

How a strong pharma chapter in TTIP will benefit the EU

Report prepared for EFPIA
May 2016



Structure of the report

- 1 Introduction and key findings
- 2 The strong economic footprint of the EU pharma industry
- 3 US barriers to EU exports of pharma products
- 4 Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry
- 5 Benefits of an ambitious pharma chapter to selected EU Member States
- 6 Benefits of an ambitious pharma chapter in TTIP to other industries in the EU
- 7 TTIP and FDI in the EU pharma industry

Introduction and key findings

Introduction and key findings

Purpose of the study

WHY?

The overall purpose of the study is to assess and quantify the benefits to the EU economy following from an ambitious pharma chapter in the Transatlantic Trade and Investment Partnership Agreement (TTIP) currently being negotiated by the EU and the US.

WHAT?

In the study, we assess:

- The importance of the pharma industry to the EU economy
- Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry
- Benefits of an ambitious pharma chapter in TTIP to selected EU Member States
- Benefits of increased production in the EU pharma industry to other EU industries and to EU society
- Impacts of TTIP on FDI in the EU pharma industry.

Introduction and key findings

Key findings

An ambitious pharma chapter in TTIP provides benefits for the EU:

- **Increases** EU pharma exports to non-EU countries by **9 billion EUR**
- **Provides around 19,000** new high value jobs in the EU pharma industry
- **Supports** around **60,000 additional jobs** in related industries
- **Benefits EU patients** via improved access to new pharma products and increased choice for EU patients and health care systems
- **Improves the efficiency** of EU regulatory resources
- **Frees up** resources for EU pharma companies that can i.e. be invested in the development of new medicines
- Can **attract more** transatlantic FDI into EU's pharma sector.

Introduction and key findings

The pharma industry brings value to the EU economy

The pharma industry has a strong footprint on the EU economy:

- Pharma supports 2.6 million jobs in the EU - **640,000** are employed directly in the pharma industry and 2 million in other industries
- For every one job in pharma, the industry supports more jobs throughout the EU economy than most other industries
- Jobs in pharma are highly productive and high skilled
- Pharma supports long-term employment via its high R&D intensity
- Pharma develops innovative medicines that increase life expectancy

Pharma exports are increasing at a faster rate than total exports of other goods. Ensuring good access to foreign markets is critical to continued export growth.

Introduction and key findings

The EU pharma industry brings value to the global economy

- The EU pharma industry is a key player on the global market for pharma products
- 60 per cent of the world's exports of pharma products originate from the EU
- EU pharma has a very large global market share in some pharma product. For instance, 90 per cent of major manufacturers' global output of vaccines are produced in Europe

Increasing R&D investments in the EU pharma industry will benefit patients all over the world.

Introduction and key findings

Pharma is an interconnected transatlantic industry

EU and US markets for pharma products are very *interconnected*:

- Eight out of ten of the worldwide top pharma companies are located in the EU or the US
- The EU and the US combined represent 75 per cent of global R&D in life science
- More than 80 per cent of global sales are in the EU and the US
- More than 60 per cent of US pharma imports are from the EU
- Many US firms have a strong presence in the EU and vice versa.

Introduction and key findings

The US is the most important non-EU market for EU pharma exports

- The US is the most important market for EU pharma exports outside the EU and is a key market for new pharma products
- The EU is the most important source of US pharma import and EU pharma is in a strong position on the US market. Since 2007, the EU's share of US pharma imports has however been falling
- TTIP can help ensure that EU pharma remains in a strong position on the US market by reducing trade barriers. This will benefit EU economies and citizens by increasing EU pharma exports and creating more high value jobs in pharma and stimulate R&D activities
- TTIP also has the potential to improve EU market access for US pharma companies and increase choice for EU patients because of better access for US pharma products to the EU market and because of the long-term increase in EU R&D in pharma.

Introduction and key findings

TTIP can increase access to the US for EU pharma producers

- There are **significant non-tariff barriers** to trade between the US and the EU in the pharma sector, including different regulatory regimes and IPR systems
- The EU and US have regulatory regimes and IPR systems with the highest quality standards. An ambitious pharma chapter in TTIP should aim at strengthening regulations to the highest standards on a global level and improve the regulatory framework without lowering of the quality or compromising patient safety
- An ambitious pharma chapter that targets key NTBs and opportunities by **aligning regulatory regimes** and reducing unnecessary duplicative costs to trade in pharma products between the EU and the US can **significantly reduce costs** of market access for pharma companies on both sides of the Atlantic
- Due to the combined market size of the US and the EU, TTIP can also induce other countries to align their regulatory regimes with the EU and the US, and TTIP can therefore also **improve market access for EU pharma products in third countries**
- In this study, we rely on the European Commission's assumption of a 25 per cent reduction in transatlantic non-tariff barriers as a result of an ambitious TTIP agreement.

Introduction and key findings

Benefits of TTIP to EU pharma and other industries

- TTIP will **increase** extra-EU pharma exports by **9 billion EUR**
- This will create up towards **19,000 high value jobs** in the EU pharma industry
- Furthermore, the increase in pharma export will increase the demand for inputs from other EU industries that supply inputs to the EU pharma sector
- Increased pharma exports will help sustain up towards 60,000 jobs in other EU industries, manufacturing as well as service sectors
- In the long run, the number of jobs in the EU is determined by the size of the labour force, and employment will reach its long run sustainable level
- This means that the new jobs in the pharma industry reflect a reallocation of resources away from other industries
- As jobs in the pharma industry are **highly productive** and **highly qualified**, the reallocation of resources will improve the overall productivity level and benefit for the EU economy as a whole
- The impacts of TTIP will differ across EU Member States. In Germany France, Ireland, Denmark, Belgium and the United Kingdom, which are analysed in this study, the impacts from pharma are found to be large compared to other industries.

Introduction and key findings

Benefits of TTIP to EU society and efficiency gains

An ambitious pharma chapter in TTIP will also have wider EU societal benefits. It will:

- **Benefit EU patients and health care systems** via improved access to new pharma products and increased patient choice
- **Free up EU regulatory resources** as duplicative and possibly even incompatible regulations are aligned. An ambitious pharma chapter in TTIP involves a reduction in cost burdens related to double regulation of e.g. manufacturing inspections which can be used for other purposes such as risk-based inspections. TTIP can thus increase the efficiency of EU regulatory resources
- **Free up resources for EU pharma companies**, currently used to ensure compliance with two different regulatory systems. These resources can instead be re-invested in R&D of new medicines or other efficiency enhancing activities, which strengthen the EU pharma industry, generate economic value for the EU economy and benefit EU patients
- TTIP furthermore TTIP can **increase transatlantic FDI** in the pharma industry benefiting the EU economy. Reducing EU barriers to FDI in pharma by 25 per cent is expected to increase employment in US pharma affiliates in the EU by approximately **8,000** (10 per cent).

The strong economic footprint of the EU pharma industry

The strong economic footprint of the EU pharma industry

Definition: The pharma industry in the EU

- The study looks at the pharma industry and its economic footprint in the EU (EU28)
- Scope is defined as all operations/manufacturing in the EU in the pharma industry regardless of ownership and location of HQ
 - We also look at indirect impacts in supplier industries as captured by the most recent input-output tables from EU Member States and how increased activity in pharma spreads across industries and EU borders
- In the trade data, we look at pharma products as defined by SITC chapter 54 "Medicinal and pharmaceutical products"
 - We split this out from the larger section 5 of "Chemicals and related products" and from the GTAP model sector "Chemicals".

The strong economic footprint of the EU pharma industry

Key findings and conclusions

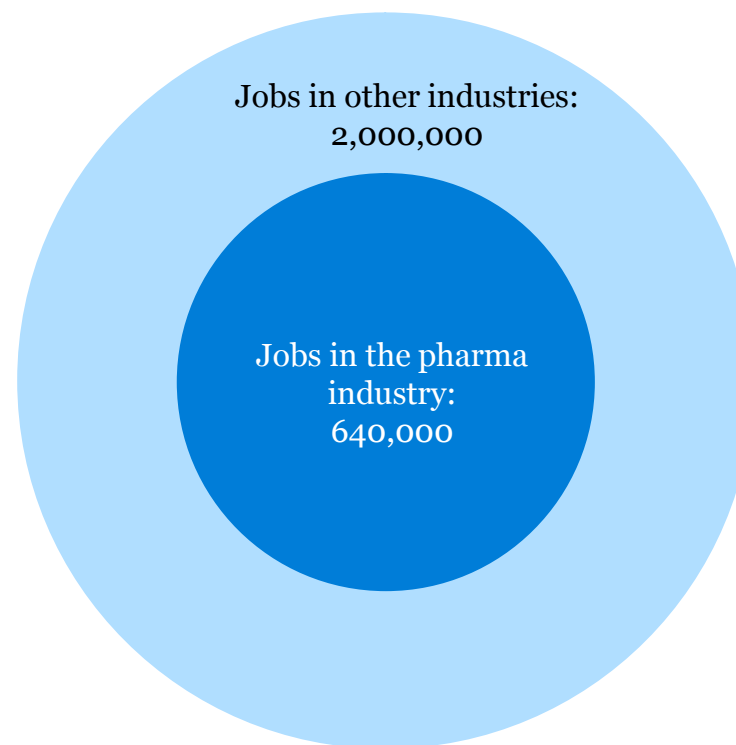
- Pharma supports more than 2.6 million jobs in the EU
- Per each job in pharma, the industry supports more jobs throughout the EU economy than most other industries (high multiplier effect)
- EU pharma exports are increasing faster than total exports of other goods
- Pharma has been a net job creator and over the period 2000-2013, **26,000 jobs** have been created in the industry, which have supported **110,000 jobs** in other industries
- The jobs created in pharma are highly productive and qualified jobs
- Pharma is R&D intensive and supports long term employment
- Pharma develops innovative medicines that increase life expectancy of patients in the EU and worldwide.

The strong economic footprint of the EU pharma industry

Pharma supports more than 2.6 million jobs in the EU

- In 2013, there were approximately 640,000 jobs in the EU pharma industry
- Taking the large employment multipliers into consideration (see next slide), the EU pharma industry supports around 2 million jobs in other industries
- The total number of jobs in the EU supported by the pharma industry thus amounts to more than 2.6 million jobs
- When employees in the pharma and supporting industries spend their wages, economic activity in the EU is spurred even further. If such so-called induced effects are also included in the analysis, additional jobs are supported in for example retail, housing and restaurants. Including induced effects, the pharma industry thus supports almost 3.6 million jobs in the EU.

Jobs supported by the pharma industry



Note: The job figures refer to employment in 2013.

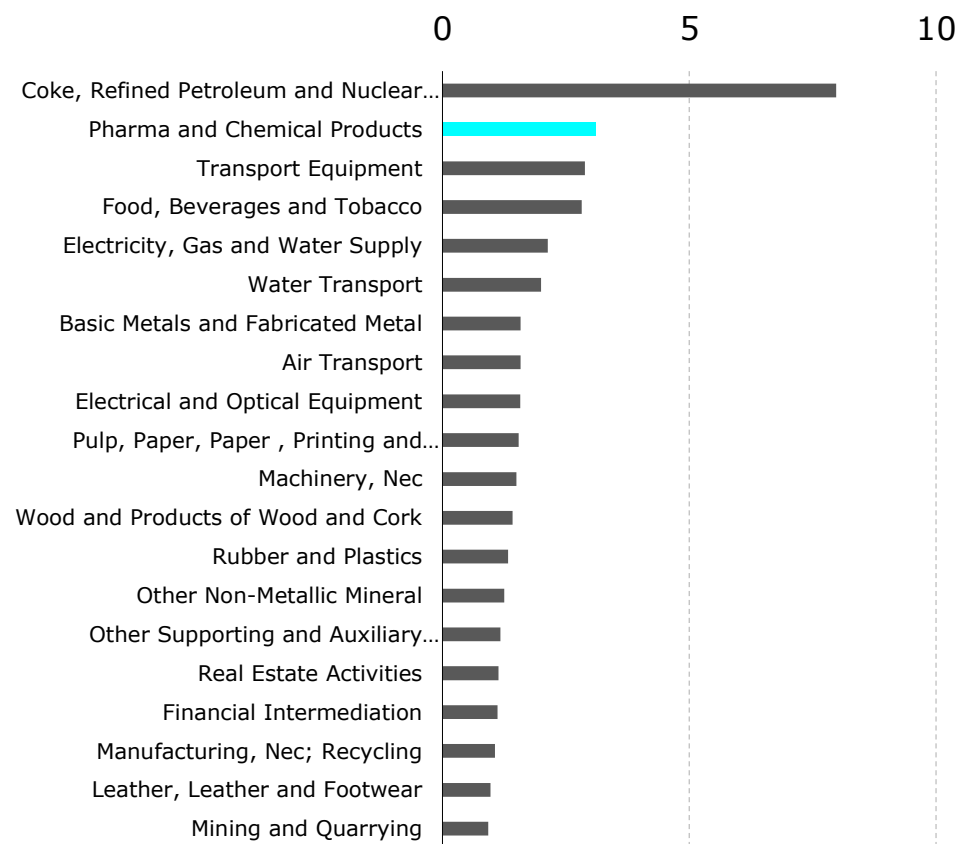
Source: Copenhagen Economics based on EFPIA "The pharmaceutical industry in figures" (edition 2015) and own analysis based on input-output tables from Eurostat

The strong economic footprint of the EU pharma industry

Pharma supports more jobs in the EU than most other industries

- The pharma industry uses goods and services from other EU industries. The pharma industry thus supports jobs in other industries
- Besides the coke, petroleum and nuclear industry, the pharma industry is in fact the industry that supports the largest number of jobs in other industries
- Every new job created in the pharma industry thus supports more than 3 jobs in other EU industries.

Pharma has a high employment multiplier



Note: The figure shows the indirect employment multipliers for the EU28 in the 20 sectors with the highest employment multipliers.

Source: Copenhagen Economics using input-output tables from Eurostat17

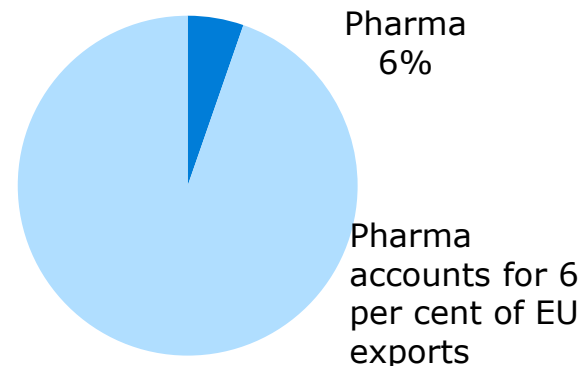
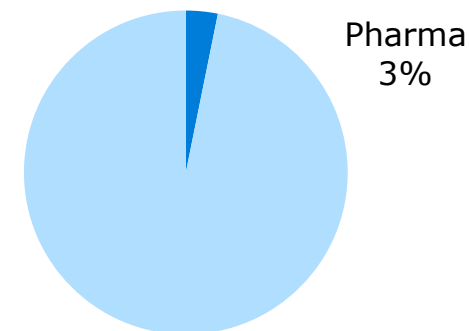
The strong economic footprint of the EU pharma industry

Pharma is a strong export industry

- Pharma accounts for approximately 3 per cent of EU production in the manufacturing sector and around 6 per cent of the EU goods export
- Pharma's contribution to EU exports thus exceeds the average contribution of other manufacturing industries.

Pharma contributes to EU exports

Pharma accounts for 3 percent of EU production



Note: Data are for 2013, and exports refer to both EU-intra and EU-extra exports. Pharma exports is defined as SITC group 54.

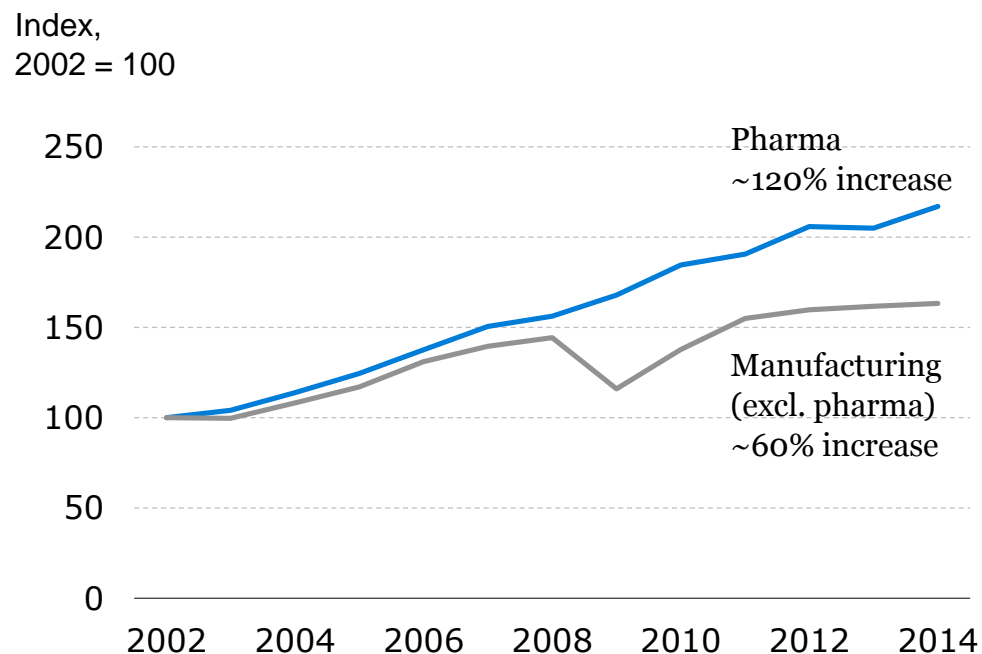
Source: Copenhagen Economics based on Eurostat's Comext and structural business statistics database

The strong economic footprint of the EU pharma industry

Pharma exports increase faster than other goods exports

- Exports of pharma products (including both intra-EU and extra-EU exports) has increased steadily over the period 2002-2014 and exports has more than doubled since 2002
- The same growth in exports cannot be seen for other manufacturing industries. These industries were hit harder by the economic crisis, and export growth has stagnated during the last few years.

Pharma exports are increasing



Note: Pharma is defined as SITC group 54. The figure shows the growth in total (EU-intra and EU-extra) exports of EU pharma products relative to the growth in EU total exports of all other goods.

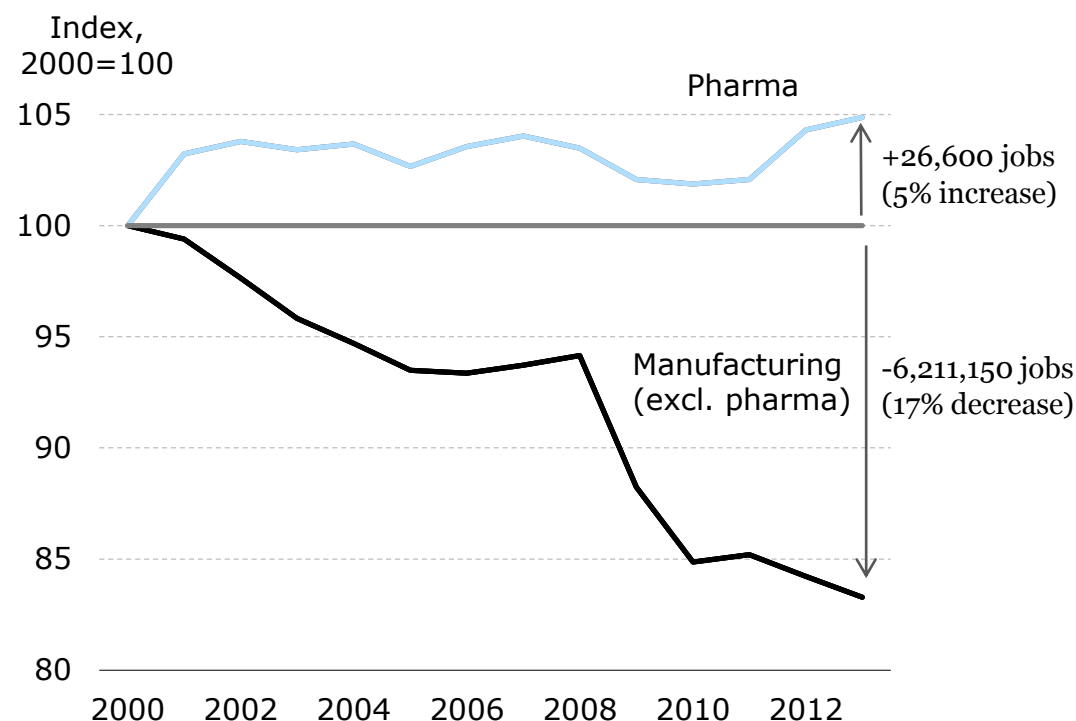
Source: Copenhagen Economics based on Eurostat's Comext

The strong economic footprint of the EU pharma industry

26,000 jobs have been created in pharma during 2000- 2013

- Pharma is a net job creator. Over the period 2000-2013, 26,000 jobs have been created in the EU pharma industry
- Over the same period, the average job creation in other EU manufacturing industries has been negative and overall jobs in the EU manufacturing sector have been lost
- Taking the large employment multiplier into consideration, the 26,000 jobs in pharma have supported almost 110,000 jobs in other industries.

Pharma is important for job creation



Source: Copenhagen Economics based on structural business statistics from Eurostat

The strong economic footprint of the EU pharma industry

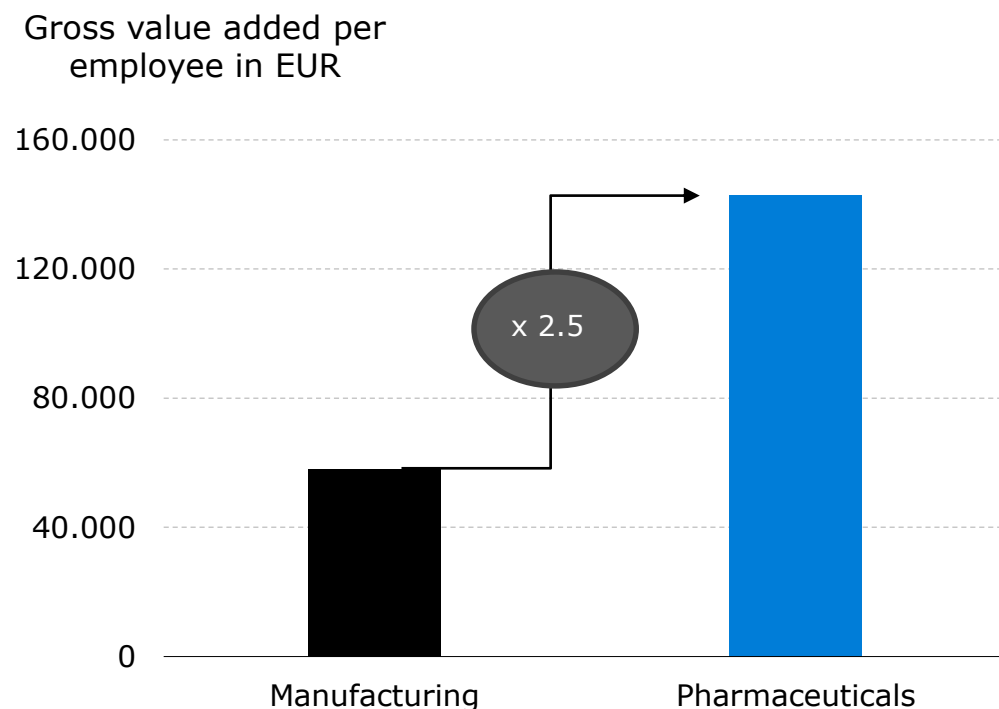
Jobs in pharma are highly productive and qualified

- Jobs in the pharma industry are highly productive (see next slide)
- On average, every employee in the EU pharma industry creates a gross value added of 143,000 EUR
- Across EU manufacturing industries, an employee on average creates a gross value added of 58,000 EUR. Pharma is thus 2.5 times more productive than the manufacturing sector on average
- Jobs in the pharma industry are also highly qualified jobs, and nearly every fifth job in the EU pharma industry is in R&D (see next slide).

The strong economic footprint of the EU pharma industry

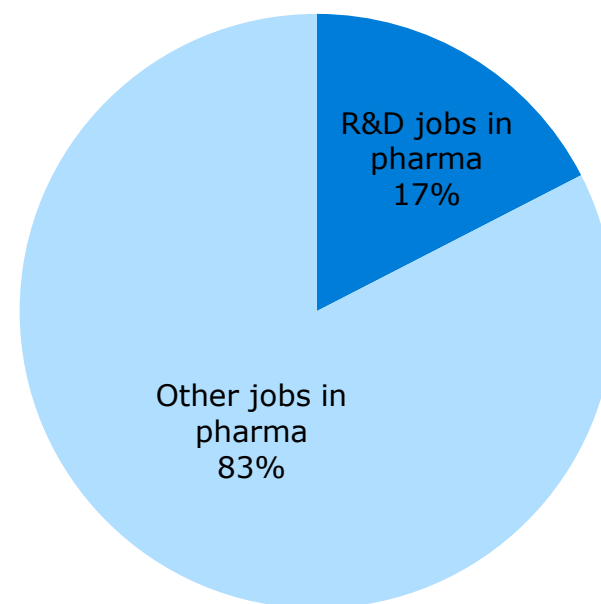
Jobs in pharma are highly productive and qualified

The pharma industry is productive



Note: Data is from 2013.
Source: Copenhagen Economics based on structural business statistics from Eurostat

Close to every fifth job in pharma is in R&D



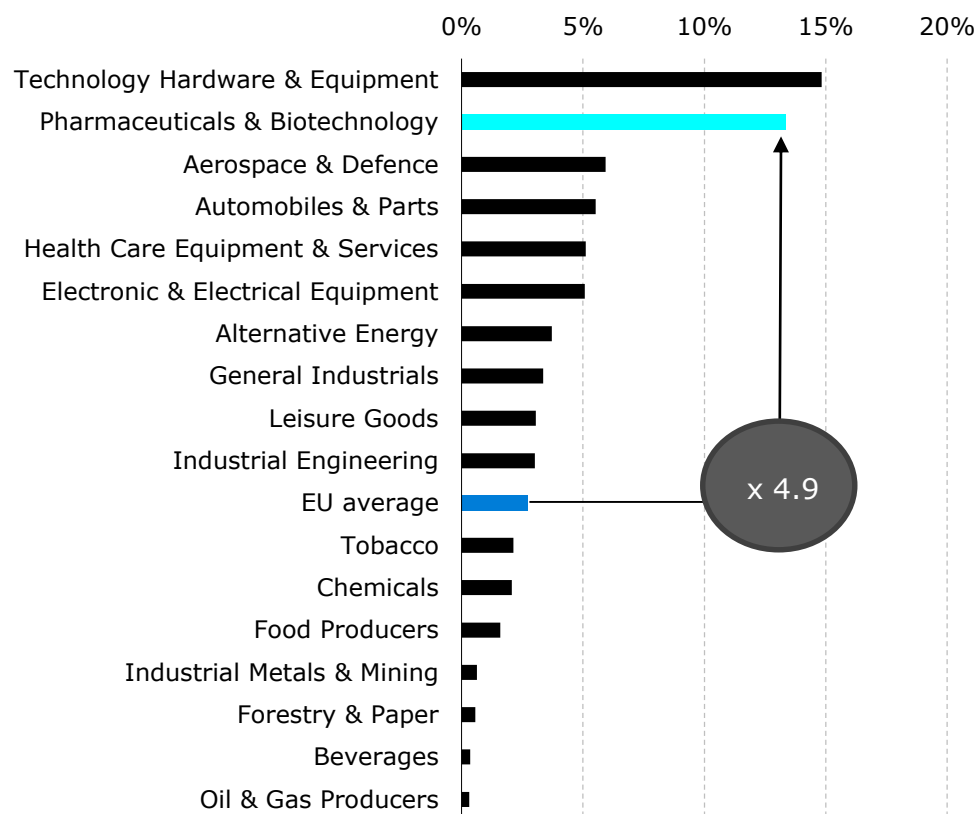
Note: Data is from 2013. The ratio of R&D jobs to total employment in Europe has been adjusted by equivalent ratio in the EU based on data from 2010.
Source: Copenhagen Economics based on EFPIA “The pharmaceutical industry in figures” (edition 2015) and EFPIA “Public consultation on a future external trade policy” (2010)

The strong economic footprint of the EU pharma industry

The pharma industry supports long term employment

- Pharma companies invest heavily in R&D. In 2015, R&D expenditures thus accounted for 13.3 per cent of the total sales in the pharma industry
- The R&D intensity of the pharma industry is almost 5 times higher than the average R&D intensity across all industries in the economy (3.4 per cent)
- In 2015, the pharma industry together with biotechnology was found to be the second most R&D intensive industry in the EU
- The large R&D investments improve the competitiveness of the EU pharma industry and enable the industry to maintain jobs in the long term.

Pharma has high R&D intensity



Note: The *Industrial R&D Investment Scoreboard* is an official EU publication that compares the R&D intensity across industries in the EU. The sectoral intensity is based on the largest 1000 EU based firms. The intensity is calculated as total R&D expenditures divided by total sales value.

Source: EU Commission Industrial R&D Investment Scoreboard 2015

The strong economic footprint of the EU pharma industry

Pharma produces both originator and generic medicines

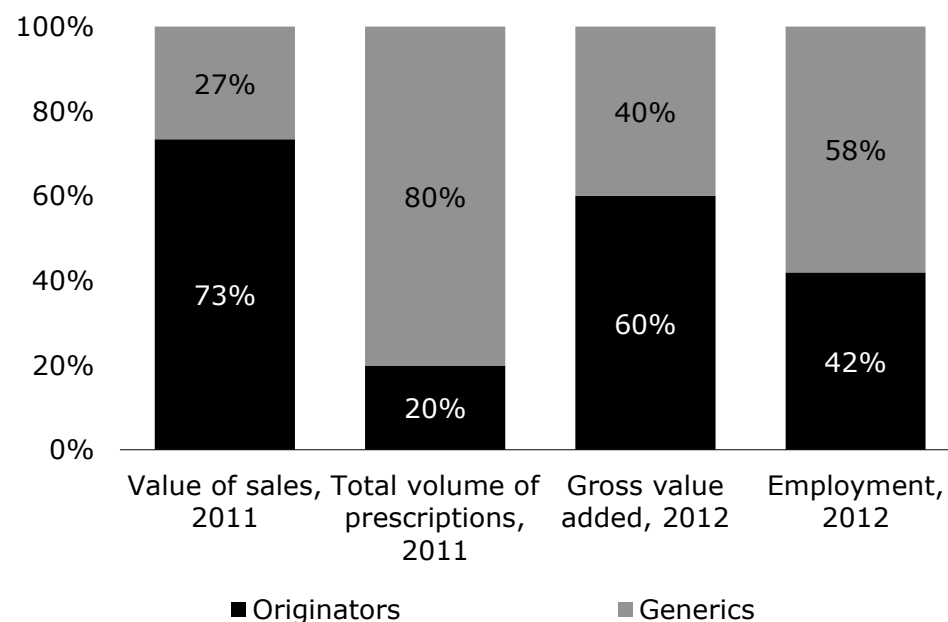
- The pharma market includes both originator and generic medicines
- Originators are innovative medicines, protected by a patent, while generics may be branded medicines marketed by the original developer or unbranded medicines marketed by other companies (WIFOR, 2015)
- As originators drive the development of new pharma products, this is an especially important segment of the market. Based on data presented in WIFOR (2015) for the global pharma industry, we find that originators generate 60 per cent of global value added in pharma (see next slide)
- As the market share of originators is larger in developed countries than in the rest of the world, originators are likely to account for a larger share of value added in the EU than globally.

The strong footprint of the EU pharma industry

Innovative medicines generate 60 per cent of global value added in pharma

- Originators generate 60 per cent of global gross value added in pharma and account for 73 per cent of the value of sales. This is driven by a large market share of originators in developed countries (72 per cent in 2012)
- Measured in volume of prescription drugs, originators make up a much smaller share of the global market (20 per cent), which may reflect the price differential between the two segments of the market
- In terms of employment, originators also account for a relatively low share (42 per cent). However, this mainly reflects the large role played by Asia. In Asia, originators account only for 31 per cent of the value of sales, while the region also accounts for 67 per cent of global employment in the industry*
- Given the large market share of originators in developed countries, the employment share of originators is likely to be significantly higher in the EU than globally
- EFPIA (2015) estimates EU employment among originators and generics to be 640,000, while the *European Generics Medicines Association (EGA)*, estimates European employment among generics to be 160,000. Holding these figures against each other suggests that the originator industry accounts for approximately 2/3 of employment in the European pharma industry.

Global shares of originators and generic medicines



Note: The share of global value of sales and gross value added of originators and generics is calculated based on the USD value.

Source: Copenhagen Economics based on WIFOR (2015)

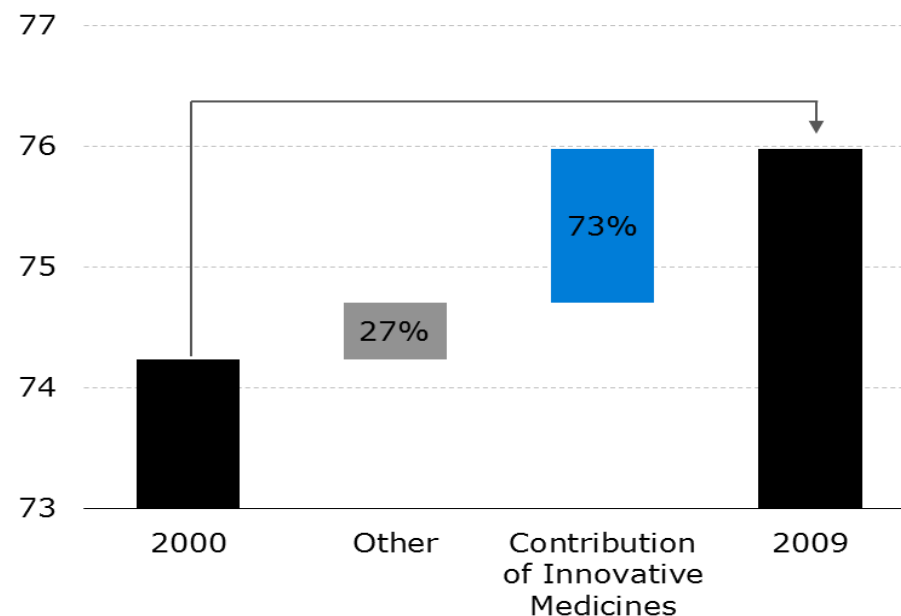
- WIFOR, 2015. Table 9 and diagram 6

The strong economic footprint of the EU pharma industry

Pharma develops innovative medicines that increase life expectancy

- The real gains from R&D carried out in the innovative pharma companies are embodied in the new medicines that are launched and used by patients
- An empirical finding suggests that innovative medicines account for 73 per cent of the increase in life expectancy recorded among the OECD countries during 2000-2009.

Innovative medicines increase life expectancy



Note: The impact of pharma innovation, as measured by the vintage (world launch year) of prescription drugs used, on longevity is estimated using longitudinal, country-level data on 30 developing and high-income countries during the period 2000-2009. The estimation controls for fixed country and year effects, real per capita income, the unemployment rate, mean years of schooling, the urbanisation rate, real per capita health expenditure (public and private), the DPT immunisation rate among children ages 12-23 months, HIV prevalence and tuberculosis incidence. The sample includes OECD countries.

Source: Lichtenberg, Pharmaceutical innovation and longevity growth in 30 developing OECD and high-income countries, 2000 - 2009 (2012)

US barriers to EU exports of pharma products

US barriers to EU exports of pharma products

Key findings and conclusions

- The EU is a key player on the global pharma market
- EU pharma is heavily dependent on global trade and 2/3 of production is exported
- The US is the most important non-EU market for EU pharma exports
- EU pharma has a strong position on the US market but the EU pharma industry is losing market share
- The US is a key market for new products
- Tariffs on transatlantic trade in pharma are already removed but non-tariff barriers are high. US non-tariff barriers are slightly higher than EU non-tariff barriers
- TTIP has the potential to target key non-tariff barriers and opportunities for transatlantic pharma
- Pharma is an interconnected transatlantic industry and reducing regulatory divergence will have direct impacts on both sides of the Atlantic and in other parts of the world.

US barriers to EU exports of pharma products

The EU is a key player on the global pharma market

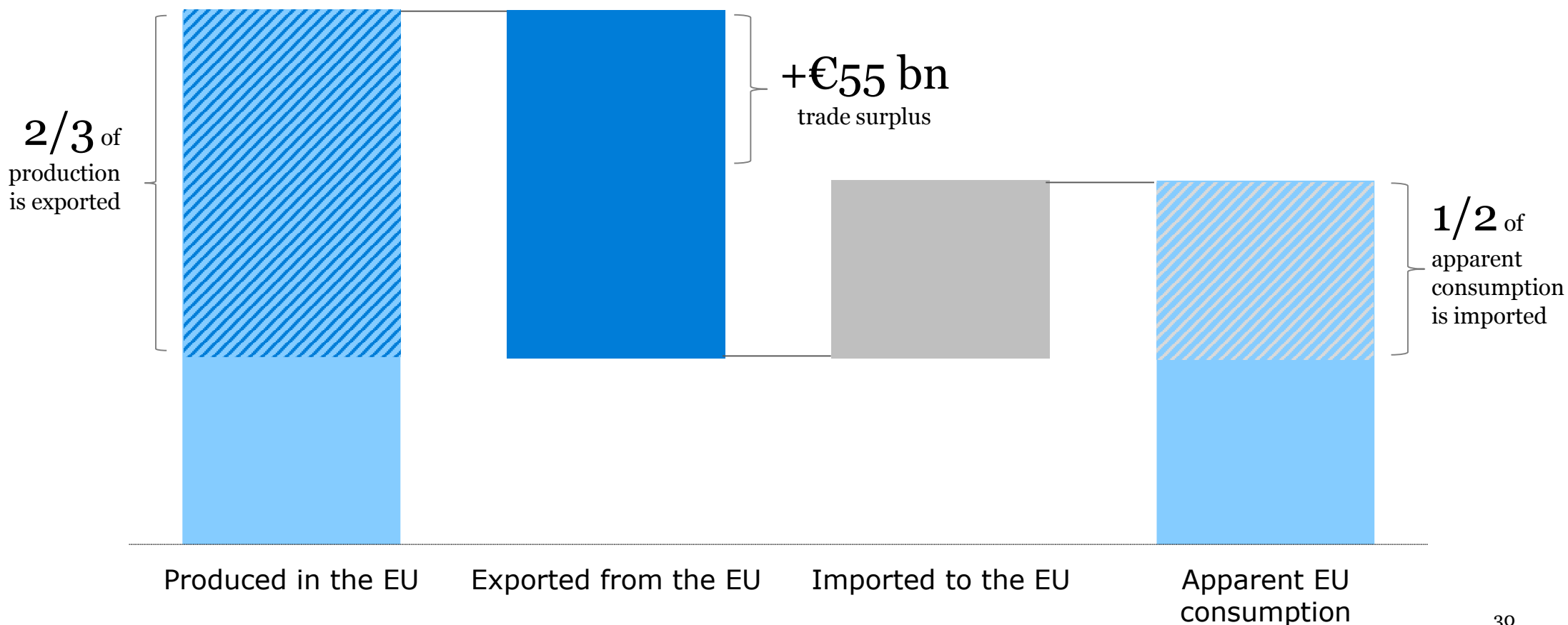
- The EU is a key player on the global market for pharma products. In 2013, 60 per cent of the world exports of pharma products thus originated in the EU (Blanc, 2014)
- The EU is a major producer of pharma products in a number of areas, including for instance the production of vaccines where 90 per cent of major manufacturers' global output of vaccines is produced in Europe (European Commission, 2011).

US barriers to EU exports of pharma products

Pharma is heavily dependent on global trade

EU production, export, import and consumption

Pattern vis-a-vis rest of the world based on 2013 data

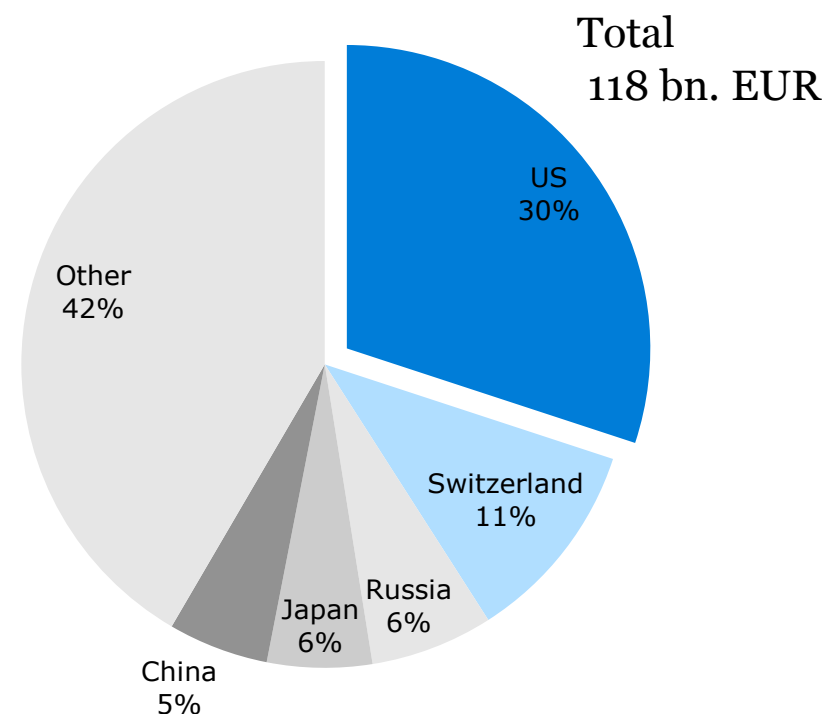


US barriers to EU exports of pharma products

The US is the most important non-EU market for EU pharma exports

- In 2014, EU exports of pharma products to destinations outside of the EU amounted to 118 bn. EUR
- The US is the single largest non-EU export market for EU pharma and accounts for 30 per cent of extra-EU exports of pharma products
- EU exports of pharma products to the US amounted to more than 35 bn. EUR in 2014.

Top 5 EU export markets outside the EU, 2014



Note: Pharma exports is defined as SITC group 54. The five countries shown are the top five destinations for EU pharma exports outside of the EU. The category 'Other' includes all other non-EU countries.

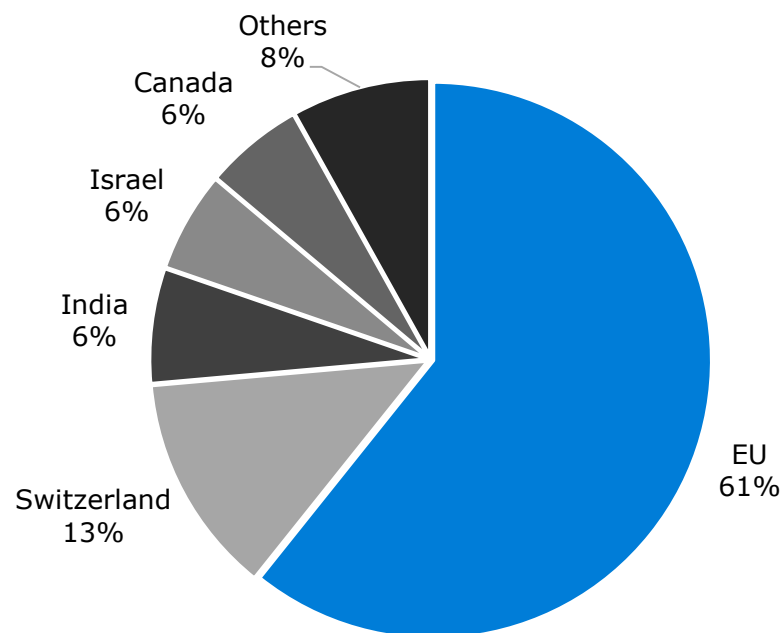
Source: Copenhagen Economics using data from Eurostat Comext database

US barriers to EU exports of pharma products

The EU is the most important source for US pharma imports

- The EU is the most important source of US pharma imports, accounting for 61 per cent of total US imports of pharma in 2014
- Imports make up a large share of pharma products used in the US and the country relies on imports to meet its demand for prescription drugs (US Bureau of Labor Statistics, 2011)
 - Measured in terms of volume, imports thus make up 40 percent of pharma used in the US (US Bureau of Labor Statistics, 2011)
 - Imports play an even larger role for active and bulk pharmaceutical ingredients used in finished drugs. For these products the import share is close to 80 percent (US Bureau of Labor Statistics, 2011)
- EU pharma is thus in a strong position on the US market.

The EU accounts for a large share of US pharma imports



Note: Pharma products are defined as SITC group 54. Data is from 2014.

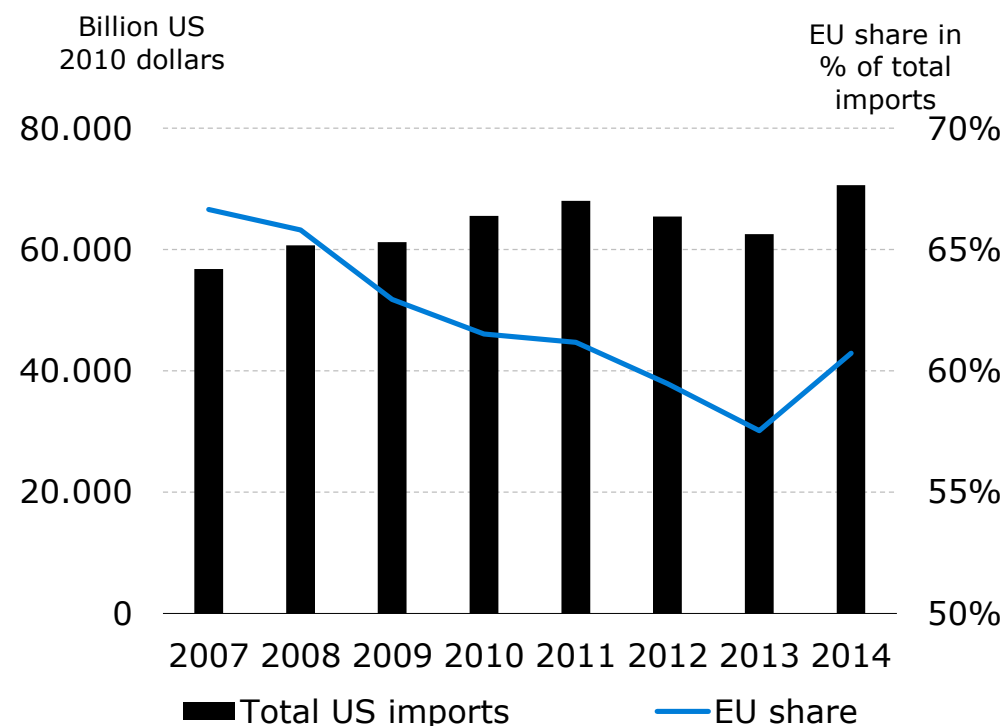
Source: Copenhagen Economics using data from UNCOM database

US barriers to EU exports of pharma products

But EU pharma is loosing market share in the US

- Over time, the EU's share of US imports has however fallen slightly
- In 2007, the EU thus accounted for 67 per cent of US pharma imports, compared to 58 per cent in 2013 and 61 per cent in 2014
- Increasing market access to the US market can help ensure that the EU pharma industry remains in a strong position on its most important non-EU market. TTIP can help ensure this.

EU share of US imports is falling



Note: Pharma products are defined as SITC group 54. Total US imports of pharma are in constant 2010 USD.

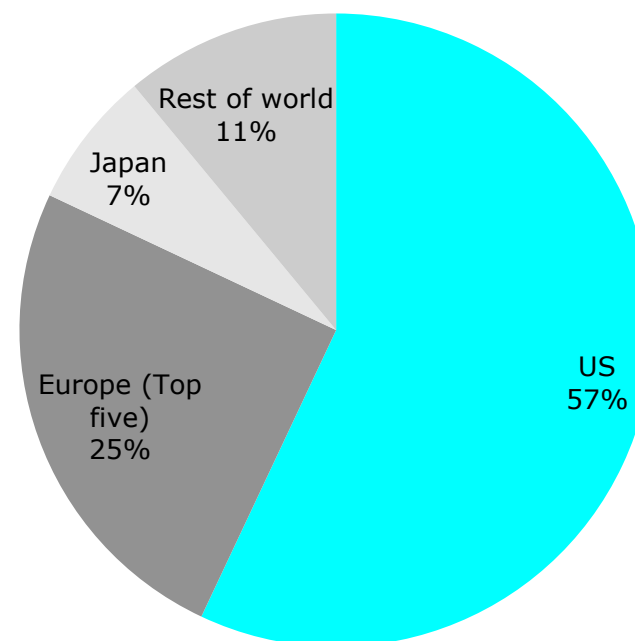
Source: Copenhagen Economics using data from UNCOM database

US barriers to EU exports of pharma products

The US is a key market for new products

- The US is an important market for the innovative part of the EU pharma industry
- The US alone accounted for 57 per cent of the sales of new medicines that were launched in 2010-2014
- The US market thus gives scale to the production of medicine and improves the incentive to invest in R&D to develop new and innovative products
- This adds to the importance of ensuring a continued competitiveness of EU pharma products on the US market.

Sales of new medicines launched, 2010-2014



Note: New medicines cover all new active ingredients marketed for the first time on the world market during the period 2010-2014. Europe (top five) includes Germany, France, Italy, Spain and the United Kingdom.

Source: IMS Health (MIDAS April, 2015) cited in EFPIA “The pharmaceutical industry in figures” (edition 2015)

US barriers to EU exports of pharma products

Tariffs on transatlantic trade in pharma are already removed

- Transatlantic trade in pharma is covered by *The Pharmaceutical Tariff Elimination Agreement* from 1995
- Under this agreement, virtually all tariffs on pharma products are removed
- The US and the EU therefore impose no tariffs on imports of pharma products*
- While the agreement also covers chemical intermediates used in the production of pharma, inputs from other industries (e.g. agriculture) are not covered.

The Pharmaceutical Tariff Elimination Agreement

During the Uruguay Round of the World Trade Organization (WTO) negotiations, the United States and several other major trading partners agreed to reciprocal tariff elimination, a so-called "zero-for-zero initiative," for pharmaceutical products and for chemical intermediates used in the production of pharmaceuticals.

Pharmaceutical-producing countries accounting for approximately 90 percent of global production of the subject pharmaceutical chemicals participate in the Agreement.

Signatories to the WTO Pharmaceutical Agreement are Canada, the European Union and its 27 Member States, Japan, Norway, Switzerland, the United States, and Macao (China).

Members of the pharmaceutical initiative have agreed to periodically update the list of items eligible for duty elimination as new pharmaceutical products and chemical intermediates are developed.

Source: Direct quote from the office of the United States Trade Representative (<https://ustr.gov/issue-areas/industry-manufacturing/industry-initiatives/pharmaceuticals>)

* Source: WTO, Tariff download facility. The EU and US MFN rate on all pharma products (HS chapter 30) is zero, with the exception of certain gels and pharmaceutical applications in the US.

US barriers to EU exports of pharma products

But non-tariff barriers on transatlantic trade in pharma are high

- While tariffs on transatlantic trade in pharma products are virtually removed, non-tariff barriers (NTBs) remain high
- CEPR (2013) estimates that NTBs impose a cost burden equivalent to a tariff of approximately:
 - 19 per cent on EU exporters of chemical/pharma products to the US
 - 14 per cent on US exporters of chemical/pharma products to the EU
- Other sources, including The Global Health Council (2007), also emphasise the restrictiveness of NTBs to global trade in pharma products
- NTBs arise due to differences in regulations in the US and EU market
- By imposing costs on pharma producers, NTBs lower EU pharma exporters' competitiveness on the US market and vice versa
- NTBs increase both the direct and indirect cost of production:
 - **Direct costs** of NTBs include the cost of unnecessary duplication of procedures and efforts arising from diverging regulatory standards and the cost of delays in introducing new products to the US market for EU producers
 - **Indirect costs** of NTBs for example arise if these barriers prevent producers from launching new products in both markets simultaneously and thereby require them to market the same product twice.

US barriers to EU exports of pharma products

TTIP has the potential to target key NTBs and opportunities for transatlantic pharma

- An ambitious pharma chapter in TTIP is assumed by the European Commission to reduce the costs of NTBs by 25 per cent for both EU and US exporters of pharma products
- The ambition is to reduce NTBs and improve EU and US exporters' competitiveness by aligning current and future regulations and IPR systems *without* lowering standards and the level of consumer protection
- The cost reduction of NTBs include the cost reduction of NTBs specific to pharma producers as well as so-called 'horizontal' NTBs that cut cross multiple sectors (e.g. IPR systems)
- An ambitious pharma chapter in TTIP that reduces the cost burden on EU pharma companies related to double regulation will free up resources for EU regulators and make government regulators more efficient. These resources can be used for other purposes such as risk-based inspections that improve patient safety
- An ambitious pharma chapter in TTIP that targets key NTBs and opportunities by increasing regulatory alignment between the EU and the US will:
 - Accelerate EU patient access to new treatments developed in the US. This will improve welfare in the EU and may eventually save lives
 - Reduce unnecessary delays in the approval of pharma products from the EU. Being able to export new medicines to the important US market will boost sales by EU pharma companies, in particular the innovative part of the pharma industry
 - Provide a more secure and predictable business environment for innovative pharma companies operating in the US, which is likely to spur an increase in R&D expenditures
 - Reduce costs of production and generate cost savings, which may be used for increased investment in R&D for pharma companies. This will benefit patients as new medicines are developed.

Trade liberalisation in TTIP

Key assumption on non-tariff barriers (NTBs)

- The study relies on key estimates of the impact and reduction potential of **non-tariff barriers** on transatlantic trade in pharma products as estimated by the European Commission and CEPR
- CEPR estimated NTBs in pharma-chemicals
 - 19 per cent trade cost equivalent on imports to the US
 - 14 per cent trade cost equivalent on imports to the EU
- An ambitious pharma chapter in TTIP is assumed by the European Commission to **reduce a quarter** of the trade cost impacts of NTBs, i.e.
 - From **19 per cent to 14 per cent** in the US
 - From **14 per cent to 10 per cent** in the EU
 - No tariff impacts in pharma since tariffs are virtually zero.

Transatlantic NTBs for pharmaceutical products

Benefits of an ambitious pharma chapter

Key NTBs and opportunities to be targeted

- 1 GMP inspections
- 2 Paediatrics and other pharma regulatory convergence
- 3 Joint EU-US Intellectual Property (IP) principles
- 4 Market access

+ Horizontal regulatory measures and cooperation

Commercial impacts

SHORT-TERM
Lower export costs for pharma companies

LONG-TERM
Improved incentives to invest in innovative pharma products

Society impacts

Jobs and growth

- Increased trade
- More highly qualified jobs
- Higher GDP
- Patient benefits

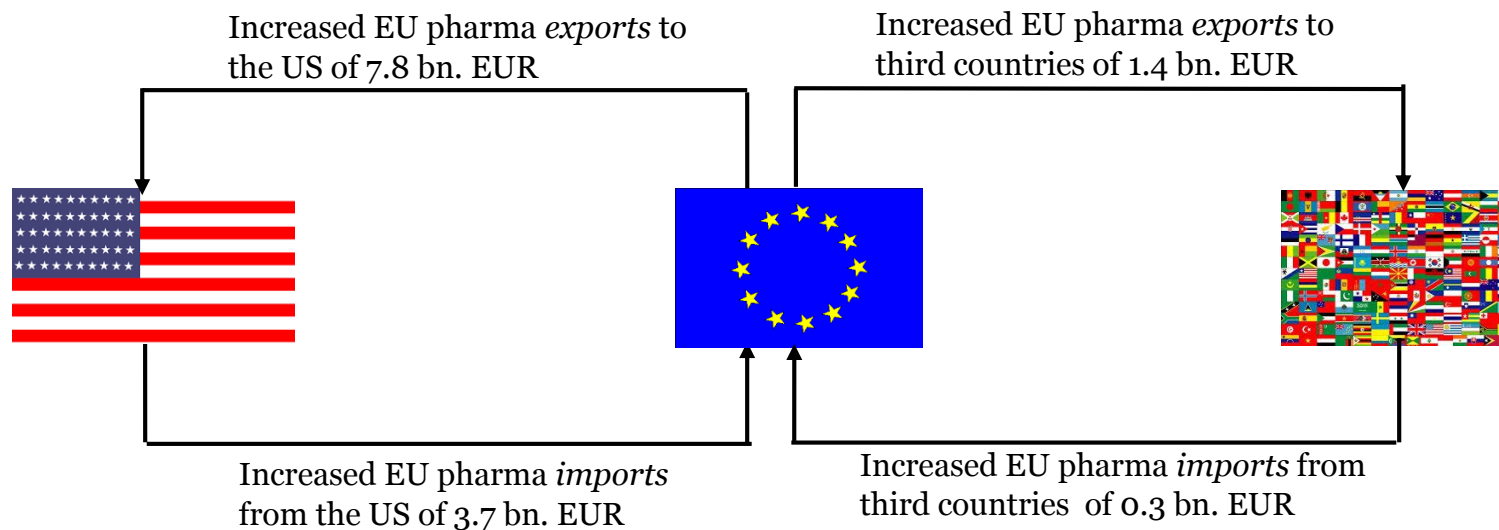
Innovation and competitiveness

- Increased investments
- More R&D
- Higher productivity
- Enhanced alignment of regulatory frameworks

Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry

Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry

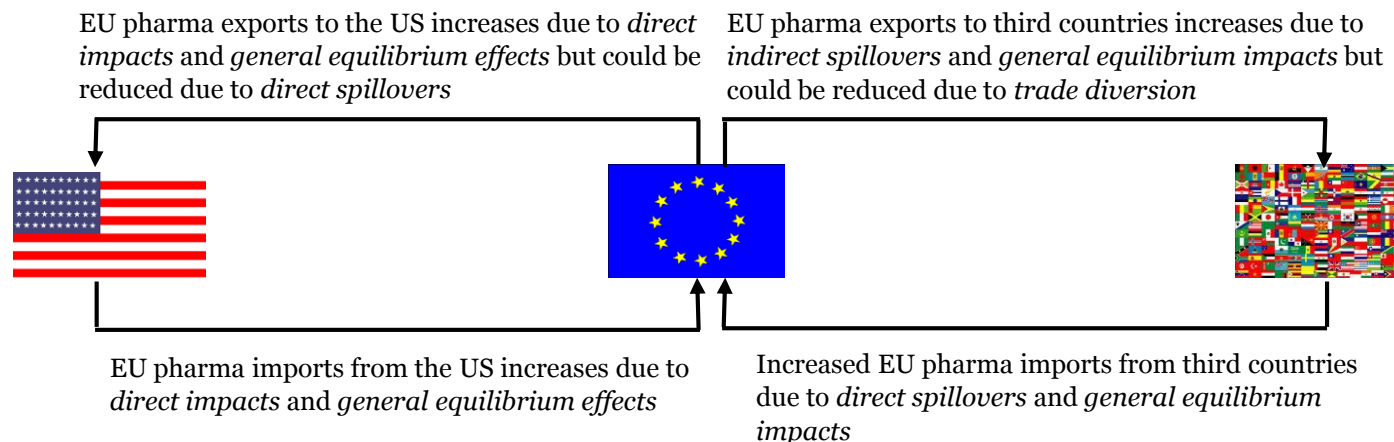
Key findings and conclusions



- TTIP is expected to increase EU pharma exports to the US by 7.8 bn. EUR and EU pharma exports to third countries by 1.4 bn. EUR, contributing to a total increase in extra-EU exports by 9.2 bn. EUR
- TTIP is expected to increase EU pharma imports from the US by 3.7 bn. EUR and EU pharma imports from third countries by 0.3 bn. EUR, contributing to a total increase in extra-EU imports by 4 bn. EUR
- TTIP is expected to provide up towards 19,000 high value jobs in the EU pharma industry.

Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry

Impacts of TTIP on EU exports to the US and third countries



- **Direct impacts:** TTIP reduces transatlantic barriers to trade and increases EU exports of pharma products to the US. Likewise, EU imports of pharma products from the US also increases
- **Spillovers:** TTIP lowers EU trade barriers for pharma companies in third countries, which means that EU pharma producers face increased competition in the US and their domestic market (*direct spillovers*). But at the same time, EU producers also get easier access to markets in third countries (*indirect spillovers*)
- **General equilibrium impacts:** As EU trade barriers on US imports are reduced, competition in the EU market increases and EU pharma producers can purchase inputs at a lower price. This increases the competitiveness of EU pharma companies in their home market and abroad
- **Trade diversion:** As US trade barriers are reduced, exports to the US becomes more attractive relative to exports to markets in third countries. TTIP increases in EU pharma exports to the US may thus be exports *diverted* from third countries.



The overall impact of TTIP on EU exports to the US and third countries will depend on the relative size of these impacts but should be expected to be **positive** (*trade creation*)

Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry

Impacts of TTIP on value added in the EU pharma industry

- Value added in the EU pharma industry is given by the difference between the value of production and the costs of the inputs used for producing the pharma goods
- TTIP will have an impact on the value of production through:
 - Increased production for sales in the domestic market due to increased demand from other industries
 - Reduced production for exports to other EU countries due to increased competition from the US and third countries and trade diversion
 - Increased production for exports to the US and third countries due to lower trade barriers and spillovers
- TTIP may have an impact on the costs of inputs for production:
 - Lower barriers to transatlantic trade will reduce the costs of inputs for production imported from the US.



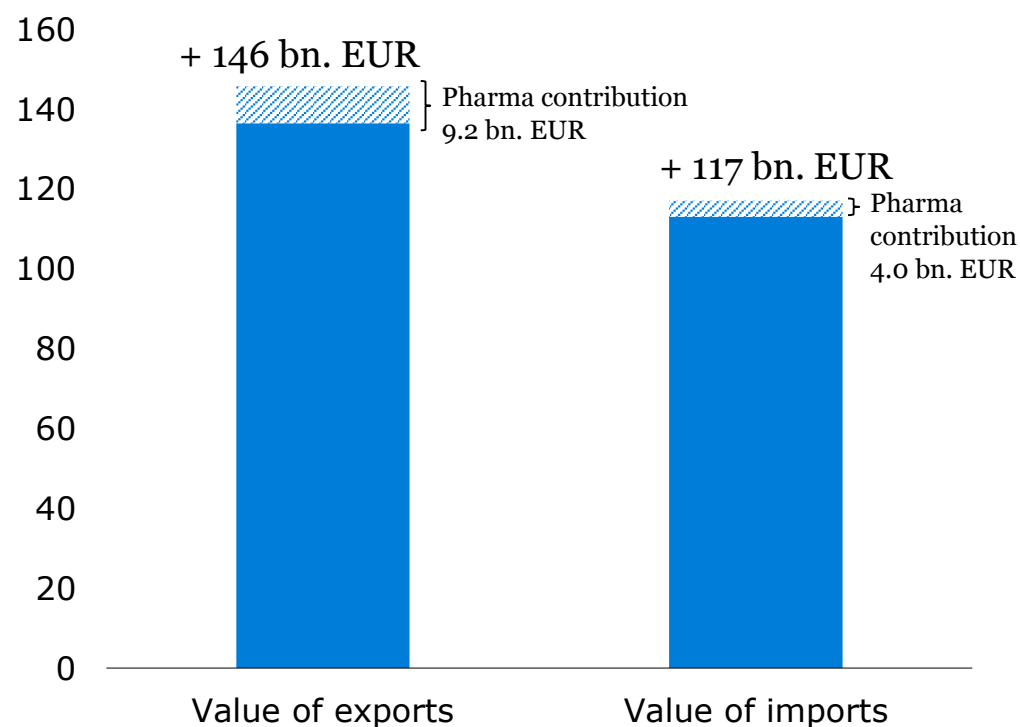
The overall impact of TTIP on value added in the EU pharma industry will depend on the relative size of these impacts but should be expected to be **positive but significantly smaller than the impact on EU pharma exports**

Benefits of an ambitious pharma chapter in TTIP for the EU pharma industry

TTIP increases EU GDP by 67 bn. EUR

- TTIP is expected to increase the combined EU GDP by 0.48 per cent. Relative to the level in 2014, this is equivalent to an increase of 67 bn. EUR
- Increases in EU GDP are driven by changes in trade flows
- TTIP is expected to increase total EU-extra exports of goods and services by 5.9 per cent. Relative to the level in 2014, this is equivalent to an increase of 146 bn. EUR. Pharma contributes to this increase by a total of 9.2 bn. EUR
- TTIP is expected to increase total EU-extra imports of goods and services by 5.1 per cent. Relative to the level in 2014, this is equivalent to an increase of 117 bn. EUR. Pharma contributes to this increase by a total of 4.0 bn. EUR.

Impacts of TTIP on the EU economy



Note: The estimated per cent impacts are relative to a projected 2027 base. Changes in exports and imports are changes in extra-EU exports and extra-EU imports.

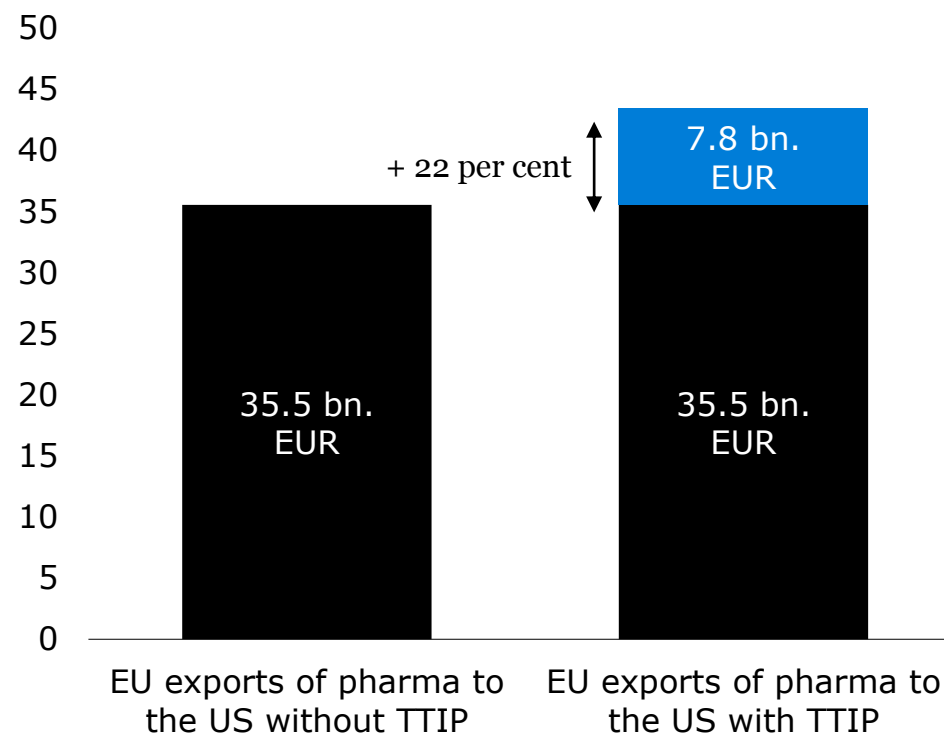
Source: Copenhagen Economics based on CEPR (2013)

Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry

TTIP increases EU pharma exports to the US by 8 bn. EUR

- An ambitious pharma chapter in TTIP, which reduces NTBs as assumed in the European Commission's impact assessment, is estimated to increase EU exports of pharma products to the US by 7.8 bn. EUR
- Compared to the level of EU exports of pharma products in 2014 (worth 35.5 bn. EUR), this is equivalent to an increase of 22 per cent.

Impacts of TTIP on EU exports of pharma to the US



Note: The value of exports with and without TTIP is computed relative to the level of EU exports of pharma to the US in 2014. The impacts are calculated based on CEPR's (2013) estimated impact for the pharma and chemical sector, which has been adjusted to take into account that tariffs do not apply to transatlantic trade in pharma products, cf. Appendix.

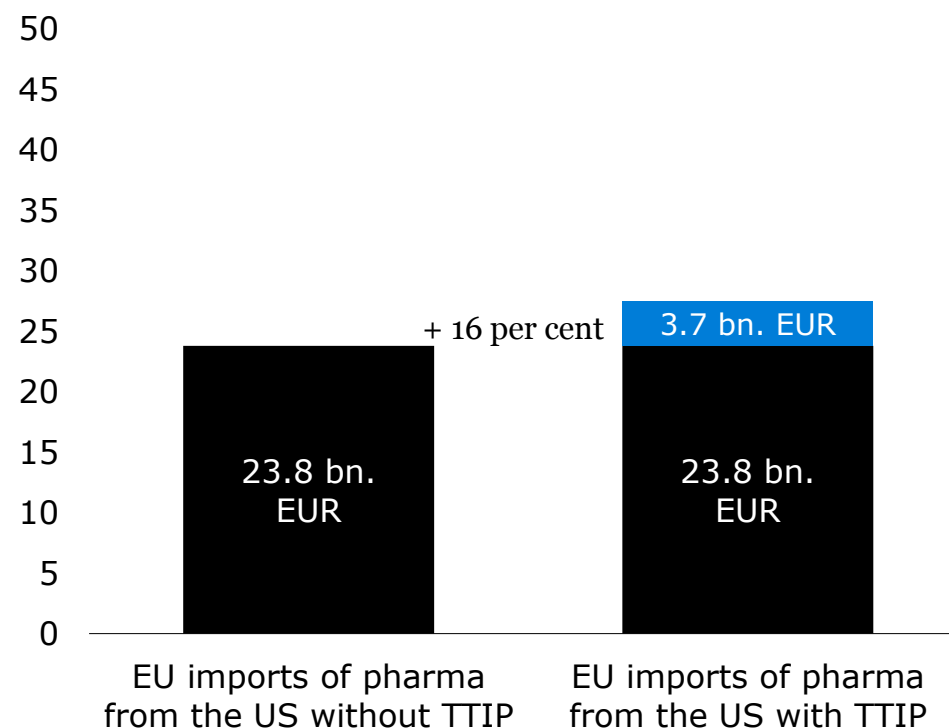
Source: Copenhagen Economics based on CEPR (2013)

Benefits of an ambitious pharma chapter in TTIP for the EU pharma industry

TTIP increases EU pharma imports from the US by 4 bn. EUR

- As trade barriers facing US exporters in the EU market will also be reduced under the TTIP, pharma imports from the US will also increase
- Under an ambitious pharma chapter, EU imports of US pharma products is estimated to increase by 3.7 bn. EUR
- Compared to the level of EU pharma imports from the US in 2014 (worth 23.8 bn. EUR), this is equivalent to an increase of 16 per cent.

Impacts of TTIP on EU imports of US pharma



Note: The value of imports with and without TTIP is computed relative to the level of EU imports of pharma from the US in 2014. The impacts are calculated based on CEPR's (2013) estimated impact for the pharma and chemical sector, which have been adjusted to take into account that tariffs do not apply to transatlantic trade in pharma products, cf. Appendix.

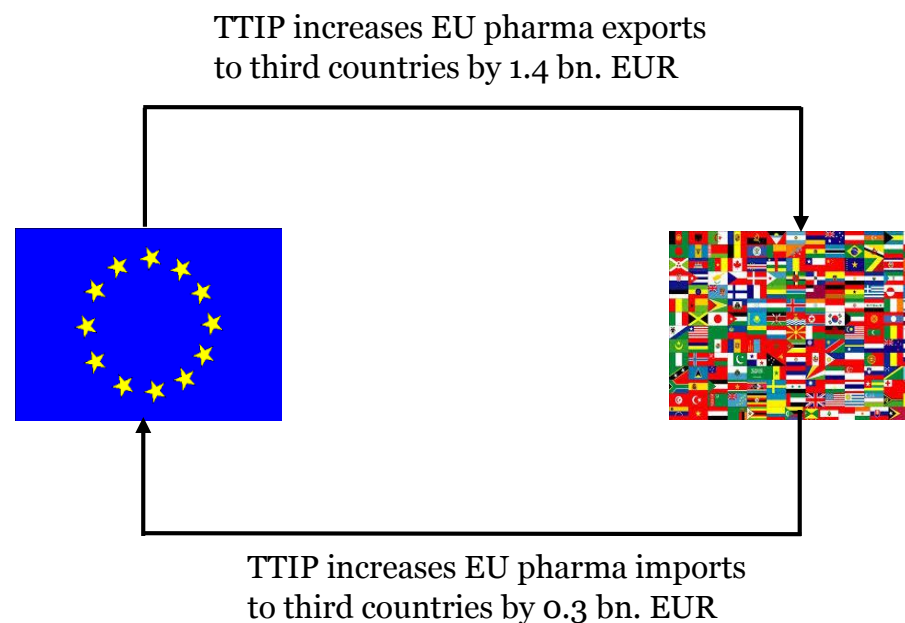
Source: Copenhagen Economics based on CEPR (2013)

Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry

TTIP increases EU net exports to third countries by 1.1 bn. EUR

- TTIP will not only increase exports to the US, but also to other non-EU countries via spillover effects (see next slide)
- Relative to 2014 (worth 83 bn. EUR), the total increase in EU pharma exports to third countries is equivalent to 1.4 bn. EUR
- Similarly, imports from third countries also increases slightly
- Relative to 2014 (worth 39 bn. EUR), the total increase in EU pharma imports from third countries is equivalent to 0.3 bn. EUR
- In total, EU pharma net exports to third countries thus increases by 1.1 bn. EUR.

Impacts of TTIP on extra-EU pharma trade with third countries



Note: The value of increases in extra-EU exports and extra-EU imports under TTIP are computed relative to the level in 2014. The impacts are calculated based on CEPR's (2013) estimated impact for the pharma and chemical sector, which have been adjusted to take into account that tariffs do not apply to transatlantic trade in pharma products, cf. Appendix.

Source: Copenhagen Economics based on CEPR (2013)

Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry

TTIP can set global standards and lead to spillovers

- Due to combined size of the EU and the US, the regulatory alignment imposed under TTIP can become de facto global standards if third countries choose to align their own standards and regulations to those of the EU and the US. This may reduce trade barriers for EU pharma exporters to third countries
- At the same time, a regulatory alignment between the EU and the US may in practice reduce EU trade barriers towards exporters from third countries, as complying with the US regulatory regime will also allow third country producers access to the EU
- The global importance of TTIP is accounted for in the impact assessment of the agreement conducted by CEPR (2013) for the European Commission, by the inclusion of so-called *direct* and *indirect spillovers* of the impact of the TTIP on trade with third countries

Together, the EU and the US generate almost 50% of the global output. They account for 40% of global GDP (in terms of purchasing power parity) and a third of global trade in goods and services. This represents almost 60% of global FDI stocks and a third of global patent applications.

TTIP's reduction of EU and US trade barriers towards third countries is modelled as *direct spillovers* and are assumed to be 20 per cent of the direct reduction of NTBs (CEPR, 2013)

Example: Direct spillovers

An NTB reduction of 25% on US export to the EU → NTB reduction of 5% for other exporters to the EU.

TTIP's reduction of third country trade barriers is modelled as *indirect spillovers* and are assumed to be 50 per cent of direct spillovers (CEPR, 2013).

Example: Indirect spillovers

An NTB reduction of 25% on EU export to the US → NTB reduction of 2.5% on EU exports to third countries.

The impacts of TTIP on the EU labour market

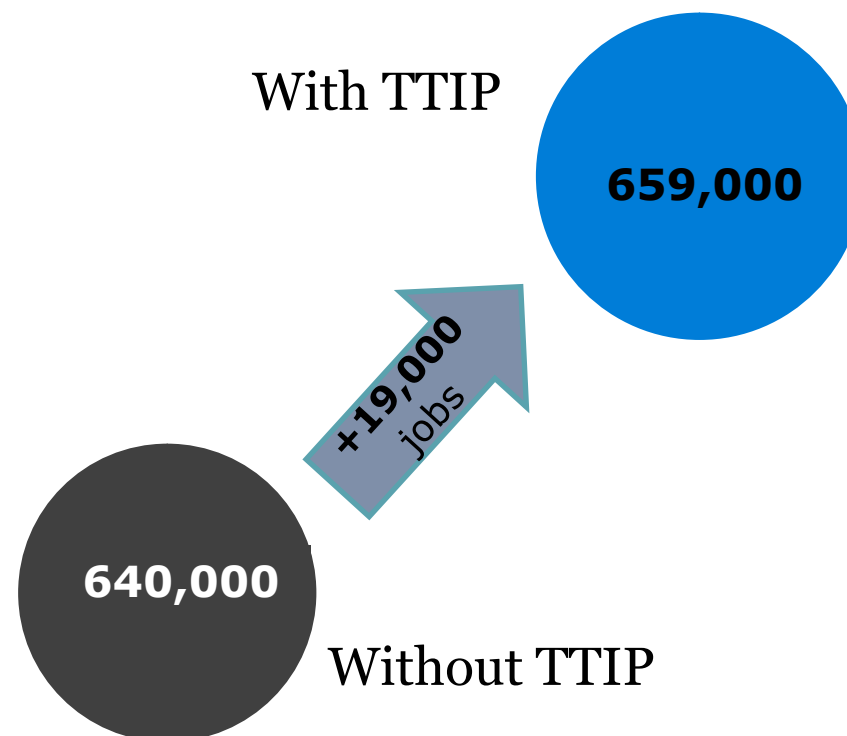
- The increase in exports resulting from TTIP will lead to increased production of pharma products in the EU
- When production in the industry increases, the demand for labour will also increase
- As employment in the long run is determined by the size of the labour force (and not trade agreements) CEPR (2013) does not assess overall job creation
- In CEPR (2013), the the impact of increased production in a given industry is instead reflected via:
 - An increase in the wages in the industry
 - A reallocation of jobs across sectors, where employment will move towards the sectors that expand as a result of the agreement. This occurs as wages increase in these sectors, cf. Appendix
- As the pharma industry is combined with the larger chemical industry in CEPR (2013), the study does not include employment reallocation effects for the pharma industry alone
- However, there is no doubt that export-related employment in the pharma industry will indeed increase as a result of TTIP
- The European Commission has for example estimated that every one billion of exports in goods and services, on average supports around 15,000 jobs in the EU. In order to reach a more exact number for the pharma industry alone, we base our employment estimates on the average production per employee in the industry (see next slide).

Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry

TTIP provides up towards 19,000 new jobs in EU pharma

- Based on the current average production per employee in the pharma industry, the net increase in extra-EU exports of pharma products resulting from TTIP could provide up towards 19,000 additional export-related jobs in pharma
- The estimate for export-related jobs is based on the assumptions of a current EU consumption, technology and investment level. Increased investments may reduce labour demand, and labour market bottlenecks could also constrain the ability to increase employment. The estimate should therefore be interpreted as an upper boundary and the employment effects could be smaller if new technologies are introduced requiring less labour per unit produced compared to today
- These employment estimates are based on production and employment data from EFPIA (2015), but the same results is obtained when using data from Eurostat.

Jobs in the EU pharma industry



Note: See Appendix for methodology.

Source: Copenhagen Economics based on CEPR (2013) and EFPIA "The pharmaceutical industry in figures" (edition 2015)

Benefits of an ambitious pharma chapter in TTIP to the EU pharma industry

Growth in the EU pharma industry improves welfare

- In the long run, the number of jobs in the EU is determined by the size of the labour force, and employment will reach its long run sustainable level
- When jobs are created in pharma, employment in other industries will go down accordingly. Given that jobs in pharma have higher productivity than the average across manufacturing industries, the allocation of labour towards pharma will benefit the economy and improve welfare.

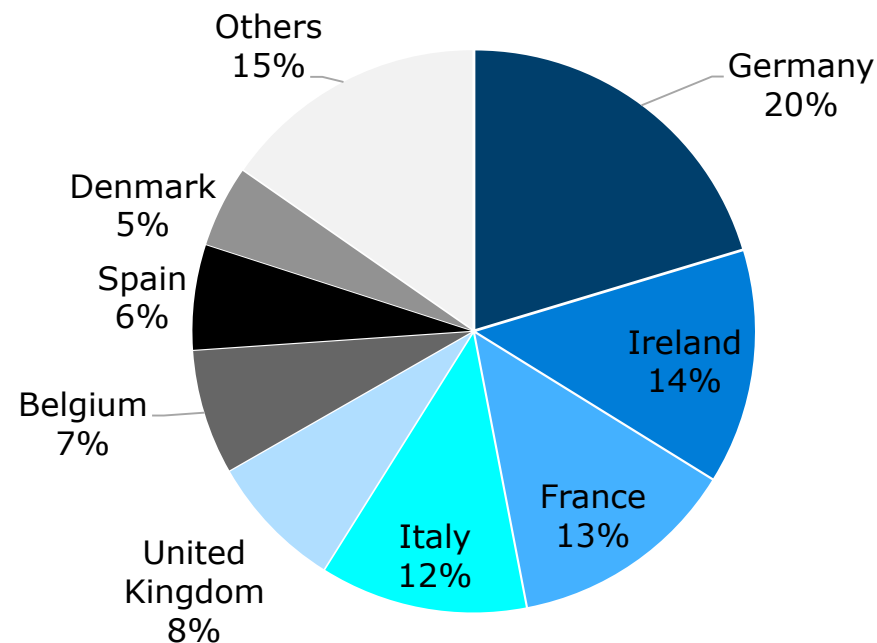
Benefits of an ambitious pharma chapter to selected EU Member States

Benefits of an ambitious pharma chapter to selected EU Member States

EU pharma production is highly concentrated

- The EU pharma production is relatively concentrated in a few EU countries:
 - Germany (20 per cent) and Ireland (14 per cent) alone account for 1/3 of the total EU pharma production
 - France (13 per cent), Italy (12 per cent) and the United Kingdom (8 per cent) account for another 1/3
- TTIP will not impact all the pharma producing countries through the same channels because trade patterns differ (cf. next slide):
 - *Germany* and *Ireland* are highly exposed to the US market and account for more than half of EU pharma exports to the US
 - Exports in *Italy* appears to be mainly for third countries with little *direct impact* of TTIP. Italy will benefit from spillovers, if TTIP sets global standards
 - Exports in *Belgium* and the *Netherlands* appears to be mainly for intra-EU trade, including outsourcing activities. These countries will benefit from increased demand for supplies from other EU countries that experience an increase in production.

Distribution of EU pharma production, 2013

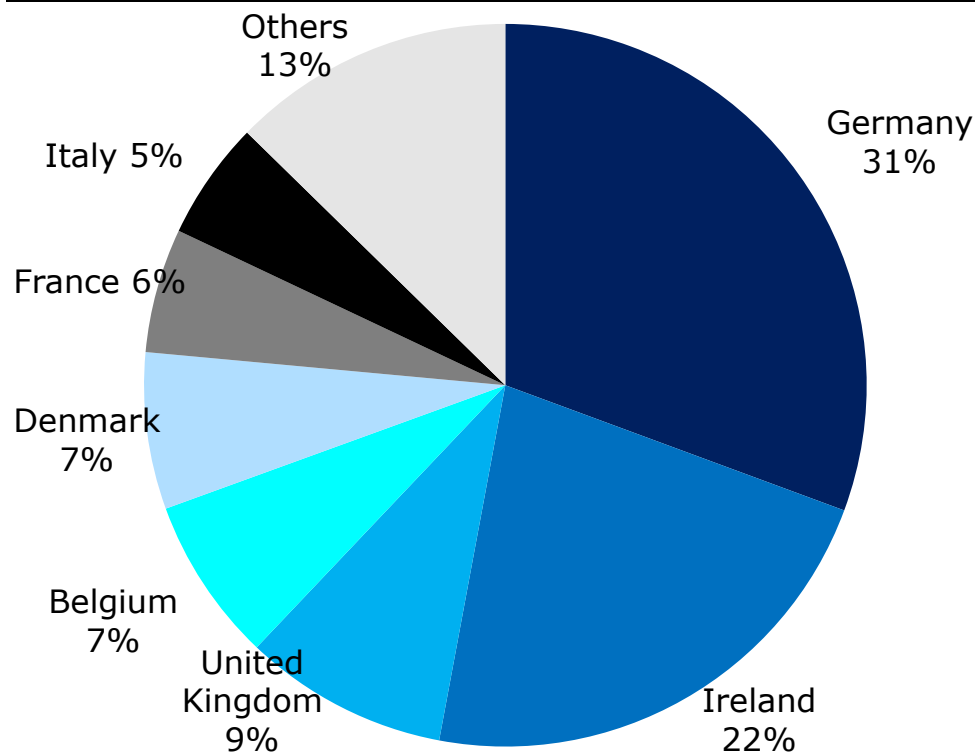


Note: The figure shows the distribution of production value in the EU pharma industry (Nace Rev.2 C21) in 2013.
Source: Copenhagen Economics based on Eurostat structural business statistics.

Benefits of an ambitious pharma chapter to selected EU Member States

Trade patterns differ across countries

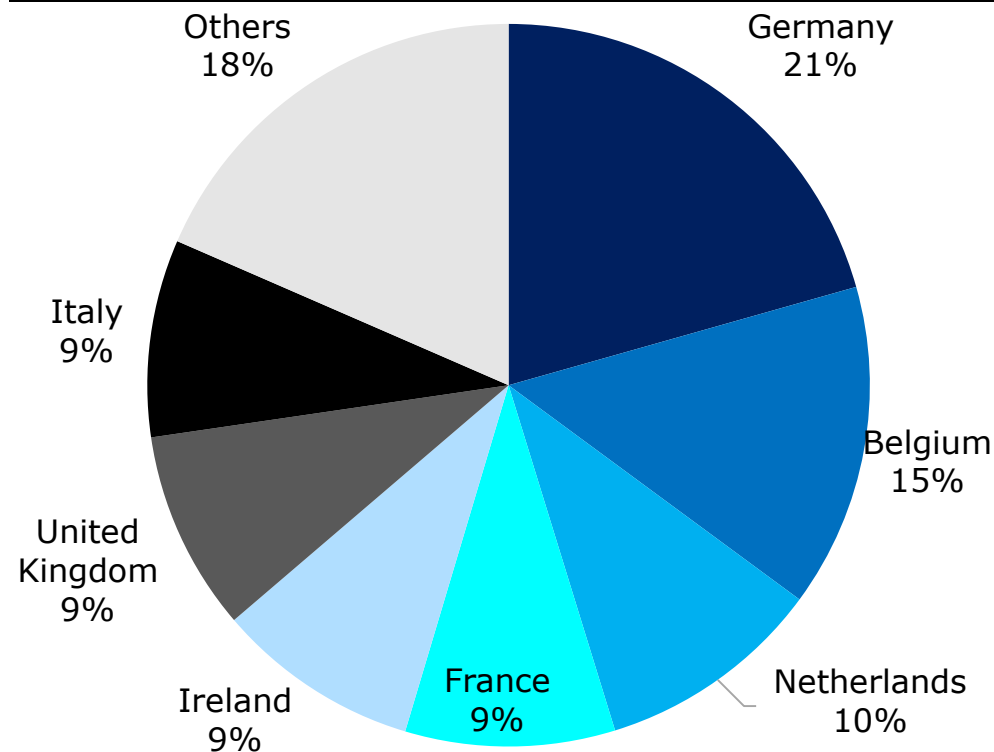
Distribution of EU pharma exports to the US, 2013



Note: The figure shows the distribution of EU pharma (SITC 54) exports to the US.

Source: Copenhagen Economics based on UN Comtrade

Distribution of intra-EU pharma exports, 2013



Note: The figure shows the distribution of intra-EU pharma (SITC 54) exports.

Source: Copenhagen Economics based on Eurostat

Benefits of an ambitious pharma chapter to selected EU Member States

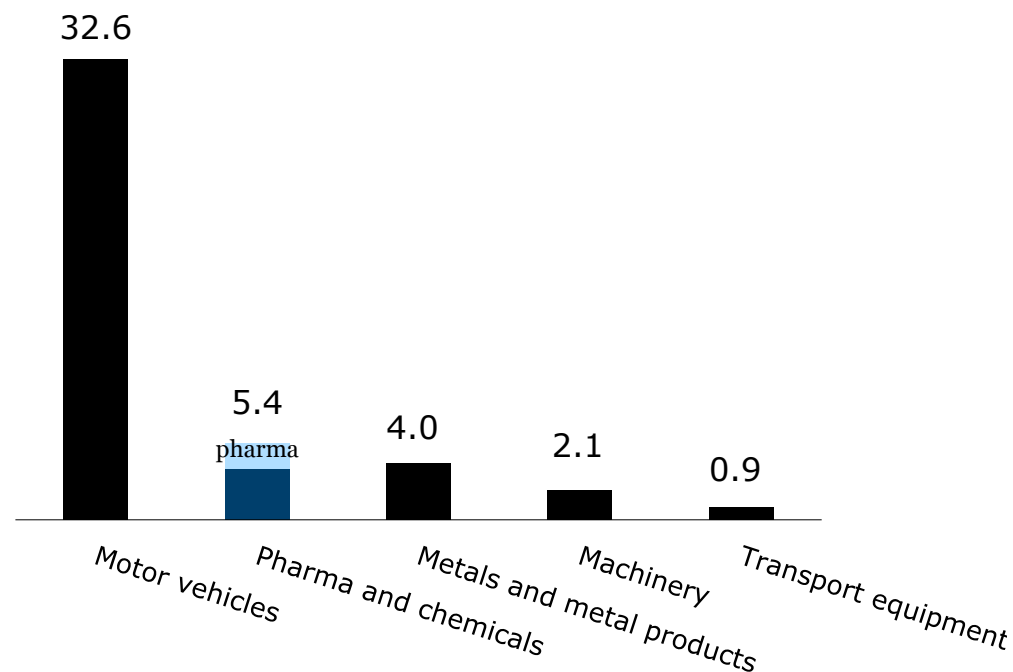
Case: Impacts of TTIP on Germany



- Germany accounts for 20 per cent of the total EU pharma production and 31 per cent of EU pharma exports to the US
- Germany should thus be expected to benefit both from direct and spillover impacts of TTIP arising from the effect of TTIP on third countries
- Using the same methodology and scenarios as in CEPR (2013), World Trade Institute (2016) finds that Germany's **total exports** of pharma and chemical products should increase by **5.4 bn. EUR.** in 2030
- Measured in absolute terms, this means that chemicals and pharma products account for the second largest expected increase in German exports following the large motor vehicles industry
- A sizeable part of this impact is likely to come from the pharma industry alone, as pharma products account for approximately 34 per cent of German exports of pharma and chemical products (based on 2014 data from Eurostat).

Impacts of TTIP on German exports 2030

Bn. EUR



Note: The figure shows the change in total German exports for top sectors measured in billion EUR. Impacts are measured relative to the 2030 projection for the baseline German exports. As the baseline data is not available, it is not possible to transform the 2030 changes into changes in current German exports.

Source: World Trade Institute (2016), *TTIP and the EU Member States*

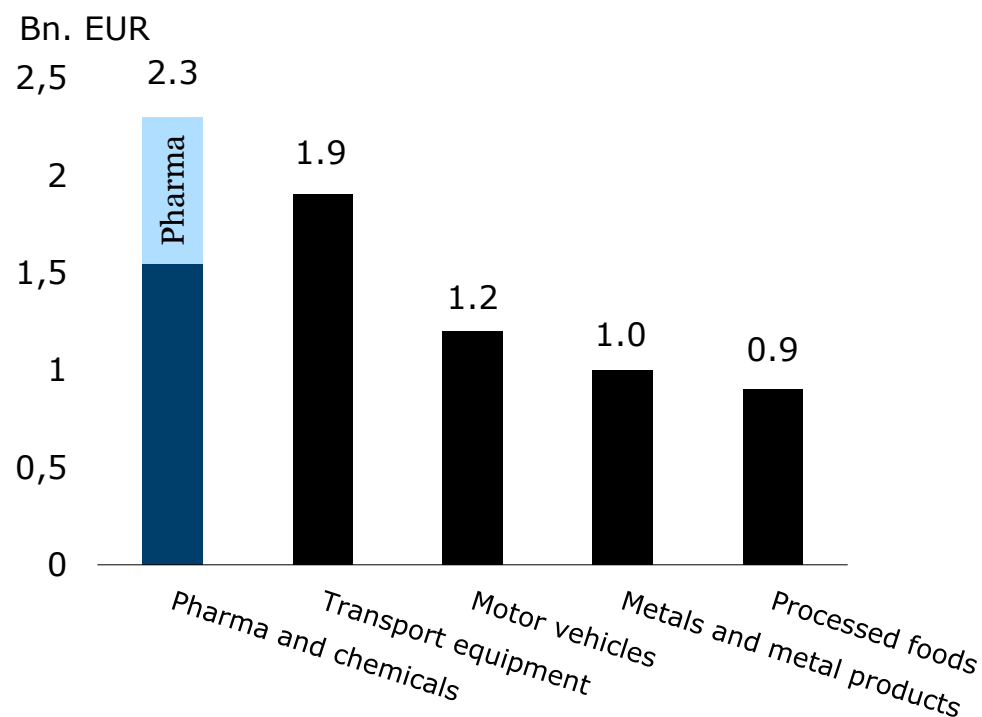
Benefits of an ambitious pharma chapter to selected EU Member States

Case: Impacts of TTIP on France



- France accounts for 13 per cent of the total EU pharma production but only 6 per cent of EU pharma exports to the US and 9 per cent of intra-EU pharma exports. France should be expected to benefit both from direct and spillover impacts of TTIP arising from the effect of TTIP on third countries
- Taking the size of the French pharma and chemicals industry into consideration, the industry is actually the industry that should be expected to benefit the most from TTIP
- World Trade Institute (2016) finds that France's total **exports** of pharma and chemical products should increase by **2.3 bn. EUR** in 2030
- A sizeable part of this impact is likely to come from the pharma industry alone, as pharma products account for approximately 33 per cent of French exports of pharma and chemical products (based on 2014 data from Eurostat).

Impacts of TTIP on French exports 2030



Note: The figure shows the change in total French exports for top sectors measured in billion EUR. Impacts are measured relative to the 2030 projection for the baseline French exports. As the baseline data is not available, it is not possible to transform the 2030 changes into changes in current French exports.

Source: World Trade Institute (2016), *TTIP and the EU Member States*

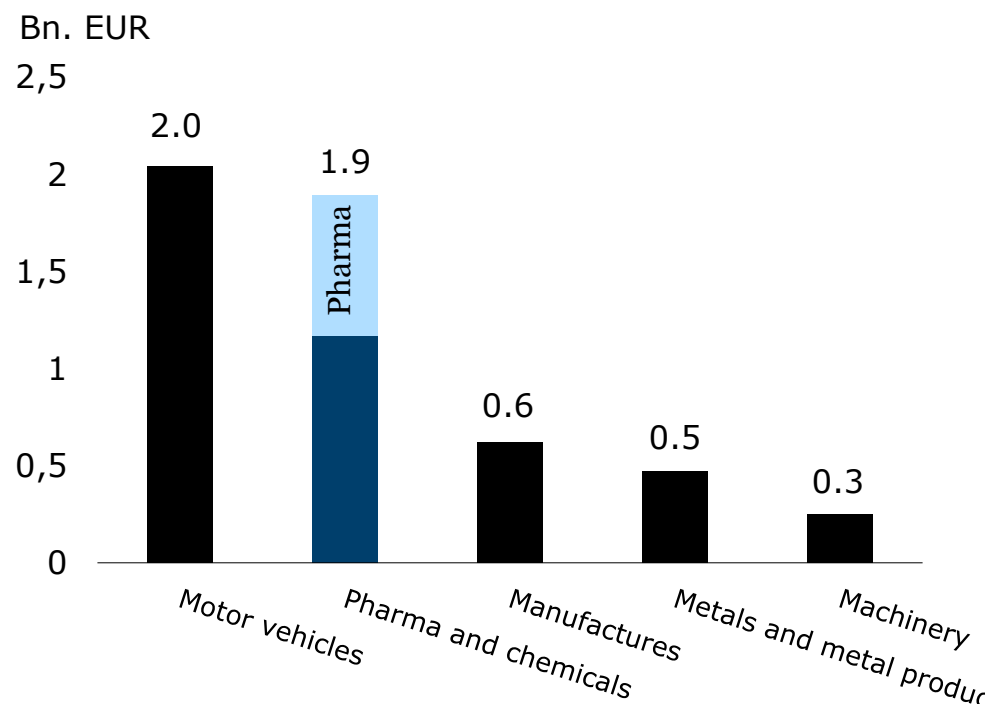
Benefits of an ambitious pharma chapter to selected EU Member States

Case: Impacts of TTIP on Belgium



- Belgium accounts for 7 per cent of the total EU pharma production, 7 per cent of EU pharma exports to the US and 15 per cent of intra-EU pharma exports. Belgium should be expected to benefit both from direct and spillover impacts of TTIP arising from the effect of TTIP on third countries
- In Belgium, the pharma and chemical industry is the industry, where the second largest export impacts of TTIP is expected
- World Trade Institute (2016) finds that Belgium's total **exports** of pharma and chemical products should increase by **1.9 bn. EUR** in 2030
- A sizeable part of this impact is likely to come from the pharma industry alone, as pharma products account for approximately 38 per cent of Belgian exports of pharma and chemical products (based on 2014 data from Eurostat).

Impacts of TTIP on Belgian exports 2030



Note: The figure shows the change in total Belgian exports for top sectors measured in billion EUR. Impacts are measured relative to the 2030 projection for the baseline Belgian exports. As the baseline data is not available, it is not possible to transform the 2030 changes into changes in current Belgian exports.

Source: World Trade Institute (2016), *TTIP and the EU Member States*⁵⁷

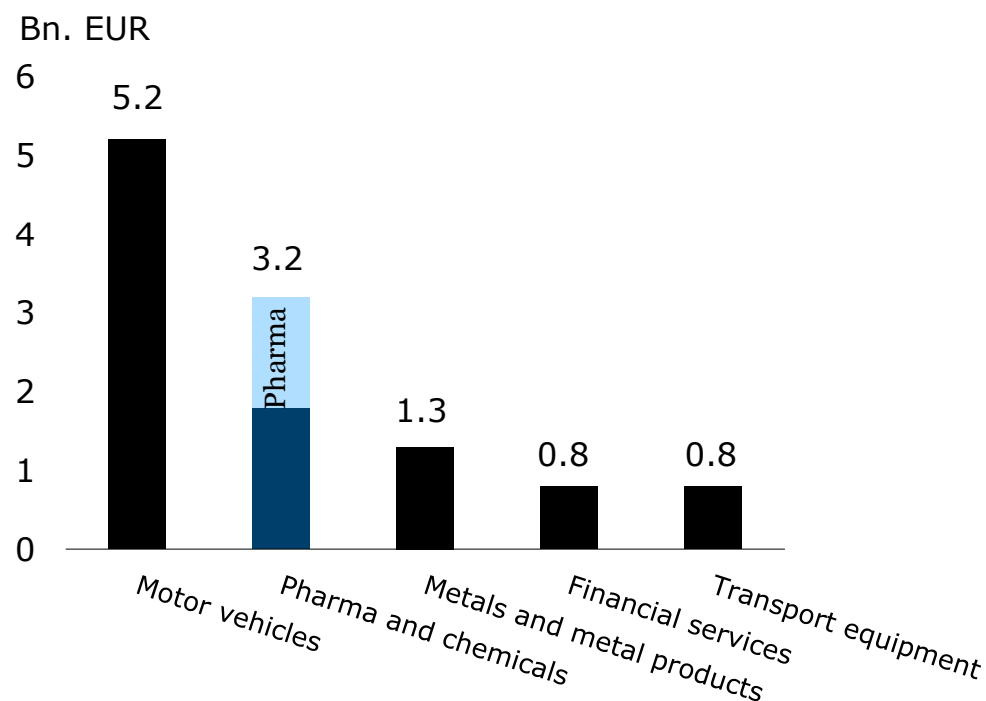
Benefits of an ambitious pharma chapter to selected EU Member States

Case: impacts of TTIP on the United Kingdom



- The United Kingdom accounts for 8 per cent of the total EU pharma production and 9 per cent of EU pharma exports to the US and 9 per cent of intra-EU pharma exports. The United Kingdom should be expected to benefit both from direct and spillover impacts of TTIP arising from the effect of TTIP on third countries
- In the United Kingdom, the pharma and chemical industry is the industry where the second largest export impacts of TTIP are to be expected
- World Trade Institute (2016) finds that the United Kingdom's total **exports** of pharma and chemical products should increase by **3.2 bn. EUR** in 2030
- A sizeable part of this impact is likely to come from the pharma industry alone, as pharma products account for approximately 44 per cent of the United Kingdom's exports of pharma and chemical products (based on 2014 data from Eurostat).

Impact of TTIP on UK exports 2030



Note: The figure shows the change in total UK exports for top sectors measured in billion EUR. Impacts are measured relative to the 2030 projection for the baseline UK exports. As the baseline data is not available, it is not possible to transform the 2030 changes into changes in current UK exports.

Source: World Trade Institute (2016), *TTIP and the EU Member States*⁵⁸

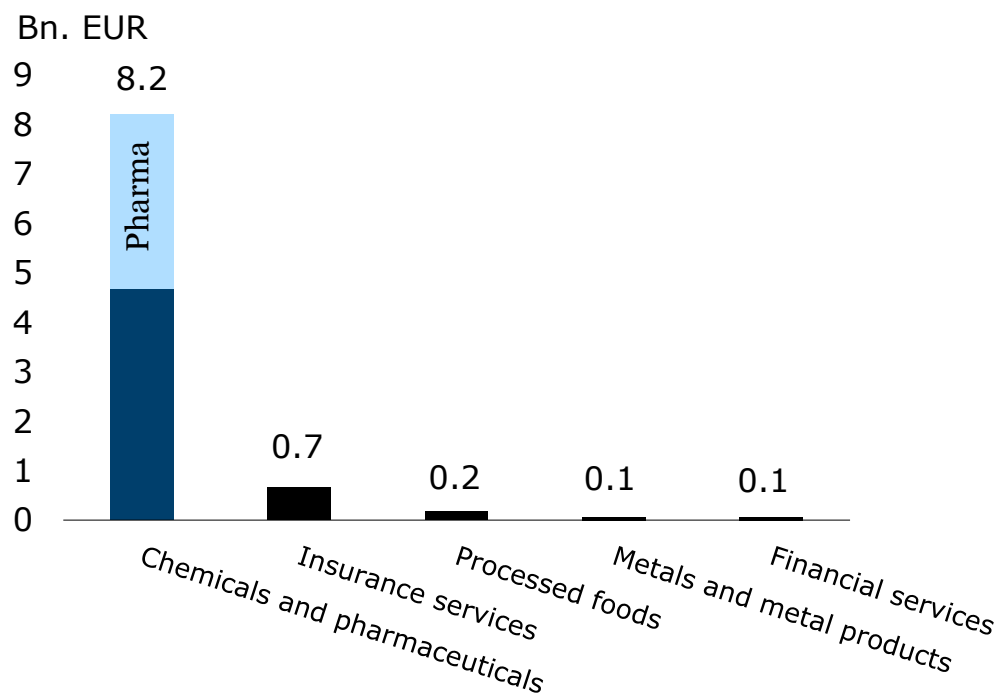
Benefits of an ambitious pharma chapter to selected EU Member States

Case: Impacts of TTIP on Irish exports



- Ireland accounts for 14 per cent of EU pharma production but 22 per cent of EU pharma exports to the US
- Ireland is thus highly exposed to the US market and should be expected to benefit both from direct and spillover impacts of TTIP arising from the effect of TTIP on third countries
- In Ireland, the pharma and chemical industry is the industry, where the largest export impacts of TTIP is expected
- World Trade Institute (2016) finds that the Ireland's total **exports** of pharma and chemical products should increase by **8.2 bn. EUR** in 2030
- A sizeable part of this impact is likely to come from the pharma industry alone, as pharma products account for approximately 43 per cent of Ireland's exports of pharma and chemical products (based on 2014 data from Eurostat).

Impacts of TTIP on Irish exports 2030



Note: The figure shows the change in total Irish exports for top sectors measured in million EUR. Impacts are measured relative to the 2030 projection for the baseline Irish exports. As the baseline data is not available, it is not possible to transform the 2030 changes into changes in current Irish exports.

Source: World Trade Institute (2016), *TTIP and the EU Member States*

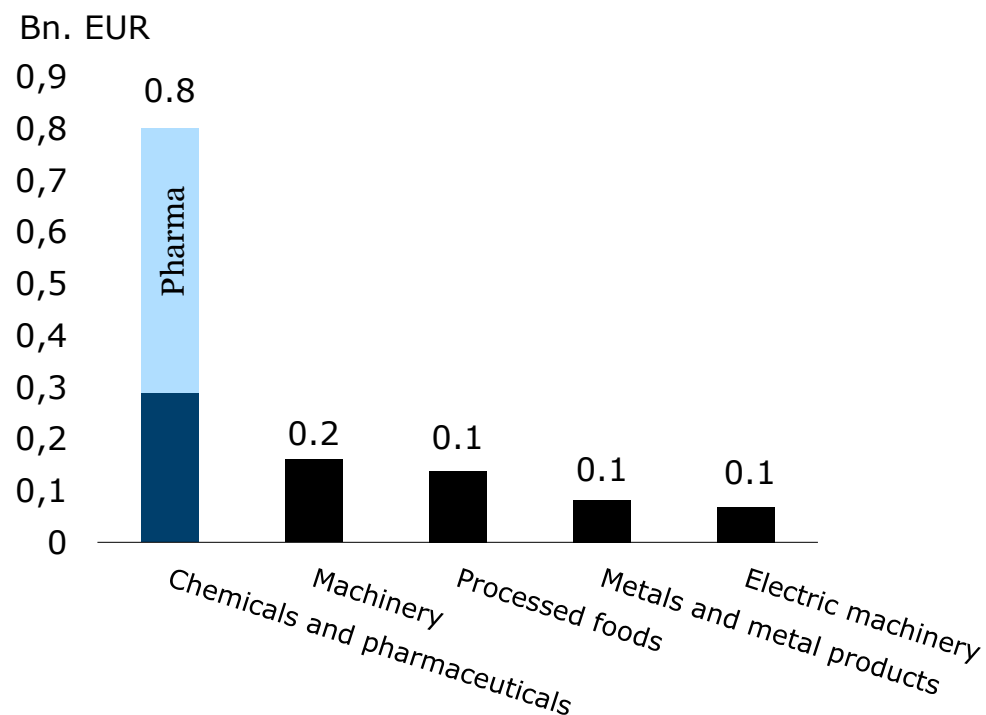
Benefits of an ambitious pharma chapter to selected EU Member States

Case: Impacts of TTIP on Denmark



- Denmark accounts for 5 per cent of EU pharma production but 7 per cent of EU pharma exports to the US
- Denmark is thus highly exposed to the US market and should be expected to benefit both from direct and spillover impacts of TTIP arising from the effect of TTIP on third countries
- In Denmark, the pharma and chemical industry is the industry, where the largest export impacts of TTIP is expected
- World Trade Institute (2016) finds that Denmark's total **exports** of pharma and chemical products should increase by **0.8 bn. EUR** in 2030
- A sizeable part of this impact is likely to come from the pharma industry alone, as pharma products account for approximately 64 per cent of Ireland's exports of pharma and chemical products (based on 2014 data from Eurostat).

Impacts of TTIP on Danish exports



Note: The figure shows the change in total Danish exports for top sectors measured in million EUR. Impacts are measured relative to the 2030 projection for the baseline Danish exports. As the baseline data is not available, it is not possible to transform the 2030 changes into changes in current Danish exports.

Source: World Trade Institute (2016), *TTIP and the EU Member States*

Benefits of an ambitious pharma chapter in TTIP to other industries in the EU

Benefits of an ambitious pharma chapter in TTIP to other industries in the EU

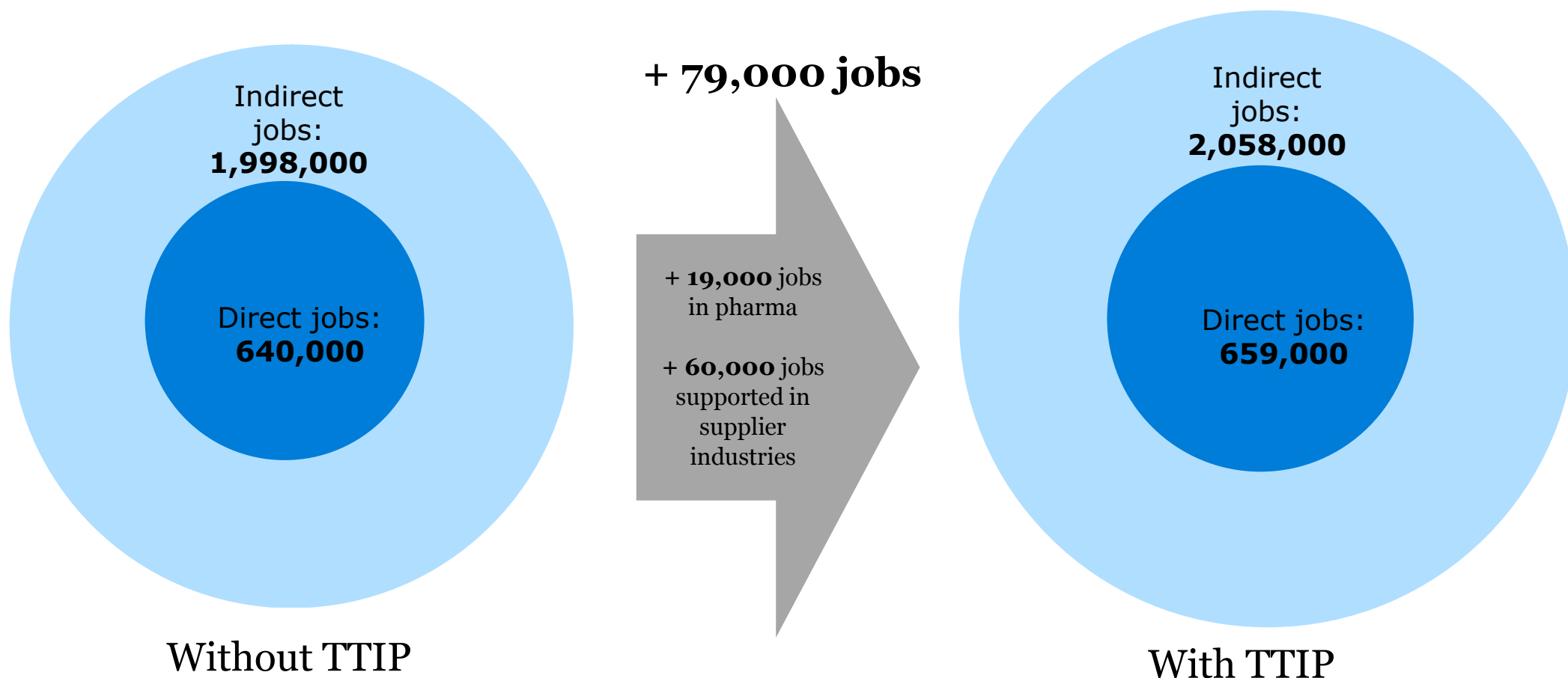
Benefits to the EU pharma industry also benefit other industries

- The increase in EU pharma production will increase the demand for inputs from other EU industries that are suppliers to the EU pharma sector
- Increased pharma production will help support up towards **60,000** jobs in other EU industries in the manufacturing as well as the service sector
- An ambitious pharma chapter in TTIP will also benefit EU society more broadly, including EU patients.

Benefits of an ambitious pharma chapter in TTIP to other industries in the EU

TTIP increases jobs in EU pharma and supplier industries

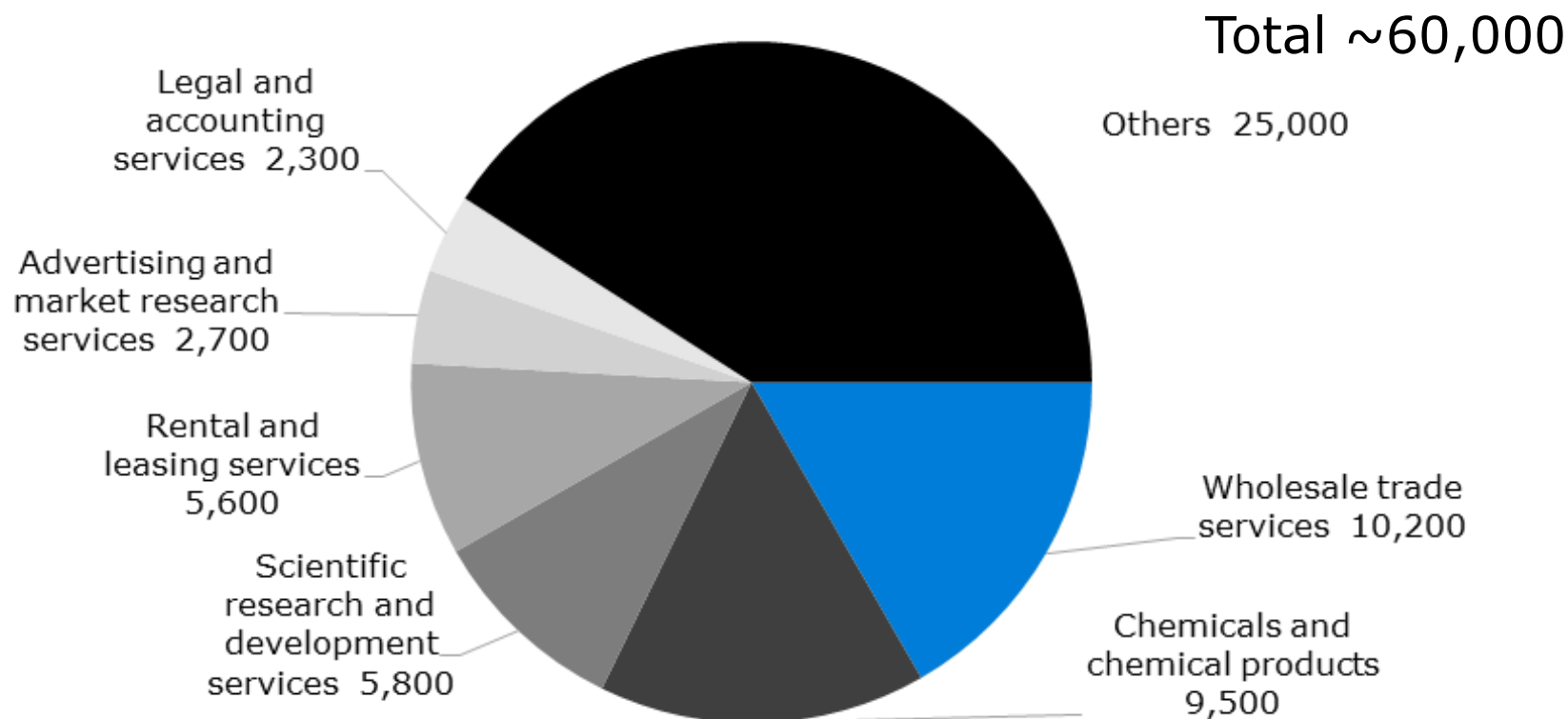
The increase in pharma production translates into an increase in jobs in the pharma industry itself and in those industries supplying inputs into the pharma industry



Benefits of an ambitious pharma chapter in TTIP to other industries in the EU

TTIP supports jobs in both manufacturing and services

Distribution of jobs supported in supplier industries due to TTIP's impact on EU pharma production



Note: Due to the rounding of decimals, the individual components does not sum exactly to the total

Source: Copenhagen Economics based on input-output analysis using input-output tables from Eurostat.

Benefits of an ambitious pharma chapter in TTIP to other industries in the EU

Societal benefits of an ambitious pharma chapter in TTIP

An ambitious pharma chapter in TTIP will also have wider EU societal benefits. It will:

- **Benefit EU patients** via increased patient choice and improved access to new pharma products from the US (see next slide)
- **Free up EU regulatory resources** as duplicative and possibly even incompatible regulations are aligned. An ambitious pharma chapter in TTIP involves a reduction in cost burdens related to double regulation of e.g. manufacturing inspections, which can be used for other purposes such as risk-based inspections. TTIP can thus increase the efficiency of EU regulatory resources
- **Free up resources for EU pharma companies** that are currently being used to ensure compliance with two different regulatory systems. These resources can instead be re-invested in R&D of new medicines or other efficiency-enhancing activities, which strengthen the competitiveness of the EU pharma industry, generate economic value for the EU economy and benefit EU patients.

Benefits of an ambitious pharma chapter in TTIP to other industries in the EU

TTIP help ensure improved access to new medicines for EU patients

- Through regulatory alignment, TTIP can ensure faster market authorisation of US medicines in the EU
- Furthermore, TTIP can help reduce the period of time that elapses from when a medicine is approved by EU authorities to when it becomes available for EU patients. During this period, pricing and reimbursement procedures are completed
- Data show that the time period from when market authorisation is approved until pricing and reimbursement procedures are completed varies between 44 to 900 days across EU27 Members (Patients W.A.I.T. Indicator, 2015)
- TTIP can help reduce the long waiting periods by putting pressure on authorities in EU Member States to align procedures and undertake pricing and reimbursement procedures faster
- In the recent FTA between the EU and South Korea, it is thus explicitly stated that:

To the extent possible, each Party shall ensure that decisions on all formal requests and applications for the pricing or approval of pharmaceutical products or medical devices for reimbursement are adopted and communicated within a reasonable and specified period from the date of their receipt.” (Official Journal of the European Union (2011) page L127/155).

TTIP and FDI in the EU pharma industry

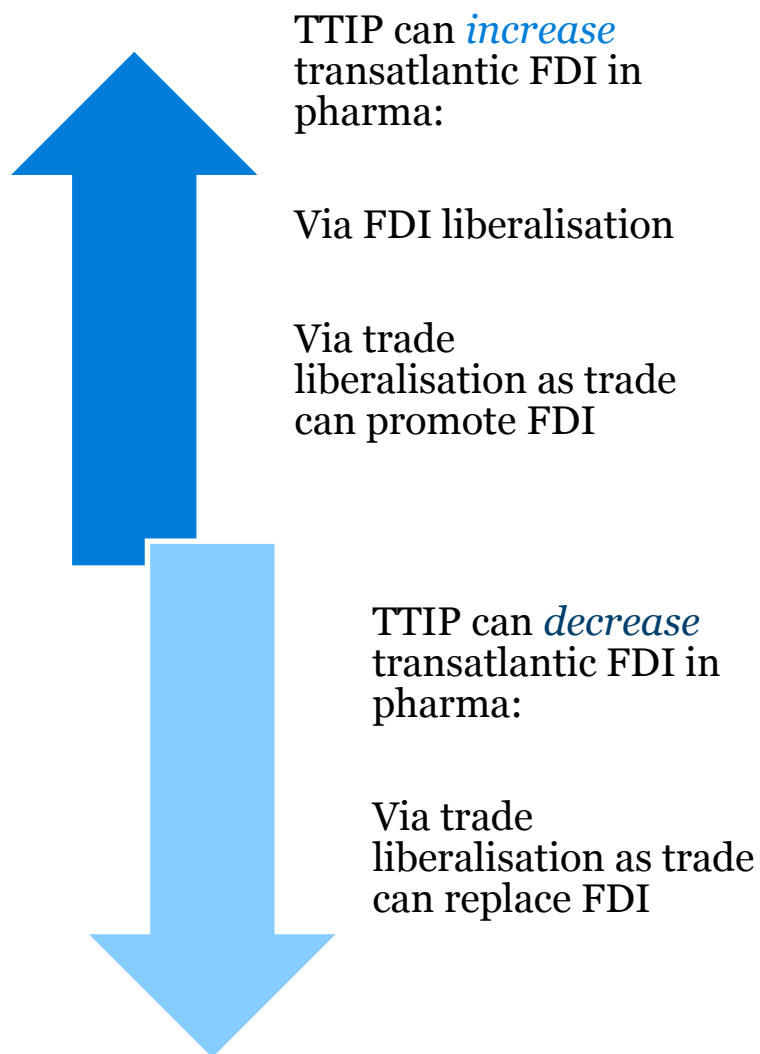
TTIP and FDI in the EU pharma industry

TTIP can stimulate transatlantic transatlantic FDI in pharma

- TTIP can ease transatlantic investments and reduce the risk of investing abroad (European Commission, 2015)
- TTIP can also impact transatlantic FDI via trade liberalisation as trade liberalisation can both increase and decrease FDI (see next slides)
- The impact of TTIP on transatlantic FDI in the pharma industry is thus a priori indeterminate
- Based on findings in the literature, it is however most likely that any potential impact will be positive and increase FDI (see following slides). This brings economic value to the EU as:
 - *Inward* FDI (e.g. US investment in EU) may create jobs in the EU and increase European firms' productivity via knowledge transfers
 - *Outward* FDI (e.g. EU investment in the US) may also benefit the EU economy by increasing the competitiveness of EU firms abroad and boosting their home operations.

TTIP and FDI in the EU pharma industry

TTIP and transatlantic FDI in pharma



TTIP can *increase* transatlantic FDI in pharma:

Via FDI liberalisation

Via trade liberalisation as trade can promote FDI

TTIP can *decrease* transatlantic FDI in pharma:

Via trade liberalisation as trade can replace FDI

Reducing FDI barriers by 25 per cent increases employment in transatlantic affiliates by **10 per cent** (average effect across all sectors)

In pharma: + **8,000 employees** in US affiliates in the EU (relative to 2012)

TTIP and FDI in the EU pharma industry

TTIP can reduce the risk of transatlantic investments

- TTIP is likely to also include a bilateral investment agreement between the EU and the US. A key element of such an agreement is to set up a legally binding level of investor protection (e.g. protection from unlawful expropriation or provisions to ensure that foreign investors are treated no less favourable than national investors)
- The key purpose of a bilateral investment agreement is thus to reduce the uncertainty of cross-border investments and thereby encourage investment flows between two countries
- Positive impacts of a bilateral investment agreement on transatlantic investment should not, however, be taken for granted. Based on existing empirical findings, Copenhagen Economics (2015a) finds that investment protection alone is unlikely to result in any substantial increase in investments.

TTIP and FDI in the EU pharma industry

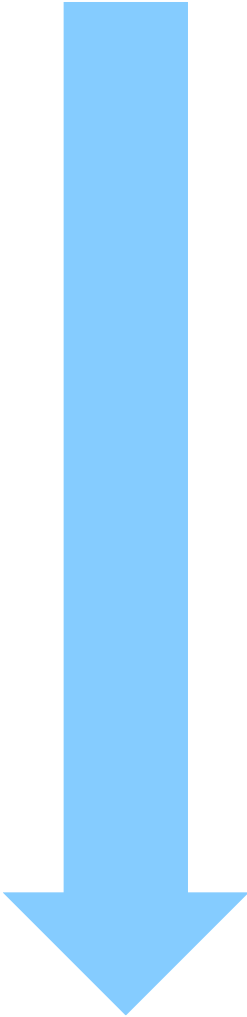
TTIP can increase transatlantic FDI in pharma via FDI liberalisation

- An agreement that goes beyond investment protection and targets barriers to investment should, however, be expected to have a real positive impact on transatlantic FDI
- CEPR (2013) finds that on average, across all sectors, reducing barriers to FDI by 25 per cent would increase employment in transatlantic affiliates by 10 per cent
- The estimate is based on an assumption of reducing investment barriers for US investors in the EU to the same level faced by EU investors investing in other EU countries. This increases employment by US firms by just over 10 per cent
- Based on this estimate, an equivalent effect in the pharma industry would increase employment in US affiliates in the EU by around 8,000 jobs, relative to the level in 2012 (~80,000)*
 - As this reflects both expansions in current US affiliates and potential new investments, this should not be interpreted as being in addition to the employment effect calculated above
- This estimate is based on the assumption that the average impact across all industries also applies to pharma and should therefore only be viewed as a rough estimate
- Impacts in pharma would differ from the average impact across all industries if:
 - Barriers to FDI in the pharma industry are higher or lower than the average barriers to FDI. Findings from CEPR (2013) indicate that the differences between barriers for EU and non-EU investors are larger in pharma than across all industries on average
 - The sensitivity of pharma investments to the reduction in barriers is different from the average sensitivity across all industries. If investments in pharma are less sensitive to investment barriers than in other industries, this will dampen the impact of FDI liberalisation. One reason why pharma investments may be less sensitive to FDI barriers is that a large share of FDI in the industry is conducted via mergers and acquisitions, driven by e.g. the search for new pharma products, as a result of the expiration of many patents (Copenhagen Economics, 2016).

* Source: Eurostat inward FATS data. Data is the latest available from 2012.

TTIP and FDI in the EU pharma industry

TTIP can decrease transatlantic FDI in pharma via trade liberalisation

- 
- Reducing barriers to trade can also decrease transatlantic FDI in pharma. This could happen if the reduction in transatlantic trade barriers makes it relatively more profitable to export pharma products across the Atlantic than to undertake FDI
 - As trade barriers are reduced, EU and US pharma firms may rely, to a greater extent, on exporting as a way of serving the market across the Atlantic, instead of FDI
 - This is most likely to occur if the primary motivation for undertaking FDI is to circumvent trade barriers by manufacturing products where they are sold
 - While trade barriers may increase the incentive to undertake transatlantic FDI in pharma, investments are driven by several other factors
 - One of the drivers of investments in pharma is, for example, the acquisition of established products. The recent expiration of many patents has incentivised pharma firms to undertake targeted acquisitions of firms with established products (Copenhagen Economics, 2016)
 - Copenhagen Economics (2016) found that the main attraction factors for foreign firms in the EU pharma industry are factors such as market size, tax-incentives, high skilled labour and cluster effects that allow firms to benefit from accumulated knowledge. These are policy factors that are isolated from the TTIP and which can help ensure continued US pharma investments to the EU and vice versa.

TTIP and FDI in the EU pharma industry

TTIP can increase transatlantic FDI in pharma via trade liberalisation

- 
- By reducing barriers to trade, TTIP can increase transatlantic FDI in pharma.
 - The literature on FDI determinants also find that lowering trade barriers tend to *increase* FDI. As found in Blonigen and Piger (2011) this occurs via three channels (illustrated here by EU inward and outward FDI):*
 1. A reduction in EU trade barriers can increase US investments in the EU. A reduction of EU trade barriers makes it less costly for US companies located within the EU to import goods and services from the US or elsewhere. This will make it more attractive for US companies to split up their supply chains and locate part of their production in the EU
 2. A reduction in trade barriers in the EU can increase EU investments in the US by lowering the cost of trading between the EU firms' affiliates in the EU and in the US. A reduction of EU trade barriers makes it less costly for EU companies located in the US, to export final or intermediate products back to the EU. This facilitates cooperation between affiliates in the EU and the US and makes it more attractive for EU companies to invest in the US
 3. A reduction in EU trade barriers can increase US investments in the EU, if US firms' operations in the EU and in the US complement each other. Thus, while the US company may choose to concentrate production for both markets in the US and serve the EU market via exports, it may also choose to locate other activities (e.g. R&D operations or sales offices) in the EU. Blonigen et al. (2007) thus find that US investment into European OECD countries tend to increase as trade barriers are reduced
 - Furthermore, if the regulatory alignment imposed under TTIP results in new global standards, the EU could become a front-runner in setting international pharma regulations. This can in turn attract FDI from third countries into the EU.

* Discussed in Copenhagen Economics (2015a), *TTIP impact in Ireland*

Appendix

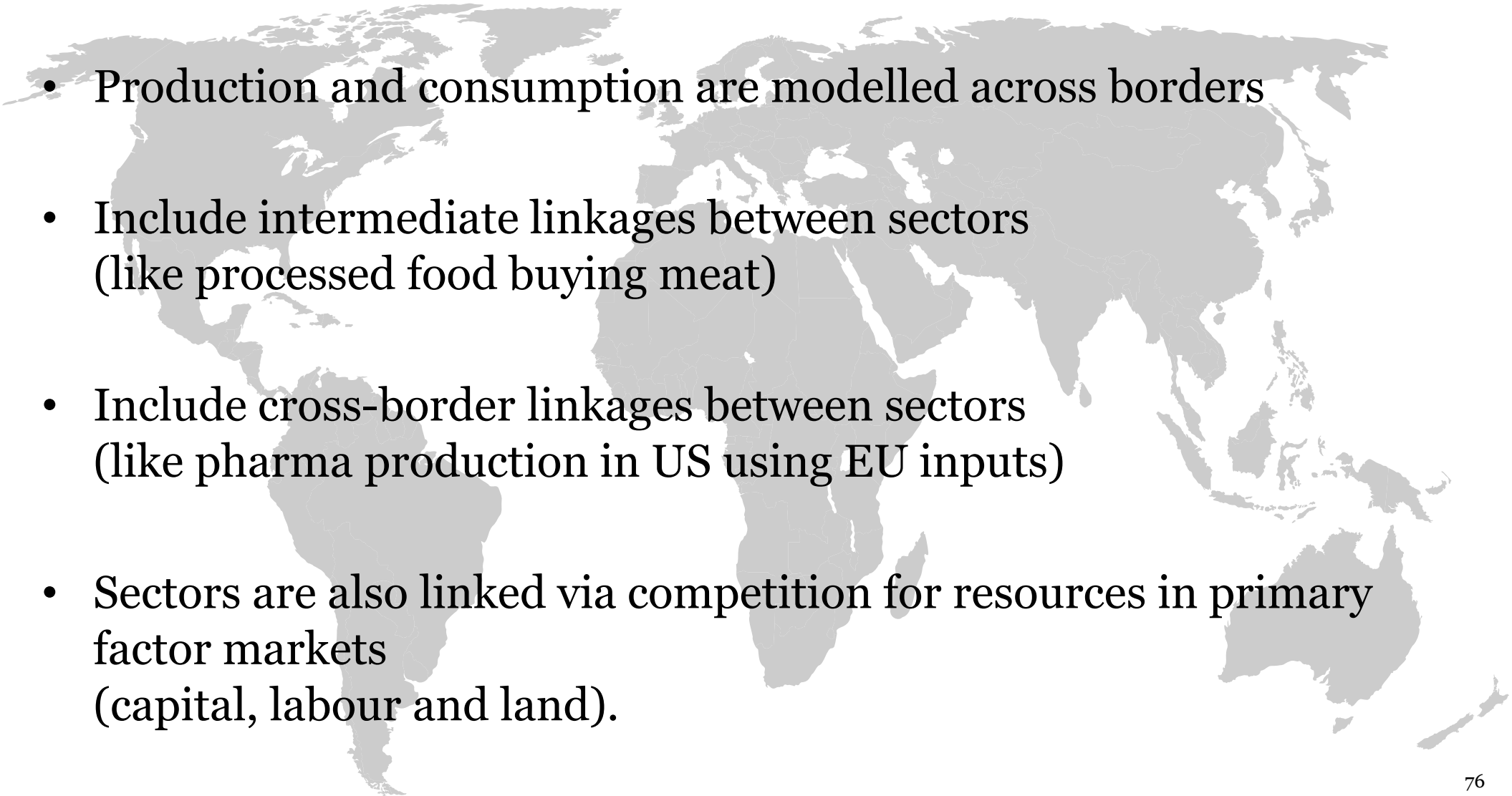
Appendix

Methodology

- This study is based on the economic assessment of TTIP by CEPR (2013). Using a global CGE model (see next slide) the authors of that study conduct a so-called counter-factual analysis in which they compute the difference in the various parameters with and without a reduction in trade barriers
- In CEPR (2013) the pharma industry is part of a larger *chemical and pharma sector*, which also includes the manufacturing of a range of chemicals, plastics, rubber, soap and paint. In order to compute the impact of the TTIP on the pharma industry alone, we assume that the same proportional changes that apply to the sector as a whole also apply to the pharma industry alone
- In CEPR (2013), results are presented relative to a projected 2027 benchmark. In this report, we apply the proportional changes to 2014 data in order to obtain the estimated changes in euro values using the most recently available data.

Appendix

Global CGE model in short

- 
- Production and consumption are modelled across borders
 - Include intermediate linkages between sectors (like processed food buying meat)
 - Include cross-border linkages between sectors (like pharma production in US using EU inputs)
 - Sectors are also linked via competition for resources in primary factor markets (capital, labour and land).

Appendix

Methodology: Trade impacts

- Trade barriers in CEPR (2013) also include tariffs placed on chemical products included in wider chemical and pharma sector
- As tariffs do not apply to pharma products, we adjust the CEPR (2013) full impacts for the impact arising from the removal of tariffs alone
- We do this by:
 1. Calculating the share of the full reduction in trade barriers in the chemical and pharma sector, that arises due to the reduction of NTBs only, cf. tables below
 2. Calculating the impact of TTIP on extra-EU exports and extra-EU imports of pharma products, by multiplying the full impact for the chemical and pharma sector (obtained from CEPR, Table 29) by the share of the reduction in trade barriers due only to the reduction of NTBs (from (1))
 3. Applying this adjusted impact to the base of extra-EU exports and extra-EU imports of pharma in 2014 (obtained from Eurostat), gives us the impact of TTIP on extra-EU exports and extra-EU imports of pharma relative to the level in 2014
 4. Calculating the impact of TTIP on EU exports and imports of pharma products to and from the US, by multiplying the full monetary impact (from (3)) by the share that is due to bilateral impacts (obtained from CEPR (2013), Table 29).

US barriers on EU exports of pharma/chemicals

Type of barrier	Without TTIP	With TTIP
Tariffs	1.2%	0.0%
NTBs	19.1%	14.3%
Total barrier	20.3%	14.3%
Share of drop in barriers due to NTB reduction only		84.9%

EU barriers on US exports of pharma/chemicals

Type of barrier	Without TTIP	With TTIP
Tariffs	2.3%	0.0%
NTBs	13.6%	10.2%
Total barrier	15.9%	10.2%
Share of drop in barriers due to NTB reduction only		70%

Appendix

General employment effects in the CEPR study

There are two ways in which TTIP could affect the labour market:

- changes in the wages that people are paid, and
- reallocation of jobs across sectors in response to the restructuring triggered by the agreement

The CEPR study looks at both of these. The CEPR study finds that TTIP will have a positive impact both on skilled and less skilled workers' wages, raising each by close to the same amount, roughly 0.5 per cent

The CEPR study also makes an assessment of how jobs would be reallocated among the different sectors of the economy. The industries that will grow the most as result of TTIP will pull away workers from other sectors by offering higher wages. The simulations suggest that these movements will be relatively limited

In the EU, less than 0.7 per cent of the labour force could be expected to move between sectors as a result of TTIP. This means that fewer than 7 workers in every 1000 would end up moving to another sector due to the TTIP. This is significantly less than the ordinary movement between sectors which takes places for several reasons as the economy adjusts to changes

The CEPR study does not look at the overall job creation and it does not include figures on TTIP's overall impact on job creation because the long-run labour supply is assumed to be fixed. This is the most reliable method for predicting the long-run impact of trade policy changes

The fixed labour supply assumption means that the long-run levels of employment do not change as a result of the agreement. However, it is important to say that the fact that the model builds on a fixed labour supply assumption is not the same as saying that the analysis assumes that there is no unemployment in the economy or that there is no impact of the agreement on unemployment in the short or medium run.

Appendix

Employment effects in the pharma industry

The CEPR study does not provide an estimate of the number of jobs created in the pharma sector as a result of TTIP. The CEPR study only provides estimates for the significantly larger combined chemicals and pharma sector and how this sector might increase its share of total EU employment as sectors are adjusting to the post-TTIP situation

According to the European Commission's own estimates, every billion EUR of trade in goods or services supports around 15,000 jobs in the EU. This is an average effect across all industries and not specific to pharma. Based on this figure and the expected increase in EU exports from the CEPR simulation exercise, the Commission has estimated that the most ambitious TTIP scenario could result in several million jobs dependent on exports in the EU. In addition, an ambitious TTIP would have the beneficial effect of shifting some of the EU's jobs to successful and export-oriented firms making the EU economy better equipped to deal with strong competition from global markets. In this way, TTIP will contribute to a more sustainable employment base in the EU

Following the same approach, we can estimate the job impacts from TTIP in pharma. As shown, we have estimated that TTIP will increase extra-EU exports of pharma by around 9 billion EUR. This would – all other things equal - require more employment in the pharma industry. The export increase alone would require an increase in employment in the sector of around 34,000 people across the EU28. However, the EU will also import more pharma as a result of TTIP

As shown, EU will increase imports of pharma by around 4 billion EUR, and the impact of this increase will need to be counter-balanced in the job assessment, which reduces the net trade-related impact by around 14,000 jobs. The net results from these changes in the EU's external trade in pharmaceutical corresponds to around 19,000 jobs in pharma which is consistent with a 3 per cent increase in EU pharma production. This number builds on the assumption that the consumption quantities in the EU will remain unchanged, that there are no productivity effects of TTIP and that the mix of inputs such as labour, capital and other input factors also remains constant

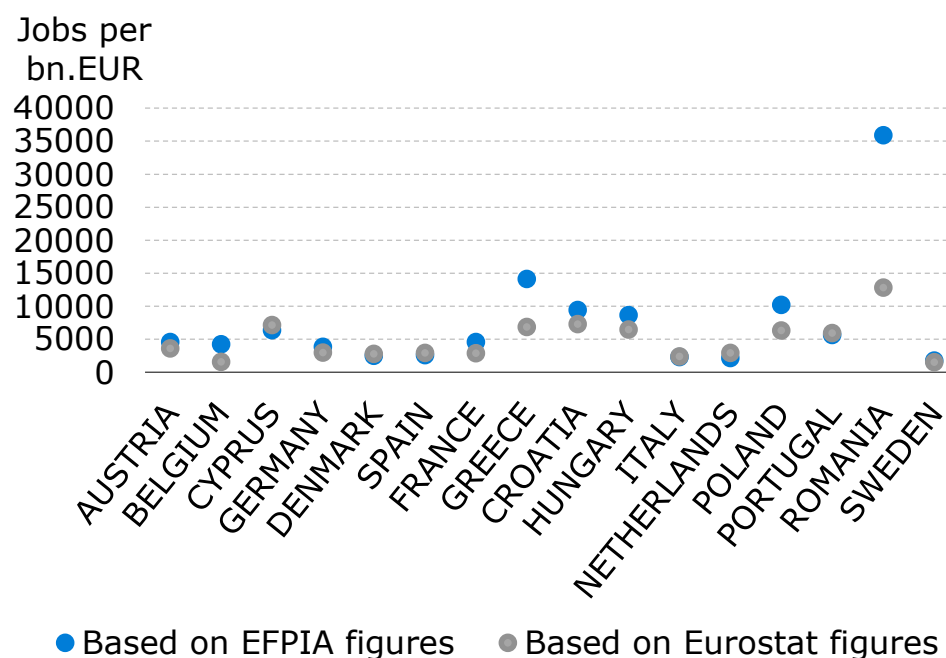
However, as the CEPR study is indicating for the aggregate pharma-chemicals sector, TTIP can also affect the composition of the inputs such as labour, capital and energy and the CEPR simulations indicate that output in the combined pharma-chemicals sector may only increase by less than 1 per cent due to limitations resulting from lack of labour (or other input factors). Furthermore, the CEPR simulations also indicate that much of the expansion of the combined pharma-chemical sector in the TTIP scenario is driven by increased investment in the sector (i.e. more capital), rather than increasing employment. Taking these changes in the mix of input factors into account, CEPR estimates a very small percentage change in employment in the combined chemicals and pharma sector (+0.08 per cent increase).

Appendix

Employment and production in the pharma industry

- Central to the calculation of the employment effects is the number of jobs relative to the production of pharma
- Data on total EU production and employment obtained from EFPIA (2015) show a ratio of approximately 3,700 jobs in pharma per 1 billion EUR worth of production. This figure differs substantially between individual MS, with 84,000 jobs per 1 bn. EUR worth of production in Bulgaria compared to 1,350 jobs in Ireland per 1 billion EUR worth of production
- Data from Eurostat on employment and production in the pharma industry (based on the NACE classification) also reveal a significant difference across individual Member States. Of the countries included (neither data from Ireland nor Bulgaria is available for 2013, which is the year the data from EFPIA (2015) refers to) the least number of jobs per 1 billion EUR worth of production is found in Sweden (1,458) while the largest figure is from Romania (12,770)
- Comparing across the two data sources reveal some differences across Member States, but there is no systematic pattern where one source consistently results in a higher or lower number of jobs per 1 billion EUR worth of production. For most Member States, the differences are relative minor, with the exception of Romania.

Jobs per bn. EUR pharma production in the EU, 2013



Note: Only Member States for which production and employment data are available from both EFPIA (2015) and Eurostat are included. Data on production in EFPIA (2015) refer to products in the SITC 54 group, while data from Eurostat are composed based on the NACE industry classification and cover the industry “Manufacture of basic pharmaceutical products and pharmaceutical preparations”.

Source: Copenhagen based on data from EFPIA “The pharmaceutical industry in figures” (edition 2015) and structural business statistics from Eurostat

References

References

References

- Blanc, Ludivine. 2014. “The European pharmaceutical industry in a global economy: What drives EU exports of pharmaceuticals overseas ?” Master Thesis, College of Europe Bruges Campus Department of Economics
- Blonigen, B.A. and J. Piger. 2011. “Determinants of Foreign Direct Investment”, NBER Working Papers 16704, National Bureau of Economic Research
- Blonigen, B.A., R.B. Davies, Glen R. Waddell and H. Naughton. 2007. “FDI in Space: Spatial Autoregressive Relationships in Foreign direct Investment”, European Economic review, 51(5), pp. 1303-1325
- CEPR. 2013. “Reducing Transatlantic Barriers to Trade and Investment: An Economic Assessment”, Report prepared for the European Commission, DG Trade
- Copenhagen Economics. 2015a. “TTIP impact in Ireland”, Report prepared for the Department of jobs, Enterprise and Innovation, Ireland
- Copenhagen Economics. 2015b. “The Danish pharmaceutical industry and TTIP”, Report prepared for Novo Nordisk A/S – Lundbeck A/S - LEO Pharma A/S.
- Copenhagen Economics. 2016. “Towards an FDI Attractiveness Scoreboard”, Forthcoming

References

References

- European Federation of Pharmaceutical Industries and Associations (EFPIA). 2015. “The pharmaceutical Industry in Figures: Key Data 2015”
- European Commission. 2011. “Pharmaceutical Sector Fiche (16.12.2011)”
- European Commission. 2015. “Creating more investment opportunities in EU and the US”, Factsheet on investment protection in TTIP
- German Federal Ministry for Economic Affairs and Energy. 2016. <http://www.bmwi.de/EN/Topics/Foreign-trade/TTIP/what-is-ttip.html>, accessed April 2016
- Official Journal of the European Union L127. 2011. Volume 54. 14 May, 2011
- Patients W.A.I.T. Indicator. 2015 Report
- The Global Health Council. 2007. “The impact of tariffs and non-tariff barriers on access to essential drugs for the poorest people”, Policy Brief
- US Bureau of Labor statistics. 2011. “The Pharmaceutical Industry: An Overview of CPI, PPI, and IPP Methodology”
- WIFOR. 2015. “The economic footprint of the pharmaceutical industry”.
- World Trade Institute. 2016. “*TTIP and the EU Member States*”, Report prepared for the American Chamber of Commerce to the European Union (Amcham EU)