



Trade benefits of the EU and the Internal Market

The EU has reduced trade costs. This has led to more trade within the EU, which has increased the GDP of the Netherlands by 3.1%, making the country one of those that benefit the most from EU trade. The positive impact of EU integration has increased over time.

Nearly all EU Member States benefit from the EU's positive impact on trade in goods and services - this is particularly true for the more recent entrants from Central and Eastern Europe. The European Union often has a negative impact on non-EU countries through trade diversion.

CPB Communication

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Trade benefits of the European Union

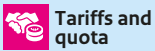
Thanks to the EU, trade costs have been reduced. This leads to more trade within the EU, leading to a 3.1% increase in GDP in the Netherlands

Trade costs with the EU

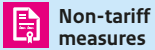
The shorter the physical distance between countries, the lower the trade costs. Low trade costs lead to larger trade flows.



Trade costs consist of:

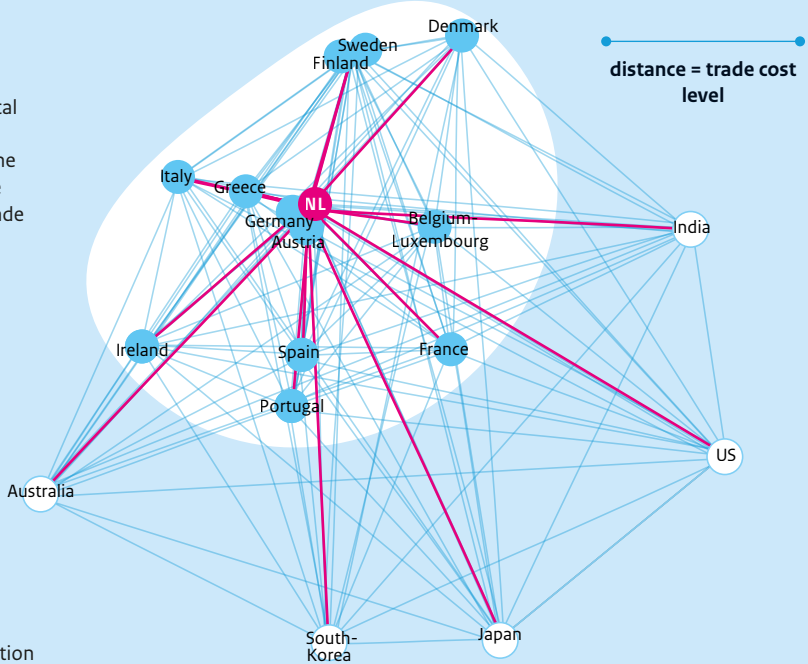


Tariffs and quota



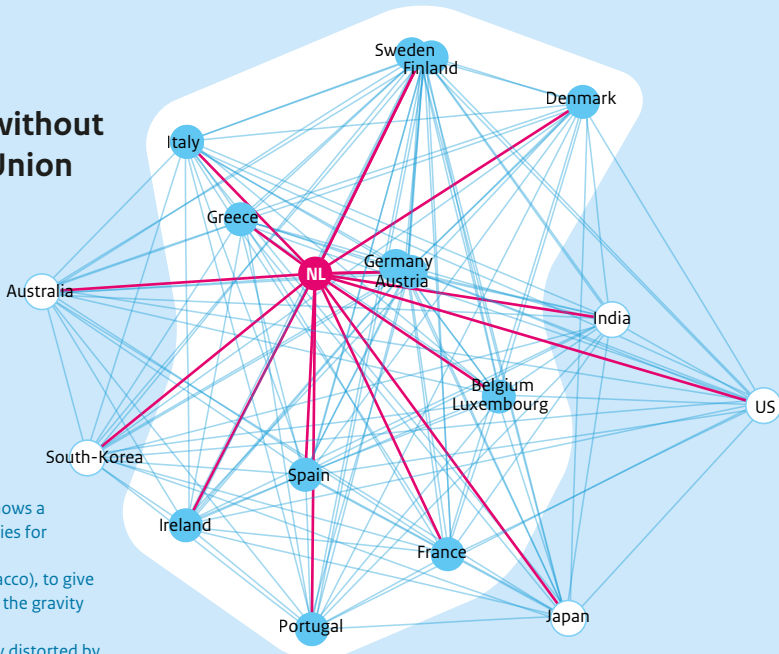
Non-tariff measures

- Standardisation
- Rules and regulations



Trade costs without a European Union

Without the EU, the distance between countries would increase due to higher trade costs.



This network diagram shows a small selection of countries for a representative sector



(food and tobacco), to give an idea of how the gravity model works.

Distances may be slightly distorted by the graphical translation to reduce overlap.

Summary

In this publication, we examine the trade benefits of the European Union as a whole, and specifically those of the Internal Market, for the Netherlands and other EU Member States. This study was conducted at the request of the Ministry of Foreign Affairs in response to the motion by Dutch Senate member Backer and others, requesting an update of earlier CPB research on the benefits of the EU Internal Market (Straathof et al., 2008). This study focuses on quantifying the benefits of the increase in the trade in goods and services.

For the Netherlands, the benefits of EU trade amount to 3.1% of GDP, placing the country amongst those that have benefited the most from the increase in EU trade. The trade benefits are calculated by comparing actual trade flows with an alternative scenario of trade between EU Member States under World Trade Organization rules. Apart from other EU regulations, the European Internal Market, which guarantees the free movement of goods and services within the EU, is particularly important for the Netherlands. It is responsible for almost 80% of Dutch trade benefits. The Netherlands is unique in this respect; in other EU Member States, this percentage is much lower.

The trade benefits are substantial for nearly all EU Member States. EU trade has benefits for all Member States except Finland, although there are differences between Member States. For example, benefits are large for many of the more recent EU entrants in Central and Eastern Europe and more limited for countries such as Italy and Greece. Trade benefits increase over time — not only because increasing economic integration further reduces trade costs, but also because the European Union continues to grow in size and therefore has an equally growing internal market for goods and services.

Countries outside the European Union benefit little in the way of EU trade or even lose out as a result of trade diversion. Export volumes of these countries decline as it becomes cheaper for EU Member States to trade with each other; non-EU countries, thus, are relatively more expensive. However, for countries that are closely integrated in the EU and the European Internal Market, such as Norway, there are substantial trade benefits, although a full EU membership would result in greater average trade benefits than being a member of only the Internal Market.

We used CPB's gravity model to outline the EU trade benefits (Bollen et al., 2020). Using this trade model, we estimated the partial impact of economic integration in the European Union on the trade in goods and services. This was done for various phases of economic integration that could be distinguished in EU history, including the European Internal Market. These results were then used for estimating an overall equilibrium effect of the EU's impact on the trade in goods and services as well as on GDP.

Our estimation of the EU impact is probably too conservative. Sectoral dependencies were not included, although recent literature shows that the benefits from increased trade are not only for the directly involved sector itself, but also for suppliers from other sectors. In addition, we did not take into account the possible increase in productivity due to increased trade. The literature shows that a reduction in trade costs within the European Union leads to more competition between EU businesses. This in turn may lead to more innovation and greater productivity and, ultimately, to higher levels of economic growth. It is therefore conceivable that the trade benefits of the EU and the Internal Market are greater than in our current estimates.

1 Introduction

1.1 Reason and scope of this study

The reason for conducting this study was a motion by Dutch Senate member Backer and others requesting the Dutch Government to commission one or more statutory advisory bodies to investigate the costs and benefits of EU membership for the Netherlands, preferably from a broad welfare perspective.¹ The government subsequently asked CPB to carry out this study,² which examines the EU's impact in general and that of the European Internal Market in particular, on the trade in goods and services, for the Dutch economy. This study is also, as requested in the motion, an update of the 2008 CPB study on the benefits of the European Internal Market (Straathof et al., 2008).

The analysis does not involve all of the economic effects of EU membership, but focuses only on the direct impact of the reduction in trade costs for goods and services within the European Union. The European Union consists of much more than the European Internal Market for goods and services; it is an economic and political cooperation of 27 EU Member States. The Internal Market, in itself, also consists of more than the free movement of goods and services. Therefore, we briefly discuss the other two pillars of the Internal Market: the effect of the free movement of people (migration) and capital (the euro and foreign direct investments).

There is a relatively small amount of literature containing econometric estimates of the broad socio-economic benefits of EU membership. Most studies focus on the benefits of the Internal Market and of the euro in terms of trade liberalisation. Few studies use broad trade and other benefits to examine the EU's impact on income and overall welfare (Campos et al., 2014; Crafts, 2015). Campos et al. (2019) estimate a broader EU effect, but this comes at the expense of providing further details. For example, they do not distinguish between the benefits of trade, investments and migration.

1.2 The EU benefits for the trade in goods and services

This study quantifies the trade benefits of the EU and the Single Market for the trade in goods and services. For this study, we examined the impact of the EU on the trade in goods since 1965 and on trade in services since 2000.³ We did not explicitly examine several other factors, such as migration, the euro and foreign direct investment (FDI). These are discussed in qualitative terms to give an idea of the possible impact of the EU.

The Netherlands is amongst the countries that have benefited the most from the increase in EU trade, with long-term trade gains of 3.1% of GDP (Figure 1). The Netherlands is a small open economy and therefore benefits greatly from the low costs related to the trade with other EU Member States. Only Ireland, Belgium–Luxembourg and some more recent entrants in Central and Eastern Europe generate higher trade benefits. For all countries, the benefits of the European Union are increasing over time. This is not only because of the stronger economic integration and the related reduction in trade costs, but also because the EU

¹ Submitted by Dutch Senate member Jhr. mr. J.P. Backer (Parliamentary document 35 403, F) ([link](#))

² See the letter to parliament by the Minister of Foreign Affairs, dated 22 Feb. 2021 (35 403 P) ([link](#))

³ As the source data for services trade before 2000 are less complete, we only use data from 2000 onwards. See also Section 2.5.

is expanding and there are increasing numbers of Member States to trade with, at very low cost. For the Netherlands, especially, the Internal Market seems to be quite important with respect to the trade in goods, because it explains almost 80% of the total added value effect of the EU. For other Member States, this is less the case and other elements of the European Union also deliver important trade benefits for them.

For countries outside the European Union the picture is different. For these countries, trade diversion often causes the European Union to have a negative impact on trade. This occurs because it becomes cheaper for EU Member States to trade with each other and, therefore, the trade with non-EU countries becomes relatively more expensive. However, this is not the case for non-EU countries that are strongly integrated in the European Union, such as Norway, which has substantial EU trade benefits — although recent research nevertheless shows that, for Norway, these benefits would have been even greater if it had become a full member of the European Union (Campos et al., 2021).

This study does not take the Brexit into account, as good quality data are only available up to 2017. The United Kingdom will therefore be consistently included as an EU Member in this study. It is likely that the total benefits of the European Union for the Netherlands will be slightly lower due to the Brexit, as the United Kingdom is an important trading partner for the Netherlands and, generally speaking, the European Union has decreased in size.

The impact of EU trade has probably been estimated conservatively. The CPB gravity model not yet makes use of so-called sectoral linkages, which would allow dependencies between sectors to be taken into account. For example, increased demand for cars due to a decrease in trade costs benefits not only the Dutch car industry but also Dutch suppliers from other sectors such as the metal and rubber industry. The inclusion of sectoral dependencies in gravity models is still a relatively recent innovation, but results from the academic literature (not specifically for the Netherlands) show that modelling sectoral linkages increases the estimated trade benefit (Costinot and Rodríguez-Clare, 2014; Mayer et al., 2019).

In addition, the gravity model does not take account of the possible dynamic impact on economic growth due to increased productivity as a result of trade (Mayer et al., 2019). For example, increasing economic integration and the associated reduction in trade costs may increase international competition between companies, which will keep only the most innovative and productive firms in business and ultimately increases productivity at the macro level (Melitz, 2003).⁴

Previous literature contains similar or higher estimates of EU trade benefits. In earlier CPB research, Straathof et al. (2008) estimate an EU effect of between 4% and 6% of GDP for the Netherlands. However, these estimates were obtained using a different method. This makes it difficult to compare the results of both studies. Straathof et al. (2008) use a growth equation to quantify the effect of trade openness. This method has fallen into disuse because it is nearly impossible to demonstrate a causal relationship between policy and economic growth (Rodrik, 2012).

For this study, we used a more recently developed method: the gravity model. The literature has strongly increased since Anderson and Van Wincoop (2003) came up with a theoretical foundation for the gravity equation. At present, this is one of the best methods available for estimating trade benefits. More recent literature using similar gravity models shows results that are closer to our estimate. For example, Head and Mayer (2021) estimate a GDP effect of around 3%. At the same time, these authors show that the effect would

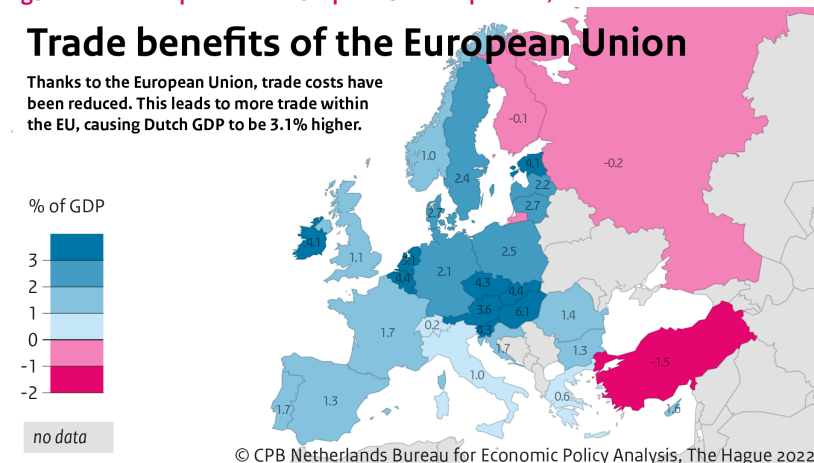
⁴ However, it is not said that the relationship between competition and innovation is always linear. For example, Aghion et al. (2005) find a U-shaped relationship between the degree of competition and innovation.

be larger if the model included the effects of suppliers through sectoral linkages. Felbermayr et al. (2018) agree with that result.

Economic integration has not only positive trade benefits, there are also negative aspects of the ever stronger economic integration.⁵ Substantial redistributive effects may arise within countries as a result of economic integration. This may lead to increased inequality between regions and various groups within the population. While, on the other hand, the benefits of reducing trade costs rapidly diminish as trade costs approach zero.⁶ For example, as a result of China joining the World Trade Organization (WTO), unemployment is higher and wages are lower in regions in the United States and Europe with relatively more firms competing with imports from China (Autor et al., 2013).⁷ Finally, economic integration leads to more limited scope for national policy, because stronger economic integration requires standardisation of laws and regulations between Member States. This was an important argument of Brexit proponents.

Recent research (Euwals et al., 2021) shows that, for the Netherlands, the redistributive effects resulting from exposure to import competition from China within the Netherlands are very limited.⁸ In general, the redistributive effects resulting from economic integration are not necessarily negative. In an extensive study, Eichengreen (2006) finds that European integration has led to substantial growth and productivity gains. In fact, it is the only group of countries with evidence of convergence; the spread of income levels across economies has decreased and relatively poor EU economies grew faster than the richer ones (also known as sigma and beta convergence). Redistributive effects and their consequences are not part of this study.

Figure 1 Trade impact of the European Union is positive, benefits for the Netherlands relatively high



Chapter 4 discusses these results in more detail. The underlying results can be found in Tables 8 and 9 of the appendix. The only EU Member State that experiences a negative effect is Finland, with a very small, statistically non-significant impact of -0.1. This effect is related to the forestry sector.

The rest of this report is constructed as follows. Chapter 2 briefly outlines the historical developments of economic integration in the European Union, divided into the three phases of integration: free trade, the Internal Market and the economic union. The remainder of this chapter explains the methodology (Section 2.4) and the data (Section 2.5) that were used to estimate the trade benefits of the European Union, as a whole, and of the Internal Market, in particular. Chapter 3 subsequently discusses the estimated partial effects⁹ of the

⁵ For example, see Rodrik (2021) for a detailed elaboration.

⁶ See Krugman et al. (2018) for a discussion on the subject. The study shows that the trade benefits from lowering trade costs are proportional to the square of the costs. Benefits, thus, decline as costs get closer to zero.

⁷ Dorn and Levell (2021) provide a recent overview of the literature.

⁸ This study uses the same method as Autor et al. (2013) and applies it to the Dutch data.

⁹ See Section 2.4 for a brief explanation of this term, also known as the *ceteris-paribus* effect. Chapter 8 contains a glossary of abbreviations and terminology used in this report, including this term.

European Union and the Internal Market on the trade in goods and services (see Sections 3.1 and 3.2, respectively). The results from the general equilibrium analysis are discussed in Chapter 4. Chapter 5 also briefly discusses the other two freedoms within the Internal Market: the free movement of persons and capital. Section 5.1 briefly discusses the costs and benefits of migration, followed by Section 5.2, where the trade benefits of the euro are discussed, and Section 5.3 that looks at the effect of EU membership on foreign direct investments (FDI). Finally, Chapter 6 provides a brief conclusion.

2 Measuring the trade benefits of the European Union

Our investigation distinguishes three phases of economic integration between Member States: (i) free trade, (ii) the Internal Market and (iii) the economic union. To promote trade, partner countries can enter into a free trade agreement in which they reduce or even abolish tariffs and import quotas. If these countries subsequently also decide to adopt a uniform trade policy towards third countries, a customs union is created. The combination of the first two forms the economic integration phase of free trade. In this phase, however, non-tariff measures (NTMs)¹⁰ may still restrict free trade. In the second phase of economic integration, NTMs on trade and restrictions on factor movements (labour and capital) between partner countries are abolished. This is what is known as an *internal* or *common market*. In addition, partner countries may also choose to cooperate in the area of economic policy. The related steps of economic integration are summarised here, under the third phase of economic integration: that of the *economic union*.¹¹

The three phases represent the most important developments in the European Union for the trade in goods and services, since its inception over 60 years ago. To distinguish the impact of the three phases, we used the fact that different phases started at different moments in EU history. For each phase, we looked at the impact on: the trade between EU Member States, the trade between EU Member States and non-EU countries, and the trade between non-EU countries (see Head and Mayer (2021), for a similar approach). These three phases of economic integration within the European Union are in turn composed of several smaller steps of economic integration, such as the customs union and the free trade agreement. However, our research design does not enable a distinction between all the various intermediate steps.

In our analysis, the three phases of integration are measured using so-called dummy variables, taking account of gradual implementation. For example, the dummy variable for the Internal Market indicates which country joined the Internal Market in what year. In this way, we are able to identify the entire impact of each of the three phases of integration without estimating the effects of each individual law or agreement. Thus, each dummy is an aggregate variable that includes several relevant regulations and agreements. Since not every phase of integration is introduced in one go, we also use delayed variables, which capture the effects of a gradual introduction for each of the three phases. Section 7.1 of the appendix provides a more detailed discussion of the method used.

¹⁰ Statistics Netherlands (CBS) defines NTBs as follows: ‘all other policy measures in addition to traditional import duties, which may have an economic impact on international trade in goods, on traded amount of prices, or both. There are a large number of diverse types of NTBs which can be divided into two main categories, (1) the technical measures that set standards for the quality and safety of products that supersede internationally set criteria, and (2) non-technical measures that regulate imports in terms of amounts or price.’ See [link](#).

¹¹ For an extensive explanation of the various economic integration phases, see Balassa (1961). For a focus on the European Union, see for example Baldwin and Wyplosz (2019) and Teulings (2017).

2.1 Free trade

The first step towards free trade was the 1957 Treaty of Rome, which removed trade barriers for goods and services. This was a treaty between the first six countries of what was then called the European Economic Community (EEC), a predecessor of the European Union (see Table 1). Article 3a of the Treaty of Rome set a timetable for the abolition of tariffs and quantitative restrictions by 1970. Before this treaty, these countries used to levy hefty tariffs on the imports between them; from 9.5% by the Benelux countries to 18.1% by France (Bown and Irwin, 2015; unweighted average tariffs in 1955). The aim of the Treaty of Rome was to achieve the four freedoms (free movement of goods, services, persons and capital). This is why, in the decades that followed, a growing number of member states attempted to achieve integration in the other dimensions.

In addition to abolishing mutual tariffs, a customs union was established in 1968. In this customs union, import duties were abolished for the goods between the six EEC countries (free trade agreement) and a common tariff was introduced on imports from third countries. The customs union was expanded with the accession of Denmark, Ireland and the United Kingdom in 1973, Greece in 1981 and Spain and Portugal in 1986, bringing the EEC to a total of 12 Member States.

In addition to free trade between EU Member States, the European Union also has economic cooperation and trade agreements with countries outside the EU. These treaties are often less extensive, compared to the cooperation between EU Member States; tariffs are not completely phased out and there is often no customs union. However, treaties may cover more than merely eliminating tariffs or import quotas. In total, the European Union has economic cooperation or trade agreements with 78 countries. The most prominent of which include Japan, Mexico, Canada, South Korea and Turkey. With Turkey, the European Union even has a customs union, since 1995. In 2021, following the Brexit, the European Union also entered into a trade and economic cooperation treaty with the United Kingdom. In addition, negotiations have been completed with another 24 countries for which only a treaty needs to be signed and/or implemented. Of these treaties, the one with the Mercosur countries¹² is the most important. The other countries with whom negotiations are ongoing include Australia, China and New Zealand. Negotiations with the United States were discontinued in 2016.

¹² Mercosur is a customs union between Brazil, Argentina, Uruguay, Paraguay and Venezuela (suspended since 2016) and associated member Bolivia.

Table 1 The Member States of the European Union

EU	Accession date	Countries	
EU-6	1958-01-01	Belgium	Italy
		Germany	Luxembourg
		France	Netherlands
EU-9	1973-01-01	Denmark	United Kingdom (withdrawal in 2020)
		Ireland	
EU-10	1981-01-01	Greece	
EU-12	1986-01-01	Portugal	Spain
EU-15	1995-01-01	Austria	Sweden
		Finland	
EU-25	2004-05-01	Cyprus	Lithuania
		Czech Republic	Malta
		Estonia	Poland
		Hungary	Slovakia
		Latvia	Slovenia
EU-27	2007-01-01	Bulgaria	Romania
EU-28	2013-07-01	Croatia	
EU-27	2020-01-01	Exit United Kingdom (31 January 2020) ¹³	

2.2 The Single Market

The European Commission’s White Paper, 'Completing the Single Market', published in 1985, was the prelude to the European Single Market. In the early 1980s, it became clear that lifting the trade tariff barriers had not resulted in a fully integrated EU market. Physical borders still hindered the flow of goods and various NTMs persisted due to national product regulations. Therefore, in 1985, the European Commission published its White Paper on 'Completing the Single Market'¹⁴ that set out the measures and timetable to achieve three goals:

- lifting material barriers,
- lifting technical barriers,
- lifting fiscal barriers.

These measures were laid down in the Single European Act of 1986 and implemented at the end of 1992, when the European Single Market became a reality. The function of the European Court of Justice was important here, especially with respect to policy harmonisation, as this court could enforce mutual recognition of product standards. Progress on the free movement of services, persons and capital went much slower, and would continue beyond 1992. It was not until 2006 that the Services Directive came into being, which ensures that service providers within the European Union are free to establish themselves or temporarily provide services in another Member State.¹⁵

The European Economic Area (EEA) was created in 1994, which expanded the Single Market by including countries in the European Free Trade Association (EFTA). EFTA was founded in 1960 by Austria, Denmark,

¹³ Despite the Brexit, we have included the United Kingdom in this research as a full member, because the data are only up to 2017.

¹⁴ See the EU website text ([link](#))

¹⁵ See the EU website text ([link](#))

Norway, Portugal, Sweden, Switzerland and the United Kingdom. Iceland and Finland joined later, in 1970 and 1986, respectively. The EFTA merged with the Single Market in 1994 to form the European Economic Area (EEA). However, EFTA countries have no say in the new regulations and directives that apply within the European Single Market to goods or services, for example, as these are determined solely by the EU Member States. Countries that would become members of the European Union automatically left the EFTA¹⁶ and, automatically, became part of the Single Market. Switzerland does not participate in the EEA but does have access to the European Single Market through a number of separate treaties. Austria, Finland and Sweden joined the European Union in 1995, after which the Single Market consisted of the EU Member States plus Norway and Iceland.¹⁷

Various expansions subsequently followed. In 2004, the EU was expanded by another 10 countries (Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia), followed by Romania, Croatia and Bulgaria, in 2007. The United Kingdom left the European Union in early 2020 (see Table 1).

2.3 Economic union

The economic union started as an economic collaboration, but also had political objectives. The European Coal and Steel Community (ECSC) Treaty of 1951 removed trade barriers (e.g. tariffs) for coal and steel and provided for cooperation in economic areas (e.g. investments) and legislation, following the establishment of the European Court of Justice in 1952. In addition, by cooperating in heavy industry, it was also hoped that, in the immediate aftermath of the Second World War, mistrust between former enemies could be overcome and a repeat of the First and Second World Wars could be avoided.

The European Union was officially established with the Maastricht Treaty coming into force in 1993. The Treaty led to the establishment of the European Central Bank and initiated the introduction of the euro as the single currency. The treaty also provided non-economic policies, such as a common foreign and security policy and cooperation in the fields of justice and security. A year later, in 1994, four freedoms were established: the free movement of people, goods, services and capital (although the free movement of some services was delayed).

The EU's main legislative measures consist of regulations that are binding and apply directly to all EU Member states, directives that harmonise legislation in the various EU Member States, and decisions that are binding only for the Member State or company to which they are addressed. These measures can be applied in various areas, ranging from trade legislation and business establishment to product liability, to name but a few. This cooperation strengthens the integration between EU Member States, which in turn may promote the further trade between them.

2.4 Two scenarios and the gravity model

We used a gravity model to analyse the impact on trade, according to two scenarios.¹⁸ The gravity model,

¹⁶ Currently, the four countries that make up the European Free Trade Association (EFTA) (i.e. Iceland, Liechtenstein, Norway and Switzerland) are not members of the European Union, but are partially committed to the EU's economy and regulations. The European Union, together with these countries, forms the European Economic Area (EEA). Within the EEA, there is free movement of goods, persons, services and capital (i.e. an internal market). Switzerland is not part of the EEA but participates in the Schengen Area and the European Internal Market through bilateral treaties.

¹⁷ And Liechtenstein.

¹⁸ See Bollen et al. (2020) for an extensive description of the gravity model used by CPB.

with renowned economist Jan Tinbergen as one of its founders, applies the analogy of gravity to trade flows.¹⁹ In short, it predicts the size of trade flows between two countries, based on the size of their economies and the distance between them. This distance can be measured in kilometres, but also as an economic, cultural or historical distance.²⁰ For the Netherlands, therefore, countries that are economically large and physically close to the Netherlands, such as Germany, will be important trading partners. This model can be used to analyse the two scenarios: (i) there is no European Union and all current Member States trade with each other on the basis of WTO regulations, and (ii) the European Union has no Single Market, but does have free trade and an economic union.

In the previous century, the gravity model was mainly an empirical success, but, at the beginning of this century, Anderson and Van Wincoop (2003) came up with a theoretical foundation. They introduced so-called multilateral trade costs, with trade not depending on the absolute distance between two countries, but on the relative distance to third countries. For example, Australia and New Zealand will trade relatively much with each other even though the absolute distance between them is still quite large, but compared to their distance to other countries they are relatively close together. In contrast, the Netherlands and Belgium are close, but because other countries, such as Germany, are also close, the Netherlands and Belgium will trade relatively little with each other, compared to the volumes traded between Australia and New Zealand. The European Union has, amongst other things, resulted in the economic distance to other Member States becoming even smaller and to more competition for Dutch exports to Belgium and vice versa.²¹

Trade costs, such as non-tariff measures (NTMs), can be considered barriers in distance — they make the trade between two countries more expensive. The Free Trade Agreement, the Single Market and the economic union have lowered trade costs for the Member States, resulting in more trade between them. This additional trade generates economic benefits in the form of value added (value of exports minus costs) and economic growth. Also see the infographic at the beginning of this publication which illustrates this distance.

For this study, we used the gravity model, because it has several advantages when investigating the impact of economic integration on trade and GDP. In the first place, the gravity model is simple and intuitive, compared to the larger general equilibrium models, such as WorldScan. All parameters can be estimated based on the data; it is, therefore, not necessary to 'pin down' parameters on the basis of the literature. The results of the gravity model can be very well explained by economic theory; it is not a 'black box', as is often the case with large complex models. Finally, we can exploit the central role that economic distance plays in the gravity model to estimate the impact of the Single Market and the European Union on trade. The simplicity of the gravity model also has some drawbacks; for example, it is difficult to include sectoral linkages, value chains and the dynamic effects of trade. This can lead to an underestimation of the impact of trade (e.g. Costinot and Rodríguez-Clare, 2014; Bekkers and Rojas-Romagosa, 2019).

The scenario analyses were conducted in two individual steps: estimation of the partial effect and the counterfactual analysis. In the first step, we used a gravity equation to estimate the individual impact of the three phases of the European Union (i.e. free trade within the European Union, the Single Market and economic union) on the trade in goods and services. This is also called the *ceteris paribus* effect; the impact on exports of, for example, joining the Single Market, everything else remaining unchanged. We do this by estimating so-called trade elasticities (the percentage change in exports due to a percentage change in a type

¹⁹ Gravity is the attracting force between two objects in space. This force is proportional to the product of the mass of both objects and inversely proportional to the distance between the two objects' centres of gravity squared.

²⁰ Statistics Netherlands (CBS), however, has calculated that economy size and distance, separately, explain a large part of the Dutch trade (Ramaekers and De Wit, 2012).

²¹ For an extensive literature overview of the gravity model, see Anderson (2011) and Head and Mayer (2014).

of trade cost), for the three phases of economic integration.²² The estimated partial effects for goods and services are presented in Sections 3.1 and 3.2. General equilibrium effects are included in step two.

In the second step, we used counterfactual analysis to calculate general equilibrium effects. Such an analysis compares the outcomes of a given intervention with the outcomes of the situation without that intervention. This enables identifying which part of the observed effect (in our case increased trade flows) is due to the intervention rather than due to other factors, such as general economic growth. Our first counterfactual scenario is: ‘What would have happened if there had been no EU?’ Here, we assumed that all three phases of economic integration had not taken place and that European countries trade with each other according to WTO regulations. Existing trade agreements between the current Member States and third countries are kept in place.²³ The second counterfactual scenario addresses: ‘What would have happened if there had been no European Single Market?’ Here, we assumed there is no Single Market between EU member states and EFTA countries. The other two phases of economic integration are still in place, so the Member States trade with each other under the free trade (FTA) and economic union agreements.

The counterfactual analyses take general equilibrium effects into account. The change in trade costs in both scenarios not only affects the trade between the countries directly involved, but also has an indirect effect on third countries. This is accounted for by the multilateral trade costs described above. In the scenarios, by ‘undoing’ the European Union or the Single Market, multilateral trade costs and thus trade prices and income were also affected in all countries. There may be trade diversion: third countries that were relatively expensive before EU disbandment, suddenly become less so, in a situation without the European Union. In the scenarios, part of the trade between current EU Member States would divert to third countries, such as the United States. The estimated general equilibrium effects are shown in Chapter 4.

2.5 Data

We used various trade data to estimate the partial effects and calculate the two scenarios. We used gross trade flows from various international input-output tables covering different periods. These tables have the advantage that, in addition to trade data, they also have information on domestic trade, i.e. domestic production consumed in the country itself. These data were used in our analysis to calculate the general equilibrium effects and are difficult to find in conjunction with international trade data.

The final data set for goods trade, with which the effects were estimated in the first step, contains 23 countries and 14 sectors over the 1965–2011 period; for services trade,²⁴ the data set contains 41 countries and 3 sectors over the 2000–2017 period. The data on the trade in goods were taken from the Long-Term WIOD database.²⁵ The advantage of this data set is its long time span, which allowed us to estimate the effects of the economic union and the Single Market, separately. For services, we used the regular WIOD²⁶ supplemented with Figaro²⁷ data, because the quality of the data on services trade before 2000 is poor. Due to this more limited period in which all EU Member States are also in the Single Market, we were unable to separately estimate the Single Market and the economic union effects for services. However, the period for the services data does continue up to 2017 instead of 2011.

²² See Section 7.1 of the appendix, for an elaborate explanation of the specification used in this analysis.

²³ Large exception is the Single Market between EFTA countries and the European Union, which is also terminated completely.

²⁴ This is an important addition to the analysis, compared to earlier publications (see Bollen et al., 2020).

²⁵ See Woltjer et al. (2021).

²⁶ See Timmer et al. (2015).

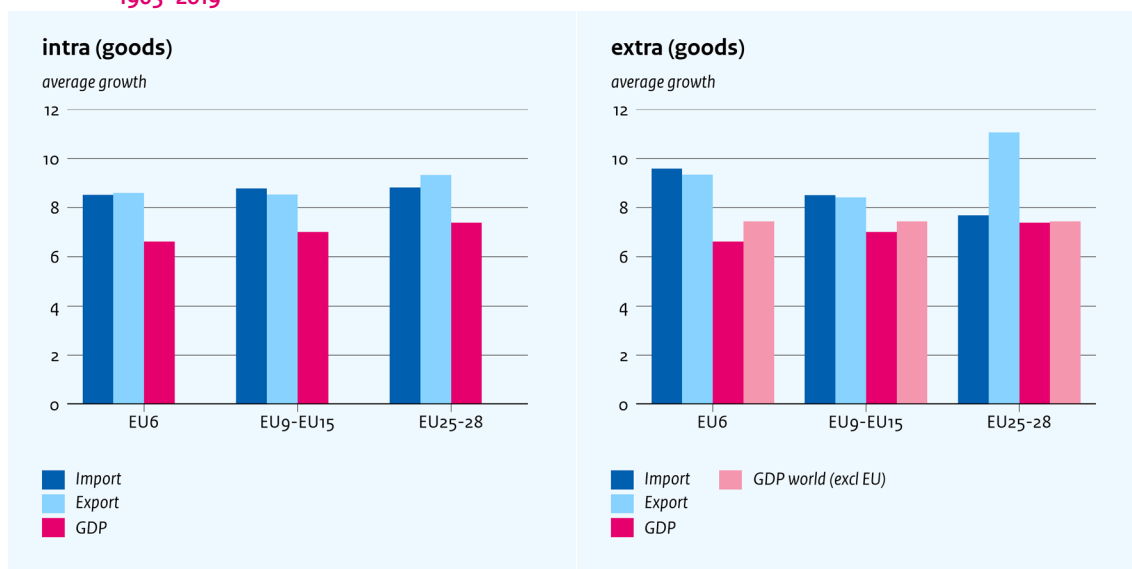
²⁷ See Rémond-Tiedrez and Rueda-Cantucho (2019).

In the second step, the counterfactual analysis, we used the WIOD/Figaro database. We carried out the counterfactual analysis for 2017 — the most recent year available. Here, we had 22 sectors available for goods, more sectors than in the first step, because several of them are merged in the LTWIOD database. In the scenario analysis, we assigned the same elasticity of substitution to sectors that were previously merged.

3 EU trade benefits: the partial impact

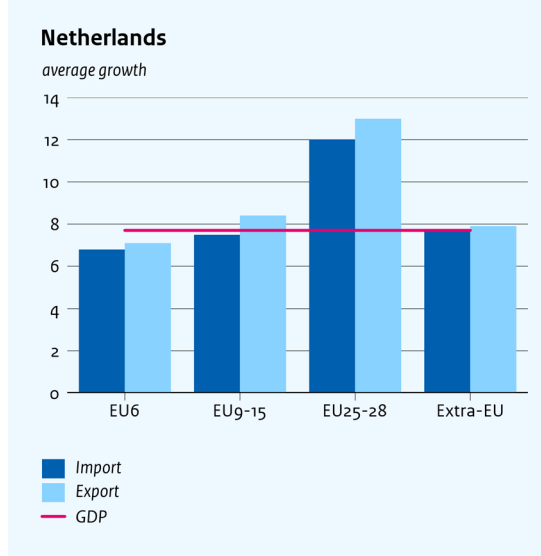
Both the internal and external EU trade in goods has increased substantially (see Figure 2). For the EU-6 and EU-9 – EU-15 Member States, the growth since 1965 is shown, whereas for the new Member States, EU-25 – EU-28, we only had data since 2002. In all cases, the growth in trade is greater than that in GDP (Figure 2). The figures for EU-6 – EU-15 depict long-term average growth, and, for EU-25 – EU-28, the period is shorter. Growth rates vary, significantly, between decades. The lower trade barriers due to EU accession have boosted trade between Member States, but the integration into the world market of emerging economies and the accompanying rapid economic growth, particularly in China, have also given an additional boost to both internal and external EU trade. External EU trade, therefore, has become more important, over time, and has led to higher growth rates in recent decades. In the Netherlands, too, recent decades have shown import and export exceeding GDP growth (Figure 3). In particular, the growth level for imports and exports to the new Member States (EU-25 – EU-28) has been high.

Figure 2 Growth in internal (left) and external (right) EU trade, import and export of goods, and average GDP growth, 1965–2019



Source: LTWIOD, Eurostat database and the World Bank. Figures for EU-25 – EU-28 are based on the 2002–2019 period. The data are in current prices. The series are up to 2019, when the United Kingdom left the European Union.

Figure 3 Growth in internal and external EU imports and exports of goods, between 1965 and 2019, for the Netherlands



Source: LTWIOD and Eurostat. Figures for EU-25 – EU-28 are based on the 2002–2019 period. The data are in current prices. The series are up to 2019, when the United Kingdom left the European Union.

The section below presents the estimated partial effects of both the European Single Market and the European Union as a whole on the trade in goods and services (Sections 3.1 and 3.2, respectively). The Single Market effect is an additional partial effect on top of the impact from the other two phases of economic integration. The additional partial effects of all three phases of economic integration are added together in the total EU effect. Section 7.3 of the appendix presents the underlying estimated elasticities for both goods and services, and Section 7.4 contains a few robustness analyses. The general equilibrium effects are subsequently described in Chapter 4, while Section 7.5 of the appendix presents the general equilibrium effects in more detail, for both goods and services.

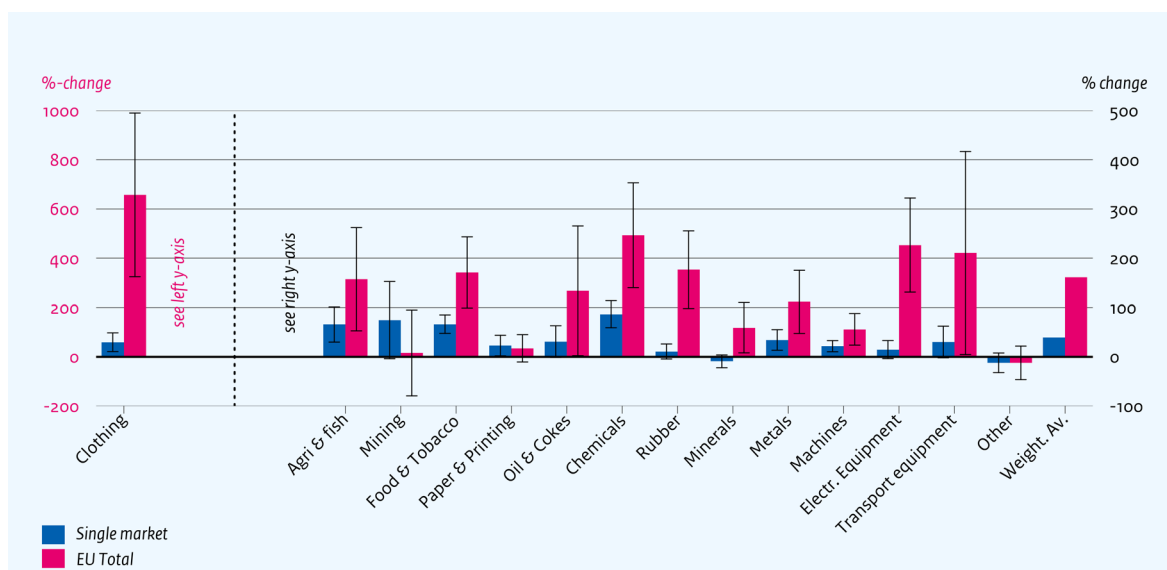
3.1 Goods

The European Single Market and the European Union as a whole (all three phases) have had a positive impact on trade in all EU Member States together, as indicated by the partial effects in Figure 4. For almost all sectors, there are positive effects of both the Single Market and the European Union as a whole. However, there are notable differences between sectors. For example, the impact is very large for the clothing industry, compared to other sectors, but there are also large impacts in other sectors. For example, the European Union has led to an increase in trade in processed foods by 177%, on average, and the Single Market has increased trade by an average 66%, compared to the trade in such goods between non-EU countries. The EU effect is significant for almost all sectors, at a 95% significance level. The Single Market effect is significant in half of the sectors. Table 4 in the appendix shows the underlying estimates.

The weighted averages²⁸ are positive for both the Single Market and the European Union over all goods sectors. The Single Market leads to 39% additional trade in goods between Member States, compared to non-member countries. For the total EU effect, this is even 161%. Free trade, the Single Market and the economic union, on average, show notably similar contributions to the European Union's overall impact.

²⁸ The weighted average was constructed using EU-15 production per sector, for 2015, from the WIOD database.

Figure 4 The European Union, as a whole, and the Single Market have had a positive impact on the trade in goods in nearly all sectors



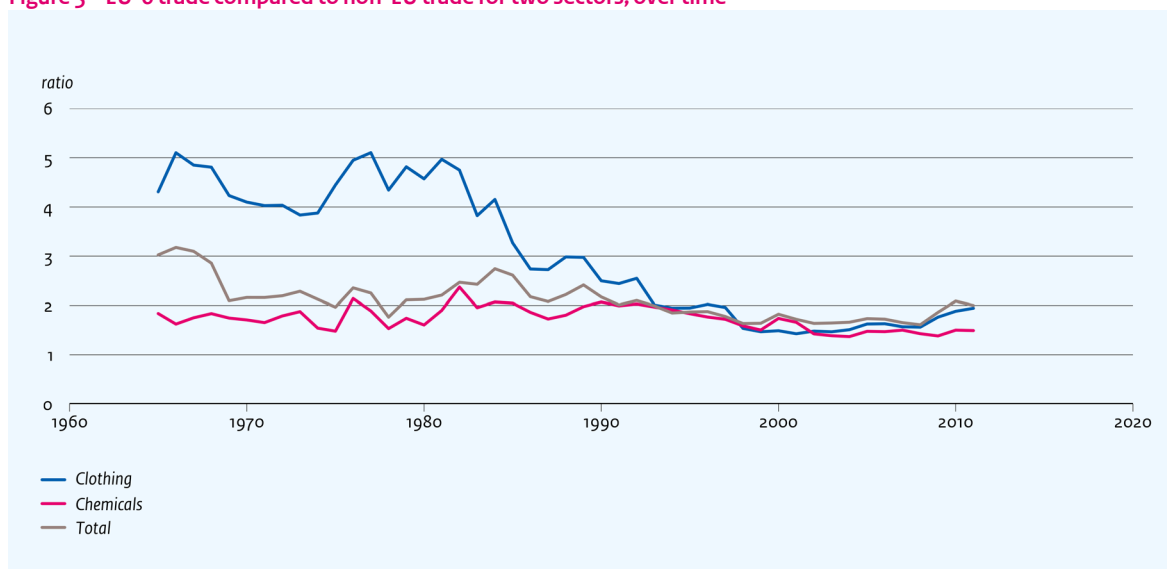
The additional partial impact of the Single Market, in %, is the estimated trade elasticity of the Single Market phase. The total EU effect is composed of the estimated partial trade elasticities of the three phases: free trade, Single Market and economic union. The whiskers represent 95% confidence intervals. These are approximated using the delta method and the standard errors of the trade elasticities clustered at the country-pair level. The mean is a weighted sum of the sector-specific estimates and therefore does not have its own confidence interval.

The estimated effects are large for some sectors, which is why we need to be able to actually see these effects in the raw trade data. Figure 5, therefore, looks at the realised ratios in trade between EU-6 Member States compared to the trade between countries where at least one of the two is not an EU Member State. We have done this for all sectors combined as well as separately for the two sectors with the largest estimated impact (i.e. the clothing and chemicals sectors).²⁹

The raw trade data in Figure 5 show that the estimated effects for the European Union as a whole are certainly not unrealistic. For the clothing industry, the average EU/non-EU ratio is around 3:1. The amount traded between EU Member States is triple the amount traded with non-EU Member States. With respect to chemicals, the ratio is around 2:1. Both are lower than the estimated effect and just outside the confidence intervals of our estimates in Figure 4. However, the total EU effect can be isolated much better in the estimates than could be done for the raw data, which may explain the deviation. The 3:1 average EU to non-EU ratio, for all sectors together, is just slightly above the average estimated effect shown in Figure 4. In all cases, a decline can be seen in this ratio from the mid-1980s onwards. This has two possible causes. First, the benefits of lowering trade costs will decline with the further phase-out of the costs and as they get closer to zero (Krugman et al., 2018). Second, the accession of new EU Member States has led to a shift in trade from the EU-6 to these new Member States.

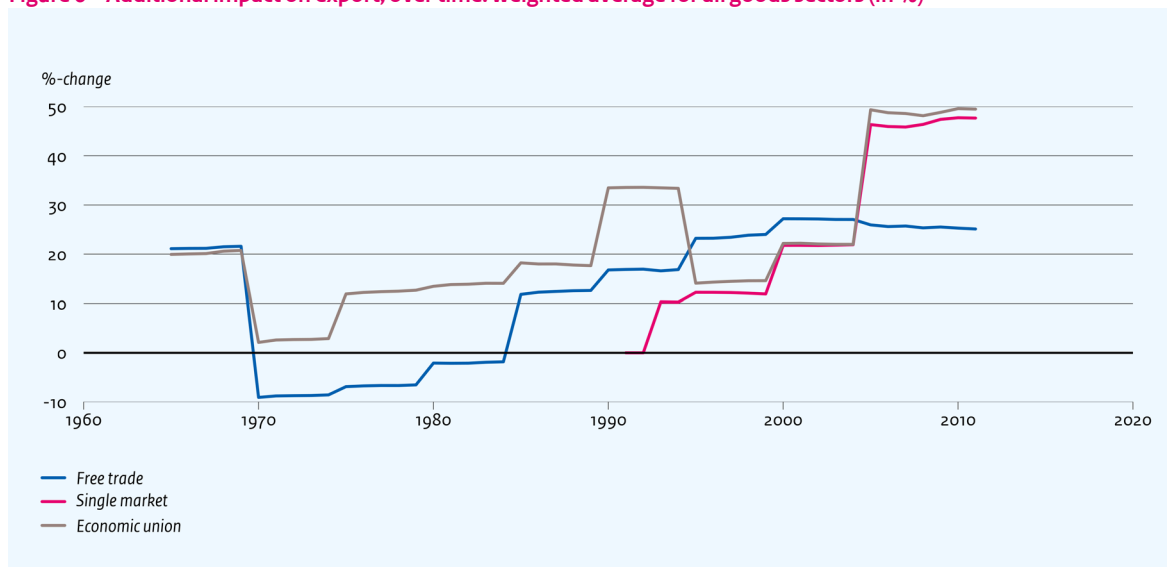
²⁹ We corrected the raw data for the general trend in exports and the developments in income and expenditures of the exporting and importing countries, respectively, so that the countries' economic size and change in their exports and imports do not distort the data. If we would not correct for these issues, countries such as the United States and China would distort the data, disproportionately (see the figure notes for a detailed technical description).

Figure 5 EU-6 trade compared to non-EU trade for two sectors, over time



Using the gravity model, we divided bilateral trade flows for each pair of countries by the exporter's average output and the importer's average expenditure and multiplied this by world output. Then we constructed the average EU-6 trade and non-EU trade per exporter and divided both series by the average trade flow. Finally, we calculated the ratio of cleared EU-6 and non-EU trade, per country, and average across all EU-6 countries.

Figure 6 Additional impact on export, over time: weighted average for all goods sectors (in %)



The presented additional partial effects on exports in the three separate phases were constructed using sector-specific trade elasticities estimated over a five-year period. An annual weighted average was then created using EU-15 output, per sector, in the year in question.

The positive effect of the three phases of EU integration has increased over time. The percentages in Figure 4 represent an average over time, whereas Figure 6 shows how the weighted average over the sectors in the three phases developed over time. The effect of the Single Market could only be estimated from its introduction in the early 1990s. Over time, all three effects can clearly be seen to increase, especially from the 1980s onwards. The reason for this is probably because, from the mid-1970s, the number of Member States increases over time, and EU integration therefore covers an increasingly large trade volume. These expansions seem to dominate the diminishing benefits of reducing trade costs.³⁰ The free trade phase was negative in the 1970s, although recovery set in around the time of the accession of the United Kingdom, Denmark and

³⁰ Note that Figure 5 only focuses on the trade between EU-6 Member States. The expansions have not been included here.

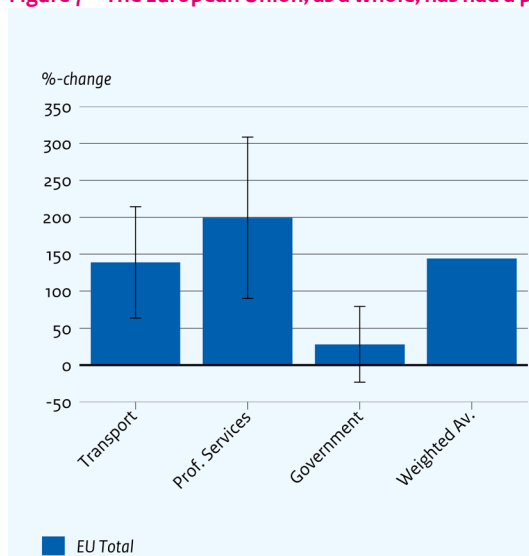
Ireland. It is possible that the time-dependent parameters of free trade, as well as those of the economic union, partially absorb the turmoil surrounding fixed exchange rate systems in that period with, amongst other things, the collapse of the Bretton Woods system in the early 1970s.

3.2 Services

For the service sectors, we limited the data we used for estimating the impact on trade to the period starting from the year 2000. However, this means that we could not separate the impact of the phase of the Single Market from that of the economic union, because both phases started before 2000 and, therefore, cannot be distinguished from each other.³¹

For services, the overall EU impact is positive for all sectors, with a higher level of trade — weighted average across sectors of 144% — between Member States than between countries outside the European Union (Figure 7). Professional services and, to a lesser extent, transport and tourism benefit the most from the European Union. Trade in public services, on the other hand, benefits far less. This is understandable as public services are generally only available to the national population. Table 5 in the appendix shows the underlying estimates.

Figure 7 The European Union, as a whole, has had a positive impact on the service trade in all sectors



The total EU impact consists of the estimated partial effects of free trade and the Single Market/economic union. The whiskers represent 95% confidence intervals. These have been approximated using the delta method and the standard errors of the trade elasticities clustered at the level of country pairs. The mean is a weighted sum of the sector-specific estimates and, therefore, does not have its own confidence interval.

The impact of free trade and the combination of the Single Market and economic union has been relatively stable for services since 2000, with a peak in most recent years (Figure 8). The free trade effect is generally negative, while the combined effect of the Single Market and economic union is positive. Services are usually limited through NTMs rather than import tariffs. Which is why the trade in services generally does not benefit from free trade, but rather from an Single Market and economic union. This is because a free trade agreement eliminates or minimises tariffs, whereas an Single Market and economic union mainly eliminates or standardises NTMs within the Single Market.

³¹ Note that the free trade phase had already started before 2000. This phase can however be distinguished from the other two phases, because there are also other comparable free trade agreements made outside the European Union that enabled us to identify this effect.

Figure 8 Additional impact on exports over time: weighted average for all services sectors (in %)



The presented additional partial effects on exports of the two individual phases were constructed using sector-specific trade elasticities estimated over a five-year period. An annual weighted average was then created using EU-15 output per sector, in the year in question.

4 EU trade benefits: general equilibrium analysis

This chapter looks at the EU trade benefits, using the general equilibrium analysis of the gravity model. This analysis uses counterfactuals to show the benefits of the European Union and the European Single Market for the Netherlands and other countries.³² Again, the same classification of the three phases is used, as described above. The results in this chapter show (unless stated otherwise) the cumulative general equilibrium effects of the three phases of the EU combined (free trade, Single Market and economic union).

³² The model and counterfactual analysis are described in Sections 2.4 and 7.1. For more details, see Bollen et al. (2020).

Figure 9 The changes in the export of goods and services (in %): EU Member States benefit from the European Union

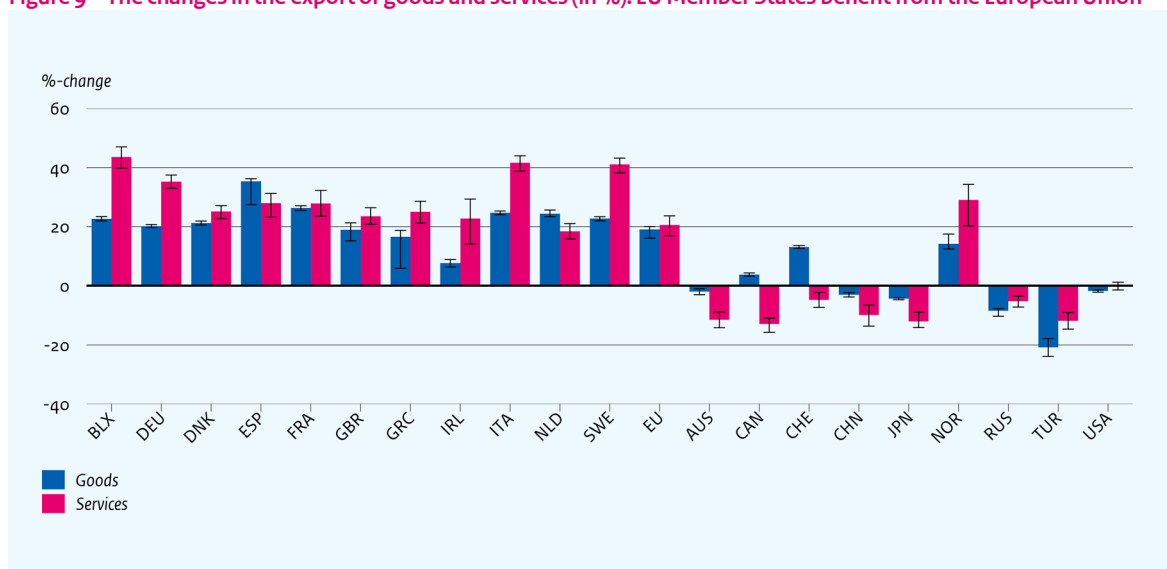


Figure shows the general equilibrium effects comparing the European Union with a scenario where all Member States trade with each other under WTO regulations. Trade agreements between EU Member States and other countries remain in place. The whiskers represent 95% confidence intervals, see Section 7.5. Detailed results can be found in Tables 8 and 9 (including ISO country codes). Under 'European Union' the average for all Member States is shown, including the Member States not shown in this figure.

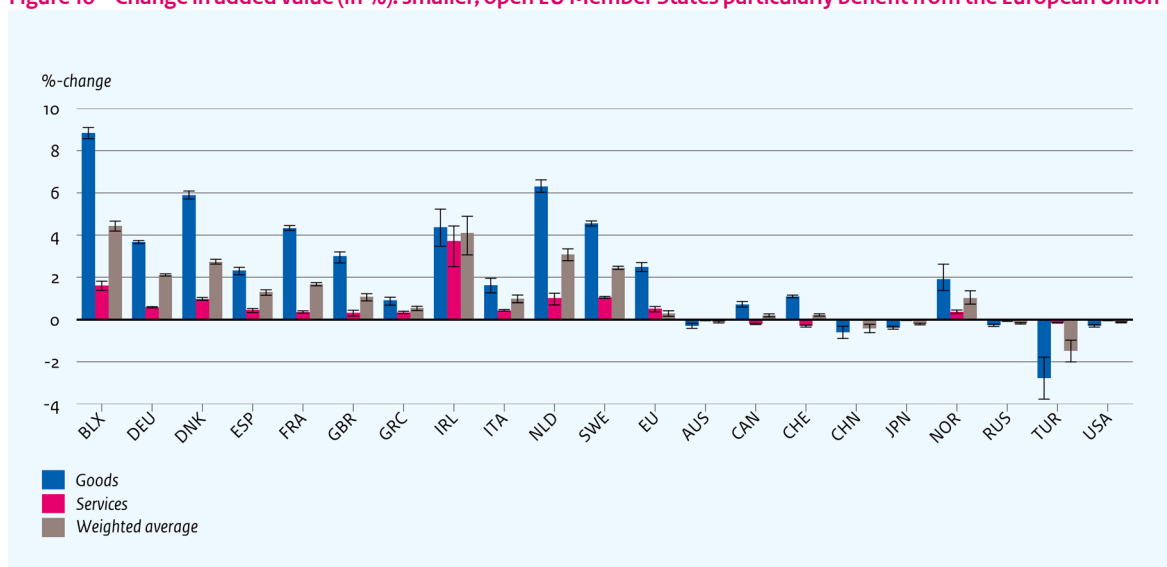
Dutch goods exports within the European Union are almost 25% higher, and for services this is almost 20%. Figure 9 shows the impact of the European Union as a whole (the three phases added together) on the exports of various countries. The differences between countries are large. For EU Member States, we found between 20% and 40% increase in exports of goods and services, due to the existence of the European Union. This, for example, also applies to Norway, which, as an external participant in the Single Market, is strongly linked to the EU.

The picture is different for countries outside the European Union. For the United States, the impact remains limited. But countries such as Russia and Australia are exporting fewer goods and services, because of trade diversion; when EU Member States trade more with each other, the trade with other countries subsequently decreases. This is particularly evident in the case of Turkey, which is not part of the European Single Market but has a customs union with the European Union. Trade levels with Turkey would thus be higher if there were no European Union, as, because of the European Union, EU Member States currently import less from Turkey and more from each other.

International trade is not equally important for all countries, as there are differences in trade revenues. Figure 10 shows the impact of the European Union on value added in the goods and services sectors, as well as a weighted average, which gives an indication of the GDP impact. For the Netherlands, the GDP effect is 3.1%. Smaller, open EU Member States such as Belgium, Luxembourg, Ireland, Denmark, as well as the Netherlands, benefit the most from the European Union. These countries are highly dependent on international trade and their trade revenues are therefore relatively large. For most countries, the value added profits related to goods are larger than those related to services. This is because many services are not traded internationally.³³ A relatively large change in services exports can therefore have a limited impact on value added, as exports only account for a small share of all services produced.

³³ This concerns the international trade in the output from the services sectors. Indirect effects, for example, because services are incorporated in the export of goods, were not included here.

Figure 10 Change in added value (in %): smaller, open EU Member States particularly benefit from the European Union

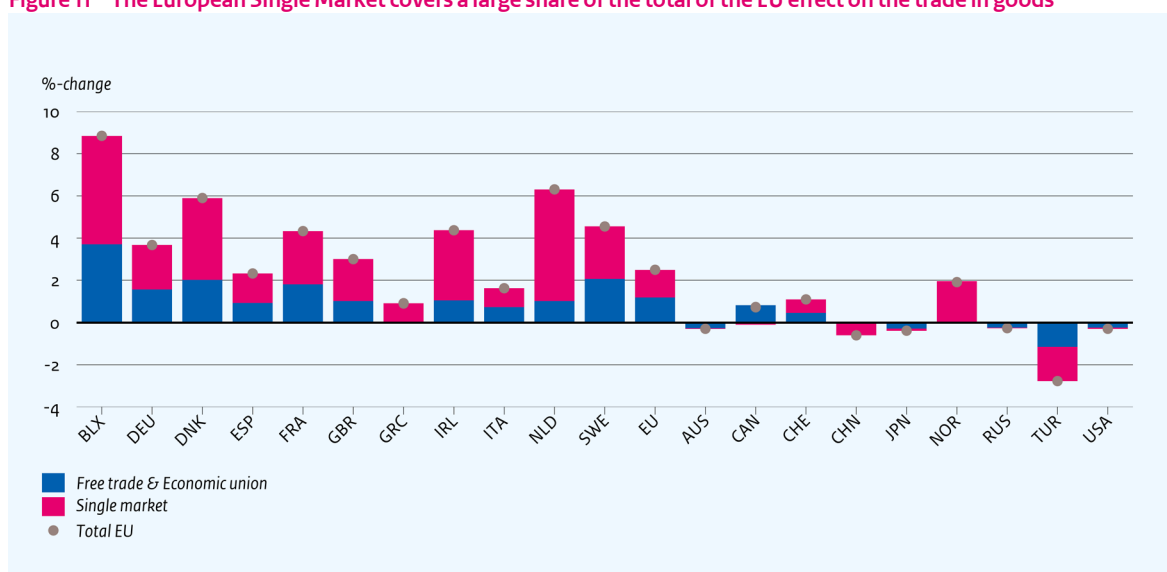


This figure shows the general equilibrium effects, comparing the European Union with a scenario in which all Member States trade under WTO regulations. Trade agreements between EU Member States and other countries remain in place. The whiskers represent 95% confidence intervals, see Section 7.5. Detailed results can be found in Tables 8 and 9 (including ISO country codes). The 'European Union' contains the average for all Member States, including those not shown in the figure.

For non-EU countries, trade diversion may reduce value added. We see that especially Turkey and China have lower added value because of the European Union. Canada, Switzerland and Norway do benefit from the European Union, because these countries have strong EU ties and, therefore, also benefit from additional trade and added value.

Between 50% and 80% of the total EU effect on goods trade can be explained by the European Single Market. For the impact of goods trade, we distinguished between that of the Single Market and of other EU components, such as free trade. Figure 11 shows that for the Netherlands almost 80% of the EU effect of goods trade on added value can be explained by the Single Market. The Netherlands is exceptional, in this respect. For most EU Member States, the Single-Market effect is about half of the total EU effect. This illustrates that the Single Market is particularly important for the Netherlands. For services, the distinction between the European Union and the European Single Market cannot be made because we can only estimate these effects from the year 2000 onwards (see earlier discussion).

Figure 11 The European Single Market covers a large share of the total of the EU effect on the trade in goods

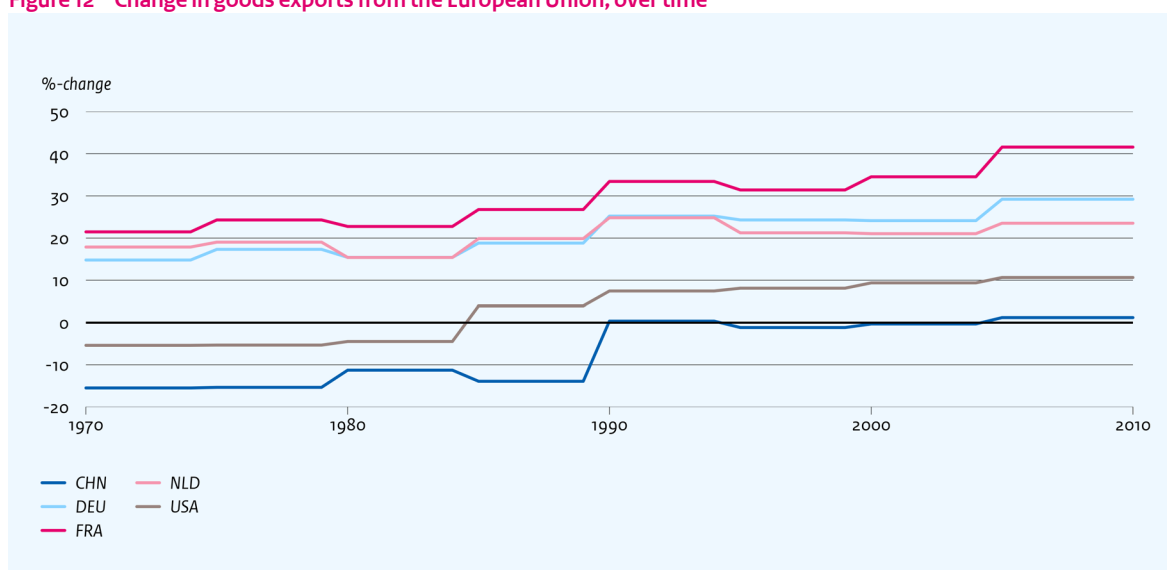


This figure shows the general equilibrium effects. Detailed results are provided in Table 8 (including ISO country codes). The ‘European Union’ contains the average of all Member States, also those not included in the figure.

The positive impact of the European Union as a whole on the trade in goods and services increases, over time. The figures above are based on the average EU effects over the 1965–2011 period (2000–2017 for services). We look at how this effect has changed, over time, by repeating the analysis for various time periods. In doing so, we used trade elasticities estimated per five years, as shown in Figures 6 and 7. Figures 12 and 13 show how the EU's impact on exports of goods and services has evolved over time. For the Member States themselves, the European Union has been of significant value since the beginning. The value of the European Union as a whole increases over time, possibly due to deeper economic integration and the expansion of the European Union.³⁴ It is striking that countries outside the European Union, until the early 1990s, exported less, as a result of the European Union. This is probably due to trade diversion, as EU Member States trade more with each other and less with non-EU countries, causing export levels for these countries to decline. As international integration increased over time, the EU has also had a positive impact on exports of these non-EU countries.

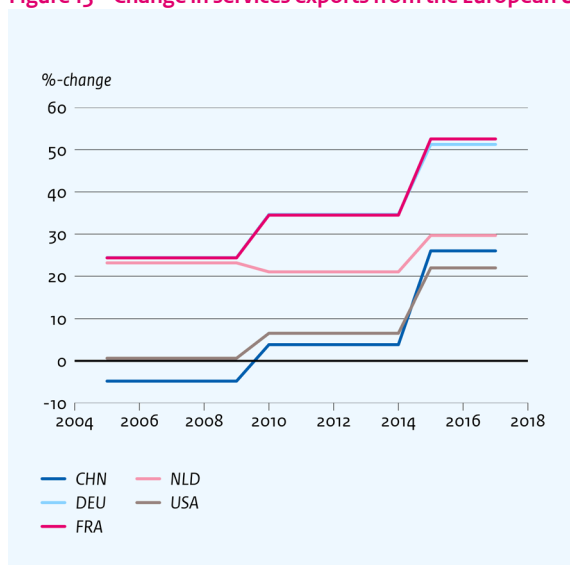
³⁴ Note that the closer the trade costs are to zero, the smaller the benefits of the stepwise reduction in trade costs, but the total sum of benefits of these steps may still increase, as can be seen here.

Figure 12 Change in goods exports from the European Union, over time



This figure shows the general equilibrium effects.

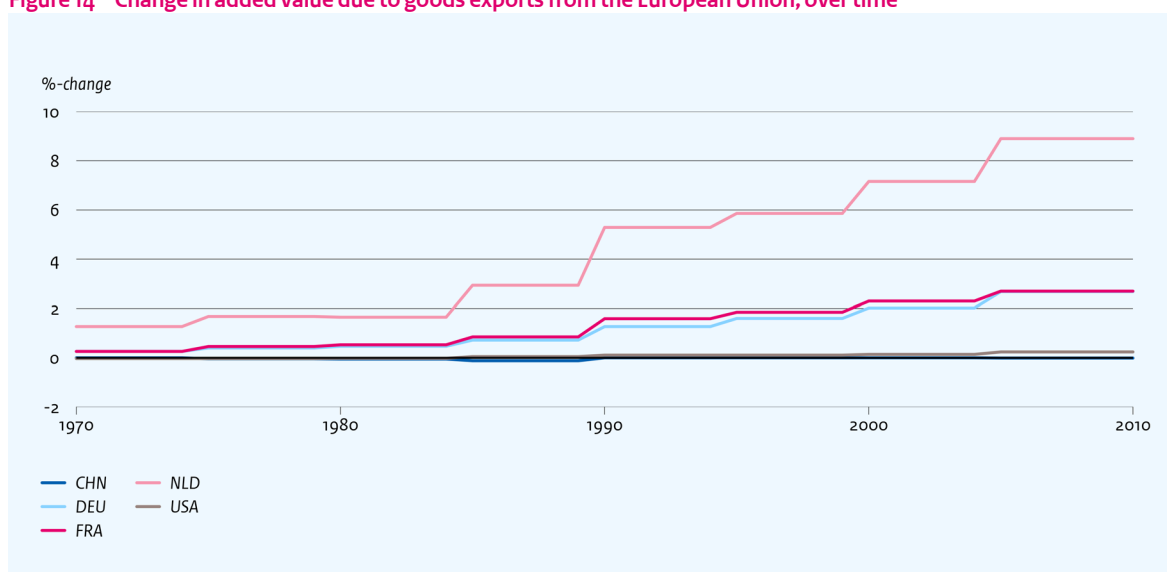
Figure 13 Change in services exports from the European Union, over time



This figure shows the general equilibrium effects.

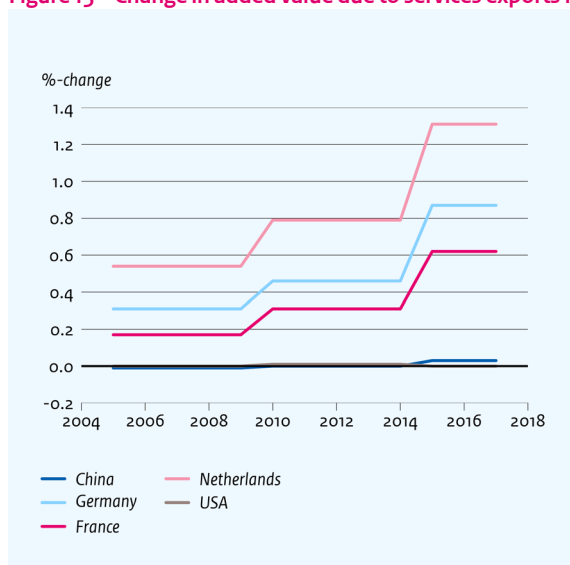
The European Union caused an increase in value added in EU Member States, especially for the Netherlands. Compared to other EU Member States, the increase in goods and services exports by the Netherlands is average (see Figures 12 and 13). Figures 14 and 15, however, show that the EU effect for value added increased strongly over time. This illustrates the importance of international trade for the Netherlands and its relatively strong integration in the European Union. Compared to other EU Member States, the Netherlands exports a large share of its domestic production. As a result, the benefits for the Netherlands have increased significantly.

Figure 14 Change in added value due to goods exports from the European Union, over time



This figure shows general equilibrium effects.

Figure 15 Change in added value due to services exports from the European Union, over time



The figure shows general equilibrium effects.

5 Further EU impact

This study focuses on identifying trade benefits, but the European Union's impact is much broader. In addition to funding the EU's foundational institutions, such as the European Parliament and the European Court of Justice, the European Union also spends money on a number of large programmes. For instance, it funds cross-border cooperation between regional and local authorities of EU Member States (the so-called Interreg programmes), partnerships on research topics (Horizon2020), and the European Fund for Strategic Investments (EFSI). The Common Agricultural Policy (CAP) is one of the largest programmes. All Member States contribute financially to the funding of these institutions and programmes. In 2019, the Netherlands contributed approximately net 0.67% of its GDP to the European Union, which already incorporates the amount received by the Netherlands (Netherlands Court of Audit, 2020). This includes paid customs duties

(according to the Dutch definition). According to the definition of the European Commission, the net payment is half (i.e. 0.35% of GDP). If the Netherlands would not be a member of the European Union, part of these customs duties would no longer be payable in the Netherlands. The payment is only an expenditure and says nothing about the effect on economic growth. On the one hand, the amount could be spent domestically, which could stimulate GDP growth, whereas it also contributes to economic growth of, particularly, the new Member States that are net recipients, which in turn, indirectly, has a positive effect on, for example, Dutch trade.

The EU also has an impact on third countries through regulation. In addition to trade diversion, the European Union also has an impact on third countries through the so-called Brussels effect (Bradford, 2020). The large size of the market and the economic importance of the European Union means that companies elsewhere also adapt a significant share of their products to meet EU standards (e.g. on safety and environment). This makes the production of goods that do not meet these standards less profitable or technically unfeasible. The EU standard thus is becoming the usual standard for the entire product range, even outside the European Union. Other regulations, such as those on data (e.g. Data Governance Act, the Digital Services Act and the Digital Markets Act), also affect EU companies as well as those outside the European Union (El-Dardiry et al., 2021).

This chapter provides an overview of important aspects of the Single Market and European Union that were not included in our current quantitative analysis. These aspects include migration, the monetary union (euro) and foreign direct investments (FDI) and relate to the free movement of people and capital, which, together with the free movement of goods and services, constitute the pillars of the European Single Market. However, they have only a limited impact on trade. The effects of these EU aspects on GDP is therefore beyond the scope of this study. The following sections provide a brief overview without quantifying the implications.

5.1 Migration

For EU citizens, the open borders and free movement of people means that they can move freely between Member States to live, work or study there; this has led to increased migration flows within the European Union (Rojas and Bollen, 2018). In this recent CPB study, Rojas and Bollen calculate that, when an EU Member State allows the free movement of persons from another Member State, migrant numbers increase, on average by 28%.

Migration has many different aspects, including socio-cultural ones. As well-known migration economist Borjas (2018) recently wrote: ‘(...) viewing immigrants as merely a collection of labour inputs may lead to a very misleading assessment of what immigration entails and provides an incomplete picture of the economic impact of immigration.’ However, there are no studies yet that provide the full picture, including broader welfare effects.

Many studies pay attention to displacement on the labour market; for the Netherlands, there are some indications of such displacement at the lower end of the labour market. If someone from another EU Member State obtains employment in the Netherlands, this may affect short-term job opportunities or wages of a Dutch worker if that migrant has competing skills. However, if a migrant has complementary skills, this may not be at the expense of local employment or wages. In a recent report (ten Berge et al., 2018), SCP and CPB interviewed Dutch citizens aged 16–67 about this subject. Their answers indicated they largely perceived reduced labour market opportunities as a result of migration. SCP and CPB also conducted their own analyses and found only a few indications of displacement at the lower end of the labour market. The skills required for

those types of jobs are probably easier to acquire and less specialised. Nevertheless, ultimately, the perceived displacement was found to be higher than the actual measurable displacement.

In the longer term, there are dynamic effects; migration has spillover effects on other parts of the economy. For example, most scientific studies do not find displacement effects: the inflow of migrants rarely has a negative long-term impact on employment or wages of the original residents, and sometimes the effects are even positive. A positive effect can be caused by the fact that, in addition to increasing labour supply, immigration also increases labour demand and thus creates new jobs. Furthermore, migrants are also consumers. In addition, sectors that employ migrant workers are therefore able to produce more.

The size of the effects also depends on the economic situation: during a downturn, labour demand may react slower than in times of economic growth. A study of intra-European migration over the 2000–2013 period finds that migration flows become larger as employment gaps widen. For example, during the 2008 economic crisis, more people migrated from the hardest-hit southern countries (i.e. Greece, Italy and Spain) to the least-affected countries, such as Denmark and the United Kingdom (Chojnicki et al., 2016). This may have the additional effect of accelerating the recovery of European countries that have fallen behind economically. Migration within the European Union will increase economic activity for the region as a whole, especially when migrants from Member States with high unemployment are able to work elsewhere within the European Union. However, the exact distribution of the benefits of additional economic activity between the EU Member States is difficult to determine. It depends on factors such as migrant integration and development in the receiving country, return migration, and the remittance (i.e. share of the earned money that migrants send to their home country). Many migrants, ultimately, also return to their country of origin (Rojas-Romagosa and Bollen, 2018; Engbersen et al., 2020). A report by the Netherlands Scientific Council for Government Policy (WRR), for example, finds that a substantial share of Polish migrant workers in the Netherlands return to Poland once they have accumulated sufficient resources, or travel back and forth on a regular basis, depending on the employment situation.

Van de Beek et al. (2021) find a positive balance for EU-immigration-related budgetary consequences for the Dutch Government budget.³⁵ The authors deducted the total costs (i.e. direct expenditures such as allowances, taxes, state pensions (AOW) and welfare benefit payments, and indirect costs such as those related to infrastructure and public administration) from the direct benefits (what a migrant pays directly in payroll taxes, premiums and VAT). According to their calculations, the first and second generation of EU immigrants resulted in a positive balance for the Netherlands of 25 billion, between 1995 and 2009. In recent years, however, the costs and benefits of EU migrants more or less balance out. It should be noted that this positive balance is not a GDP effect; the amount indicates that migrants from Europe had paid more than what the Dutch Government had spent on direct and indirect costs. The calculation, therefore, does not include the economic impact of migrants on the GDP of the Netherlands. By looking purely at Dutch Government finances, the study also does not include the positive effect on other EU Member States (as mentioned above), from which the Netherlands benefits indirectly through trade. Finally, if a broad welfare perspective would be taken, then factors such as spatial scarcity in the Netherlands and a possible brain drain from migration countries also deserve attention.

³⁵ This study is in line with an earlier publication into the budgetary consequences of migration for Dutch Government finances, by Roodenburg et al. (2003), which however, also included non-EU migrants.

5.2 The partial effect of the euro on exports

One of the main economic reasons for introducing the euro in 1999 was that it would lead to more trade by reducing trade costs (Mundell, 1961). The monetary union, of course, also has other costs and benefits, but, here, we only focus on trade benefits. By eliminating the exchange rates, importers no longer have to pay currency conversion fees. In addition, by eliminating exchange rate fluctuations, prices are more predictable and exporters and importers face less risk of sudden currency appreciation or depreciation. We looked at whether this euro effect could also be found in the data.

Since the implementation of the euro, a large amount of research has been done on the impact of the common currency on exports, leading to widely varying estimates. In a meta-analysis of 45 scientific articles, Rose (2017) finds that the average estimated partial impact of the euro on trade is around 12%. This is a fairly small impact, but it does differ significantly from zero.³⁶

We used our own gravity model to also estimate the euro effect, and found significantly smaller effects for goods than for services (see Table 2). The weighted average effect for goods is small, with 7.2% (3.6%), although there is a large variety between sectors. The estimates are clearly at the lower end of the meta estimation by Rose. For services, the weighted average impact of the euro is substantially larger, with 16.4% (21.9%). Compared to the total EU effect in our findings, the estimated euro effect we find is, as in the literature, very small.

Because the Netherlands is a trading nation, the euro effect may be larger, because it benefits more from lower transaction costs. Our analysis shows that, for both goods and services, the euro effect for the Netherlands is indeed larger than for the rest of the eurozone.³⁷ However, at the same time, the variation between sectors increases. For goods, the euro effect is predominantly positive for the Netherlands, but the size of the additional impact compared to the rest of the eurozone remains modest. For the trade in services, on the other hand, the additional impact of the euro is much larger for the Netherlands.

Table 2 The average partial impact of the euro on exports, across sectors

		Eurozone as a whole (%)	Eurozone excl. NL (%)	Netherlands (%)
Goods	Average	7.2	4.0	11.9
	Weighted average	3.6	2.2	6.4
	Standard deviation	19.3	13.9	33.1
Services	Average	16.4	14.4	37.2
	Weighted average	21.9	19.7	45.5
	Standard deviation	15.8	15.5	20.8

³⁶ However, his own estimation of the euro impact is much higher, around 54%. He argues that including more time periods and countries leads to a higher estimation. Others argue that it is, in fact, a sign of the estimated effect capturing more than the euro impact alone, such as a trend in exports. Correcting for this would lead to far lower estimations; for example, see Bun & Klaassen (2007).

³⁷ We investigated this by estimating a separate euro elasticity for the Netherlands, in addition to that for the other eurozone countries. This enabled us to distinguish between the impact of the euro on trade costs for the Netherlands and for the rest of the eurozone countries.

5.3 Foreign direct investments

A large number of studies (for an overview, see Bruno et al., 2021) show that EU membership increases the inflow of foreign direct investments (FDI). These investments are made by companies that expand their business into other countries, the so-called multinationals. FDI, for most multinationals, has one or more of three motives: market expansion, gaining access to more efficient or cheaper production factors, and acquiring knowledge and brand names. These all relate to the increase in FDI flows within the European Union, which has had two effects.

To begin with, as a result of the higher relative customs rights to trade outside the European Union, the benefits for companies in third countries have shifted from exports to direct investments. These companies are expanding their markets by investing in production capacities in the European Union. Given the large size of the European Single Market, this option has become increasingly profitable, compared to exporting to the European Union. This can be seen, for example, in the measured increase in FDI after announcements of future EU membership (e.g. Bruno and Cipollina, 2018).

Furthermore, the FDI flows between EU Member States have also increased. This is because production costs can vary greatly between them. Companies can therefore relatively easily reduce costs by moving production to other EU Member States. Bruno et al. (2021) show that it is mainly the Single Market that plays an important role in this respect. Because of the far-reaching integration of the Single Market, it is possible and cheaper for companies to divide production over various Member States in order to make maximum use of the comparative advantages of each Member State. For example, some countries may have cheaper labour, while others have more research capabilities.

The impact of larger FDI flows on GDP growth is likely positive. As long as domestic investments are not crowded out, total investment will increase under higher FDI inflows. This can create more jobs, which in turn will boost the economy. However, the companies that have been established using foreign direct investments are therefore foreign-owned, which means that profits are likely to end up with the foreign owners, and how much of the added value remains in the Netherlands is uncertain. Finally, it is possible that some of the investments are related to the multinationals' tax networks. The Netherlands is for example playing a role in international constructions whereby these companies try to minimise tax payments (Lejour et al., 2020).³⁸

6 Conclusion

This study shows that the European Union has resulted in increased trade between Member States and, thus, has caused the Dutch economy and that of nearly all EU Member States to grow. With trade benefits of 3.1% of GDP, the Netherlands is amongst the Member States who benefit the most from EU trade. Only Ireland, the Belgium–Luxembourg combination and some more recent entrants from Central and Eastern Europe, on average, benefit more from EU trade.

For countries outside the European Union, the situation is different. The European Union, via trade diversion, often has a negative impact on these countries, as EU membership means that there is more trade amongst Member States and less between Member States and countries outside the European Union. This often results in losses for these third countries. This, however, does not apply to countries that are deeply

³⁸ Although recent agreements have been made within the OECD which may change this situation.

integrated in the European Union. Norway is an example of such a country, where EU-related trade benefits are substantial, although recent research (Campos et al., 2021) shows that these benefits would be even greater if the country would be a member of the European Union. Another disadvantage of not being a member is that these countries, although fairly well integrated in the European Union, have no say in new regulations concerning, for example, the European Single Market.

The Netherlands benefits particularly strongly from the Single Market, which explains over 80% of the total impact on the trade in goods. We divide the impact of the European Union into three phases of integration: free trade, the Single Market and the economic union. These phases have different levels of importance, with respect to the total impact, which also differs between countries. The Netherlands mainly benefits from the Single Market, whereas for countries such as France and Germany, the other two phases of integration are relatively more important.

On average, the contributions of the Single Market and full economic union are similar where goods are concerned, but this varies greatly per sector. The contribution of both phases is greater than the average contribution of free trade. This observation does not apply to all sectors. For example, free trade is very important for raw material-processing industries, such as rubber and metal. For the trade in services, the difference between the phases is even greater: free trade, which is mainly aimed at lowering tariffs on goods trade, contributes nothing or even negatively to the trade in services between EU Member States. However, this is more than compensated for by further integration phases, as these were also far more focused on facilitating the trade in services.

The total in trade benefits of the European Union increases over time, for both goods and services. Although the marginal benefits from lowering trade costs decrease with each step, the steady expansion of the European Union and the ever further economic integration, overall, provide increasing benefits. The benefits of the three individual phases of economic integration can also be seen to increase over time. Here, again, the ever increasing EU seems to be an important reason for these increases.

The scope of this study is limited to quantifying the trade benefits of the European Union and the Single Market, up to 2017. We did not extensively analyse several other aspects of the European Union, such as migration, foreign direct investment (FDI) and financial integration. However, these aspects are discussed in general to give an idea of their possible impact. Based on the literature, it seems that they also generate benefits, although it is not clear whether this includes trade-related benefits. Furthermore, given the available data, it was not possible to incorporate more recent developments into the model, because of the Brexit³⁹ that took place in the early 2020s. It is likely that the United Kingdom's exit from the European Union will slightly lower the total EU benefits for the Netherlands; for one thing, because the United Kingdom is an important trading partner, but also the Brexit means the European Union has shrunk in size, which reduces EU trade opportunities.

Our calculation of the EU impact is likely to be a conservative estimate. The CPB gravity model does not yet make use of so-called sectoral linkages, which would allow including interactions between sectors. In the literature, this is still a relatively new innovation, but available results show that additional modelling of sectoral linkages increases the estimated trade benefits (Costinot and Rodríguez-Clare, 2014; Mayer et al., 2019). In addition, the gravity model does not take account of the possible dynamic impact on economic growth from trade-related increased productivity (Mayer et al., 2019). For example, reduction in trade costs may lead to increased international competition between companies. Ultimately, only the most productive firms will remain in business and productivity will increase at the macro level (Melitz, 2003).

³⁹ For an analysis of the possible impact of the Brexit; see the Brexit text box in the CEP 2021 ([link](#)).

7 Appendix

Section 7.1 provides a detailed explanation of the method used for estimating all trade elasticities in the first step, for example, for the Single Market. In addition to the trade elasticities, we also require the general elasticity of substitution per sector, to enable estimation of the general equilibrium effects. The estimated elasticity of substitution are discussed in Section 7.2, followed by the estimated trade elasticities per sector for goods and services (Sections 7.3.1 and 7.3.2, respectively). In addition, the results from a few robustness analyses are provided in Section 7.4. Finally, Section 7.5 shows the extensive counterfactual results per sector of the general equilibrium analysis.

7.1 Method: estimating trade elasticities for partial effects

To estimate the trade elasticities in the first step of our analysis, we used a standard gravity equation. We were subsequently able to use these elasticities to calculate the partial effects and to estimate the general equilibrium effects in the scenario analysis, the second step of our method. To estimate the elasticities, we used the *Poisson pseudo maximum likelihood* (PPML) estimator, as proposed by Santos Silva and Tenreyro (2006). Here, we will not provide full details on the second step of the method, the calculations of the general equilibrium effects (for more information, see the CPB background document by Bollen et al., 2020).

The estimation equation consists of the following parts:

$$X_{ijt}^k = \exp\left(t_{ijt}'\beta^k + \alpha_{ij}^k + \theta_{ijt}^{x,k} + \theta_{ijt}^{m,k}\right)\eta_{ijt}^k$$

The dependent variable X_{ijt}^k is exports in sector k of country i to j at time t . We added sector-dependent country-pair *fixed effects* (FEs), α_{ij}^k , to correct for, for example, geographical or historical time-independent factors leading to more trade between some country pairs than between certain others (see Baier and Bergstrand, 2007). In addition, we also added sector-dependent exporter-time, $\theta_{ijt}^{x,k}$, and importer-time, $\theta_{ijt}^{m,k}$ fixed effects (FEs), as is common practice in the literature. These FE-effects correct for the multilateral trade costs (also see Section 2.4). Furthermore, Fally (2015) shows that these are important for estimating the general equilibrium effects in our scenario analysis, because they enable us to exploit the PPML characteristic (i.e. the adding up characteristic): the estimated exports per country, based on the estimation equation, add up to the actually observed exports per country.

The trade cost, t_{ijt} , contains various economic integration variables that are important for our scenario analysis, as well as a number of control variables:

$$\begin{aligned} t_{ijt}'\beta^k = & FTA_{ijt}\beta_5^k + FTA_{ijt}^{3e}\beta_6^k + SM_{ijt}\beta_1^k + \sum_{s=0}^{10} \Delta SM_{ijt-s}\beta_{1s}^k + SM_{ijt}^{3e}\beta_2^k + EcoUni_{ijt}\beta_3^k \\ & + \sum_{s=0}^{10} \Delta EcoUni_{ijt-s}\beta_{3s}^k + EcoUni_{ijt}^{3e}\beta_4^k + RTA_{ijt}\beta_7^k + \sum_d BRDR_{ijd} \delta_d^k + \tau_{iCHN}^{x,k} \times t \\ & + \tau_{CHNj}^{m,k} \times t \end{aligned}$$

For our scenario analysis, we were interested in the three economic integration phases of the European Union: free trade, the Single Market, and the economic union. The FTA_{ijt} variable is a so-called *dummy* variable, which is 1 if both the exporting and the importing country are a member of a Free Trade Agreement. In all other cases, this variable equals 0. In order to distinguish the free trade impact within the EU from that of the economic union, we estimated the effects of all free trade agreements, including that of the European Union,

combined in one sector-dependent elasticity β_5^k . The *dummy*-variable SM_{ijt} equals 1 if both the exporting and the importing country are member of the European Single Market, and, if not, then the variable equals 0.⁴⁰ We also included 11 lags, since it takes time for companies and consumers to adjust to the Single Market. Because we included these delays as the first differences, the parameter of the level variable, β_1^k , captures the long-term impact; this effect was of interest to us. The SM_{ijt}^{3Q} variable corrects for trade diversion by third countries from non-member countries to EU Member States, due to the Single Market (e.g. Head and Mayer, 2021). This *dummy* is 1 when a country that is not a member of the Single Market is exporting to a Member State; in all other cases, the dummy is 0. If β_3^k is positive, this means that there has been a shift in the trade by third countries, from non-member countries to EU Member States — and the opposite is true if the elasticity is negative. In this way, we also estimated the effects for the economic union, $EcoUni_{ijt}$. This *dummy* is 1 when both the exporting and the importing country are an EU Member State, and therefore also are in an economic union, because such a union has been developed since the beginning of the European Union (or EEC before 1993) (also see Section 2.3).

We added various control variables, as suggested in the literature. We used RTA_{ijt} to correct for all other regional trade agreements that are not part of the European Union nor a free trade agreement, because these are already included in FTA_{ijt} and SM_{ijt} , $EcoUni_{ijt}$. Bergstrand et al. (2015) show the importance of distinguishing between international and domestic trade (i.e. between countries and within them). This is done by including a border dummy, $BRDR_{ijd}$, which varies over decade d , and is 1 when this concerns a trade flow between two countries in decade d and 0 when this concerns a domestic trade flow. By including such a dummy, we correct for decade-dependant factors that would affect trade flows between country pairs, such as WTO agreements.⁴¹ Bun and Klaassen (2007) and Baier et al. (2014) demonstrate that it is important to include country-pair trend FE, to correct for trends that cannot be explained by any of the other variables. The analysis of the residuals of an estimation equation without country-pair trend FE showed that, particularly, the residuals of country-pairs in which goods are imported from or exported to China still contained strong trends. Therefore, we added China-specific trends for exports $\tau_{iCHN}^{x,k}$ and imports $\tau_{CHNj}^{m,k}$, with the respective *dummies* being 1 if country i is exporting to China or country j is importing from China — both interacting with a time trend.

7.2 Estimating elasticity of substitution

The elasticity of substitution per sector is the main parameter for calculating general equilibrium effects due to changes in trade costs. The elasticity of substitution maps how sensitive export demand is to changes in price. They are indirectly included in the trade elasticities of, for example, the Single Market, as they indirectly influence price. In order to estimate the elasticity of substitution, we need trade costs that directly change the price of exports. An increase in trade tariffs leads to a direct increase in the price of exports; this allows identification of the elasticity of substitution. For goods, this is estimated by adding trade tariffs to the estimation equation for trade costs⁴² as provided above.⁴³

Table 3 provides an overview of the estimated elasticity of substitution for the goods sector. The elasticities are somewhat lower than in Bollen et al. (2020), due to adjustments to the data and the estimation

⁴⁰ In the Single Market, we also included non-EU countries that are a member of the EEA, as these countries are also part of the Single Market.

⁴¹ We experimented with 5-year border dummies instead of decade dummies. This has no bearing on the results.

⁴² By adding trade tariffs, the trade costs elasticity of free trade can no longer be estimated, as free trade implicitly means lower trade tariffs and, therefore, there is a strong correlation with trade tariffs.

⁴³ As a result, we lose a number of years from the data set, due to limited availability of detailed data on tariffs, which is why the estimations are based on the 1988–2011 period. Tariff data originate from the UNCTAD TRAINS database.

method. However, the results are consistent with others in the literature. For example, a review study by Head and Mayer (2014) shows the average elasticity estimate to be around 6. In WorldScan, the average elasticity is 7, which is even somewhat higher and closer to ours, but the sector distribution is not always similar (Lejour et al., 2006).⁴⁴

Elasticity of substitution cannot be estimated for services. This is because services are not subject to explicit trade tariffs. Thus, there is no way of estimating the related elasticity of substitution. Therefore, we followed the literature (Egger et al., 2012; Felbermayr et al., 2021) and applied an elasticity of 4 to services.

Table 3 Estimated elasticity of substitution

Sector	tariff elasticity	standard error
Agriculture and fishery	-4.1*	1.0
Mining	-6.8*	1.2
Food & tobacco	-3.2*	0.7
Clothing	-4.8*	0.8
Paper & printing	-3.2*	0.7
Oil & cokes	-7.0*	2.2
Chemicals	-7.2*	1.1
Rubber	-6.0*	1.0
Minerals	-5.4*	1.7
Metals	-5.9*	0.7
Machines	-13.2*	2.0
Electrical machines	-12.1*	1.8
Means of transport	-8.1*	1.7
Other manufacturing	-12.1*	1.3
Weighted average	-7.1 (-7.2)	

The estimated tariff elasticity equals to minus the elasticity of substitution. The * indicates that the estimation is significant, at a 95% confidence level. See Section 7.1, for more information about the estimation method.

7.3 Main estimates of trade elasticities, per sector

7.3.1 Goods

Model 3 in Table 4 provides the main estimated elasticities per sector of the main specification which underlies Figure 4. On average, all three phases — free trade agreement, Single Market and economic union — contribute equally to the EU's overall impact (see last column). However, at the sectoral level, this may vary considerably. For example, in the mining sector, the Single Market generates 74% in additional trade, but the other two phases have a negative impact. This means that the overall effect of the European Union is only barely positive at 8%. On the other hand, in the oil and cokes sector, the economic union leads to more than 100% in additional trade. The contribution of the Single Market is much smaller, with 31%, and free trade even leads to a reduction in trade. Thus, there are large differences between sectors. If we do not distinguish between the three phases of economic integration, but estimate the EU effect as a whole, we find a much smaller effect (see model 1). The big exception here is the mining sector. Therefore, distinguishing between

⁴⁴ Bollen et al. (2020) does not include elasticities of substitution lower than 4, as the optimisation problem in that case would no longer converge. This problem was solved and the method is now able to use elasticities of substitution of up to 1.5. The gravity theory excludes those of and below 1.

the three phases of integration is important. Adding dynamics (differences between models 2 and 3) leads to slightly larger effects, but overall their impact is not as great.

The Single Market, on average, has led to third countries to increase their imports from EU Member States, compared to non-member countries, but for free trade and the economic union the opposite effect is true. In total, the European Union has resulted in third countries importing slightly more from EU Member States than from other third countries, compared to the situation where the European Union had not existed. This reflects the trade diversion from trade between two non-member countries to trade between non-member countries and EU Member States instead. Why the role of the Single Market is significantly different from that of free trade agreements and the economic union is not entirely clear. Again, we see large differences between sectors in our estimations.

7.3.2 Services

The main estimated elasticities per service sector in the main specification that underpins Figure 7 are shown in Table 5 model 3. Of the two phases distinguished for services, only the Single Market and the economic union combined provide an average positive contribution to the total EU effect (see last column). The contribution of free trade is negative, although this varies per sector. Free trade lowers tariffs, which is particularly beneficial for the trade in goods. The services trade mainly benefits from the reduction in, and uniformity of, non-tariff measures (NTMs); this occurs in the Single Market and the economic union. It is not entirely clear why free trade even leads to negative effects on the trade in services. If we do not distinguish between the two phases of economic integration, but rather estimate the EU effect as a whole, then we find on average a smaller effect of 95% (see model 1). The exception is public services, for which the effect is larger. As with goods, for services it is therefore also important to distinguish between the various phases of integration. The difference between adding or not adding dynamics (i.e. the difference between models 2 and 3) is even greater than when we do or do not distinguishing between the various phases of economic integration.

The Single Market and economic union, on average, have led to third countries importing more services from Member States than from non-member countries, but the effect for free trade agreements is the opposite. In total, the European Union has led third countries to import slightly more from EU Member States than from other third countries, compared to the case where the European Union had not existed. This reflects how trade has shifted from formerly occurring between two non-member countries to currently between non-member countries and EU member states. In case of public services all phases decrease exports from EU Member States to third countries.

Table 4 Main estimation results for the Single Market and EU elasticities, goods

Model	1				2				3							
	EU		SM, Econ. Union, Free Trade Agreement (Free)				Main specification: Dynamics (11 years) for SM & Econ. Union									
Sector	EU	EU-3 ^e	FTA	FTA 3 ^e	SM	SM 3 ^e	Econ. Union	Econ. Union 3 ^e	FTA	FTA 3 ^e	SM	SM 3 ^e	Econ. Union	Econ. Union 3 ^e	SM %	Total EU %
Agriculture and fishery	0.24	-1.00*	0.11	-0.48*	0.36*	0.29*	0.10	-0.87*	0.19*	-0.40*	0.50*	0.40*	0.25	-0.86*	66*	157*
	(0.14)	(0.20)	(0.07)	(0.13)	(0.06)	(0.15)	(0.14)	(0.21)	(0.07)	(0.12)	(0.11)	(0.16)	(0.17)	(0.20)	(18)	(53)
Mining	0.24	0.60	-0.35*	-0.15	0.14	-0.49	0.10	0.77	-0.30*	-0.12	0.56*	-0.41	-0.18	0.71	74	8
	(0.31)	(0.40)	(0.13)	(0.15)	(0.19)	(0.25)	(0.34)	(0.41)	(0.13)	(0.15)	(0.23)	(0.25)	(0.38)	(0.42)	(40)	(44)
Food & tobacco	0.23*	-1.08*	0.04	-0.40*	0.33*	-0.07	0.14	-0.79*	0.16	-0.28*	0.51*	0.07	0.33*	-0.75*	66*	171*
	(0.10)	(0.18)	(0.12)	(0.08)	(0.03)	(0.14)	(0.09)	(0.15)	(0.10)	(0.07)	(0.06)	(0.14)	(0.10)	(0.15)	(10)	(37)
Clothing	0.77*	-0.01	0.52*	-0.38*	0.25*	0.30*	0.66*	0.07	0.63*	-0.28*	0.47*	0.35*	0.93*	0.08	59*	658*
	(0.14)	(0.20)	(0.13)	(0.10)	(0.06)	(0.11)	(0.14)	(0.19)	(0.13)	(0.09)	(0.12)	(0.11)	(0.16)	(0.19)	(19)	(170)
Paper & printing	-0.05	-0.27	-0.01	-0.22*	0.19*	0.38*	-0.19	-0.37	0.02	-0.18*	0.21*	0.41*	-0.07	-0.38	23*	17
	(0.10)	(0.18)	(0.05)	(0.07)	(0.05)	(0.13)	(0.10)	(0.20)	(0.05)	(0.06)	(0.09)	(0.12)	(0.12)	(0.20)	(11)	(14)
Oil & cokes	0.65*	0.75*	-0.18	-0.36*	0.27*	0.35	0.48*	0.77*	-0.12	-0.30*	0.27*	0.44*	0.71*	0.79*	31	134*
	(0.21)	(0.31)	(0.15)	(0.14)	(0.08)	(0.21)	(0.21)	(0.31)	(0.16)	(0.14)	(0.13)	(0.22)	(0.23)	(0.31)	(16)	(67)
Chemicals	0.57*	0.18	0.07	-0.17*	0.49*	0.74*	0.29*	-0.01	0.15	-0.08	0.62*	0.84*	0.47*	0.00	86*	247*
	(0.12)	(0.18)	(0.09)	(0.08)	(0.05)	(0.10)	(0.11)	(0.17)	(0.09)	(0.07)	(0.07)	(0.10)	(0.12)	(0.17)	(14)	(54)
Rubber	0.24*	-0.10	0.50*	-0.04	0.12*	0.29*	0.22	-0.11	0.52*	-0.01	0.10	0.32*	0.40*	-0.12	11	177*
	(0.12)	(0.20)	(0.08)	(0.07)	(0.06)	(0.09)	(0.12)	(0.20)	(0.08)	(0.06)	(0.07)	(0.10)	(0.14)	(0.20)	(8)	(40)
Minerals	0.03	0.17	0.40*	-0.13	-0.01	0.38*	0.04	0.09	0.38*	-0.13	-0.10	0.40*	0.18	0.07	-9	59*
	(0.13)	(0.20)	(0.06)	(0.09)	(0.05)	(0.09)	(0.12)	(0.20)	(0.06)	(0.09)	(0.07)	(0.09)	(0.13)	(0.20)	(7)	(26)
Metals	0.07	-0.45*	0.38*	-0.26*	0.27*	0.41*	-0.07	-0.44*	0.40*	-0.22*	0.29*	0.44*	0.05	-0.44*	34*	111*
	(0.12)	(0.18)	(0.11)	(0.09)	(0.05)	(0.14)	(0.10)	(0.17)	(0.11)	(0.09)	(0.08)	(0.14)	(0.11)	(0.17)	(11)	(33)
Machines	0.10	-0.16	0.22*	0.03	0.24*	0.56*	-0.06	-0.36*	0.22*	0.03	0.20*	0.56*	0.03	-0.36*	22*	56*
	(0.09)	(0.13)	(0.07)	(0.06)	(0.03)	(0.07)	(0.09)	(0.13)	(0.06)	(0.06)	(0.05)	(0.07)	(0.09)	(0.13)	(6)	(16)
Electrical machines	0.49*	0.25	0.51*	-0.08	0.20*	0.46*	0.35*	0.10	0.53*	-0.06	0.14	0.49*	0.52*	0.08	15	227*
	(0.12)	(0.17)	(0.10)	(0.06)	(0.06)	(0.09)	(0.11)	(0.16)	(0.10)	(0.06)	(0.08)	(0.10)	(0.11)	(0.16)	(9)	(49)
Means of transport	0.75*	0.13	0.17	-0.09	0.37*	0.71*	0.48	-0.18	0.18	-0.08	0.26*	0.73*	0.69*	-0.18	30	211*
	(0.33)	(0.39)	(0.15)	(0.06)	(0.09)	(0.15)	(0.31)	(0.38)	(0.14)	(0.07)	(0.13)	(0.16)	(0.32)	(0.38)	(16)	(105)
Other manufact.	-0.30*	0.03	0.15*	0.07	-0.10	0.17	-0.23	-0.06	0.14*	0.07	-0.13	0.17	-0.14	-0.06	-12	-12
	(0.14)	(0.24)	(0.05)	(0.15)	(0.08)	(0.20)	(0.13)	(0.24)	(0.05)	(0.14)	(0.12)	(0.21)	(0.14)	(0.24)	(10)	(17)
Weighted average	0.31	-0.22	0.19	-0.20	0.28	0.40	0.17	-0.27	0.22	-0.15	0.28	0.37	0.30	-0.10	39	161

Three model specifications for goods: (i) the EU effect, estimated as a whole without distinctions between the three phases, (ii) the EU effect separated into three phases: free trade agreement (FTA), Single Market (SM) and an economic union (Econ. Union), and (iii) the EU effect with dynamics for the last two phases by adding 11 lags (i.e. the total SM effect does not fully manifest itself until 11 years later). The last specification is the main one. For the impact of the various EU phases, we corrected for exports from EU member states to non-EU countries, such as Econ. Union 3^e. The last two columns convert the elasticities of model 3 into percentages for the Single Market and total EU, using the following equation: $IM \% = (\exp(IM) - 1) \times 100$; these are the partial effects. The numbers between brackets are clustered standard errors, on the level of country pairs and the * shows that the estimated elasticity is significant at a 95% confidence level. There are no standard errors for the weighted averages, due to the lack of information on the correlation of trade costs and elasticities between sectors. See Section 7.1 for more information about the estimation method.

Table 5 Main results from the estimations for the Single Market and EU elasticities, services

Model	1				2		3				
	EU		SM & Econ. Union, Free Trade Agreement (FTA)		Main specification: Dynamics for SM & Econ. Union (11 years)						
Sector	EU	EU 3 ^e	FTA	FTA 3 ^e	SM & Econ. Union	SM & Econ. Union 3 ^e	FTA	FTA 3 ^e	SM & Econ. Union	SM & Econ. Union 3 ^e	Total EU %
Transport & tourism	0.78*	0.29	-	-	1.04*	0.78*	-	-	1.42*	0.71*	139*
	(0.09)	(0.16)	(0.11)	(0.06)	(0.10)	(0.20)	(0.11)	(0.06)	(0.13)	(0.19)	(38)
Professional services	0.70*	0.54*	0.13	-0.03	0.73*	0.54*	0.21	0.02	0.89*	0.51*	199*
	(0.11)	(0.23)	(0.17)	(0.08)	(0.12)	(0.25)	(0.17)	(0.09)	(0.15)	(0.26)	(56)
Public services	0.36*	-0.82	-	-	0.71*	-0.28	-	-	0.95*	-0.27	28
	(0.15)	(0.48)	(0.25)	(0.14)	(0.20)	(0.62)	(0.25)	(0.14)	(0.23)	(0.62)	(26)
Weighted average	0.67	0.19	-0.31	-0.18	0.84	0.48	-0.25	-0.14	1.10	0.44	144

Three model specifications for services. The first specification estimates the EU effect as a whole and does not distinguish between the various phases. The second specification distinguishes two phases: free trade agreement (FTA) and the combination of the Single Market (SM) and an economic union (Econ. Union). The third specification adds dynamics for the last two phases by adding 11 lags. For more information, see the caption below Table 4.

7.4 Robustness of estimated elasticities, per sector

7.4.1 Goods

On average, as an open trading nation, the Netherlands benefits more from both the Single Market and the economic union, compared to the other EU Member States (see Table 6, models 4 and 5). The difference of 7%-points is relatively modest for the economic union, but for the Single Market this difference increases to 13%-points. Here, too, there is a great variation between sectors. For some sectors, such as the clothing sector, the Netherlands benefits no more than others (economic union) or hardly at all (Single Market). For both the Netherlands and the rest of the European Union, the average total EU effect is larger than if we do not distinguish between the impact on the Netherlands and the rest of the EU.

The average benefits of the Single Market and the economic union differ greatly between the various EU expansions (see models 6 and 7). Also here, as an open economy, the Netherlands has one of the greatest average effects for both the Single Market and the economic union phases. However, the average benefits for the EU-12 expansion, for both phases, are even greater. For the EU-15 expansion, however, the average effects of both phases are even negative. Before their accession, these countries were already very closely integrated in the European Union through the EFTA, which may explain the lack of benefits from either of those phases. Again, there are large differences between sectors.

Table 6 Heterogeneous parameter estimations of the elasticities of the Single Market, for goods

Model	3		4				5			6					7					
	Main specification		EU vs NL for Economic Union				EU vs NL for SM			Impact Economic Union for EU expansions					Impact SM for EU expansions					
			Economic Union		SM		Econ. Union			Economic Union					SM					
Sector	SM	Econ. Union	EU ex SM	EU ex NL	EU ex NL	EU ex NL	EU ex NL	Econ. Union	SM	EU-6 ex NL	NL	EU-9	EU-12	EU-15	EU-6 ex NL	NL	EU-9	EU-12	EU-15	Econ. Union
Agriculture and fishery	0.50* (0.11)	0.25 (0.17)	0.51* (0.11)	0.23 (0.18)	0.36 (0.25)	0.29* (0.09)	0.86* (0.11)	0.44* (0.15)	0.52* (0.11)	0.00 (0.17)	0.18 (0.21)	-0.38* (0.11)	0.62* (0.14)	-0.13 (0.15)	0.14* (0.05)	0.73* (0.09)	0.06 (0.06)	0.57* (0.08)	-0.11 (0.16)	0.28 (0.16)
Mining	0.56* (0.23)	-0.18 (0.38)	0.56* (0.23)	-0.19 (0.38)	-0.12 (0.39)	0.25 (0.21)	0.92* (0.29)	0.09 (0.36)	0.56* (0.23)	0.63* (0.29)	0.17 (0.28)	-0.36* (0.18)	-0.22 (0.23)	-0.52* (0.21)	0.35* (0.13)	0.84* (0.28)	-0.33* (0.16)	0.12 (0.20)	-0.22 (0.20)	0.42 (0.34)
Food & tobacco	0.51* (0.06)	0.33* (0.10)	0.51* (0.06)	0.33* (0.10)	0.30* (0.13)	0.50* (0.06)	0.53* (0.07)	0.34* (0.10)	0.51* (0.06)	0.19 (0.10)	0.12 (0.13)	0.03 (0.08)	0.26* (0.10)	0.15* (0.07)	0.25* (0.03)	0.28* (0.06)	0.24* (0.04)	0.26* (0.07)	0.21* (0.07)	0.36* (0.10)
Clothing	0.47* (0.12)	0.93* (0.16)	0.46* (0.12)	0.95* (0.16)	0.67* (0.23)	0.46* (0.12)	0.54* (0.19)	0.94* (0.16)	0.46* (0.12)	0.66* (0.12)	0.28 (0.19)	0.11 (0.11)	0.53* (0.13)	0.43* (0.13)	0.22* (0.07)	0.32 (0.17)	0.30* (0.08)	0.27* (0.09)	0.23 (0.14)	0.89* (0.15)
Paper & printing	0.21* (0.09)	-0.07 (0.12)	0.20* (0.09)	-0.06 (0.12)	-0.13 (0.20)	0.25* (0.09)	0.08 (0.11)	-0.11 (0.12)	0.22* (0.09)	0.34* (0.11)	0.11 (0.17)	-0.25* (0.10)	0.30* (0.09)	-0.21* (0.08)	0.19* (0.05)	-0.04 (0.09)	-0.14 (0.09)	0.27* (0.07)	-0.25* (0.09)	0.31* (0.14)
Oil & cokes	0.27* (0.13)	0.71* (0.23)	0.26* (0.13)	0.73* (0.23)	0.38 (0.27)	0.17 (0.12)	0.48* (0.14)	0.79* (0.23)	0.28* (0.13)	0.56* (0.21)	0.04 (0.21)	0.11 (0.15)	0.77* (0.21)	0.21 (0.11)	0.12 (0.07)	0.39* (0.13)	0.06 (0.11)	-0.03 (0.16)	-0.34* (0.17)	1.26* (0.30)
Chemicals	0.62* (0.07)	0.47* (0.12)	0.62* (0.08)	0.47* (0.12)	0.45* (0.15)	0.60* (0.07)	0.77* (0.15)	0.48* (0.12)	0.63* (0.07)	0.36* (0.09)	0.28* (0.13)	0.12 (0.08)	0.34* (0.07)	0.14 (0.08)	0.27* (0.04)	0.47* (0.13)	0.40* (0.06)	0.51* (0.06)	0.26* (0.09)	0.40* (0.11)
Rubber	0.10 (0.07)	0.40* (0.14)	0.10 (0.07)	0.38* (0.14)	0.61* (0.19)	0.04 (0.05)	0.66* (0.22)	0.45* (0.12)	0.12 (0.07)	0.35* (0.10)	0.51* (0.17)	0.02 (0.11)	0.68* (0.08)	-0.03 (0.06)	0.03 (0.03)	0.66* (0.22)	-0.05 (0.04)	0.39* (0.06)	-0.33* (0.07)	0.64* (0.13)
Minerals	-0.10 (0.07)	0.18 (0.13)	-0.10 (0.07)	0.17 (0.13)	0.39* (0.16)	-0.08 (0.08)	-0.15 (0.07)	0.16 (0.14)	-0.06 (0.07)	0.04 (0.09)	0.30* (0.15)	0.13 (0.08)	0.72* (0.09)	-0.17 (0.09)	-0.03 (0.05)	-0.09 (0.06)	-0.03 (0.05)	0.21* (0.07)	-0.61* (0.11)	0.57* (0.13)
Metals	0.29* (0.08)	0.05 (0.11)	0.29* (0.08)	0.05 (0.12)	0.07 (0.20)	0.32* (0.08)	0.18 (0.10)	0.03 (0.12)	0.31* (0.08)	0.12 (0.10)	0.12 (0.19)	-0.13 (0.08)	0.49* (0.10)	-0.16* (0.06)	0.17* (0.04)	0.02 (0.08)	0.11 (0.06)	0.33* (0.07)	-0.23* (0.08)	0.35* (0.13)
Machines	0.20* (0.05)	0.03 (0.09)	0.20* (0.05)	0.02 (0.09)	0.13 (0.16)	0.19* (0.04)	0.23 (0.15)	0.03 (0.09)	0.21* (0.05)	0.15* (0.06)	0.22 (0.15)	-0.10 (0.07)	0.34* (0.07)	-0.13* (0.06)	0.10* (0.02)	0.15 (0.14)	0.04 (0.03)	0.35* (0.05)	-0.14* (0.06)	0.19* (0.09)
Electrical machines	0.14 (0.08)	0.52* (0.11)	0.14 (0.08)	0.51* (0.11)	0.62* (0.26)	0.15 (0.08)	0.00 (0.12)	0.50* (0.11)	0.15 (0.08)	0.25* (0.10)	0.38 (0.27)	0.32* (0.10)	0.52* (0.07)	0.15 (0.11)	0.04 (0.04)	-0.06 (0.10)	0.18* (0.08)	0.41* (0.08)	-0.04 (0.11)	0.45* (0.13)
Means of transport	0.26* (0.13)	0.69* (0.32)	0.26* (0.13)	0.68* (0.33)	0.91* (0.33)	0.24 (0.13)	0.59* (0.17)	0.70* (0.32)	0.29* (0.13)	0.48* (0.24)	0.78* (0.21)	0.32 (0.18)	0.82* (0.12)	-0.06 (0.23)	0.07 (0.06)	0.50* (0.14)	0.39* (0.10)	0.48* (0.10)	-0.43* (0.19)	0.91* (0.27)
Other manufacturing	-0.13 (0.12)	-0.14 (0.14)	-0.13 (0.12)	-0.15 (0.14)	0.13 (0.16)	-0.14 (0.12)	-0.10 (0.13)	-0.14 (0.14)	-0.09 (0.12)	0.08 (0.12)	0.44* (0.14)	0.37* (0.12)	0.47* (0.11)	-0.42* (0.07)	-0.11 (0.06)	0.00 (0.09)	0.19* (0.08)	0.33* (0.08)	-0.64* (0.10)	0.29 (0.17)
Weighted average	0.28	0.30	0.31	0.32	0.39	0.29	0.41	0.35	0.33	0.27	0.31	0.06	0.50	-0.02	0.14	0.28	0.18	0.36	-0.14	0.49

Models 4 and 5 investigate the difference between the Netherlands and the rest of the European Union for the economic union and the Single Market, respectively. Models 6 and 7 do the same, but then for all EU expansions. For more information, see the caption below Table 4.

7.4.2 Services

On average, the Netherlands benefits hardly more from the combination of the Single Market and the economic union than the rest of the European Union (see Table 7 model 4). The difference is negligible, at 2%-points. Here, too, there is great variation between sectors. In the transport and tourism sectors, the Netherlands benefits 224%-points more from the Single Market and the economic union than the rest of the European Union. On the other hand, in the public services sector, the Netherlands benefits 137%-points less than the rest of the European Union.

The average benefits of the Single Market and economic union, with regard to services, differ between the various EU expansions (see model 6), but not as much as for goods. Also in this case, the open economy of the Netherlands benefits greatly from the Single Market and the economic union. The average benefits are the greatest for the EU-9 expansion, which are mainly enhanced by the trade in professional services (including financial services) with the United Kingdom. But these benefits are also true for Ireland, for whom the trade in services play a relatively important role. For the EU-12 expansion, the average impact is the smallest. This group of Member States only experiences benefits in the transport and tourism sectors. Other EU expansions also experience large differences between sectors.

Table 7 Heterogeneous parameter estimations of the elasticities of the Single Market, services

Model	3		4		6					
	Main specification		EU vs NL for SM & Economic Union		Impact SM & Economic Union for EU expansions					
Sector	EU	EU ex NL	NL	EU-6 ex NL	NL	EU-9	EU-12	EU-15	EU-25	EU-28
Transport & tourism	1.42*	1.40*	1.84*	0.36*	0.94*	0.69*	0.89*	0.41*	0.86*	0.79*
	(0.13)	(0.13)	(0.32)	(0.13)	(0.31)	(0.18)	(0.18)	(0.14)	(0.09)	(0.10)
Professional services	0.89*	0.89*	0.87*	0.48*	0.47*	0.76*	-0.02	0.48*	0.45*	0.29*
	(0.15)	(0.15)	(0.18)	(0.14)	(0.17)	(0.18)	(0.16)	(0.21)	(0.07)	(0.10)
Public services	0.95*	0.99*	0.28	0.81*	0.05	0.72*	-0.02	0.32	0.17	0.93*
	(0.23)	(0.22)	(0.37)	(0.25)	(0.29)	(0.27)	(0.34)	(0.26)	(0.12)	(0.28)
Weighted average	1.10	1.11	1.13	0.50	0.57	0.73	0.33	0.43	0.55	0.60

Model 4 investigates the difference between the Netherlands and the rest of the European Union, for the combination of the Single Market and the economic union. Model 6 does the same, but then for all EU expansions. For more information, see the caption below Table 4.

7.5 Results from general equilibrium analysis

The results from the counterfactual analysis⁴⁵ are described in Tables 8 and 9. These results underpin Figure 1 as well as the figures in Chapter 4. They can be interpreted as the benefits from the various phases of the European Union. In Table 8, columns 1 and 3, the counterfactual consists of there being no European Union at all (i.e. no free trade, Single Market or economic union). Columns 5 and 7 show the effects of an analysis in which only the Single Market is absent. This is therefore a partial effect of the broader counterfactual. Table 9 cannot make the distinction between these scenarios, because we could only create scenarios from 2000 onwards.

⁴⁵ See Bollen et al. (2020), for more information about the general equilibrium analysis. Contrary to the analysis in that report, for goods, we used another data set for the general equilibrium analysis (with more recent data) than the one used to estimate the trade elasticities. This may result in large deviations between residuals in the counterfactual analysis, which therefore no longer has a standard distribution. To prevent this from disrupting the bootstrap in the general equilibrium analysis, we re-estimated the elasticities of FTA_{ijt} and the border dummies (see Section 7.1) in the counterfactual analysis, for which we increased the frequency of the border dummies from 10 to 5 years. This causes a share of the large deviations to be counterbalanced by these elasticities. For goods, however, we do see that the uncertainty intervals are still not yet distributed normally (see Figure 9 and Table 8).

EU Member States are hardest hit by decreases in GDP of more than 7%. For other countries this loss is, as expected, far more limited. What is striking is that trade diversion mainly has positive effects on exports for many countries outside the European Union. For a number of countries, therefore, it would be positive if the EU were to break up; they would trade more with European countries, making mutual trade relatively more expensive.

7.5.1 Goods

Table 8 Change in exports and added value without the Single Market and European Union, compared to reality, goods

Country	EU total				Single Markt			
	Exports	95% Interval	Added value	95% Interval	Exports	Interval	Added value	95% Interval
European Union								
Belgium–Luxembourg	22.7	(23.4 / 21.9)	8.9	(9.1 / 8.6)	8.0	(8.5 / 7.6)	5.2	(5.3 / 5.0)
Bulgaria	23.0	(24.6 / 21.5)	1.6	(1.8 / 1.3)	6.8	(7.7 / 6.0)	0.9	(1.1 / 0.6)
Cyprus	36.7	(40.2 / 30.5)	2.7	(3.0 / 2.3)	19.7	(21.8 / 17.0)	2.1	(2.3 / 1.9)
Denmark	21.3	(21.9 / 20.5)	5.9	(6.1 / 5.7)	9.2	(9.7 / 8.8)	3.9	(4.0 / 3.8)
Germany	20.2	(20.7 / 19.7)	3.7	(3.7 / 3.6)	7.4	(7.6 / 7.1)	2.1	(2.2 / 2.1)
Estonia	18.1	(19.8 / 15.6)	6.4	(7.1 / 5.5)	5.8	(6.8 / 4.8)	3.6	(4.0 / 3.1)
Finland	16.5	(19.9 / 13.6)	-1.0	(0.6 / -3.3)	6.8	(10.8 / 5.9)	-0.4	(1.2 / -1.6)
France	26.3	(27.1 / 25.5)	4.3	(4.5 / 4.2)	9.9	(10.3 / 9.5)	2.5	(2.6 / 2.4)
Greece	16.6	(18.7 / 5.9)	0.9	(1.1 / 0.7)	10.3	(11.3 / 7.5)	0.9	(1.0 / 0.7)
Hungary	21.6	(22.4 / 20.9)	8.9	(9.2 / 8.6)	4.9	(5.2 / 4.6)	3.4	(3.5 / 3.3)
Ireland	7.7	(8.9 / 6.3)	4.4	(5.2 / 3.5)	2.7	(3.2 / 2.1)	3.3	(3.9 / 2.7)
Italy	24.7	(25.3 / 24.1)	1.6	(2.0 / 1.3)	9.4	(9.9 / 8.9)	0.9	(1.2 / 0.5)
Croatia	18.0	(20.4 / 10.5)	2.5	(2.8 / 1.8)	6.6	(7.5 / 5.5)	1.4	(1.7 / 1.0)
Latvia	22.9	(24.4 / 21.4)	5.5	(6.0 / 5.1)	8.7	(9.6 / 7.8)	3.2	(3.5 / 2.9)
Lithuania	21.0	(21.9 / 20.1)	5.3	(5.6 / 5.0)	8.2	(8.8 / 7.6)	3.2	(3.4 / 3.0)
Netherlands	24.4	(25.6 / 23.4)	6.3	(6.6 / 6.0)	10.9	(11.4 / 10.5)	5.3	(5.5 / 5.1)
Austria	23.4	(24.0 / 22.9)	6.8	(7.0 / 6.6)	7.4	(7.8 / 7.1)	3.3	(3.4 / 3.2)
Poland	31.7	(32.6 / 30.8)	4.4	(4.6 / 4.3)	10.1	(10.4 / 9.7)	2.0	(2.1 / 2.0)
Portugal	31.7	(34.1 / 29.3)	3.3	(3.7 / 2.8)	9.6	(10.4 / 8.5)	1.3	(1.8 / 0.9)
Romania	29.0	(31.1 / 26.7)	2.1	(2.3 / 1.8)	7.2	(8.0 / 6.4)	0.6	(0.8 / 0.3)
Slovenia	25.0	(26.1 / 23.7)	7.2	(7.5 / 6.9)	6.2	(6.6 / 5.7)	3.2	(3.4 / 3.1)
Slovakia	25.4	(26.8 / 23.4)	7.6	(7.9 / 7.3)	5.1	(5.5 / 4.6)	2.5	(2.7 / 2.4)
Spain	35.3	(36.2 / 27.5)	2.3	(2.5 / 2.1)	14.5	(15.0 / 12.6)	1.4	(1.5 / 1.2)
Czech Republic	26.0	(26.9 / 25.0)	6.4	(6.6 / 6.2)	6.2	(6.5 / 5.9)	2.5	(2.6 / 2.4)
Sweden	22.7	(23.4 / 22.0)	4.6	(4.7 / 4.4)	7.8	(8.2 / 7.5)	2.5	(2.6 / 2.4)
Europe								
Norway	14.2	(17.5 / 12.4)	1.9	(2.6 / 1.4)	12.4	(14.8 / 11.0)	2.0	(2.5 / 1.6)
United Kingdom	19.0	(21.3 / 15.2)	3.0	(3.2 / 2.7)	10.3	(11.0 / 9.3)	2.0	(2.2 / 1.7)
Switzerland	13.1	(13.6 / 12.7)	1.1	(1.2 / 1.0)	6.7	(7.0 / 6.4)	0.6	(0.7 / 0.6)
Other								
Australia	-2.0	(-1.1 / -3.1)	-0.3	(-0.2 / -0.4)	0.3	(0.8 / -0.4)	0.0	(0.1 / -0.1)
Brazil	-16.9	(-15.8 / -18.1)	0.0	(0.2 / -0.3)	1.3	(1.6 / 1.1)	-0.4	(-0.2 / -0.6)

Country	Exports	95% Interval	Added value	95% Interval	Exports	Interval	Added value	95% Interval
Canada	3.8	(4.3/3.2)	0.7	(0.9/0.6)	-0.1	(0.1/-0.4)	-0.1	(0.0/-0.2)
Total EU				Single Market				
China	-3.1	(-2.4/-3.8)	-0.6	(-0.3/-0.9)	0.9	(1.6/0.2)	-0.6	(-0.3/-0.9)
India	-2.6	(-1.6/-3.8)	-0.2	(0.0/-0.4)	-0.4	(0.2/-1.1)	-0.4	(-0.2/-0.6)
Indonesia	-11.5	(-10.3/-12.7)	-0.7	(-0.4/-1.1)	0.6	(1.6/-0.6)	-0.7	(-0.3/-1.0)
Japan	-4.4	(-4.1/-4.8)	-0.4	(-0.3/-0.5)	1.3	(1.4/1.2)	-0.1	(0.0/-0.2)
Korean Republic	16.5	(17.1/16.0)	0.4	(0.6/0.2)	1.6	(1.9/1.2)	-0.3	(-0.1/-0.6)
Mexico	7.6	(8.8/3.6)	1.0	(1.1/0.8)	0.0	(0.3/-0.3)	-0.2	(-0.1/-0.3)
Russian Federation	-8.4	(-7.7/-10.3)	-0.3	(-0.2/-0.3)	0.3	(1.0/-0.6)	0.0	(0.1/-0.1)
Turkey	-20.8	(-17.9/-23.9)	-2.8	(-1.8/-3.8)	3.0	(4.6/1.6)	-1.6	(-0.7/-2.6)
United States	-1.8	(-1.5/-2.2)	-0.3	(-0.2/-0.4)	2.6	(2.8/2.4)	-0.1	(0.0/-0.1)

We report the median and 95% confidence interval, based on a block-bootstrap with residuals, whereby residuals are sampled within pairs of countries. In total, 500 bootstraps are performed.

7.5.2 Services

Table 9 Change in exports and added value without EU, compared to reality, services

Country	EU total			
	Exports	95% Interval	Added value	95% Interval
European Union				
Belgium–Luxembourg	43.7	(47.0/39.8)	1.6	(1.8/1.4)
Bulgaria	34.5	(39.9/28.3)	0.9	(1.1/0.6)
Cyprus	32.4	(39.4/27.2)	1.4	(1.7/1.1)
Denmark	25.1	(27.1/22.7)	1.0	(1.0/0.9)
Germany	35.2	(37.5/33.0)	0.6	(0.6/0.6)
Estonia	46.4	(52.2/41.1)	2.2	(2.5/1.9)
Finland	34.8	(37.2/32.0)	0.6	(0.7/0.6)
France	27.9	(32.3/23.6)	0.4	(0.4/0.3)
Greece	25.0	(28.6/21.2)	0.4	(0.4/0.3)
Hungary	46.3	(50.2/41.4)	1.8	(2.1/1.4)
Ireland	22.8	(29.3/14.1)	3.7	(4.4/2.5)
Italy	41.7	(44.0/38.8)	0.4	(0.5/0.4)
Croatia	25.2	(28.8/20.4)	1.2	(2.0/0.4)
Latvia	17.8	(22.9/12.3)	0.5	(0.7/0.2)
Lithuania	17.5	(21.1/14.4)	0.0	(0.4/-0.5)
Netherlands	18.4	(21.0/15.8)	1.0	(1.2/0.7)
Austria	39.3	(42.1/36.4)	1.1	(1.1/1.0)
Poland	25.1	(28.2/21.7)	0.4	(0.6/0.1)
Portugal	38.1	(41.6/34.4)	0.3	(0.4/0.3)
Romania	17.1	(22.6/6.0)	0.7	(1.3/0.1)
Slovenia	36.1	(41.6/31.8)	1.5	(1.7/1.1)
Slovakia	25.1	(28.4/21.8)	0.2	(0.7/-0.3)
Spain	27.9	(31.2/23.2)	0.5	(0.5/0.3)
Czech Republic	40.5	(45.3/34.9)	1.4	(1.5/1.1)

Sweden	41.1	(43.2 / 38.2)	1.0	(1.1 / 1.0)
EU total				
Country	Export	95% Interval	Added value	95% Interval
Europe				
Norway	-4.8	(-2.3 / -7.3)	-0.3	(-0.3 / -0.4)
United Kingdom	29.0	(34.3 / 20.2)	0.4	(0.5 / 0.3)
Switzerland	23.5	(26.4 / 20.8)	0.3	(0.5 / 0.2)
Other				
Australia	-11.5	(-8.8 / -14.2)	0.0	(0.0 / -0.1)
Brazil	-0.6	(1.3 / -2.8)	0.0	(0.0 / 0.0)
Canada	-12.9	(-10.9 / -15.7)	-0.2	(-0.2 / -0.2)
China	-9.8	(-6.5 / -13.6)	0.0	(0.0 / 0.0)
India	-11.9	(-8.6 / -15.7)	-0.1	(0.0 / -0.1)
Indonesia	-21.1	(-14.7 / -28.2)	-0.1	(-0.1 / -0.1)
Japan	-12.0	(-8.9 / -14.1)	0.0	(0.0 / 0.0)
Korean Republic	5.8	(9.3 / 2.3)	0.0	(0.0 / 0.0)
Mexico	-29.6	(-24.6 / -34.6)	0.0	(0.0 / 0.0)
Russian Federation	-5.3	(-3.6 / -7.1)	-0.1	(-0.1 / -0.1)
Turkey	-11.7	(-9.0 / -14.6)	-0.1	(-0.1 / -0.2)
United States	0.0	(1.2 / -1.5)	0.0	(0.0 / -0.1)

We report the median and 95% confidence interval, based on a block-bootstrap with residuals, whereby residuals are sampled within country-pairs. In total, 500 bootstraps are performed.

8 Glossary

CAP	— Common Agricultural Policy
EEC	— European Economic Community
EEA	— European Economic Area
ECSC	— European Coal and Steel Community
EU	— European Union
EFTA	— European Free Trade Association
FDI	— Foreign direct investment
GDP	— Gross Domestic Product
NTM	— Non-tariff measure
PPML	— Poisson pseudo-maximum likelihood
WTO	— World Trade Organization
Trade diversion	— The dynamics by which countries outside a trade agreement export lower volumes to countries inside the agreement. This is because the trade between parties in the agreement becomes cheaper. This makes trade with non-participating countries relatively more expensive.
General equilibrium effect	— An estimate of an effect that takes into account any spillover effects of, for example, prices and demand (i.e. general equilibrium).
Partial effect (<i>Ceteris paribus</i> effect)	— A partial estimate of an effect that does not take account of general equilibrium effects, also called <i>ceteris paribus</i> effect.
Counterfactual analysis	— An analysis that simulates a scenario that differs from reality, in order to estimate the effect of this change.
Three phases of EU integration:	
Economic union	— Further economic integration and regulation, such as the Common Agricultural Policy (CAP).
Single Market	— Guarantees the free movement of persons, goods, services and capital.
Free Trade Agreement	— A treaty between two or more countries, which establishes a trade area without restrictions and a custom's union.
Trade elasticity	— A parameter that indicates the change in the demand for exported goods and services when the level of integration changes.
Elasticity of substitution	— A parameter that indicates the change in the demand for exported goods and services when prices change, estimated with tariffs, therefore also tariff elasticity .
WorldScan model	— Model for calculating trade barriers, amongst other things; no longer in use by CPB.
Gravity model	— Current CPB model for estimating the effects of trade barriers, see Bollen et al. (2020).

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