.93	2.06	1.81	2.89
17-18	3.00	2.61	4.72	4.35	4.25	4.80	1.00	0.66	2.43	1.72	1.60	2.23
20-21	0.42	0.37	0.64	0.67	0.67	0.66	-0.04	-0.09	0.16	0.13	0.13	0.11
22	0.12	0.09	0.19	0.19	0.18	0.20	0.00	-0.02	0.04	0.04	0.04	0.04
23	2.03	1.51	3.04	2.18	1.69	3.14	1.15	0.75	1.87	1.37	1.13	1.82
24-25	1.08	0.91	1.70	1.56	1.51	1.76	0.24	0.09	0.75	0.57	0.53	0.71
26-27	-0.14	-0.10	-0.24	-0.22	-0.21	-0.26	0.07	0.09	0.03	0.00	-0.02	0.04
28-33	-0.53	-0.46	-0.83	-0.93	-0.97	-0.78	0.07	0.12	-0.15	-0.14	-0.15	-0.09
29-30	1.97	1.72	3.23	3.48	3.52	3.26	-0.19	-0.40	0.78	0.73	0.74	0.70
31-32	2.68	2.40	4.39	3.55	3.40	4.48	1.37	1.11	2.86	1.93	1.78	2.77
Total	0.76	0.66	1.22	1.17	1.15	1.25	0.13	0.04	0.51	0.39	0.37	0.48

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.17: Single Market competition effects of counterfactual policy scenarios across member states – intra-EU trade potentials, % change

Country	Transposition	Infringements	TRIS	SOLVIT
Belgium	-0.37	-0.54	0.03	-0.09
Denmark	-0.15	-0.13	0.07	-0.15
Finland	-0.22	-0.14	-0.05	-0.14
France	-0.26	-0.60	0.01	-0.13
Italy	-0.34	-0.66	0.12	-0.13
Netherlands	-0.26	-0.35	-0.07	-0.14
Portugal	-0.29	-0.33	-0.08	-0.10
Spain	-0.30	-0.81	0.14	-0.14
Sweden	-0.18	-0.25	-0.04	-0.12
EU15	-0.28	-0.54	0.04	-0.13
Croatia			-0.32	-0.20
Czech Republic	-0.48	-0.43	-0.15	-0.07
Hungary	-0.49	-0.42	-0.09	-0.16
Lithuania	-0.30	-0.23	-0.14	-0.11
Poland	-0.63	-0.75	-0.17	-0.13
Slovakia	-0.32	-0.39	0.04	-0.12
Slovenia	-0.53	-0.28	-0.18	-0.07
Accession countries	-0.51	-0.52	-0.13	-0.12
Total	-0.32	-0.54	0.00	-0.13

Source: ESRI estimates based on trade potentials estimated by WIFO.

Table 4.18: Single Market productivity effects of counterfactual policy scenarios across member states – intra-EU trade potentials, % change

Country	Transposition	Infringements	TRIS	SOLVIT
Belgium	0.82	1.14	0.08	0.31
Denmark	0.38	0.36	0.07	0.38
Finland	0.43	0.34	0.19	0.34
France	0.78	1.61	0.08	0.46
Italy	0.97	1.77	-0.22	0.44
Netherlands	0.72	0.92	0.30	0.47
Portugal	0.53	0.58	0.27	0.31
Spain	0.72	1.68	-0.13	0.41
Sweden	0.48	0.58	0.23	0.37
EU15	0.75	1.33	0.04	0.42
Croatia			0.91	0.72
Czech Republic	1.09	1.03	0.54	0.41
Hungary	1.11	1.04	0.38	0.52
Lithuania	0.97	0.85	0.61	0.55
Poland	1.33	1.54	0.55	0.48
Slovakia	0.92	1.06	0.22	0.53
Slovenia	1.57	0.99	0.72	0.45
Accession countries	1.19	1.21	0.51	0.49
Total	0.82	1.31	0.12	0.43

Source: ESRI estimates based on trade potentials estimated by WIFO.

Highest and lowest country-industry potentials

Tables 4.19 and 4.20 show the highest and lowest competition and productivity potentials by country-industry associated with changes in intra-EU imports under full legal harmonisation and full compliance with the Single Market legislation. Overall, the largest and lowest potentials belong to some specific industries from the new EU member states. The "Rubber and plastic products" industry in Poland has the largest competition potentials with full transposition of the SM legislation and no cases of infringement procedures. The reduction in the concentration ratio of the Top-10 manufacturing firms with full compliance with respect to these two indicators would be around 2%. As for productivity gains, the Polish industry of "Wood and products of wood and cork" has the largest potentials, 6.4%, with correct transposition of the Single Market legislation and 5.7% with full transposition of the Single Market legislation into national law. Other industries with large potential benefits from full compliance with the Single Market legislation are: "Pulp, paper, printing, publishing", "Furniture, other manufacturing" and "Transport equipment". On the other hand, competition potential is lowest in "Basic and fabricated metals" whereas "Machinery" has the lowest productivity potential.

Table 4.19: Single Market competition effects of counterfactual policy scenarios: 10 highest and lowest country-industry effects – intra-EU trade potentials, % change

	Country	Industry	Potential		Country	Industry	Potential
	Highest potential				Lowest potential		
Transposition							
1	Poland	22	-1.81	1	Poland	24-25	0.31
2	Poland	31-32	-1.80	2	Slovenia	24-25	0.30
3	Slovenia	31-32	-1.71	3	Czech Republic	24-25	0.25
4	Poland	16	-1.62	4	Hungary	24-25	0.24
5	Czech Republic	31-32	-1.57	5	Lithuania	24-25	0.20
6	Slovenia	16	-1.56	6	Slovakia	24-25	0.20
7	Hungary	31-32	-1.52	7	Italy	24-25	0.19
8	Poland	23	-1.43	8	Belgium	24-25	0.18
9	Czech Republic	16	-1.38	9	Portugal	24-25	0.17
10	Slovenia	23	-1.38	10	Poland	13-15	0.16
Infringements							
1	Poland	22	-2.16	1	Poland	24-25	0.36
2	Poland	31-32	-2.00	2	Italy	24-25	0.32
3	Spain	22	-1.85	3	Spain	24-25	0.28
4	Poland	16	-1.83	4	France	24-25	0.25
5	France	22	-1.66	5	Belgium	24-25	0.25
6	Italy	31-32	-1.64	6	Czech Republic	24-25	0.24
7	Poland	23	-1.61	7	Hungary	24-25	0.23
8	Belgium	22	-1.58	8	Italy	13-15	0.23
9	Czech Republic	31-32	-1.53	9	Slovakia	24-25	0.23
10	Hungary	31-32	-1.48	10	Poland	13-15	0.20
TRIS							
1	Croatia	31-32	-1.28	1	Spain	22	0.34
2	Croatia	16	-1.12	2	Italy	29-30	0.28
3	Poland	31-32	-1.11	3	Spain	26-27	0.26
4	Slovenia	31-32	-1.10	4	Denmark	22	0.24
5	Czech Republic	31-32	-1.08	5	Slovakia	26-27	0.24
6	Lithuania	31-32	-1.03	6	Italy	28-33	0.24
7	Croatia	23	-1.01	7	Denmark	26-27	0.22
8	Hungary	31-32	-0.93	8	Spain	29-30	0.18
9	Poland	16	-0.90	9	Italy	20-21	0.18
10	Slovenia	16	-0.90	10	Croatia	24-25	0.18
SOLVIT							
1	Croatia	31-32	-1.10	1	Slovenia	26-27	0.15
2	Poland	31-32	-1.05	2	Croatia	24-25	0.14
3	Slovakia	31-32	-1.04	3	Slovakia	24-25	0.12
4	Hungary	31-32	-1.03	4	Hungary	24-25	0.12
5	Croatia	16	-1.01	5	Poland	24-25	0.12
6	Lithuania	31-32	-0.97	6	Czech Republic	26-27	0.11
7	Croatia	23	-0.97	7	Lithuania	26-27	0.11
8	Czech Republic	31-32	-0.97	8	Lithuania	24-25	0.10
9	Slovenia	31-32	-0.91	9	Czech Republic	24-25	0.10
10	Poland	16	-0.86	10	Finland	24-25	0.10

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.20: Single Market productivity effects of counterfactual policy scenarios: 10 highest and lowest country-industry effects – intra-EU trade potentials, % change

	Country	Industry	Potential		Country	Industry	Potential
	Highest potential				Lowest potential		
Transposition							
1	Poland	16	5.67	1	Poland	28-33	-1.06
2	Slovenia	16	5.43	2	Slovenia	28-33	-1.00
3	Poland	17-18	5.32	3	Czech Republic	28-33	-0.76
4	Slovenia	17-18	5.11	4	Italy	28-33	-0.74
5	Poland	31-32	4.90	5	Belgium	28-33	-0.71
6	Czech Republic	16	4.83	6	Hungary	28-33	-0.71
7	Hungary	16	4.70	7	Portugal	28-33	-0.63
8	Slovenia	31-32	4.67	8	Lithuania	28-33	-0.50
9	Czech Republic	17-18	4.44	9	Slovakia	28-33	-0.45
10	Hungary	17-18	4.29	10	Spain	28-33	-0.41
Infringements							
1	Poland	16	6.40	1	Italy	28-33	-1.55
2	Poland	17-18	6.02	2	Spain	28-33	-1.26
3	Italy	17-18	5.77	3	Poland	28-33	-1.21
4	Poland	31-32	5.46	4	France	28-33	-1.12
5	Spain	17-18	5.03	5	Belgium	28-33	-1.06
6	Italy	29-30	4.84	6	Portugal	28-33	-0.72
7	Czech Republic	16	4.78	7	Czech Republic	28-33	-0.59
8	Poland	29-30	4.68	8	Hungary	28-33	-0.51
9	France	17-18	4.62	9	Slovakia	28-33	-0.51
10	Hungary	16	4.59	10	Netherlands	28-33	-0.50
TRIS							
1	Croatia	16	3.92	1	Italy	29-30	-1.03
2	Croatia	31-32	3.50	2	Spain	29-30	-0.67
3	Croatia	17-18	3.48	3	Croatia	28-33	-0.60
4	Poland	16	3.15	4	Denmark	29-30	-0.47
5	Slovenia	16	3.13	5	France	29-30	-0.27
6	Poland	31-32	3.04	6	Slovenia	28-33	-0.25
7	Czech Republic	16	3.04	7	Poland	28-33	-0.23
8	Slovakia	31-32	3.00	8	Czech Republic	28-33	-0.20
9	Czech Republic	31-32	2.94	9	Italy	20-21	-0.20
10	Lithuania	16	2.83	10	Belgium	29-30	-0.18
SOLVIT							
1	Croatia	16	3.53	1	Italy	28-33	-0.21
2	Croatia	31-32	2.99	2	Croatia	28-33	-0.20
3	Poland	16	2.99	3	Denmark	28-33	-0.19
4	Slovakia	16	2.97	4	Spain	28-33	-0.15
5	Hungary	16	2.95	5	Portugal	28-33	-0.15
6	Poland	31-32	2.86	6	Netherlands	28-33	-0.15
7	Slovakia	31-32	2.83	7	Finland	28-33	-0.14
8	Hungary	31-32	2.81	8	Sweden	28-33	-0.14
9	Czech Republic	16	2.71	9	France	28-33	-0.13
10	Lithuania	16	2.70	10	Slovakia	28-33	-0.13

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

4.4.2. *Counterfactual competition and productivity effects with full legal harmonisation and full compliance with the Single Market – extra-EU trade potentials*

Industry-specific effects

Tables 4.21 and 4.22 show the estimated competition and productivity effects of changes in extra-EU imports associated with full compliance with the Single Market legislation by industry, for all countries and for the groups of EU15 and accession countries. Unlike the patterns uncovered for intra-EU imports, full compliance with the Single Market legislation is associated with lower extra-EU imports indicating trade diversion towards intra-EU trade as discussed in chapter 3. The estimated elasticities of the market concentration of the Top-10 firms with respect to extra-EU imports imply that lower extra-EU imports are associated with less competition and productivity reductions. Overall, the aforementioned effects are more evident for the accession countries, which would see an increase in the concentration ratio by 0.07% and a fall in productivity by 0.17% in the case of no cases of infringement procedures. Across industries in the group of accession countries, the industry "Pulp, paper, printing, publishing" would see the largest increase in market concentration (the largest decline in competition). On the other hand, "Wood and products of wood and cork" would experience the largest productivity decline, by 0.54%, followed by "Basic and fabricated metals" with a 0.5% fall. This pattern is similar across most of the indicators measuring compliance with the Single Market considered.

Country-specific effects

Tables 4.23 and 4.24 summarise the potential competition and productivity effects linked to extra-EU imports associated with full harmonisation and full compliance with the Single Market legislation in EU member states. The trade diversion effect mentioned earlier has negative effects on competition and productivity, with the largest losses in the accession countries. In the case of no infringement procedures, Hungary's productivity would be lower by 0.24%, while the next largest declines would be in Slovenia (-0.19%) and Lithuania (-0.16%). Among EU15 countries, Italy would have the largest productivity decline (-0.14%), followed by France (-0.12%) and Belgium (-0.09%). This pattern is fairly similar in the case of full transposition of the Single Market legislation. Slovenia would have the largest productivity decline, (-0.24%), followed by Hungary (-0.23%) and Lithuania (-0.16%).

Table 4.21: Single Market competition effects of counterfactual policy scenarios across industries – trade diversion potentials, % change

Industry	Transposition			Infringements			TRIS			SOLVIT		
	All countries	EU15	Accession	All countries	EU15	Accession	All countries	EU15	Accession	All countries	EU15	Accession
10-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-15	-0.01	0.00	-0.02	-0.01	-0.01	-0.02	0.01	0.01	0.00	0.00	0.00	0.00
16	0.06	0.04	0.16	0.07	0.05	0.17	0.02	0.01	0.11	0.04	0.03	0.10
17-18	0.11	0.07	0.38	0.15	0.11	0.42	-0.01	-0.03	0.22	0.06	0.05	0.19
20-21	0.07	0.05	0.23	0.12	0.10	0.26	-0.03	-0.05	0.07	0.03	0.02	0.05
22	0.13	0.08	0.34	0.20	0.16	0.40	-0.04	-0.07	0.10	0.06	0.05	0.08
23	0.06	0.03	0.13	0.06	0.04	0.14	0.03	0.01	0.09	0.04	0.02	0.08
24-25	-0.05	-0.04	-0.15	-0.07	-0.06	-0.16	0.00	0.01	-0.08	-0.03	-0.02	-0.07
26-27	0.01	0.00	0.02	0.01	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00
28-33	0.03	0.02	0.11	0.05	0.04	0.12	-0.02	-0.03	0.03	0.01	0.01	0.02
29-30	0.02	0.02	0.07	0.04	0.03	0.08	-0.01	-0.01	0.02	0.01	0.01	0.02
31-32	0.04	0.03	0.15	0.05	0.04	0.16	0.01	0.00	0.10	0.03	0.02	0.10
Total	0.02	0.01	0.06	0.03	0.02	0.07	-0.01	-0.01	0.02	0.01	0.01	0.01

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.22: Single Market productivity effects of counterfactual policy scenarios across industries – trade diversion potentials, % change

Industry	Transposition			Infringements			TRIS			SOLVIT		
	All countries	EU15	Accession	All countries	EU15	Accession	All countries	EU15	Accession	All countries	EU15	Accession
10-12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13-15	0.01	0.01	0.04	0.03	0.03	0.05	-0.01	-0.02	0.00	0.00	0.00	-0.01
16	-0.17	-0.12	-0.50	-0.22	-0.17	-0.54	-0.07	-0.02	-0.33	-0.12	-0.09	-0.31
17-18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20-21	-0.09	-0.06	-0.26	-0.14	-0.11	-0.31	0.04	0.06	-0.08	-0.03	-0.03	-0.06
22	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
23	-0.16	-0.09	-0.36	-0.17	-0.10	-0.39	-0.09	-0.02	-0.25	-0.11	-0.06	-0.23
24-25	-0.15	-0.11	-0.46	-0.22	-0.18	-0.50	0.01	0.04	-0.23	-0.08	-0.07	-0.21
26-27	0.10	0.06	0.20	0.15	0.11	0.25	-0.05	-0.06	-0.02	0.00	0.02	-0.04
28-33	0.07	0.05	0.21	0.10	0.08	0.24	-0.04	-0.05	0.05	0.03	0.02	0.03
29-30	-0.16	-0.12	-0.46	-0.27	-0.23	-0.52	0.06	0.10	-0.15	-0.07	-0.06	-0.12
31-32	-0.48	-0.37	-1.88	-0.65	-0.53	-2.05	-0.12	-0.02	-1.30	-0.36	-0.28	-1.23
Total	-0.04	-0.03	-0.16	-0.06	-0.05	-0.17	-0.01	0.00	-0.12	-0.04	-0.03	-0.12

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.23: Single Market competition effects of counterfactual policy scenarios across member states – trade diversion potentials, % change

Country	Transposition	Infringements	TRIS	SOLVIT
Belgium	0.02	0.03	-0.02	0.01
Denmark	0.01	0.00	-0.01	0.01
Finland	0.01	0.00	0.00	0.02
France	0.01	0.02	-0.01	0.01
Italy	0.01	0.03	-0.02	0.01
Netherlands	0.01	0.02	-0.01	0.00
Portugal	0.03	0.02	0.00	0.00
Spain	0.02	0.05	-0.03	0.01
Sweden	0.01	0.01	0.00	0.01
EU15	0.01	0.02	-0.01	0.01
Croatia			0.03	0.01
Czech Republic	0.05	0.04	0.01	0.01
Hungary	0.08	0.08	0.02	0.02
Lithuania	0.02	0.02	0.01	0.01
Poland	0.06	0.08	0.02	0.01
Slovakia	0.02	0.03	0.00	0.01
Slovenia	0.06	0.04	0.02	0.01
Accession countries	0.06	0.06	0.02	0.01
Total	0.02	0.03	-0.01	0.01

Source: ESRI estimates based on trade potentials estimated by WIFO.

Table 4.24: Single Market productivity effects of counterfactual policy scenarios across member states – trade diversion potentials, % change

Country	Transposition	Infringements	TRIS	SOLVIT
Belgium	-0.07	-0.09	0.00	-0.04
Denmark	-0.03	-0.03	-0.01	-0.04
Finland	-0.02	-0.02	-0.02	-0.02
France	-0.06	-0.12	0.02	-0.05
Italy	-0.08	-0.14	0.04	-0.04
Netherlands	-0.04	-0.04	-0.02	-0.03
Portugal	-0.05	-0.04	-0.02	-0.03
Spain	-0.04	-0.08	0.01	-0.03
Sweden	-0.03	-0.03	-0.02	-0.03
EU15	-0.06	-0.09	0.01	-0.04
Croatia			-0.14	-0.12
Czech Republic	-0.03	-0.05	-0.08	-0.09
Hungary	-0.23	-0.24	-0.12	-0.13
Lithuania	-0.16	-0.16	-0.14	-0.13
Poland	-0.10	-0.11	-0.09	-0.09
Slovakia	-0.08	-0.07	-0.10	-0.09
Slovenia	-0.24	-0.19	-0.14	-0.12
Accession countries	-0.12	-0.12	-0.10	-0.10
Total	-0.07	-0.10	0.00	-0.05

Source: ESRI estimates based on trade potentials estimated by WIFO.

Highest and lowest country-industry potentials

Tables 4.25 and 4.26 show the Top-10 and Bottom-10 country-industry pairs with the highest and lowest competition and productivity potentials associated with changes in extra-EU imports linked to full compliance of the Single Market legislation. Similarly, with results reported above, lower potential extra-EU imports are linked to market concentration increases and productivity declines in accession countries, particularly in Slovenia, Poland, Hungary and the Czech Republic. However, it appears that the industry "Basic and fabricated metals" would experience an increase in competition associated with lower extra-EU imports. Similarly, industries like "Machinery" and "Computer, electronic, electrical and optical products" would gain in terms of productivity. On the other hand, "Pulp, paper, printing, publishing" and "Furniture, other manufacturing" would be the industries with the lowest competition and productivity potentials.

Table 4.25: Single Market competition effects of counterfactual policy scenarios: 10 highest and lowest country-industry effects – trade diversion potentials, % change

	Country	Industry	Potential		Country	Industry	Potential
	Highest potential				Lowest potential		
			Transposition				
1	Poland	24-25	-0.16	1	Poland	17-18	0.41
2	Slovenia	24-25	-0.16	2	Slovenia	17-18	0.41
3	Czech Republic	24-25	-0.15	3	Czech Republic	17-18	0.38
4	Hungary	24-25	-0.14	4	Poland	22	0.38
5	Slovakia	24-25	-0.12	5	Czech Republic	22	0.35
6	Lithuania	24-25	-0.11	6	Hungary	17-18	0.35
7	Portugal	24-25	-0.07	7	Hungary	22	0.31
8	Belgium	24-25	-0.04	8	Lithuania	17-18	0.31
9	Italy	24-25	-0.04	9	Slovakia	17-18	0.31
10	Sweden	24-25	-0.03	10	Poland	20-21	0.24
			Infringements				
1	Poland	24-25	-0.20	1	Poland	22	0.51
2	Czech Republic	24-25	-0.14	2	Poland	17-18	0.51
3	Hungary	24-25	-0.14	3	Czech Republic	17-18	0.38
4	Slovakia	24-25	-0.14	4	Hungary	17-18	0.37
5	Slovenia	24-25	-0.12	5	Slovakia	17-18	0.37
6	Lithuania	24-25	-0.11	6	Poland	20-21	0.33
7	Italy	24-25	-0.08	7	Slovenia	17-18	0.33
8	Spain	24-25	-0.07	8	Czech Republic	22	0.32
9	France	24-25	-0.06	9	Lithuania	17-18	0.31
10	Belgium	24-25	-0.06	10	Hungary	22	0.31
			TRIS				
1	Spain	22	-0.09	1	Croatia	17-18	0.25
2	Slovenia	24-25	-0.08	2	Slovenia	17-18	0.24
3	Czech Republic	24-25	-0.08	3	Czech Republic	17-18	0.23
4	Lithuania	24-25	-0.08	4	Poland	17-18	0.23
5	Poland	24-25	-0.08	5	Lithuania	17-18	0.22
6	Italy	20-21	-0.08	6	Hungary	17-18	0.20
7	France	22	-0.07	7	Slovakia	17-18	0.17
8	Croatia	24-25	-0.07	8	Czech Republic	22	0.13
9	Hungary	24-25	-0.07	9	Poland	22	0.12
10	Belgium	22	-0.07	10	Slovenia	16	0.12
			SOLVIT				
1	Slovakia	24-25	-0.07	1	Slovakia	17-18	0.20
2	Hungary	24-25	-0.07	2	Hungary	17-18	0.20
3	Poland	24-25	-0.07	3	Poland	17-18	0.19
4	Czech Republic	24-25	-0.07	4	Lithuania	17-18	0.19
5	Lithuania	24-25	-0.07	5	Czech Republic	17-18	0.19
6	Slovenia	24-25	-0.06	6	Slovenia	17-18	0.18
7	Croatia	24-25	-0.06	7	Croatia	17-18	0.17
8	Finland	24-25	-0.05	8	Finland	22	0.16
9	Denmark	24-25	-0.04	9	Hungary	16	0.11
10	Sweden	24-25	-0.03	10	Slovakia	16	0.11

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table 4.26: Single Market productivity effects of counterfactual policy scenarios: 10 highest and lowest country-industry effects – trade diversion potentials, % change

	Country	Industry	Potential		Country	Industry	Potential
	Highest potential				Lowest potential		
Transposition							
1	Poland	28-33	0.25	1	Slovenia	31-32	-2.02
2	Slovenia	28-33	0.24	2	Poland	31-32	-1.95
3	Poland	26-27	0.24	3	Czech Republic	31-32	-1.92
4	Slovenia	26-27	0.23	4	Hungary	31-32	-1.84
5	Czech Republic	28-33	0.22	5	Slovakia	31-32	-1.67
6	Czech Republic	26-27	0.22	6	Lithuania	31-32	-1.65
7	Hungary	28-33	0.19	7	Portugal	31-32	-0.60
8	Portugal	26-27	0.17	8	Slovenia	16	-0.54
9	Slovakia	28-33	0.14	9	Czech Republic	16	-0.53
10	Lithuania	28-33	0.13	10	Poland	16	-0.53
Infringements							
1	Poland	26-27	0.37	1	Poland	31-32	-2.30
2	Poland	28-33	0.34	2	Czech Republic	31-32	-1.94
3	Spain	26-27	0.21	3	Hungary	31-32	-1.93
4	Czech Republic	28-33	0.20	4	Slovakia	31-32	-1.90
5	Hungary	28-33	0.19	5	Slovenia	31-32	-1.79
6	Slovakia	28-33	0.18	6	Lithuania	31-32	-1.69
7	Czech Republic	26-27	0.18	7	Poland	29-30	-0.70
8	Belgium	26-27	0.17	8	Italy	31-32	-0.63
9	Slovakia	26-27	0.16	9	Poland	16	-0.63
10	Slovenia	28-33	0.14	10	Spain	31-32	-0.62
TRIS							
1	Italy	29-30	0.15	1	Slovenia	31-32	-1.40
2	Croatia	28-33	0.13	2	Czech Republic	31-32	-1.36
3	Spain	29-30	0.12	3	Lithuania	31-32	-1.33
4	France	29-30	0.10	4	Croatia	31-32	-1.31
5	Belgium	29-30	0.10	5	Poland	31-32	-1.31
6	Italy	20-21	0.09	6	Hungary	31-32	-1.28
7	Denmark	29-30	0.08	7	Slovakia	31-32	-1.17
8	Italy	31-32	0.08	8	Slovenia	16	-0.36
9	Slovenia	28-33	0.07	9	Czech Republic	16	-0.35
10	Italy	24-25	0.07	10	Lithuania	16	-0.35
SOLVIT							
1	Finland	28-33	0.11	1	Hungary	31-32	-1.29
2	Finland	26-27	0.11	2	Slovakia	31-32	-1.29
3	Denmark	28-33	0.06	3	Czech Republic	31-32	-1.22
4	Denmark	26-27	0.05	4	Lithuania	31-32	-1.22
5	Sweden	28-33	0.04	5	Poland	31-32	-1.22
6	Slovakia	28-33	0.04	6	Slovenia	31-32	-1.21
7	Hungary	28-33	0.04	7	Croatia	31-32	-1.10
8	Poland	28-33	0.03	8	Finland	31-32	-0.55
9	Croatia	28-33	0.03	9	Denmark	31-32	-0.41
10	Sweden	26-27	0.03	10	Sweden	31-32	-0.35

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

4.5. Summary of key findings and policy implications

This chapter has reviewed the recent theoretical and empirical literature on international trade with heterogenous firms with the aim to put forward a conceptual framework for the analysis of the gap between expected and realised benefits of the Single Market other than trade. Insights from this literature suggest heterogeneous effects of trade liberalisation on competition and productivity across firms and between industries. The evidence provided by this literature strand suggests that these heterogenous effects follow from variable mark-ups across firms which condition the pass-through of falling trade costs on prices and productivity. This heterogeneity of effects implies smaller welfare gains from trade than initially expected based on the trade literature with representative firms and constant mark-ups.

Our results indicate that market concentration has increased in recent years in many industries, including: "Textiles, wearing apparel, leather products" and "Machinery". In some other industries, market concentration has had a "U-shape" evolution where market concentration declined before 2008 but started to rise afterwards. This is the case for: "Wood and products of wood and cork", "Pulp, paper, printing, publishing", "Chemicals and pharmaceuticals", "Non-metallic mineral products", "Furniture, other manufacturing". Two industries have experienced declining market concentration: "Computer, electronic, electrical and optical products" and "Transport equipment".

Further descriptive evidence indicates that in most industries higher trade integration among EU countries appears to be associated with higher competition and, furthermore, in most industries productivity is positively correlated with competition levels. This descriptive evidence is indicative of pro-competitive effects of the Single Market. These results are complemented with more robust evidence from a multivariate econometric analysis that accounts for unobserved factors and potential endogeneity in the relationships between trade, competition and productivity.

The results of the econometric analysis indicate heterogenous competition and productivity effects of trade integration across industries. Taken together, these results uncover the following patterns across industries:

- *Higher intra-EU trade associated with more competition and higher productivity:* "Chemicals and pharmaceuticals", "Furniture, other manufacturing", "Wood and products of wood and cork", "Pulp, paper, printing, publishing", "Non-metallic mineral products", "Transport equipment"
- *Higher intra-EU trade associated with more competition and lower productivity:* "Machinery"
- *Higher intra-EU trade associated with more competition and no productivity change:* "Rubber and plastic products", "Computer, electronic, electrical and optical products"
- *Higher intra-EU trade associated with no change in competition and productivity:* "Food, beverages, tobacco"
- *Higher intra-EU trade associated with no change in competition and higher productivity:* "Textiles, wearing apparel, leather products"
- *Higher extra-EU trade associated with more competition and higher productivity:* "Wood and products of wood and cork", "Chemicals and pharmaceuticals"
- *Higher extra-EU trade associated with more competition and lower productivity:* "Machinery"
- *Higher extra-EU trade associated with more competition and no productivity change:* "Pulp, paper, printing, publishing", "Rubber and plastic products"
- *Higher intra-EU trade associated with no change in competition and higher productivity:* "Textiles, wearing apparel, leather products", "Transport equipment.
- *Higher extra-EU trade associated with no change in competition and productivity:* "Food, beverages, tobacco", "Furniture, other manufacturing", "Non-metallic mineral products", "Computer, electronic, electrical and optical products" and "Basic and fabricated metals"

These heterogenous effects are likely to be generated by variable mark-ups across firms between industries, as suggested by the literature reviewed in subchapter 4.1. As discussed above, variable mark-ups are key to understanding the incomplete pass-through of falling trade costs on prices and productivity across firms and between industries. While the underlying factors of these patterns cannot be uncovered at this stage given data limitations, this evidence is useful to better understand the gap between the expected and realised benefits of the Single Market for goods.

Our results indicate that higher trade potentials associated with full harmonisation and full compliance with the Single Market would result, overall, in increased competition and productivity gains. Across the four indicators of compliance with the Single Market legislation considered, the largest competition and productivity potentials are associated with eliminating the need for infringement procedures followed by full transposition of the Single Market legislation into national legislation. The counterfactual competition and productivity potentials are only marginal in the cases of the other two indicators measuring full compliance with the Single Market in terms of comments on technical regulation drafts (TRIS) and solving all cases of misapplication of the Single Market legislation (SOLVIT). These results are consistent with the estimated trade potentials discussed in subchapter 3.2.4.

Looking at industry-specific estimates across all countries, the three industries with the largest competition and productivity potentials are: "Pulp, paper, printing and publishing", "Wood and products of wood and cork", "Furniture, other manufacturing". These three industries are those identified to benefit the most in terms of trade potential in the case of full legal harmonisation and full compliance with the Single Market.

Taken together, these results indicate that full compliance with the Single Market legislation could be a source of productivity gains, particularly in the new EU member states. The largest untapped productivity benefits would be in the case of eliminating the need for infringement proceedings (a correct transposition of the Single Market legislation into national law) followed by the full transposition of the Single Market legislation into national law.

Further research on the responsiveness of firm and industry performance to trade integration could provide additional evidence on the untapped benefits of the Single Market. In particular, using firm-level data could allow to examine the responsiveness of prices, productivity and product variety to falling trade costs in the context of the Single Market under firm heterogeneity and variable mark-ups across firms within industries. This evidence will be useful to better understand how market power impacts on the pro-competitive effects of trade integration in the short and long run.

5. THE QUALITY OF THE SINGLE MARKET LEGAL FRAMEWORK AS A SOURCE OF COMPARATIVE ADVANTAGE AND DETERMINANT OF INTERNATIONAL PRODUCTION CHOICES IN EU COUNTRIES

The Single Market Programme introduced in 1993 focused on the reduction and elimination of non-tariff barriers between member states (administrative and regulatory barriers) with the aim to foster intra-EU trade, increasing competition and productivity and ultimately welfare gains in the long run. In addition to these benefits which were predicted by the traditional trade theory, the implementation of the Single Market legislation might have induced other benefits, unexpected initially. Such benefits, including increased export specialisation and intra-EU production linkages, are suggested by theoretical and empirical advances in institutional economics. More specifically, recent theoretical models and empirical findings suggest that the quality of institutions is an important determinant of comparative advantage and international production patterns.

A growing body of empirical literature has found that the quality of institutions is a source of export specialisation (Nunn, 2007; Levchenko, 2007; Chor, 2010; Cuñat and Melitz, 2012). To the extent that export specialisation is linked to higher productivity in the long run (see for example, Quah and Rauch, 1990), improving the quality of institutions could be an important driver of welfare gains. On the other hand, another literature strand has found that institutional characteristics across countries, in particular with respect to contract enforcement, matter for firms' organisational choices for their international production operations (Antràs and Chor, 2013; Antràs and Yeaple, 2013). More specifically, theoretical models and empirical evidence which are part of this literature indicate that in the presence of market imperfections such as incomplete contracts, vertical integration is greater in industries which are more dependent on contract enforcement (contract-intensive industries). In relation to the expected benefits of such organisational choices, recent research has shown that international sourcing choices are associated with relationship-specific investments that are linked to productivity growth and welfare (Antràs et al., 2017; Constantinescu et al., 2017).

Taken together, this recent international evidence suggests that the quality of institutions, in particular with respect to contract enforcement, could foster specialisation, international production linkages and productivity growth. To the extent that market imperfections such as incomplete contracts exist in EU countries, we expect greater specialisation in contract-intensive industries in countries with lower contracting costs, greater vertical integration in contract-intensive industries in countries with higher contracting costs, and greater outsourcing in countries with lower contracting costs.

Against this background, this chapter examines whether the quality of the Single Market legal framework has been a source of comparative advantage and a determinant of international production choices in EU countries over and above other institutional factors including judicial quality (Rule of Law). This analysis is underpinned by recent theoretical models on the role of institutions as sources of comparative advantage and firms' organisational choices for international production patterns in the context of market imperfections such as incomplete contracting (Grossman and Hart, 1986; Nunn, 2007; Levchenko, 2007; Antràs and Chor, 2013; Antràs and Yeaple, 2013; Nunn and Trefler, 2013). On the basis of these results, implications on productivity and welfare effects linked to trade integration in the Single Market are explored and discussed.

The rest of this chapter is organised as follows. Subchapter 5.1 identifies and quantifies the effects of the quality of the Single Market legal framework as a source of export specialisation in contract-intensive industries. Subchapter 5.2 examines the role of the quality of the Single Market legal framework as a determinant of firms' international production choices in EU countries. Subchapter 5.3 summarises the key findings and discusses implications on the performance of the Single Market.

5.1. The quality of the Single Market legal framework as a source of comparative advantage and specialisation in contract-intensive industries

5.1.1. *Research objectives and methodology*

This subchapter identifies and quantifies the role of the quality of the legal framework related to the Single Market Programme (SMP) on the specialisation of EU countries in contract-intensive industries. This analysis builds on the existing literature on the institutional determinants of international trade reviewed by Nunn and Trefler (2013). Thus, several studies have shown that countries with a higher institutional quality export relatively more in industries that are more exposed to institutional frictions and incomplete contracts measured as intermediate inputs concentration (Levchenko, 2007) or the intensity of relationship-specific investment (Nunn, 2007). In addition, other studies have focused on other institutional differences across countries such as financial development (Beck, 2003; Manova, 2013) and labour market flexibility (Cuñat and Melitz, 2012) as sources of comparative advantages. Chor (2010) examines the effects of all these institutional determinants on comparative advantage together with interactions of country and industry characteristics (factor endowments and factor intensities, respectively).

Following on from these results, the question we investigate is whether and to which extent differentials in the implementation of the SMP across EU countries have been a source of comparative advantage and specialisation in industries in which contract enforcement is relatively more important than in the rest of industries. Drawing on this literature, the baseline model specification to be estimated is as follows:

$$lnx_{ki} = \beta_1 z_k Q_i^{RL} + \beta_2 h_k H_i + \beta_3 k_k K_i + \beta_4 fin_k FIN_i + \beta_5 salesvol_k LFLEX_i + \alpha_k + \alpha_i + \varepsilon_{ki} \quad (5.1)$$

The dependent variable measures exports from industry k in country i to all other countries in the world, averaged over the analysed period 2000-2014, to net out year-to-year fluctuations in the distribution of exports across industries.[27] z_k is a measure of contract intensity in industry k; h_k , k_k , denote industry intensity in skills and capital, respectively; fin_k is a measure of external finance dependence in industry k; Q_i^{RL} is a measure of the quality of the legal framework (Rule of Law) in country i; H_i , K_i are country-level measures of skills and capital intensities; FIN_i is a measure of country-level financial development; $LFLEX_i$ is a measure of labour market flexibility; $salesvol_k$ is a measure of industry output volatility, α_k , α_i, are industry-specific and country-specific fixed effects, respectively. Following on from Cuñat and Melitz (2012), these fixed effects imply that the above model specification is equivalent to a specification where exports are measured relative to a reference country.

To capture the effect of the quality of the SM legal framework on export specialisation in EU member states, we augment the baseline model described by Equation (5.1) above with measures reflecting the quality of the application of the SM legislation in EU member states Q_i^{SMP} interacted with the industry-specific contract intensity z_k .

$$lnx_{ki} = \beta_1 z_k Q_i^{RL} + \beta_2 z_k Q_i^{SMP} + \beta_3 h_k H_i + \beta_4 k_k K_i + \beta_5 fin_k FIN_i + \beta_6 salesvol_k LFLEX_i + \alpha_k + \alpha_i + \varepsilon_{ki} \quad (5.2)$$

The empirical identification strategy exploits the variation of the quality of the SM legal framework across countries and of contract intensity across industries.

We expect a positive value for β_1 which would indicate that institutional quality is a source of comparative advantage, as found in the previous studies reviewed above. The parameter of interest is β_2. A positive value would indicate that countries with a higher quality of the SM implementation are specialised (i.e. export relatively more) in industries which are more dependent on contract enforcement over and above other determinants of comparative advantage. The interactions between factor endowments and factor intensity capture specialisation patterns following from the Heckscher-Ohlin model, which suggests that countries abundant in a given

[27] We follow the approach of Cuñat and Melitz (2012) who make this point about export fluctuations across industries.

factor (skilled labour or capital) have a comparative advantage in industries that use that factor intensively. We expect positive and significant estimates for the parameters β_3 and β_4.[28]

The next two interactions capture the role of other institutions found to be sources of comparative advantage: countries with more developed financial systems are specialised in industries with a greater dependence on external finance (as shown by Chor, 2010 and Manova, 2013); countries with more flexible labour markets export relatively more in industries with more output volatility, where adjustment to industry-specific shocks is facilitated by labour reallocation across industries (as shown by Cuñat and Melitz, 2012).[29] We expect positive and significant estimates for the parameters β_5 and β_6.

Following on from Nunn and Trefler (2013), a possible reverse causality concern might arise from the fact that specialisation in contract-intensive industries might reflect greater incentives for EU countries to develop a higher quality of the SMP implementation. To address this potential endogeneity, the legal origin of law is used as a determinant of the institutional quality at country level following Nunn (2007).[30]

5.1.2. *Data and measurement*

Country-industry data

Data on exports by industry for all EU countries is taken from the WIOD 2016 dataset. The data is available for the period 2000-2014 for 19 manufacturing industries at the 2-digit ISIC rev. 4 classification.[31] In the regression analysis, we use the annual average of exports by industry from each country to the rest of the world over the period 2000-2014.

Industry-specific characteristics

We follow the existing literature (Chor, 2010; Cuñat and Melitz, 2012) and take the US as a benchmark country to construct the industry-specific indicators included in the model specification described by Equation (5.1). This choice alleviates potential endogeneity concerns.

To measure industry-specific contract intensity, we construct an index of institutional intensity following Levchenko (2007). The index captures the sensitivity of an industry to the quality of contract enforcement. This measure is the Herfindahl index of intermediate input use and is a proxy for product complexity. The intuition behind this measure is that the greater the number of input suppliers an industry uses, the greater its sensitivity to the quality of contract enforcement will be. As argued by Levchenko (2007), using a measure of intermediate input use concentration rather than the number of intermediate inputs avoids giving excessive weights to marginal (small) suppliers, which would overestimate the importance of contract enforcement. To construct this measure, we use information from the 2014 US World Input-Output Tables available from the WIOD. The data is available for 56 sectors and products at the 2-digit ISIC rev. 4 classification (19 manufacturing industries). Given the focus of this study, the institutional intensity measure is computed by considering manufacturing inputs only. To obtain a measure which increases in institutional intensity, we multiply the index by (-1) as in Levchenko (2007).

Table 5.1 shows the ranking of manufacturing industries based on their institutional intensity index counting manufacturing inputs. The top five industries with the highest institutional intensity are: "Furniture, other manufacturing", "Repair and installation of machinery and equipment", "Printing and reproduction of recorded media", "Machinery and equipment nec.", "Rubber and plastic products". At the other end of the ranking, the five industries with the lowest dependence on contract enforcement are: "Basic metals", "Food products, beverages and tobacco products", "Coke

[28] Romalis (2004) provides empirical evidence on the relative factor endowments as a source of comparative advantage.

[29] Murphy et al. (2017) show that countries with more flexible labour markets innovate more in industries with higher rates of job reallocations.

[30] The empirical approach followed by Nunn (2007) is based on previous evidence indicating that legal origin is an important determinant of differences in judicial quality and contract enforcement (Djankov et al., 2003; Acemoglu and Johnson, 2004; Lerner and Schoar, 2005).

[31] We gratefully thank the Austrian Institute of Economic Research (WIFO) for sharing with us the data on exports and imports extracted from the WIOD 2016.

and refined petroleum products2, "Wood and of products of wood and cork", Paper and paper products". This ranking appears to be broadly similar to the results reported by Levchenko (2007).

Table 5.1: Ranking of manufacturing industries by institutional intensity

Manufacturing industry	Institutional intensity
Furniture; other manufacturing	-0.1017
Repair and installation of machinery and equipment	-0.1126
Printing and reproduction of recorded media	-0.1411
Machinery and equipment nec.	-0.1458
Rubber and plastic products	-0.1875
Electrical equipment	-0.1999
Computer, electronic and optical products	-0.2196
Motor vehicles, trailers and semi-trailers	-0.2251
Other transport equipment	-0.2271
Other non-metallic mineral products	-0.2328
Textiles, wearing apparel and leather products	-0.2715
Chemicals and chemical products	-0.2906
Basic pharmaceutical products and pharmaceutical preparations	-0.2906
Fabricated metal products, except machinery and equipment	-0.3115
Paper and paper products	-0.3120
Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	-0.4048
Coke and refined petroleum products	-0.4473
Food products, beverages and tobacco products	-0.4902
Basic metals	-0.4945

Source: ESRI calculations following Levchenko (2007) using the US WIOD 2014 data.

Skills intensity is computed using the NBER US Manufacturing Industry Data. The data is available over the period 1958-2011 at 6-digit NAICS 1997 industry classification (473 industries). We follow Levchenko (2007) and compute skill intensity for each industry as the share of non-production workers payroll in total industry value added. To obtain the measure by industry at the 2-digit ISIC rev. 4 (the classification used in WIOD 2016) we use concordance tables and take the median value of skill intensity across the component industries.

Capital intensity is computed using the NBER US Manufacturing Industry Data. We follow Levchenko (2007) and compute capital intensity for each industry as 1-(total payroll/total value added in industry). To obtain the measure by industry at the 2-digit ISIC rev. 4 (the classification used in WIOD 2016) we use concordance tables and take the median value of capital intensity across the component industries.

Industry dependence on external finance is computed following the methodology of Rajan and Zingales (1998), using data for the US from CompStat.[32] To obtain the measure by industry at the 2-digit ISIC rev. 4 (the classification used in WIOD 2016) we use concordance tables and take the median value of financial dependence across firms and component industries.

The volatility of sales at the industry level has been computed by Cuñat and Melitz (2012)[33] at 2-, 3-, and 4-digit SIC classification as the employment-weighted standard deviation of sales growth at firm-level. To obtain the measure by industry at the 2-digit ISIC rev. 4 (the classification used in WIOD 2016) we use concordance tables and take the median value of the output volatility across component industries.

[32] The fraction of capital expenditure not financed by internal cash flow. The measure of dependence of external finance in a given industry is computed as the median across all firms of the ratio between external finance and capital expenditures at firm-level.

[33] We gratefully thank Alejandro Cuñat for sharing with us his data on industry output volatility.

Country-specific characteristics

EU countries' institutional quality is measured by the Rule of Law Index (Q_i^{RL}) taken from the World Bank Governance Indicators. The index is increasing in the quality of the legal framework and ranges between -2.5 and 2.5.[34] A normalised version of the Rule of Law Index (Q_i^{RLN}) is used in the regression analysis obtained as follows:

$$Q_i^{RLN} = \frac{Q_i^{RL} - Q_{min}^{RL}}{Q_{max}^{RL} - Q_{min}^{RL}} \quad (5.3)$$

$Q_{min}^{RL}, and\ Q_{max}^{RL}$ denote the minimum and maximum values of the Rule of Law Index across all EU countries and the analysed period, 2000-2014, respectively.

The quality of the SM legal framework with respect to the timely and correct transposition of the SM legislation in a given EU country *i* is measured by the number of pending infringement proceedings ($Infr_i$). The indicator used in the regression analysis is a normalised version of this measure, as follows:

$$Infr_i^N = 1 - \frac{Infr_i}{Infr_{max}} \quad (5.4)$$

$Infr_{max}$ denotes the highest number of pending infringement proceedings across all EU countries and all years. $Infr_i^N$ ranges between 0 (in the case of the EU country with the highest number of pending infringement proceedings across all EU countries and all years) and 1 (for the EU country with a perfect timely and correct transposition of the SM legislation). The indicator is increasing in the quality of the SM legal framework.

Skills endowment is an index of human capital based on years of schooling and returns to education taken from the Penn World Database, version 9.[35]

Capital endowment is a measure of capital stock in constant prices (in 2011 US dollars, constant 2011 national prices) over the number of persons engaged (in millions). The data is taken from the Penn World Database, version 9.

Financial development is measured as the ratio of private credit to GDP. The data is taken from the World Development Indicators database.

Labour market flexibility is an index of hiring and firing practices taken from the World Economic Forum Competitiveness Dataset. The index ranges between 1 and 7 (7 denotes the highest flexibility of labour markets).

Real GDP per capita is GDP in constant prices (in 2011 US dollars, constant 2011 national prices) over population (in millions) taken from the Penn World Database, version 9.

5.1.3. *Results of the econometric analysis*

The results of the empirical analysis based on the model specification described by Equation (5.1) indicate that a higher institutional quality in EU member states is associated with export specialisation in contract-intensive industries (industries which are more dependent on contract enforcement). Table 5.2 shows that this result is robust to additional co-variates controlling for other determinants of comparative advantage: factor endowments (skills and capital), financial development and labour market flexibility.

Table 5.3 reports the estimates obtained with the augmented model described by Equation (5.2). These results indicate that the quality of the implementation of the Single Market legislation is an important determinant of export specialisation patterns in EU member states over and above the

[34] The Rule of Law Index is a composite indicator capturing perceptions on the extent to which agents have confidence and abide by the rules of society, in particular with respect to the quality of contract enforcement, property rights, the policy and the courts as well as the likelihood of crime and violence. A detailed description of the methodology is available from Kaufmann et al. (2011).

[35] The dataset is described in detail by Feenstra et al. (2015). The full dataset is available at www.ggdc.net/pwt.OLS.

quality of institutions and the other determinants of comparative advantage examined. The quality of the implementation of the Single Market is measured by the correct transposition and application of the Single Market legislation into national legislation.

Table 5.4 reports country-specific estimates of counterfactual export outcomes for each EU country in the case of the best judicial quality (Rule of Law Index=1). The figures for export specialisation shown in the table indicate the export increase in the industry with the highest contract intensity relative to the industry with the lowest contract intensity. The potential increased export specialisation is highest in countries with the worst performance with respect to the implementation of the Single Market legislation and lowest in countries with the best performance. For example, in Bulgaria (the country with the worst performance with respect to this indicator) exports in the "Furniture, other manufacturing" industry relative to exports in "Basic metals" would be higher by 0.6% while the corresponding export increase for Sweden (the country with the second best performance) would be 0.03%. The average increase in export specialisation for all EU countries would be 0.3%.

Table 5.5 reports country-specific estimates of counterfactual export outcomes for each EU country in the case of no pending infringement proceedings (Infringements=1). The figures for export specialisation shown in the table indicate the export increase in the industry with the highest contract intensity relative to the industry with the lowest contract intensity. The potential increased export specialisation is highest in countries with the worst performance with respect to the implementation of the Single Market legislation and lowest in countries with the best performance. For example, in Italy (the country with the worst performance with respect to this indicator) exports in the industry "Furniture, other manufacturing" relative to exports in "Basic metals" would be higher by 1.6% while the corresponding export increase for Estonia (the country with the best performance) would be 0.2%. The average increase in export specialisation for all EU countries would be 0.7%.

Table 5.2: Determinants of comparative advantage – baseline model, OLS estimates

Dep. Var.: Exports from industry i in country k to the world (in logs)	(1)	(2)	(3)	(4)
Institutional intensity* Rule of Law	15.45***	4.159***	4.520***	4.264***
	(0.573)	(1.444)	(1.451)	(1.384)
Skill intensity*Skills endowment		8.142**	8.499**	8.083**
		(3.286)	(3.293)	(3.352)
Capital intensity*Capital endowment		0.0000186***	0.0000179***	0.0000165***
		(0.00000329)	(0.00000329)	(0.00000457)
Financial dependence*Financial development			0.00112***	0.00113***
			(0.000341)	(0.000337)
Output volatility*Labour market flexibility				1.231
				(2.046)
N	532	532	532	532
R2	0.980	0.984	0.984	0.984
Adj. R2	0.978	0.982	0.983	0.983

Source: ESRI estimates.
Notes: All regressions include country-specific and industry-specific fixed effects. All explanatory variables are in levels with the exception of industry output volatility. Robust standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 5.3: Determinants of comparative advantage – augmented model, OLS estimates

Dep. Var.: Exports from industry i in country k to the world (in logs)	(1)	(2)	(3)	(4)	(5)
Institutional intensity* Rule of Law	15.45***	4.115***	2.863**	3.107**	3.075**
	(0.573)	(1.303)	(1.380)	(1.385)	(1.330)
Institutional intensity*Infringements		17.07***	7.184**	7.998**	7.955**
		(1.803)	(3.366)	(3.374)	(3.460)
Skill intensity*Skills endowment			6.942**	7.194**	7.136**
			(3.285)	(3.289)	(3.321)
Capital intensity*Capital endowment			0.0000119**	0.0000104**	0.0000102*
			(0.00000502)	(0.00000500)	(0.00000552)
Financial dependence*Financial development				0.00121***	0.00121***
				(0.000349)	(0.000348)
Output volatility*Labour market flexibility					0.192
					(2.053)
N	532	532	532	532	532
R2	0.980	0.983	0.984	0.984	0.984
Adj. R2	0.978	0.982	0.982	0.983	0.983

Source: ESRI estimates.
Notes: All regressions include country-specific and industry-specific fixed effects. All explanatory variables are in levels with the exception of industry output volatility. Robust standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 5.4: Counterfactual increase in export specialisation in contract-intensive industries in the case of maximum institutional quality (Rule of Law Index), country-specific effects

Country	Rule of Law Index 2017 (Normalised)	Export specialisation increase Rule of Law Index =1 (%)
Bulgaria	0.524	0.5756
Greece	0.552	0.5408
Italy	0.608	0.4738
Croatia	0.610	0.4711
Romania	0.622	0.4563
Poland	0.642	0.4326
Hungary	0.655	0.4168
Slovakia	0.665	0.4052
Cyprus	0.737	0.3179
Latvia	0.748	0.3050
Lithuania	0.762	0.2879
Spain	0.765	0.2835
Slovenia	0.769	0.2793
EU average	0.787	0.2572
Czech Republic	0.790	0.2534
Portugal	0.794	0.2491
Malta	0.796	0.2459
Estonia	0.828	0.2074
Belgium	0.842	0.1903
Ireland	0.862	0.1667
France	0.864	0.1639
Germany	0.904	0.1165
United Kingdom	0.920	0.0967
Luxembourg	0.933	0.0805
Austria	0.951	0.0597
Netherlands	0.955	0.0548
Denmark	0.962	0.0454
Sweden	0.979	0.0253
Finland	1.000	0.0000

Source: ESRI estimates.
Notes: The figures in column 2 indicate country-specific increases in exports in the industry with the highest institutional intensity ("Furniture, other manufacturing") relative to the industry with the lowest institutional intensity ("Basic metals"). The marginal effects are computed using the estimated coefficient for the interacted variable Institutional Intensity*Normalised Rule of Law Index shown in Table 5.3, column 5. The counterfactual export increase is for an improvement in the Rule of Law Index to its maximum value (1), the best institutional quality.

Table 5.5: Counterfactual increase in export specialisation in contract-intensive industries in the case of maximum quality of the SM legal framework (no infringement cases), country-specific effects

Country	Infringements	Export specialisation increase No infringement cases (%)
Italy	0.500	1.562
Greece	0.560	1.376
France	0.590	1.283
Spain	0.597	1.259
Germany	0.612	1.213
Poland	0.627	1.166
Belgium	0.694	0.956
Portugal	0.731	0.840
United Kingdom	0.739	0.816
EU average	0.776	0.699
Austria	0.784	0.676
Bulgaria	0.784	0.676
Ireland	0.784	0.676
Czech Republic	0.791	0.653
Romania	0.791	0.653
Slovakia	0.799	0.630
Sweden	0.806	0.606
Hungary	0.813	0.583
Netherlands	0.836	0.513
Finland	0.858	0.443
Luxembourg	0.858	0.443
Slovenia	0.858	0.443
Denmark	0.866	0.420
Lithuania	0.888	0.350
Croatia	0.896	0.326
Cyprus	0.896	0.326
Latvia	0.910	0.280
Malta	0.933	0.210
Estonia	0.940	0.187

Source: ESRI estimates.
Notes: The figures in column 2 indicate country-specific increases in exports in the industry with the highest institutional intensity ("Furniture, other manufacturing") relative to the industry with the lowest institutional intensity ("Basic metals"). The marginal effects are computed using the estimated coefficient for the interacted variable Institutional Intensity*Infringements shown in Table 5.3, column 5. The counterfactual export increase is for an improvement of the infringement ratio to its maximum value (1), meaning best institutional quality.

5.1.4. *Sensitivity analysis*

Tables 5.6-5.9 report results obtained with alternative indicators for judicial quality and the quality of the Single Market legal framework (Rule of Law Rank; the extent of the transposition of the Single Market legislation into national law). Taken together, these results are qualitatively similar to the findings discussed above.

Table 5.7 reports country-specific estimates of counterfactual export outcomes for each EU country in the case of the best judicial quality measured with the Rule of Law Rank. This measure ranges from 0 (lowest judicial quality) to 100 (highest judicial quality) and represents a country's percentile rank among all countries included in the sample.[36] The figures for export specialisation shown in the table indicate the export increase in the industry with the highest contract intensity relative to the industry with the lowest contract intensity. The potential increased export specialisation is highest in countries with the worst performance with respect to the implementation of the Single Market legislation and lowest in countries with the best performance. For example, in Bulgaria (the country with the worst performance with respect to this indicator) exports in the industry "Furniture, other manufacturing" relative to exports in "Basic metals" would be higher by 1.5%, while the corresponding export increase for Sweden (the country with the second best performance) would be 0.03%. The average increase in export specialisation for all EU countries would be 0.02%.

[36] Detailed information is available from the Worldwide Governance Indicators, 2018, www.govindicators.org.

Table 5.6: Determinants of comparative advantage – alternative measure of judicial quality, baseline model, OLS estimates

Dep. Var.: Exports from industry i in country k to the world (in logs)	(1)	(2)	(3)	(4)
Institutional intensity*Rule of Law Rank	3.888***	6.276***	5.949***	5.960***
	(0.0730)	(1.378)	(1.365)	(1.449)
Skill intensity*Skills endowment		0.756	0.900	0.896
		(0.907)	(0.904)	(0.916)
Capital intensity*Capital endowment		1.150	0.537	0.538
		(0.885)	(0.839)	(0.842)
Financial dependence*Financial development			0.120***	0.120***
			(0.0304)	(0.0304)
Output volatility*Labour market flexibility				-0.190
				(7.687)
N	532	532	532	532
R2	0.984	0.984	0.984	0.984
Adj. R2	0.982	0.982	0.983	0.983

Source: ESRI estimates.
Notes: All regressions include country-specific and industry-specific fixed effects. All variables are in logs with the exception of institutional intensity and financial dependence. Robust standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 5.7: Counterfactual export specialisation in contract-intensive industries with the best performance for judicial quality (Rule of Law Rank), country-specific effects

Country	Rule of Law Rank 2017	Export specialisation increase Rule of Law Rank =100% (%)
Bulgaria	51.9	1.5344
Greece	56.7	1.3271
Italy	62.5	1.1004
Croatia	63.5	1.0646
Romania	63.9	1.0469
Poland	68.3	0.8937
Hungary	70.2	0.8286
Slovakia	71.6	0.7810
Cyprus	79.8	0.5281
Latvia	80.3	0.5140
Lithuania	80.8	0.5000
Spain	81.3	0.4861
EU average	81.7	0.4728
Slovenia	82.7	0.4449
Czech Republic	83.7	0.4179
Portugal	84.1	0.4044
Malta	85.1	0.3778
Estonia	86.5	0.3385
Belgium	87.5	0.3126
Ireland	88.9	0.2743
France	89.4	0.2617
Germany	91.3	0.2119
United Kingdom	92.8	0.1752
Luxembourg	95.2	0.1154
Austria	96.2	0.0918
Netherlands	97.1	0.0685
Denmark	97.6	0.0570
Sweden	99.0	0.0226
Finland	100.0	0.0000

Source: ESRI estimates.
Notes: The figures in column 2 indicate country-specific increases in exports in the industry with the highest institutional intensity ("Furniture, other manufacturing") relative to the industry with the lowest institutional intensity ("Basic metals"). The marginal effects are computed using the estimated coefficient for the interacted variable Institutional Intensity*Rule of Law Rank shown in Table 5.6, column 4. The counterfactual export increase is for an improvement in the Rule of Law Rank to its maximum value (100%), the best institutional quality.

Table 5.8 shows the results obtained with the quality of the Single Market legal framework measured by the extent of the transposition of the Single Market legislation into national law. These results indicate that countries with a higher transposition of the Single Market legislation export relatively more in industries that are more dependent on contract enforcement. This result suggests that the quality of the Single Market legal framework is a source of comparative advantage in EU countries.

Table 5.8: Determinants of comparative advantage – alternative measure of the quality of the SM legal framework, baseline OLS estimates

Dep. Var.: Exports from industry i in country k to the world (in logs)	(1)	(2)	(3)	(4)
Institutional intensity*SM Transposition	3.955***	8.473***	8.010***	8.633***
	(0.0728)	(1.866)	(1.854)	(2.144)
Skill intensity*Skills endowment		2.766**	2.791**	2.885**
		(1.126)	(1.128)	(1.134)
Capital intensity*Capital endowment		0.589	0.005	0.029
		(0.922)	(0.882)	(0.890)
Financial dependence*Financial development			0.119***	0.119***
			(0.0307)	(0.0311)
Output volatility*Labour market flexibility				-5.885
				(8.344)
N	532	532	532	532
R2	0.984	0.984	0.984	0.984
Adj. R2	0.982	0.982	0.983	0.983

Source: ESRI estimates.
Notes: All regressions include country-specific and industry-specific fixed effects. All variables are in logs with the exception of institutional intensity and financial dependence. Robust standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 5.9: Counterfactual export specialisation in contract-intensive industries with full transposition of the SM legislation, country-specific effects

Country	Transposition 2017	Export specialisation increase (%)
Spain	98.3	0.0581
Belgium	98.5	0.0513
Romania	98.5	0.0513
Poland	98.6	0.0478
Bulgaria	98.7	0.0444
Croatia	98.7	0.0444
Ireland	98.7	0.0444
Austria	98.8	0.0409
Czech Republic	98.8	0.0409
Slovenia	98.8	0.0409
Cyprus	98.9	0.0375
Germany	98.9	0.0375
United Kingdom	98.9	0.0375
Luxembourg	99.0	0.0341
EU average	99.1	0.0310
Greece	99.1	0.0307
Netherlands	99.1	0.0307
Lithuania	99.2	0.0272
Malta	99.3	0.0238
Finland	99.4	0.0204
Latvia	99.4	0.0204
Denmark	99.5	0.0170
Estonia	99.5	0.0170
Slovakia	99.5	0.0170
Italy	99.6	0.0136
Portugal	99.6	0.0136
Hungary	99.7	0.0102
Sweden	99.7	0.0102
France	99.8	0.0068

Source: ESRI estimates.
Notes: The figures in column 2 indicate country-specific increases in exports in the industry with the highest institutional intensity ("Furniture, other manufacturing") relative to the industry with the lowest institutional intensity ("Basic metals"). The marginal effects are computed using the estimated coefficient for the interacted variable Institutional Intensity*SM Transposition shown in Table 5.3, column 4.

Table 5.9 shows counterfactual export outcomes for each EU country in the case of full transposition of the Single Market legislation. The figures for exports shown in the table indicate the export increase in the industry with the highest institutional intensity relative to the industry with the lowest institutional intensity. The baseline is the transposition of the Single Market legislation in 2017, the last year for which data is available. Overall, the potential export specialisation increases are low given the high (nearly full) transposition of the Single Market

legislation in all EU countries. The potential increased export specialisation is highest in countries with the lowest transposition and lowest in countries with the highest transposition. For example, in Spain (the country with the lowest transposition of the Single Market legislation) exports in the manufacture of furniture relative to exports in basic metals would be higher by 0.06%, while the corresponding export increase for France (the country with the best performance) would be 0.01%.

Table 5.10: Determinants of comparative advantage – additional co-variates, OLS estimates

Dep. Var.: Exports from industry i in country k to the world (in logs)	(1)	(2)	(3)	(4)
Institutional intensity*Infringements	9.035***	8.689**	8.402**	10.67**
	(3.385)	(3.780)	(4.143)	(4.648)
Skill intensity*Skills endowment	7.053**	6.460	6.507	6.419
	(3.379)	(3.945)	(3.967)	(3.913)
Capital intensity*Capital endowment	0.00000971*	0.00000882	0.00000869	0.00000890
	(0.00000544)	(0.00000553)	(0.00000552)	(0.00000546)
Financial dependence*Financial development	0.00123***	0.00124***	0.00125***	0.00125***
	(0.000353)	(0.000354)	(0.000354)	(0.000353)
Output volatility*Labour market flexibility	-0.437	-0.985	-1.015	-0.972
	(2.012)	(2.064)	(2.065)	(2.064)
Institutional intensity*GDP per capita	0.0000756*	0.0000344	0.0000302	0.0000314
	(0.0000396)	(0.0000899)	(0.0000975)	(0.0000979)
Institutional intensity*Skills endowment		0.543	0.657	1.501
		(1.319)	(1.478)	(1.504)
Institutional intensity*Capital endowment		0.00000414	0.00000361	0.000000265
		(0.00000704)	(0.00000684)	(0.00000730)
Institutional intensity*Financial development			0.00351	0.0127
			(0.0135)	(0.0149)
Institutional intensity*Labour market flexibility				-1.229
				(0.795)
N	532	532	532	532
R2	0.984	0.984	0.984	0.985
Adj. R2	0.983	0.983	0.983	0.983

Source: ESRI estimates.
Notes: All regressions include country-specific and industry-specific fixed effects. All explanatory variables are in levels with the exception of output volatility. Robust standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table 5.11: Determinants of comparative advantage – additional co-variates, OLS estimates

Dep. Var.: Exports from industry i in country k to the world (in logs)	(1)	(2)	(3)	(4)
Institutional intensity*SM Transposition	6.972*	7.404*	7.972*	8.745
	(3.726)	(4.340)	(4.583)	(5.486)
Skill intensity*Skills endowment	2.774**	3.089**	3.062*	3.072*
	(1.159)	(1.549)	(1.563)	(1.566)
Capital intensity*Capital endowment	0.326	0.431	0.421	0.420
	(0.848)	(0.915)	(0.918)	(0.919)
Financial dependence*Financial development	0.118***	0.117***	0.119***	0.119***
	(0.0310)	(0.0312)	(0.0311)	(0.0310)
Output volatility*Labour market flexibility	-6.032	-6.406	-6.333	-6.365
	(8.327)	(8.384)	(8.404)	(8.420)
Institutional intensity*GDP per capita	0.802	0.313	-0.529	-0.727
	(1.232)	(2.459)	(3.019)	(3.201)
Institutional intensity*Skills endowment		-0.865	0.964	1.910
		(4.725)	(5.496)	(6.116)
Institutional intensity*Capital endowment		0.540	0.487	0.320
		(1.766)	(1.773)	(1.744)
Institutional intensity*Financial development			1.028	1.278
			(1.312)	(1.539)
Institutional intensity*Labour market flexibility				-1.163
				(2.680)
N	532	532	532	532
R2	0.984	0.984	0.984	0.984
Adj. R2	0.983	0.983	0.983	0.983

Source: ESRI estimates.
Notes: All regressions include country-specific and industry-specific fixed effects. All variables are in logs, with the exception of institutional intensity and financial dependence. Robust standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

The next set of estimates shown in Tables 5.10-5.11 are obtained with additional co-variates controlling for country-specific characteristics other than the quality of the Single Market legal framework which might determine the specialisation of countries in contract-intensive industries: income per capita, human and physical endowments, financial development and labour market flexibility. These country-specific characteristics are interacted with industry-specific institutional intensity. The estimated coefficients for the interacted variable of interest are still positive and statistically significant. The economic magnitude of the estimated effect of interest is similar to the one obtained in the baseline OLS regression discussed above.

5.1.5. *Endogeneity*

As pointed out in subchapter 5.1.1, the OLS estimates discussed above may reflect the fact that EU countries with a comparative advantage in contract-intensive industries might have greater incentives to develop and maintain a higher quality of the enforcement of the Single Market legal framework. To address this potential reverse causality, we use an instrumental variables estimation approach aiming to identify the causal impact of the quality of the Single Market legal framework on EU countries' export patterns. To this purpose, we instrument the quality of the Single Market legal framework with the legal origin of EU countries' law. This approach is similar to the one used by Nunn (2007) to instrument judicial quality. Table 5.12 shows the grouping of EU countries using information on the legal origin of their law taken from La Porta et al. (1997).

Table 5.12: EU countries classified by the origin of their law

Country	Legal origin
Ireland	British common law
United Kingdom	
Belgium	French civil law
France	
Greece	
Italy	
Luxembourg	
Netherlands	
Portugal	
Spain	
Austria	German civil law
Germany	
Denmark	Scandinavian civil law
Finland	
Sweden	
Bulgaria	Other civil law
Croatia	
Cyprus	
Czech Republic	
Estonia	
Hungary	
Latvia	
Lithuania	
Malta	
Poland	
Romania	
Slovakia	
Slovenia	

Source: La Porta et al. (1997).

Table 5.13 shows the IV estimates of the baseline model specification described by Equation (5.1) with the transposition of the Single Market legislation measuring the quality of the Single Market legal framework. The interaction variable institutional intensity*SM transposition is instrumented with variables obtained by interacting industry-specific institutional intensity with indicator variables equal to 1 if the country's legal origin is British legal law, French civil law, German civil law, and Scandinavian law. The indicator variable equals 0 for countries with other civil law (Central and Eastern European countries, Malta and Cyprus).

The first stage estimates indicate that countries with the German legal origin of law have the highest quality of the Single Market legal framework (this result is consistent with evidence provided by La Porta et al., 1997 and Nunn, 2007). The coefficients for the variable of interest are positive and significant, suggesting that countries with a better quality of the Single Market legal framework export relatively more in contract-intensive industries. The test statistics reported in

Table 5.13 (Wooldridge robust score and robust regression-based tests) fail to reject the exogeneity of the instrumented variable, suggesting that there is no need for instrumentation.

Table 5.13: Determinants of comparative advantage, baseline IV estimates

Dep. Var.: Exports from industry i in country k to the world (in logs)	(1)	(2)	(3)	(4)
Instruments: Institutional intensity * Origin of legal system				
Institutional intensity*SM Transposition	3.966***	11.74***	11.54***	12.73***
	(0.0724)	(3.929)	(3.938)	(4.670)
Skill intensity*Skills endowment		4.669**	4.840**	4.898**
		(2.193)	(2.187)	(2.214)
Capital intensity*Capital endowment		1.112	0.588	0.598
		(1.150)	(1.141)	(1.147)
Financial dependence*Financial development			0.115***	0.115***
			(0.0297)	(0.0308)
Output volatility*Labour market flexibility				-13.90
				(11.39)
N	532	532	532	532
R2	0.984	0.984	0.984	0.984
Adj. R2	0.982	0.982	0.983	0.983
Wooldridge robust score chi^2 test	0.343	0.993	1.154	1.072
Robust regression-based F test	0.324	0.911	1.065	0.979
First stage IV estimates. Dep. Var.: Institutional intensity*SM Transposition				
Institutional intensity*English legal system	0.296***	0.00894	0.00885	0.00676
	(0.0920)	(0.0437)	(0.0436)	(0.0379)
Institutional intensity*French legal system	0.292***	-0.140***	-0.141***	-0.125***
	(0.0862)	(0.0281)	(0.0281)	(0.0228)
Institutional intensity*German legal system	3.075***	0.169***	0.168***	0.138***
	(0.109)	(0.0458)	(0.0458)	(0.0423)
Institutional intensity*Scandinavian legal system	0.302***	0.0266	0.0261	0.0226
	(0.0895)	(0.0194)	(0.0194)	(0.0214)
Adj. R2	0.999	1.000	1.000	1.000
Underidentification LM test	37.53***	50.31***	50.16***	49.87***
Hansen J overidentification test	5.369	3.582	3.710	3.955

Source: ESRI estimates.
Notes: All regressions include country-specific and industry-specific fixed effects. All variables are in logs with the exception of institutional intensity and financial dependence. Robust standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

5.2. The quality of the Single Market legal framework as a determinant of international production choices in EU countries

5.2.1. *Research objectives and methodology*

This subchapter examines the role of the quality of the Single Market legal framework as a determinant of firms' organisational choices for their international production operations in EU countries. More specifically, we analyse whether and to what extent differences in the timely and correct transposition of the Single Market legislation across EU countries affect firms' choice to source inputs intra-firm via foreign direct investment (vertical integration) or from an unrelated supplier (outsourcing). The analysis is underlined by theoretical insights from the literature on the role of institutional characteristics on firms' internal organisational choices and more recent contributions from the property rights theory on vertical integration. While the early theoretical models (transaction costs models) predict that vertical integration reduces the hold-up problems when markets are imperfect (Williamson, 1975, 1985), more recent theoretical models (the property rights models) are less conclusive on whether better contracting institutions foster or discourage vertical integration (Grossman and Hart, 1986; Hart and Moore, 1990; Grossman and Helpman, 2002; Antràs, 2003; Antràs and Helpman, 2004; Antràs and Chor, 2013).[37] In this latter

[37] The empirical predictions of these models are discussed in detail by Acemoglu et al. (2009) and Acemoglu et al. (2010).

class of theoretical models, the ambiguous effect of contracting costs on firms' organisational choices is related to transaction costs associated with vertical integration. As emphasised by Grossman and Hart (1986) and Hart and Moore (1990), these costs arise from residual rights of control over assets resulting from ownership. In turn, these property rights affect firms' incentives to engage in relationship-specific investments and thus the choice between vertical integration and outsourcing as organisational modes. Recent contributions to this literature focusing on organisational choices in the context of international production have shown that the choice between vertical integration and outsourcing depends on the characteristics of goods and production technology which determine the relative importance in the production process of inputs supplied intra-firm versus inputs from unrelated suppliers (Acemoglu et al. 2010; Antràs and Chor, 2013; Antràs et al., 2017).

Against this background, this subchapter examines whether and to what extent there is evidence for these effects in the context of the EU Single Market. To measure vertical integration, we combine information on the ownership structure and company accounts from the Orbis dataset with input-output data from the World Input-Output Tables (WIOD) dataset.

Using the most recent information on ownership combined with company accounts from the Orbis dataset we identify parent companies established in the 28 EU countries using the NACE codes for primary activities. For each parent company (global ultimate owner) we identify integrated inputs following Di Ubaldo and Siedschlag (2018)[38] by combining information on firms' ownership structure from the Orbis dataset[39] with input-output data for the EU countries.

For each global ultimate owner, we identify the primary NACE 2-digit code as its output industry k. Given that the WIOD data allow the identification of input-output linkages across countries, for each output industry k in each home country i, the set of production inputs will be as follows: $I_{k,i}^{n,j} = \{n: a_{njki} > 0 \quad \}$. a_{njki} is the value of input *n* in host country *j* required to produce one unit of production in industry *k* in home country *i*. The World Input-Output Tables include information on 56 industries in each of the 28 EU countries.

For each parent company, we then identify integrated inputs as follows. The set of integrated inputs $I_{k,i}^{n,j}$ comprises the affiliates in country *j* whose primary (NACE 2-digit) activity corresponds to a production input *n* for output *k* in country *i*, as identified in the World Input-Output Tables. We designate the remainder of $I_{k,i}^{n,j}$ inputs for which no affiliate is detected as possible outsourced inputs.

The econometric model to be estimated is a linear probability model, which reads as follows:

$$v_{gkilj} = \beta_1 z_{lj} Q_j^{SMP} + \beta_2 fin_{lj} FIN_j + \beta_3 z_{lj} GDPCAP_j + \beta_4 z_{lj} H_j + \beta_5 z_{lj} K_j + \beta_6 z_{lj} LFLEX_j + \beta_7 z_{lj} FIN_j + \alpha_g + \alpha_k + \alpha_l + \alpha_i + + \alpha_j + \varepsilon_{gkilj} \quad (5.3)$$

v_{glj}^{ki} is a binary indicator equal to 1 (intra-firm vertical integration) if parent firm g in sector k in home country i owns an affiliate in sector l in host country j, and 0 otherwise (outsourcing). z_{lj} is a measure of contract intensity in industry l in host country j; Q_j^{SMP} is a measure of the quality of the SMP legal framework in country j; H_j , K_j are country level measures of skills and capital intensities; $\boldsymbol{fin_l}$ is a measure of industry-external finance dependence; FIN_j is a measure of country level financial development; $LFLEX_j$ is a measure of labour market flexibility; α_g, α_k, α_l , α_j, are firm-, industry-, and country-specific fixed effects.

The parameter of interest is β_1 which indicates the sensitivity of firms' organisational choices for international production to the quality of the Single Market legal framework conditioned by industry-specific contract intensity.

[38] The methodology follows Alfaro et al. (2015).

[39] The most recent data available in the Orbis dataset will be extracted.

As a robustness check we estimate the model described by Equation (5.3) in two steps:

- In the first stage, we explain firms' organisational choice for international production using firm fixed effects as explanatory variables and retrieve the unexplained residual.
- In the second stage, we explain the retrieved residual from the first stage with the interactions of industry-specific and country-specific variables.

5.2.2. *Descriptive analysis*

Table 5.14 shows descriptive statistics for the 7,012 identified parent companies with headquarters in EU countries by industry and the average number of integrated inputs. The largest average number of integrated manufacturing inputs appears to be in "Other transport equipment" (1.47) while "Repair and installation of machinery and equipment" has the lowest (0.48).

Table 5.14: The distribution of parent companies and the intensity of integrated inputs - manufacturing firms

WIOD sector of parent company (HQ)	Number of HQs	Mean number of integrated inputs-all inputs	Mean number of integrated inputs-manuf. inputs only
Food, beverages and tobacco	1,104	1.97	0.54
Textiles, wearing apparel, and leather products	483	1.61	0.62
Wood and of products of wood and cork	264	1.39	0.52
Paper and paper products	132	3.28	1.33
Printing and reproduction of recorded media	242	1.82	0.59
Coke and refined petroleum products	26	4.92	0.77
Chemicals and chemical products	310	2.34	0.74
Basic pharmaceutical prod. and preparations	82	2.78	0.73
Rubber and plastic products	360	2.02	0.98
Other non-metallic mineral prod.	386	2.02	0.66
Basic metals	176	2.94	1.18
Fabricated metal products.	1,104	1.55	0.73
Computer, electronic and optical prod.	312	2.52	0.86
Electrical equipment	260	2.23	0.88
Machinery and equipment nec.	870	2.52	0.99
Motor vehicles, trailers and semi-trailers	145	2.54	1.19
Other transport equipment	90	3.63	1.47
Furniture; other manufacturing	411	1.65	0.54
Repair and installation of machinery and equipment	255	1.39	0.48
Total	7,012		

Source: ESRI calculations based on linked data from Orbis and WIOD datasets.

5.2.3. *Results of the econometric analysis*

Tables 5.15–5.17 report the estimates of the model described by Eq. 5.3 with alternative indicators for the quality of the Single Market legal framework including the following:

- the extent of the transposition of the Single Market legislation into national law;
- the relative reduction of the number of pending infringement proceedings – the ratio of the number of pending infringement proceedings in 2007 over the corresponding number in 2014;[40]
- the absolute reduction in the number of pending infringement proceedings over the period 2007-2014.

The above indicators are increasing in the quality of the Single Market legal framework, in particular with respect to contract enforcement. Following on from this interpretation, higher values of these indicators in a given EU country imply lower contracting costs in that country. Thus, a timely and correct transposition of the Single Market legislation is negatively linked to contracting costs.

[40] 2007 is taken as a base year to include Bulgaria and Romania in the analysis while 2014 is the last year with available trade data in the WIOD.

Overall, the results of the econometric analysis indicate that the effect of contracting costs on firms' international production choices is greater in industries with a higher institutional dependence (contract-intensive industries). More specifically, in countries with higher contracting costs, vertical integration is more likely in industries with a higher institutional dependence. Similar results are obtained with the two-step estimation described in subchapter 5.2.1. These estimates are reported in Tables 5.18-5.20.

These results hold when controlling for other country characteristics, which could influence firms' choices for input sourcing via vertical integration or outsourcing such as the level of economic development (GDP per capita), factor endowments (human and physical capital endowments) as well as other institutional characteristics (labour market flexibility and financial development). These results are consistent with similar evidence obtained by Acemoglu et al. (2009) using capital intensity as a measure of institutional dependence.

Taken together, the results of this analysis suggest that in the context of market imperfections such as incomplete contracts, the quality of the Single Market legal framework is a determinant of firms' international production choices across EU countries.

Table 5.15: Determinants of vertical integration, institutional quality measured by the transposition of the SM legislation, LPM estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	integrated	integrated	integrated	integrated	integrated	integrated
Institutional intensity*SM transposition	-0.0000597***	-0.0000596***	-0.0000449***	-0.000299***	-0.000370***	-0.000402***
	(0.00000475)	(0.00000474)	(0.00000873)	(0.0000673)	(0.0000682)	(0.0000682)
Financial dependence*Financial development		-0.000000364'	-0.000000357'	-0.000000320	-0.000000409*	-0.000000449**
		(0.000000221)	(0.000000222)	(0.000000224)	(0.000000225)	(0.000000223)
Institutional intensity*GDP per capita			-5.10e-08	0.000000574***	0.000000451***	0.000000390***
			(3.57e-08)	(7.52e-08)	(7.90e-08)	(7.40e-08)
Institutional intensity*Skills endowment				0.0117***	0.0103***	0.0138***
				(0.00206)	(0.00206)	(0.00220)
Institutional intensity*Capital endowment				-0.000000106***	-9.56e-08***	-0.000000115***
				(1.13e-08)	(1.06e-08)	(1.30e-08)
Institutional intensity*Labour market flexibility					0.00330***	0.00110
					(0.000691)	(0.000867)
Institutional intensity* Financial development						0.0000746***
						(0.0000167)
Constant	0.00708***	0.00706***	0.00712***	0.00763***	0.00853***	0.00895***
	(0.000410)	(0.000408)	(0.000431)	(0.000450)	(0.000609)	(0.000616)
Observations	3,732,318	3,732,318	3,732,318	3,732,318	3,732,318	3,732,318

Source: ESRI estimates.
Notes: All regressions include firm fixed effects, as well as industry and home and host country fixed effects. The institutional dependence measure is calculated using the 2014 WIOD tables for the 28 EU countries. Standard errors clustered at firm-level in parentheses. ' p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 5.16: Determinants of vertical integration, institutional quality measured by the ratio of infringement proceedings 2007/2014, LPM estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	integrated	integrated	integrated	integrated	integrated	integrated
Institutional intensity*Infringement ratio	-0.00279***	-0.00279***	-0.00150***	-0.000527**	-0.000488**	-0.00121***
	(0.000224)	(0.000224)	(0.000185)	(0.000225)	(0.000225)	(0.000237)
Financial dependence*Financial development		-0.000000383*	-0.000000327'	-0.000000186	-0.000000237	-0.000000297
		(0.000000221)	(0.000000222)	(0.000000223)	(0.000000224)	(0.000000222)
Institutional intensity*GDP per capita			-0.000000107***	0.000000818***	0.000000767***	0.000000726***
			(2.05e-08)	(7.16e-08)	(7.37e-08)	(7.01e-08)
Institutional intensity*Skills endowment				0.00296***	0.000215	0.00330***
				(0.000493)	(0.000656)	(0.000994)
Institutional intensity*Capital endowment				-0.000000134***	-0.000000131***	-0.000000153***
				(1.08e-08)	(1.06e-08)	(1.33e-08)
Institutional intensity*Labour market flexibility					0.00250***	0.000122
					(0.000680)	(0.000877)
Institutional intensity* Financial development						0.0000783***
						(0.0000176)
Constant	0.00616***	0.00616***	0.00708***	0.00765***	0.00831***	0.00866***
	(0.000333)	(0.000333)	(0.000472)	(0.000469)	(0.000616)	(0.000623)
Observations	3,599,090	3,599,090	3,599,090	3,599,090	3,599,090	3,599,090

Source: ESRI estimates.
Notes: All regressions include firm fixed effects, as well as industry and home and host country fixed effects. The institutional dependence measure is calculated using the 2014 WIOD tables for the 28 EU countries. Standard errors clustered at firm-level in parentheses. ' p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 5.17: Determinants of vertical integration, institutional quality measured by the absolute reduction of pending infringement proceedings, LPM estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	integrated	integrated	integrated	integrated	integrated	integrated
Institutional intensity*Infringements reduction	-0.000452***	-0.000452***	-0.000531***	-0.000419***	-0.000432***	-0.000501***
	(0.0000423)	(0.0000423)	(0.0000557)	(0.0000533)	(0.0000525)	(0.0000539)
Financial dependence*Financial development		-0.000000313	-0.000000345'	-0.000000270	-0.000000260	-0.000000324'
		(0.000000220)	(0.000000220)	(0.000000222)	(0.000000222)	(0.000000221)
Institutional intensity*GDP per capita			9.70e-08***	0.000000760***	0.000000772***	0.000000720***
			(2.26e-08)	(6.93e-08)	(7.38e-08)	(7.01e-08)
Institutional intensity*Skills endowment				0.000524*	0.00116*	0.00562***
				(0.000307)	(0.000616)	(0.000912)
Institutional intensity*Capital endowment				-8.22e-08***	-8.12e-08***	-0.000000110***
				(8.22e-09)	(8.06e-09)	(1.13e-08)
Institutional intensity*Labour market flexibility					-0.000650	-0.00480***
					(0.000579)	(0.000762)
Institutional intensity* Financial development						0.000121***
						(0.0000172)
Constant	0.00950***	0.00949***	0.00823***	0.00873***	0.00859***	0.00928***
	(0.000701)	(0.000701)	(0.000566)	(0.000562)	(0.000631)	(0.000659)
Observations	3,599,090	3,599,090	3,599,090	3,599,090	3,599,090	3,599,090

Source: ESRI estimates.
Notes: All regressions include firm fixed effects, as well as industry and home and host country fixed effects. The institutional dependence measure is calculated using the 2014 WIOD tables for the 28 EU countries. Standard errors clustered at firm-level in parentheses. ' p<0.15, * p<0.10, ** p<0.05, *** p<0.01

Table 5.18: Determinants of vertical integration, institutional quality measured by the transposition of the SM legislation, two steps estimation

	(1)	(2)	(3)	(4)	(5)	(6)
	Residuals	Residuals	Residuals	Residuals	Residuals	Residuals
Institutional intensity*SM transposition	-0.0000603***	-0.0000602***	-0.0000458***	-0.000301***	-0.000373***	-0.000405***
	(0.00000489)	(0.00000488)	(0.00000931)	(0.0000686)	(0.0000697)	(0.0000698)
Financial dependence*Financial development		-0.000000371*	-0.000000364'	-0.000000327'	-0.000000417*	-0.000000457**
		(0.000000223)	(0.000000223)	(0.000000225)	(0.000000226)	(0.000000225)
Institutional intensity*GDP per capita			-4.99e-08	0.000000578***	0.000000454***	0.000000393***
			(3.80e-08)	(7.75e-08)	(8.25e-08)	(7.73e-08)
Institutional intensity*Skills endowment				0.0118***	0.0103***	0.0139***
				(0.00210)	(0.00210)	(0.00226)
Institutional intensity*Capital endowment				-0.000000106***	-9.60e-08***	-0.000000116***
				(1.14e-08)	(1.07e-08)	(1.32e-08)
Institutional intensity*Labour market flexibility					0.00334***	0.00111
					(0.000720)	(0.000906)
Institutional intensity* Financial development						0.0000754***
						(0.0000172)
Constant	0.00520***	0.00518***	0.00523***	0.00575***	0.00666***	0.00708***
	(0.000452)	(0.000451)	(0.000472)	(0.000492)	(0.000654)	(0.000661)
Observations	3,732,318	3,732,318	3,732,318	3,732,318	3,732,318	3,732,318

Source: ESRI estimates.
Notes: All regressions include industry and home and host country fixed effects. The dependent variable is the residual retrieved from the first stage estimation of the propensity of firms to integrate inputs with firm fixed effects as explanatory variables. The institutional dependence measure is calculated using the 2014 WIOD tables for the 28 EU countries. Standard errors clustered at firm-level in parentheses. ' p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 5.19: Determinants of vertical integration, institutional quality measured by the ratio of pending infringement proceedings 2007/2014, two steps estimation

	(1)	(2)	(3)	(4)	(5)	(6)
	Residuals	Residuals	Residuals	Residuals	Residuals	Residuals
Institutional intensity*Infringement ratio	-0.00281***	-0.00281***	-0.00151***	-0.000520**	-0.000480**	-0.00121***
	(0.000232)	(0.000232)	(0.000190)	(0.000234)	(0.000234)	(0.000247)
Financial dependence*Financial development		-0.000000390*	-0.000000334'	-0.000000192	-0.000000244	-0.000000304
		(0.000000222)	(0.000000224)	(0.000000224)	(0.000000225)	(0.000000223)
Institutional intensity*GDP per capita			-0.000000109***	0.000000824***	0.000000773***	0.000000732***
			(2.14e-08)	(7.43e-08)	(7.71e-08)	(7.32e-08)
Institutional intensity*Skills endowment				0.00295***	0.000169	0.00329***
				(0.000509)	(0.000676)	(0.00103)
Institutional intensity*Capital endowment				-0.000000134***	-0.000000132***	-0.000000154***
				(1.09e-08)	(1.07e-08)	(1.35e-08)
Institutional intensity*Labour market flexibility					0.00254***	0.000133
					(0.000708)	(0.000916)
Institutional intensity* Financial development						0.0000790***
						(0.0000180)
Constant	0.00426***	0.00425***	0.00518***	0.00577***	0.00644***	0.00679***
	(0.000373)	(0.000372)	(0.000514)	(0.000512)	(0.000661)	(0.000667)
Observations	3,599,090	3,599,090	3,599,090	3,599,090	3,599,090	3,599,090

Source: ESRI estimates.
Notes: All regressions include industry and home and host country fixed effects. The dependent variable is the residual retrieved from the first stage estimation of the propensity of firms to integrate inputs with firm fixed effects as explanatory variables. The institutional dependence measure is calculated using the 2014 WIOD tables for the 28 EU countries. Standard errors clustered at firm-level in parentheses. ' p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

Table 5.20: Determinants of vertical integration, institutional quality measured by the absolute reduction of pending infringement proceedings, two steps estimation

	(1)	(2)	(3)	(4)	(5)	(6)
	Residuals	Residuals	Residuals	Residuals	Residuals	Residuals
Institutional intensity*Infringements reduction	-0.000455***	-0.000455***	-0.000533***	-0.000421***	-0.000434***	-0.000503***
	(0.0000433)	(0.0000433)	(0.0000567)	(0.0000544)	(0.0000533)	(0.0000546)
Financial dependence*Financial development		-0.000000320'	-0.000000352'	-0.000000277	-0.000000267	-0.000000331'
		(0.000000221)	(0.000000222)	(0.000000223)	(0.000000223)	(0.000000222)
Institutional intensity*GDP per capita			9.67e-08***	0.000000766***	0.000000777***	0.000000725***
			(2.30e-08)	(7.23e-08)	(7.71e-08)	(7.32e-08)
Institutional intensity*Skills endowment				0.000509'	0.00112*	0.00562***
				(0.000316)	(0.000634)	(0.000938)
Institutional intensity*Capital endowment				-8.27e-08***	-8.18e-08***	-0.000000110***
				(8.46e-09)	(8.28e-09)	(1.16e-08)
Institutional intensity*Labour market flexibility					-0.000627	-0.00481***
					(0.000601)	(0.000794)
Institutional intensity* Financial development						0.000122***
						(0.0000176)
Constant	0.00760***	0.00760***	0.00634***	0.00685***	0.00672***	0.00741***
	(0.000733)	(0.000732)	(0.000607)	(0.000604)	(0.000676)	(0.000703)
Observations	3,599,090	3,599,090	3,599,090	3,599,090	3,599,090	3,599,090

Source: ESRI estimates.
Notes: All regressions include industry and home and host country fixed effects. The dependent variable is the residual retrieved from the first stage estimation of the propensity of firms to integrate inputs with firm fixed effects as explanatory variables. The institutional dependence measure is calculated using the 2014 WIOD tables for the 28 EU countries. Standard errors clustered at firm-level in parentheses. ' p<0.15, * p<0.10, ** p<0.05, *** p<0.01.

5.3. Summary of key findings and policy implications

It was expected that the Single Market Programme introduced in 1993 would result in greater intra-EU trade, a better allocation of resources, increased competitiveness and productivity, and ultimately welfare gains in the member states. In addition to these benefits foreseen by the traditional economic theory, the implementation of the Single Market legislation might have resulted in additional unexpected benefits stemming from the quality of the Single Market legal framework as a source of comparative advantage and a determinant of intra-EU production linkages. These unexpected benefits are suggested by recent theoretical advances in institutional economics and related empirical evidence. A large body of literature has established that export specialisation and international production networks are associated with efficiency and productivity gains.

Against this background, this chapter examined whether and to what extent the quality of the Single Market legal framework in the sense of timely and correct transposition of the Single Market legislation has been a source of comparative advantage and a determinant of firms' organisational choices for international production in EU countries. The key findings are summarised below.

The quality of the Single Market legal framework has been a source of comparative advantage in EU countries. This result is robust to using alternative indicators to measure the quality of the Single Market legal framework as well as broader measures of judicial quality (Rule of Law) and to using alternative estimation methods. The results also hold when controlling for additional determinants of comparative advantage such as factor endowments (human and physical capital), and other institutional determinants, namely financial development and labour market flexibility.

A correct transposition of the Single Market legislation would result in increased export specialisation in contract-intensive industries in EU countries. With no cases of infringement proceedings, export specialisation across all EU countries would be higher by 0.7%. The potential country-specific export specialisation increases range from 1.6% in Italy (the country with the largest number of infringement cases) to 0.2% in Estonia (the country with the lowest number of infringement cases). These results are over and above the effects of the quality of institutions (Rule of Law) and of other determinants of comparative advantage (factor endowments, financial development and labour market flexibility).

The full transposition of the Single Market legislation into national law would increase the export specialisation in contract-intensive industries by 0.03% on average across all EU countries. These potential country-specific increases in export specialisation and associated productivity gains would be low, given the high degree of the transposition of the Single Market legislation in all EU countries.

Some of the contract-intensive industries identified in this analysis (for example "Furniture, other manufacturing") are among those found in chapter 4 as having the largest potential productivity gains associated with a correct and timely transposition of the Single Market legislation. These results suggest that increased specialisation in contract-intensive industries associated with a correct and timely transposition of the Single Market legislation could increase productivity and welfare gains in the long run in EU countries.

In the context of market imperfections such as incomplete contracts, differences in the quality of the Single Market legal framework have been a determinant of firms' international production choices across EU countries. The results of this analysis indicate that higher contracting costs are associated with greater vertical integration in industries that are more dependent on the quality of contract-enforcement institutions. These results are robust to using alternative indicators for the quality of the Single Market legal framework and to alternative estimation methods. These results also hold when controlling for other country characteristics that could influence firms' organisational choices for international production such as the level of economic development (GDP per capita), factor endowments (human and physical capital endowments) and other institutional characteristics (labour market flexibility and financial development). These results are consistent with the institutional economics literature showing that in an environment of incomplete contracts, differences in institutional characteristics across countries affect firms' organisational choices for their international production operations.

Taken together, the results of this analysis indicate that full compliance with the Single Market in the sense of a correct and timely transposition of the Single Market legislation into national law,

could be a driver of productivity and welfare gains in the long run. These gains would come about through increased specialisation and greater intra-EU production linkages via vertical integration and outsourcing of intermediate inputs. While these productivity gains appear to be small relative to other gains associated with the Single Market they could contribute to sustainable growth in the European Union in the long run.

6. SPECIAL TOPIC: THE IMPACT OF CHANGES IN THE QUALITY OF INSTITUTIONS THROUGH EU MEMBERSHIP: EVIDENCE FROM THE EU ACCESSION OF COUNTRIES IN CENTRAL AND EASTERN EUROPE

6.1. Introduction

This chapter complements the findings on the effects of the quality of the legal framework related to the Single Market. It provides evidence on the impact of EU accession on regulatory change and presents firm-level evidence, therefore it relates to the firm-level analysis conducted in chapters 4 and 5.

Methodologically, this chapter reviews the results of three interrelated, academically published empirical papers which shed light on the effect of the EU Eastern enlargement rounds in accession countries (Böheim and Friesenbichler, 2016; Friesenbichler, 2018; Friesenbichler and Peneder, 2016).[41] This evidence is useful to understand the effects of EU membership on improving the quality of institutions in the new EU member states, and the subsequent effects on market structures and productivity distributions. Jointly interpreted, these results are new to the international policy discussion.

The research conducted allows to focus on the following three guiding questions:

- What impact did EU accession - and the required implementation of the Acquis Communautaire (AC) - have on the de facto quality of institutions in accession countries with respect to competition policy in a wider sense?
- Has EU accession changed broadly defined, self-reported market structures in accession countries?
- How has the factor allocation (firm-level productivity distributions) changed in EU-acceding countries?

6.1.1. *The impact of the Community Acquis on the quality of institutions*

Joining the European Union requires acceding countries to adjust their economic and legal settings on many levels. Acceding countries are required to implement the legal body of the EU, the Community Acquis (Borchardt, 2010). Hence, EU accession not only implies lifting trade barriers, but also harmonising and improving economic policies and administrative procedures (Kancs, 2007; Krieger-Boden and Soltwedel, 2013). As part of their institutional reform process, countries are required to introduce or adjust existing competition laws to promote competitive markets within domestic economies. These reforms are tightly linked to the Single Market. They aim to generate a business environment in which firms can compete in a free and fair manner.

The regulatory instruments of competition policy in a wider sense include bankruptcy, company law and competition law and regulations. Acceding countries are thus required to align their legislation with the European Union (Borchardt, 2010), which prominently included the competition policy chapters of the Community Acquis (Hölscher and Stephan, 2009; Buccirossi et al., 2011). In other words, the Community Acquis considers various dimensions of market-oriented policies, which jointly constitute the regulatory cornerstones of a market economy. Regulations are set to establish and maintain market efficiency, as well as seek to preclude anticompetitive behaviour (Motta, 2004; Lyons, 2009). Qualifying for EU membership may involve the development of new and the restructuring of existing institutions alike. Ultimately, such policy reforms aim at improving the quality of the institutional and regulatory environment, thus facilitating a country's economic development (Voigt, 2009).

[41] The project, financed by the OeNB's Anniversary Fund, was titled "Competition, Competition Policy, Productivity and Innovation in Eastern Europe and Central Asia" (see Böheim and Friesenbichler, 2016; Friesenbichler and Peneder, 2016; Friesenbichler, 2014, 2018).

Studying the effectiveness of competition policy as an element of a country's institutional framework is particularly relevant in an Eastern European transition context. These countries have surpassed their economic planning heritage in the period examined in this study. The pivotal element was replacing economy-wide planning with a market-based selection mechanism that determines factor allocations (Kornai, 1992; Dutz and Vagliasindi, 2000; Friesenbichler et al., 2014).

Key indicators and the sample used

To assess the accession effect on competition policy, Böheim and Friesenbichler (2016) use the indicator "regulatory quality" from the World Governance Indicators.[42] The indicator captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development. It thereby considers possible differences between de-jure legislation and de-facto implementation. The index is a construct of 57 items, stemming from six representative and nine non-representative sources.

The variables are available biannually from 1996 to 2000, and annually from 2002 onwards. They provide reliable, comparable and consistent indicators of institutional development for the countries in question. The chosen index "regulatory quality" is a composite indicator, which has been shown to be more robust than single measures of competition policies. It generates a holistic picture of policies affecting competition by integrating competition policies with other forms of regulatory reform that affect the business climate and a level playing field for entrepreneurs. This is advantageous, since empirical findings show that regulatory reform is correlated with other dimensions of governance (Kaufmann et al., 2011).

The index is a sound measure of the competition chapter of the Community Acquis. It quantifies the extent of market competition and the effectiveness of competition and anti-trust policies and legislation. It incorporates the extent of government intervention in the economy and the prevalence of regulations and administrative requirements that impose a burden on an entrepreneurial level playing field. In addition, it captures several aspects of the general quality of legal systems affecting the business climate. These include labour market policies, the complexity and efficiency of the tax system, trade policy, the investment attractiveness (e.g., the extensiveness of legal rules and effectiveness of legal regulations in the banking and securities sectors, or the participation of the private sector in infrastructure projects).

The key variable explaining regulatory quality is the membership status of the European Union. The EU accession process comprises several phases. Using official information on the accession process provided by the European Commission, the authors constructed an index ranging from one (no affiliation) to six (full membership). The index allows for a substantial degree of variation in the status variable. The indicator assigns a one to countries without any documented accession relations to the EU. Phase two describes countries that have a formal bilateral accession procedure with the EU, which is documented by a signed partnership and/or co-operation agreement. Step three denotes a country that was officially identified as a potential candidate, while the formal application for EU membership is considered in stage four. Stage five describes countries during ongoing membership negotiations. Stage six indicates official EU membership.[43]

The sample consists of country-level findings on a total of 48 countries for six 3-year periods starting from the year 1997. The sample consists of accession countries, old member states, as well as other industrialised countries and catching-up economies in Eastern Europe and Central Asia that share the transition history.

Empirical results

Böheim and Friesenbichler (2016) show descriptive statistics suggesting an overall trend in the improvement of competition policies. However, policy reforms seem more pronounced in countries that accessed the EU, i.e. increased their membership status. Not a single country fell back in its regulatory quality index in the time span covered. This suggests that the policy reforms seem to be lasting – at least in the sample covered.

[42] See http://info.worldbank.org/governance/wgi/index.aspx#home (accessed on 9 January 2019).

[43] See http://ec.europa.eu/enlargement/index_en.htm (accessed on 10 January 2018).

The results show that EU membership was conducive to policy reform. The mean of the regulatory quality index increases steadily as countries approach the EU, while the standard deviation decreases. The relatively higher mean of the countries in the group that is unaffiliated with the EU is due to the inclusion of both developed countries (like the US and Japan) and catching-up economies (see Table 6.1).

Table 6.1: Regulatory quality across EU membership status

	Mean	S.d.
Unaffiliated	2.40	1.02
Partnership agreement	2.07	0.70
Potential candidate	2.57	0.60
Formal application	3.08	0.48
Candidate	3.32	0.36
Member state	3.82	0.36

Source: Böheim and Friesenbichler (2016).

Böheim and Friesenbichler (2016) then use a variety of regression techniques to quantify the impact of EU accession on the regulatory quality index. Additional control variables were included in the estimates, such as time effects, GDP per capita, GDP growth, the unemployment rate and inflation. These variables account for the impact of the financial and economic crisis that affected the countries in the sample differently and has also had substantial effects on competition policy.

The regression results robustly show that countries that move towards EU membership improve their regulatory quality index. This can be seen in the coefficients obtained from a random effects regression, which increase steadily as countries approach the EU. Filing a formal candidate application has a level effect of 0.23 points in the outcome indicator, being granted candidate status increases 0.25 and full EU membership 0.28 index points.

Some countries neighbouring the EU have made steps to join the EU, while their neighbouring countries have not. In other words, the political preferences of some countries render EU accession more likely than others. Hence, EU accession is not "random". This means that EU accession cannot be interpreted as a natural experiment, which may point towards a potential bias of the panel estimates. Hence, the authors controlled for endogeneity, i.e. possible endogeneity of the EU membership status in an instrumental variable regression. The instrumental variable used is based on voting behaviour in the UN general assembly, which measures a country's ideological proximity to the European Union. The stronger the overlap of a country's UN voting behaviour with EU member states at the given time, the closer the ideological proximity that renders EU accession more likely. This variable sufficiently explained the status index. The ideological proximity exerted a positive influence on the EU membership status, which again increased the regulatory quality indicator.

To summarise, the process of acceding the EU has been linked to improvements in the regulatory quality indicator, a measure of the de facto quality of competition policies and an entrepreneurial playing field. It is well established in the literature that better and more effective competition policies at the country level lower transaction costs and thereby increase firm dynamics, and has been linked to higher productivity growth (Ahn, 2002; Friesenbichler, 2018). This leads to the question of whether this holds empirically. Have the changes in EU membership status effectively changed market structures and productivity distributions?

6.1.2. *EU accession and market concentration*

In subchapter 6.1.1 it is tested whether the quality of institutions facilitate specialisation in contract-intensive industries. In addition, the previous subchapter has shown that EU accession causally leads to improvements of the institutional setting, especially regulatory quality. This leads to the question of whether the institutional changes had an impact on firms in accession countries. The following summarises Friesenbichler (2018), who provides empirical results on the effect of EU accession on market concentration.

Conceptually, there are two contrasting mechanisms that are plausible in the accession context:

First, one may argue from a trade-theory-based market integration perspective (Melitz and Ottaviano, 2008). In the initial stage of market integration, the number of firms active is expected to increase. In the accession countries analysed, this phase of international market entry began in

the mid-1990s and was largely completed when the Eastern enlargement rounds became effective. In later stages, the allocation dynamics induced by international trade suggest that more competition forces unproductive firms to exit with high productivity firms pertaining. This leads to a reallocation of resources across firms, which changes the distribution of firm-level productivity. (Melitz, 2003; Melitz and Ottaviano, 2008). Hence, the Melitz models predict market concentration to increase due to fiercer international competition.

Second, this is contrasted by the institutional reform literature, which seems particularly applicable to accession countries, which went through a long reform process. Improving the institutional and regulatory environment aims to promote a level playing field for entrepreneurs (Schimmelfennig and Sedelmeier, 2004; Hölscher and Stephan, 2009; Grabbe, 2002) and may therefore induce less concentrated markets.

The dataset

The main data source is the Business Environment and Enterprise Performance Survey (BEEPS), an establishment-level survey that is jointly implemented by the World Bank and the European Bank for Reconstruction and Development. The dataset provides information about 40,297 establishments in 27 countries covering survey waves in 2002, 2005, 2007, 2009, 2012 and 2013. The countries in the sample were classified as EU member states, candidates, potential candidates and no candidates.[44] The database has some notable advantages over other firm-level datasets such as CompNet data or Orbis.

- It not only sufficiently covers private sector firms in all accession and accession candidate countries, but also neighbouring countries in the region, whose observations can be used as control groups when estimating the effects of accession.
- The data are a stratified random sample considering (i) firm size groups, (ii) the industry affiliation and (iii) the region in which an establishment is located. Hence, the data can be claimed to be representative at the country level. Thorough quality assurance has been implemented in the data collection process.
- The data contain a question about the perceived market concentration, which relies on the respondent's assessment of the "main market", thus avoiding market definition issues. In addition, some indicators allow constructing a total factor productivity index, which will be described in the next subchapter.

These data allow assessing the effects of EU membership on market structures using a control group which consists of firms in comparable transition economies. This argument is particularly relevant in the early 2000s, when the transition was still ongoing. It has been argued that the transition has been largely completed, and that transition issues more and more turn into institutional and development questions (Havrylyshyn, 2013; EBRD, 2013).[45]

The key variables

The target variable is market structure, which is an ordinal measure of market concentration, indicating the number of competitors on the local or national market. This does not inform about the origins of the competitors. Reporting firms that were competing internationally were excluded from the analysis to focus on structural dynamics within domestic economies. The variable is self-reported by the survey respondent. While self-reporting has the advantage of a precise definition of the relevant market, it might be prone to a subjectivity bias. The variable takes on three values. It assigns "1" to a monopoly, "2" to a highly concentrated market (either a duopoly or an oligopoly with no more than four or five competitors), and "3" to a polypoly, where the respective firm reports more than four or five competitors. The threshold for a polypoly changes over time due to changes in the answer categories in the questionnaires.

A distinction needs to be made between market structures and competition. Market structures mainly refer to the number of firms and perhaps their size distribution, while this may differ from

[44] For methodological details see http://www.enterprisesurveys.org/ (accessed on 10 January 2019).

[45] Certainly, there is a possible selection bias, which will be addressed by an instrumental variable approach using "ideological proximity" as an instrument affecting a country's EU membership status, but not necessarily its implemented policies.

competitive firm behaviour at the industry level (Martin, 2012). However, it seems unlikely that this will bias the results given that the categories are a proxy of market concentration.

The key independent variable is EU membership status. This country-year-level variable is constructed using official information provided by the European Commission on the membership and negotiation status.[46] The sampled countries were assigned to four ordinal categories over time: no affiliation to the EU (1), countries that will potentially negotiate (2), candidate countries (3) and member states (4). Countries in the European Neighbourhood Policy (e.g., the EU's "Eastern Partnership") are labelled as unaffiliated, since these agreements have no effect on domestic reforms.

Only observations in countries that changed their membership status are considered in the estimates, i.e. only firms in countries that received the "treatment" were considered. These comprise Poland, Romania, Serbia, Bosnia and Herzegovina, Republic of North Macedonia, Estonia, Czech Republic, Hungary, Latvia, Lithuania, Slovakia, Slovenia, Bulgaria and Croatia.

Empirical results

An ordered logit regression explaining market structure as a function of the EU membership status variable and time, industry and country dummies allows predicting the marginal probabilities for each accession stage. These cross-sectional results provide first insights into the relationship between broadly defined market concentration at the firm level and EU membership at the country level. The likelihood of observing a monopoly steadily decreases from 6.8% for unaffiliated countries to 1.9% for member states. The same pattern is found for oligopolies that become less likely. Less concentrated markets (i.e. markets where more than five competitors are active) are more likely to be found in EU member states. While 47.7% of the randomly sampled firms in unaffiliated countries report operating in a polypoly, this figure increases to 77% for member states (see Table 6.2).

Next, regressions using a difference-in-difference estimation procedure to identify a causal effect (Greene, 2003) are carried out. Even though the dataset is not in a panel structure, data are available for two periods, leading to two different samples. The first sample covers the period between 2002 and 2005, containing 2,050 observations of which 54% received the treatment. The second period covers the years 2005 and 2009 and contains a total of 3,122 observations, of which 15% received the treatment. These two samples were pooled to increase the number of observations, of which a total of 31% received the treatment.

Friesenbichler (2018) estimated a series of specifications. First, a straightforward difference-in-difference estimation was implemented, with and without a period dummy measuring the effect of possible level differences due to the pooling of two periods. The next regressions relax the common trend assumption on which double difference estimations hinge. They include firm-specific variables (the export share, the labour stock as a proxy for firm size, the firm-specific capital-labour ratio, firm age and the share of university graduates) and developments at both the country and the firm level. The country-level variables used are GDP per capita and GDP per capita growth. In addition, a country's import penetration was considered, captured by the country's overall import penetration ratio and the import share of the sector in which the observed firm operates. Due to data availability, this last regression was confined to manufacturing firms. The estimated coefficient for the double difference variable was positive and significant in all specifications, thereby indicating that EU accession causally leads to less concentrated markets.

Table 6.2: Predicted marginal probabilities of market structure across membership status

Market structure \ membership status	Unaffiliated	Potential candidate	Candidate	Member states
Polypoly	47.7%	58.5%	68.5%	77.0%
Oligopoly	45.5%	37.0%	28.6%	21.0%
Monopoly	6.8%	4.5%	3.0%	1.9%

Source: WIFO calculations, data by Böheim and Friesenbichler (2016).

[46] See http://ec.europa.eu/enlargement/index_en.htm (accessed on 10 January 2018).

6.1.3. *EU accession and total factor productivity*

The previous subchapters have shown that EU accession has causally improved the institutional quality of accession countries in Eastern Europe, which eventually lowered market concentration. The following summarises Friesenbichler (2018), who provides empirical results on the effect of EU accession on total factor productivity. In other words, this review addresses the question of how the factor allocation (firm-level productivity distributions) has changed in EU-acceding countries.

A productivity indicator

The BEEPS data described above contain financial information that allow to estimate a productivity index. To generate the total factor productivity (TFP) indicator, the study followed Syverson (2011) and World Bank methodology (e.g., Saliola and Seker, 2011). First real value added (VA) of firm m, industry k and country i, in period t is computed as the difference between sales and intermediate inputs. Second, this indicator was regressed on the firm-specific labour (L) and capital stock (K), and the interaction of country-industry-specific effects ($* \mu_{k,i}$) with both capital and labour.[47] The interaction terms capture possible simultaneity issues at the industry level (Olley and Pakes, 1996). This equation was estimated for all countries in the sample. All variables enter the equation in natural logs. Standard errors were clustered at the country-year level to control for the survey design.

$$VA_{m,k,i,t} = \beta_0 + \beta_1 L_{m,k,it} + \beta_2 K_{m,k,it} + L_{m,k,it} * \mu_{,k,i} + K_{m,k,it} * \mu_{k,i} + u_{m,k.i,,t} \quad (6.1)$$

The TFP indicator at the firm level is computed as the sum of the intercept and the residual of equation, expressed as a percentage of the firm's value added. The productivity indicator reflects a firms' size-independent productivity level, or the contribution of productivity to the value added, respectively.

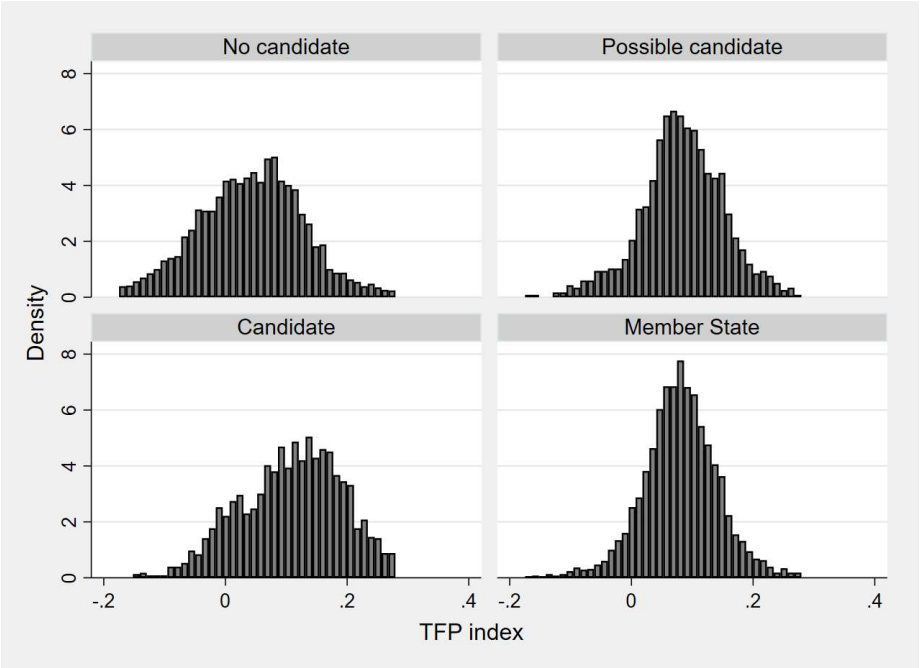
The data structure imposes some drawbacks affecting the computation of total factor productivity. The data are not available in a panel structure. Hence, simultaneity issues in productivity estimates cannot be controlled for with established methods (Olley and Pakes, 1996; Petrin et al., 2004), requiring alternative estimation strategies (Saliola and Seker, 2011). This also implies that productivity is estimated in levels only, and productivity growth cannot be tracked.

Empirical results

The estimated firm-level TFP levels resemble the productivity levels that were previously reported for firms in the region (e.g., Saliola and Seker, 2011). This index can be plotted for each EU status level (i.e. the subsamples across membership status). Both the mean and the median productivity tend to increase with the EU membership status, even though the present data show a minor reduction in the mean and median TFP levels in EU member countries when compared to candidates. In addition, the standard deviation falls substantially, indicating that the efficiency of the regulatory environment improved (Bartelsman et al., 2013).

[47] The Enterprise Surveys report monetary values in US dollars. Since data from survey waves from several years were used, monetary values were first converted back into the local currency, deflated and then converted again to US dollars. The exchange rates used were provided by Word Bank Indicators (official exchange rate; local currency unit per US$, period average), which does not include Euro countries. The official Euro conversion rate as well as the exchange rate from Euro to USD provided by Eurostat was used to obtain comparable time series. Exchange rate data for Uzbekistan was retrieved from UNCTAD. The deflators were obtained from the IMF, with 2005 as the reference year.

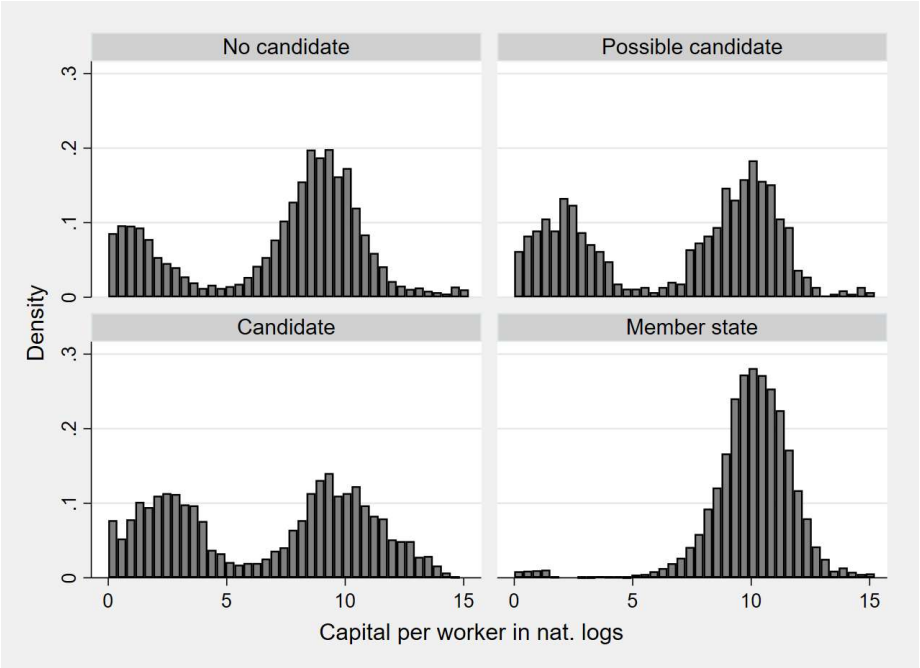
Figure 6.1: Firm-level TFP distributions across membership status



Source: Friesenbichler (2018).
Notes: These boxplots show the distribution of TFP across countries in a pooled sample across all survey waves. The 1st and the 99th percentile excluded as outliers.

There are fewer outliers on the left side of the firm-level TFP distribution. The 5th percentile is higher in countries with a higher EU membership status. Hence, the number of highly unproductive firms seems to decrease. An ambivalent picture emerges on the right side of the distribution, which may be due to two effects. First, firms might be more efficient and therefore exhibit higher TFP indices. Second, the TFP index does not consider policy-induced market structures and may thus contain monopoly rents (see Figure 6.1).

Figure 6.2: Firm-level capital-labour-ratio distributions across membership status



Source: Friesenbichler (2018).
Notes: These boxplots show the distribution of the capital-labour ratio (in natural logs) across countries in a pooled sample across all survey waves. Capital is defined as the sum of the replacement values for machinery and equipment and land and buildings. The 1st and the 99th percentile are excluded as outliers.

In addition, a shift in the relationship between TFP and the production factors towards capital is observable as countries increase their accession status. Figure 6.2 provides descriptive statistics on the capital-labour-ratio across membership statuses. The density distribution shows two peaks. There seem to be two clusters of firms – one with a high and one with a low capital-labour ratio. The distribution in EU member states does not show a large group of firms with low capital intensity. This suggests a substantial increase in the capital-labour ratio. Correlation coefficients between the TFP index and the capital stock (in natural logs) corroborate this picture. The coefficients indicate that capital became more important for productivity. For potential candidates the correlation coefficient was -0.37, while it was -0.31 for candidates and eventually turned positive for member states (0.06).

Eventually, Friesenbichler (2018) explores factors explaining firm-level productivity. Conceptually, two strands of literature have been summarised in the previous subchapter: trade theory and institutional reform literature. Both imply that aggregate productivity increases, and that low productivity firms exit. While the expected changes in the productivity distribution are the same, the Melitz-type trade models suggest that the increases in market concentration reallocate market shares towards more productive, exporting firms, thus increasing market concentration. However, the reform literature perceives more entrepreneurial freedom and greater variety of firms as the source for productivity growth.

Friesenbichler (2018) uses regression analysis to explore whether lower or higher levels of market concentration exert a positive effect on firm-level productivity. The results of a quantile and an OLS regression indicate higher productivity levels for firms in an oligopoly and a polypoly market. The magnitude of the effect is larger for the latter. The benchmark is the group of firms that are monopolies. These results might, however, be biased due to reverse causality. Hence, a 2SLS regression was implemented. Two specifications were implemented. First, all countries in the sample were used, i.e. countries that changed and those that did not change their membership status. The instruments used in this estimation are the EU membership status index, the EBRD competition policy index as a reform indicator and the interaction of these two. Second, the sample was restricted to accession countries only, and the EU membership status index was used as an instrument. Macroeconomic control variables are included in each specification. The results support the previous findings. These results qualitatively support previous findings from a simultaneous equation model which considers the interwoven relationship of competition, R&D, innovation and firm performance (Friesenbichler and Peneder,2016).

6.1.4. *Summary and policy conclusions*

This subchapter provided a short review of evidence on the effects of EU accession on institutional change, market structures and firm-level total factor productivity. Acceding the EU and the implementation of the Community Acquis have been linked to improvements in the regulatory quality indicator, a measure of the de-facto quality of competition policies and an entrepreneurial playing field. Economic literature finds that better and more effective competition policies at the country level lower transaction costs and thereby increase productivity (Ahn, 2002; Friesenbichler, 2018). This relationship was explored empirically in an EU accession context. Regression results causally linked declining market concentration perceived by firms in the EU accession process and full membership, eventually. The research results indicate that being in a less concentrated market was more likely if a firm was in an EU member state, rather than in a country that is unaffiliated with EU membership or an accession candidate.

EU accession has also impacted firm-level total factor productivity distributions. The variance of firm-level productivity decreased as countries acceded to the EU, indicating that the efficiency of the regulatory environment improved. The firm productivity distribution shifted to the right as countries joined the EU. The membership status tended to increase not only the 5%-percentile, but also the mean and the median productivity level. However, a minor backlash was observable for firms in member countries as opposed to membership candidates. In other words, this may point towards lead structures with respect to policy implementation and EU accession. While policy makers might implement pro-competitive policies prior to accession, once countries have become member states, reform efforts may slow down.

The results on the effects of EU accession on market structures offer a channel through which regulatory institutions affect economic performance. It has been shown that lower degrees of market concentration are positively associated with higher firm productivity. Hence, the continuation of institutional reform is thought to be of great importance for sustaining economic growth in the (former) transition economies (EBRD, 2013). In addition, it seems likely that the

shifts of the productivity distribution are reversible if the quality of the regulatory environment suffers a decline.

Competition policies in Central and Eastern Europe have been found to stimulate innovation (Friesenbichler and Peneder, 2016). Putting this result into a policy background implies that competition policies should not be interpreted independently of innovation policies. Both policy fields are important for firms in countries that advance technologically, and shift from investment-based growth towards a growth model that is driven by innovation and creative destruction (Acemoglu et al., 2004). Eventually, the reviewed papers discuss accession effects. It is plausible that these are not only applicable to EU accession dynamics, but also to countries exiting the EU if policy achievements are reversed.

7. SUMMARY OF RESULTS AND CONCLUSIONS

This report quantifies the gains from European trade integration, but also highlights potentials for further gains by eliminating remaining shortcomings of the Single Market for goods related to incorrect or incomplete transposition, the application of harmonised rules as well as the functioning of the mutual recognition principle. More specifically, the study assesses the degree of unexploited benefits that remain to be achieved from further integration in goods markets by addressing existing weaknesses in the implementation and enforcement of the Single Market rules in terms of goods trade, competition, productivity and ultimately welfare at the disaggregated level of individual industries and countries. Thereby, the analysis follows the tradition of earlier studies, starting with the Cecchini report in 1988, by focusing on mechanisms and expected benefits predicted by traditional (trade) theory. As such, the Single Market is expected to deliver benefits from increased trade, which in turn should generate efficiency gains through economies of scale and increased specialisation according to comparative advantages. Furthermore, pro-competitive effects of market opening are expected to lower prices to the advantage of consumers and by reducing firms' mark-ups, to strengthen incentives to achieve productivity gains through innovation. In addition, the study takes a step beyond the analysis of originally expected Single Market benefits foreseen by traditional economic theory and focuses on the role of the quality of the Single Market legal framework as a source of comparative advantage and determinant of intra-EU production linkages via (intra-firm) vertical integration or cross-border outsourcing of inputs.

7.1. Key findings

Single Market performance in terms of goods trade

Results for goods trade are based on a theory-consistent specification of the gravity model ("structural gravity model"), which is particularly useful for the counterfactual policy analysis provided in the report as well as the derivation of general equilibrium effects. The model is specified for bilateral trade at the industry and country levels over the period 1995 to 2014. The analysis focuses on trade in manufacturing goods and provides important insights into the evolution of intra-EU "border effects" distinguishing not only between industries but also between impacts stemming from EU membership versus accession.

Insights into realised Single Market-induced trade effects over the period covered are gained by counterfactual analysis comparing baseline results – i.e. results from EU integration as realised – with estimates from a counterfactual scenario of non-membership/non-accession.

The analysis of the performance of the Single Market for goods reveals the following main findings:

Positive trade effects mainly driven by accession: The resulting trade effects turn out positive and are mainly driven by large positive Single Market trade effects stemming from the accession of new members after 2004. The latter reflect enhanced trade between EU15 economies and accession countries, but also among the accession countries themselves. In general, the findings suggest that the EU15 economies benefit from EU enlargement in terms of fostering their trade relationships with the new members, which counterbalanced the weak and partly dampening membership effects for intra-EU15 trade. On the one hand, the relatively weak growth performance of intra-EU15 trade reflects the rather strong integration of these economies prior to the implementation of the Single Market Programme in 1993 and prior to 1995, the first year analysed in this report. On the other hand, it mirrors trade diversion from intra-EU15 trade towards trade with accession countries.

EU accession effects accelerating over time: In terms of the observed time patterns of the estimates, effects from EU accession are found to accelerate, reaching their observable maximums in either 2013 or 2014 for most of the considered industries. This suggests that the Single Market accession effects have been evolving dynamically over time and thus additional positive effects on trade between the "old" and the "new" members might be expected for the years to come.

Average Single Market trade effect of 9%: General equilibrium trade results reveal that the volume of intra-EU imports of goods is higher by 9% on average due to the Single Market as compared to the counterfactual situation. This effect on imports amounts to 47.5% and 6.5% for accession countries and EU15 economies, respectively.

Heterogeneous trade effects by industry: Detailed results at the individual industry level suggest positive Single Market trade effects for all industries except for "Coke and refined petroleum products". This is related to the particular characteristics of this industry, which include specific regulations and massive industry restructuring dynamics observed over the sample period. Mirroring the strong accession effects, the largest Single Market trade effects are found in industries which benefited most from trade between the EU15 and accession countries: "Textiles, wearing apparel and leather", "Transport equipment", "Food, beverages, tobacco", "Pulp, paper, printing, publishing" and "Furniture and other manufacturing". These correspond to the industries with the highest Single Market impact on EU15 imports (or accession countries exports) and correspond well with the expected competitiveness of accession countries in industries characterised by relatively higher intensities of low-skilled labour or the importance of vertical linkages such as in the "Transport equipment" industry. EU15 economies in turn benefit most from the Single Market-induced imports of accession countries of products from the "transport equipment" as well as "Food, beverages, tobacco" industries, but additionally from the "Computer and electronic devices", "Basic and fabricated metals" as well as "Rubber and plastic products" industries.

Strongest trade effects from accession country imports of "Transport equipment": The overall largest effect results in the transport equipment industry in the most recent acceding country, Croatia (112.7%) followed by Romania and Bulgaria (98.3% and 96.9%, respectively). At the low end of realised Single Market trade effects – ignoring the highly adverse effects of the "Coke and refined petroleum products" industry – one finds EU15 countries in the "Non-metallic mineral products", "Wood and product of woods" as well as in the "Basic and fabricated metals" industries. Germany ranks prominently within the Top-10 countries experiencing dampening Single Market effects on its imports including "Machinery". The results suggest that this was driven by a pronounced redirection of trade from the EU15 towards accession countries, as especially Germany is an important partner in vertically linked production chains in the Central European production area.

Single Market harmonisation, legislation and compliance

EU-wide legislation for goods and the adoption of harmonised standards ("harmonisation legislation") as well as the application of the mutual recognition principle are two main policy tools with which to realise the principle of free movement of goods within the Single Market. However, recent analyses provide evidence on important remaining weaknesses of market surveillance with respect to harmonised goods and mutual recognition mechanisms. This has shifted the focus to reforms with which to strengthen compliance and the enforcement of EU Internal Market harmonisation.

To assess the degree of harmonisation legislation within industries as well as compliance with Single Market rules in various dimensions, the study applies a set of different indicators. It constructs an indicator capturing the share of goods in each industry subject to harmonisation legislation. This is complemented by a set of indicators covering different but also interrelated aspects of Single Market compliance of member states. The degree of transposition of EU directives into national laws and the number of infringement proceedings related to the incorrect transposition or misapplication of EU law signal compliance with Single Market legal obligations. Misapplications of Internal Market rules directly related to cross-border problems of doing business are measured by the number of misapplications reported to SOLVIT and a variable reflecting the solving capacity of the SOLVIT mechanism in preventing cross-border barriers rooted in the misapplication of rules by national authorities. Last not least, empirical measures based on TRIS signalling the potential of new technical barriers by draft regulations at the EU national level are applied. The chosen indicator counts the amount of comments and detailed opinions (DOs) issued by the European Commission related to regulations with a potential to create new barriers.

The descriptive analysis of the harmonisation and the compliance indicators finds:

High shares of harmonised goods: The study finds that harmonisation legislation covers most goods within manufacturing industries. Within "Food, beverages and tobacco", "Textiles, wearing apparel and leather" and "Computer and electronic devices", practically all goods are covered by Community harmonisation legislation.

High transposition rates with a clear upward trend over time: The transposition indicator generally reveals high transposition rates. While variation by country is limited, there is a clear trend of improvement of transposition efforts over time in both the EU15 as well as accession countries with the most favourable changes in the first part of the period considered (2004 to 2009). For accession countries, the data reveals a distinct pattern of a very strong improvement in the first year after accession for several accession countries and generally higher transposition rates than the average EU15 country in subsequent years.

Most pending infringement proceedings evolve in Italy, Spain, Greece and France: As for initiated infringement proceedings, the results reveal the least relative occurrence of infringement proceedings in accession countries, except for Poland. The indicator exhibits more variation among the EU15 countries with most infringements evolving in Italy, Spain, Greece and France. While performance according to this indicator is generally better in accession countries, the data also reveals a clear trend towards improvement of the infringement indicator among EU15 countries over the sample period.

Cross-border problems due to the misapplication of EU law most frequently occur in Spain, France, Italy and Germany: As documented by the SOLVIT misapplication indicator, cross-border problems due to the misapplication of EU law most frequently occur in Spain, France, Italy and Germany. Again, better compliance of accession countries than for the group of EU15 members is found. At the individual country level, Romania and Poland form an exception. The SOLVIT indicator signalling the (problem) solving capacity of the SOLVIT mechanism reveals Slovenia and Greece as the two countries with the lowest share of resolved cases. In contrast to the results for the other compliance indicators, this SOLVIT indicator does not exhibit a distinct level difference between accession and EU15 countries.

Germany, France, Italy, the UK and Spain receive the most comments and DOs from the Commission: Finally, the TRIS indicator considering the number of comments and detailed opinions (DOs) issued by the Commission reveals that Germany, France, Italy, the UK and Spain attract most comments and DOs from the Commission as they were also among the countries with the highest regulatory activity and thus a higher potential for cross-border technical barriers. Accession countries generally attract fewer comments and DOs than EU15 countries. Within the group of accession countries, this is particularly true for smaller countries and countries with low regulatory activity. However, the TRIS indicator has also significantly improved for the EU15 over the period considered.

Trade and welfare potentials from strengthening compliance with and enforcement of Single Market rules

Counterfactual analysis based on scenarios of full-sector coverage of harmonisation legislation and perfect compliance with Single Market rules identifies untapped potentials for intra-EU trade and welfare. The analysis applied the indicator on the degree of harmonisation legislation across industries as well as five different compliance indicators and distinguishes between five counterfactual scenarios of full harmonisation combined with:

- Transposition: full transposition of the Single Market legislation into national legislation
- Infringements: no cases of infringement proceedings
- SOLVIT solutions: all business cases of incorrect application of the Single Market legislation received by the lead centre resolved
- SOLVIT misapplications: no cases of misapplications of Single Market rules by public administrations
- TRIS: no comments or detailed opinions on draft technical regulations (unnecessity of the correction mechanism under TRIS)

The analysis finds:

Sizeable within-Single Market trade and welfare potentials associated with increased compliance – highest potentials from full legal transposition and unnecessity of infringement proceedings: Overall, the analysis identifies economically sizable within-Single Market trade and welfare effects. The highest potentials are associated with the first two scenarios of complete transposition and the unnecessity of infringement procedures against any member state which would signal correct and full transposition as well as a lack of misapplications of law. The infringement scenario capturing selected instances of more severe violations is associated with the highest potentials. The elimination of the need for infringements would amount to increased intra-EU imports of 7.5% and 8.5% in the EU15 and accession economies, respectively. The associated welfare effects would rise to 0.4% in the EU15 and 1.9% in accession economies.

Additional gains from improvements of SOLVIT and TRIS mechanisms: The other three counterfactual scenarios based on the SOLVIT and TRIS indicators also indicate positive trade and welfare effects, but the results are more heterogeneous. As for the two scenarios based on SOLVIT indicators, positive welfare and trade effects are associated with a lower number of misapplications as well as a higher share of solved misapplication cases. The analysis finds some instances of small adverse trade and welfare effects for some country-industry combinations with respect to both SOLVIT indicators, which at least for these combinations signal that detection and awareness of the mechanism should be improved.

The counterfactual scenario based on the TRIS indicator on national draft regulations issued by the European Commission identifies adverse trade and welfare effects for many member states. This finding clearly suggests that the TRIS mechanism and the practice of the possibility to report comments and detailed opinions on national regulations is effective for avoiding the establishment of new trade barriers within the Common Market and, therefore, positively contributes to the completion of the Single Market for goods.

Across the different counterfactual analyses some general and robust findings can be identified:

Highest trade potentials for accession countries: Across all scenarios, manufacturing goods trade with and within the group of accession economies would benefit the most from increased compliance with Single Market regulation. Potential long-run import effects associated with different scenarios of full harmonisation and full compliance range between 3.6% and 8.6%, which are associated with welfare increases between 0.6% and 1.9%. Poland could materialise the highest import potential, while Latvia would benefit most in terms of welfare.

Positive but lower trade potentials for the EU15: The EU15 member states would also benefit from better compliance with Single Market regulation but to a smaller extent as compared to the accession economies. Estimated intra-EU trade potentials across different scenarios range from 0.1% to 7.5%, and welfare effects from 0.2% to 0.4%. This again points to the fact that the EU15 are already very strongly integrated and most of the potentials stemming from the Single Market for goods have already been exploited for trade among this group of members. However, they would additionally benefit as exporting economies trading with the accession member states.

Heterogeneous trade potentials across industries: Concentrating on different manufacturing industries, large but not yet exploited trade potentials are identified for "Coke and production of refined petroleum products". This industry has been identified as an industry where the Single Market has so far had a dampening effect on intra-EU imports. This has been related to the particular characteristics of this industry, which include specific regulations and massive industrial restructuring dynamics observed over the sample period. Other industries with high import potentials are "Wood and production of wood and cork", "Non-metallic mineral products" and the "Furniture and other manufacturing goods". These effects are again most pronounced for imports of the accession economies. EU15 trade would benefit most in the "Chemicals and pharmaceuticals" and the "Rubber and plastic products" industries. By contrast, other industries that are already characterised by a large coverage of harmonisation legislation of goods production have exhibited only relatively moderate unexplored trade potentials from more compliance with Single Market regulations. Among this group of industries are, e.g., "Food, beverages and tobacco", "Textiles, wearing apparel and leather production" and "Computer and electronic devices".

Single Market competition and productivity effects

The pro-competitive effects of market opening as well as associated productivity increases were one of the key expected benefits of the Single Market Programme introduced in 1993. Competition potentially drives productivity in three main ways: (i) through a reduction of X-inefficiency within firms; (ii) by ensuring that more productive firms increase their market shares at the expense of less productive firms (relocation between firms); and (iii) by incentivising firms to innovate.

A review of the recent theoretical and empirical literature on international trade with heterogenous firms suggests heterogeneous effects of trade liberalisation on competition and productivity across firms and between industries. These heterogenous effects are likely to be generated by variable mark-ups across firms between industries and an incomplete pass-through of falling trade costs on prices and productivity across firms and between industries. This heterogeneity of effects implies smaller welfare gains from trade than initially expected based on the trade literature with representative firms and constant mark-ups. Furthermore, benefits related to the pro-competitive effects of falling trade barriers may be higher in the short run than in the long run. The underlying reason for these different effects is the pattern of firm entry: while in the short run the number of firms and the productivity distribution are fixed, in the long run these effects may be reversed due to free firm entry and changes in the relative pattern of firm entry as entry to the bigger market becomes relatively more attractive.

The analysis finds:

Increasing market concentration in many industries: The analysis of competition within the Single Market indicates that market concentration has increased in many industries. It has, for example, increased since 2002 in "Textiles, wearing apparel and leather production" and "Machinery". In some other industries, market concentration has a "U-shape" evolution where market concentration declined before 2008 but started to rise afterwards. This is the case for "Wood and products of wood and cork", "Pulp, paper, printing, publishing", "Chemicals and pharmaceuticals", "Non-metallic mineral products" and "Furniture and other manufacturing". Two industries have experienced declining market concentration: "Computer, electronic, electrical and optical products" and "Transport equipment".

Heterogeneous effects of trade liberalisation on competition and productivity across industries: Descriptive evidence as well as econometric analysis indicate pro-competitive effects of increased trade openness as well as a positive impact of trade-induced competition on productivity. Intra-EU trade effects turn out to be the main driver of both positive competition and productivity. However, industries clearly adjust in different ways and the results confirm heterogenous effects across industries, as implied by theory in both the responsiveness of competition to trade and the responsiveness of productivity to trade-induced competition. In most industries higher intra-EU imports are associated with an increase in competition. Exceptions are found in the "Food, beverages, tobacco" and the "Basic and fabricated metals" industries. Furthermore, the pro-competitive effects of intra-EU trade are linked to productivity gains. However, higher competition is associated with lower productivity in the "Machinery" industry, and higher competition has had no effects in the "Textiles, wearing apparel and leather production", "Rubber and plastic products" and "Computer and electronical equipment" industries. These effects could be explained by within-industry firm characteristics and firm behaviour such as size and market power.

Higher trade potentials associated with full harmonisation and full compliance with the Single Market result in increased competition and productivity gains: Across the four indicators of compliance with the Single Market legislation considered, the largest competition and productivity potentials are associated with eliminating the need for infringement procedures followed by full transposition of the Single Market legislation into national legislation. The counterfactual competition and productivity potentials turn out to be only marginal in the cases of the other two indicators measuring full compliance with the Single Market in terms of comments on technical regulation drafts (TRIS) and solving all cases of misapplication of the Single Market legislation (SOLVIT). The results are consistent with the estimated trade potentials.

Looking at industry-specific estimates across all countries, the three industries with the largest competition and productivity potentials are: "Pulp, paper, printing and publishing", "Wood and products of wood and cork" and "Furniture and other manufacturing". These three industries are those identified to benefit most in terms of trade potential in the case of full legal harmonisation and full compliance with the Single Market.

The Single Market legal framework as a source of comparative advantage and enhanced intra-EU production linkages

Examining whether and to what extent the quality of the Single Market legal framework in the sense of complete and correct transposition and application of the Single Market legislation has been a source of comparative advantage and a determinant of firms' organisational choices for international production in EU countries, the following key and robust findings may be summarised:

The quality of the Single Market legal framework is a source of comparative advantage in EU countries: Higher institutional quality in EU member states – measured by the quality of the implementation of the Single Market legislation – is associated with export specialisation in contract-intensive industries (industries which are more dependent on contract enforcement).

A correct transposition of the Single Market legislation would result in increased export specialisation in contract-intensive industries: With no cases of infringement proceedings, export specialisation across all EU countries would be higher by 0.7%. The potential country-specific export specialisation increases range from 1.6% in Italy (the country with the largest number of infringement cases) to 0.2% in Estonia (the country with the lowest number of infringement cases). These results are over and above the effects of the quality of institutions (Rule of Law) and of other determinants of comparative advantage (factor endowments, financial development and labour market flexibility).

The quality of the Single Market legal framework determines organisational choices related to intra-EU production linkages: In the context of market imperfections such as incomplete contracts, differences in the quality of the Single Market legal framework have been a determinant of firms' organisational choices for their international production operations across EU countries. Full compliance with the Single Market in the sense of a correct and timely transposition of the Single Market legislation into national law, is a driver of greater intra-EU production linkages via vertical integration and outsourcing of intermediate inputs.

The effect of EU accession on institutional quality, market structures and productivity

The review of evidence of the effects of EU accession on institutional quality, market structures and firm-level total factor productivity reveals:

The quality of institutions and competition policies in the process of accession effectively changes market structures towards more competitive markets. Lower market concentration is in turn associated with higher productivity: Acceding to the EU and implementing the Community Acquis resulted in clear improvements in "regulatory quality", as a measure of the de-facto quality of competition policies and the presence of an entrepreneurial playing field. Improving institutional quality and competition policies were in turn found to effectively change market structures resulting in lower market concentration. This was in turn linked to higher productivity levels due to lower transaction costs. The variance of firm-level total factor productivity decreased during the accession process and both mean and median productivity increased as countries acceded to the Single Market. However, a minor backlash was observable for firms in member states as opposed to those in membership candidates. This may point towards lead structures with respect to policy implementation and EU accession: while policy makers might implement pro-competitive policies prior to accession, reform efforts may slow down once countries have become part of the Single Market.

7.2. Overall conclusions

Overall, the study confirms that the Single Market has delivered benefits in terms of increased trade, competition, productivity and ultimately welfare. Accession has been a key driver for trade effects in the period considered (1995 to 2014). The results further indicate that improvements in transposition and enforcement of Single Market rules could be a driver for trade, productivity and welfare gains in the long run. Apart from pro-competitive effects, these gains would also come about through increased specialisation and greater intra-EU production integration. In this respect the study offers evidence of – so far less obvious – additional benefits stemming from improvements of institutional quality (the quality of the Single Market legal framework over and above other institutional factors including judicial quality, i.e. Rule of Law, and its impact on

comparative advantage and export specialisation). Improvements in regulatory institutional quality have also been a relevant driver of pro-competitive effects on market structure as well as productivity levels due to lower transaction costs in accession countries. Furthermore, differences in the quality of the Single Market legal framework are found to matter for firms' organisational choices for their intra-EU production operations via (intra-firm) vertical integration and cross-border outsourcing, in the context of incomplete contracts.

Most importantly, the analysis suggests the possibility for Pareto improvements within the Single Market, especially with respect to the transposition and correct application of EU law (in a scenario of no infringements). Estimates indicate positive welfare effects for all industries and all member countries within the Single Market. This would come with some costs for third countries, which would experience some decline in their exports to Single Market member states. However, these trade diversion effects would be relatively moderate and would be more than offset by positive trade effects for the Single Market participants.

The analysis further underlines the positive impact of informal and faster solution mechanisms such as SOLVIT, as well as the notification system implemented in TRIS as a correction mechanism to possible cross-border barriers stemming from national technical regulations. The results also identify potentials from the increasing awareness of businesses as well as the knowledge and commitment of member state authorities with respect to market surveillance. This confirms related weaknesses found in earlier evaluations on the effectiveness of Single Market policy tools.

The counterfactual scenarios considered in the analysis imply a perfect world of full compliance and enforcement of Single Market rules through fully effective market surveillance and mutual recognition mechanisms. However, Pareto improvements could only be realised when policy coordination across member states were able to increase joint compliance efforts. This fact leaves us with a game-theoretical problem, as each member state might face some incentives to deviate from the joint and coordinated efficient equilibrium. Whenever all other member states fully comply with the Single Market, the exporting member state would benefit in terms of increased exports but could find it profitable to engage in non-complying behaviour to shelter its industry from increased import competition. Hence, one needs to introduce mechanisms that result in better compliance of the Single Market for all participants including the EU15 members and the accession economies. From a political economy point of view, this is certainly a difficult task, which might also be able to explain the observed non-compliance with selected issues of the Single Market by different member states.

In this respect the following points seem to be most relevant:

Strengthen coordination and cooperation: Implementation and enforcement of Single Market rules crucially depend on member states' commitment and involvement and better cooperation between all European actors. Overall, the "Goods package" of December 2017 presents important recommendations and steps towards better enforcement and compliance and suggests important improvements in market surveillance as well as mutual recognition mechanisms. These measures include a reinforcement of cooperation mechanisms to strengthen the European perspective of enforcement, the creation of "Single Access Points" and compliance networks with an improved grouping of functions and activities as well as a pooling of knowledge related to the Single Market which should also help increase the awareness and deepen the knowledge of the mechanisms in place for businesses and national authorities alike. These measures specifically address the lack of uniformity in approach to market surveillance across member states. Steps to reinforce mutual recognition of goods not subject to EU-wide harmonisation regulations include increasing the awareness and scale of SOLVIT mechanism as well as voluntary mutual recognition declarations of businesses to demonstrate "lawful marketing". These are all important steps in the right direction.

Policy enforcement faces increasing challenges: A major challenge at the EU/member states' interface is to manage the balancing between the need to harmonise national enforcement systems which implies a certain amount of pooling of sovereignty and the need to make sure that member state competencies or, more broadly, their policy autonomy remain intact. In addition, further integration and the adoption of the proposals on the table have gotten more difficult than at the outset of the Internal Market Programme as it increasingly touches the more sensitive economic and social issues and is confronted with "Euroscepticism".

Development of indicators reflecting cross-border intra-EU barriers in everyday business: Effective monitoring and evaluation tools at the national and EU levels including indicators that promote a common understanding of the challenges and additionally help to assess the economic

effects of Single Market tools could help trigger reforms in enforcement systems and raise awareness and commitment. The Single Market Scoreboard has proven useful for assessing Single Market legal obligations and has also provided insights into legal enforcement barriers and misapplications in the practical execution of the law in this study. However, the development of a composite indicator with a focus on reflecting cross-border barriers in everyday business could be more helpful and actionable. The OECD Product Market Regulation (PMR) indicators or the World Bank Doing Business indicators are widely-used examples, but not readily applicable for the purpose of assessments of the state of the Single Market. This indicator would have to be designed with an EU focus and would have to be adapted to reflect Single Market barriers in a comprehensive manner.

Increase quality, comparability and coverage of relevant datasets …

***…by increasing reporting standards*:** Any development of indicators or (econometric) assessments of the economic impacts of regulatory tools must be based on detailed, reliable and complete datasets. Data preparation for the evaluations in this study revealed important gaps in the availability of data as well as the quality of the available data, limiting useful and straightforward interpretation. This was especially true with respect to the measurement of the effectiveness of market surveillance. Since market surveillance is organised very differently in member states (centralised or decentralised at the sectoral level and or the regional/local level) these differences carry over to national market surveillance reports resulting in very limited comparability across countries, with significant variation in reporting standards by member states and reporting inconsistencies over time and a serious lack of data. The inhomogeneity of national market surveillance reports renders them unusable for systematic research. In this respect, it will be important to promote effective and correct reporting by providing clearer and more precise guides on the kind of data to be reported and the precise measurement of individual indicators, as well as by training officials and further harmonising reporting standards.

…by increasing awareness of the Single Market tools in place: Awareness raising with respect to various mechanisms of market surveillance and enforcement (such as SOLVIT, TRIS, RAPEX, etc.) should minimise non-reporting. This in turn would increase the quality of data and facilitate the more straightforward interpretation of indicators retrieved.

…by providing more detailed data: Most of the relevant data was only available at the country level of disaggregation and for too-short time periods. For a more precise assessment of the trade frictions induced by non-compliance with Single Market regulation, more detailed information at the country-industry level would be preferable as well as a longer time span of available data.

…by increasing accessibility: It will be important to develop databases summarising all relevant information systematically and electronically to increase accessibility. There should also be facilitated and improved data access for academics and researchers to detailed disaggregated data at the country-industry level as well as to time series data as a prerequisite for building meaningful Single Market indicators for economic analysis.

More detailed monitoring at the disaggregated sector level: Heterogeneous responses and effects between industries identified in this study call for a better identification of barriers to the functioning of the Internal Market at the disaggregated country and industry levels as well as more detailed monitoring of sector-related market developments. Upon the construction of industry-level information, one should also bear in mind correspondences of different sector classifications. In focusing on the economic impacts of Single Market tools this presents a major challenge to researchers.

Focus on the most outstanding cases at the industry level: This research study was a first step towards disaggregated analysis at the country and industry levels and provided evidence for the industries in which Single Market policies or implementation leave room for improvement and detailed analysis and monitoring. Across different analyses presented, the industries identified with the highest potentials in terms of trade, competition, productivity and welfare are "Wood and products of wood and cork", "Furniture and other manufacturing", "Pulp, paper, printing, publishing" as well as "Transport equipment". These were identified as industries in which significant productivity improvements linked to trade-induced pro-competitive effects have already been realised, but higher potential gains could be realised due to improvements in Single Market implementation and enforcement. The "Non-metallic mineral products" as well as "Basic and fabricated metals" were identified as industries of lower realised trade effects and in which the Single Market-induced productivity impacts realised have been weak so far.

Importance of complementary policies: Even fully abolishing prevailing Single Market barriers to goods trade would not automatically translate into productivity and welfare improvements. Single Market policies need to be accompanied by complementary policies, most importantly in the fields of innovation and competition policies and their interrelations, but also with respect to the effectiveness of welfare systems (appropriate national redistribution policies to cope with increasing political resistance). For example, national regulations protecting rents or implying cumbersome procedures to set up businesses hamper the process of reallocation of resources to the most productive firms following the opening of borders ("creative destruction").

This report has also highlighted the importance of institutional reforms. Specific evidence from the EU accession of countries on regulatory change shows quite clearly that improvement in institutional (regulatory) quality effectively changes market structures towards more competitive markets. Lower market concentration is in turn associated with higher productivity. Competition policies in Central and Eastern Europe have also been found to stimulate innovation at the firm level.

Putting these results into a wider policy context implies that Single Market policies and competition policies should be viewed as an integral part of more general innovation policies.

8. APPENDIX A: PRE-ACCESSION TRADE EFFECTS IN ACCESSION COUNTRIES

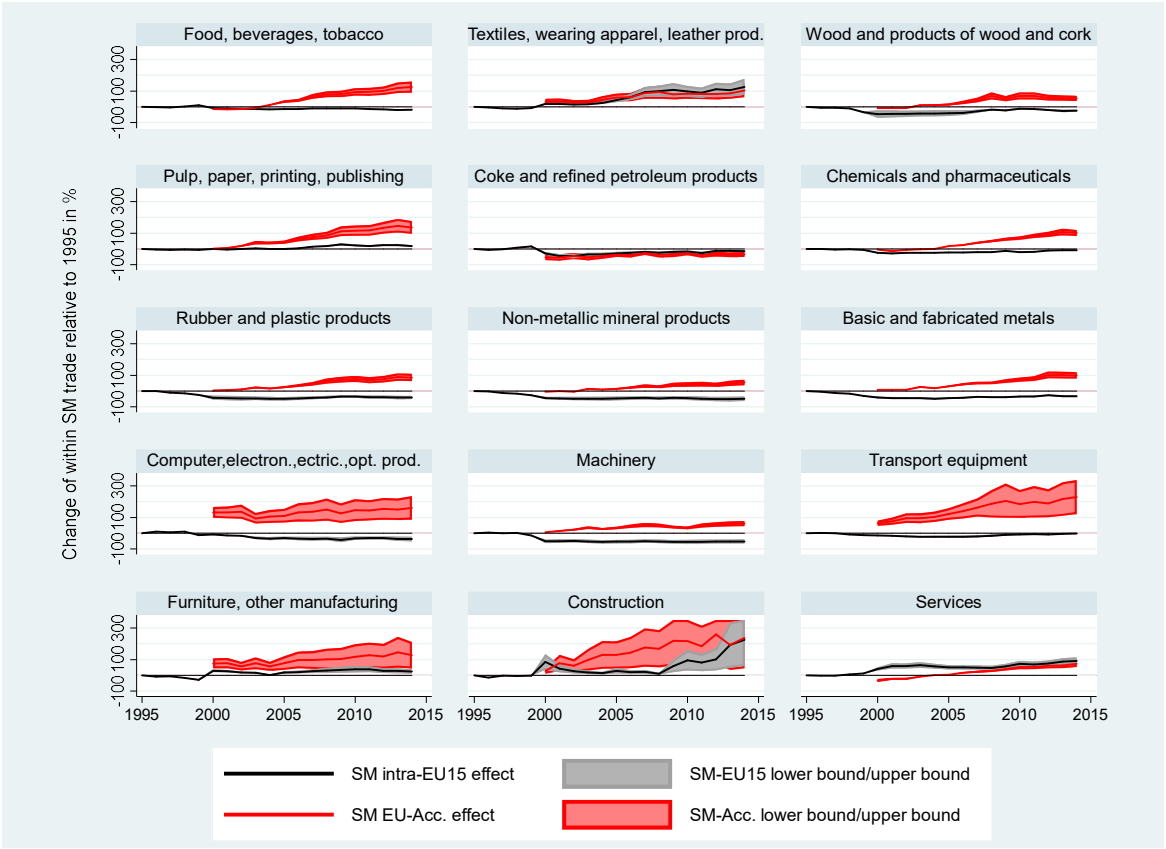
In this appendix, we provide an additional robustness check for the validity of Equation (3.3) summarised in Figure A3.1. In particular, we allow for 4-year pre-accession trade effects stemming from the accession of the new member states. For the countries joining the EU in 2004, these effects begin with the year 2000; similarly, for Bulgaria and Romania we already allow for trade effects in 2003, and for Croatia from 2009 onwards. The corresponding estimation results are reported in Figure A3.1. When interpreting the corresponding results, we only focus on the effects for the accession countries from 2000 to 2004. The accession of Bulgaria, Romania, and Croatia does not add a lot of new effects for the accession effects observable from 2004 onwards.

In line with the previous findings and discussions, we also observe heterogeneous pre-accession trade effects across different industries. A first group of industries exhibits positive pre-accession trade effects. Among this group are five manufacturing industries including "Textiles, wearing apparel and leather production", "Computer and electronical equipment", "Transport equipment", "Furniture and other manufacturing industries" and to some extent "Machinery". The "Construction" sector is also characterised by positive pre-accession effects, which are however somewhat more volatile over time.

More interestingly, for seven out of the 15 considered industries we do not observe any remarkable pre-accession trade effects for the 10 new member states that joined the Single Market in 2004. In many cases, the estimated trade effects are actually very close to zero from 2000 to 2003 and only in the aftermath of the accession turn out positive. These seven industries all belong to the manufacturing sector and include "Food, beverages and tobacco", "Wood and products of wood and cork", "Pulp, paper, printing and publishing", "Chemicals and pharmaceuticals", "Rubber and plastic products", "Non-metallic mineral products" and "Basic and fabricated metals". For all the industries, only the accession to the Single Market obviously brought the trade advantages that come with the possibility of border-less trade in an enlarged European Single Market.

Finally, for two industries we even observe dampening (i.e. below zero) trade effects for the new member states prior to their accession to the Single Market. For "Coke and refined petroleum products", this finding is in line with the overall adverse effects already identified in Figure 3.3. For the "Services", dampening effects are observable from 2000 onwards, but reach a turning point at the date of the accession and later on become positive and larger over time. This picture indicates a regulation-based discrimination of the new member states in the services industries prior to their EU membership which vanishes with their official accession to the Single Market. This result further documents that different regulation matters for bilateral trade and that the Single Market may have induced positive trade effects especially in some industries including the services sector. Furthermore, the estimation results once more strengthen our argument for using Equation (3.3), which separates the membership from the accession trade effects of the Single Market.

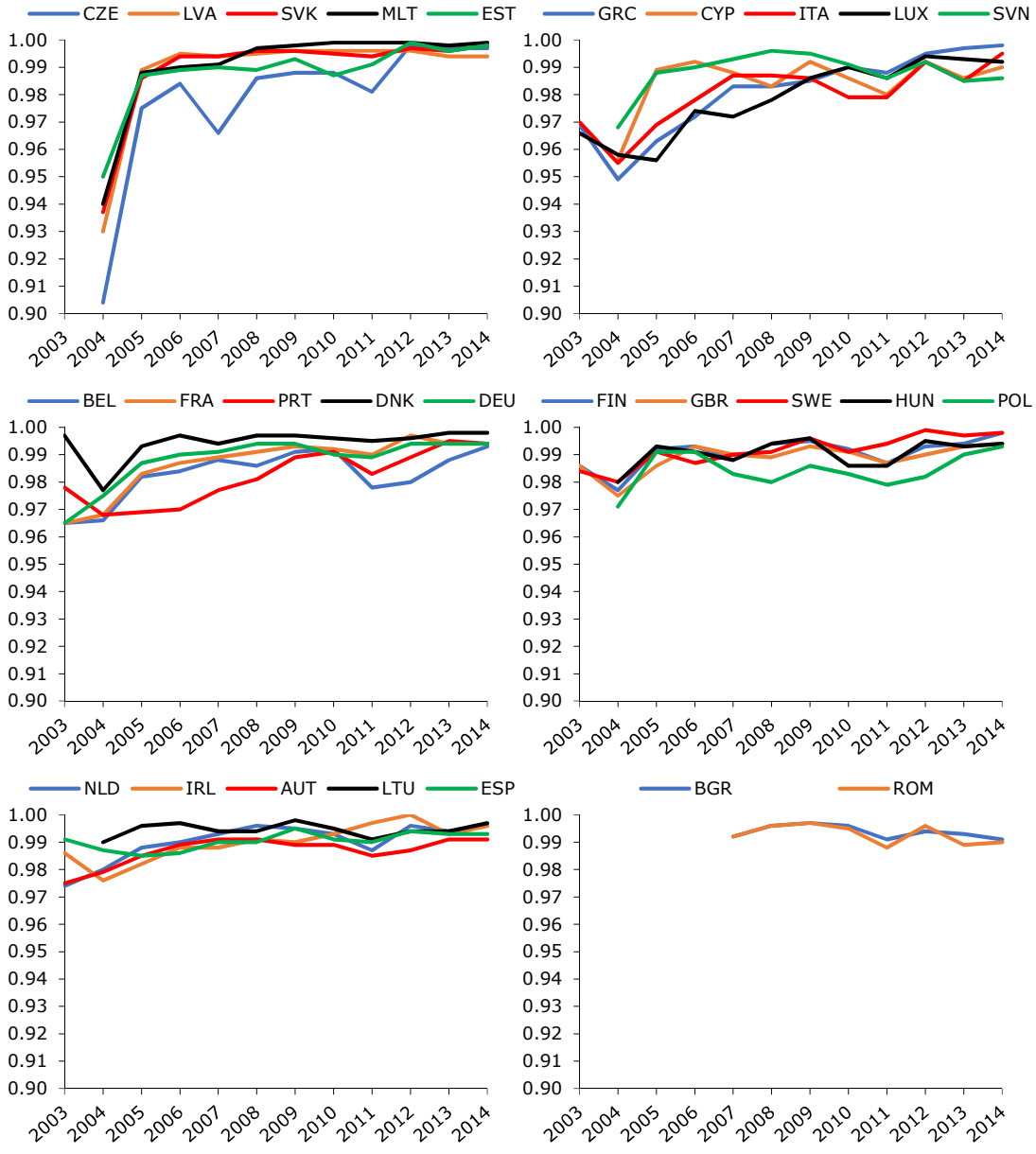
Figure A3.1: The impact of the Single Market: 4-year pre-accession effects for new member states



Source: WIFO calculations.

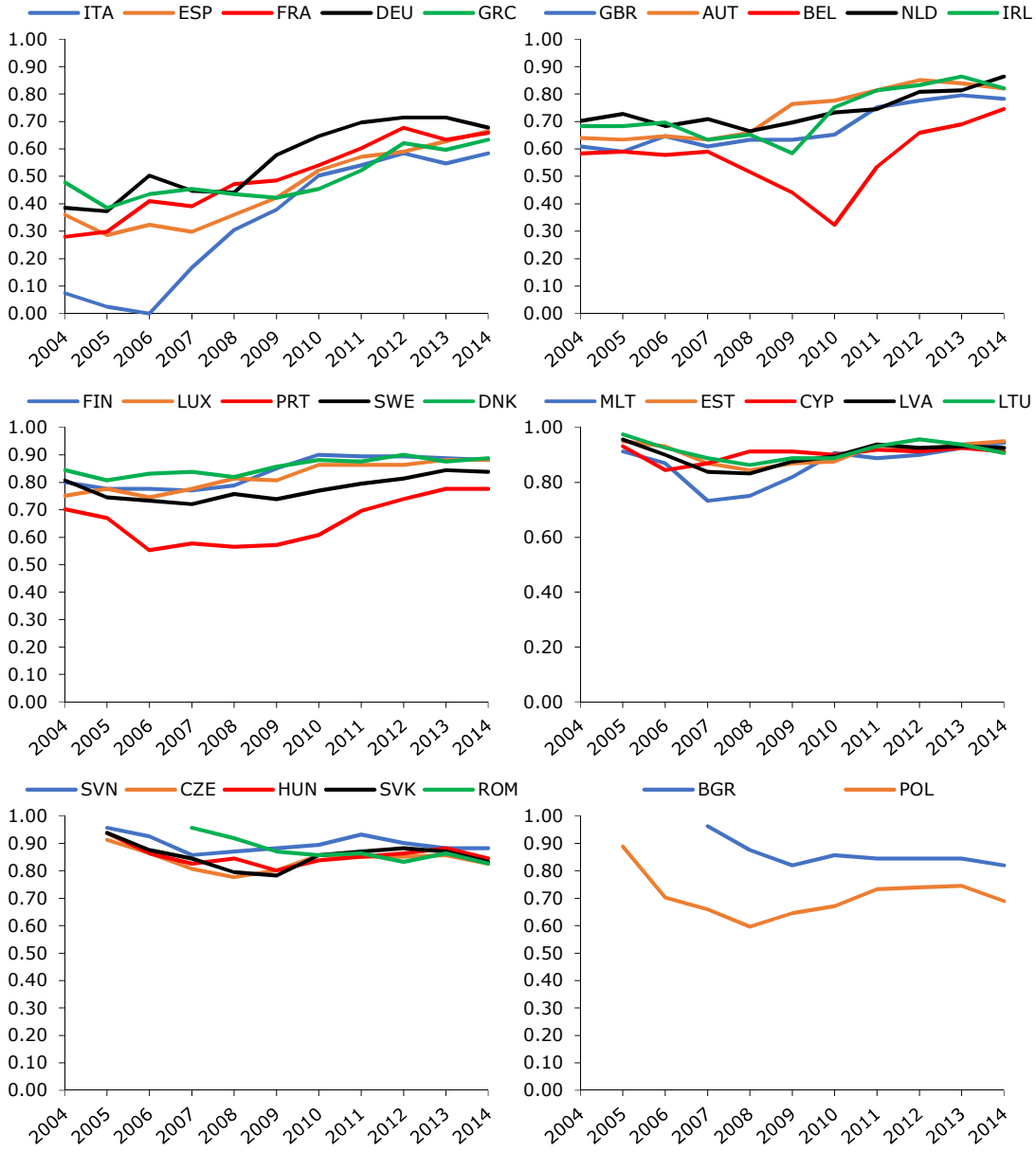
9. APPENDIX B

Figure B2.1: Development of transposition by member states, 2003-2014



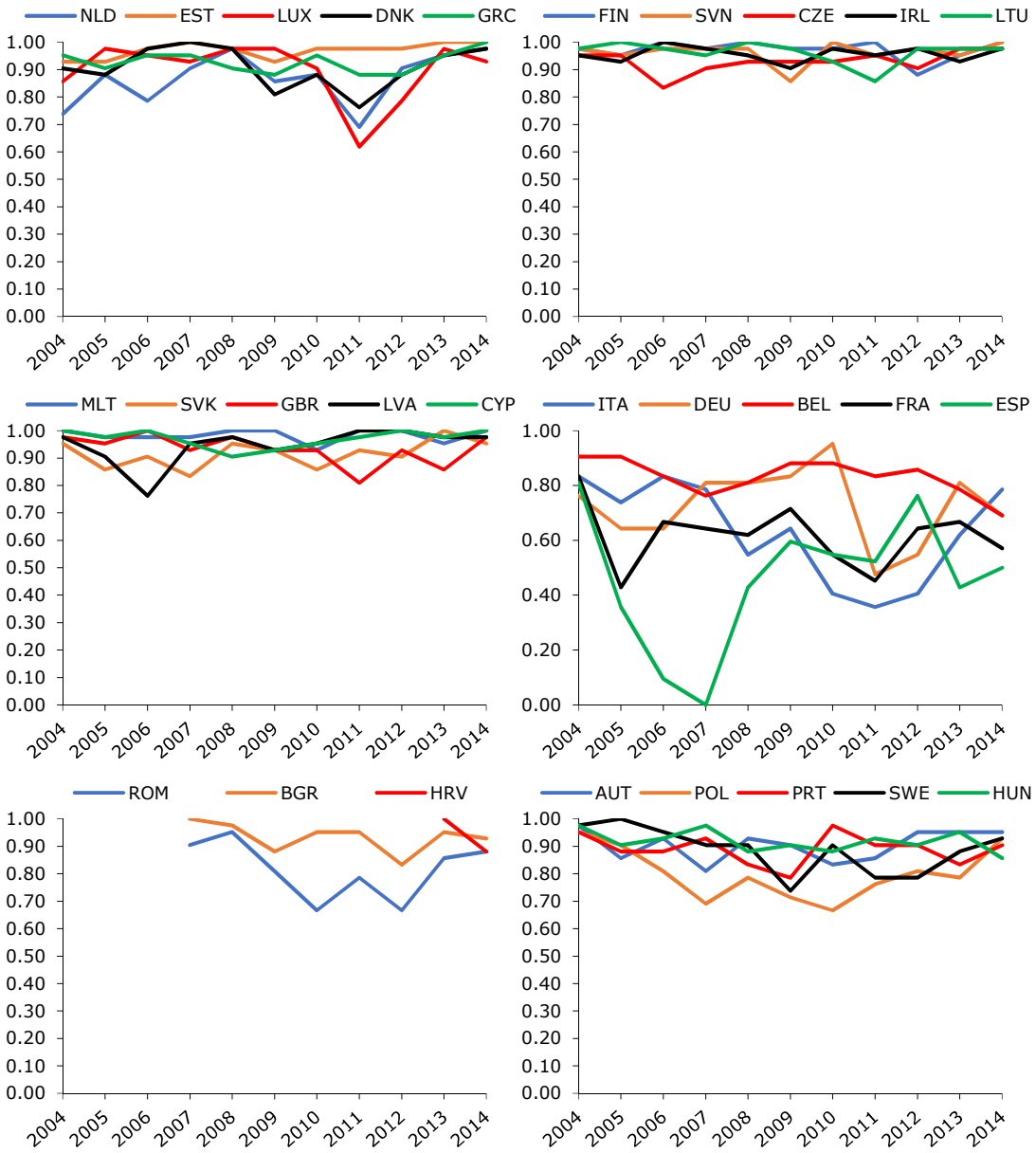
Source: Single Market Scoreboard, WIFO calculations.

Figure B2.2: Development of the infringement indicator by member states, 2004-2014



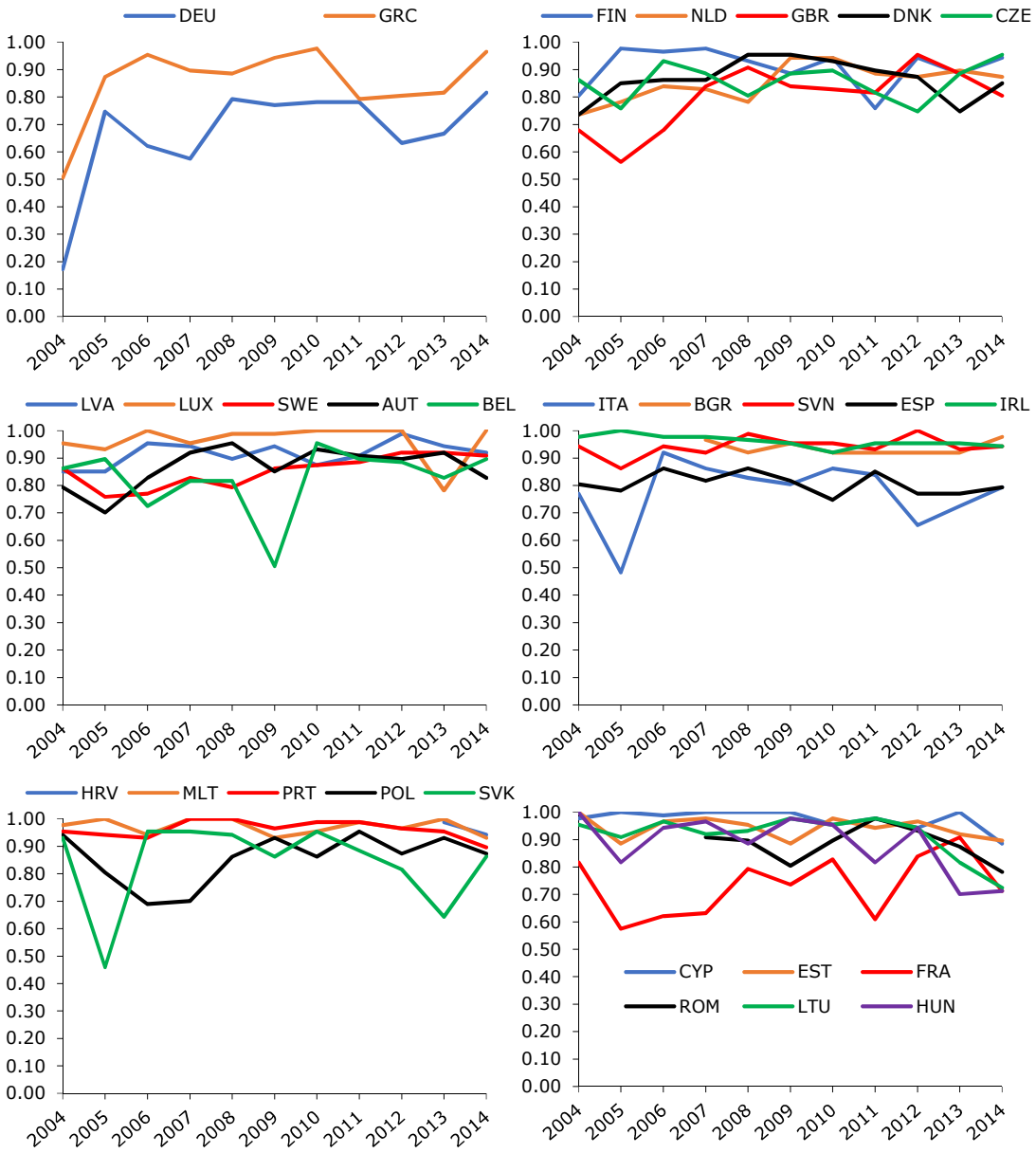
Source: Single Market Scoreboard, WIFO calculations.

Figure B2.3: Development of the SOLVIT misapplication indicator by member states, 2004-2014



Source: SOLVIT database, WIFO calculations.

Figure B2.4: Development of the TRIS indicator on comments and DOs by member states, 2004-2014



Source: TRIS database, WIFO calculations.

Table B3.1: General equilibrium intra-EU trade effects of the Single Market across member states and industries (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	15.18	25.05	-0.50	14.55	-10.22	8.80	1.44	-0.93	0.89	1.20	17.43	12.97	6.52
Belgium	15.15	25.60	-0.21	14.54	-10.40	8.60	1.48	-0.99	0.80	1.58	17.76	12.95	6.88
Germany	14.76	26.20	-1.69	14.91	-10.79	7.68	-2.19	-3.16	-1.65	-5.60	14.83	13.45	4.98
Denmark	15.18	25.16	-0.19	14.51	-10.24	8.70	1.35	-0.74	1.03	1.47	17.44	12.95	6.31
Spain	14.89	26.41	-0.74	14.64	-10.49	8.38	0.42	-2.18	0.13	0.89	16.82	13.10	7.22
Finland	15.19	25.67	-0.43	14.57	-10.29	8.70	1.19	-0.77	0.94	1.44	17.34	12.96	6.08
France	14.81	26.04	-0.83	14.74	-10.65	8.18	-0.33	-2.10	-0.02	-0.67	16.57	13.06	6.50
United Kingdom	14.94	26.03	-0.74	14.70	-10.50	8.18	-0.11	-1.73	0.21	0.28	16.74	13.10	7.72
Greece	15.17	25.66	-0.10	14.51	-10.30	8.75	1.28	-0.78	1.03	1.64	17.26	12.94	8.00
Ireland	15.18	25.21	-0.12	14.56	-10.20	8.46	1.39	-0.70	1.11	1.77	17.34	13.06	8.66
Italy	14.87	28.45	-1.54	14.70	-10.68	8.23	-0.87	-3.04	-0.83	-1.86	16.76	13.33	6.27
Luxembourg	15.26	25.32	0.10	14.50	-10.23	8.89	1.89	-0.56	1.26	1.91	17.46	12.79	7.39
Netherlands	15.08	25.51	-0.18	14.56	-10.41	8.50	1.42	-0.89	0.88	1.15	17.33	13.02	7.34
Portugal	15.18	25.95	-0.21	14.52	-10.27	8.74	1.23	-0.84	1.06	1.67	17.32	12.95	8.75
Sweden	15.17	25.56	-0.63	14.59	-10.29	8.62	1.18	-0.83	0.75	1.16	17.12	13.00	6.71
EU15	14.92	26.53	-0.97	14.70	-10.57	8.22	-0.41	-2.16	-0.30	-1.32	16.38	13.18	6.53
Bulgaria	75.13	35.36	40.82	51.78	-12.53	58.00	60.71	55.45	62.47	40.83	92.97	40.39	50.12
Cyprus	61.37	30.86	33.99	42.32	-14.29	45.67	51.88	48.27	52.84	37.81	83.71	35.39	45.01
Czech Rep.	61.81	30.91	34.35	42.55	-14.22	45.52	52.29	48.53	53.07	38.02	84.87	35.67	48.64
Estonia	61.41	31.03	34.13	42.37	-14.24	45.69	51.68	48.21	52.84	38.43	81.43	35.59	43.47
Croatia	98.32	42.48	42.95	67.20	-15.22	80.42	73.88	70.51	81.72	48.72	112.66	51.03	68.17
Hungary	61.75	30.76	34.00	42.46	-14.27	45.74	51.47	48.24	52.64	36.62	81.42	35.30	46.47
Lithuania	61.50	30.88	34.09	42.35	-14.27	45.96	51.85	48.25	52.70	38.10	81.18	35.73	41.46
Latvia	61.45	30.97	34.20	42.38	-14.28	45.83	51.65	48.24	52.90	38.35	81.27	35.48	42.30
Malta	60.89	30.91	33.65	42.02	-14.17	45.78	51.26	47.93	52.30	38.82	84.29	35.12	41.84
Poland	62.86	31.00	34.76	43.00	-14.39	46.06	53.03	49.02	53.30	38.33	84.19	36.45	46.34
Romania	75.71	35.29	41.12	51.88	-12.53	58.10	60.87	55.62	62.42	40.63	96.92	40.64	54.10
Slovakia	61.53	30.83	34.14	42.46	-14.24	45.78	51.71	48.30	52.91	37.82	83.18	35.48	48.36
Slovenia	61.39	30.90	33.86	42.41	-14.11	45.41	51.67	48.03	52.62	37.25	81.34	35.03	46.37
Access. countries	64.72	31.86	35.15	43.82	-14.07	47.4	53.33	49.53	54.18	38.22	84.95	36.54	47.54

Source: WIFO calculations.

Table B3.2: Single Market potential intra-EU trade effects of counterfactual policy scenarios across member states and industries - transposition indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	2.42	2.65	6.55	5.36	10.94	3.86	3.44	7.69	5.29	2.98	3.65	7.49	5.10
Belgium	3.33	3.66	7.34	6.22	11.95	4.83	4.32	8.56	6.22	3.81	4.51	8.30	6.01
Germany	1.60	1.73	5.89	4.68	10.24	3.07	2.72	7.07	4.57	2.34	3.03	6.94	4.19
Denmark	0.43	0.55	4.70	3.42	8.92	1.82	1.50	5.83	3.29	1.06	1.72	5.64	2.90
Spain	1.67	1.85	5.86	4.65	10.23	3.09	2.70	7.10	4.56	2.21	2.92	6.85	4.25
Finland	1.46	1.67	5.68	4.44	10.00	2.88	2.51	6.80	4.34	2.03	2.71	6.58	4.13
France	1.54	1.70	5.73	4.55	10.16	2.96	2.60	6.92	4.42	2.11	2.80	6.69	4.00
United Kingdom	1.85	2.04	6.02	4.89	10.43	3.30	2.91	7.21	4.73	2.41	3.11	7.03	4.31
Greece	2.29	2.76	6.45	5.16	10.98	3.77	3.37	7.61	5.26	2.60	3.53	7.35	5.17
Ireland	1.01	1.22	5.23	4.00	9.57	2.47	2.08	6.36	3.89	1.54	2.27	6.22	3.78
Italy	3.43	3.95	7.59	6.36	12.11	4.91	4.49	8.84	6.41	4.00	4.62	8.67	6.01
Luxembourg	2.93	3.44	6.99	5.79	11.30	4.45	4.00	8.16	5.89	3.23	4.15	7.95	5.64
Netherlands	1.29	1.44	5.47	4.28	9.85	2.72	2.33	6.63	4.15	1.89	2.54	6.46	4.02
Portugal	3.05	3.57	7.14	5.92	11.72	4.56	4.11	8.31	5.99	3.37	4.26	8.06	5.62
Sweden	0.83	1.03	5.15	3.84	9.39	2.25	1.91	6.21	3.74	1.40	2.13	6.03	3.45
EU15	1.98	2.47	6.19	4.90	10.63	3.45	3.05	7.43	4.96	2.55	3.21	7.16	4.55
Bulgaria	3.48	4.15	12.29	8.64	19.61	6.01	5.55	14.80	9.19	4.19	5.76	13.00	8.60
Cyprus	4.91	5.73	12.92	9.68	19.32	7.34	6.84	15.04	10.27	5.32	7.04	13.68	10.14
Czech Rep.	3.51	4.06	11.55	8.46	18.41	5.85	5.51	13.50	8.79	4.08	5.72	12.55	7.78
Estonia	1.93	2.27	10.00	6.97	16.69	4.24	3.89	11.89	7.12	2.73	4.00	11.08	7.09
Croatia	.	.	.	.	.	.	.	.	.	.	.	.	.
Hungary	3.26	3.77	11.25	8.18	18.14	5.59	5.18	13.31	8.48	3.79	5.34	12.20	7.27
Lithuania	1.87	2.21	9.96	6.88	16.64	4.18	3.82	11.91	7.05	2.67	4.02	11.04	7.14
Latvia	2.12	2.49	10.25	7.15	16.44	4.46	4.08	12.12	7.34	2.90	4.28	11.24	7.40
Malta	0.81	0.98	8.84	5.92	15.47	3.12	2.79	10.73	5.94	1.76	3.05	9.99	5.93
Poland	5.36	6.17	13.56	10.13	20.45	7.71	7.33	15.67	10.70	5.67	7.44	14.39	10.02
Romania	4.27	5.05	13.15	9.34	20.44	6.79	6.31	15.65	10.00	4.84	6.63	13.74	8.91
Slovakia	1.59	1.87	9.68	6.68	16.36	3.90	3.57	11.58	6.79	2.42	3.81	10.77	6.01
Slovenia	4.97	5.84	12.99	9.74	19.73	7.38	6.88	15.09	10.32	5.35	7.06	13.72	9.44
Access. countries	4.16	4.65	12.11	9.06	19.16	6.43	6.04	14.48	9.41	4.51	6.08	13.15	8.58

Source: WIFO calculations.

Table B3.3: Single Market potential intra-EU trade effects of counterfactual policy scenarios across member states and industries - infringements indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	1.95	2.30	6.27	5.12	11.28	3.72	3.11	7.35	5.10	2.39	3.28	7.29	4.81
Belgium	5.37	5.94	9.23	8.41	14.86	7.28	6.41	10.50	8.51	5.70	6.59	10.37	8.20
Germany	4.62	4.98	8.69	7.84	14.14	6.56	5.82	9.90	7.88	5.25	6.18	9.97	7.33
Denmark	0.05	0.27	4.51	3.27	9.31	1.76	1.25	5.60	3.18	0.61	1.45	5.53	2.68
Spain	6.53	7.11	10.28	9.58	15.96	8.42	7.52	11.69	9.65	6.74	7.71	11.55	9.13
Finland	0.29	0.54	4.77	3.52	9.59	2.02	1.49	5.82	3.43	0.82	1.68	5.74	3.17
France	5.68	6.09	9.46	8.80	15.17	7.55	6.74	10.73	8.74	6.03	6.90	10.69	8.16
United Kingdom	3.01	3.36	7.18	6.25	12.40	4.85	4.15	8.36	6.14	3.43	4.33	8.32	5.59
Greece	5.72	6.22	9.44	8.80	15.14	7.61	6.74	10.68	8.79	6.09	6.91	10.71	8.65
Ireland	2.16	2.56	6.41	5.32	11.50	4.00	3.32	7.55	5.30	2.58	3.49	7.50	5.07
Italy	7.94	8.95	11.70	11.00	17.55	9.90	9.01	13.03	11.17	8.33	9.05	13.12	10.57
Luxembourg	0.68	0.95	5.06	3.86	9.59	2.40	1.86	6.18	3.80	1.18	2.06	6.07	3.58
Netherlands	2.24	2.60	6.47	5.39	11.62	4.03	3.36	7.63	5.37	2.68	3.55	7.56	5.12
Portugal	3.45	3.93	7.54	6.56	12.82	5.27	4.56	8.72	6.58	3.85	4.74	8.63	6.14
Sweden	1.41	1.72	5.80	4.62	10.73	3.18	2.58	6.85	4.56	1.93	2.79	6.79	4.17
EU15	4.93	5.75	8.61	7.67	14.33	6.72	6.01	10.24	8.14	5.18	6.07	9.93	7.45
Bulgaria	2.83	3.77	11.98	8.12	19.78	5.64	5.10	14.56	8.90	3.42	5.25	12.64	8.20
Cyprus	0.80	1.31	9.52	6.15	16.27	3.47	2.99	11.65	6.49	1.54	3.18	10.51	6.41
Czech Rep.	2.65	3.46	11.44	7.87	18.81	5.33	4.88	13.62	8.46	3.17	5.07	12.29	7.28
Estonia	0.79	1.32	9.55	6.14	16.81	3.44	2.98	11.63	6.48	1.56	3.03	10.57	6.36
Croatia	.	.	.	.	.	.	.	.	.	.	.	.	.
Hungary	2.31	3.03	10.97	7.55	18.52	5.00	4.47	13.19	8.03	2.77	4.58	11.86	6.65
Lithuania	0.43	0.90	9.19	5.80	16.50	3.10	2.63	11.28	6.09	1.24	2.81	10.29	6.12
Latvia	0.82	1.35	9.60	6.17	16.40	3.50	3.01	11.66	6.51	1.58	3.17	10.58	6.55
Malta	1.75	2.44	10.37	6.98	17.82	4.49	3.92	12.55	7.46	2.44	4.17	11.33	7.22
Poland	6.55	7.89	15.31	11.46	23.16	9.31	8.76	17.65	12.49	6.47	8.73	16.03	11.54
Romania	2.55	3.41	11.79	7.85	19.45	5.31	4.80	14.30	8.57	3.13	5.07	12.43	7.41
Slovakia	2.16	2.90	10.89	7.42	18.34	4.88	4.35	13.05	7.93	2.74	4.55	11.79	6.93
Slovenia	1.02	1.59	9.72	6.36	16.90	3.68	3.21	11.87	6.71	1.73	3.38	10.67	5.88
Access. countries	3.84	4.34	12.34	9.07	20.22	6.48	6.03	15.00	9.58	4.06	5.94	13.39	8.61

Source: WIFO calculations.

Table B3.4: Single Market potential intra-EU trade effects of counterfactual policy scenarios across member states and industries - SOLVIT misapplication indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	0.29	0.39	4.47	3.29	8.59	1.66	1.39	5.38	3.06	0.90	1.51	5.40	2.96
Belgium	0.14	0.13	4.20	3.20	8.51	1.52	1.24	5.12	2.88	0.80	1.35	5.26	2.79
Germany	1.55	1.60	5.62	4.67	10.05	3.04	2.70	6.54	4.41	2.28	2.91	6.78	4.06
Denmark	0.38	0.48	4.51	3.37	8.69	1.76	1.48	5.44	3.15	0.98	1.59	5.47	2.78
Spain	3.86	4.17	7.55	6.83	12.34	5.36	4.88	8.64	6.65	4.20	4.96	8.81	6.29
Finland	-0.42	-0.40	3.80	2.62	7.87	0.93	0.69	4.70	2.33	0.25	0.82	4.72	2.23
France	2.31	2.41	6.15	5.36	10.78	3.76	3.39	7.11	5.05	2.86	3.47	7.30	4.66
United Kingdom	-0.21	-0.21	3.99	2.89	8.13	1.16	0.90	4.94	2.55	0.48	1.03	5.00	2.22
Greece	0.23	0.33	4.37	3.22	8.56	1.60	1.33	5.32	3.00	0.83	1.45	5.32	3.03
Ireland	-0.21	-0.16	3.96	2.82	8.08	1.17	0.90	4.89	2.55	0.42	1.02	4.95	2.51
Italy	2.56	2.88	6.56	5.59	11.05	4.02	3.66	7.57	5.40	3.20	3.70	7.73	5.06
Luxembourg	0.23	0.28	4.34	3.24	8.23	1.60	1.33	5.26	2.98	0.85	1.45	5.31	2.86
Netherlands	1.07	1.23	5.14	4.06	9.48	2.51	2.16	6.05	3.86	1.56	2.26	6.14	3.73
Portugal	0.32	0.40	4.43	3.33	8.64	1.69	1.42	5.35	3.07	0.93	1.52	5.40	2.81
Sweden	0.27	0.34	4.44	3.31	8.59	1.65	1.37	5.33	3.04	0.93	1.50	5.38	2.83
EU15	1.63	1.82	5.49	4.44	9.98	2.98	2.69	6.66	4.45	2.18	2.75	6.63	4.04
Bulgaria	0.50	0.57	8.92	5.79	15.86	2.82	2.60	11.05	5.80	1.57	2.76	9.98	5.42
Cyprus	-0.03	0.03	7.81	5.08	13.76	2.20	1.96	9.50	4.93	0.97	2.08	9.02	5.05
Czech Rep.	0.56	0.69	8.47	5.65	14.86	2.78	2.57	10.13	5.56	1.49	2.70	9.65	4.74
Estonia	0.00	0.05	7.88	5.11	14.25	2.22	1.98	9.51	4.95	1.00	2.04	9.10	5.03
Croatia	0.05	-0.46	8.36	5.08	12.31	1.88	1.94	10.35	4.75	1.25	2.04	9.03	3.78
Hungary	0.41	0.52	8.22	5.51	14.76	2.65	2.39	9.93	5.37	1.32	2.49	9.43	4.36
Lithuania	-0.04	0.01	7.83	5.06	14.26	2.18	1.94	9.49	4.90	0.96	2.06	9.08	5.10
Latvia	0.32	0.42	8.19	5.42	14.17	2.56	2.30	9.80	5.28	1.27	2.41	9.39	5.45
Malta	-0.30	-0.28	7.53	4.79	13.90	1.92	1.67	9.21	4.61	0.75	1.85	8.73	4.68
Poland	2.43	2.81	10.36	7.42	17.03	4.71	4.46	12.09	7.50	3.10	4.47	11.53	6.99
Romania	2.05	2.35	10.47	7.21	17.52	4.40	4.14	12.65	7.41	2.91	4.33	11.42	6.50
Slovakia	0.66	0.81	8.50	5.74	15.01	2.91	2.65	10.17	5.65	1.57	2.78	9.70	4.96
Slovenia	0.08	0.16	7.92	5.19	14.22	2.30	2.07	9.60	5.04	1.06	2.18	9.10	4.44
Access. countries	1.42	1.47	9.22	6.42	15.90	3.56	3.32	11.12	6.33	2.12	3.35	10.44	5.73

Source: WIFO calculations.

Table B3.5: Single Market potential intra-EU trade effects of counterfactual policy scenarios across member states and industries - SOLVIT solution indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	0.30	0.32	4.50	3.16	8.29	1.49	1.35	5.46	2.98	0.94	1.47	5.29	2.91
Belgium	-0.09	-0.08	4.10	2.74	7.95	1.09	0.96	5.12	2.59	0.52	1.07	4.90	2.49
Germany	0.22	0.17	4.47	3.22	8.36	1.45	1.34	5.47	2.98	0.98	1.52	5.43	2.69
Denmark	0.54	0.79	4.79	3.28	8.58	1.76	1.62	5.82	3.30	1.01	1.74	5.48	2.89
Spain	0.21	0.19	4.38	3.09	8.25	1.39	1.26	5.43	2.89	0.83	1.38	5.25	2.67
Finland	0.50	1.07	5.00	3.22	8.68	1.80	1.66	6.01	3.43	0.78	1.77	5.44	3.16
France	0.07	0.04	4.27	3.00	8.17	1.26	1.15	5.29	2.76	0.71	1.27	5.12	2.44
United Kingdom	1.32	1.62	5.56	4.13	9.42	2.57	2.40	6.64	4.09	1.72	2.51	6.28	3.68
Greece	0.48	0.84	4.77	3.16	8.60	1.71	1.58	5.80	3.29	0.79	1.69	5.38	3.25
Ireland	0.84	1.00	4.94	3.63	8.90	2.10	1.89	5.96	3.54	1.31	2.00	5.78	3.44
Italy	0.51	0.65	4.80	3.37	8.63	1.71	1.61	5.86	3.28	1.14	1.68	5.68	3.00
Luxembourg	0.71	0.84	4.83	3.50	8.53	1.92	1.77	5.82	3.42	1.19	1.87	5.61	3.27
Netherlands	0.03	-0.08	4.14	2.95	8.04	1.21	1.07	5.14	2.66	0.78	1.21	5.07	2.64
Portugal	0.15	0.13	4.30	3.02	8.14	1.33	1.20	5.30	2.81	0.81	1.32	5.14	2.58
Sweden	0.19	0.31	4.46	3.02	8.21	1.38	1.26	5.42	2.91	0.73	1.38	5.16	2.68
EU15	0.40	0.49	4.64	3.31	8.43	1.59	1.49	5.64	3.10	0.99	1.62	5.49	2.86
Bulgaria	-0.23	-0.40	7.84	4.92	14.44	1.88	1.75	9.87	4.77	0.96	1.90	8.99	4.47
Cyprus	-0.36	-0.53	7.15	4.55	12.72	1.61	1.50	8.81	4.30	0.76	1.65	8.38	4.48
Czech Rep.	-1.16	-1.43	6.47	3.84	12.36	0.81	0.73	8.08	3.49	0.06	0.90	7.74	2.85
Estonia	-0.79	-1.01	6.76	4.16	12.73	1.19	1.08	8.36	3.85	0.37	1.20	8.04	4.01
Croatia	-0.15	-0.21	8.44	4.83	12.52	1.96	1.77	10.57	4.86	1.07	2.04	8.80	3.71
Hungary	-0.50	-0.69	7.05	4.43	13.05	1.46	1.36	8.72	4.15	0.64	1.51	8.26	3.27
Lithuania	-1.13	-1.40	6.45	3.84	12.41	0.83	0.75	8.06	3.50	0.09	0.91	7.75	3.78
Latvia	-0.68	-0.90	6.88	4.25	12.38	1.29	1.18	8.49	3.96	0.48	1.33	8.11	4.22
Malta	0.18	0.09	7.67	5.02	13.71	2.17	2.03	9.36	4.85	1.26	2.20	8.85	4.92
Poland	-0.59	-0.79	7.15	4.41	13.08	1.39	1.31	8.80	4.11	0.58	1.46	8.42	3.82
Romania	-0.62	-0.83	7.54	4.57	14.05	1.49	1.38	9.53	4.38	0.62	1.56	8.68	3.66
Slovakia	-0.45	-0.64	7.11	4.47	13.09	1.52	1.40	8.76	4.20	0.68	1.57	8.32	3.64
Slovenia	-1.57	-1.91	5.98	3.44	11.80	0.38	0.31	7.58	3.05	-0.31	0.48	7.27	2.59
Access. countries	-0.67	-0.91	6.99	4.32	13.10	1.29	1.17	8.75	3.98	0.50	1.32	8.26	3.56

Source: WIFO calculations.

Table B3.6: Single Market potential intra-EU trade effects of counterfactual policy scenarios across member states and industries - TRIS indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	-0.84	-1.32	2.82	2.00	6.41	0.09	0.13	3.66	1.43	0.07	0.23	3.95	1.53
Belgium	-1.47	-2.09	2.18	1.46	5.76	-0.57	-0.49	3.00	0.76	-0.42	-0.34	3.40	0.86
Germany	-3.62	-4.32	0.16	-0.56	3.81	-2.75	-2.74	0.93	-1.43	-2.80	-2.81	1.45	-1.46
Denmark	-1.99	-2.63	1.67	0.96	5.27	-1.07	-0.99	2.46	0.25	-0.98	-0.88	2.91	0.22
Spain	-2.44	-3.10	1.36	0.66	4.91	-1.46	-1.37	2.16	-0.13	-1.19	-1.25	2.65	-0.11
Finland	-0.44	-0.84	3.22	2.38	6.84	0.52	0.54	4.04	1.86	0.41	0.64	4.33	1.88
France	-1.64	-2.17	2.14	1.35	5.71	-0.66	-0.62	2.98	0.69	-0.55	-0.50	3.35	0.59
United Kingdom	-1.41	-1.92	2.34	1.50	5.90	-0.46	-0.42	3.17	0.90	-0.39	-0.30	3.49	0.77
Greece	-1.14	-1.64	2.52	1.75	6.15	-0.18	-0.14	3.32	1.15	-0.21	-0.05	3.70	1.31
Ireland	0.10	-0.21	3.76	2.88	7.39	1.08	1.09	4.62	2.43	0.90	1.18	4.84	2.50
Italy	-3.12	-4.12	0.65	-0.01	4.23	-2.17	-2.16	1.45	-0.91	-2.02	-1.93	1.92	-0.88
Luxembourg	-1.07	-1.54	2.59	1.78	5.93	-0.13	-0.07	3.41	1.21	-0.16	0.01	3.75	1.25
Netherlands	-0.69	-1.14	2.98	2.19	6.60	0.26	0.31	3.82	1.61	0.25	0.42	4.13	1.73
Portugal	-0.01	-0.33	3.66	2.77	7.28	0.96	0.98	4.51	2.32	0.80	1.06	4.72	2.17
Sweden	-0.56	-1.02	3.09	2.26	6.68	0.38	0.41	3.94	1.71	0.36	0.50	4.21	1.70
EU15	-2.12	-2.79	1.68	0.96	5.19	-1.19	-1.25	2.39	-0.01	-1.22	-1.16	2.88	0.10
Bulgaria	0.25	-0.10	8.13	5.41	14.63	2.22	2.25	10.05	5.11	1.51	2.34	9.45	4.85
Cyprus	0.75	0.51	8.05	5.59	13.52	2.60	2.61	9.66	5.29	1.85	2.70	9.36	5.47
Czech Rep.	-0.10	-0.45	7.27	4.81	13.10	1.72	1.78	8.84	4.42	1.10	1.88	8.64	3.79
Estonia	0.18	-0.14	7.51	5.06	13.37	2.01	2.04	9.06	4.69	1.36	2.09	8.88	4.85
Croatia	1.80	1.05	9.38	6.62	12.98	3.37	3.69	11.04	6.10	3.21	3.70	10.28	5.29
Hungary	-1.38	-1.88	5.91	3.63	11.81	0.43	0.51	7.46	3.06	-0.03	0.62	7.43	2.31
Lithuania	-0.53	-0.95	6.77	4.40	12.67	1.28	1.34	8.31	3.94	0.71	1.43	8.25	4.24
Latvia	0.41	0.13	7.75	5.27	13.18	2.26	2.27	9.31	4.93	1.56	2.35	9.07	5.19
Malta	0.72	0.49	8.01	5.53	13.92	2.58	2.57	9.62	5.25	1.86	2.70	9.30	5.35
Poland	0.03	-0.30	7.53	4.98	13.38	1.87	1.93	9.12	4.58	1.23	2.01	8.93	4.33
Romania	-0.20	-0.61	7.73	5.00	14.16	1.77	1.81	9.61	4.64	1.10	1.94	9.08	3.98
Slovakia	-2.28	-2.90	5.06	2.77	10.84	-0.50	-0.39	6.57	2.13	-0.84	-0.27	6.61	1.72
Slovenia	0.18	-0.14	7.48	5.06	13.26	2.00	2.04	9.07	4.68	1.35	2.13	8.82	4.21
Access. countries	-0.20	-0.62	7.23	4.75	13.09	1.56	1.60	8.86	4.25	0.90	1.58	8.64	3.85

Source: WIFO calculations.

Table B3.7: Single Market potential trade division effects of counterfactual policy scenarios across member states and industries - transposition indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	-0.43	-0.33	-1.18	-0.83	-1.13	-0.52	-0.63	-1.20	-0.72	-0.60	-0.70	-1.24	-0.81
Belgium	-0.64	-0.46	-1.44	-1.05	-1.20	-0.67	-0.86	-1.38	-0.89	-0.88	-0.94	-1.46	-0.96
Germany	-0.22	-0.20	-0.89	-0.53	-0.85	-0.29	-0.34	-0.88	-0.44	-0.22	-0.30	-0.86	-0.46
Denmark	-0.06	-0.07	-0.84	-0.51	-0.89	-0.23	-0.25	-0.87	-0.43	-0.19	-0.31	-0.92	-0.45
Spain	-0.31	-0.25	-1.06	-0.71	-1.00	-0.43	-0.51	-0.99	-0.61	-0.51	-0.57	-1.08	-0.64
Finland	-0.31	-0.23	-1.05	-0.71	-1.03	-0.43	-0.50	-1.09	-0.63	-0.47	-0.57	-1.15	-0.68
France	-0.31	-0.28	-1.07	-0.69	-0.95	-0.43	-0.48	-1.04	-0.63	-0.49	-0.56	-1.11	-0.64
United Kingdom	-0.31	-0.26	-1.07	-0.65	-0.99	-0.40	-0.49	-1.05	-0.62	-0.49	-0.56	-1.08	-0.63
Greece	-1.09	-0.77	-1.77	-1.51	-1.50	-1.13	-1.22	-1.75	-1.26	-1.47	-1.33	-1.83	-1.34
Ireland	-0.41	-0.33	-1.17	-0.82	-1.10	-0.50	-0.59	-1.20	-0.73	-0.63	-0.67	-1.19	-0.77
Italy	-0.70	-0.34	-1.34	-1.06	-1.18	-0.74	-0.84	-1.26	-0.85	-0.85	-0.98	-1.26	-0.90
Luxembourg	-1.27	-0.92	-1.97	-1.66	-1.65	-1.26	-1.39	-1.95	-1.42	-1.65	-1.51	-1.98	-1.50
Netherlands	-0.21	-0.19	-1.01	-0.63	-0.94	-0.33	-0.42	-1.01	-0.56	-0.36	-0.48	-1.03	-0.60
Portugal	-1.15	-0.80	-1.85	-1.55	-1.57	-1.17	-1.30	-1.82	-1.33	-1.53	-1.41	-1.89	-1.37
Sweden	-0.32	-0.26	-1.01	-0.72	-1.03	-0.45	-0.50	-1.10	-0.63	-0.50	-0.55	-1.13	-0.69
EU15	-0.39	-0.32	-1.11	-0.74	-1.03	-0.48	-0.54	-1.09	-0.65	-0.49	-0.55	-1.11	-0.68
Bulgaria	-1.21	-0.68	-4.43	-4.12	-4.69	-1.93	-2.08	-4.47	-2.70	-2.41	-2.33	-5.96	-2.88
Cyprus	-1.76	-1.08	-4.98	-4.57	-5.20	-2.41	-2.61	-5.15	-3.19	-3.08	-2.83	-6.39	-3.64
Czech Rep.	-1.60	-1.12	-4.84	-4.31	-4.94	-2.32	-2.39	-5.13	-3.09	-2.83	-2.61	-6.09	-3.20
Estonia	-0.87	-0.58	-4.20	-3.60	-4.46	-1.65	-1.73	-4.56	-2.50	-1.91	-2.03	-5.43	-2.87
Croatia	.	.	.	.	.	.	.	.	.	.	.	.	.
Hungary	-1.20	-0.77	-4.52	-3.97	-4.64	-1.95	-2.08	-4.74	-2.78	-2.44	-2.33	-5.83	-2.72
Lithuania	-0.67	-0.39	-4.00	-3.44	-4.29	-1.46	-1.54	-4.31	-2.33	-1.69	-1.76	-5.24	-2.69
Latvia	-0.88	-0.57	-4.16	-3.61	-4.49	-1.64	-1.74	-4.53	-2.49	-1.93	-1.96	-5.46	-2.99
Malta	-0.53	-0.39	-3.96	-3.26	-4.26	-1.32	-1.40	-4.32	-2.24	-1.45	-1.56	-5.15	-2.43
Poland	-1.78	-1.11	-4.82	-4.59	-4.95	-2.50	-2.58	-4.99	-3.21	-3.18	-2.88	-6.18	-3.49
Romania	-1.44	-0.81	-4.56	-4.38	-4.85	-2.15	-2.32	-4.60	-2.90	-2.75	-2.47	-6.16	-2.98
Slovakia	-0.73	-0.50	-4.07	-3.44	-4.34	-1.51	-1.59	-4.42	-2.37	-1.75	-1.77	-5.30	-2.44
Slovenia	-1.74	-1.03	-4.95	-4.55	-5.16	-2.41	-2.60	-5.13	-3.17	-3.07	-2.84	-6.38	-3.35
Access. countries	-1.49	-0.89	-4.61	-4.30	-4.80	-2.20	-2.32	-4.85	-2.98	-2.74	-2.52	-6.00	-3.13

Source: WIFO calculations.

Table B3.8: Single Market potential trade division effects of counterfactual policy scenarios across member states and industries - infringements indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	-0.41	-0.41	-1.27	-0.85	-1.24	-0.58	-0.65	-1.32	-0.79	-0.57	-0.74	-1.31	-0.87
Belgium	-0.94	-0.76	-1.95	-1.34	-1.51	-0.96	-1.22	-1.83	-1.22	-1.16	-1.31	-1.85	-1.30
Germany	-0.74	-0.74	-1.63	-1.02	-1.32	-0.73	-0.88	-1.56	-0.93	-0.67	-0.78	-1.42	-0.98
Denmark	0.08	-0.04	-0.81	-0.41	-0.92	-0.16	-0.16	-0.86	-0.39	0.01	-0.22	-0.87	-0.37
Spain	-1.16	-0.98	-2.19	-1.52	-1.73	-1.19	-1.48	-1.93	-1.42	-1.50	-1.55	-1.97	-1.52
Finland	-0.03	-0.11	-0.87	-0.48	-0.97	-0.25	-0.26	-0.96	-0.47	-0.12	-0.33	-0.97	-0.49
France	-0.90	-0.86	-1.97	-1.24	-1.48	-0.95	-1.17	-1.84	-1.24	-1.12	-1.27	-1.80	-1.29
United Kingdom	-0.48	-0.48	-1.40	-0.80	-1.23	-0.58	-0.70	-1.36	-0.84	-0.65	-0.79	-1.32	-0.85
Greece	-1.02	-0.88	-2.12	-1.38	-1.65	-1.04	-1.31	-2.01	-1.33	-1.22	-1.40	-1.91	-1.41
Ireland	-0.46	-0.43	-1.37	-0.89	-1.27	-0.56	-0.69	-1.37	-0.84	-0.64	-0.78	-1.33	-0.88
Italy	-1.48	-0.86	-2.37	-1.76	-1.82	-1.43	-1.67	-2.17	-1.57	-1.62	-1.90	-2.01	-1.66
Luxembourg	-0.09	-0.15	-0.99	-0.58	-1.04	-0.31	-0.32	-1.02	-0.53	-0.20	-0.39	-1.05	-0.55
Netherlands	-0.38	-0.38	-1.30	-0.82	-1.17	-0.52	-0.64	-1.29	-0.77	-0.53	-0.72	-1.27	-0.81
Portugal	-0.66	-0.54	-1.61	-1.08	-1.40	-0.77	-0.91	-1.57	-1.01	-0.84	-1.00	-1.57	-1.03
Sweden	-0.18	-0.23	-1.03	-0.61	-1.08	-0.37	-0.43	-1.12	-0.59	-0.28	-0.48	-1.11	-0.63
EU15	-0.85	-0.74	-1.73	-1.11	-1.44	-0.87	-1.06	-1.71	-1.12	-0.92	-1.05	-1.59	-1.15
Bulgaria	-1.35	-0.79	-4.68	-4.45	-5.02	-2.16	-2.23	-4.73	-2.90	-2.65	-2.51	-6.33	-3.11
Cyprus	-0.61	-0.41	-4.12	-3.60	-4.74	-1.52	-1.53	-4.41	-2.39	-1.70	-1.77	-5.57	-2.77
Czech Rep.	-1.28	-0.82	-4.63	-4.30	-5.05	-2.18	-2.14	-4.87	-2.91	-2.53	-2.37	-6.15	-3.02
Estonia	-0.61	-0.38	-4.08	-3.60	-4.59	-1.54	-1.53	-4.41	-2.39	-1.66	-1.89	-5.50	-2.74
Croatia	.	.	.	.	.	.	.	.	.	.	.	.	.
Hungary	-1.15	-0.76	-4.62	-4.16	-4.89	-2.03	-2.08	-4.82	-2.86	-2.46	-2.37	-6.11	-2.80
Lithuania	-0.47	-0.30	-3.97	-3.46	-4.43	-1.39	-1.39	-4.29	-2.28	-1.49	-1.63	-5.34	-2.64
Latvia	-0.63	-0.40	-4.09	-3.62	-4.61	-1.54	-1.55	-4.43	-2.41	-1.69	-1.80	-5.54	-2.90
Malta	-1.06	-0.68	-4.58	-4.10	-4.92	-1.90	-1.98	-4.82	-2.79	-2.17	-2.15	-6.03	-3.01
Poland	-2.62	-1.72	-5.77	-5.70	-5.83	-3.40	-3.44	-5.87	-4.04	-4.32	-3.85	-7.29	-4.39
Romania	-1.19	-0.70	-4.47	-4.30	-4.92	-2.04	-2.09	-4.57	-2.80	-2.49	-2.25	-6.14	-2.85
Slovakia	-1.11	-0.71	-4.54	-4.12	-4.89	-1.97	-2.02	-4.79	-2.79	-2.32	-2.24	-6.02	-2.89
Slovenia	-0.67	-0.41	-4.18	-3.66	-4.73	-1.59	-1.58	-4.45	-2.44	-1.77	-1.83	-5.66	-2.54
Access. countries	-1.69	-0.97	-4.89	-4.77	-5.24	-2.50	-2.55	-5.16	-3.22	-3.04	-2.76	-6.50	-3.42

Source: WIFO calculations.

Table B3.9: Single Market potential trade division effects of counterfactual policy scenarios across member states and industries - SOLVIT misapplication indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	-0.06	-0.07	-0.79	-0.53	-0.89	-0.24	-0.26	-0.83	-0.42	-0.19	-0.30	-0.91	-0.48
Belgium	-0.04	-0.12	-0.89	-0.48	-0.83	-0.21	-0.25	-0.91	-0.43	-0.15	-0.29	-0.90	-0.45
Germany	-0.42	-0.46	-1.14	-0.71	-0.98	-0.46	-0.54	-1.15	-0.63	-0.42	-0.47	-1.04	-0.66
Denmark	-0.11	-0.12	-0.88	-0.58	-0.93	-0.29	-0.31	-0.90	-0.47	-0.25	-0.35	-0.97	-0.50
Spain	-1.25	-1.02	-2.09	-1.56	-1.64	-1.25	-1.46	-1.92	-1.42	-1.63	-1.51	-1.88	-1.52
Finland	0.18	0.09	-0.58	-0.30	-0.73	-0.04	-0.03	-0.63	-0.23	0.10	-0.06	-0.72	-0.25
France	-0.58	-0.57	-1.45	-0.91	-1.14	-0.66	-0.77	-1.41	-0.88	-0.77	-0.83	-1.36	-0.91
United Kingdom	0.18	0.09	-0.58	-0.22	-0.68	-0.01	-0.02	-0.58	-0.21	0.12	-0.04	-0.63	-0.18
Greece	-0.06	-0.07	-0.83	-0.54	-0.87	-0.24	-0.26	-0.83	-0.42	-0.20	-0.30	-0.93	-0.46
Ireland	0.06	0.01	-0.72	-0.41	-0.82	-0.12	-0.14	-0.74	-0.34	-0.05	-0.18	-0.79	-0.37
Italy	-0.52	-0.30	-1.23	-0.87	-1.08	-0.60	-0.68	-1.15	-0.72	-0.61	-0.79	-1.12	-0.77
Luxembourg	-0.05	-0.10	-0.85	-0.52	-0.90	-0.24	-0.26	-0.88	-0.44	-0.18	-0.29	-0.94	-0.46
Netherlands	-0.52	-0.46	-1.26	-0.94	-1.13	-0.62	-0.71	-1.29	-0.81	-0.75	-0.76	-1.30	-0.87
Portugal	-0.09	-0.11	-0.88	-0.56	-0.91	-0.27	-0.29	-0.90	-0.46	-0.22	-0.34	-0.96	-0.46
Sweden	0.03	-0.01	-0.72	-0.42	-0.82	-0.15	-0.18	-0.77	-0.34	-0.05	-0.20	-0.83	-0.38
EU15	-0.44	-0.36	-1.13	-0.72	-1.04	-0.50	-0.57	-1.18	-0.69	-0.51	-0.57	-1.11	-0.71
Bulgaria	-0.29	-0.14	-3.56	-3.06	-3.93	-1.09	-1.14	-3.70	-1.91	-1.20	-1.32	-4.89	-2.03
Cyprus	-0.06	-0.02	-3.43	-2.76	-3.95	-0.90	-0.93	-3.73	-1.78	-0.88	-1.10	-4.60	-2.11
Czech Rep.	-0.34	-0.23	-3.60	-3.02	-4.02	-1.18	-1.18	-3.92	-2.00	-1.23	-1.34	-4.79	-2.02
Estonia	-0.10	-0.06	-3.43	-2.79	-3.87	-0.95	-0.97	-3.79	-1.82	-0.92	-1.19	-4.59	-2.14
Croatia	-0.17	0.04	-2.26	-2.41	-2.97	-0.69	-0.79	-2.25	-1.28	-0.90	-0.83	-3.88	-1.31
Hungary	-0.28	-0.19	-3.65	-2.97	-3.95	-1.12	-1.16	-3.93	-1.99	-1.20	-1.35	-4.81	-1.87
Lithuania	-0.03	0.00	-3.39	-2.74	-3.79	-0.89	-0.91	-3.71	-1.78	-0.85	-1.08	-4.52	-2.09
Latvia	-0.30	-0.21	-3.61	-2.98	-4.01	-1.12	-1.16	-3.98	-1.99	-1.17	-1.35	-4.78	-2.43
Malta	0.06	0.06	-3.34	-2.67	-3.79	-0.80	-0.83	-3.65	-1.71	-0.71	-0.95	-4.52	-1.88
Poland	-1.03	-0.69	-4.15	-3.70	-4.35	-1.80	-1.82	-4.41	-2.56	-2.12	-2.08	-5.30	-2.77
Romania	-0.87	-0.50	-4.03	-3.68	-4.32	-1.62	-1.71	-4.13	-2.39	-1.96	-1.85	-5.43	-2.43
Slovakia	-0.40	-0.27	-3.72	-3.08	-4.04	-1.21	-1.26	-4.04	-2.07	-1.31	-1.42	-4.88	-2.11
Slovenia	-0.10	-0.05	-3.48	-2.80	-3.95	-0.96	-0.98	-3.79	-1.83	-0.94	-1.15	-4.66	-1.88
Access. countries	-0.66	-0.37	-3.81	-3.31	-4.14	-1.40	-1.45	-4.08	-2.20	-1.58	-1.62	-5.02	-2.31

Source: WIFO calculations.

Table B3.10: Single Market potential trade division effects of counterfactual policy scenarios across member states and industries - SOLVIT solution indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	-0.11	-0.06	-0.78	-0.54	-0.87	-0.24	-0.29	-0.84	-0.43	-0.27	-0.31	-0.92	-0.49
Belgium	-0.08	-0.03	-0.77	-0.55	-0.80	-0.22	-0.26	-0.78	-0.40	-0.26	-0.30	-0.92	-0.43
Germany	-0.11	-0.11	-0.73	-0.42	-0.73	-0.20	-0.22	-0.75	-0.34	-0.16	-0.19	-0.73	-0.36
Denmark	-0.49	-0.26	-1.08	-0.99	-1.11	-0.59	-0.63	-1.07	-0.72	-0.77	-0.66	-1.29	-0.80
Spain	-0.11	-0.09	-0.80	-0.52	-0.81	-0.24	-0.28	-0.77	-0.42	-0.28	-0.31	-0.88	-0.43
Finland	-1.01	-0.53	-1.35	-1.48	-1.40	-1.03	-1.08	-1.36	-1.08	-1.43	-1.11	-1.74	-1.19
France	-0.13	-0.11	-0.80	-0.51	-0.78	-0.26	-0.28	-0.81	-0.44	-0.29	-0.32	-0.91	-0.44
United Kingdom	-0.56	-0.29	-1.10	-0.95	-1.09	-0.62	-0.68	-1.06	-0.76	-0.88	-0.72	-1.27	-0.80
Greece	-0.87	-0.53	-1.39	-1.39	-1.32	-0.95	-0.98	-1.38	-1.03	-1.29	-1.02	-1.66	-1.11
Ireland	-0.63	-0.44	-1.31	-1.07	-1.20	-0.68	-0.79	-1.31	-0.88	-0.94	-0.83	-1.39	-0.96
Italy	-0.22	-0.07	-0.78	-0.62	-0.82	-0.33	-0.34	-0.76	-0.44	-0.37	-0.41	-0.85	-0.46
Luxembourg	-0.60	-0.44	-1.27	-1.04	-1.19	-0.69	-0.75	-1.30	-0.85	-0.89	-0.80	-1.41	-0.90
Netherlands	0.13	0.08	-0.64	-0.27	-0.67	-0.01	-0.06	-0.67	-0.24	0.07	-0.07	-0.68	-0.26
Portugal	-0.02	0.00	-0.75	-0.46	-0.80	-0.17	-0.21	-0.78	-0.37	-0.16	-0.24	-0.86	-0.36
Sweden	-0.29	-0.15	-0.88	-0.73	-0.96	-0.42	-0.44	-0.94	-0.56	-0.51	-0.47	-1.10	-0.62
EU15	-0.23	-0.13	-0.85	-0.64	-0.85	-0.33	-0.36	-0.84	-0.46	-0.36	-0.36	-0.94	-0.51
Bulgaria	-0.03	-0.04	-3.30	-2.57	-3.58	-0.78	-0.86	-3.48	-1.66	-0.78	-1.02	-4.38	-1.74
Cyprus	0.10	0.07	-3.21	-2.39	-3.61	-0.68	-0.74	-3.56	-1.59	-0.63	-0.88	-4.20	-1.89
Czech Rep.	0.36	0.22	-2.89	-2.09	-3.34	-0.44	-0.46	-3.29	-1.35	-0.28	-0.59	-3.87	-1.31
Estonia	0.19	0.10	-3.11	-2.28	-3.47	-0.59	-0.65	-3.52	-1.52	-0.50	-0.82	-4.07	-1.80
Croatia	0.14	0.05	-2.15	-1.92	-2.86	-0.50	-0.55	-2.19	-1.18	-0.42	-0.67	-3.47	-1.09
Hungary	0.21	0.16	-3.08	-2.27	-3.41	-0.58	-0.63	-3.42	-1.49	-0.49	-0.76	-4.09	-1.33
Lithuania	0.38	0.25	-2.91	-2.09	-3.30	-0.42	-0.45	-3.32	-1.35	-0.25	-0.58	-3.87	-1.62
Latvia	0.21	0.14	-3.07	-2.27	-3.47	-0.57	-0.63	-3.47	-1.49	-0.48	-0.77	-4.07	-1.89
Malta	-0.05	-0.01	-3.35	-2.58	-3.65	-0.81	-0.89	-3.67	-1.72	-0.80	-1.01	-4.38	-1.87
Poland	0.25	0.18	-2.88	-2.18	-3.29	-0.53	-0.56	-3.24	-1.41	-0.42	-0.70	-3.85	-1.51
Romania	0.13	0.07	-3.07	-2.38	-3.45	-0.63	-0.69	-3.30	-1.51	-0.57	-0.82	-4.18	-1.48
Slovakia	0.20	0.15	-3.07	-2.29	-3.44	-0.58	-0.64	-3.44	-1.49	-0.50	-0.76	-4.08	-1.49
Slovenia	0.47	0.27	-2.87	-1.98	-3.33	-0.34	-0.36	-3.29	-1.28	-0.13	-0.48	-3.83	-1.28
Access. countries	0.22	0.14	-2.95	-2.20	-3.37	-0.54	-0.57	-3.29	-1.43	-0.44	-0.70	-3.96	-1.46

Source: WIFO calculations.

Table B3.11: Single Market potential trade division effects of counterfactual policy scenarios across member states and industries - TRIS indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	0.40	0.28	-0.30	0.05	-0.36	0.27	0.24	-0.33	0.05	0.38	0.25	-0.32	0.03
Belgium	0.65	0.41	-0.11	0.33	-0.20	0.47	0.47	-0.17	0.24	0.72	0.52	-0.08	0.26
Germany	0.78	0.48	0.02	0.50	-0.02	0.56	0.50	-0.09	0.29	0.65	0.37	0.10	0.36
Denmark	0.58	0.33	-0.19	0.26	-0.25	0.42	0.42	-0.28	0.17	0.62	0.43	-0.14	0.22
Spain	0.74	0.46	0.05	0.52	-0.08	0.62	0.63	-0.03	0.36	0.97	0.65	0.13	0.42
Finland	0.14	0.09	-0.52	-0.21	-0.52	0.04	-0.01	-0.57	-0.16	0.05	-0.01	-0.55	-0.19
France	0.65	0.49	0.00	0.38	-0.12	0.54	0.51	-0.05	0.32	0.77	0.54	0.02	0.36
United Kingdom	0.52	0.36	-0.14	0.19	-0.24	0.38	0.36	-0.19	0.18	0.57	0.38	-0.16	0.21
Greece	0.26	0.14	-0.44	-0.06	-0.44	0.14	0.11	-0.51	-0.07	0.23	0.11	-0.43	-0.09
Ireland	0.02	0.05	-0.60	-0.33	-0.59	-0.05	-0.12	-0.62	-0.23	-0.09	-0.11	-0.64	-0.29
Italy	0.94	0.35	0.18	0.70	0.05	0.78	0.72	0.09	0.46	1.05	0.84	0.24	0.51
Luxembourg	0.26	0.17	-0.43	-0.09	-0.45	0.14	0.12	-0.49	-0.07	0.22	0.12	-0.44	-0.08
Netherlands	0.32	0.23	-0.35	0.01	-0.38	0.21	0.19	-0.39	0.01	0.32	0.20	-0.36	0.00
Portugal	0.04	0.06	-0.58	-0.31	-0.57	-0.04	-0.09	-0.59	-0.21	-0.06	-0.09	-0.64	-0.23
Sweden	0.40	0.29	-0.29	0.04	-0.36	0.27	0.23	-0.33	0.06	0.38	0.24	-0.32	0.04
EU15	0.65	0.37	-0.07	0.33	-0.14	0.50	0.48	-0.12	0.27	0.69	0.45	-0.03	0.29
Bulgaria	-0.23	-0.06	-3.40	-2.89	-3.66	-0.93	-1.03	-3.54	-1.76	-1.12	-1.17	-4.66	-1.88
Cyprus	-0.31	-0.10	-3.48	-2.87	-3.81	-0.99	-1.10	-3.77	-1.83	-1.20	-1.23	-4.61	-2.20
Czech Rep.	-0.07	0.03	-3.23	-2.60	-3.56	-0.79	-0.85	-3.55	-1.64	-0.88	-0.97	-4.32	-1.67
Estonia	-0.14	0.00	-3.32	-2.69	-3.61	-0.85	-0.94	-3.66	-1.71	-0.97	-1.10	-4.40	-2.04
Croatia	-0.65	-0.15	-2.45	-2.85	-3.04	-1.01	-1.24	-2.33	-1.51	-1.59	-1.22	-4.16	-1.65
Hungary	0.23	0.21	-3.06	-2.27	-3.32	-0.52	-0.56	-3.41	-1.43	-0.47	-0.68	-4.06	-1.29
Lithuania	0.03	0.08	-3.21	-2.50	-3.46	-0.70	-0.77	-3.56	-1.59	-0.75	-0.89	-4.22	-1.91
Latvia	-0.20	-0.03	-3.36	-2.76	-3.66	-0.90	-1.00	-3.70	-1.76	-1.05	-1.13	-4.49	-2.21
Malta	-0.29	-0.08	-3.49	-2.88	-3.74	-0.97	-1.09	-3.77	-1.84	-1.15	-1.18	-4.62	-2.04
Poland	-0.04	0.08	-3.08	-2.53	-3.40	-0.74	-0.80	-3.39	-1.58	-0.83	-0.94	-4.15	-1.74
Romania	-0.12	-0.01	-3.26	-2.76	-3.58	-0.83	-0.91	-3.44	-1.67	-0.98	-1.02	-4.50	-1.68
Slovakia	0.59	0.44	-2.72	-1.92	-3.10	-0.21	-0.22	-3.11	-1.14	-0.02	-0.32	-3.71	-1.12
Slovenia	-0.10	0.03	-3.32	-2.65	-3.65	-0.82	-0.90	-3.62	-1.68	-0.94	-1.03	-4.43	-1.75
Access. countries	-0.05	0.06	-3.14	-2.55	-3.45	-0.73	-0.79	-3.42	-1.57	-0.79	-0.87	-4.24	-1.66

Source: WIFO calculations.

Table B3.12: Single Market potential welfare effects of counterfactual policy scenarios across member states and industries - transposition indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	0.25	0.09	0.59	0.51	0.40	0.26	0.30	0.74	0.32	0.19	0.16	0.46	0.42
Belgium	0.29	0.11	0.64	0.56	0.41	0.29	0.34	0.78	0.35	0.23	0.18	0.49	0.39
Germany	0.18	0.08	0.50	0.40	0.33	0.20	0.22	0.61	0.25	0.13	0.10	0.37	0.23
Denmark	0.17	0.07	0.53	0.44	0.37	0.20	0.23	0.66	0.27	0.14	0.12	0.41	0.28
Spain	0.20	0.08	0.55	0.46	0.37	0.23	0.27	0.64	0.29	0.18	0.14	0.41	0.34
Finland	0.22	0.08	0.56	0.48	0.39	0.24	0.27	0.71	0.31	0.18	0.14	0.45	0.40
France	0.20	0.08	0.55	0.45	0.35	0.23	0.25	0.66	0.29	0.17	0.14	0.42	0.30
United Kingdom	0.21	0.08	0.55	0.44	0.37	0.23	0.26	0.68	0.30	0.17	0.14	0.41	0.32
Greece	0.39	0.14	0.71	0.67	0.46	0.39	0.41	0.87	0.42	0.31	0.22	0.54	0.50
Ireland	0.24	0.09	0.59	0.51	0.40	0.25	0.29	0.74	0.33	0.20	0.15	0.44	0.37
Italy	0.28	0.07	0.57	0.53	0.39	0.28	0.31	0.69	0.31	0.20	0.17	0.42	0.32
Luxembourg	0.43	0.15	0.76	0.72	.	0.42	0.44	0.93	0.45	0.33	0.24	0.57	0.58
Netherlands	0.20	0.08	0.56	0.46	0.37	0.22	0.26	0.69	0.29	0.16	0.13	0.42	0.31
Portugal	0.40	0.14	0.73	0.68	0.47	0.39	0.42	0.89	0.43	0.31	0.23	0.55	0.43
Sweden	0.22	0.09	0.55	0.48	0.39	0.24	0.27	0.71	0.31	0.18	0.14	0.44	0.38
EU15	0.21	0.08	0.54	0.44	0.36	0.22	0.25	0.66	0.28	0.15	0.11	0.40	0.28
Bulgaria	0.61	0.18	1.92	2.09	1.49	0.82	0.86	2.33	1.04	0.63	0.46	1.89	1.16
Cyprus	0.72	0.22	2.04	2.16	0.49	0.91	0.95	2.57	1.13	0.71	0.52	1.93	1.84
Czech Rep.	0.67	0.22	1.98	2.07	1.51	0.88	0.88	2.52	1.09	0.66	0.47	1.86	1.12
Estonia	0.51	0.17	1.87	1.91	1.44	0.74	0.77	2.40	1.00	0.55	0.42	1.77	1.64
Croatia	.	.	.	.	.	.	.	.	.	.	.	.	.
Hungary	0.59	0.20	1.94	2.00	1.46	0.81	0.84	2.45	1.05	0.62	0.46	1.83	0.87
Lithuania	0.48	0.15	1.83	1.88	1.42	0.71	0.74	2.35	0.97	0.53	0.40	1.74	1.40
Latvia	0.52	0.17	1.86	1.91	0.15	0.74	0.77	2.40	1.00	0.56	0.41	1.77	1.72
Malta	0.44	0.15	1.82	1.83	1.41	0.68	0.71	2.35	0.95	0.49	0.37	1.72	1.09
Poland	0.71	0.22	1.96	2.13	1.49	0.91	0.91	2.46	1.12	0.71	0.50	1.86	1.37
Romania	0.66	0.19	1.93	2.16	1.51	0.87	0.90	2.35	1.08	0.68	0.47	1.92	1.13
Slovakia	0.48	0.16	1.84	1.87	1.42	0.71	0.74	2.36	0.97	0.53	0.39	1.74	0.96
Slovenia	0.72	0.22	2.03	2.16	1.46	0.92	0.94	2.56	1.13	0.71	0.51	1.93	1.26
Access. countries	0.69	0.21	1.95	2.11	1.49	0.89	0.89	2.46	1.10	0.68	0.48	1.86	1.26

Source: WIFO calculations.

Table B3.13: Single Market potential welfare effects of counterfactual policy scenarios across member states and industries - infringements indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	0.35	0.16	0.73	0.61	0.47	0.36	0.39	0.94	0.43	0.26	0.21	0.54	0.53
Belgium	0.46	0.19	0.88	0.73	0.51	0.43	0.50	1.07	0.50	0.33	0.27	0.62	0.54
Germany	0.38	0.18	0.76	0.59	0.44	0.35	0.39	0.93	0.41	0.23	0.18	0.51	0.37
Denmark	0.24	0.12	0.65	0.51	0.43	0.27	0.30	0.84	0.36	0.19	0.16	0.48	0.36
Spain	0.48	0.20	0.89	0.73	0.52	0.46	0.52	1.01	0.51	0.36	0.28	0.60	0.59
Finland	0.26	0.13	0.66	0.53	0.43	0.29	0.32	0.86	0.37	0.20	0.17	0.49	0.46
France	0.41	0.19	0.84	0.65	0.48	0.40	0.45	1.01	0.48	0.30	0.25	0.58	0.49
United Kingdom	0.34	0.16	0.74	0.56	0.46	0.34	0.38	0.93	0.42	0.26	0.21	0.52	0.44
Greece	0.47	0.20	0.91	0.73	0.53	0.44	0.51	1.11	0.52	0.34	0.28	0.62	0.61
Ireland	0.36	0.16	0.76	0.62	0.48	0.35	0.40	0.96	0.44	0.27	0.22	0.54	0.48
Italy	0.52	0.16	0.87	0.76	0.52	0.48	0.53	1.04	0.50	0.34	0.30	0.58	0.51
Luxembourg	0.28	0.13	0.69	0.55	.	0.30	0.33	0.88	0.38	0.21	0.18	0.51	0.51
Netherlands	0.34	0.15	0.75	0.60	0.46	0.35	0.39	0.94	0.42	0.25	0.21	0.53	0.44
Portugal	0.40	0.17	0.81	0.67	0.50	0.39	0.44	1.01	0.47	0.29	0.24	0.58	0.46
Sweden	0.30	0.14	0.69	0.56	0.45	0.31	0.35	0.90	0.39	0.22	0.19	0.51	0.47
EU15	0.42	0.16	0.80	0.63	0.48	0.38	0.43	0.99	0.45	0.27	0.20	0.54	0.44
Bulgaria	1.27	0.40	2.51	2.90	1.87	1.34	1.38	3.04	1.52	1.06	0.73	2.41	1.66
Cyprus	1.11	0.38	2.42	2.66	0.73	1.21	1.26	3.05	1.44	0.95	0.68	2.27	2.26
Czech Rep.	1.26	0.43	2.51	2.82	1.87	1.35	1.36	3.15	1.53	1.05	0.72	2.35	1.55
Estonia	1.11	0.38	2.42	2.66	1.81	1.22	1.26	3.06	1.45	0.94	0.68	2.26	2.16
Croatia	.	.	.	.	.	.	.	.	.	.	.	.	.
Hungary	1.23	0.43	2.52	2.79	1.85	1.32	1.36	3.15	1.53	1.04	0.73	2.35	1.30
Lithuania	1.08	0.37	2.39	2.63	1.79	1.19	1.23	3.02	1.43	0.92	0.65	2.23	1.89
Latvia	1.12	0.38	2.41	2.67	0.44	1.22	1.26	3.06	1.45	0.95	0.67	2.26	2.27
Malta	1.21	0.41	2.52	2.79	1.86	1.29	1.34	3.17	1.52	1.01	0.70	2.34	1.69
Poland	1.53	0.51	2.72	3.14	1.97	1.59	1.58	3.36	1.73	1.28	0.87	2.51	2.06
Romania	1.23	0.39	2.45	2.86	1.85	1.32	1.35	2.99	1.50	1.04	0.70	2.37	1.58
Slovakia	1.22	0.41	2.50	2.79	1.85	1.31	1.35	3.15	1.52	1.03	0.71	2.34	1.46
Slovenia	1.12	0.38	2.44	2.68	1.74	1.23	1.27	3.06	1.45	0.96	0.67	2.28	1.60
Access. countries	1.45	0.45	2.63	3.06	1.94	1.50	1.50	3.28	1.64	1.17	0.78	2.47	1.86

Source: WIFO calculations.

Table B3.14: Single Market potential welfare effects of counterfactual policy scenarios across member states and industries – SOLVIT misapplication indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	0.16	0.07	0.50	0.41	0.36	0.19	0.21	0.67	0.27	0.14	0.12	0.39	0.35
Belgium	0.14	0.07	0.52	0.38	0.34	0.18	0.20	0.68	0.26	0.12	0.11	0.39	0.29
Germany	0.20	0.10	0.53	0.40	0.33	0.20	0.23	0.68	0.26	0.13	0.11	0.37	0.24
Denmark	0.17	0.07	0.52	0.42	0.36	0.20	0.22	0.69	0.27	0.14	0.12	0.40	0.28
Spain	0.36	0.15	0.71	0.60	0.44	0.36	0.40	0.84	0.40	0.29	0.21	0.50	0.47
Finland	0.10	0.05	0.46	0.35	0.33	0.15	0.17	0.62	0.23	0.10	0.09	0.37	0.30
France	0.23	0.11	0.60	0.45	0.37	0.25	0.27	0.76	0.32	0.18	0.15	0.43	0.33
United Kingdom	0.10	0.05	0.45	0.32	0.32	0.14	0.16	0.59	0.22	0.09	0.09	0.34	0.23
Greece	0.16	0.07	0.51	0.41	0.35	0.19	0.21	0.67	0.27	0.14	0.12	0.40	0.33
Ireland	0.13	0.06	0.49	0.38	0.35	0.17	0.19	0.65	0.25	0.12	0.11	0.37	0.29
Italy	0.23	0.07	0.54	0.45	0.36	0.24	0.26	0.68	0.29	0.17	0.15	0.39	0.29
Luxembourg	0.15	0.07	0.52	0.40	.	0.19	0.21	0.68	0.27	0.13	0.12	0.40	0.37
Netherlands	0.24	0.10	0.59	0.49	0.39	0.26	0.28	0.77	0.33	0.20	0.16	0.44	0.35
Portugal	0.16	0.07	0.52	0.41	0.36	0.20	0.21	0.69	0.27	0.14	0.12	0.40	0.28
Sweden	0.14	0.06	0.48	0.38	0.35	0.17	0.19	0.66	0.25	0.12	0.11	0.38	0.31
EU15	0.22	0.08	0.54	0.41	0.35	0.22	0.24	0.71	0.28	0.15	0.12	0.39	0.28
Bulgaria	0.38	0.12	1.69	1.73	1.32	0.60	0.63	2.11	0.87	0.45	0.34	1.66	0.97
Cyprus	0.39	0.13	1.73	1.70	0.28	0.61	0.64	2.28	0.90	0.45	0.36	1.64	1.54
Czech Rep.	0.45	0.15	1.75	1.75	1.36	0.66	0.68	2.30	0.93	0.49	0.37	1.66	0.94
Estonia	0.40	0.14	1.73	1.71	1.35	0.62	0.65	2.29	0.90	0.45	0.36	1.63	1.51
Croatia	0.00	-0.01	0.87	1.04	0.87	0.22	0.24	1.05	0.42	0.16	0.13	1.10	0.48
Hungary	0.44	0.15	1.77	1.74	1.35	0.65	0.68	2.31	0.93	0.48	0.38	1.66	0.76
Lithuania	0.39	0.13	1.72	1.70	1.34	0.61	0.64	2.27	0.90	0.44	0.35	1.62	1.30
Latvia	0.44	0.15	1.76	1.75	0.04	0.65	0.68	2.33	0.93	0.48	0.37	1.66	1.62
Malta	0.37	0.13	1.71	1.68	1.34	0.59	0.62	2.26	0.89	0.43	0.34	1.63	1.02
Poland	0.59	0.20	1.84	1.90	1.39	0.78	0.79	2.39	1.02	0.60	0.45	1.72	1.25
Romania	0.50	0.16	1.77	1.88	1.38	0.71	0.73	2.21	0.95	0.54	0.39	1.74	1.00
Slovakia	0.46	0.16	1.78	1.77	1.37	0.67	0.70	2.34	0.95	0.50	0.38	1.68	0.93
Slovenia	0.40	0.14	1.74	1.71	1.26	0.62	0.65	2.29	0.91	0.46	0.36	1.65	1.00
Access. countries	0.55	0.17	1.81	1.86	1.38	0.74	0.75	2.35	0.98	0.55	0.41	1.71	1.13

Source: WIFO calculations.

Table B3.15: Single Market potential welfare effects of counterfactual policy scenarios across member states and industries – SOLVIT solution indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	0.10	0.03	0.42	0.38	0.32	0.15	0.16	0.53	0.20	0.10	0.08	0.36	0.29
Belgium	0.09	0.03	0.42	0.38	0.31	0.14	0.15	0.52	0.20	0.10	0.08	0.37	0.24
Germany	0.08	0.03	0.38	0.31	0.27	0.12	0.13	0.47	0.17	0.07	0.06	0.30	0.16
Denmark	0.19	0.05	0.48	0.50	0.36	0.22	0.23	0.60	0.26	0.17	0.12	0.43	0.30
Spain	0.09	0.03	0.41	0.36	0.30	0.14	0.15	0.49	0.19	0.10	0.08	0.34	0.24
Finland	0.31	0.08	0.54	0.62	0.41	0.33	0.32	0.68	0.33	0.27	0.17	0.50	0.44
France	0.09	0.03	0.40	0.34	0.29	0.14	0.14	0.50	0.19	0.10	0.08	0.34	0.20
United Kingdom	0.19	0.05	0.47	0.45	0.34	0.22	0.22	0.57	0.26	0.18	0.12	0.40	0.30
Greece	0.27	0.08	0.55	0.59	0.39	0.30	0.29	0.67	0.32	0.24	0.16	0.48	0.39
Ireland	0.21	0.07	0.52	0.50	0.37	0.23	0.25	0.65	0.29	0.19	0.13	0.43	0.35
Italy	0.11	0.02	0.39	0.38	0.30	0.16	0.16	0.48	0.19	0.11	0.09	0.33	0.20
Luxembourg	0.20	0.07	0.52	0.50	.	0.24	0.24	0.65	0.28	0.18	0.13	0.44	0.38
Netherlands	0.04	0.01	0.39	0.31	0.29	0.10	0.11	0.49	0.17	0.06	0.06	0.32	0.19
Portugal	0.08	0.02	0.41	0.36	0.31	0.13	0.14	0.52	0.19	0.09	0.08	0.36	0.20
Sweden	0.14	0.04	0.43	0.43	0.34	0.18	0.19	0.56	0.23	0.14	0.10	0.39	0.30
EU15	0.10	0.03	0.40	0.36	0.29	0.14	0.15	0.49	0.18	0.09	0.07	0.33	0.20
Bulgaria	-0.01	0.00	1.32	1.23	1.09	0.29	0.30	1.69	0.58	0.18	0.18	1.33	0.68
Cyprus	-0.03	-0.01	1.34	1.19	-0.03	0.27	0.29	1.79	0.58	0.17	0.17	1.30	1.11
Czech Rep.	-0.08	-0.03	1.26	1.11	1.05	0.23	0.24	1.71	0.54	0.12	0.14	1.24	0.54
Estonia	-0.05	-0.01	1.31	1.17	1.08	0.26	0.28	1.78	0.57	0.15	0.17	1.28	1.12
Croatia	0.00	0.00	0.89	0.99	0.88	0.23	0.25	1.09	0.44	0.14	0.14	1.08	0.48
Hungary	-0.05	-0.02	1.31	1.16	1.07	0.26	0.27	1.75	0.56	0.15	0.16	1.28	0.43
Lithuania	-0.09	-0.03	1.27	1.12	1.05	0.23	0.24	1.73	0.54	0.12	0.14	1.25	0.91
Latvia	-0.05	-0.02	1.31	1.16	-0.29	0.26	0.27	1.77	0.57	0.15	0.16	1.28	1.17
Malta	0.01	0.00	1.37	1.24	1.11	0.31	0.32	1.82	0.61	0.19	0.19	1.33	0.74
Poland	-0.06	-0.02	1.25	1.12	1.03	0.25	0.26	1.67	0.55	0.14	0.16	1.23	0.71
Romania	-0.04	-0.01	1.27	1.19	1.06	0.26	0.27	1.64	0.56	0.15	0.16	1.30	0.57
Slovakia	-0.05	-0.02	1.31	1.17	1.07	0.26	0.28	1.76	0.57	0.15	0.16	1.28	0.57
Slovenia	-0.11	-0.03	1.27	1.09	0.94	0.21	0.22	1.72	0.53	0.10	0.13	1.24	0.60
Access. countries	-0.06	-0.02	1.26	1.13	1.04	0.25	0.25	1.68	0.55	0.14	0.15	1.24	0.65

Source: WIFO calculations.

Table B3.16: Single Market potential welfare effects of counterfactual policy scenarios across member states and industries - TRIS indicator (changes in %)

	Food, bever., tobacco	Text.,wear. apparel, leather p.	Wood, prod. of wood, cork	Pulp, paper, printing, publishing	Coke, refined petrol. prod.	Chemicals, pharma-ceuticals	Rubber, plastic products	Non-metallic min. prod.	Basic, fabric. metals	Machinery	Transport equipm.	Furniture, oth. manuf.	Total
Austria	-0.31	0.10	0.09	0.13	0.09	0.19	0.19	0.16	0.08	0.18	0.10	0.05	0.03
Belgium	-0.37	-0.11	0.05	-0.20	0.06	-0.23	-0.23	0.11	-0.12	-0.23	-0.12	0.01	-0.11
Germany	-0.36	-0.11	0.04	-0.19	0.04	-0.22	-0.19	0.11	-0.09	-0.17	-0.08	0.00	-0.12
Denmark	-0.36	-0.10	0.06	-0.19	0.07	-0.23	-0.23	0.14	-0.11	-0.22	-0.12	0.02	-0.14
Spain	-0.36	-0.11	0.02	-0.24	0.04	-0.25	-0.25	0.07	-0.13	-0.26	-0.13	-0.02	-0.13
Finland	-0.26	-0.08	0.13	-0.07	0.11	-0.14	-0.14	0.21	-0.04	-0.14	-0.07	0.08	-0.01
France	-0.33	-0.11	0.04	-0.19	0.06	-0.23	-0.21	0.09	-0.12	-0.21	-0.12	0.00	-0.15
United Kingdom	-0.32	-0.10	0.06	-0.15	0.07	-0.20	-0.19	0.12	-0.10	-0.20	-0.10	0.03	-0.12
Greece	-0.29	-0.08	0.11	-0.11	0.10	-0.17	-0.17	0.19	-0.06	-0.17	-0.08	0.06	-0.03
Ireland	-0.23	-0.07	0.15	-0.04	0.13	-0.12	-0.12	0.23	-0.03	-0.12	-0.06	0.10	-0.01
Italy	-0.40	-0.08	0.00	-0.27	0.03	-0.28	-0.25	0.06	-0.14	-0.25	-0.15	-0.02	-0.13
Luxembourg	-0.29	-0.09	0.11	-0.10	.	-0.17	-0.17	0.19	-0.06	-0.17	-0.08	0.07	-0.01
Netherlands	-0.29	-0.09	0.10	-0.12	0.09	-0.18	-0.18	0.17	-0.07	-0.17	-0.09	0.06	-0.08
Portugal	-0.23	-0.07	0.15	-0.04	0.12	-0.12	-0.12	0.22	-0.03	-0.12	-0.06	0.10	-0.01
Sweden	-0.31	-0.10	0.09	-0.12	0.09	-0.19	-0.18	0.16	-0.08	-0.18	-0.09	0.05	-0.05
EU15	-0.35	-0.09	0.03	-0.19	0.05	-0.23	-0.21	0.09	-0.11	-0.20	-0.09	0.00	-0.12
Bulgaria	-0.01	-0.01	1.33	1.25	1.07	0.28	0.29	1.69	0.57	0.18	0.18	1.33	0.67
Cyprus	-0.03	-0.02	1.32	1.19	-0.04	0.26	0.28	1.76	0.56	0.17	0.17	1.30	1.09
Czech Rep.	-0.08	-0.04	1.26	1.12	1.04	0.23	0.23	1.69	0.52	0.13	0.14	1.24	0.54
Estonia	-0.07	-0.03	1.29	1.15	1.05	0.24	0.24	1.73	0.54	0.14	0.15	1.26	1.09
Croatia	-0.28	-0.11	0.59	0.63	0.65	-0.02	-0.03	0.74	0.18	-0.05	0.00	0.81	0.21
Hungary	-0.15	-0.06	1.23	1.04	1.00	0.17	0.17	1.65	0.48	0.07	0.11	1.20	0.36
Lithuania	-0.11	-0.04	1.26	1.10	1.03	0.21	0.21	1.70	0.52	0.11	0.13	1.23	0.89
Latvia	-0.05	-0.03	1.30	1.17	-0.29	0.25	0.26	1.74	0.55	0.15	0.16	1.27	1.17
Malta	-0.03	-0.03	1.32	1.20	1.07	0.27	0.28	1.76	0.56	0.17	0.16	1.30	0.70
Poland	-0.08	-0.04	1.22	1.10	1.00	0.22	0.22	1.63	0.51	0.13	0.14	1.21	0.68
Romania	-0.04	-0.02	1.29	1.21	1.06	0.26	0.27	1.66	0.55	0.16	0.16	1.31	0.58
Slovakia	-0.23	-0.08	1.16	0.96	0.97	0.11	0.11	1.58	0.43	0.02	0.08	1.15	0.45
Slovenia	-0.08	-0.04	1.29	1.14	0.94	0.24	0.24	1.72	0.53	0.14	0.15	1.26	0.62
Access. countries	-0.08	-0.03	1.23	1.10	1.01	0.22	0.22	1.64	0.51	0.12	0.13	1.22	0.62

Source: WIFO calculations.

Table B4.1: CompNet – coverage by country, sector and year

Country	Time coverage	Sample available	Excluded sectors*
Belgium	2004-2015	Full and 20+	
Czech Republic	2003-2015	20+	
Germany	1999-2014	20+	Construction and services
Denmark	2000-2015	Full and 20+	
Spain	2009-2015	Full and 20+	
Finland	1999-2015	Full and 20+	Real estate activities
France	2004-2014	Full and 20+	
Croatia	2008-2015	Full and 20+	
Hungary	1999-2015	Full and 20+	
Italy	2001-2014	Full and 20+	
Lithuania	2000-2015	Full and 20+	
Netherlands	2000-2014	Full and 20+	
Poland	2005-2015	20+	
Portugal	2006-2015	Full and 20+	Manufacture of tobacco products; manufacture of coke and refined petroleum products; air transport; postal and courier activities; real estate activities
Romania	2005-2015	Full and 20+	
Slovenia	2005-2016	Full and 20+	
Sweden	2003-2015	Full and 20+	
Slovakia	2000-2015	20+	

Source: CompNet 6th vintage of data: Novelties and stylised facts, www.comp-net.org.
Notes: In addition to sectors excluded in CompNet which are: mining and agriculture; utilities; financial sector; public administration.

Table B4.2: Summary statistics for mark-ups by industry, 2002-2014

Manufacturing industry	Obs.	Mean	Sd	Min	Max
29-30: Transport equipment	186	6.85	18.61	0.15	90.37
31-32: Furniture, other manufacturing	207	4.42	6.85	0.16	28.94
13-15: Textiles, wearing apparel, leather products	187	2.81	2.71	0.21	13.75
16: Wood and products of wood and cork	170	2.33	2.98	0.33	14.59
17-18: Pulp, paper, printing, publishing	184	2.28	2.27	0.53	10.41
26-27: Computer, electronic, electrical and optical products	158	2.02	1.63	0.33	8.02
23: Non-metallic mineral products	158	1.86	1.07	0.35	5.06
20-21: Chemicals and pharmaceuticals	149	1.85	1.22	0.48	4.72
10-12: Food, beverages, tobacco	174	1.74	1.38	0.43	13.44
22: Rubber and plastic products	136	1.54	1.28	0.45	4.55
24-25: Basic and fabricated metals	191	1.12	1.49	0.04	9.20
28-33: Machinery	206	1.11	1.03	0.28	8.47
19: Coke and refined petroleum products	19	0.35	0.06	0.24	0.46
All industries average	2,125	2.53	6.33	0.04	90.37

Source: ESRI calculations based on data from CompNet.
Notes: The industry-specific median values for mark-ups are summarised above.

Table B4.3: Summary statistics for price-cost margin by industry, 2002-2014

Manufacturing industry	Obs.	Mean	Sd	Min	Max
23: Non-metallic mineral products	148	0.212	0.100	0.045	0.380
17-18: Pulp, paper, printing, publishing	182	0.199	0.091	0.040	0.358
20-21: Chemicals and pharmaceuticals	145	0.199	0.094	0.058	0.421
22: Rubber and plastic products	136	0.199	0.075	0.045	0.303
28-33: Machinery	202	0.180	0.094	0.023	0.336
10-12: Food, beverages, tobacco	163	0.178	0.101	0.032	0.505
26-27: Computer, electronic, electrical and optical products	152	0.177	0.087	0.012	0.390
24-25: Basic and fabricated metals	184	0.173	0.085	0.060	0.346
31-32: Furniture, other manufacturing	199	0.163	0.084	0.014	0.304
16: Wood and products of wood and cork	159	0.153	0.083	0.021	0.290
13-15: Textiles, wearing apparel, leather products	180	0.152	0.093	0.027	0.307
29-30: Transport equipment	173	0.151	0.085	0.019	0.366
19: Coke and refined petroleum products	17	0.138	0.063	0.065	0.277
All industries average	2,040	0.177	0.091	0.012	0.505

Source: ESRI calculations based on data from CompNet.
Notes: The industry-specific median values for price-cost margins are summarised above.

Table B4.4: Summary statistics of variables, 2002-2014

Variable	Obs.	Mean	Sd	Min	Max
Capital/turnover	1,909	0.32	0.19	0.02	2.05
Employment (in log)	1,973	3.85	0.36	1.30	5.49
Labour cost/turnover	1,989	0.71	0.13	0.31	1.22
Domestic market (in log)	2,081	15.67	1.54	10.86	21.62
Export/turnover	2,081	0.0013	0.0033	0.0000	0.0785
HHI	2,106	0.053	0.070	0.001	0.573
CR10 (CR10)	1,846	0.45	0.23	0.02	0.96
Import (in log)	2,106	8.42	1.44	4.50	11.94
Intra-EU import (in log)	2,125	8.15	1.39	4.22	11.57
Extra-EU import (in log)	2,125	7.22	1.72	2.13	12.15
Labour productivity (in log)	2,106	3.48	0.55	1.38	5.32
Trade/turnover	2,081	0.0028	0.0095	0.0000	0.2061

Source: ESRI calculations based on data from CompNet.

Table B4.5: Single Market competition effects of counterfactual policy scenarios across member states and industries, transposition - intra-EU trade potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	-0.05	0.09	-0.88	-0.62	-0.41	-1.06	-0.78	0.18	-0.32	-0.45	-0.66	-1.04	-0.37
Denmark	-0.01	0.01	-0.56	-0.34	-0.15	-0.37	-0.53	0.10	-0.06	-0.13	-0.25	-0.70	-0.15
Finland	-0.02	0.04	-0.68		-0.24	-0.62	-0.62	0.13	-0.16	-0.24	-0.40	-0.82	-0.22
France	-0.02	0.04	-0.69	-0.46		-0.64		0.13		-0.25	-0.41	-0.84	-0.26
Italy	-0.05	0.10		-0.64	-0.41			0.19		-0.47	-0.68	-1.08	-0.34
Netherlands		0.04	-0.66	-0.43	-0.23		-0.61	0.12	-0.14	-0.22	-0.37	-0.81	-0.26
Portugal	-0.05		-0.85	-0.59	-0.38		-0.76	0.17	-0.32	-0.40		-1.01	-0.29
Spain				-0.47	-0.26	-0.67		0.13	-0.17	-0.26	-0.43	-0.86	-0.30
Sweden	-0.01	0.03	-0.62	-0.38		-0.47	-0.57	0.11	-0.10	-0.17	-0.31	-0.75	-0.18
Industry weighted average	-0.03	0.06	-0.69	-0.50	-0.33	-0.67	-0.65	0.14	-0.17	-0.29	-0.47	-0.88	
Accession countries													
Croatia													
Czech Republic	-0.05	0.10	-1.38	-0.85	-0.49	-1.36	-1.23	0.25	-0.37	-0.48	-0.84	-1.57	-0.48
Hungary	-0.05	0.10	-1.35	-0.82	-0.47	-1.28	-1.22	0.24		-0.45	-0.78	-1.52	-0.49
Lithuania	-0.03	0.06	-1.19	-0.69			-1.09	0.20	-0.20	-0.32	-0.59	-1.38	-0.30
Poland	-0.08	0.16	-1.62	-1.01	-0.65	-1.81	-1.43	0.31	-0.54	-0.67	-1.09	-1.80	-0.63
Slovakia	-0.02	0.05	-1.16	-0.67		-0.88		0.20	-0.18	-0.29	-0.56	-1.34	-0.32
Slovenia	-0.07	0.15	-1.56	-0.98	-0.62		-1.38	0.30	-0.51	-0.63	-1.03	-1.71	-0.53
Industry weighted average	-0.06	0.12	-1.44	-0.90	-0.57	-1.45	-1.31	0.27	-0.41	-0.53	-0.88	-1.61	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.6: Single Market productivity effects of counterfactual policy scenarios across member states and industries, transposition - intra-EU trade potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	-0.02	-0.18	3.07	3.27	0.45	0.14	1.81	1.14	-0.18	-0.71	2.41	2.83	0.82
Denmark	0.00	-0.03	1.97	1.80	0.17	0.05	1.24	0.60	-0.03	-0.20	0.92	1.92	0.38
Finland	-0.01	-0.08	2.38		0.27	0.08	1.44	0.79	-0.09	-0.38	1.45	2.24	0.43
France	-0.01	-0.09	2.40	2.39		0.08		0.81		-0.39	1.50	2.28	0.78
Italy	-0.02	-0.20		3.34	0.46			1.17		-0.74	2.47	2.95	0.97
Netherlands		-0.07	2.29	2.24	0.25		1.40	0.76	-0.08	-0.35	1.36	2.20	0.72
Portugal	-0.01		2.98	3.11	0.43		1.76	1.09	-0.18	-0.63		2.74	0.53
Spain				2.44	0.29	0.09		0.83	-0.10	-0.41	1.56	2.33	0.72
Sweden	0.00	-0.05	2.15	2.02		0.06	1.32	0.68	-0.06	-0.26	1.14	2.05	0.48
Industry weighted average	-0.01	-0.12	2.41	2.61	0.37	0.09	1.51	0.91	-0.10	-0.46	1.72	2.40	
Accession countries													
Croatia													
Czech Republic	-0.02	-0.20	4.83	4.44	0.55	0.17	2.86	1.61	-0.21	-0.76	3.06	4.27	1.09
Hungary	-0.01	-0.19	4.70	4.29	0.52	0.16	2.82	1.55		-0.71	2.86	4.15	1.11
Lithuania	-0.01	-0.11	4.16	3.61			2.52	1.29	-0.12	-0.50	2.15	3.76	0.97
Poland	-0.02	-0.31	5.67	5.32	0.72	0.23	3.32	1.96	-0.31	-1.06	3.98	4.90	1.33
Slovakia	-0.01	-0.09	4.05	3.50		0.11		1.24	-0.10	-0.45	2.04	3.67	0.92
Slovenia	-0.02	-0.29	5.43	5.11	0.69		3.20	1.89	-0.29	-1.00	3.78	4.67	1.57
Industry weighted average	-0.02	-0.23	5.01	4.72	0.64	0.19	3.04	1.70	-0.24	-0.83	3.23	4.39	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.7: Single Market competition effects of counterfactual policy scenarios across member states and industries, infringements - intra-EU trade potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	-0.08	0.15	-1.11	-0.84	-0.61	-1.58	-0.96	0.25	-0.54	-0.67	-0.97	-1.29	-0.54
Denmark	0.00	0.01	-0.54	-0.33	-0.15	-0.31	-0.51	0.09	-0.06	-0.07	-0.21	-0.69	-0.13
Finland	0.00	0.01	-0.57		-0.17	-0.37	-0.53	0.10	-0.08	-0.10	-0.25	-0.72	-0.14
France	-0.08	0.16	-1.13	-0.88		-1.66		0.25		-0.71	-1.01	-1.33	-0.60
Italy	-0.12	0.23		-1.10	-0.83			0.32		-0.98	-1.33	-1.64	-0.66
Netherlands		0.07	-0.78	-0.54	-0.34		-0.70	0.16	-0.26	-0.32	-0.52	-0.94	-0.35
Portugal	-0.05		-0.90	-0.66	-0.44		-0.80	0.19	-0.37	-0.45		-1.08	-0.33
Spain				-0.96	-0.71	-1.85		0.28	-0.64	-0.80	-1.13	-1.44	-0.81
Sweden	-0.02	0.04	-0.69	-0.46		-0.63	-0.63	0.13	-0.18	-0.23	-0.41	-0.85	-0.25
Industry weighted average	-0.08	0.15	-0.91	-0.81	-0.60	-1.44	-0.73	0.24	-0.37	-0.62	-0.96	-1.25	
Accession countries													
Croatia													
Czech Republic	-0.04	0.09	-1.37	-0.79	-0.45	-1.20	-1.24	0.24	-0.33	-0.37	-0.74	-1.53	-0.43
Hungary	-0.03	0.08	-1.31	-0.76	-0.42	-1.10	-1.21	0.23		-0.33	-0.67	-1.48	-0.42
Lithuania	-0.01	0.02	-1.10	-0.58			-1.03	0.18	-0.11	-0.15	-0.41	-1.28	-0.23
Poland	-0.10	0.20	-1.83	-1.15	-0.78	-2.16	-1.61	0.36	-0.71	-0.76	-1.28	-2.00	-0.75
Slovakia	-0.03	0.07	-1.30	-0.74		-1.07		0.23	-0.28	-0.32	-0.67	-1.47	-0.39
Slovenia	-0.02	0.04	-1.16	-0.64	-0.31		-1.08	0.19	-0.16	-0.20	-0.49	-1.33	-0.28
Industry weighted average	-0.05	0.13	-1.46	-0.92	-0.59	-1.54	-1.36	0.28	-0.46	-0.49	-0.89	-1.64	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.8: Single Market productivity effects of counterfactual policy scenarios across member states and industries, infringements - intra-EU trade potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	-0.02	-0.30	3.86	4.42	0.68	0.20	2.22	1.55	-0.31	-1.06	3.53	3.53	1.14
Denmark	0.00	-0.01	1.88	1.71	0.17	0.04	1.19	0.58	-0.03	-0.11	0.78	1.88	0.36
Finland	0.00	-0.03	1.99		0.19	0.05	1.23	0.63	-0.05	-0.15	0.90	1.95	0.34
France	-0.03	-0.31	3.96	4.62		0.21		1.60		-1.12	3.69	3.64	1.61
Italy	-0.04	-0.45		5.77	0.93			2.04		-1.55	4.84	4.47	1.77
Netherlands		-0.13	2.71	2.83	0.38		1.62	0.98	-0.15	-0.50	1.90	2.57	0.92
Portugal	-0.02		3.15	3.44	0.49		1.85	1.20	-0.21	-0.72		2.94	0.58
Spain				5.03	0.79	0.24		1.76	-0.36	-1.26	4.13	3.93	1.68
Sweden	-0.01	-0.09	2.42	2.43		0.08	1.45	0.83	-0.10	-0.36	1.50	2.31	0.58
Industry weighted average	-0.02	-0.29	3.16	4.25	0.67	0.18	1.69	1.51	-0.21	-0.97	3.52	3.40	
Accession countries													
Croatia													
Czech Republic	-0.01	-0.17	4.78	4.13	0.50	0.15	2.88	1.55	-0.19	-0.59	2.71	4.18	1.03
Hungary	-0.01	-0.15	4.59	3.96	0.47	0.14	2.79	1.47		-0.51	2.45	4.04	1.04
Lithuania	0.00	-0.05	3.84	3.05			2.39	1.11	-0.06	-0.23	1.50	3.50	0.85
Poland	-0.03	-0.40	6.40	6.02	0.87	0.28	3.74	2.28	-0.40	-1.21	4.68	5.46	1.54
Slovakia	-0.01	-0.15	4.55	3.89		0.14		1.45	-0.16	-0.51	2.43	4.01	1.06
Slovenia	0.00	-0.08	4.06	3.34	0.34		2.51	1.23	-0.09	-0.32	1.81	3.63	0.99
Industry weighted average	-0.02	-0.25	5.10	4.80	0.66	0.20	3.14	1.76	-0.26	-0.78	3.26	4.48	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.9: Single Market competition effects of counterfactual policy scenarios across member states and industries, TRIS - intra-EU trade potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.02	-0.05	-0.26	-0.15	0.05	0.12	-0.27	0.02	0.17	0.05	0.05	-0.42	0.03
Denmark	0.03	-0.07	-0.20	-0.10	0.09	0.24	-0.22	0.01	0.22	0.12	0.13	-0.36	0.07
Finland	0.01	-0.02	-0.39		-0.04	-0.13	-0.37	0.05	0.07	-0.05	-0.09	-0.54	-0.05
France	0.02	-0.06	-0.26	-0.13		0.15		0.02		0.07	0.07	-0.42	0.01
Italy	0.05	-0.11		0.00	0.18			-0.03		0.24	0.28	-0.24	0.12
Netherlands		-0.03	-0.36	-0.22	-0.02		-0.35	0.05	0.09	-0.03	-0.06	-0.52	-0.07
Portugal	0.00		-0.44	-0.28	-0.08		-0.41	0.07	0.02	-0.09		-0.59	-0.08
Spain				-0.07	0.12	0.34		0.00	0.26	0.14	0.18	-0.33	0.14
Sweden	0.01	-0.03	-0.37	-0.23		-0.10	-0.36	0.05	0.08	-0.04	-0.07	-0.53	-0.04
Industry weighted average	0.03	-0.06	-0.30	-0.13	0.08	0.15	-0.32	0.01	0.16	0.08	0.11	-0.41	
Accession countries													
Croatia		0.03	-1.12	-0.66	-0.28		-1.01	0.18	-0.11	-0.38	-0.54	-1.28	-0.32
Czech Republic	0.00	-0.01	-0.87	-0.48	-0.14	-0.44	-0.81	0.13	0.03	-0.13	-0.28	-1.08	-0.15
Hungary	0.02	-0.05	-0.71	-0.36	-0.04	-0.13	-0.68	0.09		0.00	-0.09	-0.93	-0.09
Lithuania	0.01	-0.02	-0.81	-0.44			-0.76	0.11	0.07	-0.08	-0.21	-1.03	-0.14
Poland	0.00	-0.01	-0.90	-0.50	-0.16	-0.48	-0.83	0.13	0.02	-0.15	-0.29	-1.11	-0.17
Slovakia	0.03	-0.07	-0.61	-0.28		0.10		0.06	0.24	0.10	0.04	-0.82	0.04
Slovenia	0.00	0.00	-0.90	-0.51	-0.17		-0.83	0.14	0.00	-0.16	-0.31	-1.10	-0.18
Industry weighted average	0.01	-0.02	-0.84	-0.46	-0.14	-0.32	-0.81	0.12	0.05	-0.09	-0.21	-1.05	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.10: Single Market productivity effects of counterfactual policy scenarios across member states and industries, TRIS - intra-EU trade potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.01	0.11	0.91	0.77	-0.05	-0.02	0.64	0.14	0.10	0.08	-0.18	1.16	0.08
Denmark	0.01	0.13	0.70	0.50	-0.10	-0.03	0.52	0.05	0.12	0.18	-0.47	0.99	0.07
Finland	0.00	0.04	1.35		0.05	0.02	0.86	0.34	0.04	-0.08	0.34	1.47	0.19
France	0.01	0.11	0.90	0.71		-0.02		0.13		0.10	-0.27	1.14	0.08
Italy	0.01	0.21		-0.01	-0.20			-0.17		0.38	-1.03	0.65	-0.22
Netherlands		0.06	1.25	1.15	0.02		0.81	0.30	0.05	-0.05	0.22	1.40	0.30
Portugal	0.00		1.53	1.45	0.09		0.96	0.42	0.01	-0.15		1.61	0.27
Spain				0.35	-0.14	-0.04		-0.02	0.15	0.22	-0.67	0.90	-0.13
Sweden	0.00	0.05	1.29	1.19		0.01	0.83	0.31	0.05	-0.07	0.27	1.43	0.23
Industry weighted average	0.01	0.12	1.04	0.66	-0.09	-0.02	0.75	0.09	0.09	0.12	-0.40	1.11	
Accession countries													
Croatia		-0.05	3.92	3.48	0.32		2.34	1.11	-0.06	-0.60	1.98	3.50	0.91
Czech Republic	0.00	0.02	3.04	2.53	0.16	0.06	1.87	0.81	0.02	-0.20	1.01	2.94	0.54
Hungary	0.01	0.09	2.47	1.90	0.04	0.02	1.58	0.56		0.01	0.33	2.53	0.38
Lithuania	0.00	0.05	2.83	2.31			1.76	0.72	0.04	-0.13	0.77	2.81	0.61
Poland	0.00	0.02	3.15	2.61	0.18	0.06	1.93	0.84	0.01	-0.23	1.08	3.04	0.55
Slovakia	0.01	0.15	2.12	1.45		-0.01		0.39	0.14	0.16	-0.14	2.25	0.22
Slovenia	0.00	0.01	3.13	2.66	0.19		1.92	0.86	0.00	-0.25	1.14	3.00	0.72
Industry weighted average	0.00	0.04	2.93	2.43	0.16	0.04	1.87	0.75	0.03	-0.15	0.78	2.86	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.11: Single Market competition effects of counterfactual policy scenarios across member states and industries, SOLVIT - intra-EU trade potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.00	0.00	-0.49	-0.27	-0.09	-0.24	-0.47	0.07	0.00	-0.06	-0.16	-0.61	-0.09
Denmark	-0.01	0.02	-0.57	-0.33	-0.15	-0.40	-0.53	0.10	-0.07	-0.12	-0.25	-0.68	-0.15
Finland	-0.01	0.03	-0.60		-0.15	-0.41	-0.55	0.10	-0.10	-0.09	-0.26	-0.68	-0.14
France	0.00	0.00	-0.51	-0.30		-0.28		0.08		-0.08	-0.19	-0.64	-0.13
Italy	-0.01	0.02		-0.34	-0.14			0.09		-0.13	-0.25	-0.71	-0.13
Netherlands		0.00	-0.50	-0.30	-0.10		-0.47	0.08	0.00	-0.09	-0.18	-0.63	-0.14
Portugal	0.00		-0.51	-0.30	-0.11		-0.48	0.08	-0.02	-0.10		-0.64	-0.10
Spain				-0.31	-0.12	-0.31		0.08	-0.02	-0.10	-0.20	-0.66	-0.14
Sweden	0.00	0.01	-0.53	-0.30		-0.31	-0.50	0.08	-0.03	-0.09	-0.20	-0.64	-0.12
Industry weighted average	0.00	0.01	-0.52	-0.31	-0.12	-0.30	-0.49	0.08	-0.03	-0.10	-0.20	-0.65	
Accession countries													
Croatia		-0.01	-1.01	-0.48	-0.17		-0.97	0.14	0.01	-0.13	-0.30	-1.10	-0.20
Czech Republic	0.02	-0.04	-0.78	-0.38	-0.07	-0.18	-0.74	0.10	0.11	-0.01	-0.13	-0.97	-0.07
Hungary	0.01	-0.02	-0.84	-0.44	-0.12	-0.33	-0.80	0.12		-0.08	-0.22	-1.03	-0.16
Lithuania	0.02	-0.04	-0.77	-0.38			-0.74	0.10	0.11	-0.01	-0.13	-0.97	-0.11
Poland	0.01	-0.02	-0.86	-0.44	-0.12	-0.32	-0.80	0.12	0.06	-0.07	-0.21	-1.05	-0.13
Slovakia	0.01	-0.02	-0.85	-0.45		-0.35		0.12	0.04	-0.08	-0.23	-1.04	-0.12
Slovenia	0.02	-0.05	-0.72	-0.34	-0.03		-0.69	0.09	0.15	0.04	-0.07	-0.91	-0.07
Industry weighted average	0.01	-0.02	-0.83	-0.43	-0.10	-0.29	-0.79	0.11	0.08	-0.06	-0.19	-1.01	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.12: Single Market productivity effects of counterfactual policy scenarios across member states and industries, SOLVIT - intra-EU trade potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.00	0.00	1.71	1.44	0.10	0.03	1.08	0.47	0.00	-0.10	0.57	1.67	0.31
Denmark	0.00	-0.04	2.00	1.72	0.17	0.05	1.23	0.60	-0.04	-0.19	0.93	1.86	0.38
Finland	0.00	-0.05	2.09		0.17	0.05	1.27	0.63	-0.06	-0.14	0.95	1.85	0.34
France	0.00	0.00	1.78	1.57		0.04		0.50		-0.13	0.68	1.74	0.46
Italy	0.00	-0.03		1.77	0.16			0.60		-0.21	0.90	1.93	0.44
Netherlands		0.00	1.73	1.55	0.11		1.09	0.49	0.00	-0.15	0.65	1.73	0.47
Portugal	0.00		1.80	1.58	0.12		1.12	0.51	-0.01	-0.15		1.75	0.31
Spain				1.62	0.13	0.04		0.53	-0.01	-0.15	0.74	1.79	0.41
Sweden	0.00	-0.02	1.86	1.58		0.04	1.15	0.53	-0.02	-0.14	0.74	1.75	0.37
Industry weighted average	0.00	-0.01	1.81	1.60	0.13	0.04	1.13	0.53	-0.02	-0.15	0.74	1.78	
Accession countries													
Croatia		0.01	3.53	2.54	0.18		2.24	0.89	0.00	-0.20	1.09	2.99	0.72
Czech Republic	0.01	0.07	2.71	2.02	0.08	0.02	1.71	0.64	0.06	-0.01	0.48	2.63	0.41
Hungary	0.00	0.03	2.95	2.32	0.14	0.04	1.85	0.76		-0.12	0.81	2.81	0.52
Lithuania	0.01	0.07	2.70	2.02			1.71	0.64	0.06	-0.02	0.48	2.64	0.55
Poland	0.00	0.04	2.99	2.31	0.13	0.04	1.86	0.75	0.03	-0.11	0.78	2.86	0.48
Slovakia	0.00	0.03	2.97	2.34		0.04		0.77	0.03	-0.13	0.84	2.83	0.53
Slovenia	0.01	0.10	2.50	1.81	0.04		1.61	0.56	0.09	0.06	0.26	2.48	0.45
Industry weighted average	0.00	0.05	2.89	2.23	0.11	0.04	1.82	0.71	0.04	-0.09	0.70	2.77	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.13: Single Market competition effects of counterfactual policy scenarios across member states and industries, transposition-trade diversion potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.00	-0.01	0.05	0.09	0.07	0.13	0.04	-0.04	0.01	0.04	0.03	0.04	0.02
Denmark	0.00	0.00	0.03	0.05	0.02	0.04	0.02	-0.02	0.00	0.01	0.01	0.02	0.01
Finland	0.00	0.00	0.04		0.04	0.07	0.03	-0.03	0.00	0.02	0.02	0.03	0.01
France	0.00	0.00	0.04	0.06		0.07		-0.03		0.02	0.02	0.03	0.01
Italy	0.00	-0.01		0.09	0.07			-0.04		0.03	0.03	0.03	0.01
Netherlands		0.00	0.04	0.06	0.03		0.03	-0.03	0.00	0.01	0.01	0.03	0.01
Portugal	0.00		0.07	0.14	0.11		0.05	-0.07	0.01	0.06		0.05	0.03
Spain				0.06	0.04	0.08		-0.03	0.00	0.02	0.02	0.03	0.02
Sweden	0.00	0.00	0.04	0.06		0.07	0.03	-0.03	0.00	0.02	0.02	0.03	0.01
Industry weighted average	0.00	0.00	0.04	0.07	0.05	0.08	0.03	-0.04	0.00	0.02	0.02	0.03	
Accession countries													
Croatia													
Czech Republic	0.00	-0.02	0.17	0.38	0.22	0.35	0.14	-0.15	0.02	0.11	0.07	0.15	0.05
Hungary	0.00	-0.01	0.16	0.35	0.19	0.31	0.13	-0.14		0.10	0.06	0.14	0.08
Lithuania	0.00	-0.01	0.14	0.31			0.11	-0.11	0.01	0.07	0.05	0.13	0.02
Poland	0.00	-0.02	0.17	0.41	0.24	0.38	0.13	-0.16	0.02	0.13	0.08	0.15	0.06
Slovakia	0.00	-0.01	0.14	0.31		0.23		-0.12	0.01	0.07	0.05	0.13	0.02
Slovenia	0.00	-0.02	0.17	0.41	0.23		0.14	-0.16	0.02	0.12	0.08	0.16	0.06
Industry weighted average	0.00	-0.02	0.16	0.38	0.23	0.34	0.13	-0.15	0.02	0.11	0.07	0.15	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing

Table B4.14: Single Market productivity effects of counterfactual policy scenarios across member states and industries, transposition-trade diversion potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.00	0.02	-0.16	0.00	-0.08	0.00	-0.10	-0.14	0.10	0.07	-0.17	-0.46	-0.07
Denmark	0.00	0.00	-0.09	0.00	-0.03	0.00	-0.06	-0.07	0.02	0.01	-0.06	-0.29	-0.03
Finland	0.00	0.01	-0.11		-0.05	0.00	-0.08	-0.10	0.05	0.04	-0.10	-0.36	-0.02
France	0.00	0.01	-0.12	0.00		0.00		-0.10		0.04	-0.10	-0.35	-0.06
Italy	0.00	0.01		0.00	-0.08			-0.13		0.07	-0.18	-0.40	-0.08
Netherlands		0.01	-0.11	0.00	-0.04		-0.07	-0.09	0.04	0.03	-0.09	-0.33	-0.04
Portugal	0.00		-0.20	0.00	-0.13		-0.13	-0.20	0.17	0.12		-0.60	-0.05
Spain				0.00	-0.05	0.00		-0.09	0.06	0.04	-0.10	-0.34	-0.04
Sweden	0.00	0.01	-0.11	0.00		0.00	-0.08	-0.10	0.05	0.04	-0.10	-0.36	-0.03
Industry weighted average	0.00	0.01	-0.12	0.00	-0.06	0.00	-0.09	-0.11	0.06	0.05	-0.12	-0.37	
Accession countries													
Croatia													
Czech Republic	0.00	0.05	-0.53	0.00	-0.26	0.01	-0.38	-0.47	0.22	0.22	-0.47	-1.92	-0.03
Hungary	0.00	0.03	-0.50	0.00	-0.22	0.01	-0.35	-0.42		0.19	-0.42	-1.84	-0.23
Lithuania	0.00	0.02	-0.44	0.00			-0.32	-0.36	0.09	0.13	-0.32	-1.65	-0.16
Poland	0.00	0.04	-0.53	0.00	-0.28	0.01	-0.37	-0.49	0.24	0.25	-0.52	-1.95	-0.10
Slovakia	0.00	0.02	-0.45	0.00		0.01		-0.36	0.10	0.14	-0.32	-1.67	-0.08
Slovenia	0.00	0.04	-0.54	0.00	-0.27		-0.38	-0.48	0.23	0.24	-0.52	-2.02	-0.24
Industry weighted average	0.00	0.04	-0.50	0.00	-0.26	0.01	-0.36	-0.46	0.20	0.21	-0.46	-1.88	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.15: Single Market competition effects of counterfactual policy scenarios across member states and industries, infringements – trade diversion potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.00	-0.01	0.07	0.12	0.09	0.18	0.05	-0.06	0.01	0.05	0.04	0.05	0.03
Denmark	0.00	0.00	0.03	0.04	0.02	0.02	0.02	-0.02	0.00	0.00	0.01	0.02	0.00
Finland	0.00	0.00	0.03		0.02	0.04	0.03	-0.02	0.00	0.00	0.01	0.02	0.00
France	0.00	-0.01	0.07	0.11		0.17		-0.06		0.04	0.03	0.04	0.02
Italy	0.00	-0.01		0.16	0.14			-0.08		0.06	0.05	0.05	0.03
Netherlands		-0.01	0.05	0.07	0.05		0.03	-0.04	0.01	0.02	0.02	0.03	0.02
Portugal	0.00		0.06	0.10	0.07		0.04	-0.05	0.01	0.03		0.04	0.02
Spain				0.14	0.12	0.22		-0.07	0.02	0.06	0.04	0.05	0.05
Sweden	0.00	0.00	0.04	0.05		0.06	0.03	-0.03	0.00	0.01	0.01	0.03	0.01
Industry weighted average	0.00	-0.01	0.05	0.11	0.10	0.16	0.04	-0.06	0.01	0.04	0.03	0.04	
Accession countries													
Croatia													
Czech Republic	0.00	-0.01	0.16	0.38	0.21	0.32	0.13	-0.14	0.01	0.10	0.06	0.15	0.04
Hungary	0.00	-0.01	0.16	0.37	0.20	0.31	0.13	-0.14		0.10	0.06	0.15	0.08
Lithuania	0.00	0.00	0.14	0.31			0.11	-0.11	0.01	0.06	0.04	0.13	0.02
Poland	0.00	-0.03	0.20	0.51	0.33	0.51	0.16	-0.20	0.03	0.17	0.11	0.18	0.08
Slovakia	0.00	-0.01	0.16	0.37		0.30		-0.14	0.01	0.09	0.06	0.15	0.03
Slovenia	0.00	-0.01	0.15	0.33	0.15		0.12	-0.12	0.01	0.07	0.05	0.14	0.04
Industry weighted average	0.00	-0.02	0.17	0.42	0.26	0.40	0.14	-0.16	0.02	0.12	0.08	0.16	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.16: Single Market productivity effects of counterfactual policy scenarios across member states and industries, infringements-trade diversion potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.00	0.03	-0.21	0.00	-0.11	0.01	-0.13	-0.19	0.17	0.09	-0.24	-0.59	-0.09
Denmark	0.00	0.00	-0.09	0.00	-0.02	0.00	-0.06	-0.06	0.01	0.00	-0.04	-0.27	-0.03
Finland	0.00	0.00	-0.10		-0.03	0.00	-0.07	-0.07	0.03	0.01	-0.06	-0.31	-0.02
France	0.00	0.03	-0.22	0.00		0.01		-0.19		0.09	-0.23	-0.57	-0.12
Italy	0.00	0.03		0.00	-0.16			-0.24		0.13	-0.35	-0.63	-0.14
Netherlands		0.02	-0.14	0.00	-0.06		-0.09	-0.12	0.08	0.04	-0.13	-0.40	-0.04
Portugal	0.00		-0.18	0.00	-0.09		-0.11	-0.15	0.12	0.07		-0.50	-0.04
Spain				0.00	-0.13	0.01		-0.22	0.21	0.12	-0.28	-0.62	-0.08
Sweden	0.00	0.01	-0.11	0.00		0.00	-0.08	-0.09	0.05	0.02	-0.09	-0.35	-0.03
Industry weighted average	0.00	0.03	-0.17	0.00	-0.11	0.01	-0.10	-0.18	0.11	0.08	-0.23	-0.53	
Accession countries													
Croatia													
Czech Republic	0.00	0.03	-0.51	0.00	-0.25	0.01	-0.36	-0.44	0.18	0.20	-0.43	-1.94	-0.05
Hungary	0.00	0.03	-0.51	0.00	-0.23	0.01	-0.35	-0.44		0.19	-0.43	-1.93	-0.24
Lithuania	0.00	0.01	-0.44	0.00			-0.31	-0.35	0.07	0.12	-0.30	-1.69	-0.16
Poland	0.00	0.07	-0.63	0.00	-0.38	0.02	-0.43	-0.62	0.37	0.34	-0.70	-2.30	-0.11
Slovakia	0.00	0.03	-0.50	0.00		0.01		-0.43	0.16	0.18	-0.41	-1.90	-0.07
Slovenia	0.00	0.02	-0.46	0.00	-0.18		-0.33	-0.37	0.10	0.14	-0.33	-1.79	-0.19
Industry weighted average	0.00	0.05	-0.54	0.00	-0.31	0.01	-0.39	-0.50	0.25	0.24	-0.52	-2.05	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.17: Single Market competition effects of counterfactual policy scenarios across member states and industries, TRIS - trade diversion potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.00	0.01	0.00	-0.03	-0.05	-0.07	0.00	0.01	-0.01	-0.03	-0.01	0.00	-0.02
Denmark	0.00	0.01	0.01	-0.02	-0.04	-0.06	0.01	0.01	-0.01	-0.02	-0.01	0.00	-0.01
Finland	0.00	0.00	0.02		0.00	0.00	0.02	-0.01	0.00	0.00	0.00	0.01	0.00
France	0.00	0.01	0.00	-0.03		-0.07		0.02		-0.03	-0.01	0.00	-0.01
Italy	0.00	0.01		-0.06	-0.08			0.02		-0.04	-0.02	-0.01	-0.02
Netherlands		0.00	0.01	0.00	-0.02		0.01	0.00	0.00	-0.01	-0.01	0.01	-0.01
Portugal	0.00		0.02	0.03	0.00		0.02	-0.01	0.00	0.00		0.02	0.00
Spain				-0.05	-0.06	-0.09		0.02	-0.01	-0.04	-0.02	0.00	-0.03
Sweden	0.00	0.00	0.01	0.00		-0.03	0.01	0.00	0.00	-0.02	-0.01	0.01	0.00
Industry weighted average	0.00	0.01	0.01	-0.03	-0.05	-0.07	0.01	0.01	0.00	-0.03	-0.01	0.00	
Accession countries													
Croatia		0.00	0.09	0.25	0.10		0.06	-0.07	0.00	0.06	0.03	0.10	0.03
Czech Republic	0.00	0.00	0.11	0.23	0.08	0.13	0.09	-0.08	0.00	0.04	0.03	0.11	0.01
Hungary	0.00	0.00	0.11	0.20	0.05	0.08	0.09	-0.07		0.02	0.02	0.10	0.02
Lithuania	0.00	0.00	0.11	0.22			0.09	-0.08	0.00	0.03	0.02	0.10	0.01
Poland	0.00	0.00	0.11	0.23	0.07	0.12	0.09	-0.08	0.00	0.03	0.03	0.10	0.02
Slovakia	0.00	0.01	0.10	0.17		0.03		-0.06	-0.01	0.00	0.01	0.09	0.00
Slovenia	0.00	0.00	0.12	0.24	0.08		0.10	-0.08	0.00	0.04	0.03	0.11	0.02
Industry weighted average	0.00	0.00	0.11	0.22	0.07	0.10	0.09	-0.08	0.00	0.03	0.02	0.10	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.18: Single Market productivity effects of counterfactual policy scenarios across member states and industries, TRIS - trade diversion potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.00	-0.02	-0.01	0.00	0.05	0.00	-0.01	0.04	-0.09	-0.06	0.10	-0.02	0.00
Denmark	0.00	-0.01	-0.02	0.00	0.05	0.00	-0.02	0.03	-0.07	-0.05	0.08	-0.04	-0.01
Finland	0.00	0.00	-0.06		0.00	0.00	-0.04	-0.02	-0.02	0.00	0.00	-0.17	-0.02
France	0.00	-0.02	0.00	0.00		0.00		0.05		-0.06	0.10	0.01	0.02
Italy	0.00	-0.01		0.00	0.09			0.07		-0.08	0.15	0.08	0.04
Netherlands		-0.01	-0.04	0.00	0.02		-0.03	0.00	-0.04	-0.03	0.04	-0.11	-0.02
Portugal	0.00		-0.06	0.00	0.00		-0.04	-0.03	-0.01	0.01		-0.20	-0.02
Spain				0.00	0.07	0.00		0.06	-0.10	-0.08	0.12	0.04	0.01
Sweden	0.00	-0.01	-0.03	0.00		0.00	-0.02	0.01	-0.05	-0.03	0.04	-0.10	-0.02
Industry weighted average	0.00	-0.02	-0.02	0.00	0.06	0.00	-0.02	0.04	-0.06	-0.05	0.10	-0.02	
Accession countries													
Croatia		0.01	-0.27	0.00	-0.11		-0.17	-0.23	0.04	0.13	-0.22	-1.31	-0.14
Czech Republic	0.00	0.00	-0.35	0.00	-0.09	0.00	-0.26	-0.25	0.00	0.07	-0.18	-1.36	-0.08
Hungary	0.00	-0.01	-0.34	0.00	-0.06	0.00	-0.25	-0.22		0.04	-0.12	-1.28	-0.12
Lithuania	0.00	0.00	-0.35	0.00			-0.26	-0.24	-0.01	0.06	-0.16	-1.33	-0.14
Poland	0.00	0.00	-0.34	0.00	-0.08	0.00	-0.25	-0.24	-0.01	0.07	-0.17	-1.31	-0.09
Slovakia	0.00	-0.02	-0.30	0.00		0.00		-0.17	-0.08	0.00	-0.06	-1.17	-0.10
Slovenia	0.00	0.00	-0.36	0.00	-0.09		-0.27	-0.26	0.00	0.07	-0.19	-1.40	-0.14
Industry weighted average	0.00	0.00	-0.33	0.00	-0.08	0.00	-0.25	-0.23	-0.02	0.05	-0.15	-1.30	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.19: Single Market competition effects of counterfactual policy scenarios across member states and industries, SOLVIT - trade diversion potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.00	0.00	0.03	0.05	0.02	0.04	0.02	-0.02	0.00	0.01	0.01	0.02	0.01
Denmark	0.00	0.00	0.04	0.09	0.06	0.09	0.03	-0.04	0.00	0.03	0.02	0.03	0.01
Finland	0.00	-0.01	0.05		0.10	0.16	0.04	-0.05	0.01	0.06	0.03	0.04	0.02
France	0.00	0.00	0.03	0.05		0.04		-0.02		0.01	0.01	0.02	0.01
Italy	0.00	0.00		0.06	0.03			-0.02		0.01	0.01	0.02	0.01
Netherlands		0.00	0.02	0.02	0.00		0.02	-0.01	0.00	0.00	0.00	0.02	0.00
Portugal	0.00		0.03	0.04	0.02		0.02	-0.02	0.00	0.01		0.02	0.00
Spain				0.05	0.02	0.04		-0.02	0.00	0.01	0.01	0.02	0.01
Sweden	0.00	0.00	0.03	0.07		0.07	0.02	-0.03	0.00	0.02	0.01	0.03	0.01
Industry weighted average	0.00	0.00	0.03	0.05	0.02	0.05	0.02	-0.02	0.00	0.01	0.01	0.02	
Accession countries													
Croatia		0.00	0.08	0.17	0.05		0.06	-0.06	0.00	0.02	0.02	0.09	0.01
Czech Republic	0.00	0.00	0.10	0.19	0.04	0.07	0.09	-0.07	0.00	0.01	0.02	0.10	0.01
Hungary	0.00	0.00	0.11	0.20	0.06	0.09	0.09	-0.07		0.02	0.02	0.10	0.02
Lithuania	0.00	0.00	0.10	0.19			0.09	-0.07	0.00	0.01	0.02	0.10	0.01
Poland	0.00	0.00	0.10	0.19	0.05	0.08	0.09	-0.07	0.00	0.02	0.02	0.09	0.01
Slovakia	0.00	0.00	0.11	0.20		0.09		-0.07	0.00	0.02	0.02	0.10	0.01
Slovenia	0.00	0.00	0.10	0.18	0.03		0.09	-0.06	0.00	0.01	0.01	0.09	0.01
Industry weighted average	0.00	0.00	0.10	0.19	0.05	0.08	0.08	-0.07	0.00	0.02	0.02	0.10	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

Table B4.20: Single Market productivity effects of counterfactual policy scenarios across member states and industries, SOLVIT – trade diversion potentials, % change

	10-12	13-15	16	17-18	20-21	22	23	24-25	26-27	28-33	29-30	31-32	Country weight. average
EU15													
Belgium	0.00	0.00	-0.09	0.00	-0.03	0.00	-0.06	-0.06	0.01	0.02	-0.05	-0.29	-0.04
Denmark	0.00	0.01	-0.12	0.00	-0.07	0.00	-0.08	-0.11	0.05	0.06	-0.12	-0.41	-0.04
Finland	0.00	0.02	-0.15		-0.12	0.01	-0.10	-0.17	0.11	0.11	-0.20	-0.55	-0.02
France	0.00	0.00	-0.09	0.00		0.00		-0.07		0.02	-0.06	-0.29	-0.05
Italy	0.00	0.00		0.00	-0.04			-0.07		0.03	-0.08	-0.27	-0.04
Netherlands		0.00	-0.07	0.00	0.00		-0.05	-0.04	-0.01	-0.01	-0.01	-0.22	-0.03
Portugal	0.00		-0.08	0.00	-0.02		-0.06	-0.06	0.00	0.01		-0.27	-0.03
Spain				0.00	-0.03	0.00		-0.06	0.02	0.02	-0.06	-0.28	-0.03
Sweden	0.00	0.01	-0.10	0.00		0.00	-0.07	-0.09	0.03	0.04	-0.09	-0.35	-0.03
Industry weighted average	0.00	0.00	-0.09	0.00	-0.03	0.00	-0.06	-0.07	0.02	0.02	-0.06	-0.28	
Accession countries													
Croatia		0.00	-0.24	0.00	-0.06		-0.16	-0.18	-0.01	0.03	-0.12	-1.10	-0.12
Czech Republic	0.00	-0.01	-0.32	0.00	-0.05	0.00	-0.24	-0.21	-0.04	0.02	-0.11	-1.22	-0.09
Hungary	0.00	-0.01	-0.34	0.00	-0.07	0.00	-0.25	-0.23		0.04	-0.14	-1.29	-0.13
Lithuania	0.00	-0.01	-0.32	0.00			-0.24	-0.21	-0.05	0.02	-0.11	-1.22	-0.13
Poland	0.00	-0.01	-0.32	0.00	-0.06	0.00	-0.24	-0.22	-0.03	0.03	-0.13	-1.22	-0.09
Slovakia	0.00	-0.01	-0.34	0.00		0.00		-0.23	-0.03	0.04	-0.14	-1.29	-0.09
Slovenia	0.00	-0.01	-0.32	0.00	-0.04		-0.24	-0.20	-0.06	0.01	-0.09	-1.21	-0.12
Industry weighted average	0.00	-0.01	-0.31	0.00	-0.06	0.00	-0.23	-0.21	-0.04	0.03	-0.12	-1.23	

Source: ESRI estimates based on trade potentials estimated by WIFO.
Notes: 10-12: Food, beverages, tobacco; 13-15: Textiles, wearing apparel, leather products; 16: Wood and products of wood and cork; 17-18: Pulp, paper, printing, publishing; 20-21: Chemicals and pharmaceuticals; 22: Rubber and plastic products; 23: Non-metallic mineral products; 24-25: Basic and fabricated metals; 26-27: Computer, electronic, electrical and optical products; 28-33: Machinery; 29-30:Transport equipment; 31-32: Furniture, other manufacturing.

10. REFERENCES

Acemoglu, D., Aghion, P., Griffith, R., Zillibotti, F. (2010), "Vertical Integration and Technology: Theory and Evidence", Journal of the European Economic Association, 8(5), pp. 989-1033.

Acemoglu, D., Aghion, P., Zilibotti, F. (2004), "Distance to Frontier, Selection, and Economic Growth", NBER Working Paper, (9066).

Acemoglu, D., Johnson, S. (2004), "Unbundling Institutions", Journal of Political Economy, CXIII, pp. 949-995.

Acemoglu, D., Johnson, S., Mitton, T. (2009), "Determinants of Vertical Integration: Financial Development and Contracting Costs", Journal of Finance, LXIV(3), pp. 1251-1290.

Ahn, S. (2002), "Competition, Innovation and Productivity Growth: A Review of Theory and Evidence", OECD Economics Department Working Papers, (317).

Alfaro, L., Antràs, P., Chor. D., Conconi, P. (2015), "Internalising Global Value Chains: A Firm-Level Analysis", NBER Working Paper, (21582).

Allen, T., Arkolakis, C., Takahashi, Y. (2018), "Universal gravity", manuscript.

Altomonte, C., Favoino, D., Sonno, T. (2018), "Markups and Productivity under Heterogeneous Financial Frictions",BAFFI CAREFIN Centre Research Paper, (2018-100).

Anderson, J. E., van Wincoop, E. (2003), "Gravity with gravitas: A solution to the border puzzle", American Economic Review, 93(1), pp. 170-192.

Antràs, P. (2003). "Firms, Contracts, and Trade Structure", Quarterly Journal of Economics, 118(4), pp. 1375-1418.

Antràs, P., Chor, D. (2013), "Organising the Global Value Chain", Econometrica, 81(6), pp. 2127-2204.

Antràs, P., Fort, T.C., Tintelnot, F. (2017), "The Margins of Global Sourcing: Theory and Evidence from U.S. Firms", American Economic Review, 107(9), pp. 2514-64.

Antràs, P., Helpman, E. (2004), "Global Sourcing", Journal of Political Economy, CXII, pp. 552–580.

Antràs, P., Yeaple, S.R. (2013), "Multinational Firms and the Structure of International Trade", NBER Working Papers, (18775).

Arkolakis, C., Costinot A., Rodríguez-Clare, A. (2012), "New Trade Models, Same Old Gains?", American Economic Review, 102(1), pp. 94-130.

Arkolakis, C., Costinot, A., Donaldson, D., Rodríguez-Clare, A. (2019), "The Elusive Pro-Competitive Effects of Trade", The Review of Economic Studies, 86(1), pp. 46-80.

Atkeson, A., Burstein, A. (2008), "Pricing-to-Market, Trade Costs, and International relative Prices", American Economic Review, 102(1), pp. 1998-2031.

Bajgar, M., Berlingieri, G., Calligaris, S., Criscuolo, C., Timmis, J. (2019), "Industry Concentration in Europe and North America", OECD Productivity Working Papers, (2019-18).

Baldwin, R.E., Venables, A.J. (1995), "Regional economic integration", Handbook of International Economics, Volume 3, pp. 1597-1644.

Barkai, S. (2016), "Declining Labor and Capital Shares", University of Chicago, New Working Paper Series, (2).

Bartelsman, E.,Haltiwanger, J., Scarpetta, St. (2013), "Cross-Country Differences in Productivity: The Role of Allocation and Selection", American Economic Review, 103(1), pp. 305–334.

Beck, Th. (2003), "Financial Dependence and International Trade", Review of International Economics, 11(2), pp. 296–316.

Behrens, K., Mion, G., Murata, Y., Südekum, J. (2014), "Trade, wages, and productivity", International Economic Review, 55(4), pp. 1305-1348.

Bellone, F., Musso, P., Nesta, L., Warzynski, F. (2014), "International trade and firm-level markups when location and quality matter", Journal of Economic Geography, 16(1), pp. 67-91.

Bergstrand, J.H., Larch, M., Yotov, Y.V. (2015), "Economic integration agreements, border effects, and distance elasticities in the gravity equation", European Economic Review 78(1), pp. 307-327.

Bernard, A.B., Eaton, J., Jensen, J.B., Kortum, S. (2003), "Plants and Productivity in International Trade", American Economic Review, 93(4), pp. 1268-1290.

Böheim, M.H., Friesenbichler, K.S. (2016), "Exporting the Competition Policy Regime of the European Union: Success or Failure? Empirical Evidence for Acceding Countries", Journal of Common Market Studies, 54(3), pp. 569–582.

Borchardt, K.D. (2010), The ABC of European Union Law, Publications Office of the European Union Luxembourg.

Braconier, H., Pisu, M. (2013), "Road Connectivity and the Border effect: Evidence form Europe", OECD Economics Department Working Papers, (1073).

Brakman, St., Garretsen, H., Kohl, T. (2018), "Consequences of Brexit and options for a "Global Britain"", Papers in Regional Science 97(1), pp. 55-72.

Buccirossi, P., Ciari, L., Duso, T., Spagnolo, G., Vitale, C. (2011), " Measuring the deterrence properties of competition policy: The competition policy indexes", Journal of Competition Law and Economics, 7(1), pp. 165–204.

Calligaris, S., Criscuolo, C., Marcolin, L. (2018), "Mark-ups in the digital era", OECD Science, Technology and Industry, Working Papers, (2018/10).

Cecchini, P., Catinat, M., Jacquemin, A. (1988), The Benefits of a Single Market, Wildwood House.

Chen, N., Imbs, J., Scott, A. (2009), "The dynamics of trade and competition", Journal of International Economics, 77(1), pp. 50-62.

Chor, D. (2010), "Unpacking sources of comparative advantage: A quantitative approach", Journal of International Economics 82(2), pp.152–167.

Constantinescu, C., Mattoo, A., Ruta, M. (2017), "Does vertical specialisation increase productivity?", World Bank, Policy Research Working Paper, (7978).

Costinot, A., Rodríguez-Clare, A. (2014), "Trade Theory with Numbers: Quantifying the Consequences of Globalisation", in Gopinath, G., Helpman, E., Rogoff, K., Handbook of International Economics, Volume 4, Elsevier, B.V.

Cuñat, A., Melitz, M.J. (2012), "Volatility, labor market flexibility, and the pattern of comparative advantage", Journal of the European Economic Association, 10(2), pp. 225-254.

De Loecker, J., Eeckhout, J. (2018a), "The Rise of Market Power and the Macroeconomic Implications", NBER Working Paper, (23687).

De Loecker, J., Fuss, C., Van Biesebroeck, J. (2018b), "Markup and price dynamics: linking micro to macro", National Bank of Belgium, Working Paper Research, (357).

De Loecker, J., Goldberg, P.K., Khandelwal, A.K., Pavcnik, N. (2016), "Prices, markups, and trade reform", Econometrica, 84(2), pp. 445-510.

Dhingra, S., Huang, H., Ottaviano, G., Pessoa, J.P., Sampson, Th., Van Reenen, J. (2017), "The costs and benefits of leaving the EU: Trade effects", Economic Policy, 32(92), pp. 651-705.

Di Ubaldo, M., Siedschlag, I. (2018), "Determinants of Firms' Inputs Sourcing Choices: The Role of Institutional and Regulatory Factors", ESRI Working Paper, (599).

Djankov, S., La Porta, R., Lopez-de-Silanes, F., Shleifer, A. (2003), "Courts", Quarterly Journal of Economics, CXVIII, pp. 453-517.

Dutz, M.A., Vagliasindi, M. (2000), "Competition Policy Implementation in Transition Economies: An Empirical Assessment", European Economic Review, 44(4–6), pp. 762–72.

Eaton, J., Kortum, S. (2002), "Technology, Geography, and Trade", Econometrica, 70(5), pp. 1741-1779.

EBRD (2013), "Transition Report 2013: Stuck in Transition?", EBRD Publications.

Egger, P., Larch., M. (2008), "Interdependent preferential trade agreement memberships: An empirical analysis", Journal of International Economics 76(2), pp. 384-399.

Egger, P., Tarlea, F. (2015), "Multi-way clustering estimation of standard errors in gravity models", Economic Letters 134(1), pp. 144-147.

EPRS (European Parliamentary Research Service) (2016), A strategy for completing the Single Market: the trillion euro bonus, Report of the High-Level Panel of Experts to the IMCO Committee, European Added Value Unit.

European Commission (1985), Completing the Internal Market: White paper from the Commission to the European Council, Milan, 28-29 June, (COM/85/0310 FINAL).

European Commission (1997), The Single Market Review Studies, Brussels.

European Commission (2003), The Internal Market - Ten Years Without Frontiers, http://ec.europa.eu/internal_market/top_layer/historical_overview/docs/workingdoc_en.pdf.

European Commission (2007), "Quantitative Assessment of Structural Reforms: Modelling the Lisbon strategy", Economic papers, (282), http://ec.europa.eu/economy_finance/publications/pages/publication9583_en.pdf.

European Commission (2015A), COM(2015) 550 final: Upgrading the Single Market: more opportunities for people and business, Communication from the Commission to the European parliament, The Council, the European Economic and Social Committee of the Regions, https://ec.europa.eu/transparency/regdoc/rep/1/2015/EN/1-2015-550-EN-F1-1.PDF.

European Commission (2015B), Directorate-General for Internal Market, Industry, Entrepreneurship and SME, Single Market Integration and Competitiveness in the EU and its Member States, Report.

European Commission (2016), Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Single Market Integration and Competitiveness, Report.

European Commission (2017A), Impact assessment accompanying the document: Proposal for a Regulation of the European Parliament and of the Council laying down rules and procedures for compliance with and enforcement of Union harmonisation legislation on products, Commission Staff Working Document, SWD(2017) 466 final https://ec.europa.eu/transparency/regdoc/rep/10102/2017/EN/SWD-2017-466-F1-EN-MAIN-PART-1.PDF.

European Commission (2017B), REFIT Evaluation. Accompanying the document: Proposal for a Regulation of the European Parliament and of the Council laying down rules and procedures for compliance with and enforcement of Union harmonisation legislation on products, Commission Staff Working Document, SWD(2017) 469 final PART 3/3 https://ec.europa.eu/info/sites/info/files/mark_surv_swd_2017_469_p3.pdf.

European Commission (2017C), Inception Impact Assessment on the initiative of achieving more and better mutual recognition for the Single Market for goods, http://ec.europa.eu/smart-regulation/roadmaps/docs/2017_grow_005_mutual_recognition_revision_en.pdf.

European Commission (2017D), Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs, Single Market integration and competitiveness in the EU and its Member States 2017, https://ec.europa.eu/growth/content/single-market-integration-and-competitiveness-eu-and-its-member-states-2017_en.

European Commission (2017E), The Goods Package: Reinforcing trust in the Single Market, Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee, COM(2017) 787 final, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52017DC0787&from=EN.

European Commission (2017F), Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL laying down rules and procedures for compliance with and enforcement of Union harmonisation legislation on products and amending Regulations, COM (2017)795, https://eur-lex.europa.eu/legal-content/EN/HIS/?uri=COM:2017:795:FIN.

European Commission (2017G), Proposal for a REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the mutual recognition of goods lawfully marketed in another Member State, COM (2017)796, https://eur-lex.europa.eu/legal-content/EN/HIS/?uri=COM:2017:0796:FIN.

European Commission (2018), Single Market Scoreboard 07/2018, http://ec.europa.eu/internal_market/scoreboard/governance_cycle/index_en.htm.

Feenstra, R.C., Inklaar, R., Timmer, M.P. (2015), "The Next Generation of the Penn World Table" American Economic Review, 105(10), pp. 3150-3182.

Félix, S., Maggi, C. (2019), "What is the Impact of Increased Business Competition?", Banco de Portugal, Economics and Research Department, Working Papers, (4).

Friesenbichler, K., Peneder, M. (2016), "Innovation, competition and productivity", Economics of Transition, 24(3), pp. 535–580.

Friesenbichler, K.S. (2014), "EU Accession, Domestic Market Competition and Total Factor Productivity. Firm Level Evidence", WIFO Working Papers, (492).

Friesenbichler, K.S. (2018), "Does EU-Accession Affect Domestic Market Structures and Firm Level Productivity?", Empirica, https://doi.org/10.1007/s10663-018-9423-9.

Friesenbichler, K.S., Böheim, M., Laster, D.C. (2014), "Market Competition in Transition Economies: A Literature Review", WIFO Working Papers, (477).

Goldberg, P.K., Verboven, F. (2005), "Market Integration and Convergence to the Law of One Price: Evidence from the European Car Market", Journal of International Economics, 65(1), pp. 49-73.

Grabbe, H. (2002), "European Union Conditionality and the Acquis Communautaire", International Political Science Review,23(3), pp. 249–268.

Gradzewicz, M., Mućk, J. (2019), "Globalization and the fall of markups", NBP Working Paper, (304).

Greene, W.H. (2003), Econometric Analysis, 5th Edition, Upper Saddle River, N.J, Prentice Hall.

Grossman, G., Helpman, E. (2002). "Integration versus Outsourcing in Industry Equilibrium", Quarterly Journal of Economics, 117(1), pp. 85-120.

Grossman, S.J., Hart, O.D. (1986), "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration", Journal of Political Economy, 94(4), pp. 691-719.

Guillou, S., Nesta, L. (2017), "Mark-up heterogeneity, export status and the establishment of the Euro", GREDEG Working Paper, (2017-35).

Hart, O.D., Moore, J. (1990), "Property Rights and the Nature of the Firm", Journal of Political Economy, 98(6), pp. 1119-1158.

Havrylyshyn, O. (2013), Is the Transition over? , A Definition and Some Measurements, Handbook of the Economics and Political Economy of Transition, London, Routledge

Heid, B., Larch, M., Yotov, Y.V. (2015), "A Simple Method to Estimate the Effects on Non-discriminatory Trade Policy within Structural Gravity Models", unpublished.

Hölscher, J., Stephan, J. (2009), "Competition and Antitrust Policy in the Enlarged European Union: A Level Playing Field?",Journal of Common Market Studies, 47(4), pp. 863–889.

Ilzkovitz, F., Dierx, A., Kovacs, V., Sousa, N. (2007), "Steps towards a deeper economic integration: The Internal Market in the 21st century. A contribution to the Single Market Review", Ecfin Economic Paper, (271).

Imbs, J., Mejan, I. (2017), "Trade Elasticities", Review of International Economics, 25(2), pp. 383-402.

Kancs, D. (2007), "Does Economic Integration Affect the Structure of Industries? Empirical Evidence from the CEE", Economic Systems Research, 19(1), pp. 73–97.

Kaufmann, D., Kraay, A., Mastruzzi, M. (2011), "The worldwide governance indicators: methodology and analytical issues", Hague Journal on the Rule of Law, 3(02), pp. 220–246.

Kornai, J. (1992), "The Postsocialist Transition and the State: Reflections in the Light of Hungarian Fiscal Problems", American Economic Review, 82(2), pp. 1–21.

Krieger-Boden, Ch., Soltwedel, R. (2013), "Identifying European Economic Integration and Globalization: A Review of Concepts and Measures", Regional Studies, 47(9), pp. 1425–42.

Krugman, P. (1980), "Scale Economies, Product Differentiation, and the Pattern of Trade", American Economic Review, 70(5), pp. 950-959.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., Vishny, R.W. (1997), "Legal Determinants of External Finance", Journal of Finance, LII(3), pp. 1131–1150.

Larch, M., Wanner, J., Yotov, Y.V. (2018), "Bi- and unilateral trade effects of joining the Euro", Economics Letters, 171(1), pp. 230-234.

Lerner, J., Schoar, A. (2005), "Does Legal Enforcement Affect Financial Transactions? The Contractual Channel in Private Equity", Quarterly Journal of Economics, CXX, pp. 223–246.

Levchenko, A.A. (2007), "Institutional Quality and International Trade", Review of Economic Studies, 74(3), pp. 791-819.

London Economics, PwC (2013), The cost of non-Europe: the untapped potential of the European Single Market, Final Report, London/Luxembourg.

Lukach, R., Marschinski, R., Bakhtieva, D., Mraz, M., Temurshoev, U., Eder, P., Sancho, L.D. (2015), EU Petroleum Refining Fitness Check: Impact of EU Legislation on Sectoral Economic Performance, JRC Science for Policy Report.

Lyons, B. (ed., 2009), Cases in European Competition Policy, Cambridge University Press.

Manova, K. (2013), "Credit constraints, heterogeneous firms, and international trade", Review of Economic Studies, 80(2), pp. 711-744.

Martin, St. (2012), "Market structure and market performance", Review of Industrial Organization, (40)2, pp. 87-108.

Mayer, T., Melitz, M.J., Ottaviano, G.I. (2014), "Market Size, Competition, and the Product Mix of Exporters", American Economic Review, 104(2), pp. 495-536.

Mayer, T., Vicard, V., Zignago, S. (2018), "The Cost of Non-Europe, Revisited", CEPII Working paper, (2018-06-April).

Mayer, Th., Zignago, S. (2011), "Notes on CEPII"s distances measures: The GeoDist database", CEPII Working Paper, (2011-25).

Melitz, M.J. (2003), "The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity", Econometrica, 71(6), pp. 1695–1725.

Melitz, M.J., Ottaviano, G.I. (2008), "Market size, trade, and productivity", The Review of Economic Studies, 75(1), pp. 295-316.

Mertens, M. (2019), "Micro-mechanisms behind declining labour shares: Market power, production processes, and global competition", IWH-CompNet Discussion Papers, (3).

Monti, M. (2010), A new strategy for the Single Market, Report to the President of the European Commission José Manuel Barroso, May 10, http://ec.europa.eu/bepa/pdf/monti_report_final_10_05_2010_en.pdf.

Motta, M. (2004), Competition Policy: Theory and Practice, Cambridge University Press.

Murphy, G., Siedschlag, I., McQuinn, J. (2017), "Employment Protection and Industry Innovation", Industrial and Corporate Change, 26(3), pp. 379-398,

Nunn, N. (2007), "Relationship-specificity, Incomplete Contracts, and the Patterns of Trade", The Quarterly Journal of Economics, 122(2), pp. 569-600.

Nunn, N., Trefler, D. (2013), "Domestic Institutions as a Source of Comparative Advantage", NBER Working Papers, (18851).

Oberhofer, H., Pfaffermayr, M. (2017), "Estimating the trade and welfare effects of Brexit: A panel data structural gravity model", CESifo Working Paper, (6828).

Olley, G.S., Pakes, A. (1996), "The Dynamics of Productivity in the Telecommunications Equipment Industry", Econometrica, 94(6), pp. 1263–1297.

Pacchioli, C. (2011), "Is the EU internal market suffering from an integration deficit? Estimating the home-bias effect", CEPS working document, (348).

Pelkmans, J., Correia de Brito, A. (2012), Enforcement in the EU Single Market, Centre for European Policy Studies (CEPS), Brussels.

Pelkmans, J., Renda, A., Alcidi, C., Luchetta, G., Timini, J. (2014), Indicators for Measuring the Performance of the Single Market – Building the Single Market Pillar of the European Semester, Study for the IMCO Committee, Directorate-General for Internal Policy, Economic and Scientific Policy Department, European Union.

Petrin, A., Poi, B.P., Levinsohn, J. (2004), "Production function estimation in Stata using inputs to control for unobservables", Stata Journal, 2004, 4(2), pp. 113–123.

Quah, D., Rauch, J. (1990), Openness and the Role of Economic Growth, MIT, Cambridge.

Rajan, R., Zingales, L. (1998), "Financial Dependence and Growth", American Economic Review, 88(3), pp. 559-586.

Romalis, J. (2004), "Factor Proportions and the Structure of Commodity Trade", American Economic Review, 94(1), pp. 67-97.

Rytz, K.B., Sylvest, J., Culver, J., Teichler, T, Kosk, K., Männik, K. (2015), Evaluation of the application of the mutual recognition principle in the field of goods, Document has been prepared for the European Commission (Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs).

Salas, V., San Juan, L., Vallés, J. (2018), "Corporate cost and profit shares in the euro area and the US: The same story?", Banco de España, Documentos de Trabajo, (1833).

Saliola, F., Seker, M., "Total Factor Productivity Across the Developing World", Enterprise Surveys, 2011, (23).

Santos Silva, J.M.C., Tenreyro, S. (2006), "The log of gravity", Review of Economics and Statistics 88(4), pp. 641-658.

Schimmelfennig, F., Sedelmeier, U. (2004), "Governance by Conditionality: EU Rule Transfer to the Candidate Countries of Central and Eastern Europe", Journal of European Public Policy, 11(4), pp. 661–79.

Syverson, C. (2011), "What determines productivity?", Journal of Economic Literature, 49(2), pp. 326-365.

Timmer, M.P., Dietzenbacher, E., Los, B., Stehrer, R., de Vries, G.J. (2015), "An illustrated user guide to the World Input–Output Database: The case of global automotive production", Review of International Economics, 23(3), pp. 575-605.

Timmer, M.P., Erumban, A.A., Los, B., Stehrer, R., De Vries, G.J. (2014), "Slicing up global value chains", Journal of Economic Perspectives, 28(2), pp. 99-118.

Voigt, St. (2009), "The Effects of Competition Policy on Development – Cross-Country Evidence Using Four New Indicators", The Journal of Development Studies, 45(8), pp. 1225–1248.

Williamson, O. (1975), Markets and Hierarchies: Analysis and Antitrust Implications, Free Press, New York.

Williamson, O. (1985), The Economic Institutions of Capitalism, Free Press, New York.

WTO (2012), A Practical Guide to Trade Policy Analysis, Geneva.

Ye, M., Meng, B., Wei, S.-J. (2015), "Measuring smile curves in global value chains," Institute of Developing Economies, Japan External Trade Organization (JETRO), IDE Discussion Papers, (530).

Yotov, Y.V. (2012), "A Simple Solution to the Distance Puzzle in International Trade", Economics Letters, 117(3), pp. 794-798.

Yotov, Y.V., Piermartini, R., Monteiro, J.-A., Larch, M. (2016), An advanced guide to trade policy analysis: The structural gravity model, World Trade Organisation, Geneva.