ECIPE | EUROPEAN CENTRE FOR INTERNATIONAL POLITICAL ECONOMY

The Benefits of Intellectual Property Rights in EU Free Trade Agreements

FULL REPORT

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PREFACE ECIPE

This study brings together two major sources of growth in the modern economy: trade and new ideas. Trade is a crucial process to improve economic specialisation and raise the productivity of economies. It is also a channel to diffuse technology and knowledge across countries. International exchange is therefore helping countries to modernise their economies. New ideas are all the innovations, technologies, know-how and business models that gradually power the economy – the intangible assets that define a significant part of modern economic growth. They are the basis for a society's stock of intellectual property, and that stock increases every time there are investments in research and development, production methodologies, brands, novel product design, business know-how and new artistic creations. Most societies allow for protection of intellectual property because intellectual property is necessary for prosperity.

Our mission for this multi-year study was to get a much better and granular understanding of what role that intellectual property rights (IPRs) play for trade, productivity and growth, and how trade policies for IPRs have developed over time. Even by our cautious estimates, the results are very clear: copyrights, geographical indications, patents, trademarks and other intellectual property rights support trade and value added in Europe, and stronger IPR provisions in Free Trade Agreements (FTAs) increase the payoff even more.

These results are novel. It has been known for a long time that trade agreements boost trade and economic growth. It is much less known that IPRs are a crucial part for the successes of trade policy. IPR policy is routinely neglected in policy discussions over trade. In Europe, IPRs tend to rank low when Member States make priorities about what outcomes the EU should seek from trade negotiations. This is a problem, and it is not just about intentional neglect and low motivation. The problem goes deeper and concerns a problem with information. It is notoriously difficult to estimate the value of IPRs and few Member States have a clear understanding about how much they depend on intellectual property and its protection for their prosperity and international competitiveness. This study is a first step to rectify this problem. It presents results for all EU Member States and a selection of non-EU countries. These results are extraordinarily enlightening and, for some countries, very surprising. The key takeaway point for many governments is that it is high time to take a much deeper interest in IPRs when they consider their trade policies.

We are grateful to a great number of economists, policymakers and experts that have shared their knowledge with us – including officials from the European Commission, the EU Intellectual Property Office, OECD, and several EU Member States.

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PREFACE ASSOCIATIONS

We are delighted to present the ECIPE study "The Benefits of Intellectual Property Rights in European Union Free Trade Agreements", which brings together the expertise of the think tank with inputs from leading academics from across Europe and the world. The study has a clear goal: to assess the impact of stronger Intellectual Property Rights (IPRs) provisions in EU Free Trade Agreements (FTAs) for the EU and its Member States. In conducting this study, ECIPE has not only looked at the economic, trade and investment effects of IP provisions in EU FTAs, but also provides insights into the links between IP and the EU's industrial policy, pharmaceutical innovation, sustainable development, biodiversity, COVID-19, the Single Market and SMEs, and the Green Deal.

The study looks at different IPRs, concluding that stronger IP provisions in EU FTAs are expected to bring a range of economic and social benefits to business, consumers, patients and societies overall across the EU. World-class IP provisions could result in permanent income increases for EU families, significant export growth for the EU and its Member States, a significant rise in investments into R&D intensive industries, and access to state-of-the-art technologies that enhance EU manufacturing capabilities and global competitiveness, which will all strengthen EU resilience. For SMEs who lack the resources of larger firms – limiting their ability to defend against IP infringements – a combination of IP protections in EU FTAs and SME Chapters in recent EU FTAs are particularly relevant.

But stronger IP provisions in EU FTAs are about more than just economics. They underpin the knowledge economy in the European Union that values innovation and thought leadership globally for the world of tomorrow. They stand for an EU that wants latest technologies available for its citizens and for the Green Deal and digital transformation, safer products and food for consumers, patients to benefit from faster access to innovative treatments, to combat counterfeit products, and to remain a competitive global player in the post-COVID-19 world.

Innovation-focused FTAs that contain robust IP provisions can serve as a model for future trade agreements globally. As business associations representing a broad range of sectors vital for the EU and Member State economies, we are confident that this study will provide a positive contribution to the discussion about the value of IPRs, helping European businesses and citizens to develop an informed opinion of what Intellectual Property could mean for them. They would enable Europe to play a leading role in shaping globalisation, at a time when the rules and norms that govern trade and investment are challenged more than ever.

KEY TAKEAWAYS

Key Takeaway 1: What are Intellectual Property Rights and why do they matter?

Intellectual Property gives the creator (e.g. an artist, a company doing R&D, indigenous peoples, a creative studio) an exclusive right over the commercial use of that intellectual creation for a certain period of time. *IP motivates people/companies to invest in innovation by providing the opportunity to recoup the investments made.* By motivating such new discoveries, innovations and other immaterial creations, IP directly leads to progress that is beneficial for society as a whole.

Key Takeaway 2: The economy-wide relevance of IP-intensive industries

IP-intensive industries constitute *44.8 percent of EU GDP* and generate 38.9 percent of total EU employment. *Wages are 47 percent higher* on average in IP-intensive industries compared to non-IP-intensive industries. They are responsible for *68% of total EU exports* and they *drive investments in the EU economy* (51% of all investments occur in a set of IP-intensive industries).

Key Takeaway 3: EU trade agreements: strong on niche types of IP but weaker on the broad IP types

EU FTAs are particularly strong in some niche types of IP (e.g. geographical indications), but less so in the broad types of IP of patents and trademarks, while the latter matter most economically. The EU did not copy the equivalents of EU law into its FTAs and there is much less focus on patents and trademarks in EU FTAs compared to US FTAs.

Key Takeaway 4: 55% of EU exports (of which 60% is IP intensive) are not covered by an FTA

Because of the EU's bilateral FTA strategy, the share of EU exports covered by FTAs rose to 45% in 2018 and IP-intensive trade covered by FTAs grew fast. However, *55% of all EU exports are not covered by bilateral FTAs and 60% of these exports are IP-intensive.* They do not have FTA IP protection which could be an issue for trade with countries where IP systems (including enforcement) are weaker.

Key Takeaway 5: The EU IP score and EU's global share of IP-intensive exports declined

From 2009 to 2018, *the EU IP score has declined vis-à-vis the US, China, Japan and Switzerland*.[1] The global share of EU IP-intensive exports is also eroding gradually. The fact that the decline in IP-intensive export shares is gradual is likely due to the long-term nature of R&D, which also means this trend cannot easily be turned around once it happens.

[1] EUIPO measure of the strength of an IP framework

Key Takeaway 6: Sector-specific relevance of IP-intensive industries.

- Most *value-added* for the EU economy is created by machinery (€232bn), motor vehicles (€206bn), and architecture & engineering (€158bn).
- Pharmaceuticals (€161k), telecoms (€156k), chemicals (€107k), transport equipment (€88k) and motor vehicles (€81k) create the most *productive and highest value-added jobs.* These sectors are 2-3 times as productive as non-IP-intensive industries (€51k).
- Machinery (€240 bn), motor vehicles (€169 bn), chemicals (€161 bn) and pharmaceuticals (€135bn) contribute *most to EU exports.* IP-intensive sectors export 68% of all EU exports.
- Telecom (€44k per person), motor vehicles (€39k p.p.), machinery (€22k p.p.) and electrical equipment (€13k p.p.) create *most investments per capita in the EU* in 2019.

Key Takeaway 7: Strengthening IP in EU FTAs has a significant positive economic and societal effect for the EU and EU Member States

Stronger IP provisions in EU FTAs matter: they create a level playing field, improve market access, reduce trade costs for IP-intensive products, and create predictability for long-term investments. *Stronger IP provisions in EU FTAs lead – each year – to higher EU GDP* (€63bn), *more EU exports* (€74bn), *higher investments in the EU* (€17bn) and *higher wages for EU citizens* (€245 per EU family of 4). Every EU Member State benefits. All 27 EU Member States participate in these gains.

Key Takeaway 8: Strengthening IP in EU FTAs also has positive sectoral effects in the EU and in EU Member States

The EU IP-intensive sectors that would *increase exports* most in case of stronger IP provisions in EU FTAs are: machinery (+4.0%), transport equipment (+3.4%) and electronics (+3.2%). In terms of production, transport equipment (+6.3%), machinery (+2.3%), electronics (+2.2%), electrical equipment (+2.0%) and pharmaceuticals (+2.0) would *increase production in the EU.*

Key Takeaway 9: Patents and trademarks matter most for IP-intensive EU exports

The *largest positive impact on exports comes from patent and patent-related provisions,* followed by the effects of trademarks. For EU FTAs, however, the patent and trademark provisions have a weaker trade-enhancing effect compared to other FTAs due to EU FTA patent and trademark provisions being weaker than those in other FTAs. By strengthening these provisions a *stronger export performance and more export-oriented jobs in EU Member States would result.*

Key Takeaway 10: IP and the EU industrial strategy: an opportunity for EU IP-intensive industries

The biggest gains in economic activity are created when new innovations such as digital technologies, new machines, innovative medicines, and green technologies *are also broadly adopted.* IP provisions in EU FTAs can meaningfully *contribute to EU strategic resilience by promoting innovation in the EU, driving the digital transformation, green technology development and R&D into innovative medicines,* especially if done in parallel to a strong regulatory framework and deepening of the EU Single Market.

Key Takeaway 11: IP in the EU pharmaceutical strategy: the EU at a crossroads

The EU has lost ground in terms of pharmaceutical innovation – the most R&D intensive industrial sector – since 1990. The EU Pharmaceutical Strategy has the potential to turn this trend around, but in spite of some positive IP elements in the strategy, it looks like this may not happen, mainly because it could introduce conditionalities on IP and incentives. This is the opposite of what the EU's global trading partners are doing and *could undermine the positive effect of strong IP provisions in EU FTAs.*

Key Takeaway 12: IP effective against counterfeit goods

Counterfeiting is a violation of IP. Strong IP provisions (e.g. trademarks, patents, copyrights) that are enforced jointly by companies and governments (e.g. an EU-wide food fraud risk management system, the EU falsified medicines directive) are one of the most efficient ways to *combat counterfeiting and piracy and reducing their negative economic, environmental, health and societal impact.*

Key Takeaway 13: IP and biodiversity

The EU-ANDEAN FTA contains most IP provisions on the protection of 'traditional knowledge and genetic resources'. *IP helps to combat the overexploitation of natural resources,* supporting the lives and livelihoods of indigenous and local communities and allowing these communities to capture larger shares of the economic benefits, while focusing on preserving the planet for future generations.

Key Takeaway 14: IP and SMEs

The *protection granted from IP is vital for small- and medium-sized enterprises (SMEs).* Many SMEs fail to consider their IP in early stages of development and overlook that it is one of their most valuable assets. Stronger IP provisions in EU FTAs, linked to SME chapters, could help SMEs overcome the export hurdle as more predictability and certainty are provided and investments protected. Stronger FTA enforcement too is especially beneficial for SMEs who do not have the resources for legal battles to protect their (intellectual) property.

KEY POLICY RECOMMENDATIONS

Key Policy Recommendation 1: Stronger IP provisions in EU FTAs

The EU should strengthen IP provisions in EU FTAs to the level of protection provided for in EU law, especially, but not only, with developed countries (e.g. Australia, New Zealand, Chile). The EU has the opportunity to deepen FTAs and strengthen IP after several years when FTAs are 'upgraded' to the benefit of EU Member States' and trading partner economies. Mirroring the EU IP system in EU FTAs was the ambition in 2006 of the 'Global Europe' strategy. If the EU would refocus on this objective in 2021, the EU economy and its citizens would benefit in various ways: economically (e.g. higher levels of welfare, investments and exports), socially (e.g. higher wages, more high-quality export jobs), environmentally (e.g. support for biodiversity, green technologies), and in terms of recapturing part of the EU's former global leadership in innovation, and via stronger resilience for the EU economy.

Key Policy Recommendation 2: Strengthen patent and trademark provisions in EU FTAs especially

The EU is already including strong provisions in its FTAs for geographical indications (GIs), plant variety rights (PVRs) and – depending on the trade partners – traditional knowledge. *But the EU should include stronger provisions on two large types of IP: trademarks and patents.* For these two types, the EU should agree provisions in line with those provided for in EU law. Currently, EU FTAs are weaker in these two types of IP than other FTAs, notably US FTAs, while these two types of IP are among the most important for the EU and EU Member State economies. The current levels of trademark and patent protection constitute the largest untapped potential of EU FTAs. The EU should lift the level of patent and trademark protection to what is already done on GIs. On trademarks, the EU could include provisions in its FTAs that would allow for the refusal or invalidation of a trademark on the grounds of bad faith, in order to disincentivise bad faith registrations by local companies infringing foreign trademarks. On patents, the EU could agree on EU-levels of RDP and SPC provisions in its FTAs.

Key Policy Recommendation 3: Strengthen the enforcement of FTAs

The EU should strengthen IP in EU FTAs via more emphasis on enforcement of its FTAs, including for IP provisions. The appointment of the Chief Trade Enforcement Officer (CTEO) in 2020 and the entering into force new trade enforcement rules in February 2021[2] are important. In addition, the EU should continue its bi-annual reporting on IP frameworks in third countries, the use of bilateral IP forums to strengthen IP frameworks in third countries, and use the Access2Markets Database to collect and follow IP-related market access barriers. In addition, trading partners should not be allowed to circumvent FTA provisions by adopting mitigating domestic policies that undo the effect of the FTA after the FTA has been applied. Also, the EU should actively check how the FTA (and its IP provisions) are embedded

[2] European Commission (2021) "Strong EU trade enforcement rules enter into force"; URL: https://ec.europa.eu/commission/presscorner/detail/en/IP_21_601

in national laws of the partner countries, taking likely implementation and enforcement already into account when (re)negotiating an FTA, and the scope of dispute settlement provisions in EU FTAs should as a standard include trade-related disputes arising from the violation of IP. This will strengthen global IP enforcement and – for example – help address the common challenge of counterfeit / fake goods that have significant negative economic, environmental, health and reputational effects.

Key Policy Recommendation 4: Strengthen the wording of IP provisions in EU FTAs

Effectiveness of IP provisions in EU FTAs does not only depend on more or longer protections (e.g. years of copyrights, patent term restoration or trademarks), but *also on the detailed ways of wording provisions in EU FTAs.* One way to strengthen IP in EU FTAs would be for the European Commission to engage in a dialogue with IP-intensive industries to discuss how provisions are applied / work in practice and how they could be reformulated to become more effective in protecting and enforcing IP on the ground.

Key Policy Recommendation 5: Link IP in FTAs more directly to EU strategic objectives

The EU should add a requirement in its impact assessment work around EU FTAs to explore the effects of strong IP provisions in EU FTAs on achieving EU core policy objectives, especially in combination with the trade enhancing effects of the FTA. For example, how can IP strengthen the EU's Green Deal, the Digital Transformation, support economic development of the poorest nations in the world, or increase EU strategic resilience against future pandemics? And what flanking measures could be agreed upon with the EU's trading partners to allow the IP framework to best support these policy objectives.

Key Policy Recommendation 6: Make IP work better for SMEs

With IP generating substantial benefits for SMEs in Europe, there is not only a need to strengthen IP provisions in EU FTAs overall with a focus on benefiting SMEs, also a *clear link to SME chapters in EU FTAs needs to be made* and the FTAs need to be flanked by a stronger interaction between IP offices, SME support institutions, business associations, national, regional and local governments and other relevant actors to first identify the IP needs of entrepreneurs and remove barriers to a more effective use of the IP system.

Key Policy Recommendation 7: Support partner countries to enforce IP better

Very often, implementation and enforcement of IP in trading partner countries is weak and not up to the level of implementation and enforcement in the EU. This is not always bad will, but also simply the result of weaker systems and structures, lack of budgets, and lack of understanding of IP. We therefore recommend the EU to think of flanking capacity building projects in the area of IP – especially in case of FTAs with developing countries. These capacity building projects could focus on: 1) Helping trade partners to set-up specialised IP courts and train judges that will strengthen domestic IP enforcement; 2)

Support partner countries to be clear on what has to happen with seized counterfeit goods: create ample storage space for detention of seized products and budgets for destruction of these counterfeit goods; 3) Awareness raising on what IP is and what IP enforcement entails.

Key Policy Recommendation 8: Extend the global coverage of EU FTAs

Ideally, each country would have its own strong domestic IP system to support innovation and R&D and protect creators from illegal use of ones' IP. This is vital for IP-intensive industries first and foremost, but also for the EU, because if EU company's IP rights are violated in a third country, the negative consequences are also born by the EU where the investment costs were made and where falsified goods could enter. Parallel to deepening IP in EU FTAs, *the EU should consider expanding the bilateral coverage of EU FTAs with strong IP provisions* with Australia, New Zealand, Indonesia, Chile, but also – more challenging – with key trade partners like China and Russia where domestic IP systems are much weaker and an FTA would add much-needed legal certainty for industry. Also an understanding with the US, where EU and US could together set a global example of strong IP provisions driving R&D and innovation, should be considered.

Key Policy Recommendation 9: Explain the benefits of IP better

Because they are important, but also conceptually difficult to understand, the EU – together with EU IP-intensive industries – *should explain more about what IP is, how they work, and why it is important for the EU to have a strong IP framework.* Especially the use of concrete examples in illustrating IP is important. One way would be to add more information to the "Report on the protection and enforcement of Intellectual property rights in third countries". Another way would be to explain the quid pro quo inherent in certain IP rights. For example, patents will not be granted unless the patent application contains sufficient detail concerning the invention, permitting further research. Similarly, regulatory data protection (RDP) for innovative medicines protects marketing authorisation dossiers which in turn leads to more transparency. That transparency forms the basis for future generic and biosimilar products.

Key Policy Recommendation 10: IP provisions in EU FTAs matter for EU Member States

Working on stronger IP provisions in EU FTAs is not only a role for the European Commission or the negotiators. Industry has an important role to play by highlighting the actual effects and benefits of IP provisions in EU FTAs and share these broadly, including illustrative examples. IP-intensive industries should invest into reporting and be transparent about the relevance of different IP provisions for them. This also applies to making clear to EU Member States what the specific Member State benefits of stronger IP in EU FTAs are in terms of production, exports, jobs and wages – and for what types of IP and IP-intensive industries these effects are most pronounced.

1. INTRODUCTION

The EU finds itself at a crossroads in 2021: the COVID-19 pandemic is still ongoing, but strategies are looking beyond and chart a course for the EU for the next 10 years to come that will determine its competitiveness and dynamic innovative drive. On 18 February 2021, the new 'Open, Sustainable and Assertive Trade Policy' came out[3] and on 5 May 2021 the update of the Industrial Strategy has been published.[4] The EU Green Deal, EU Biodiversity, and EU Digital Decade strategies are cross-cutting strategies across multiple sectors.[5][6][7] At sectoral level also various strategies have been published or are under construction, like the Pharmaceutical Strategy (24th of November 2020)[8], the Chemicals Strategy (14 October 2020)[9] and the Machinery Directive revision (2021).[10] These will have a major impact on Europe's attractiveness for investments and long-term competitiveness. Strategising and long-term planning are also taking place in Washington and Beijing where the EU's main competitors are working on their long-term strategies for (green) economic growth and competitiveness.

Four Major Themes

For this reason, in support of EU policy making that will reverberate for many years to come, this study has been conducted to look at one of the main drivers for innovation and long-term competitiveness of the European economy: intellectual property rights. There are four major themes of this study:

- First, the study provides an introduction into intellectual property rights: what they are why we have them.
- Second, the study illustrates that IP is increasingly important for the EU and EU Member States in terms of Gross Domestic Product (GDP), employment, wages, labour productivity, SME R&D potential, investments, to protect against counterfeit goods, and their global competitiveness.
- Third, the study tracks the evolution of IP provisions in EU Free Trade Agreements (FTAs), with the view of understanding if the current standard of provisions enable Europe to fully exploit opportunities for trade and production in its IP-intensive industries.

[3] European Commission (2021) "Open, sustainable and assertive EU trade policy", 18 February 2021. URL: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_644 [accessed 1 May 2021].

[4] EU updated industrial policy strategy (2021); URL: https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/european-industrial-strategy_en

[5] EU Green Deal (2021) ; URL : https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

[6] EU Biodiversity strategy (2021) ; URL : https://www.arc2020.eu/wp-content/uploads/2020/05/biodiversity-strategy-2030.pdf

[7] EU Digital Decade strategy (2021) ; URL : https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

[8] EU Pharmaceutical Strategy (2020); URL: https://ec.europa.eu/health/human-use/strategy_en

[9] EU Chemical Strategy (2020); URL: https://ec.europa.eu/environment/strategy/chemicals-strategy_en

[10] EU Machinery Directive revision (2021); URL: https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/2019-Machinery-Directive-revision_en

- Fourth, the study analyses the effect of stronger IP provisions in EU FTAs in terms of production, trade, investments, and citizen's incomes in Europe (both in the EU and all EU Member States). Stronger is defined as both 'content-wise stronger' and 'stronger enforcement'.

Methodological Approach

ECIPE has employed a multi-pronged methodological approach. By using different quantitative and qualitative sources that are also used for cross-validation, this study can draw conclusions that are methodologically robust and strongly rooted in both quantitative and qualitative techniques.

Extensive statistical analysis is used, employing publicly available data sources with regional global coverage (e.g. Eurostat, UN Comtrade, OECD, ILO), for example for the relevance of IP in the EU and its Member States. This allows for transparency and replicability of the results. We also use the DESTA database, which provides information at detailed level whether a type of IP-related provision is in an FTA or not – and how inclusion of IP provisions has evolved over time. For the impact analysis of stronger IP provisions in EU FTAs, we use a gravity analysis to estimate trade elasticities that are then entered into a Computable General Equilibrium (CGE) model to calculate the likely macro-economic effects in terms of GDP, production, wage, trade, investments.[11] To flank all these data and quantitative approaches, ECIPE hosted an 'external workshop' with experts and key stakeholders to discuss the themes of the study as a part of the methodology. This workshop was organized as a round-table discussion over half a day with expert participants from academia, the business community, and policymakers. The workshop discussions focused on the core themes of the study, and each session started with a short presentation by one ECIPE scholar.

Defining and Selection of IP-intensive Sectors

This study uses a novel definition of IP-intensive goods and services on the basis of various sources and indicators. The first source is the EUIPO (2019) report, which provides a detailed ranking by 4-digit NACE sector classification of sectors that are not only intensive in the use of IP generally, but in the type of IP. The second source is Eurostat, which reports data on the R&D expenditure performed by 2-digit NACE level sectors over employment. We strengthen these two measures of IP-intensity with a third source: the European Commission's Joint Research Centre (JRC) firm-level data on R&D expenditure performed by 2500 companies across the EU provided by IP-industry representatives. This data also provides information on the amount of labour used for each firm.

[11] This model, in turn, is calibrated using the GTAP database, and an integrated assessment that builds on an econometric estimation of trade elasticities that determine the trade volume effects of the trade cost reductions in FTAs. In particular, we measure three different types of trade costs: tariff-rate quotas (TRQs), preferential tariffs and non-tariff measures (NTMs). The resulting structurally estimated general equilibrium model (SEGE model) ensures consistency between the empirically-based estimates of the effects of trade agreements, and the subsequent modelling of those agreements.

After checking for consistency and applying several robustness checks, the choice of IP-intensive sectors for our study based on the abovementioned three sources provides a list of IP-intensive goods industries and services sectors, ranked as follows: (1) Pharmaceuticals; (2) Scientific R&D; (3) Electronics; (4) Motor vehicles; (5) Chemicals; (6) Machinery; (7) Electrical equipment; (8) Other transport equipment; (9) Other manufacturing; (10) Information services; (11) Telecommunication; and (12) Architectural & Engineering services.[12]

Structure of this Study

First, we look at *IP and its economic relevance in general.* In Chapter 2, we look at what IP is and how it has evolved over time. In Chapter 3, we look at what the economic reasons for intellectual property (IP) are and what their purpose is. Chapter 4 focuses on how wide-spread IP is and where the economic relevance of IP lies: for GDP, employment, high-quality jobs and wages, SME R&D potential, investments, against counterfeit goods. This Chapter also looks at how IP matters for the EU's global competitive position.

Second, we look at *IP provisions in EU FTAs and what economic effects result from stronger IP provisions in EU FTAs.* Chapter 5 looks at the TRIPS agreement and the emergence of novel IP provisions, overall trends and patterns in novel IP provisions in EU FTAs, trends and patterns specific to individual novel IP provision categories, how IP provisions in EU FTAs have evolved over time (from 2000 – 2019) and what can we say about the enforcement of IP provisions. Chapter 6 covers the key question of what the economic effects are of stronger IP provisions in EU FTAs: what is the FTA coverage of IP-intensive trade, what are the macro-economic and sector-specific effects of stronger IP provisions in EU FTAs and what types of IP matter most for IP-intensive trade in goods.

Third, we broaden the analysis and relevance of IP in two ways in Chapter 7: 1) What is the relevance and what are the effects of stronger IP provisions in EU FTAs for individual EU Member States and selected non-EU trading partners; 2) What is the broader importance of IP for, for example, for the EU's industrial policy, for pharmaceutical innovation, for sustainable development, for biodiversity, COVID-19, the Green Deal, the EU Single Market, SMEs, and agriculture?

[12] While IP is also of importance in other services sectors, the study lays a focus on architectural & engineering services, information services and telecommunication. The selection of these sectors is also due to the lack of data in IP services categories for other sectors.

2. WHY DO WE HAVE INTELLECTUAL PROPERTY RIGHTS?

2.1. What are Intellectual Property Rights?

IP is a property right given to persons and organisations for creations of their minds – so these are property rights, not over physical products (like cars or clothes) but over intangible assets like ideas and inventions. They usually give the creator an exclusive right over the use of the creation for a certain period of time.[13] They can best be described as a family of exclusivity rights. This family includes different legal instruments that all confer upon the holder of the specific intellectual property (e.g. an artist, an inventor or a company engaging in R&D) the right to determine its use. There are many different variants of IP – the most common ones are trademarks, patents, and copyrights. Their exact legal manifestations vary across these variants. The duration of the rights also differs. While a holder of a trademark is in principle entitled to the exclusivity infinitely, a patent is valid for 20 years and copyright duration is defined by the TRIPS Agreement (Art. 12) and the Berne Convention (Art. 7(1)) as the life of the creator and for at least 50 years after the creator's death (some countries choose to extend this to 70 years). See Box 2.1 for a general, international description of various types of IP.

BOX 2.1: THE FAMILY OF INTELLECTUAL PROPERTY RIGHTS

COPYRIGHT – copyright protection must include books and other written works, plays and musicals, translations and adaptations, film and other cinematographic works, songs and other musical works, artistic works such as paintings and sculpture, dance, speeches, photographs, maps and architectural plans. It can also protect computer programmes and other data compilations (Article 10 TRIPS). Copyright is automatically extended from the moment an artist creates a work and may not be subject to any formality (Berne Convention, Article 5(2)). The duration of a copyright is the life of the creator plus 50 years. Many countries, however, have extended the period to be 70 years after the death of the originator.

DESIGN PROTECTION – protects the shape or visual appearance of a product (but not the function of it). A product can be industrial or a handicraft item, and can include packaging, typefaces and symbols. Protection can be granted on the condition that the designs are new or original. Design protection according to TRIPS should be at least 10 years in TRIPS. EU law provides for a 25-year period of protection.

GEOGRAPHICAL INDICATIONS (GI) – protect products that have a specific geographic origin when the quality, reputation or other characteristic of the product is essentially attributable to its geographical origin. At EU level, GIs are protected for agricultural products, food and beverages, and examples of GI protected products are Champagne, Parma ham and Parmesan cheese. In Europe there are two types of GIs: Protected Designation of Origin (PDO) – which

[13] World Trade Organisation (2020) https://www.wto.org/english/tratop_e/trips_e/intel1_e.htm

cover products that are produced, processed and prepared in a certain whose quality or characteristics are essentially or exclusively due to a particular geographical environment- and Protected Geographical Indication (PGI), which covers products originating in a certain territory whose particular quality, reputation or other characteristic is essentially attributable to its geographical origin.[14]

PATENT – protects novel or original inventions that aim to offer new solutions to technical problems. To get a patent, the invention must be "new", involves and "inventive step" and is capable of "industrial application". There are no patentability provisions at EU level. Patent protection lasts for at least 20 years.[15] Some products – mostly pharmaceuticals and agri-chemicals – can get an *effective* extension through so-called patent-term restoration provisions that 'restore' the duration of the rights conferred by a patent to compensate for the loss of the effective patent protection that may be caused by requirements to obtain authorisation to market the product and delays in obtaining such marketing authorisation.

PLANT VARIETY RIGHTS (PVR) – protect the breeder of a new variety of plants and give the breeder the right to control of the propagating material (e.g. seeds and tissue culture) for a number of years. The International Union for the Protection of New Varieties of Plants (UPOV) specifies 25 years for trees and vines, and 20 years minimum protection for other plants. EU Council Regulation (EC) No. 2100/94 talks of 30 years for trees and vines and 25 years for other plants.

TRADEMARK – is any sign, or any combination of signs, capable of distinguishing the goods or services of one undertaking from those of other undertakings. Initial registration, and each renewal of registration, of a trademark shall be for a term of no less than seven years. The registration of a trademark shall be renewable indefinitely (TRIPS, Art. 18).

TRADE SECRETS – are intangible assets which are protected in many jurisdictions by special laws on business practices, processes, formulas, designs et cetera that are secrets and that the owner have made reasonable efforts to keep hidden from the public domain.

[14] The EU adopted its definitions in Regulation (EU) No 1151/2012 (Art 5).

[15] The TRIPS language (Art. 33) is: "[...] shall not end before the expiration of a period of twenty years counted from the filing date."

2.2. Economic Reasons for Intellectual Property Rights

Intellectual Property Rights Grow in Importance as "Knowledge" Becomes More Important

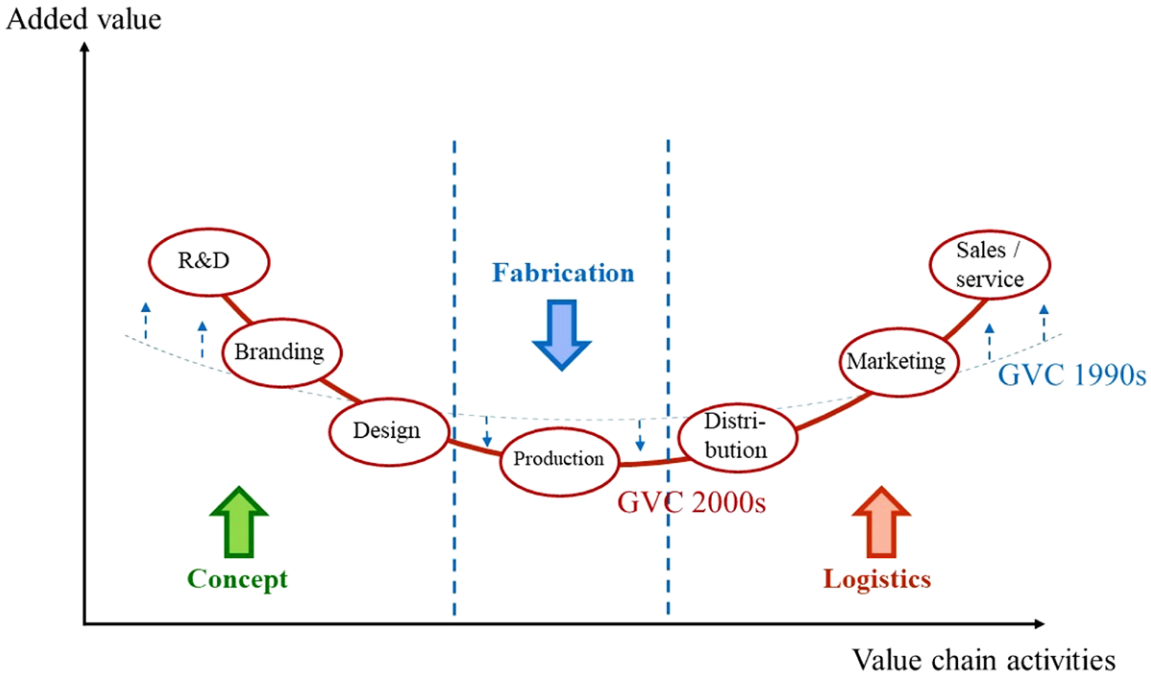
What is true for all IP is that the production organization and the market for them have changed as the economy has grown more sophisticated. The more an economy specialises, the more common it is that IP protected by copyrights, designs and patents are licensed and traded. Consequently, there is a big and vibrant market for IP, and it is of increasing importance the more countries move towards 'knowledge-economies'. This market is therefore also relatively bigger and more relevant for more developed and technologically advanced economies in terms of economic growth, economic development, jobs, and exports.

Awareness Raising on the Importance of IP

Stakeholders in the 'Workshop on IP in EU FTAs' conducted for this study called for educating EU citizens, business and decision-makers about the importance of IP for the EU economy in order to maintain a strong, high-quality and coherent IP strategy in both bilateral and multilateral negotiations.

The role of IP has also been amplified by the way modern economies grow. Take trade and supply chains, and how they have fragmented over the past decades. The so-called "smiling curve" (see Figure 2.1) illustrates how the value chain is now dependent on many different actors, all of which have become more specialised. Economies that have grown more sophisticated by the fragmentation of supply and value chains, have also seen thicker networks of IP and a growing value emanating from them. IP is obviously a strong part of the concept phase of a product. For modern economies, trade has expanded the value of IP in the same way as trade has increased the value of other assets that are used relatively more intensively. Moreover, the more the economy grows on the back of knowledge and innovation, the greater the significance of IP that help the innovator to recoup the investment needed to generate the innovation, the more attractive that economy is for further investments into knowledge and innovation: it is a virtuous circle.

FIGURE 2.1: THE "SMILING CURVE": VALUE-ADDED ALONG THE VALUE CHAIN[16]



Because of ongoing specialisation and international production fragmentation, modern production requires the involvement of many different actors – and rights are therefore often split between a multitude of players. IP is needed to define actors' claims on the final product and create legal certainty. The more an economy specialises, the more common it is that IP protected by copyright, designs and patents are licensed and traded. Consequently, when policies aim to turn a country into a 'knowledge economy' this goes hand-in-hand with a strong and predictable IP framework to drive idea-generation and investments to spur knowledge generation – as illustrated by the "smiling curve" (see Figure 2.1). The more an economy grows on the back of knowledge and innovation, the greater the significance of IP that help the innovator to recoup the investment needed to generate the innovation, the more attractive that economy is for further investments into knowledge and innovation.

Intellectual Property Rights Aim to Create Incentives to Invest Where Needed for Society

For IP, the incentive problem they aim to solve is that those actors who have made an investment in creating new IP should stand a chance to recuperate the investment and be rewarded for the risk they took. For private economic actors to take that kind of financial risk, there must be the chance of a future reward; a reward that enables an originator to recoup the costs of creating new IP by future sales. In addition, companies that are involved need to make profits to either

[16] The smiling curve was first conceptualized by ACER Group Chairman and Chief Executive Officer, Stan Shih. This figure also draws on Dedrick, J.; K. Kraemer, and G. Linden (2010) and Baldwin, R. (2011). , "Who profits from innovation in global value chains? a study of the iPod and notebook PCs, Industrial and Corporate Change, vol. 19 (1) and Baldwin, Richard, 2011, Trade and Industrialisation after Globalisation's 2nd unbundling: How building and joining a supply chain are different and why it matters. NBER Working Paper No. 17716.

reinvest these profits into further research to secure companies' continued existence; to satisfy shareholders so as to keep access to venture capital; and/or to provide a living for the company owners. Since many of their investments to develop new products also fail, their successful product revenues also need to cover the cost of investments that never yielded a new product. And to create financial space for future research and development, firms need to be able to get rewards for their successful efforts to generate new IP in the future.

This is a central concern for many companies and investors. It is of even larger importance for those who are involved in developing products with substantial costs for development but small variable costs for making the product. The pharmaceutical sector is a good example: its cost structure highlights the incentive problem discussed above very clearly. Developing a new medicine is associated with substantial costs for research and development. Dimasi et al. (2016) estimate average R&D costs from 2000 to the mid-2010s to be around €2.2 billion on average.[17] However, the variable cost for producing one single pill is very small (e.g. the cost of a pack of paracetamol of 50 pills is between €1 - €2). The variable cost can be measured in cents while the development costs are measured in billions. This cost pattern is by no means exclusive to pharmaceutical development. It is the commercial reality for many other companies that are investing in IP and product development, such as brand sensitive producers of sports ware and telecom equipment manufacturers.

If the pharmaceutical market would only work on the basis of marginal cost pricing, i.e. if the price of each new pill would only reflect the variable cost for producing the pill, companies would not be able to recoup their development costs, not be able to attract necessary investments for R&D, and not develop the generic medicines of the future. If markets would only work on the basis of competition and everyone would have the freedom to copy the product innovations of other firms, few firms would have an incentive to make investments in innovation in the first place. The originator would find that others would be free riding on his or her innovation: they would be reproducing or using the work without having to pay for the cost of developing it. In the end, fewer investments in innovation would inevitably be the result.

Intellectual Property Rights Matter for SMEs

The protection granted from IP is also very important for small- and medium-sized enterprises (SMEs). IP matters not only for large, but also for medium and small-sized firms because IP matters for investments and SME development plans. Many start-ups and SMEs fail to consider their IP and its value in early stages of development and overlook that it is one of their most valuable assets.[18] SMEs can be very innovative but do not fully commercially apply

[17] Joseph. A. DiMasi, Henry G. Grabowski, Ronald W.Hansen, Innovation in the pharmaceutical industry: New estimates of R&D costs, Journal of Health Economics, 47 (2016), 20-33

[18] Abou Naja IP (2021): "IP for Small- and Medium Sized Enterprises", 18th of February 2021. URL: https://abounaja.com/blogs/intellectual-property-for-sme

this innovative power.[19] Whereas large firms have size advantages and can build customer relations on the basis of brands and reputation, SMEs are not enjoying these advantages. For example, if a big broadcaster commissions a new television series, it can rely on its marketing and distribution organisation to enable revenues that will pay for the production. A small studio producing a television series do not have that opportunity. For them, and for SMEs generally, there has to be much more focus on protecting the actual immaterial output.

Intellectual Property Rights Help to Advance Broader Societal Goals

The economics of IP includes many different economic factors and aggregates, and this study will cover many of them. But IP does not just create economic value: behind this value stand many societal objectives that greater investments in knowledge, discovery and innovation aim to address. For example, innovation in green technologies is needed in the fight against climate change and in support of the EU's Green Deal, increasing energy efficiency and reducing emissions. Innovation in pharmaceutical R&D supports healthcare systems in fighting disease by developing innovative medicines and innovation, especially regarding the COVID-19 pandemic. In other words, IP is not just motivated because the value they represent or the number of jobs they create. Countries make use of IP because it helps to advance broader societal goals like greening the economy and curing more illnesses. The purpose of IP is to solve specific problems that arise when someone wants to invest in immaterial works, but they are not sure that they actually can benefit from the revenues that the works will generate in the future.

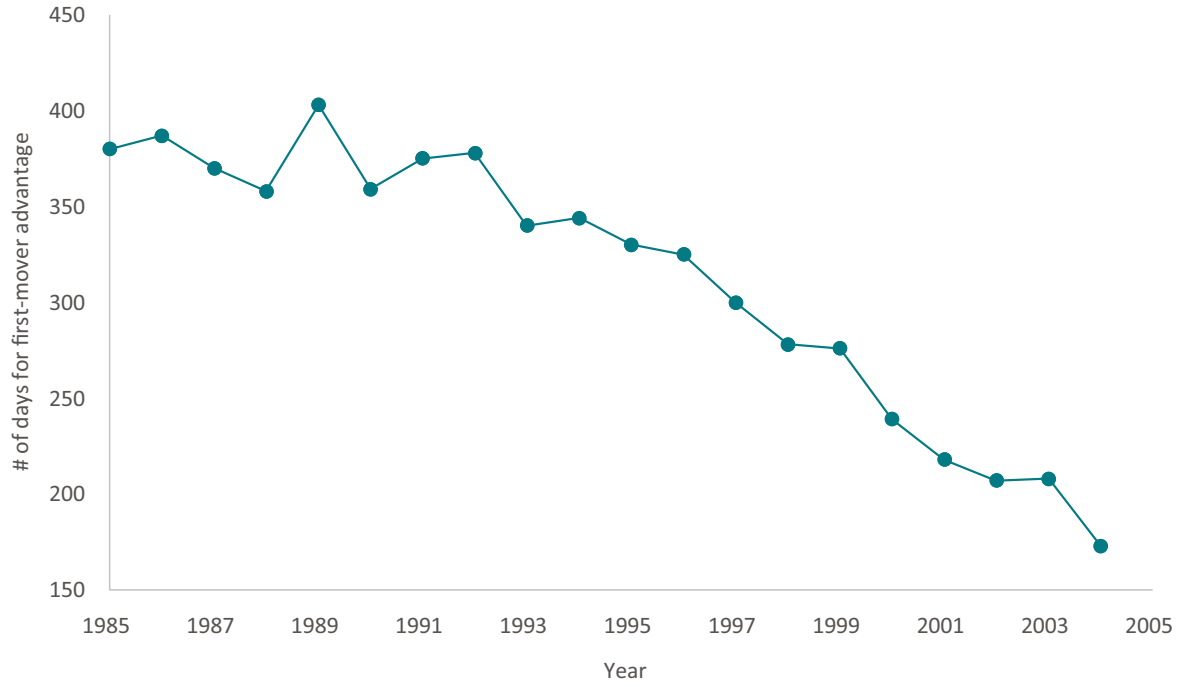
Is there an alternative to Intellectual Property Rights in the form of first-mover advantage?

There may be other ways than IP to reward those making the investment in the immaterial work, but they may not be very efficient, and they come with negative side-effects. One alternative is to ensure that the creator or those making the investment to commercialise the immaterial work has a first-mover advantage. Because they originated a new immaterial work, firms will either have a first-mover advantage or – a second alternative – they should be given it through government restrictions on competition. For instance, certain firms would be given a market monopoly (this is the standard motivation for utilities – projects with high fixed or development costs but with low variable costs).

Neither option, however, is desirable. The role of first-mover advantage has declined over time. Driven by technological development and more market competition, the time between the introduction of a new product and the introduction of a copy has declined. In a sample of different sectors, the mean lead time was approximately cut in half between 1985 and 2004 (as shown in Figure 2.2). Since 1993 the mean lead time for first movers have been less than 365 days – or less than a year.

[19] Sukarmijan, S.S and O. De Vega Sapong (2013) "The importance of intellectual property for SMEs: challenges and moving forward", International Agribusiness Marketing Conference 2013, IAMC 2013, 22-23 October 2013, Kuala Lumpur, Malaysia.

FIGURE 2.2: DIMINISHING FIRST-MOVER ADVANTAGE 1985-2004 (# OF DAYS)[20]



If firms cannot recoup their investments because of being fast to the market, it becomes more important that IP gives them a chance to raise revenues to cover for past and future expenditure on creating new innovations and immaterial works. Therefore, the importance of IP is higher than ever to achieve a balance between a higher rate of innovation and the possibility to recuperate investments made (successfully and unsuccessfully).

20 Poletti, Michael, Engelland, Brian & Ling, Howard, 2011, "An Empirical Study of Declining Lead Times: Potential Ramifications on the Performance of Early Market Entrants", Journal of Marketing Theory and Practice, Vol. 19(1).

3. INTELLECTUAL PROPERTY RIGHTS AND THE EUROPEAN UNION

For a modern economy like the European Union, IP is at the centre of value creation. The number of trademark filings in Europe – and by European applicants – has increased from about 40,000 in 2004 to nearly 100,000 in 2018. As one of the most developed regions in the world, it is natural that patent filings and other rights' registrations in Europe are the top of global performance. In 2020, for instance, the European Patent Office (EPO) received more than 180,000 patent applications and granted close to 138,000 patents. This represent a growth of 4.0 and 8.0 percent respectively – and this has been the trend for several decades. The sectors with the highest number of patent applications are medical technologies, digital communications, computer technologies, electrical machinery and transport. The highest growth in patent applications in 2020 came from pharmaceuticals (+10.2%), biotechnology (+6.3%) and medical technology (+2.6%). The company that in 2020 filed the highest number of patents was Samsung, followed by Huawei, LG, and Qualcomm.[21]

3.1. IP-intensity of Sectors and by Type of IP

Not all sectors are equally IP-intensive: some are more dependent on IP than others. Also, IP-intensity can be measured in different ways. Table 3.1 shows the most IP-intensive sectors, ranked by three different measures: 1. R&D expenditures over net sales (EU Joint Research Centre); 2. Patent in employment (EUIPO) and 3. R&D expenditures over turnover (Eurostat). Our analysis shows that these three measures are strongly correlated (see Annex).

[21] Data on patent applications and approvals are from the European Patent Office's Patent Index 2020.

TABLE 3.1: SECTORS RANKED BY IP-INTENSITY

Sector name	Rank R&D expenditure over net sales (JRC)	Rank Patent in employment (EUIPO)	Rank R&D expenditures over turnover (Eurostat)	Overall Rank IP-intensity
Pharmaceuticals	1	1	3	1
Scientific R&D		2	1	2
IT services	2			3
Electronics	3	3	2	4
Electrical equipment	5	6	6	5
Motor vehicles	6	8	4	6
Machinery	8	4	7	7
Transport equipment		7	8	8
Architecture & engineering	7	11	5	9
Other manufacturing	4	10	9	10
Chemicals	9	5	10	11
Telecom	10	9		12

Sources: JRC (2019), Eurostat (2019), EUIPO (2019).

From Table 3.1 it becomes clear that pharmaceuticals, scientific R&D, IT services, and electronics are relatively the most IP-intensive sectors. For these sectors, IP rights are relatively most important. But the reality is that all sectors in the economy will, in one way or the other, be associated with IP and rely on them for some parts of their output. Farmers that grow stock crops, using chemical products to protect crops and encourage them to grow, and will ultimately sell their agricultural output to firms that protect their trademarks. The education sector uses textbooks and technology that have copyright protection. The healthcare sector uses medical devices and medicines that are under patent protection. Mobile and telecommunications feature products that are some of the most patent-intensive products that exist. Europe's audio-visual sector relies crucially on copyright protection. Europe's producers of textile and clothing are behind some of the most-valued brands in the sector globally.

While there is a common perception that IP only powers some industries – especially those with exceptional degrees of expenditures on research and development – the reality is that IP-dependency can be found in all types of sectors. For example, in trademarks we find sectors such as food, wallpapers, or wine. The patent list includes sectors that are often associated with IP-dependency such as communication equipment, biotechnology, pharmaceuticals and electricity generation. Among the ten most design-intensive industries we find electric lightning, cutlery and watches. Among sectors relying on copyright, we find publishing, broadcasting, and computer programming. Finally, cheeses, spirits, and wines

are some of the GI-intensive industries while research in biotechnology, and agricultural products such as grain or seeds are users of both patents and Plant Variety Rights (PVR).

3.2. The Role of Intellectual Property in the EU Economy

It is difficult to measure the exact economic value of IP to the European economy. Naturally, some IP generates more economic value than others – mostly because they cover a larger part of the economy. But in many sectors, it is impossible to make a distinction on what type of IP they are basing their general strategy for protecting intellectual property. A typical firm will utilize several types of IP: they will protect their brands through trademark protection at the same time as they protect innovation through patens and products through design protection.

Contribution to EU GDP

However, approximations can be made. In Table 3.2 below, we can see the value generated by different types of IP to the European economy. It is important to note that the data only shows the value for IP-intensive industries: all sectors and industries make use of IP, but only some can be classified as being IP-intensive. Expectedly, trademark-intensive industries contribute most to EU GDP – close to Euro 5.45 trillion – followed by design-intensive and patent-intensive industries that contribute Euro 2.37 trillion and Euro 2.35 trillion respectively. In total, Euro 6.5 trillion of the EU's GDP comes from IP-i ntensive industries – representing almost 45 percent of the region's total value added. This share has also grown over time. Between the period 2011-2013 and the period 2014-2016, the share of GDP coming from IP-intensive industries went up by 0.8 percentage points.

TABLE 3.2: CONTRIBUTION OF IP-INTENSIVE INDUSTRIES TO GDP, 2014-2016 AVERAGE[22]

Type of IP-intensive industry	Value added-Gross Domestic Product (million EUR)	Share of Total EU GDP (%)
Trademark-intensive	5,447,857	37.3
Design-intensive	2,371,282	16.2
Patent-intensive	2,353,560	16.1
Copyright-intensive	1,008,383	6.9
GI-intensive	20,155	0.1
PVR-intensive	181,570	1.2
All IP-intensive	**6,551,768**	**44.8**
Total EU GDP	14,621,518	

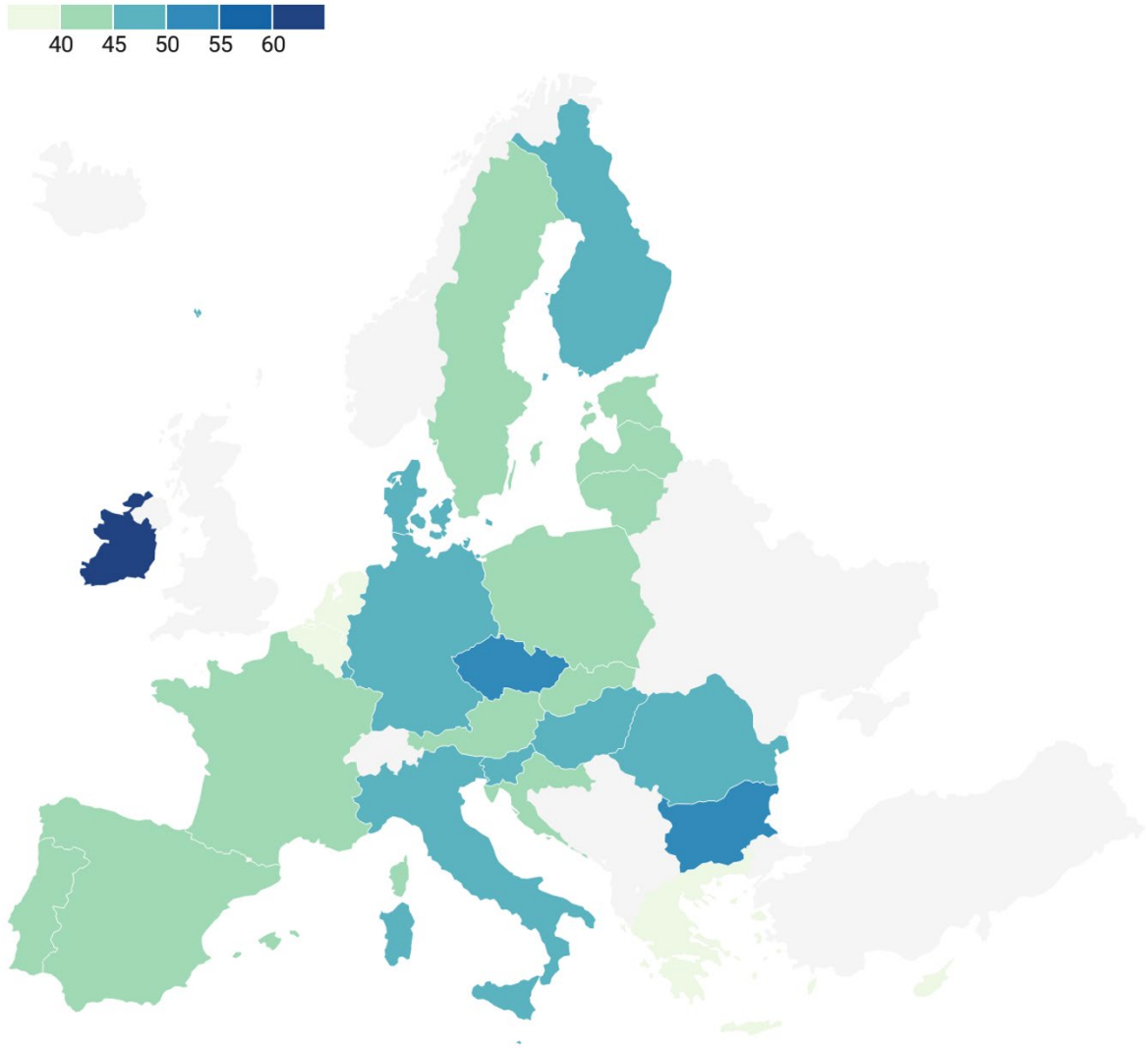
Source: EPO-EUIPO, IP intensive industries and economic performance in the European Union, September 2019

While the share of IP-intensive industries is significant across all EU countries, there is some

[22] Due to overlapping use of IP rights, the sum of the figures for the individual IP exceeds the total figure for IP-intensive industries.

variation. The map in Figure 3.1 shows that the EU countries where IP-intensive industries represent a higher share of their countries GDP were Ireland (65.0%), Czech Republic (51.4%), and Bulgaria (51.3%) while the EU countries with the lowest – but still significant – shares were Greece (35.9%), Cyprus (35.9%), and Belgium (39.1%). In relation to the EU countries where IP-intensive industries made the largest contribution to their economies, the pharmaceutical sector is the key sector in Ireland while motor vehicles are the largest IP-intensive sector by value-added in the Czech Republic and telecommunications is the most important IP-intensive sector for Bulgaria. This shows the broad range of sectors relying on IP.

FIGURE 3.1: CONTRIBUTION OF IP-INTENSIVE INDUSTRIES TO GDP (2014-2016 AVERAGE VALUE-ADDED AS SHARE OF GDP)



Source: EPO-EUIPO (2019)

Contribution to EU Employment

Given the significant contribution from IP-intensive industries to GDP, it is logical that these industries also represent a significant part of employment. Table 3.3 demonstrates this – and, again, it shows relevant data from IP-intensive industries, not total employment that in one way or the other includes some form of reliance on IP. IP-intensive industries generate directly almost 63 million jobs in the European Union. If indirect jobs are included – jobs in sectors that supply IP-intensive industries in a direct way – the number of jobs rises to more than 83 million. Trademark-intensive industries have the highest level of employment, followed by design-intensive and patent -intensive industries.

TABLE 3.3: DIRECT AND INDIRECT CONTRIBUTION OF IP-INTENSIVE INDUSTRIES TO EMPLOYMENT (2014-2016 AVERAGE)[23]

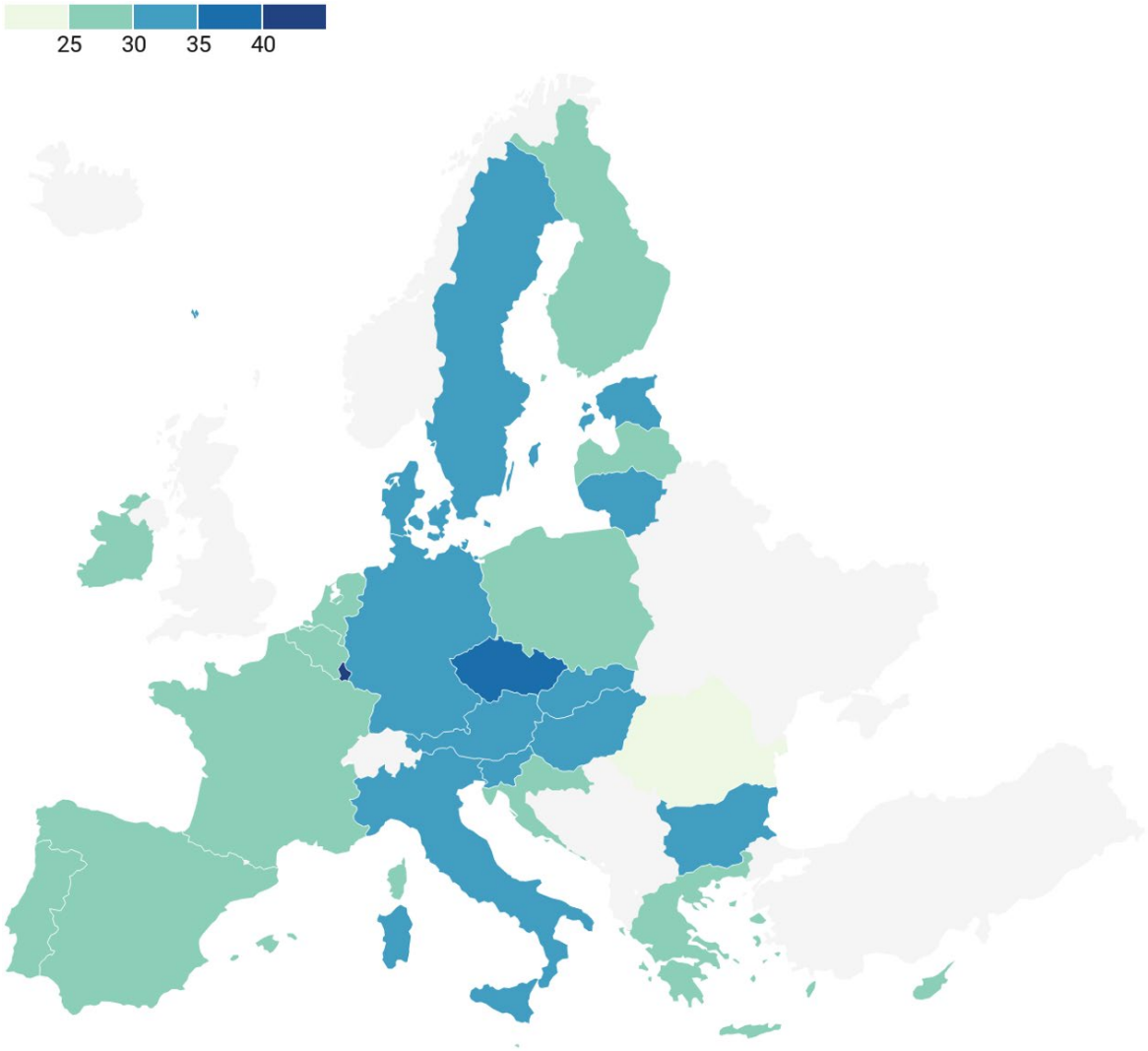
Type of IP-intensive industry	Direct employment	Direct and indirect employment	Share of total employment in % (direct and indirect)
Trademark-intensive	46,700,950	65,047,936	30.2
Design-intensive	30,711,322	45,073,288	20.9
Patent-intensive	23,571,234	34,740,674	16.1
Copyright-intensive	11,821,456	15,358,044	7.1
GI-intensive	n/a	399,324	0.2
PVR-intensive	1,736,407	2,618,502	1.2
All IP-intensive	**62,962,766**	**83,807,505**	**38.9**
Total EU employment		215,520,505	

Source: EPO-EUIPO, IP-intensive industries and economic performance in the European Union, September 2019

Figure 3.2 shows the share of direct employment in IP-intensive industries across EU countries. Luxembourg, Czech Republic, and Germany are the EU countries where this share is the highest while Romania, France, and Cyprus are the EU countries where IP-intensive industries contribute the least to the overall employment – although this share is no lower than 23.5%.

[23] Due to overlapping use of IP rights, the sum of the figures for the individual IP exceeds the total figure for IP-intensive industries.

FIGURE 3.2: CONTRIBUTION OF IP-INTENSIVE INDUSTRIES TO EMPLOYMENT (2014-2016 AVERAGE)



Source: EPO-EUIPO (2019)

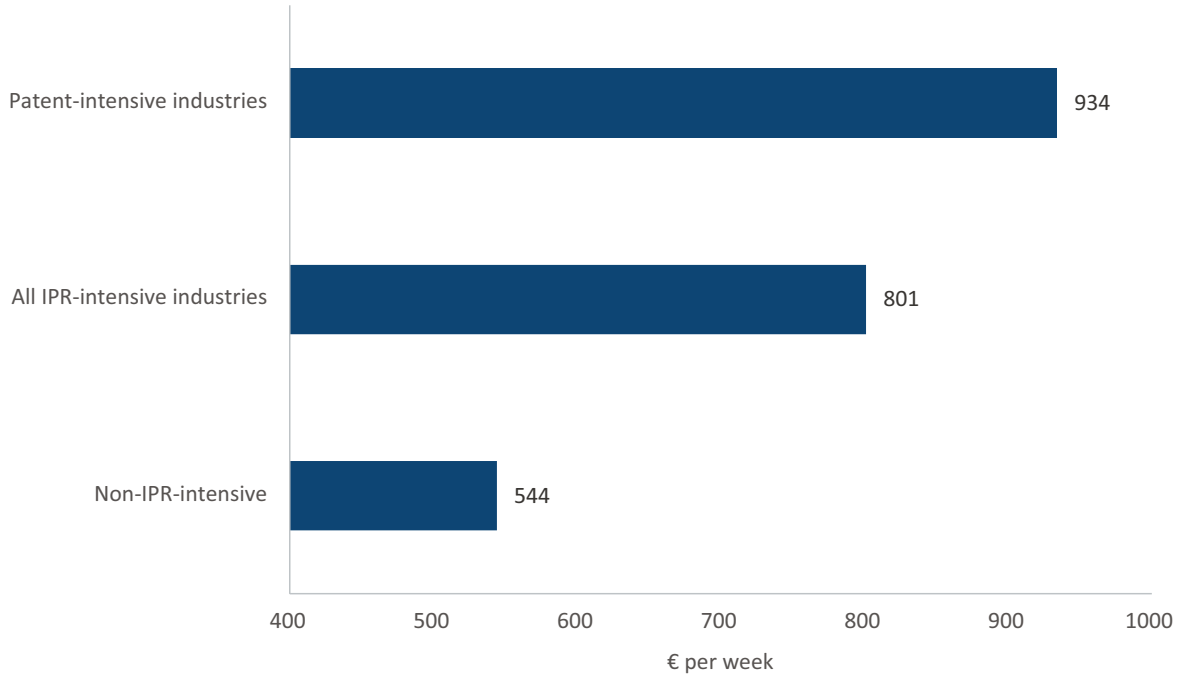
Across economic sectors, machinery, architecture and engineering, and motor vehicles are the largest IP-intensive employers in the EU. This is also the case for the Czech Republic and Germany where machinery and motor vehicles are the two largest IP-intensive sectors contributing to the overall employment of these two countries.

Link between Intellectual Property and wages (labour productivity)

Importantly, IP-intensive industries also tend to have higher wage levels than sectors that are not IP-intensive. This is natural since, as discussed above, IP is motivated by their positive effect on investments in innovation and other immaterial work and therefore lead to higher levels of investment and thus productivity, which translates into higher wages.

It also follows that some types of IP tend to have a stronger effect on wages than others. IP that protect activities with high R&D intensity are generally associated with both higher productivity and higher wages. These activities require a higher amount of human capital and there is thus a natural contribution to higher productivity and wages. Therefore, wages in patent-intensive industries tend to be higher than in IP-intensive industries generally because patents have been shown to impact innovation and productivity more than other IP. Higher wages are an indication of the creation of more value added. Figure 3.3 below shows exactly this pattern in European salaries.

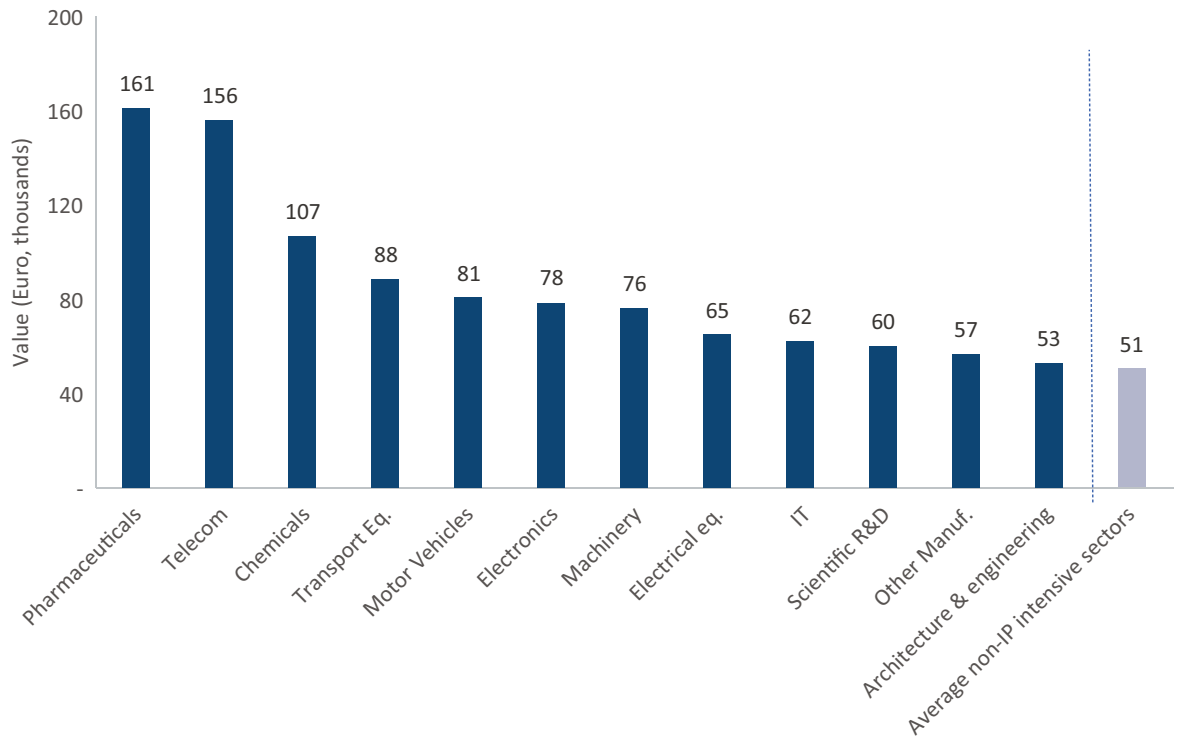
FIGURE 3.3: WAGES IN DIFFERENT INDUSTRIES (AVERAGE PERSONNEL COSTS, € PER WEEK)



Source: EPO-EUIPO, IP-intensive industries and economic performance in the European Union, September 2019

Similar to wages, labour productivity in IP-intensive sectors is higher than in non-IP-intensive sectors. As can be seen in the Figure 3.4, sectors such as pharmaceuticals, telecom, and chemicals are not just the most productive of the IP-intensive sectors but more than twice more productive than the average non-IP-intensive sectors. Again, the type of IP that is mostly relevant for the activities with the highest R&D intensity is patents. Therefore, value added generation is highest in patent-intensive industries; and higher than for IP-intensive industries in general because patents have been shown to impact innovation and productivity more than other IP.

FIGURE 3.4: EU27 LABOUR PRODUCTIVITY FOR IP-INTENSIVE SECTORS (2019, VALUE ADDED PER EMPLOYEE)



Source: Eurostat (2021), author's calculations.

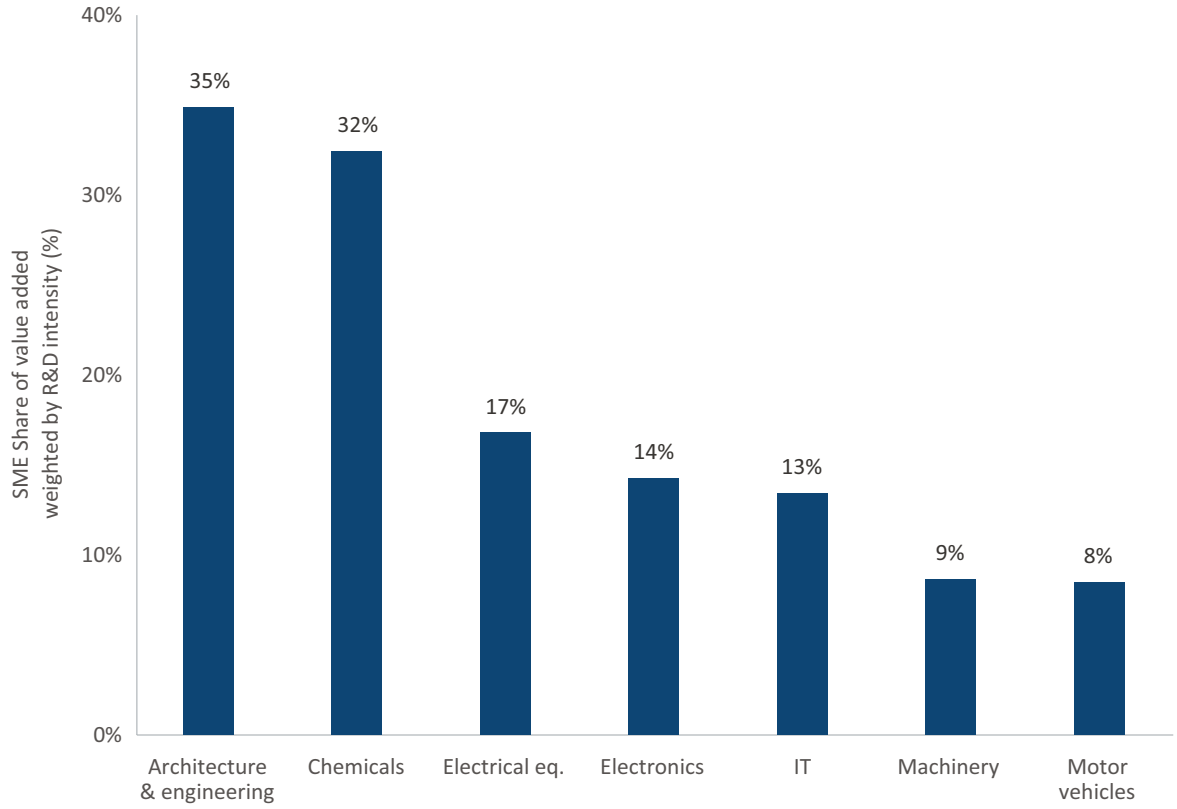
SME R&D Potential in the EU

IP is important for all businesses, both SMEs and large firms. SMEs do not fully utilise IP in their commercial strategies and cannot compete in the same way as large multinationals can. They do not have the same size advantage, nor the same levels of brand name recognition, for example. Innovative SMEs rely heavily on IP not just to protect their inventions but also to quantify the value of these new inventions.

Stakeholders ask for EU FTAs: Think-small-first to support SMEs with appropriate IP protection

Multiple industry stakeholders asked the EU to implement a so-called "think small first" principle in EU trade negotiations, thus including a comprehensive small business chapter in EU FTAs to improve utilization rates and uptake of FTAs among SMEs. This is particularly important with respect to IP, which is a topic that is often challenging for SME managers because of its abstract and legal nature.

FIGURE 3.5: EU27 INDEX OF SME R&D POTENTIAL (2019)



Source: Eurostat (2021), author's calculations.

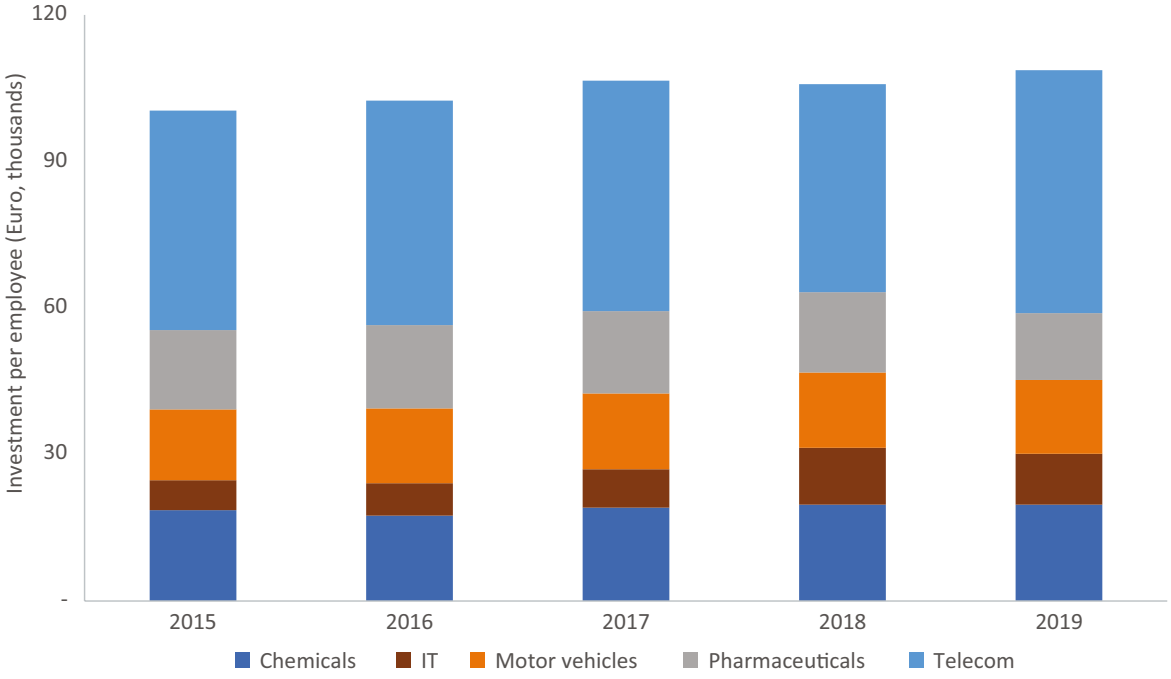
Within the 12 selected IP-intensive sectors, SMEs – defined as companies with less than 250 employees – are responsible for 30% of the value-added, ranging from 63% in architecture and engineering to 8% in motor vehicles. As can be seen in Figure 3.5, weighing this SME share of value-added by an index of R&D intensity shows that architecture & engineering and chemicals are the economic sectors with the largest SME R&D potential in the EU.

Intellectual Property Investments in the EU economy

IP-intensive industries are not only significant contributors to EU GDP and employment, but they are also responsible for more than half (51%) of EU total gross investment.[24] The IP-intensive sectors that invested the most are telecom (€44bn), motor vehicles (€39bn) and chemicals (€24bn). In terms of investments per employee, telecom, chemicals, and motor vehicles are the most important sectors (see Figure 3.6).

[24] The total EU gross investment attributed to IP-intensive industries was calculated as the sum of Eurostat Gross Investment for the sectors identified as IP-intensive industries in the EUIPO and EPO (2019) report.

FIGURE 3.6: INVESTMENT PER EMPLOYEE FOR TOP-5 IP-INTENSIVE SECTORS (2015-2019)



Source: Eurostat (2021), authors' calculations.

Intellectual Property and Counterfeit Goods

Counterfeit goods are a serious challenge in many societies, ranging from food fraud, and unsafe counterfeit products, to sub-standard tools and materials in construction, counterfeit sporting goods, toys, digital devices, cosmetics, fake medicines, and pesticides. EU customs stopped fake goods worth €760 million from entering the EU in 2019 (EC, 2019).[25] Also the EUIPO report on 'Mapping the economic impact of trade in counterfeit and pirated goods' highlights the costs of counterfeit goods and importance of IP to combat trade in fake goods.[26] EU Executive Vice-President Dombrovskis said: *"Strengthening the protection and enforcement of EU Intellectual Property Rights in third countries is a European Commission priority. … Counterfeiting and piracy are a scourge on our economy and expose our citizens to low quality and dangerous counterfeits, such as the fake medical products that flooded the European market in the first months of the COVID-19 pandemic."*[27] Especially when goods are in one way or another consumed by humans, health risks are immediately an area for

[25] European Commission (2019), "Annual report on EU Customs Enforcement of IPR", 2019. URL: https://ec.europa.eu/taxation_customs/sites/taxation/files/2019-ipr-report.pdf

[26] EU IPO (2019) 'Le commerce mondial de produits contrefaits et de produits piratés' (2019). URL: https://euipo.europa.eu/ohimportal/fr/web/observatory/mapping-the-economic-impact

[27] European Commission (2021) Speech of Mr. V. Dombrovskis at the launch of the EU's biennial report on the protection and enforcement of intellectual property rights in third countries. 28 April 2021.

concern. Spink (2011) makes it clear that one qualitative but important benefit of IP is *"the deterrence and enforcement against 'irresponsible defendants' including product counterfeiters*[28]"

In the area of food, the issue is that IP helps combat food fraud because it protects originator products and creates a legal framework against illegal copies. Since 2013, the EU Food Fraud Network has engaged with Europol targeting fake and substandard food and beverages and counterfeit food protection products. Apart from the reputational impact for food and beverage producers, food and beverage fraud also pose health risks to consumers. Food can be contaminated or contain substances that are not supposed to be in the product according to health and safety regulations. This can lead to illness or even deaths of consumers eating these fake products.

Use FTAs and IP provisions to strongly combat food fraud and fake medicines

There is a strong need for food fraud to be recognized as a major issue as it not only poses risks for the health of consumers but also for food supply chains as a whole. Consequently, the food industry calls for the development of an EU-wide food fraud risk management system to assess and provide protection for food supply chains. The very same applies for the use of medicines, where falsified medicines could have serious health implications. In the EU, this is already being addressed through the Falsified Medicines Directive (FMD), but a stronger link to EU FTAs should be made.

In the area of medicines, IP helps to combat fake medicines because it allows the enforcement of property rights linked to quality standards and quality control (pharmacovigilance) of innovative medicines. Since 2013, the EU Falsified Medicines Directive (2011/62/EU) is in force. Falsified medicines are often disguised as authentic medicines but may contain ingredients of bad or toxic quality, or the wrong dosage. This could pose a serious threat to human health. The FMD effectively helps to combat falsified medicines, supported by the EU's framework to enforce IP protection. Falsified medicines also pose environmental challenges as their disposal and destruction may place a burden on the environment.

In the area of sporting goods, the counterfeiting problem is also significant: the industry is one of the main targets for counterfeiters. According to EUIPO-OECD figures, the most frequently seized counterfeit goods are footwear (23% in 2016 compared to 21% in 2013), followed by clothing and leather.[29] More particularly, 4.1% of sales are lost in the sporting goods sector annually due to counterfeiting, which translates into €300 million of revenue annually, the loss of 3.625 direct and indirect jobs, and €100 million in loss of tariff revenues for governments. But like with fake medicines, the impact is not only economic in nature: for some categories of sporting goods (e.g. personal protective equipment or clothing) counterfeiting can pose risks for consumers' health and safety. EUIPO found in 2019 that

[28] Spink, J. (2011), The Challenge of Intellectual Property Enforcement for Agriculture Technology Transfers, Additives, Raw Materials, and Finished Goods against Product Fraud and Counterfeiters, Journal of Intellectual Property Rights 16(2), 2011.

[29] EUIPO-OECD (2019), Illicit Trade - Trends in Trade and in Counterfeit and Pirated Goods.

97% of recorded dangerous counterfeit goods were posing serious health risks.[30] Moreover, for clothing, textiles and toys, 80% of the intended end users of counterfeit products were children. Also environmentally, there is an impact from counterfeit products: they are not made to the same quality standards nor subject to the same rigorous testing and production methods. This means that counterfeit products can contain toxic chemicals with make production, storage and also destruction environmentally challenging. Finally, counterfeit products can have serious reputational damage for sporting goods producers because fooled consumers will often blame the brands (that were illegally used on the counterfeit products) which leads to lack of trust and brand reputational damage.

From the above examples, the overarching challenges stemming from counterfeit/fake products are: 1) Significant economic damage to sectors; 2) Health and safety risks for consumers (adults and children); 3) Environmental pressure and damage; 4) Reputational damage (brand name damage).

In addition to the above arguments, IP holders asking the customs authorities to enforce their rights also have to bear the costs of destroying the seized counterfeit goods. Although in theory, right holders can often seek compensation from the infringer or other persons, including intermediaries such as carriers, it also depends on the national legislation of the countries and it is not always correctly applied. For these reasons the protection and enforcement of IP are crucial for a wide range of industries. EU FTAs with third country partners are a key instrument to help address them because it is mostly in third country partners that IP provisions would prove helpful – especially in those partner countries where a lot of counterfeit goods are produced and transited, where high EU protection rules to not apply.

3.3. The EU's Global Competitive Position and Intellectual Property

The importance of IP-intensive industries is not limited to EU countries. Because of the broad range of sectors for which IP is fundamental and the growing relevance of IP for many firms, including but not only IP-intensive industries, have become a significant part of the economy across many countries. Not in the least because technological development goes ever faster and that is why protection of technological innovations is vital for continued growth. While an international comparison of IP-intensive industries is challenging due to data issues, we provide a short comparative analysis in terms of labour productivity, investments and trade.

Stronger focus on new technologies and related IP

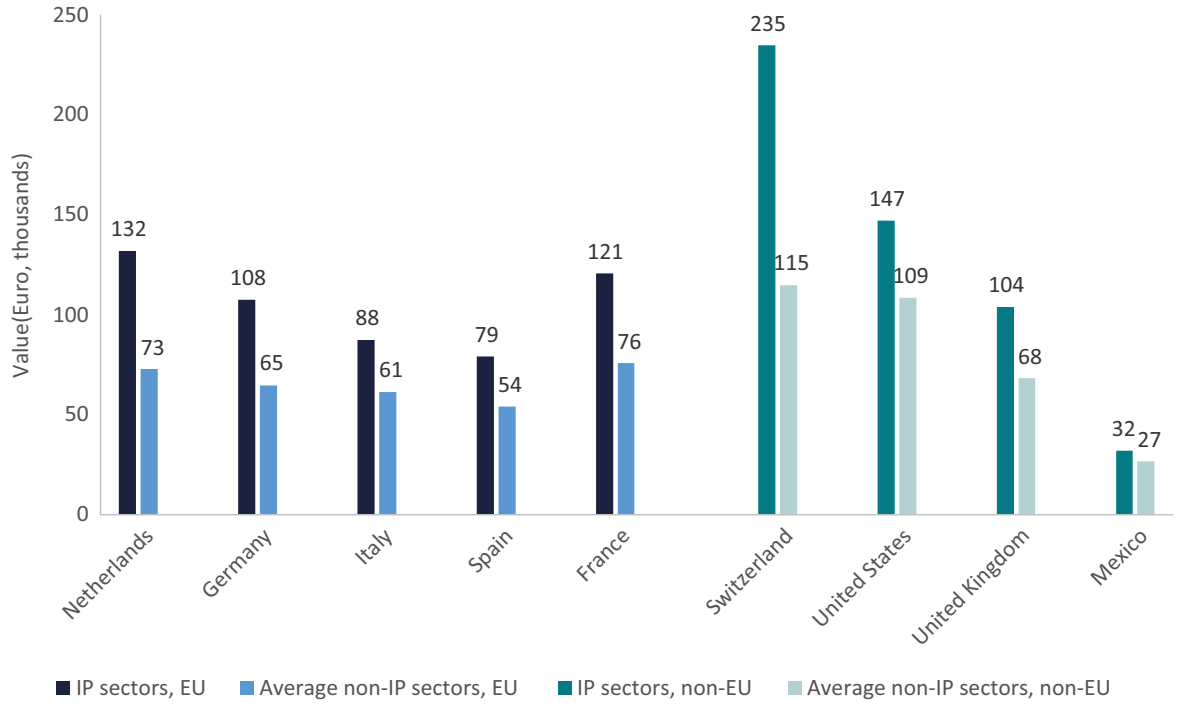
Surveyed stakeholders mention the need for future EU trade agreements to focus more on new technologies, especially in the areas of 3D printing, artificial intelligence, 5G, data management, innovative medicines and the Internet of Things (IoT), thus regaining for the EU the position as the global "IP standard setter".

[30] EUIPO (2019), Qualitative Study on Risks Posed by Counterfeits to Consumers.

EU's Global Competitiveness in Terms of Labour Productivity

Figure 3.7 uses an OECD database to present consistent estimates of labour productivity (2019)[31] in the 12 sectors identified as IP-intensive in a selection of EU and non-EU countries for which data is available. The Figure clearly shows that labour productivity in IP-intensive industries is higher than in non-IP-intensive industries not just in EU countries but also in Switzerland, US, UK and Mexico. The OECD data also shows that, while labour productivity in the UK is comparable to EU levels, labour productivity in the Swiss and US IP-intensive industries is higher than for EU countries. We also report the relative strength of the EU IP-framework compared to main competitors and see that it is sliding. Across sectors, pharmaceuticals and telecom are among the most productive IP sectors across all countries while IT services are especially productive in the US economy.

FIGURE 3.7 LABOUR PRODUCTIVITY FOR IP-INTENSIVE SECTORS AND AVERAGE NON-IP SECTORS (2019) IP-INTENSIVE



Source: OECD STAN, authors' calculations.

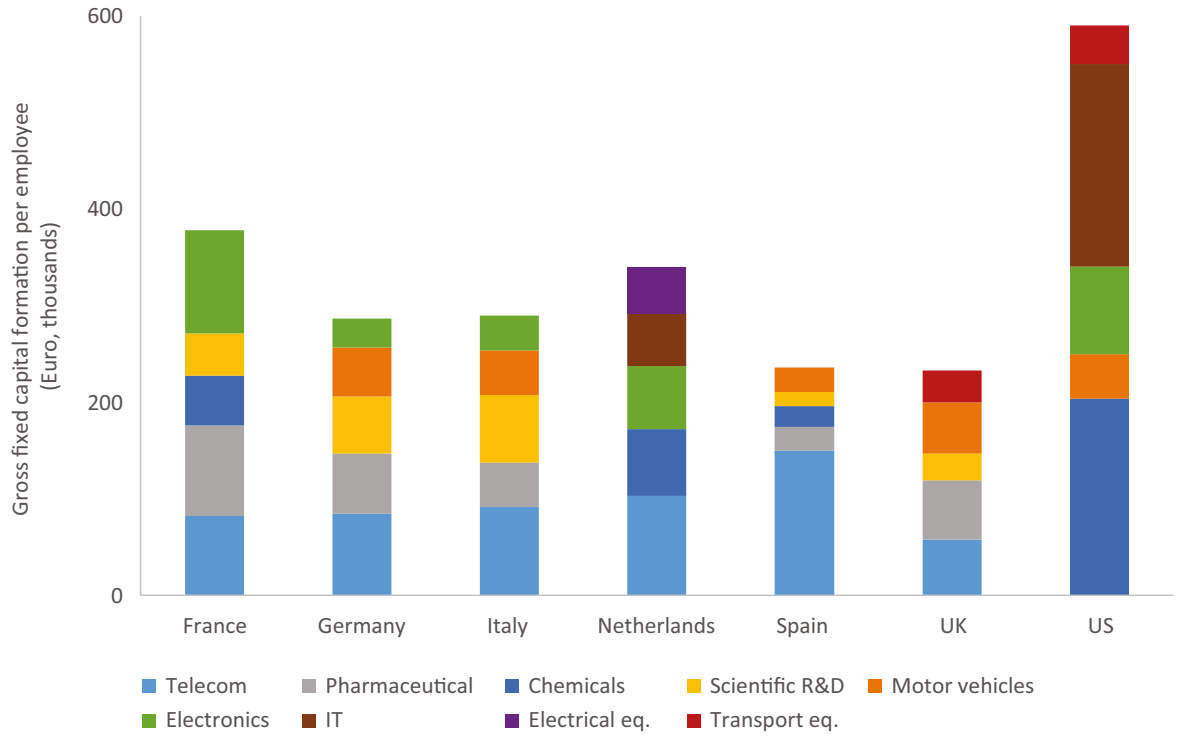
[31] Labour productivity was calculated as ratio of value-added, current prices and number of persons engaged for the sum of the 12 IP intensive sectors. Data availability across sector vary between countries.

EU's Global Competitiveness in Terms of Investments

The importance of IP-intensive industries is not just measured in terms of labour productivity but especially also in terms of investment. The same OECD database was used in Figure 3.8. It shows the levels of investment per employee in IP-intensive industries for France, Germany, Italy, the Netherlands, Spain, UK, and US.

The Figure 3.8 clearly shows that the US economy has a much larger level of investment per employee than the other countries. In addition, the Figure shows the five IP sectors with the highest IP investment per employee. Chemicals and IT services are two of the most important sectors for the US while telecom, pharmaceuticals, and scientific R&D are consistently one of the top-five sectors in the UK and across the selected EU countries.

FIGURE 3.8: GROSS FIXED CAPITAL FORMATION PER EMPLOYEE (2017)

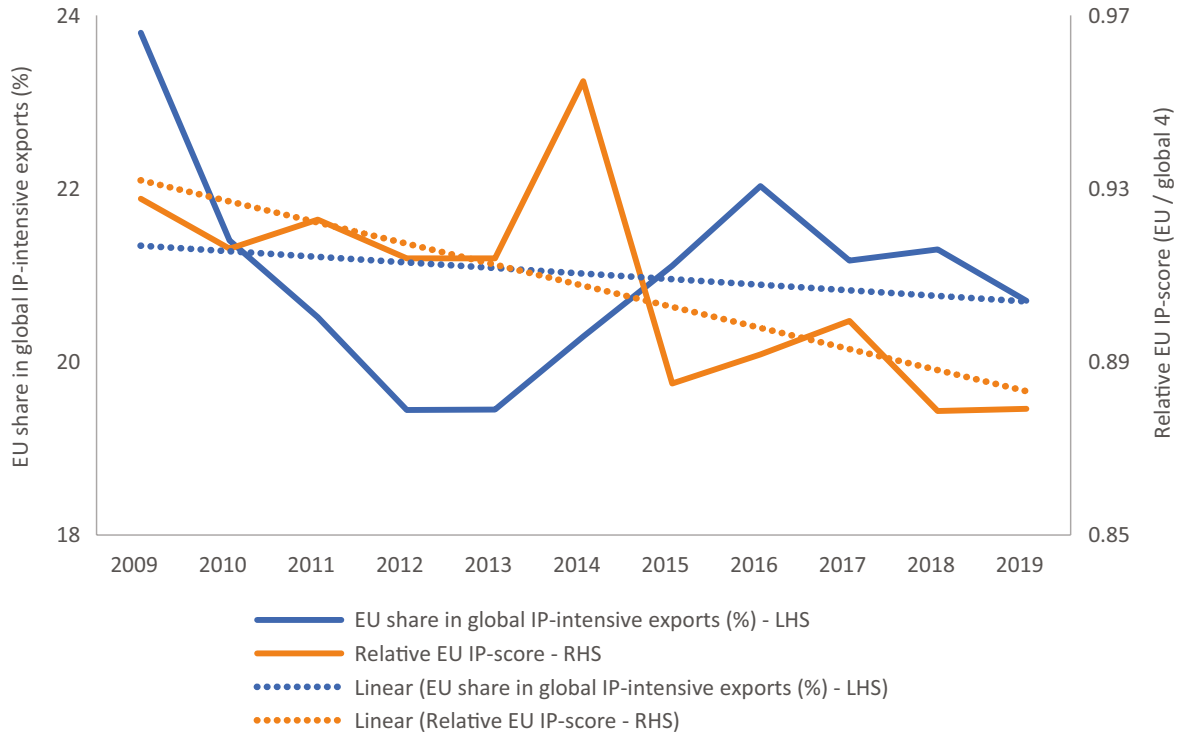


Source: OECD STAN and OECD Capital Formation by Activity, authors' calculations.

EU's Global Competitiveness in Terms of Trade in IP-intensive Products

The EU share of global exports in IP-intensive industries declined from 24 percent in 2009 to 21 in 2019 as shown in Figure 3.9 (blue line).

FIGURE 3.9: EU SHARE IN GLOBAL IP-INTENSIVE EXPORTS AND RELATIVE EU IP-SCORE (2009 – 2019)



Source: WITS; IPRI Index (IPR component), 2019

This decline was more pronounced up to 2013. From that year onwards, EU's share of global trade in IP-intensives industries has at first partially recovered and then declined again. In 2019, it remains below its 2009 level. The decrease in EU's share of global trade in IP-intensive industries coincides with the weakening of Europe's relative score of IP protection compared to the EU's main global competitors in IP-intensive products: the US, Japan, China, and Switzerland.

Conclusions on the EU's Global Competitiveness in IP-intensive Industries

In conclusion, we find that the EU is still competitive in IP-intensive industries, but the EU's relative competitiveness has been sliding compared to traditional global competitors like the US, Japan and Switzerland, but also increasingly vis-à-vis the main upcoming competitor: China.

4. INTELLECTUAL PROPERTY RIGHTS PROVISIONS IN FREE TRADE AGREEMENTS

4.1. The TRIPS Agreement and the Emergence of Novel IP Provisions

By the beginning of the 1980s it became clear that the GATT was no longer as well adapted to the realities of trade as it had been in the 1950s – in particular, with regard to intellectual property. The driver behind the inclusion of intellectual property in international trade was the United States – large parts of US industry and the US government were increasingly of the view that protection of US intellectual property abroad was inadequate or ineffective, undermining the competitiveness of US industry and damaging US trade interests. The Uruguay Round was launched in Punta del Este in 1986, and by 1994 a comprehensive agreement on Trade-Related Aspects of Intellectual Property (TRIPS) was reached, which significantly broadened the reach of the international trading regime.

The objectives of the TRIPS agreement were essentially aimed at strengthening and harmonising certain aspects of the protection of intellectual property at the global level. The economic case for protecting IP rests on the tension between encouraging the efficient use of knowledge and its dissemination on the one hand and providing the appropriate incentive for its creation on the other (without which there would be no knowledge to disseminate or use). TRIPS covers both categories of IP: literary and artistic property, and industrial property. The agreement stresses the need to promote adequate and effective protection of IP while recognising the distributive implications of IP on issues such as public health and international development. In addition to setting out the minimum standards of protection to be provided by each Member, the agreement also deals with domestic procedures and remedies for the enforcement of IP and makes disputes between WTO Members regarding respect for the TRIPS obligations subject to the WTO's dispute settlement procedures.

Many developed countries did not achieve all they sought after in terms of strengthened IP during TRIPS negotiations, and many almost immediately began negotiating for the inclusion of more protectable subject matter, broader and more extensive coverage, increased harmonisation, and stronger enforcement mechanisms. Having failed to achieve these objectives in the years following the implementation of TRIPS, paired with the lack of progress during the 1999 Seattle Ministerial Conference, many of these nations started to shift their focus away from achieving these strengthened IP on the multilateral level to the bilateral level within Free Trade Agreements (FTAs). This started the process, that is still going on, by which many developed countries pursue and promote a higher standard of IP than the minimum standard set out by the TRIPS agreement, including novel IP provisions in bilateral FTAs. It is key that negotiating FTAs does not result in a lower level of protection as currently ensured by IP laws on patents and trademarks. Furthermore, IP experts, business organisations as well as relevant stakeholders should be a part of the process.

Numerous FTAs today go beyond the minimum requirements of TRIPS Agreement and include stronger IP commitments. The T+PTA dataset (DESTA)[32] includes novel IP provisions for 137 different FTAs (November 2020) that were signed since 1991. These provisions are characterised according to a taxonomy that follows 13 different IP categories: copyrights, domain names, encrypted program-carrying satellite signals, enforcement, exhaustion, geographical indications (GIs), industrial design, new plant variety rights (PVR), patents, semiconductors, trademarks, traditional knowledge and genetic resources, and undisclosed information. Each of these categories includes variables that provide more detailed information on specific novel IP provisions. In total, the dataset covers 90 variables.[33] In addition, many developed countries have engaged in coordinating on IP issues and aimed for further IP harmonisation, among others via WIPO and via IP offices in various countries (e.g. the Group B+).

Increase coordination and harmonisation on IP with third countries – alongside the FTA strategy

Industry representatives also call for further harmonisation and coordination with third countries, where the current cooperative framework between intellectual property offices of the EU, Japan, South Korea, China and the US (the so-called IP5) is being cited as a promising avenue, particularly in the area of patents.

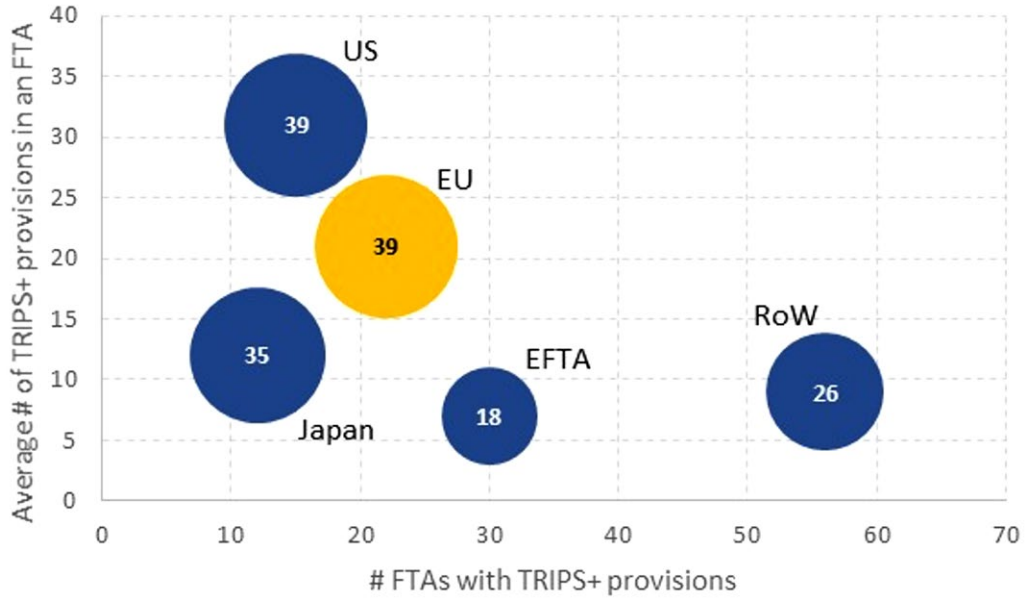
4.2. Overall Trends and Patterns in Novel IP Provisions in FTAs

Novel IP provisions began to emerge in FTAs even before the WTO TRIPS agreement came into force. Since then, FTAs including novel IP provisions have been increasing constantly. Especially since 2010, a clear upward trend can be observed when it comes to stronger IP provisions in FTAs.

[32] The T+PTA (DESTA) dataset is available here: https://www.designoftradeagreements.org/downloads/. Note that variables used in the database are meant as groupings of provisions and that there might be legal variation among the provisions identified under each of these variables. The database counts the provisions in place, but does not include a detailed legal analysis of the depth of the provisions.

[33] See Morin and Surbeck, 2019. For the sake of our analysis, all entries of FTAs in the dataset were considered (a total of 137 FTAs) except two: the Central American Free Trade Agreement (CAFTA) which has two entries in the dataset, one with and one without accession of the Dominican Republic. Only the dataset entry including the accession of the Dominican Republic was included. In addition, we did not consider the dataset entry for the Trans-Pacific Partnership (TPP), as the TPP never came into force and the analysis focused on the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) instead.

FIGURE 4.1: FTAS AND NOVEL IP PROVISIONS [34]



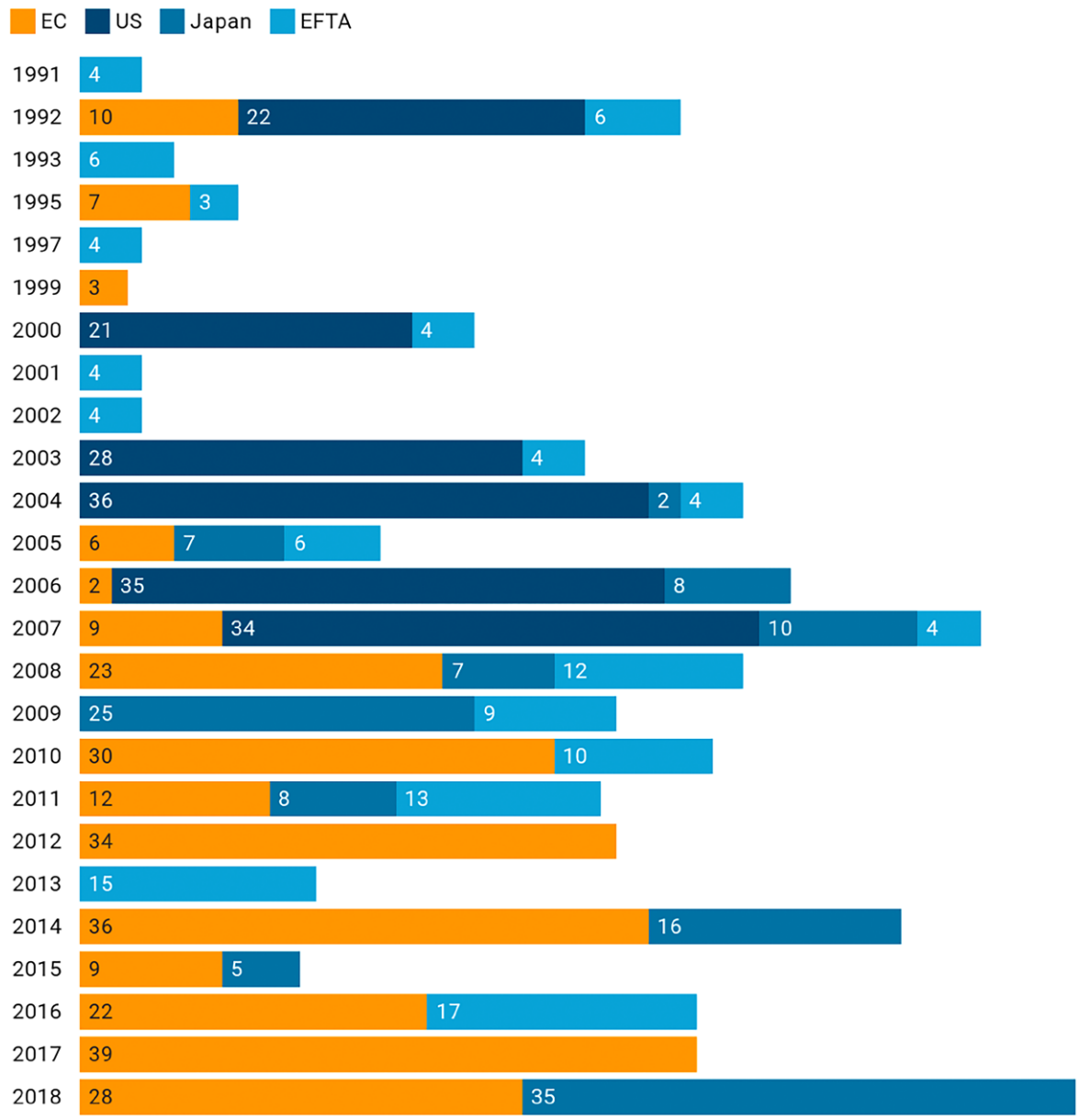
As of today, 135 FTAs include novel IP provisions. Most of these are EFTA FTAs (30), followed by EU FTAs (22) and US FTAs (15). On average, agreements with novel IP provisions include 13 different provisions across all FTAs that contain novel IP elements. US agreements have the highest average number of 31 novel IP provisions per FTA, followed at a distance by the EU with 21. The EU-Canada CETA FTA (2017) contains 27 provisions and the EU-Korea FTA (2010) 30 provisions. The Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) contains 35 novel IP provisions (which is the highest-ranking FTA including Japan). This is illustrated in Figure 4.1. The latest agreement concluded is the Regional Comprehensive Economic Partnership (RCEP) agreement in Asia, but it is not comprehensive in terms of novel IP provisions.

Figure 4.1 shows the number of FTAs with novel IP provisions on the horizontal axis and the average number of novel IP provisions per FTA on the vertical axis. The size of the bubble shows the maximum number of novel IP provisions found in an FTA for that country (group of countries).

Figure 4.2 outlines specific patterns regarding this evolution of novel IP provisions in FTAs of the main users (EFTA, EU, Japan, US) from 1991 up to now. The Figure allows us to observe the evolution of the use of novel IP provisions, compared to the total number of FTAs and compared across main users.

[34] The Rest of the World (RoW) category used for this analysis covers all FTAs in the dataset except those including the EU, US, Japan or EFTA. The category includes a total of 56 FTAs with a wide variety of countries.

FIGURE 4.2: EVOLUTION OF NOVEL IP PROVISIONS PER FTA (AVERAGE PER YEAR)



From Figure 4.2, we observe several overall trends. First, the number of novel IP provisions in EU FTAs has increased over time, especially since 2006 when the "Global Europe" strategy was adopted. Second, the US has consistently agreed a high number of novel IP provisions in its FTAs from the 1990s onwards. The US has signed less FTAs than the EU, especially after 2008. Third, Japan started adding novel IP provisions to its FTAs from 2004 onwards. With the exception of the Japan-Switzerland FTA in 2009 and the 2018 CPTPP agreement, Japan's overall use of novel IP provisions has, however, been relatively low. Fourth, EFTA countries started using novel IP provisions early on (pre-WTO TRIPS), but the number of these kinds of provisions in EFTA FTAs has remained low, although their number has steadily increased.

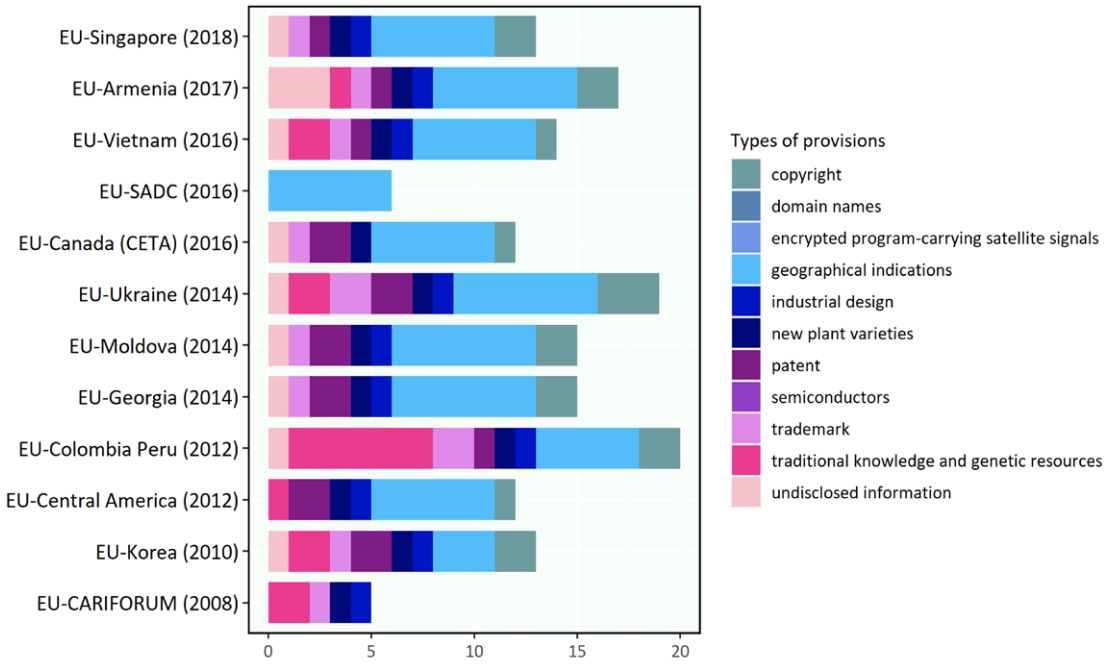
What Figure 4.2 does not show, is what types of IP provisions are included in EU and reference country FTAs and whether the types of IP that have been included have changed over time between 2000 and 2018.

4.3. Trends and Patterns Specific to Individual Novel IP Provision Categories

In addition to analysing how the overall coverage of novel IP provisions has evolved over time, we also focus on the evolution of specific novel IP categories. Overall, when it comes to the specific categories of novel IP provisions in all FTAs of the DESTA dataset, most of the FTAs include one or more provisions on either copyright, trademark, patent or geographical indications. Our analysis covers the broadest possible selection of recent FTAs with enough data for EU FTAs that will be compared to US FTAs. This analysis focuses on key novel IP categories: copyrights, domain names, encrypted program-carrying satellite signals, GIs, industrial designs, new plant variety rights, patent, semiconductors, trademark, traditional knowledge and genetic resources, and undisclosed information. We also look at three specific novel IP provisions that are part of the patent-subset: regulatory data protection (RDP) and Supplementary Protection Certificates (SPCs).

Figure 4.3 shows the number of provisions in EU FTAs (since 2008) going beyond the minimum standards of the TRIPS Agreement, differentiated by type of provision. Copyrights and trademarks matter for sectors like IT (software and database), publishing, music, and the music, radio and television industry.

FIGURE 4.3: NOVEL IP PROVISIONS IN EU FTAS



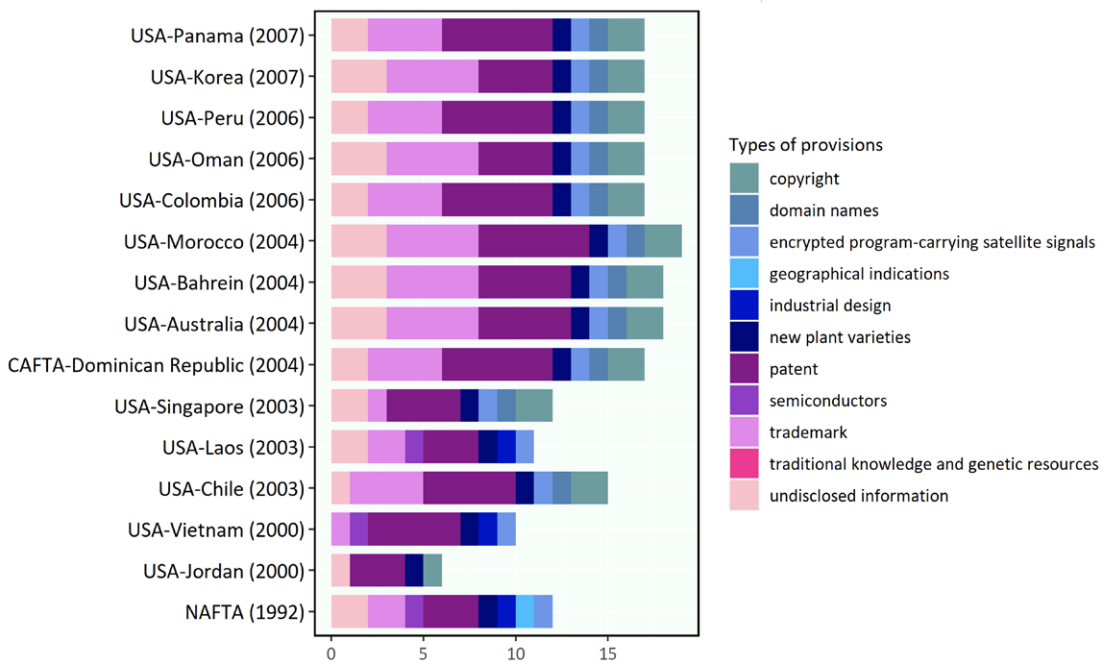
Source: DESTA Trips+ PTA Dataset

Geographical indications and new plant variety rights are important for the agricultural sector. Domain names and encrypted program-carrying satellite signals are important for the IT industry. Industrial designs are relevant for the motor vehicles sector, the machinery industry, electronics, electrical equipment, textiles and fashion. Patents (and patent-term extension) are important for the motor vehicles and pharmaceutical industries, for machinery and the agri-chemical sectors (e.g. plant protection). Regulatory Data Protection and Supplementary Protection Certificates matter for agri-chemicals, pharmaceuticals and the plant protection industry. Next to industrial designs, the EU electronics sector also uses IP in semi-conductors and trademarks.

Figure 4.3 shows a high degree of consistency across EU FTAs. EU FTAs generally encompass a wide range of IP (except for the EU-SADC FTA). It is also very clear that the EU puts a lot of emphasis on geographical indications (there are about six GI-related novel IP provisions per EU FTA). For some FTAs with developing economies (e.g. Colombia, Peru, CARIFORUM, Vietnam) traditional knowledge and genetic resources – IP is also incorporated. Across the board only a limited number of copyright and patent provisions are included, and the number of patent provisions has decreased in the later FTAs.

As shown in Figure 4.4, in comparison to the EU, the approach of the US in FTA negotiations seems to be more concentrated on specific IP, especially since 2004. US FTAs have no focus on GIs, but they do cover a wider range of topics, especially in the area of domain names and encrypted programs. Additionally, US FTAs are much more comprehensive particularly in the matter of trademarks and patents. Though the US withdrew from it in 2017, the CPTPP of 2018 also has the same structure as the US FTAs in Figure 4.4 (which shows that the US was the driving force behind the original TPP negotiations) and this is also close to several USMCA provisions.

FIGURE 4.4: NOVEL IP PROVISIONS IN US FTAS

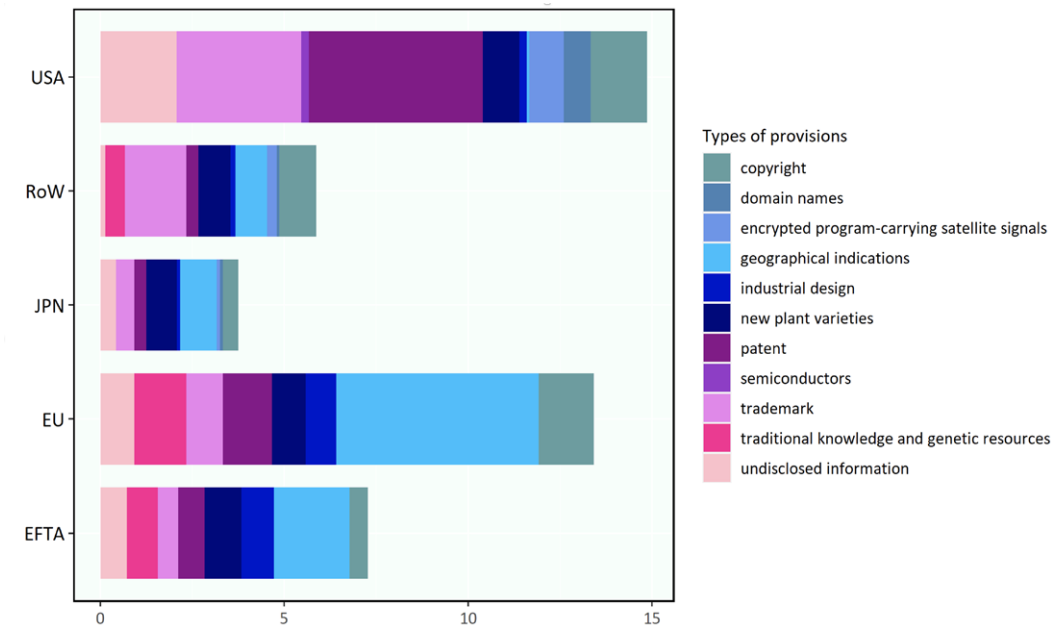


Source: DESTA Trips+ PTA Dataset

Finally, we analyse the averages of all FTAs combined, which provides an overview of the most prominent novel IP provisions by country, as well as the overall profiles of the different country categories. When looking at the overall average of novel IP provisions per type, it becomes apparent that IP provisions on geographical indications are most frequent, followed by IP provisions on patents, trademarks and copyrights.

However, a closer look at the averages per country category, reveals that the US focuses on strong protection of patents and trademarks in its FTAs, but also has consistently covered undisclosed information and copyright provisions. EU FTAs are more heterogenous, with a lower focus on patent provisions. The strong focus of the EU (as well as EFTA) on geographical indications is what drives the high average number of provisions on GIs in FTAs overall. EU FTAs also have the highest share of IP provisions on traditional knowledge and genetic resources. Japan includes the least number of novel IP provisions in its FTAs overall. This is shown in Figure 4.5.

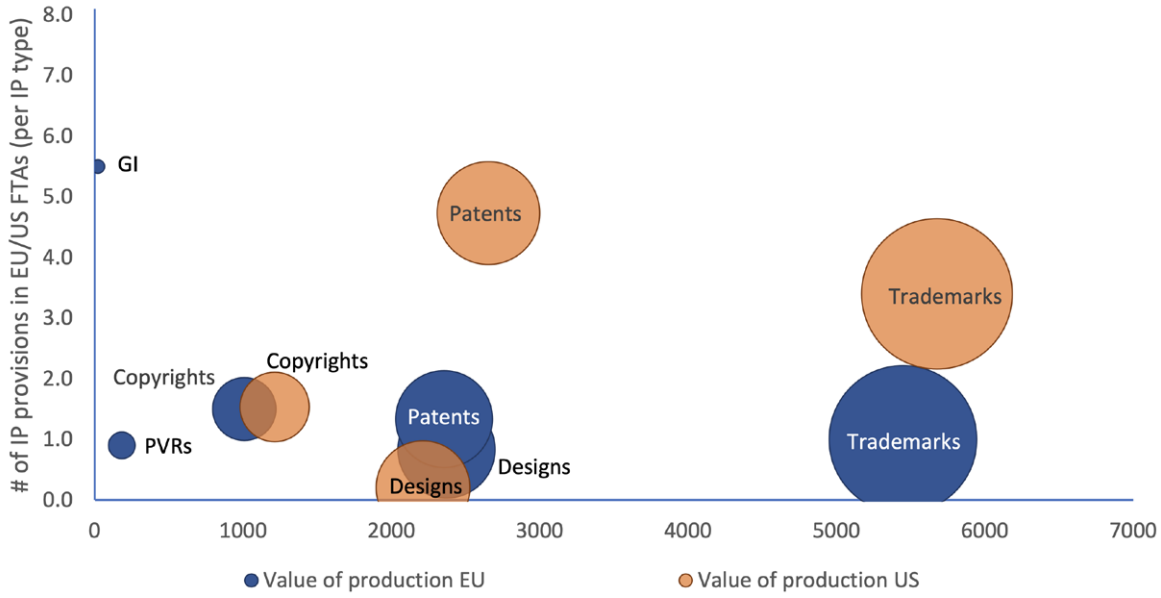
FIGURE 4.5: AVERAGE NOVEL IP PROVISIONS



Source: DESTA Trips+ PTA Dataset

Figure 4.6 shows the economic importance (by total value of production) of each type of IP plotted against the DESTA number of provisions for each type of IP in EU FTAs (in blue). In the same graph – for comparative reasons – we also show the same statistics for the US (orange). What becomes clear is the fact that EU FTAs are strong in some niche types of IP in economic terms but less in the broad types of IP (e.g. patents and trademarks) that matter most economically. In fact, regarding patents, in 2019, the EU has changed the patent term restoration provisions in the EU by allowing for a manufacturing waiver to the Supplementary Protection Certificate (SPC) for exports and for stockpiling. The introduction of the manufacturing waiver raises questions of compliance with some EU FTAs which contain substantive commitments on patent term restoration or restoration without waivers. The EU-Canada Comprehensive Economic and Trade Agreement (CETA) does contain a waiver for sui generis patent restoration rights, but that waiver refers only to manufacturing for exports, and not to manufacturing for stockpiling for domestic sales. While the strong geographical indication provisions create value for the EU agricultural sector, setting a gold standard for the treatment of IP in EU FTAs, there is significant untapped potential for stronger IP provisions in trademarks and patents in EU FTAs with potentially significant positive economic implications for the EU.

FIGURE 4.6: ECONOMIC IMPORTANCE AND NUMBER OF IP PROVISIONS PER TYPE OF IP (2-DIGIT LEVEL)



Source: DESTA, Eurostat

4.4. How have IP Provisions in EU FTAs Evolved Over Time, from 2000 until Today?

Starting in 2000, since the conclusion of the EU-Mexico FTA, IP provisions have played an increasingly important role for the EU in FTA negotiations. The EU's IP chapters have evolved considerably over the last three decades in terms of detail and importance. This reflects the observation made earlier that IP is amplified by the way modern economies grow: they have become more sophisticated because of value chains and global production fragmentation in a drive for ongoing specialisation, on the back of knowledge generation and innovation. The more important innovation to meet global competition, the greater the significance of IP that help innovators recoup investments needed to generate the innovations, the more attractive the economy is for further investments into knowledge and innovation of tomorrow. And the EU's FTAs, as part of a wider trade strategy, play a significant role. That said, there are significant differences between how the different types of IP have been covered in EU FTAs.

Although the EU established a variety of arrangements like Association Agreements (AAs), Free Trade Agreements (FTAs), Economic Partnership Agreements (EPAs), as well as agreements which relate to the integration of potential new member states (Deep

and Comprehensive FTAs – the DCFTAs), IP provisions seek similar objectives and the generalizations in this section can be applied to all of them.[35]

The evolution in IP provisions has been incremental at first. Early FTAs as with South Africa, Mexico and Chile were set to facilitate the implementation of TRIPS and partners should commit to "the highest international standards of protection".[36] However, the approach of the EU changed considerably with the adoption of the "Strategy for the Enforcement of Intellectual Property Rights in Third Countries" in 2004 and the "Global Europe" strategy in 2006. This is one of the reasons why the EU makes a distinction between "first generation" and "new generation" FTAs, emphasising the fundamental change in EU trade policy in 2004/2006.[37]

"New generation" agreements try to parallel the ambition of the US, as they are more comprehensive, go beyond TRIPS and include issues like protection of data exclusivities.[38] An official document of the EU from 2011 describes the EU objective as follows: "In negotiating FTAs, the IP clauses should as far as possible offer identical levels of IP protection to that existing in the EU while taking into account the level of development of the countries concerned." In practice this has been translated in IP provisions following EU Directives and Regulations[39], thus establishing a strong EU standard as a basis for IP protection in FTAs. The EU – like the US before – realised that protection of EU intellectual property abroad was inadequate or ineffective and highly dependent on trading partner IP systems. This would undermine the competitiveness of EU industry, especially when an FTA would aim to increase bilateral trade and investment. Despite the ambition to ask for EU-level IP clauses, the EU standard is rarely met for some types of IP, like patent (e.g. SPC duration) provisions, where partner countries commit to significantly lower levels of protection than the EU has itself.

Different types of IP provisions have evolved differently over time. For the different types, we provide a short overview below.

[35] Roffe, P., 2014. Intellectual Property Chapters in Free Trade Agreements: Their Significance and Systemic Implications. https://link.springer.com/chapter/10.1007/978-3-642-39097-5_2

[36] European Commission, 2002. EU-Chile FTA, IPR Chapter. https://eur-lex.europa.eu/resource.html?uri=cellar:f83a503c-fa20-4b3a-9535-f1074175eaf0.0004.02/DOC_2&format=PDF

[37] European Commission, 2019. Report from the Commission to the European Parliament, the Council, the European Economic and social Committee and the Committee of the Regions on Implementation of Free Trade Agreements. https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52019DC0455&qid=1571406458279&from=EN

[38] Roffe, P., 2014. Intellectual Property Chapters in Free Trade Agreements: Their Significance and Systemic Implications. https://link.springer.com/chapter/10.1007/978-3-642-39097-5_2

[39] Souheir Nadde-Phlix, S., 2014. IP Protection in EU Free Trade Agreements vis-à-vis IP Negotiations in the WTO. https://link.springer.com/chapter/10.1007%2F978-3-642-39097-5_7

General Provisions
The theme of "General Provisions" has not changed considerably. The spirit of the IP chapter of the FTA shall be one of facilitation of innovation and promotion of sharing knowledge, technology, culture and arts; thus, improving trading relations between the Parties. Furthermore, the baseline of protection for IP is usually defined by abiding to the usual international agreements like TRIPS or the Paris Convention.

Copyright Protection
Provisions regarding copyright have not changed much. International treaties, such as the Berne Convention and the WIPO Copyright Treaty, form the basis of copyright protection and "new generation" FTAs do not seem to add additional specifications. However, copyright protection seems to increase from 50 to 70 years of minimal protection.

Trademarks
In the subsection of trademarks, the wording has become much more precise over time. Whilst "first generation" FTAs only seem to specify the exclusive rights for holders of registered trademarks, "new generation" FTAs with developed countries (South Korea, Japan, Mexico and Canada) emphasise the establishment of a registration procedure for trademarks as well as the requirement for electronic databases of trademark registrations/applications, open to the public. In the future, EU FTAs might also follow USMCA or CPTPP and its own EU-Colombia, Peru, Ecuador FTA in allowing the inclusion of trademarks composed of sounds or scents, and establish a bilateral forum to deal with domain name disputes.

Industrial Designs
EU FTAs signed after 2006 ("new generation") all require the ratification of the Geneva Act (1999) of the Hague Agreement Concerning the International Registration of Industrial Designs and set the protection for industrial designs at a minimum of 15 years. Furthermore, USMCA demands an electronic system for the application of industrial designs, which might again be a route the EU will follow in future FTA negotiations.

Geographical Indications
In "first generation" FTAs the EU particularly focuses on maintaining the right for higher domestic protection of geographical indications. "New generation" FTAs include the establishment of working groups in order to facilitate cooperation in the practical use of geographical indications (South Korea and Mercosur), establishing of lists of geographical indications the partners agree to, while the EU-Singapore FTA necessitates the implementation of a system for the registration and protection of geographical indications.

The EU is the leading advocate for geographical indication protection worldwide. Consequently, geographical indication protection is an essential part of all EU FTAs with the objective to promote the EU standard as the basis of protection (see Section 4.3). Newer

FTAs extend the additional protection for wines and spirits to all other products protected as geographical indications and call for the establishment of a geographical indication register in line with the EU global approach. In another important area for the EU, the protection of plant variety rights, also became more precise and extensive in requiring a minimum level of protection in accordance with TRIPS and a requirement to accede UPOV (1991).[40] Another novelty in "new generation" FTAs is the protection of biodiversity as a component of IP chapters, which implies that the EU sees IP as vital to protect biodiversity. However, these mostly refer to existing obligations under the Convention on Biological Diversity (CBD).

Patents

All FTAs acknowledge their commitment to the TRIPS Agreement and the Declaration on the TRIPS Agreement and Public Health, the so-called Doha Declaration. The TRIPS Agreement sets the basic duration for patent protection to at least 20 years. This is also the standard provision in EU FTAs. In addition, patent term restoration via Supplementary Protection Certificates (SPC) can be granted to extend a patent right for a maximum of five more years to compensate for the loss in effective patent protection in the R&D phase. In this, the EU seems to follow the US in establishing provisions for cases of administrative delays. However, in a shift of its IP-strategy, the EU has decided to reduce the value of this innovation incentive by adopting the SPC Manufacturing Waiver (Regulation (EU) 2019/933). The Waiver allows EU-based companies to manufacture a generic or biosimilar version of an SPC-protected medicine during the term of the SPC if done for the purpose of exporting the medicine to a non-EU market or for stockpiling during the final six months of an SPC ahead of entry into the EU market. Not so much the SPC waiver, but the comparison of the number of years of SPC protection between the EU and its trading partners is illustrated in Box 4.1. The SPC waiver and the more recent adjustments to the SPC framework are noteworthy, when we know that economic development will focus more and more on complex and multi-facetted innovations that may take longer than before to develop and put onto the market, and when we know that the EU relative IP index compared to is main competitors has been declining since 2009.

Stakeholders ask for EU FTAs: EU tools to restore market access and strengthen IP

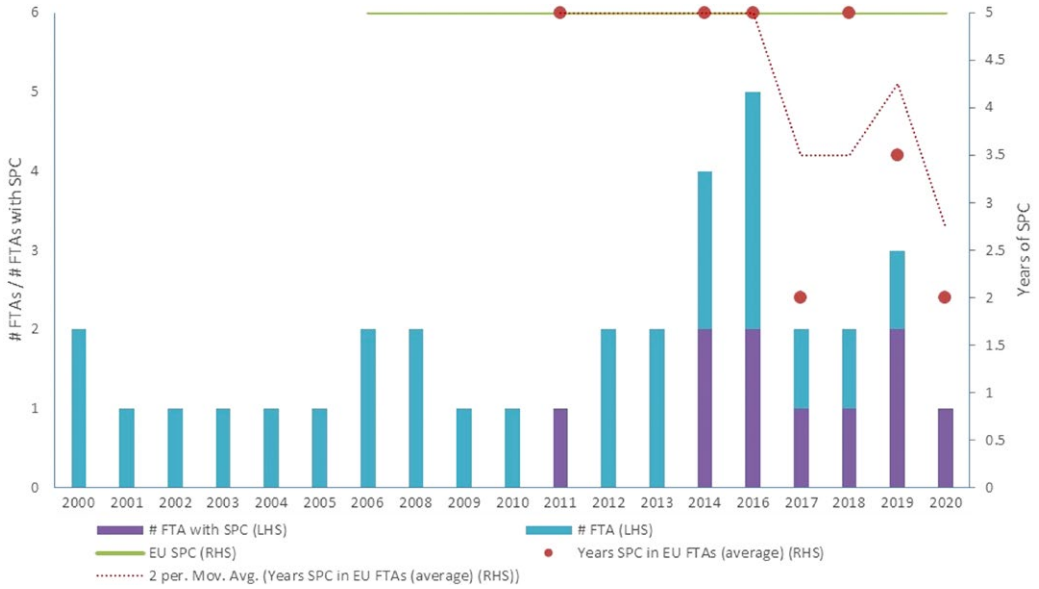
Multiple stakeholders in the EU call for EU trade policy to be endowed with unilateral tools to gain and/or restore market access in third countries and to strengthen the overall level of IP protection by including more and better-defined novel IP provisions, particularly in the fields of trade secrets, patents and forced technology transfers.

[40] Souheir Nadde-Phlix, S., 2014. IP Protection in EU Free Trade Agreements vis-à-vis IP Negotiations in the WTO. https://link.springer.com/chapter/10.1007%2F978-3-642-39097-5_7

BOX 4.1: EVOLUTION OF IP PROVISIONS IN EU FTAS – THE EXAMPLE OF SUPPLEMENTARY PROTECTION CERTIFICATES IN EU FTAS

An SPC is an IP right that extends the patent right.41 SPCs are relevant for pharmaceutical and plant protection products. While a patent is valid for 20 years, if the entire R&D process until and including marketing authorisation takes 15 years, only 5 years of effective patent protection to recuperate an investment are left. This does not provide for sufficient time to recoup the investment and thus provides insufficient protection to continue to innovate in these products. SPCs can then extend a patent right for a maximum of five years to compensate for this loss in effective patent protection. In addition, a six-month additional extension is possible for completing agreed paediatric investigation plan for clinical trials with medicinal products for children (Regulation (EC) No 1901/2006) – the so-called paediatric extension. Since 2010, 43% of EU FTAs (notably with developed economies or the Deep & Comprehensive FTAs) have SPC provisions in them (purple part of the bar columns in Figure B5.1), like the EU has itself. The EU has not included SPC provisions in 57 percent of its FTAs. However, with recent FTAs like with Singapore, Canada and Vietnam only two years of PTR are agreed and the EU SPC manufacturing waiver has impacted the level of SPC protection in the EU, no longer allowing the types of SPC provisions as agreed in the EU-Canada CETA agreement. This is why Figure B5.1 shows a decline from 2016 in average SPC duration (red dotted line representing the moving average) from a 5-year average from 2011 to 2016.

FIGURE B4.1: EVOLUTION OF SPC PROVISIONS IN EU FTAS



Also, in many FTAs no SPC provisions are agreed (blue part of the bar columns) or alternative ones that are not achieving their goal (e.g. in the CARIFORUM, EU-Mercosur, EU-Central America or EU-Colombia, Peru and Ecuador FTAs). Thus, while Figure 5.3 looks at the number of patent provisions, detailed evidence suggests that SPC provisions have changed more recently, notwithstanding the fact the number of patent provisions have remained the same.

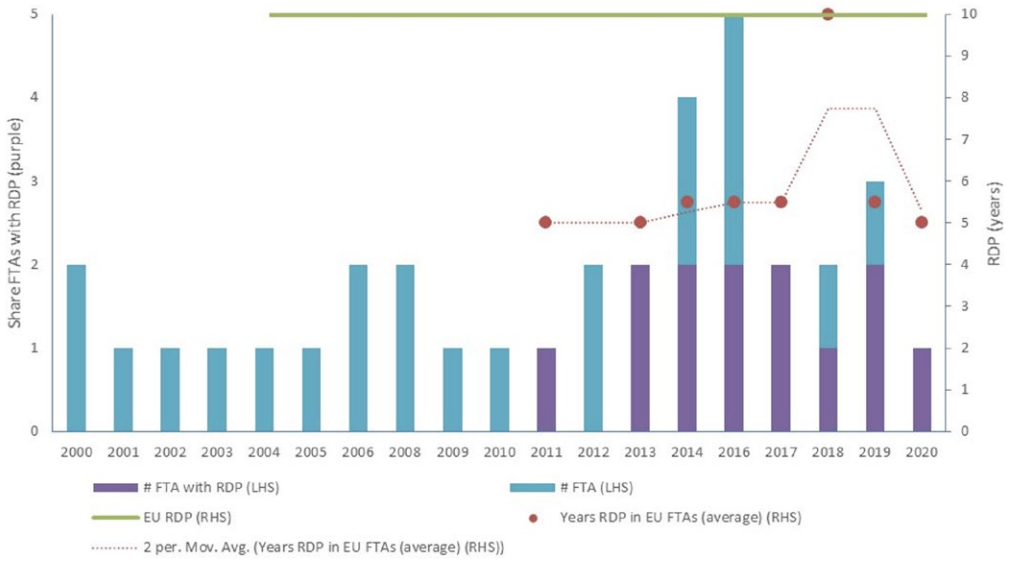
[41] European Commission (2020), https://ec.europa.eu/growth/industry/policy/intellectual-property/patents/supplementary-protection-certificates_en [accessed 2 November 2020]

Another important IP right is regulatory data protection (RDP). RDP provisions are negotiated more frequently "new generation" FTAs. They matter especially in countries where patent enforcement is weak. However, while the level of RDP protection is envisaged to mirror the EU's framework, duration of RDP protection in EU FTA trading partners is almost always lower than in the EU itself, also in FTAs with developed economies (e.g. Japan). One of the latest negotiated EU FTA to date, the EU-Mercosur FTA, is particularly weak on RDP-related novel IP provisions. A more detailed RDP analysis is presented in Box 4.2.

BOX 4.2: EVOLUTION OF IP PROVISIONS IN EU FTAS – THE EXAMPLE OF REGULATORY DATA PROTECTION IN EU FTAS

Regulatory Data Protection (RDP) typically protect data submitted for marketing authorisation by either providing protection for the test data used or protecting the market from direct competition which relies on such test data (data exclusivity + market protection). This matters for innovation because the data generation efforts to obtain proper regulatory approval are costly and time-consuming and need to be protected against free riding. RDP prevents free riding from happening: without prior consent of the party that first filed the data and obtained the original marketing authorisation, others cannot rely on the submitted data to obtain another marketing authorisation for the purposes of submitting an application, obtaining marketing authorisation or placing a product on the market. In the EU, data exclusivity and market protection are around 10 years. RDP is more often included in EU FTAs after 2010 than before. Since 2010, RDP provisions have been included in EU FTAs in 56 percent of the FTAs. However, as shown in Figure B5.2, with the exception of 2018, the RDP provisions the EU negotiates with trade partners are significantly lower than this 10-year term that are part of the EU incentives framework and in more recent FTAs, like the EU-Mercosur FTA, no RDP provisions are included, as shown in Figure B5.2. This could have a negative effect on innovation as EU data are potentially less protected in trading partner territory.

FIGURE B4.2: EVOLUTION OF RDP PROVISIONS IN EU FTAS



4.5. Enforcement of Intellectual Property Provisions in EU FTAs

In 2019, the newly formed IP Tribunal under the Supreme People's Court of China (SPCoC) ruled in favour of Valeo.[42] Valeo is a French global automotive supplier that was locked in a patent dispute against two Chinese car accessories companies. The Court upheld a lower court ruling that indeed the Chinese companies had infringed Valeo's patent on a connector for windshield wipers – illegally copying the innovation – and awarded Valeo RMB 7 million (Euro 911.000) in damages. The patent system acted to protect the invention – and with it the investments made – by Valeo to develop the windshield wiper connector and prevent illegal copying of its invention without having to bear the development costs. It will ensure that Valeo continues to be incentivised to continue innovating.

Regarding the enforcement of China's IP framework, Valeo is a positive example. However, more and more often, issues regarding the protection of IP occur; and these issues very often turn out to be country specific.[43] Problems are particularly serious in Indonesia, Turkey, Mexico, Peru and Canada for counterfeit and pirated goods. Whilst copyright piracy (on- and offline) remain especially problematic in China, Ukraine, Thailand, the Philippines and Mexico. Patent provisions are violated most often in Indonesia, India and Russia. In the field of trademarks, especially in pharmaceuticals, China, Indonesia, India, Mexico, Argentina and Russia see high traffic volumes of counterfeit medicines. With regards to geographical indications, protection is still not always working properly for agricultural products and foodstuff, which often forces firms to opt for protection through trademarks, which in many cases is inadequate and costly. A recurring problem in the protection of GIs is that the name of the product is considered to be too generic. Finally, forced technology transfer practices are most pervasive in China and Indonesia.

Forced Technology Transfers (FTTs) are a serious and increasing problem. Technology transfers happen frequently and there are many legal ways in which they happen – for example through Foreign Direct Investments (FDI) or Venture Capital (VC) investments. But other mechanisms entail a forced element, for example technology transfers as part of market access requirements (e.g. NEVs), provisions of Technology in import-export regulations, excessive technology transfers as part of regulatory approval processes, data localisation requirements, and localisation requirements for R&D centers as preconditions for joint ventures. These practices occurred in China. But also the Indonesia 2016 patent law requirement for transfer of old patented technologies and processes implies FTT and so is the overly broad basis for compulsory licensing in South Africa.

[42] Valeo v. Lucas, Fuke, & Chen www.lexicology.com (2019) China top 10 IP case [accessed 7 October 2020].

[43] European Commission (2020): https://trade.ec.europa.eu/doclib/docs/2020/january/tradoc_158561.pdf [accessed 2 November 2020].

From the perspective of IP enforcement, the EU FTA strategy provides a unique opportunity: it would be most unfortunate to find out, after having negotiated for many years to conclude an FTA between the EU and a partner country that aims to increase trade, investment and economic development, that business is not using the provided opportunities because the partner country does not live up to its FTA commitments, for example by not adhering to appropriate IP protections.

The EU uses a range of tools to encourage IP enforcement in trade partner countries. First, the EU, comparable to the "301 Report" system of the US, periodically evaluates the IP provisions of "priority countries" – most recently in 2020 in its "Report on the protection and enforcement of intellectual property rights in third countries" (January 2020). Unlike the US, and despite the great potential of the wide EU bilateral trade network, the EU has, however, no sanctioning mechanism linked to any negative conclusions, and the overall assessment is less comprehensive when compared to the US "301 Report". A second way of 'binding' trading partners more closely to EU IP provisions is by establishing bilateral cooperation forums. The EU has such forums, for example with China and Russia (while with Russia it does not have an FTA): High Level IP Dialogues. Initially these forums were mostly on a voluntary basis, but in recent "new generation" FTA negotiations these are an essential part of the FTA itself. These settings are meant to provide for a political dialogue as well as a platform from which to provide technical assistance. However, in an official notice, the EU also makes clear that it is "willing to assist them [the partner countries] in raising the level of enforcement, but also, that it will not refrain from using the instruments at its disposal in cases where deficient enforcement is harming its right-holders".[44] Third, the EU uses the Market Access Database (MADB) or Access2Markets Database to collect and then follow market access barriers, some of which are IP-related. Once in the Access2Markets Database, the EU consistently uses its many formal political and technical engagements to raise these issues with the trade partner country. Fourth, the use of dispute settlement is a fourth tool. The scope of dispute settlement provisions in some EU FTAs extend to trade-related disputes arising from the violation of IP.

In 2020, the EU made an important step forward on enforcement of commitments in EU FTAs, including IP commitments, by appointing a Chief Trade Enforcement Officer (CTEO) – at deputy Director-General level in DG Trade. The CTEO focuses on the implementation and enforcement of trade rules, including "ensuring that countries the EU has trade agreements with meet the commitments they make under them on: opening their

[44] Krizic, I., Serrano, O., 2017. Exporting Intellectual Property Rights to Emerging Countries: EU and US Approaches Compared. European Foreign Affairs Review 22(2/1): 57-75.

markets to EU exports and investments, respecting other trade commitments that benefit EU operators, …".[45] This revised EU enforcement regulation also foresees possible measures against non-complying trading partners in the area of IP. Transparent and consistent enforcement of commitments, if needed combined with appropriate technical assistance to support implementation of the FTA, would allow the EU to become a stronger global knowledge-player, spreading new innovations globally, and setting global standards.

[45] European Commission (2020): https://ec.europa.eu/trade/trade-policy-and-you/contacts/chief-trade-enforcement-officer/ [accessed 12 January 2021]

5. ECONOMIC RELEVANCE OF INTELLECTUAL PROPERTY PROVISIONS IN EU FREE TRADE AGREEMENTS

This Chapter looks at overall EU trade patterns like main exporting sectors and main trading partners, and to what extent EU trade is covered by its FTAs. We look at what has happened over time with IP-intensive exports and how this relates to the strength of the IP framework in the EU compared to the EU's global competitors. Second, we look at the economic effects from stronger IP provisions. We have calculated what types of IP matter most for growth and exports and look at the impact of stronger IP provisions in EU FTAs for the EU as a whole.[46]

5.1. EU Trade Patterns and FTA Coverage

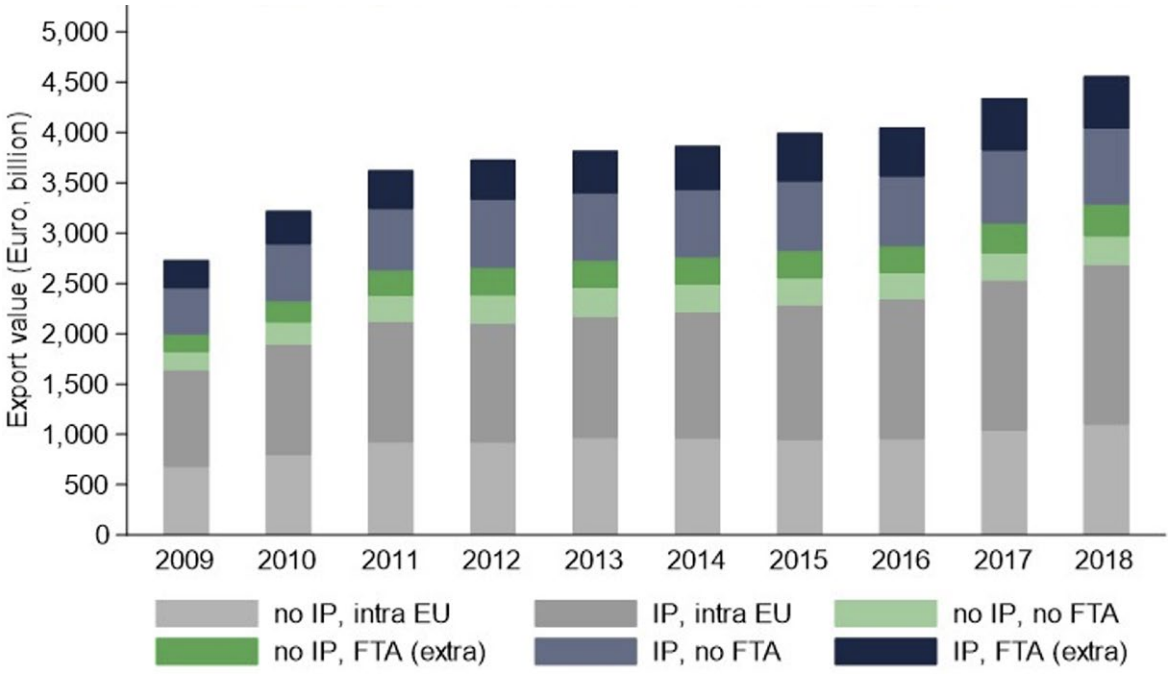
The EU has the largest global trade network in the world with – in 2020 – 45 (regional) FTAs signed with a total number of 77 countries. But when looking at the EU's bilateral FTA partners, it is also clear that a vast share of EU exports is not covered by its FTAs – notably EU trade with the US and China (both imports and exports). In Figure 6.1 we show EU exports from 2009 – 2018 split into IP- and non-IP intensive exports, and into intra-EU trade (not subject to an FTA), FTA or no FTA. The intra-EU trade part is significant but because intra-EU trade is not subject to EU FTAs with third countries, we will not focus on this trade element further. We find that:

- EU exports have risen steadily until 2018 and clearly the EU Internal Market continues to play a very significant role for EU Member States (grey areas in Figure 5.1).
- Because of the EU signing various FTAs (e.g. with Korea, Central America, ANDEAN, Canada, Singapore, Japan, Vietnam) that have been provisionally applied or come into force, the share of EU exports covered by FTAs went from 42% in 2009 to 45% in 2018. This leaves 55% of EU exports not covered by bilateral FTAs, notably trade with the US and China (see Figure 6.1). This means that there is still a significant gap of EU exports (and imports) not covered by FTAs.
- IP-intensive exports constituted 68% of total EU exports in 2009 and this share has remained stable between 2009 and 2018. In absolute terms (in Euros), this means that the amount of IP-intensive exports covered by FTAs has grown much more than the amount not covered, indicating that EU FTAs do contribute to IP-intensive trade.
- Of these IP-intensive exports 41% was covered by EU FTAs, while 59% was not. This implies that EU IP-intensive industries still export 59% to trade partners without bilateral FTA IP protection. This may not be a large issue in countries where IP rights are also well protected and enforced (e.g. the US), but it could be an issue for various other countries (e.g. China, Russia, Turkey) where the IP system (including enforcement) is much weaker.

[46] We recall that based on EUIPO (2019), Eurostat (2019) and JRC (2018), we have identified the following sectors as IP-intensive in ranked order from most to relatively least IP-intensive: pharmaceuticals, scientific R&D, electronics, motor vehicles, chemicals, machinery, electrical equipment, transport equipment, other manufacturing, IT services, telecoms, and architectural & engineering services.

In Table 5.1 we present the top-10 of extra-EU exports by destination.[47] The main EU export destinations and their relative export shares are the US (26.4%), the United Kingdom (23.4%), China (14.3%), Switzerland (10.2%), and Russia (6.3%). Because the EU does not have an FTA with the US, with China, and with Russia (some of the top export destinations), the IP-intensive export shares not covered are substantial – and mainly relate to these countries. The nature of the EU-US and EU-China trade relationships are very different, however, because of imports. The EU imports mostly IP-intensive goods from the US, while EU imports from China are much less IP-intensive. The US has a much more established, strong IP framework, including enforcement, than China. From this perspective, for EU IP-intensive exports concluding any agreement that include strong IP provisions would be a higher priority as that would be vital to protect EU IP in a trade relationship with China, preventing – for example – forced technology transfers. Such focus is relatively less needed with the US (and also with Switzerland), both EU trading partners with strong IP frameworks of their own that also protect EU IP.

FIGURE 5.1: EU27 TOTAL EXPORTS BY IP INTENSITY AND FTA COVERAGE (2009 – 2018)



[47] We will not focus on intra-EU trade further because intra-EU trade is not subject to FTAs between the EU (as a bloc) and third country partners.

TABLE 5.1: TOP-10 EXPORT DESTINATIONS BY IP INTENSITY AND FTA COVERAGE (EXTRA-EU, 2018)

Country	No IP, No FTA (€, bn)	No IP, FTA (€, bn)	IP, no FTA (€, bn)	IP, FTA (€, bn)	TOTAL (€, bn)
United States	75.5		253.7		329.2
United Kingdom*		112.0		179.9	291.8
China	38.2		140.7		178.9
Switzerland		49.9		77.7	127.6
Russia	21.9		56.9		78.8
Turkey		20.0		41.7	61.7
Japan**		14.4		40.4	54.8
Norway		19.2		27.8	47.0
South Korea		9.7		31.6	41.2
India	11.9		25.0		36.9
TOTAL	**161.9**	**210.7**	**516.7**	**358.7**	**1248**
Share extra EU exports					**66.7%**

* The statistic reported here is for 2018 when the UK was part of the EU but which are split out.
** Japan did not yet have an FTA with the EU until February 2019, but with the 2 months difference two years ago, we report Japan as 'having an FTA'.

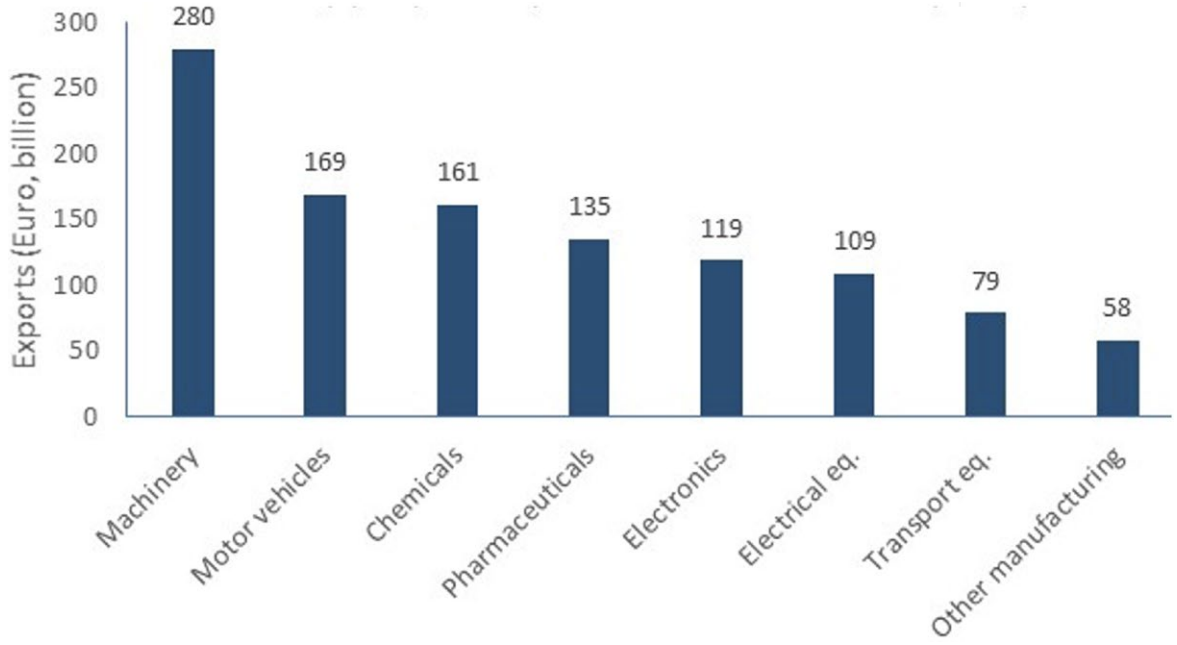
Main IP-intensive sectors responsible for the bulk of the EU's export performance (in total and by main trading partners) are machinery (€240 billion), motor vehicles (€169 billion), chemicals (€161 billion), pharmaceuticals (€135 billion) and electronics (€119 billion). Figure 5.2 shows that most of these IP-intensive sectors are of strategic interest for the EU27 in various ways and should be key from an industrial policy angle. First with respect to economic relevance for the EU economy. For example, in terms of high-quality jobs and investments. Second, dynamically, from a perspective of ensuring the EU remains a knowledge-intensive economy that innovates and remains at the forefront of new scientific and technological developments. For example, engine technologies are vital for achieving Green Deal emission objectives. Third, from a strategic resilience perspective, these sectors give the EU global leverage to defend EU interests globally. Many of these industries are already

Stakeholders ask the EU to strengthen global supply chains and refrain from protectionist measures to increase resilience

COVID-19 has demonstrated the immense importance of open trade and global supply chains as engines for resilience and agility in case of a crisis. The long-term implications of COVID still have to become clear, but in order to develop the treatments and/or vaccines for COVID-19 today and the medicines for an as yet unknown pandemic in the future, stakeholders ask for the combination of strong IP provisions in the EU and in EU FTAs combined with open trade, based on the multilateral trading system or the EU's bilateral trade partner network based on the WTO framework.

quite resilient.[48] [49] Fourth, some of these sectors allow the EU to strengthen its future pandemic resilience in a post-COVID-19 world. For example, the EU exports 63.8% of all medicines globally, putting the EU in a strong and resilient position and the EU has a strong competitive position in pharmaceuticals and vaccines (though waning in light of increasing US, Swiss, Japanese and Chinese competition).

FIGURE 5.2: EU27 SECTORAL IP-INTENSIVE EXPORTS (MAIN SECTORS, 2018)



Source: Eurostat, WITS

5.2. EU Macro-conomic Effects of sStronger IP Provisions in EU FTAs

In this section, we first look at the macro-economic effects of stronger IP provisions in EU FTAs and then at what types of IP provisions are the main drivers in EU FTAs for these effects.

Methodological Approach

Our quantitative strategy to estimate the economic effects of the FTA involves the use of a computable general equilibrium (CGE). This model is calibrated using the GTAP database[50] and an integrated assessment that builds on an econometric estimation of trade elasticities that determine the trade volume effects of the trade cost reductions in FTAs. In particular, we measure three different types of trade costs: tariff-rate quotas (TRQs), preferential tariffs and non-tariff measures (NTMs). The resulting structurally estimated general equilibrium

[48] With strategic resilience, we mean the degree to which sectors have a strong domestic production position and/or relatively low dependence on imports, especially imports concentrated to come from one country.

[49] ECIPE (2020) "Key trade data for pharmaceutical supply chains", ECIPE, July 2020.

[50] Version 10 with base year 2014. See Aguiar et al. (2019).

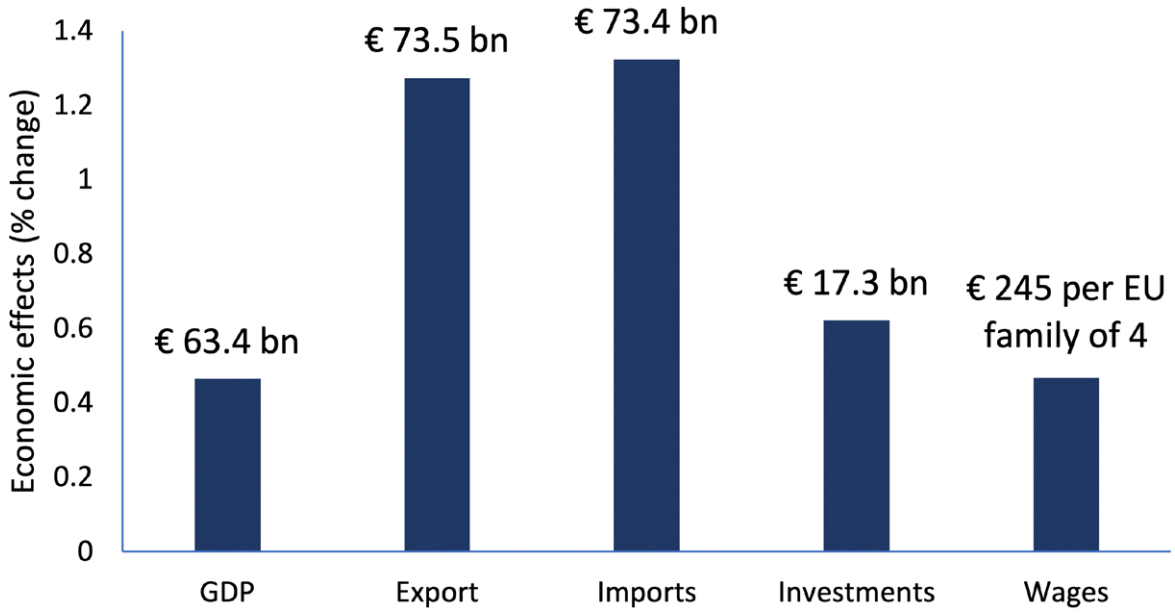
model (SEGE model) ensures consistency between the empirically-based estimates of the effects of trade agreements, and the subsequent modelling of those agreements. See Annex for a more detailed description.

We look at what happens if the EU would strengthen IP provisions in its FTAs – to the level provided for in EU law (e.g. around 10 years of RDP; 10 years for a trademark, 70 years after the death of an author for copyright). In 2011, the EU described the EU objective in terms of IP as follows: *"In negotiating FTAs, the IP clauses should as far as possible offer identical levels of IP protection to that existing in the EU…"*[51]. Modelling this scenario would lead to a larger effect, but given the fact the EU also adds: *"… while taking into account the level of development of the countries concerned"* (this is different from the US approach) this scenario could possibly overstate the likely effects from stronger IP provisions in EU FTAs.

Macro-economic Results

Our econometric estimations show very clear annual gains for the EU from stronger IP provisions in EU FTAs (Figure 5.3). What stronger IP provisions in EU FTAs do is make the EU a stronger innovation hub, strengthening global links and market access for IP-intensive exports, reducing trade costs for IP-intensive products, that – in turn – create IP-intensive export-related jobs inside EU Member States. The overall macro-economic effects are clear.

FIGURE 5.3: ANNUAL MACRO-ECONOMIC EFFECTS OF STRONGER IP PROVISIONS IN EU FTAS FOR THE EU

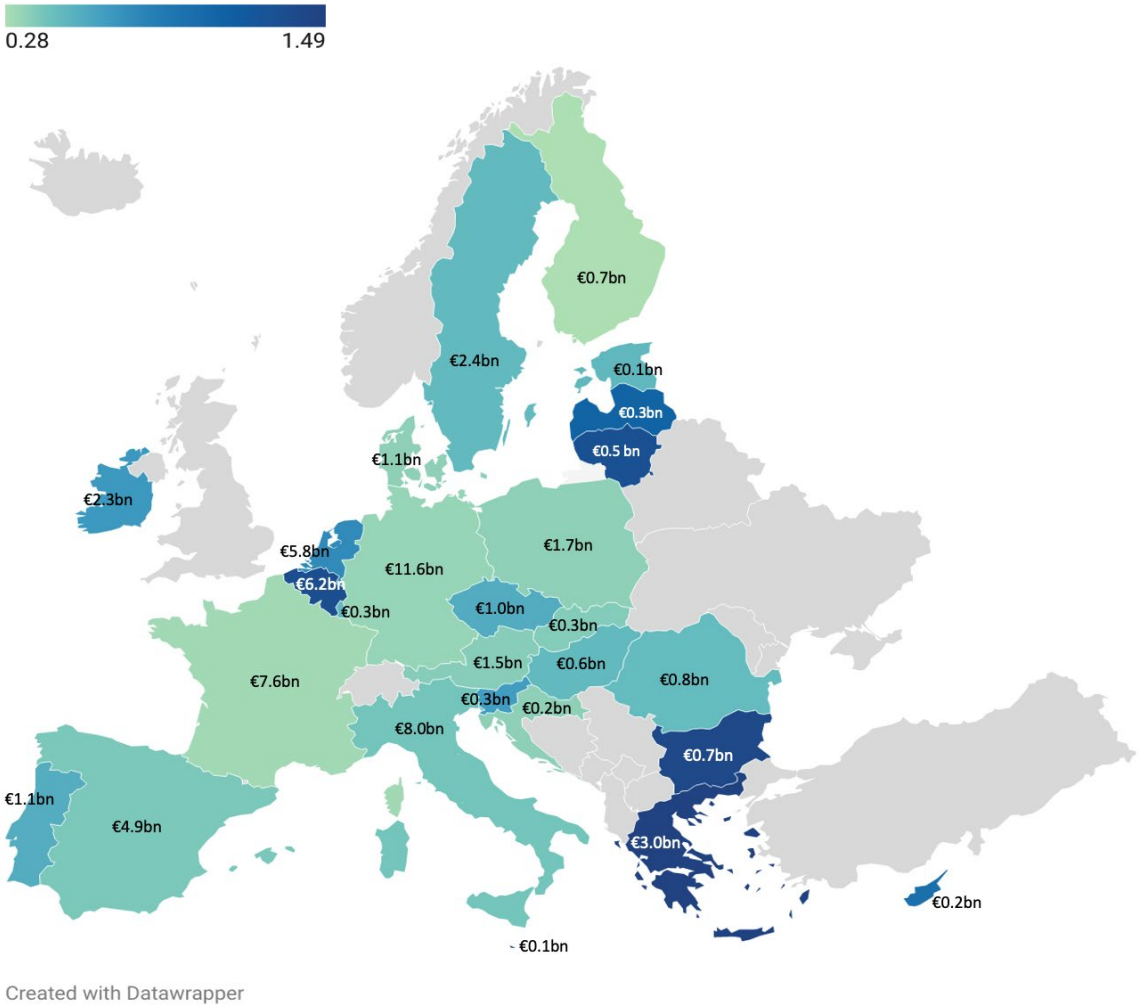


Source: GTAP10; author's calculations

[51] IP Protection in EU Free Trade Agreements vis-a`-vis IP Negotiations in the WTO by Souheir Nadde-Phlix.

First, EU GDP would be €63.4 billion higher each year (0.4%) compared to a situation without stronger IP provisions. EU total exports would go up by €73.5 billion a year (1.3%) and imports would increase by roughly the same absolute and amounts. Because IP-intensive industries create higher levels of value added (see Section 3.2) and create higher-quality, higher-paid jobs, wages in the EU would go up. An average EU family of four (parents and two children) would earn €245 more per year. This amounts to €23.6 billion annually in higher wages paid across the EU. Investments would go up by €17.3 billion annually for the EU.

FIGURE 5.4: IMPACT OF STRONGER IP ON EU MEMBER STATE GDP (% CHANGE AND SELECTED € CHANGE).



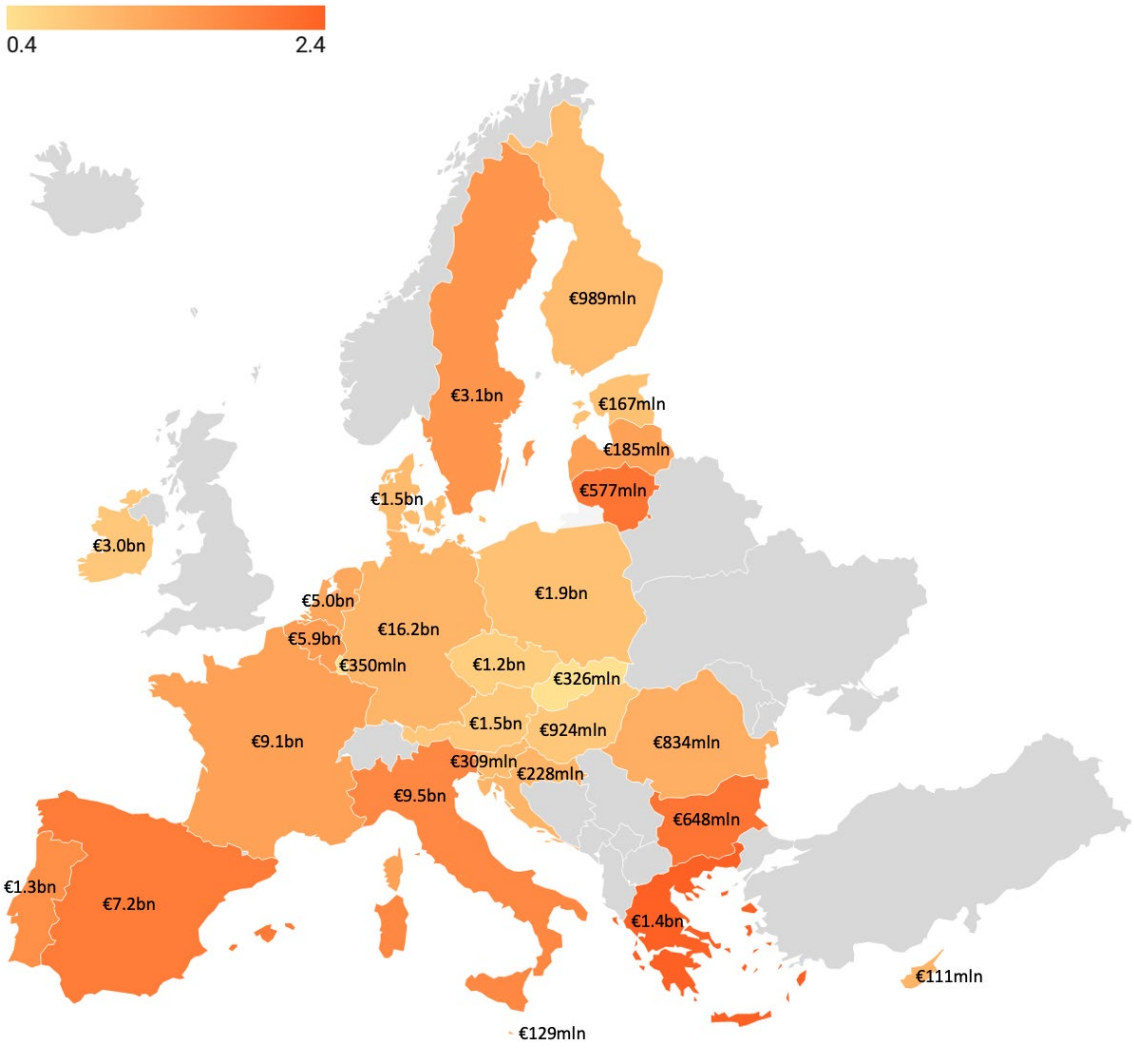
Source: GTAP10; author's calculations

In Figure 5.4, we show how the EU total GDP effect of €63.4 billion is divided across EU Member States. We see that the largest relative increases in GDP (in %) would take place in Greece (+1.5%), Malta (+1.4%), Bulgaria (+1.4%), Belgium (+1.3%) and Lithuania (+1.3%). The largest GDP increases in absolute terms (i.e. in Euros) would happen in Germany (€11.6 billion each year), Italy (€8.0 billion each year), France (€7.6 billion each year), Belgium

(€6.2 billion each year) and The Netherlands (€5.8 billion each year). Even though the relative and absolute GDP effects differ across EU Member States, all EU Member States benefit from stronger IP provisions in EU FTAs.

In Figure 5.5, we show how the EU export effect of €73.5 billion is divided across EU Member States. We see that the largest relative increases in exports would take place in Greece (+1.5%), Lithuania (+1.4%), Bulgaria (+1.4%), Spain (+1.3%) and Italy (+1.3%), whereas relatively the lowest increases would happen in Luxembourg and Slovakia. The largest export increases in Euro's happen in Germany (€16.2 billion each year), followed by Italy (€9.5 billion each year), France (€9.1 billion each year), Spain (€7.2 billion each year), and Belgium (€5.9 billion each year). Even though the export effects vary across EU Member States, all of them benefit in terms of exports from stronger IP provisions in EU FTAs.

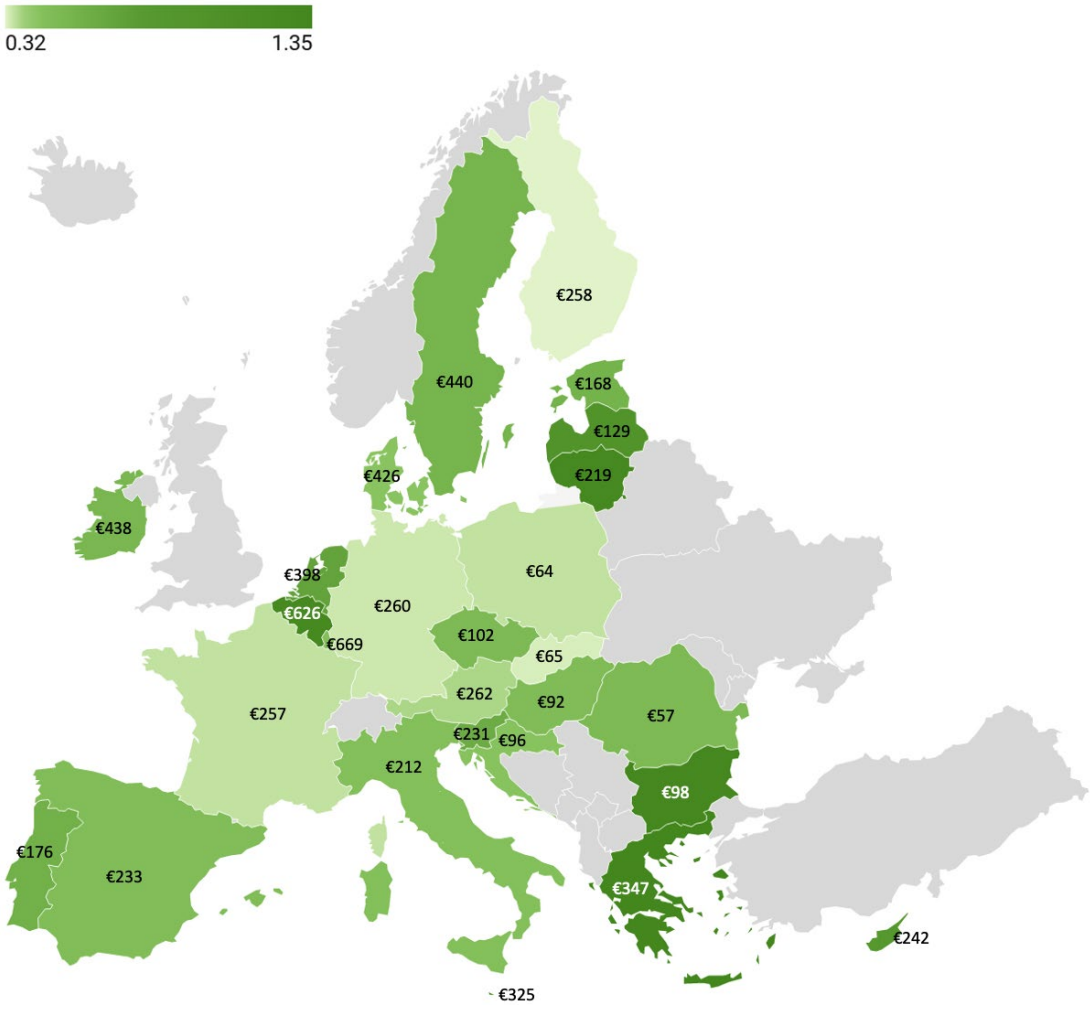
FIGURE 5.5: IMPACT OF STRONGER IP ON EU MEMBER STATE EXPORTS (% CHANGE AND € CHANGE).



Source: GTAP10; author's calculations

In Figure 5.6, we show the effect of stronger IP provisions in EU FTAs for investments across the different EU Member States. We find that the largest relative increases would occur in Greece (+1.9%), Malta (+1.8%), Bulgaria (+1.6%), Lithuania (+1.6%) and Belgium (+1.5%). If we look at the total investment effects – not in relative changes but in total Euro terms – we find that the largest investment gains would accrue to Germany (€3.4 billion each year), France (€2.5 billion each year), Belgium (€1.9 billion each year), Italy (€1.7 billion each year) and Spain (€1.4 billion each year). This is the total investment effect that consists of very small levels of divestment away from non-IP intensive sectors plus a significant increase in investments in IP-intensive industries.

FIGURE 5.6: IMPACT OF STRONGER IP ON EU MEMBER STATE INVESTMENTS (% CHANGE AND € CHANGE).



Source: GTAP10; author's calculations

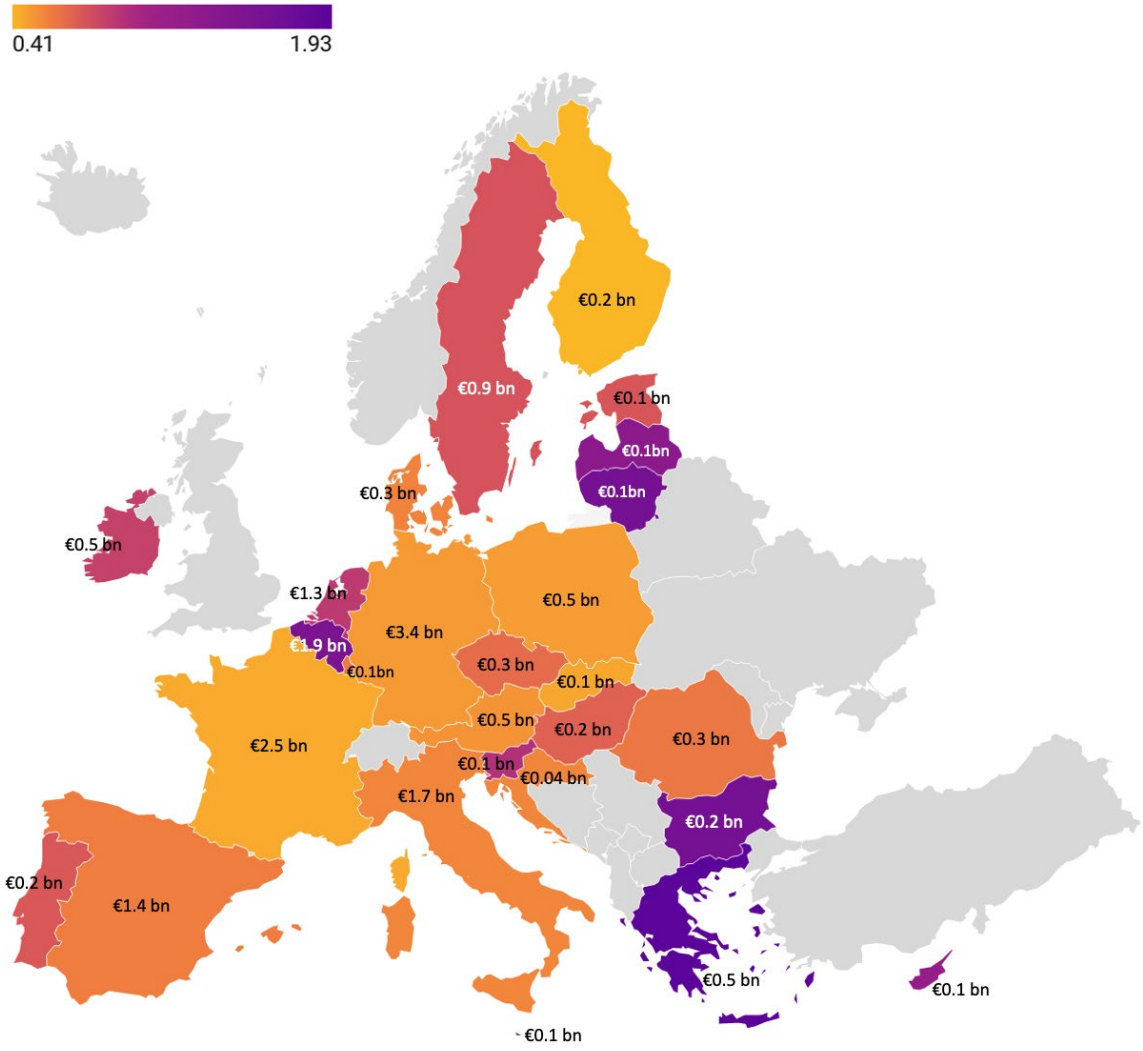
These investment effects are in line with effects found by Francois (2021) where he looks at the effect of including an IP Chapter in EU FTAs on investment using a gravity regression approach.[52] He finds that inclusion of a substantive (general) IP chapter in EU FTAs has

[52] Francois, J. (2021) "Investment effects of stronger pharmaceutical IP provisions in EU FTAs", May 2021.

led to 7.4% higher levels of bilateral investment in the EU and EU FTA partner countries than would have been the case without the IP Chapter. He also finds that adding a strong services chapter – because a lot of IP effects are linked to services – also has a very strong positive effect on investments.

Finally, in Figure 5.7 below, we show the impact on wages for an average EU family of four (two parents and two children). The average increase across the EU would be €245 per family per year, but there are differences across EU Member States. In Greece wages would be 1.4% higher each year, in Malta, Bulgaria, Lithuania and Belgium 1.3% higher. Because baseline salaries differ a lot across EU Member States, in absolute terms, a Luxembourg family would gain €501 per year, a Danish family €355 per year, an Irish family €288 per year and Finnish and Swedish families €276 per year.

FIGURE 5.7: IMPACT OF STRONGER IP ON EU MEMBER STATE WAGES (% CHANGE AND € CHANGE).



Source: GTAP10; author's calculations

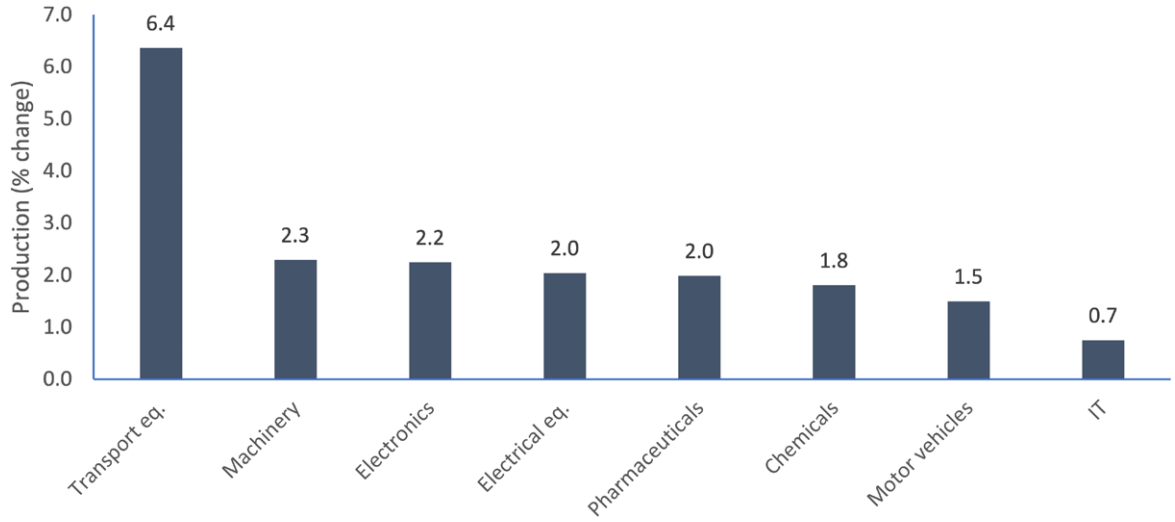
5.3. EU Sectoral Effects of Stronger IP Provisions in EU FTAs

At sectoral level for the EU in total, we also find clear effects from stronger IP provisions in EU FTAs when we look at exports, production (output), and employment.

Sectoral Production Effects

As a consequence of stronger IP provisions in EU FTAs, production in the EU would increase for key IP-intensive sectors because the IP provisions in EU FTAs give EU based companies and/or affiliates access to a more predictable global level playing field provided by the EU's trade network (see Figure 5.8). Also, barriers to IP-intensive exports come down because of these novel IP provisions. The largest relative gains accrue to transport equipment, machine, electronics and electrical equipment sectors. Pharmaceutical, chemical and motor vehicle production in the EU would also increase by around 2% pointing towards the fact that stronger IP in EU FTAs will lead to a higher degree of strategic resilience for the EU economy for these strategic sectors. The processed food sector is impacted by GIs and benefits from them. Because GIs apply only to a small subsector of the sector, in Figure 6.8 this sector has a mixed colour.

FIGURE 5.8: SECTORAL PRODUCTION EFFECTS FROM STRONGER IP PROVISIONS IN EU FTAS

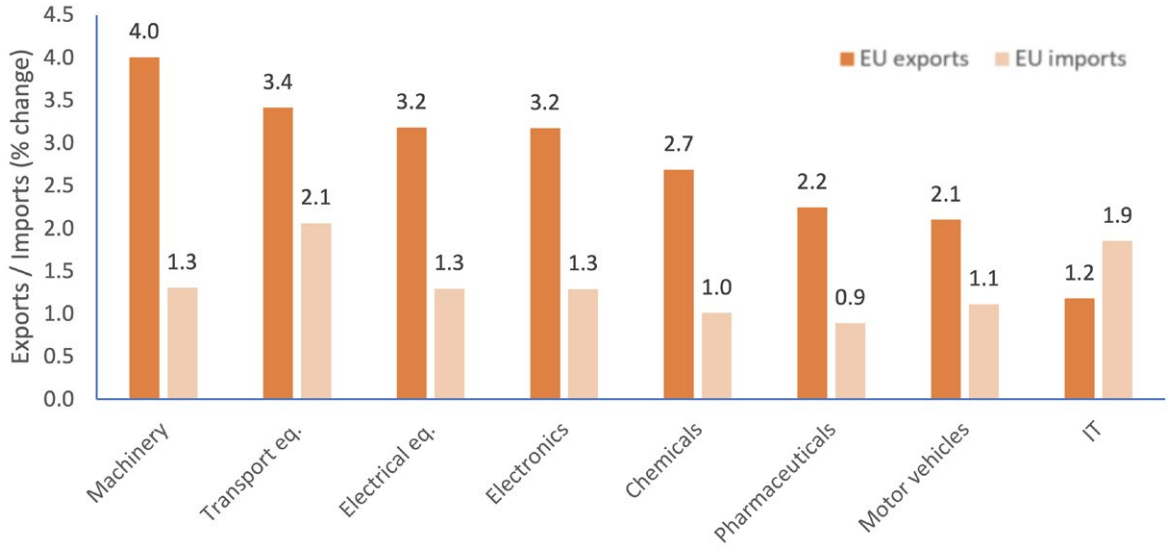


Source: GTAP10; author's calculations

Sectoral Trade Effects

Machinery, transport equipment, electrical equipment, electronics, chemicals and pharmaceuticals exports grow between 4.0% and 2.5%. For most IP-intensive industries, exports grow faster than imports, which suggests the EU will improve its trade balance regarding IP-intensive goods and become more resilient (i.e. strengthens its export position vis-à-vis imports).

FIGURE 5.9: SECTORAL TRADE EFFECTS FROM STRONGER IP PROVISIONS IN EU FTAS

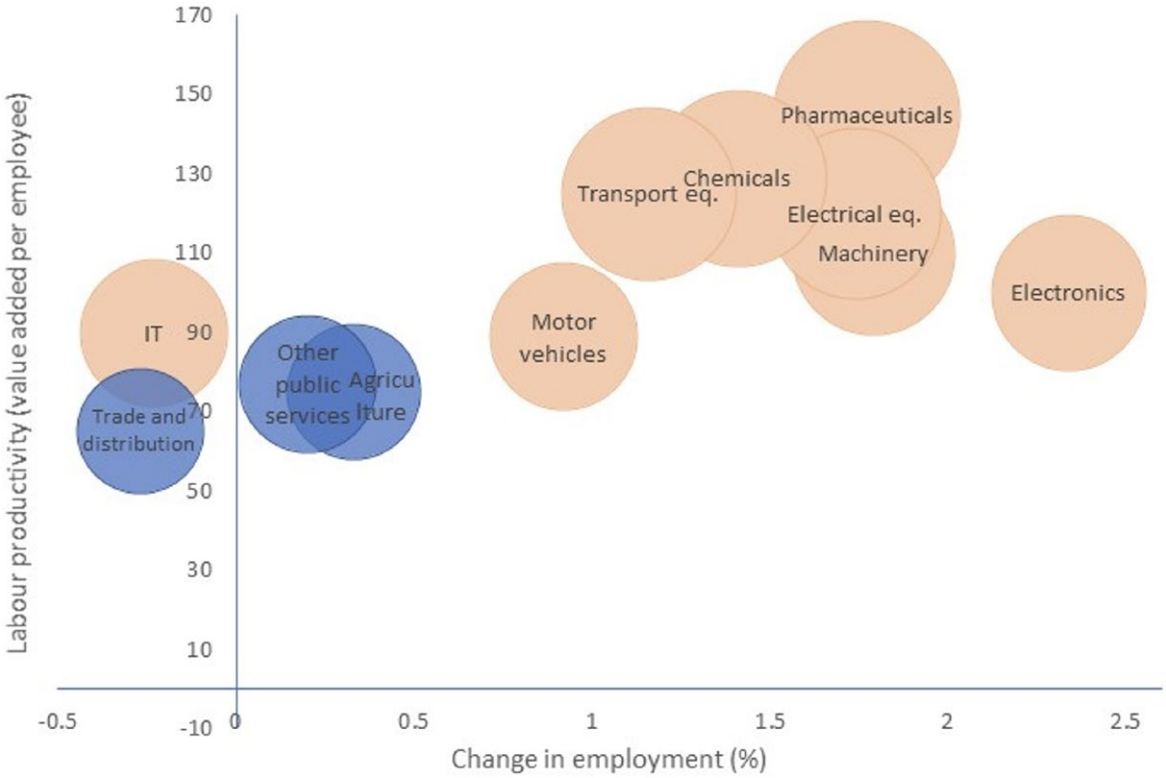


Source: GTAP10; author's calculations

Sectoral Employment Effects

For the most important IP-intensive sectors, except for Telecom & IT, we see that employment increases when the EU strengthens its IP provisions in EU FTAs because jobs are created for IP-intensive exports. For most sectors (except for electronics), production rises faster than employment, which suggests the creation of high value-added and highly productive jobs for the EU economy. Figure 5.10 shows the employment changes (% change on the horizontal axis) while on the vertical axis we show the labour productivity (value added per employee) as a proxy for the wages and productivity level of jobs created. The most significant increases in employment occur in electronics, machinery and pharmaceuticals. These are also sectors with relatively high levels of labour productivity – implying that not just average jobs, but high-productivity, high-paying jobs are being created into the EU economy. The reason we see a small negative employment effect for 'Telecom and IT' could be due to the fact the model underestimates the effect on Telecom and IT because it focuses on cross-border trade and underestimates Mode 3 commercial presence effects. Another reason could be that the EU does not have a comparative advantage in IT sectors so expansion of trade due to IP provisions in EU FTAs (see previous paragraph) is not translated into greater employment due to the 'sorting effect' – the effect that other more competitive sectors draw workers and other resources like capital away from the less competitive sectors in the EU.

FIGURE 5.10: SECTORAL EMPLOYMENT EFFECTS OF STRONGER IP IN EU FTAS



Source: GTAP10; author's calculations

5.4. Types of IP Provisions and Impact on IP-intensive Trade in Goods

After having looked at the macro-economic and sectoral effects of stronger IP provisions in EU FTAs, it is important to look deeper into exactly *which* types of IP provisions are most important to reach the macro-economic and sectoral effects that were described. To look at the extent to which specific IP provisions in FTAs are associated with trade in IP intensive goods and services, we developed a methodology, based on Maskus and Ridley (2016).[53] The link in EU FTAs between IP provisions and trade is very important and will be further explored in this section. This importance is not only due to an effect on exports, but also because IP supports broader policy goals. For example, to tackle climate change in the EU via the Green Deal, innovation in renewable energy and environmental goods – most often IP-intensive – is vital. Without innovation (i.e. assuming no further innovation will take place in environmental goods and processes) the EU cannot meet its 2030 and 2050 environmental policy goals. Moreover, with support from trade in environmental goods with the EU via EU FTAs, especially developing nations have a much higher chance of addressing climate change challenges as well, increasing the EU's positive global impact in climate change mitigation.

[53] Maskus, K.E. and W. Ridley (2016) "Intellectual Property-Related Preferential Trade Agreements and the Composition of Trade", RSCAS Working Papers 2016/35, European University Institute.

We use the same 12 IP-intensive sectors that were defined earlier[54] and employ the DESTA database to look at different types of IP provisions in FTAs, focusing on: patents, trademarks, industrial designs, lay-out designs, copyrights, geographical indications and plant variety rights. We choose not to report the effects of geographical indications and plant variety rights because a detailed assessment of sectors that are GI/PVR intensive revealed that only a small sub-set of these sectors is reliant on GIs/PVRs. Because only aggregate data are available, it is not possible to capture a meaningful impact of these two types of IP provisions on trade. We do, however, show indirectly the effect of 'other IP rights' (that are dominated by geographical indications) by comparing the trade effects of IP overall with the main types of IP specified.

Using this novel econometric approach (see Annex for the full details), we derive several important results.

- FTAs with IP provisions are associated with greater levels of exports in IP-intensive goods and services.
- There is a marginal negative effect of FTAs with IP provisions on exports in non-IP-intensive goods and services (that are much offset by the increase in IP-intensive goods and services). Markus & Ridley (2016) call this the 'sorting effect' where resources are allocated towards the IP-intensive sectors.
- Greater market size is associated with greater levels of IP-intensive exports. This is corroborated by the significant IP-intensive exports of the EU (with a larger Internal Market) and the US, as well as the rising relevance of IP-intensive exports for China.
- Inclusion of basic TRIPS references in FTAs have a marginally positive (and statistically weakly significant) effect on IP-intensive exports only. Because the TRIPS agreement is the minimum standard on IP commitments for all WTO members, this was expected: TRIPS provisions do not distinguish an FTA from more general practice for WTO members.
- Different types of IP have different effects on exports of IP intensive goods as shown in Figure 6.11. The largest positive impact comes from patent and patent-related (e.g. SPC) provisions, followed by the effects of trademarks, industrial designs and lay-out designs. The effect of copyrights on exports may be limited (in part because many other regulations apply for sectors where copyright matters, like data, platforms, and Mode 1 regulations).

When we split the overall FTA effects into EU FTAs and 'Other' FTAs (where Other FTAs are all FTAs that do not have the EU as a party to them), we see that the results change a bit (Figure 5.12).

[54] See Section 3.2: pharmaceuticals, scientific R&D, electronics, motor vehicles, chemicals, machinery, electrical equipment, transport equipment, other manufacturing, IT services, telecommunications, and architectural & engineering services

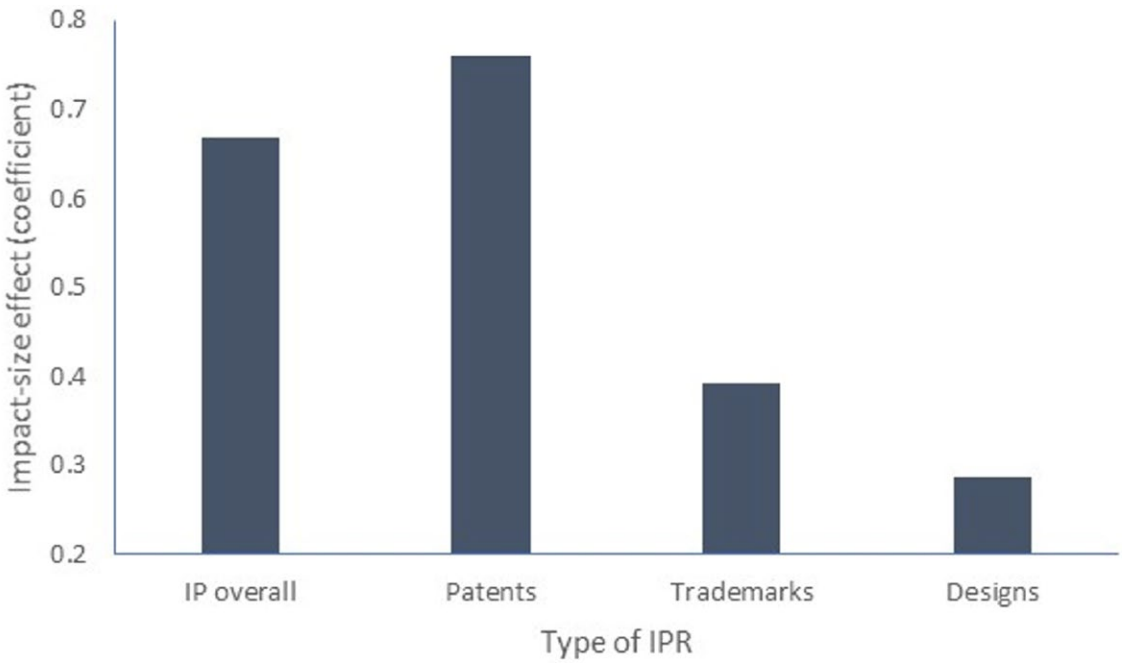
Based on the split of FTAs between EU FTAs and 'Other' FTAs, we gather some interesting insights:

- First, we find that FTAs with IP provisions are associated with greater levels of exports in IP-intensive goods and services, but, overall, much more for the EU FTAs than for Other FTAs ('IP' column in Figure 5.12).

- Second, we find that there is a marginal negative effect of FTAs with IP provisions on exports in non-IP-intensive goods and services (that are much offset by the increase in IP-intensive goods and services). This effect is, however, smaller for EU FTAs than for Other FTAs.

- Third, inclusion of basic TRIPS references in FTAs have a marginally positive (statistically weakly significant) effect on IP-intensive exports only. Because the TRIPS agreement is the minimum standard on IP commitments for all WTO members, this was expected: TRIPS provisions do not distinguish an FTA from more general practice for WTO members.

FIGURE 5.11: IMPACT COEFFICIENTS PER TYPE OF IP ON IP-INTENSIVE EXPORTS FOR ALL FTAS (2005–2015)

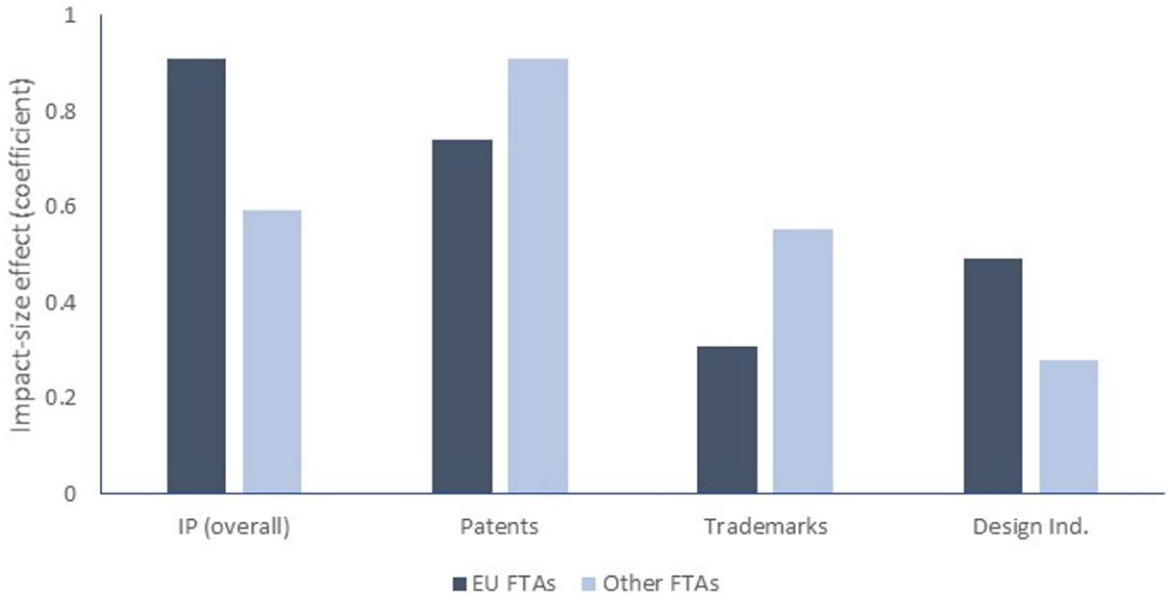


Source: OECD, DESTA database

- Fourth, as before, different types of IP have different effects on exports of IP intensive goods as shown in Figure 5.12. The econometrics show that EU FTAs are relatively weak in their trade-enhancing effect for patent provisions and trademark provisions. EU FTAs, in comparison, are leading to stronger IP-intensive trade effects for industrial design IP provisions:
    - Though the largest positive trade impact comes from patent and patent-related (e.g. SPC) provisions for both the EU and Other FTAs, when we compare EU to Other FTAs, we find that the kind of patent provisions the EU has in its FTAs lead to a smaller increase in IP-intensive exports than the patent provisions in Other FTAs. Patent and patent-related provisions are therefore found to be relatively weak in EU FTAs in comparison. This econometric finding is corroborated by the FTA provision analysis carried out in the previous Chapter – where we showed the EU has a relatively low number of patent and patent-related provisions in its FTAs.
    - This effect – at a lower trade increasing level – is also clear for trademarks: trademark provisions in EU FTAs are much weaker and lead to much lower levels of increases in IP-intensive exports than in Other FTAs. When looking at trademark provisions in Other FTAs, we see that trademark provisions occur much more frequently in US FTAs (e.g. US-Korea, US-Peru, US-Oman, US-Morocco), Japan FTAs (e.g. CPTPP, Japan-Switzerland) and various other FTAs (e.g. Korea-Australia FTA, Korea-New Zealand FTA, Colombia-Korea FTA).

- Finally, the fact that, overall, EU FTAs are associated with much larger IP-intensive exports than Other FTAs, even though this is not the case for patent provisions and trademark provisions, can be explained in various ways. First, methodologically, the inclusion of 'other manufacturing' in the overall IP column (but not the specific types of IP column) could explain the effect as the EU has a strong comparative advantage in this sector. Second, GIs and PVRs have been excluded from the analysis for sector-disaggregation (data accuracy) reasons. Their effects could be contributing, however, to the overall strong effect of IP provisions in EU FTAs on IP-intensive exports (although this result should be taken with caution because it is not straightforward to clearly teas out the GI- and /or PVR effects).

FIGURE 5.12: IMPACT COEFFICIENTS PER TYPE OF IP ON IP-INTENSIVE EXPORTS (2005–2015)



Source: OECD, DESTA database

5.5. Third Country Effects of Stronger IP Provisions in EU FTAs

Stronger IP provisions in EU FTAs are evidently economically beneficial for the EU overall and all EU Member States (in terms of GDP, exports, imports, investments, family wages as well as sector-level trade, production and jobs). The effects for third countries of stronger IP provisions in EU FTAs vary because they depend on whether or not the third country has a trade agreement with the EU and – if so – what the current level of IP protection in the FTA is. The simulation is looking to increase the strength of EU FTAs to the level of that provided for in EU law. This means that:

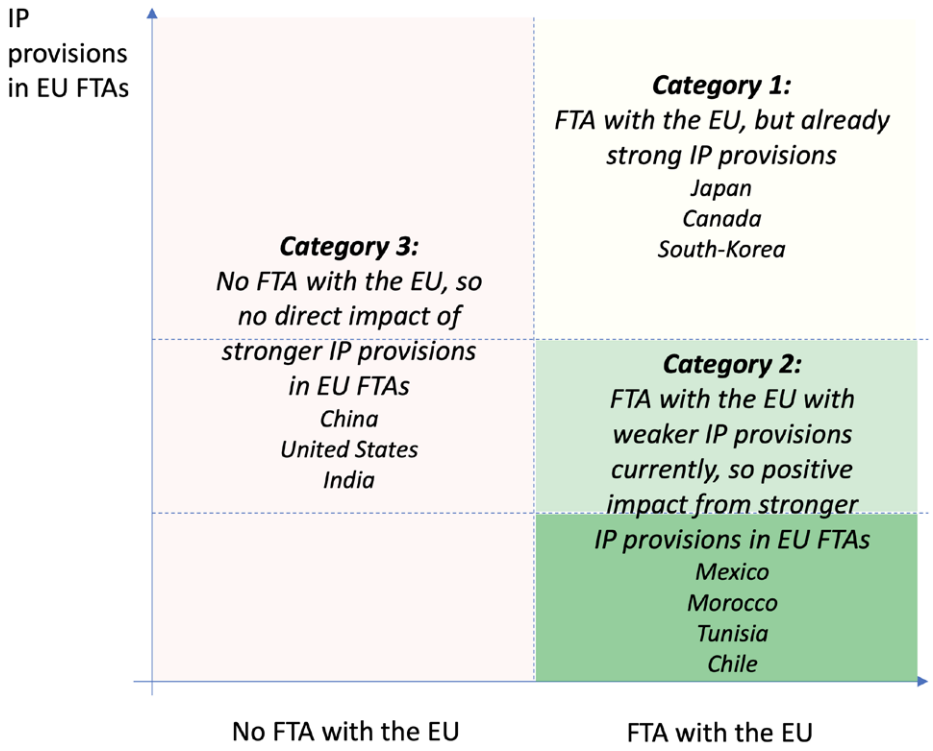
- For countries like Canada or Japan, there is a marginal increase in IP provisions in EU FTAs modelled, because they already have strong IP provisions. This means that with other countries increasing the strength of their IP provisions, they could marginally lose out compared to those countries that gain. This would be Category 2 type third countries (see Figure 6.13).

- For countries like Chile, Mexico, Morocco, Tunisia, an increase the strength of IP provisions in EU FTAs is modelled, because while they have currently an FTA with the EU, in those FTAs IP provisions are much weaker than those provided for under EU law. This would be Category 2 type third countries (see Figure 6.13).

- For countries like the US and China, there is no possibility for strengthening IP provisions in an EU FTA because these countries do not have FTAs with the EU, so they do not benefit economically from stronger IP provisions. In fact, relatively speaking, they will lose out vis-à-vis countries that do have FTAs and that do benefit from stronger IP provisions. This would be Category 3 type third countries (see Figure 6.13).

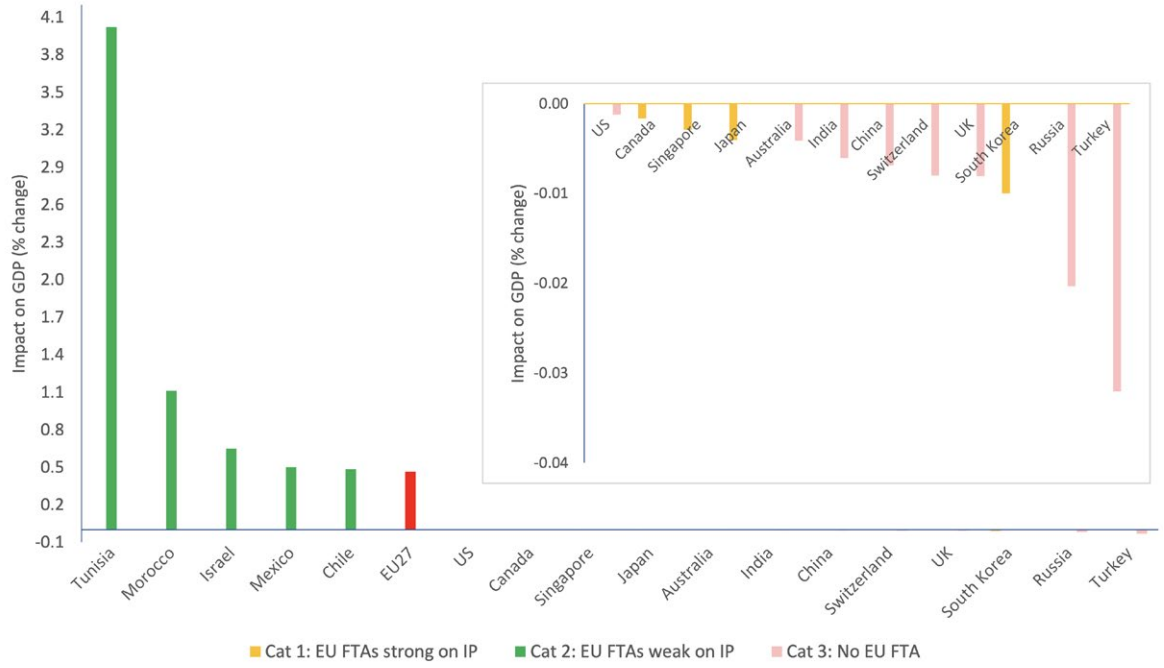
Figure 5.13 shows conceptually how some of the key EU trading partners can be grouped into these three categories.

FIGURE 5.13: THIRD COUNTRY CATEGORIES



If we look at the effect of stronger IP provisions in EU FTAs for third countries, we find – as shown in Figure 5.14 – that for those countries with EU FTAs without strong IP provisions, GDP gains are considerable (e.g. a 4.0% increase in GDP for Tunisia and a 0.5% increase for Mexico). For countries with already strong provisions in EU FTAs (e.g. Singapore, Canada, Japan) there is no GDP effect because IP provisions are not strengthened.

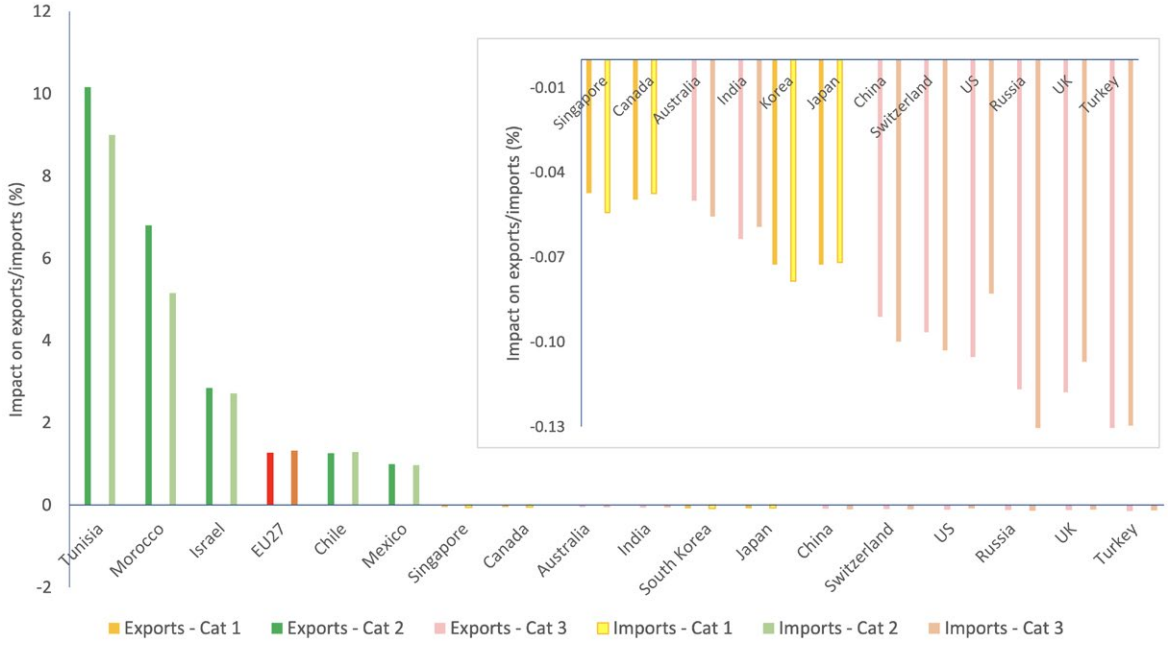
FIGURE 5.14: IMPACT OF STRONGER IP PROVISIONS IN EU FTAS ON GDP IN THIRD COUNTRIES



For countries without an EU FTA (e.g. the US, Russia, India, but also Turkey with a Customs Union that is not updated yet), the GDP effects are marginally negative, because more IP intensive (high-value added) trade occurs between the EU and its FTA partners instead of with no-FTA third countries. The difference in the effect on GDP between countries that get stronger IP provisions in EU FTAs (category 2) and the countries who do not have EU FTAs shows the economic potential of signing an EU FTA with a strong IP chapter for countries like Australia, India, New Zealand, Indonesia or for upgrading the existing EU FTA for countries like Mexico, Morocco, Tunisia, and Chile. Also inclusion of a strong IP chapter would matter for countries who have different relationships with the EU like Turkey and Switzerland. Talks on the CU's modernization could foster Turkey's alignment with the EU on the legal framework, as well as the enforcement of the IP.

If we look at export and import effects for third countries, Figure 5.15 shows that again countries with EU FTAs with weaker IP provisions would gain most if the level of IP protection is increased to the level provided for in EU law (e.g. for Israel, Morocco, Mexico, Chile). For third countries without an FTA with the EU and those with already strong IP chapters in EU FTAs the effects are marginally negative in both exports and imports.

FIGURE 5.15: IMPACT OF STRONGER IP PROVISIONS IN EU FTAS ON EXPORTS AND IMPORTS IN THIRD COUNTRIES



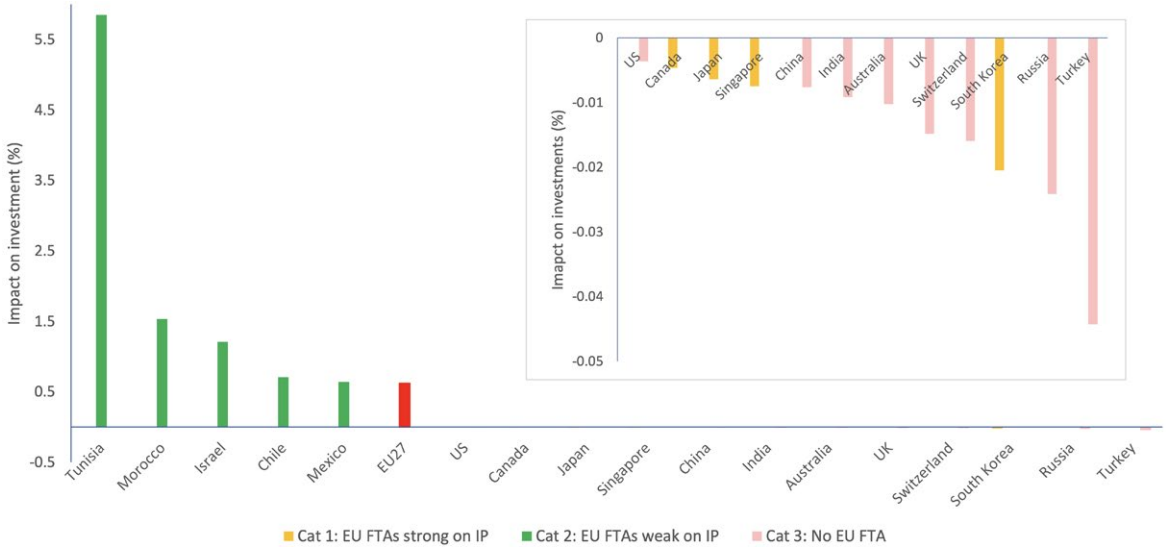
The picture for investments (Figure 5.16) is very similar: all countries with EU FTAs with weaker IP provisions stand to gain (up to 6% each year) in extra investments if IP provisions are strengthened. But countries that do not have an FTA with the EU would not benefit. Neither do countries that already have strong IP provisions.

These results show the investment potential for countries who do not yet have an FTA with the EU (or who are negotiating an FTA upgrade): for Australia, New Zealand, Indonesia, Chile, Mexico and others, investments are expected to go up significantly if they sign a bilateral FTA with strong IP provisions to the level provided for in EU law. These data also suggest that these investment effects do not occur to the same degree for countries who sign FTAs with weak IP chapters, like the Mercosur countries.

These investment effects are also found by Francois (2021) where he looks at the effect of including an IP Chapter in EU FTAs on investment by means of a gravity regression methodology.[55] He finds that inclusion of a substantive (general) IP chapter in EU FTAs has led to 7.4% higher levels of bilateral investment in the EU and EU FTA partner countries than would have been the case without the IP Chapter. He also finds that specific pharmaceutical IP provisions, notably regulatory data protection (RDP) and patent term restoration (PTR) add 2.0% and 0.7% to overall investments on average, on top of the IP Chapter effect. The standard TRIPS provisions, because they are already the minimum standard for WTO members, do not have a positive impact on investments.

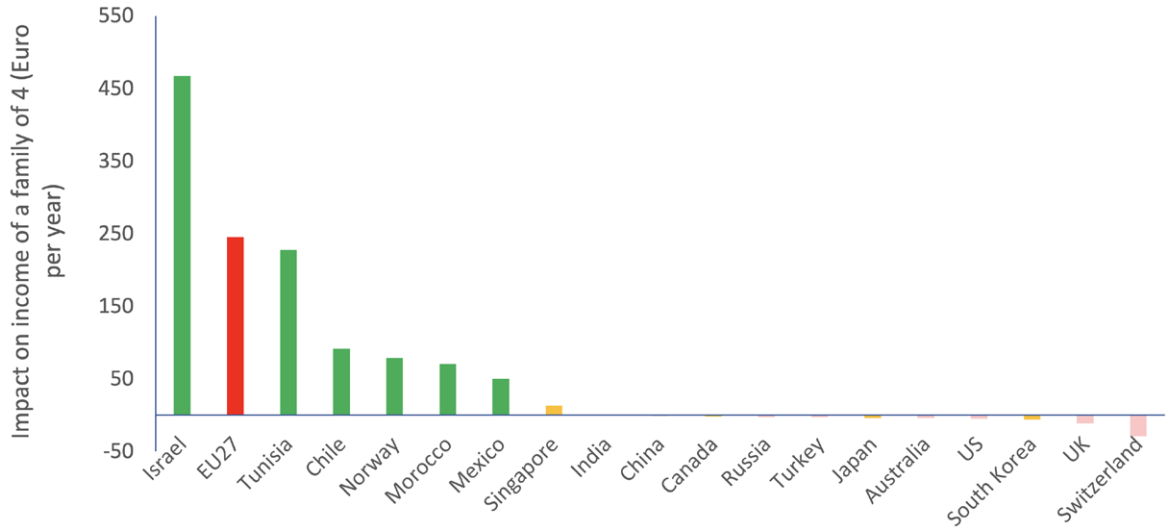
[55] Francois, J. (2021) "Investment effects of stronger pharmaceutical IP provisions in EU FTAs", May 2021.

FIGURE 5.16: IMPACT OF STRONGER IP PROVISIONS IN EU FTAS ON INVESTMENTS IN THIRD COUNTRIES



Finally, we look at how the average family of 4 (two parents, two children) is impacted by stronger IP provisions in EU FTAs with third countries (see Figure 5.17). We see that in Israel, Tunisia, Chile and others, families benefit significantly from stronger IP provisions in FTAs with the EU. For countries where IP provisions are already close to the level of what is provided for in EU law and for those countries that do not have EU FTAs, families do not benefit.

FIGURE 5.17: IMPACT OF STRONGER IP PROVISIONS IN EU FTAS ON ANNUAL INCOME FOR A FAMILY OF FOUR



6. RELEVANCE OF IP FOR INDIVIDUAL ECONOMIES AND INSERTS ON KEY ANGLES TO IP

In this Chapter, we present:

- 2-pagers with key information on IP for all 27 EU Member States (in alphabetical order) as well as for third countries: Canada, India, Japan, Mexico, Russia, South Korea, Switzerland, Turkey, United Kingdom and United States
- Inserts from a wide range of authors that place the topic of IP in the broader context of: the industrial strategy, services, the Green Deal, SMEs, COVID-19, Sustainable Development Goals, innovative medicines, geographical indications and agriculture, the EU single market, and biodiversity.

6.1. Country 2-pagers: Relevance of IP and IP in EU FTAs

On each first page, we report key statistics that highlight the role of IP in the economy:

- Figure 1: IP intensive sector production and employment
- Figure 2: Economic relevance of each type of IP
- Figure 3: Value-added for IP-intensive sectors
- Figure 4: Labour-productivity for IP intensive sectors
- Figure 5: Index of SME R&D potential
- Figure 6: Investment per employee for IP intensive sectors

On each second page, we report key statistics that highlight the role of IP with regard to trade and EU FTAs:

- Figure 1: Total EU exports by IP intensity and FTA coverage
- Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage
- Figure 3: Exports by IP intensive sectors
- Figure 4: Relative IP score and share in global IP intensive exports
- Figure 5: Macro-economic effects of stronger IP in EU FTAs
- Figure 6: Exports, production and employment effects of stronger IP in EU FTAs

6.2. Inserts: Relevance of IP in a Broader Context

In order to highlight the relevance of IP from a broader perspective, a range of leading authors have contributed with their thoughts on the role of IP in key policy files:

- What is the role for IP in the EU Industrial Policy that aims to support global competitiveness of EU industry?
- How vital is a strong IP framework for pharmaceutical innovation, especially in a highly competitive post-COVID world?
- In what way is IP important to support the development of technologies that enable the Green Deal – a top EU policy priority?

- How important is IP especially for SMEs?
- Can IP help to combat biodiversity loss due to trade and if so, how?
- With most economic activity happening in services sectors, how important is IP for services?
- The sustainable development goals (SDGs) set an ambitious global agenda – how IP can contribute is an important element to discuss.
- One of the most successful EU types of IP are geographical indications and how they contribute to the EU's agriculture, both in terms of production and in terms of traditions.
- And finally, how important is IP in the current fight against the COVID-19 pandemic and what role does IP play?

The following inserts are spread in between the 2-page country reports in this Chapter:

- Insert 1: *The EU's Industrial Strategy: Blessing or Curse for Europe's Knowledge- and Intellectual Property-intensive Industries?*
  (author: Dr. Matthias Bauer, ECIPE)

- Insert 2: *Relevance of Intellectual Property for Pharmaceutical Innovation*
  (author: Mr. Maarten Meulenbelt, Sidley Austin LLP)

- Insert 3: *Intellectual Property and the European Green Deal*
  (author: Mr. Fredrik Erixon, ECIPE)

- Insert 4: *The Role of Intellectual Property for the Single Market and SMEs*
  (author: Mr. Fredrik Erixon, ECIPE)

- Insert 5: *Intellectual Property and Biodiversity*
  (author: Dr. Philipp Lamprecht, ECIPE)

- Insert 6: *Intellectual Property in Services Sectors*
  (author: Mr. Pascal Kerneis, European Services Forum)

- Insert 7: *The Role of Intellectual Property in Achieving the Health Sustainable Development Goal*
  (author: Prof. Dr. David Taylor, University College London)

- Insert 8: *IP in EU Agriculture: Geographical Indications*
  (author: Dr. Christian Häberli, World Trade Institute)

- Insert 9: *Intellectual Property and COVID-19*
  (author: Dr. Kevin Noonan, McDonnell Boehnen Hulbert & Berghoff LLP)

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Intellectual property matters for an economy like the Austrian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Austria. In Figure 2, we show how relevant different types of IP are for the Austrian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Austria as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how critical R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

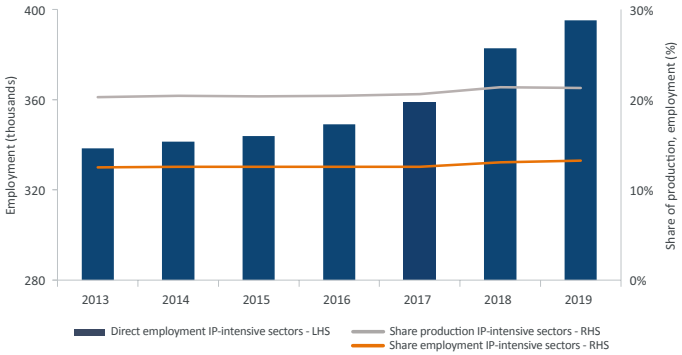


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

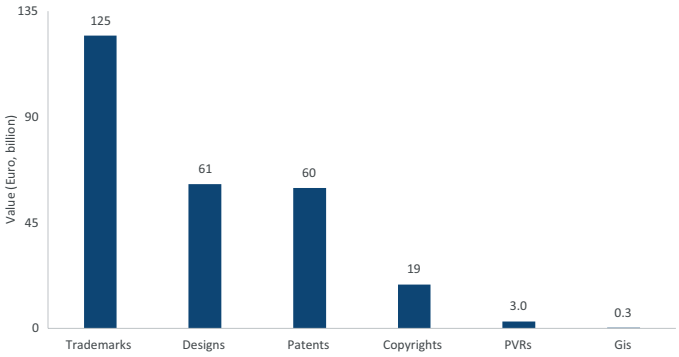


Figure 3: Value-added for IP-intensive sectors (2019)

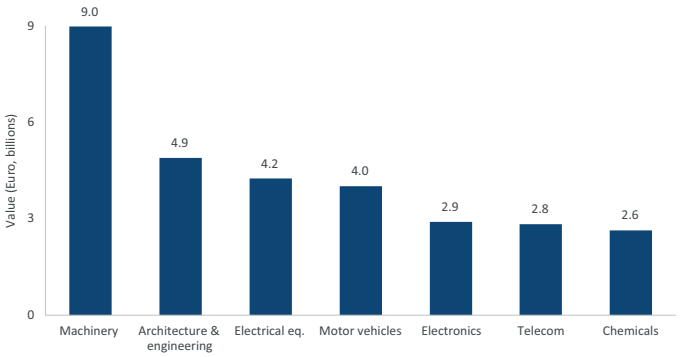


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

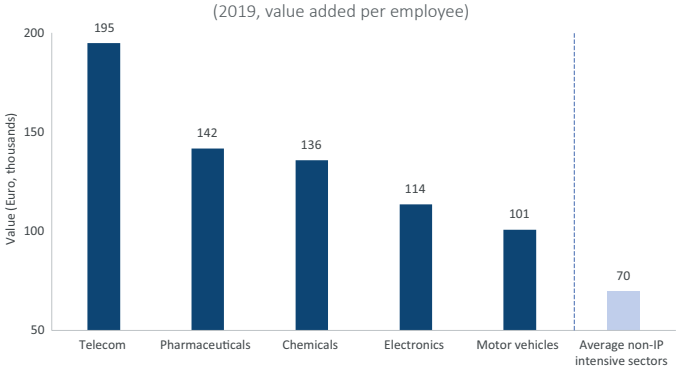


Figure 5: Index of SME R&D potential (2019)

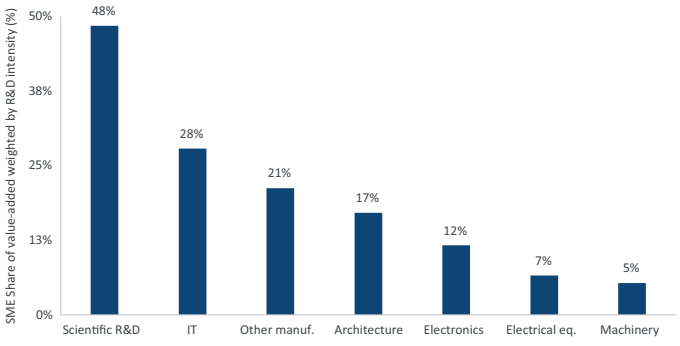
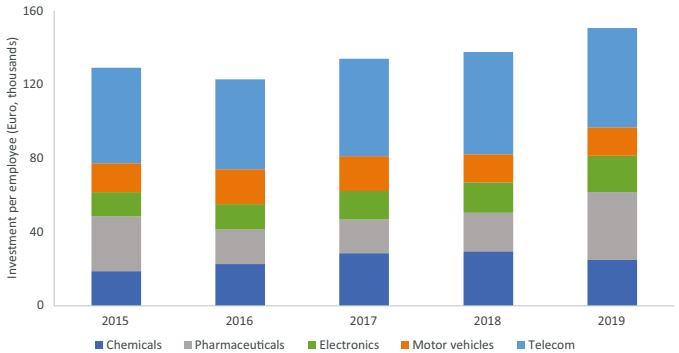


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)



Intellectual Property is highly relevant for the Austrian economy. The IP-intensive sectors in Austria employ more than 395 thousand workers directly, increasing since 2013, and represent 21% of total Austrian production (Figure 1). Trademarks (€125 bn), designs (€61 bn), and patents (€60 bn) are the most important types of IP for the Austrian economy (Figure 2). Most economic value in Austria is created by the machinery (€9 bn), architecture & engineering (€5 bn) and electrical equipment (€4 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Austrian economy (telecom, pharmaceuticals, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Austria is up to three times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, pharmaceuticals, and chemicals are the IP-intensive sectors with the highest levels of investment per employee in Austria (Figure 6). Austrian SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and IT services, but also other manufacturing and architecture & engineering (Figure 5).

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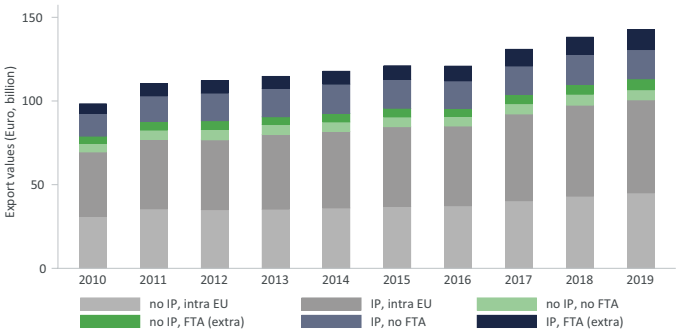
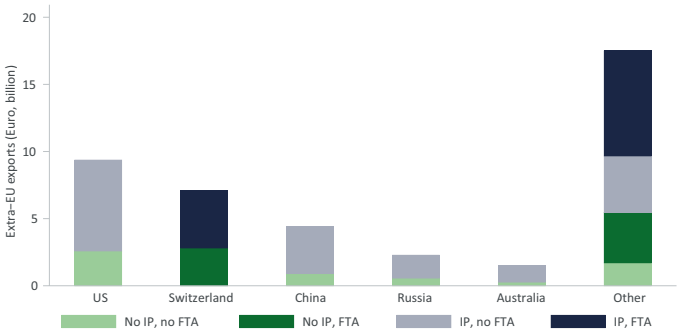
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Austrian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Austrian IP framework is related with the Austrian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Austria (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010-2019)



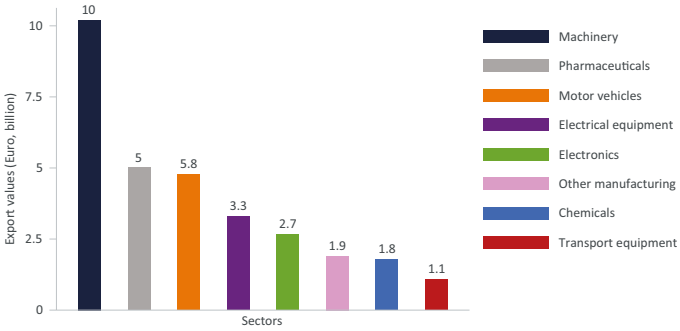
For Austria, the share of IP-intensive exports outside the EU has gone up from 20% in 2010 to 21% in 2019, but of those exports only 41% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



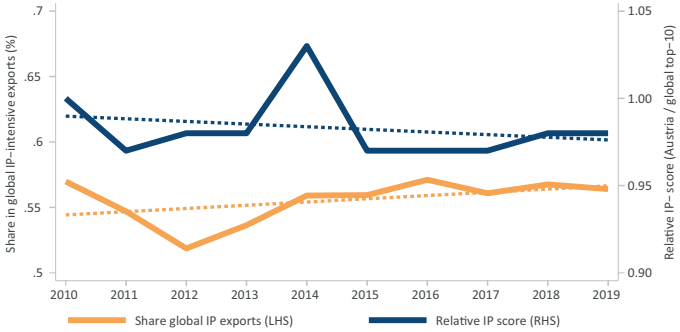
The US (€ 9 bn), Switzerland (€ 7 bn), China (€ 4 bn), Russia (€ 2 bn) and Australia (€ 2 bn) are the main Austrian export destinations. For these markets IP-intensive exports constitute 71% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



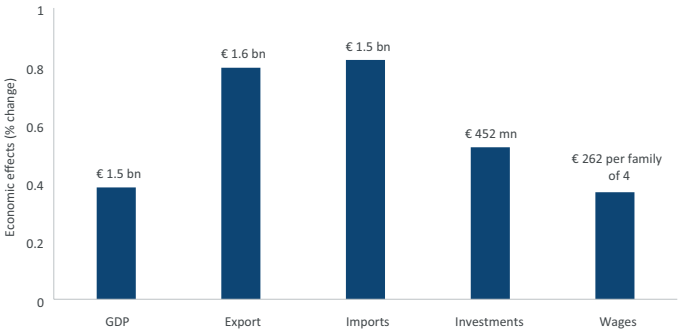
The top-8 IP-intensive manufacturing sectors together export € 31 bn in 2019 and contribute significantly to Austria's trade surplus. The largest Austrian export sectors that depend on IP are machinery (€ 10 bn) and pharmaceuticals (€ 5 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010-2019)



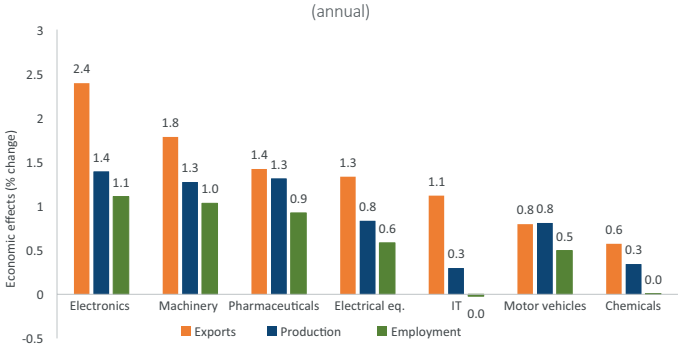
In recent years, Austria reports a slight decrease in its relative IP score compared to the global top-10. This corresponds to a small increase in Austria's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Austria. Austria's GDP, exports, and investments will be between 0.4% and 0.8% higher each year. The average Austrian family of four would benefit by €262 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Austria's IP-intensive sectors would support growth in exports (by 0.6 to 2.4%), increase resilience by boosting domestic production (by 0.3 to 1.4%), and create high value-added jobs for the Austrian economy

BELGIUM

Intellectual property matters for an economy like the Belgian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Belgium. In Figure 2, we show how relevant different types of IP are for the Belgian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Belgium as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

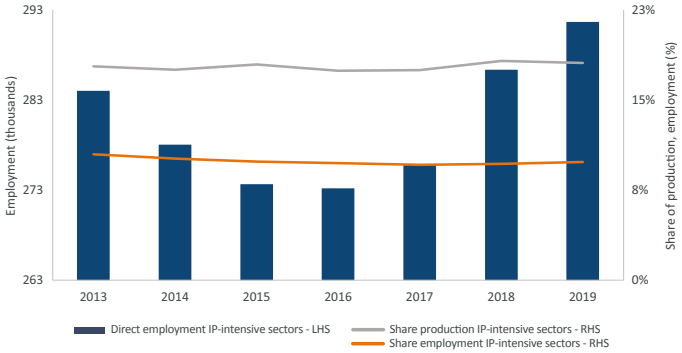


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

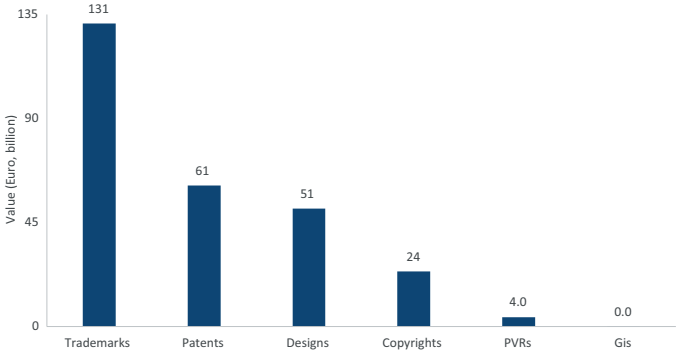


Figure 3: Value-added for IP-intensive sectors (2019)

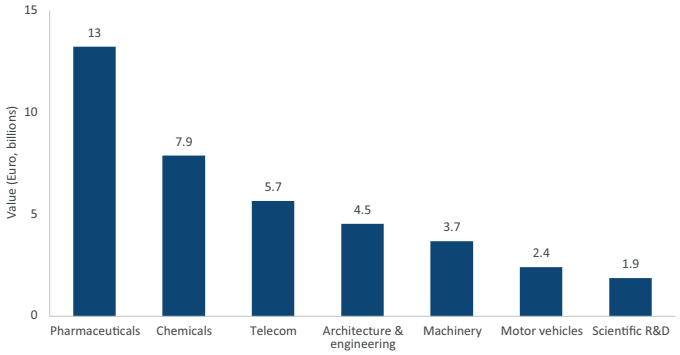


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

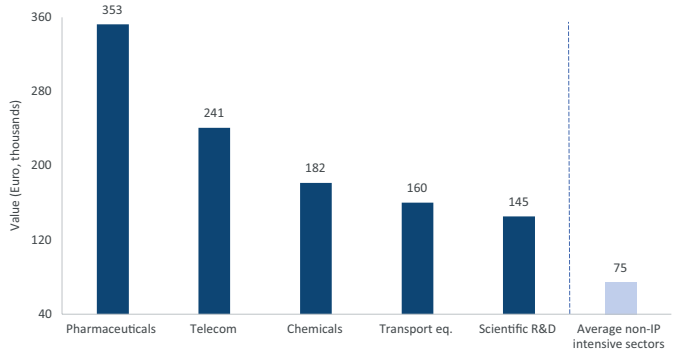


Figure 5: Index of SME R&D potential (2019)

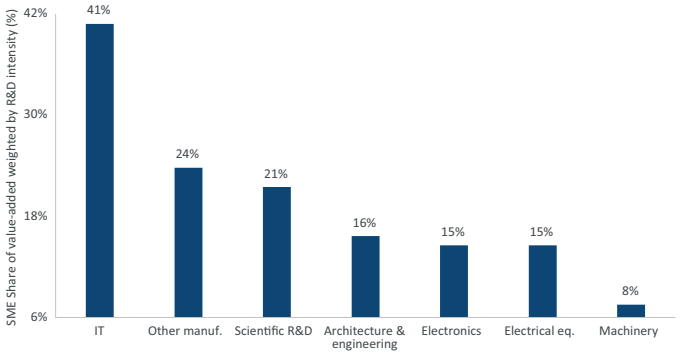
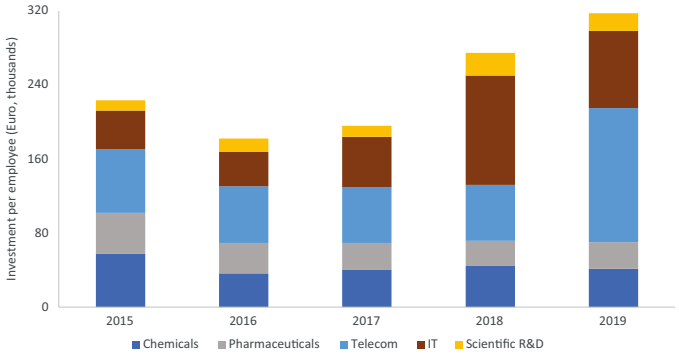


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)



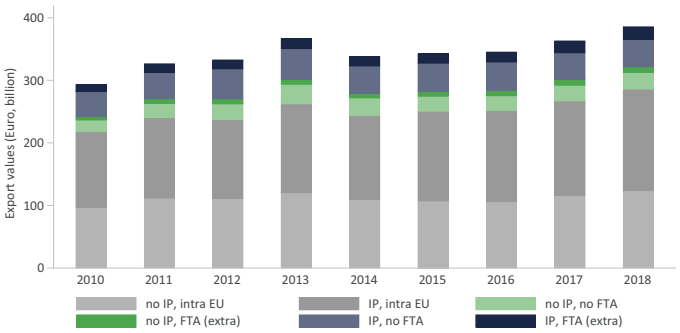
Source for employment data in the pharmaceutical sector Office national de sécurité sociale. Authors' calculations.

Intellectual Property is highly relevant for the Belgian economy. The IP-intensive sectors in Belgium employ more than 292 thousand workers directly, increasing slightly since 2016, and represent 18% of total Belgian production (Figure 1). Trademarks (€131 bn), patents (€61 bn), and designs (€51 bn) are the most important types of IP for the Belgian economy (Figure 2). Most economic value in Belgium is created by pharmaceutical (€13 bn), chemicals (€8 bn) and telecom (€6 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Belgian economy (pharmaceuticals, telecom, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Belgium is up to five times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, IT services, and chemicals are the IP-intensive sectors with the highest levels of investment per employee in Belgium (Figure 6). Belgian SMEs make a significant contribution to value-added in sectors with high R&D spending such as IT services and other manufacturing, but also in scientific R&D and architecture & engineering (Figure 5).

BELGIUM

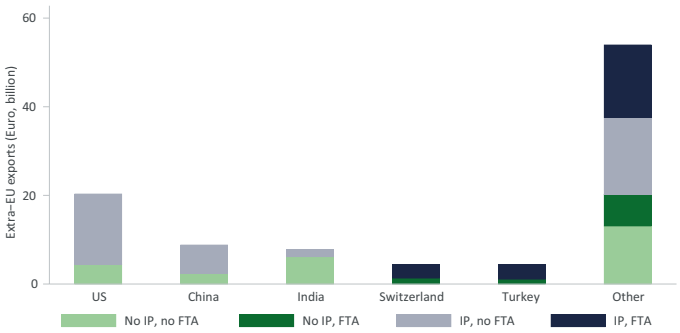
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Belgian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Belgian IP framework is related with the Belgian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Belgium (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP-intensity and FTA coverage (2010- 2018)



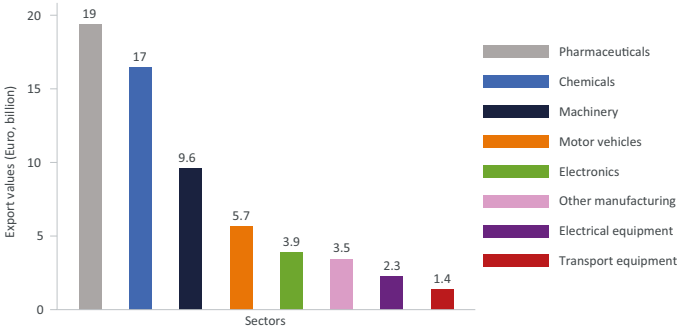
For Belgium, the share of IP-intensive exports outside the EU has remained stable at 17% in 2010 and 17% in 2018. Of those exports only 31% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP-intensity and FTA coverage (2018)



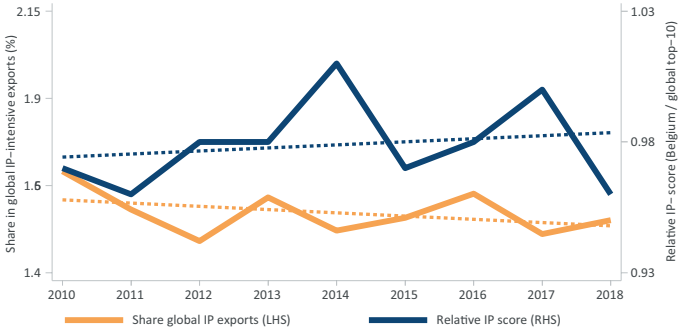
The US (€ 20 bn), China (€ 9 bn), India (€ 8 bn), Switzerland (€ 4 bn) and Turkey (€ 4 bn) are the main Belgian export destinations. For these markets IP-intensive exports constitute 66% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2018)



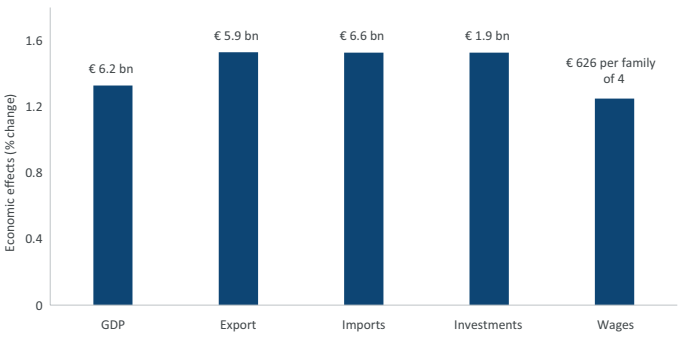
The top-8 IP-intensive manufacturing sectors together export € 62 bn in 2018 and contribute significantly to Belgium's trade surplus. The largest Belgian export sectors that depend on IP are pharmaceuticals (€ 19 bn) and chemicals (€ 16 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2018)



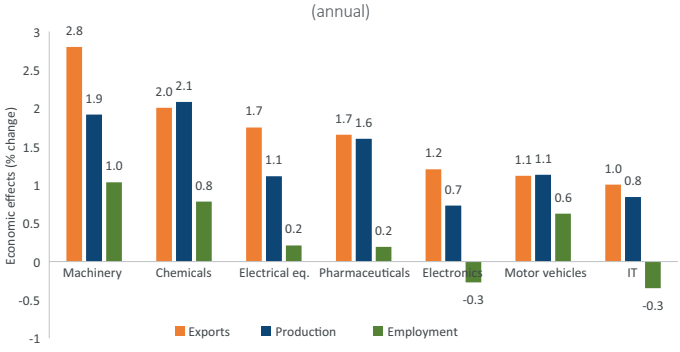
In recent years, Belgium reports a decrease in its relative IP score compared to the global top-10. This corresponds to an also small decline in Belgium's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Belgium. Belgium's GDP, exports, and investments will be between 1.2% and 1.6% higher each year. The average Belgian family of four would benefit by €626 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Belgium's IP-intensive sectors would support growth in exports (by 1.0 to 2.8%), increase resilience by boosting domestic production (by 0.7 to 2.1%), and create high value-added jobs for the Belgian economy.

BULGARIA

Intellectual property matters for an economy like the Bulgarian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Bulgaria. In Figure 2, we show how relevant different types of IP are for the Bulgarian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Bulgaria as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

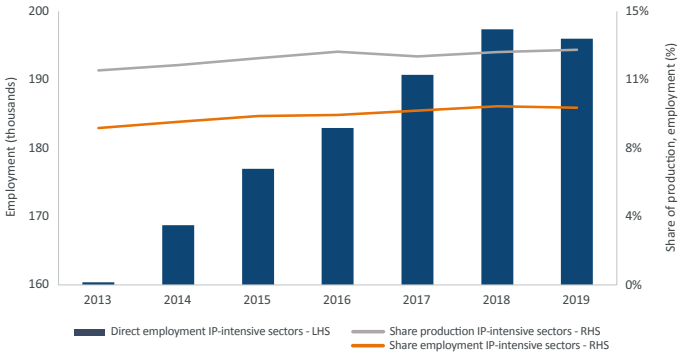


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

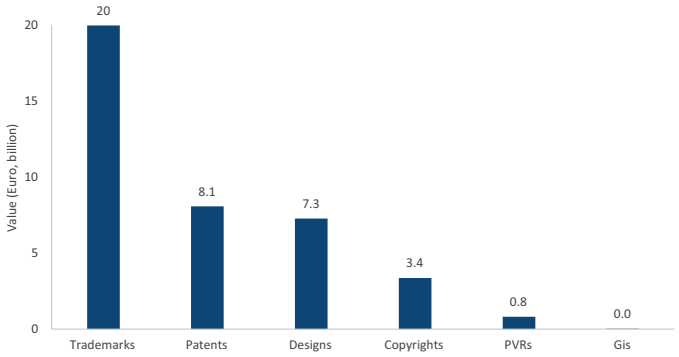


Figure 3: Value-added for IP-intensive sectors (2019)

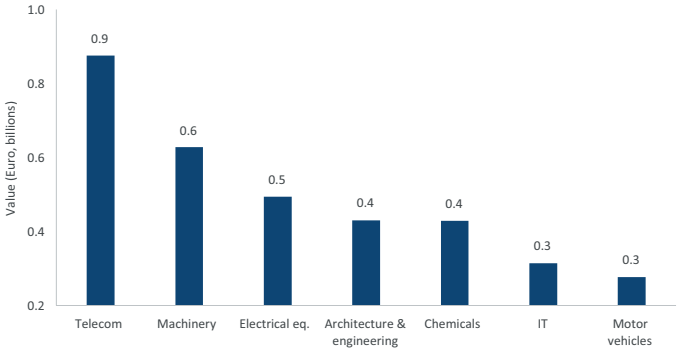


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

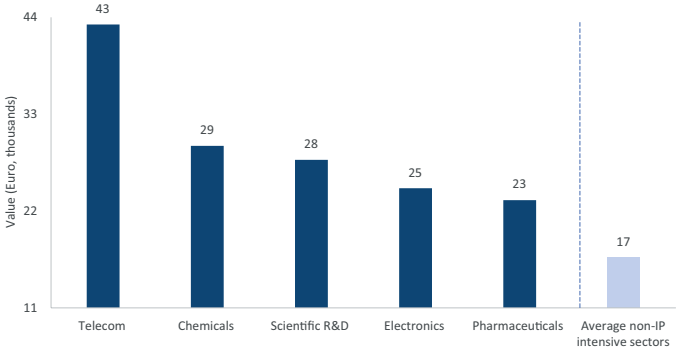


Figure 5: Index of SME R&D potential (2019)

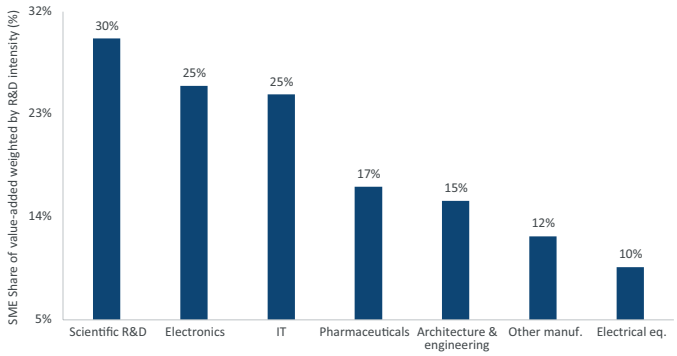
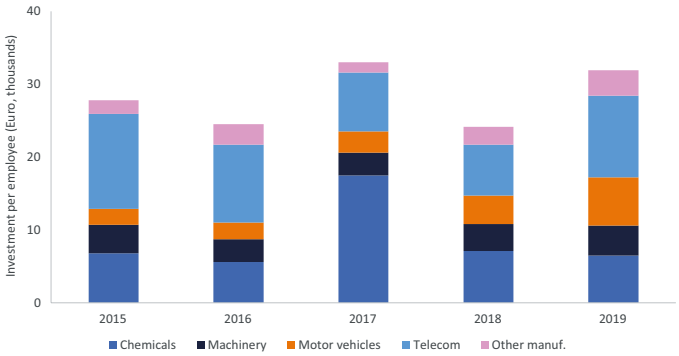


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

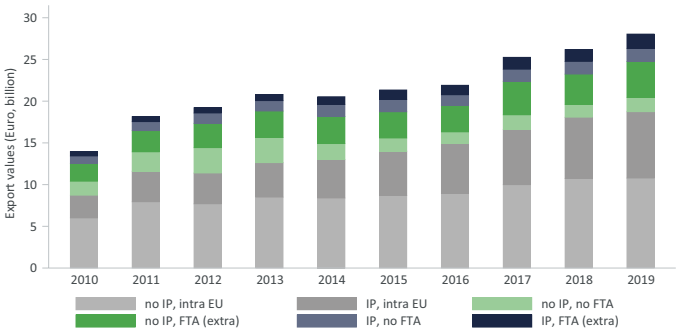


Intellectual Property is highly relevant for the Bulgarian economy. The IP-intensive sectors in Bulgaria employ more than 196 thousand workers directly, increasing since 2013, and represent 13% of total Bulgarian production (Figure 1). Trademarks (€20 bn), patents (€8 bn), and designs (€7 bn) are the most important types of IP for the Bulgarian economy (Figure 2). Most economic value in Bulgaria is created by the telecom (€0.9 bn), machinery (€0.6 bn) and electrical equipment (€0.5 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Bulgarian economy (telecom, chemicals, scientific R&D) creating the highest value jobs. Labour productivity in IP-intensive sectors in Bulgaria is up to 2.5 times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, chemicals, and motor vehicles are the IP-intensive sectors with the highest levels of investment per employee in Bulgaria (Figure 6). Bulgarian SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and electronics, but also IT services and pharmaceuticals (Figure 5).

BULGARIA

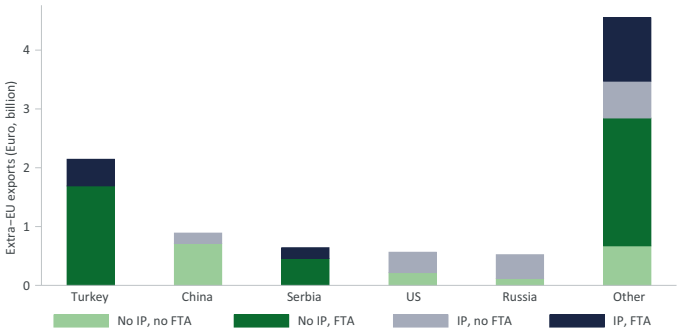
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Bulgarian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Bulgarian IP framework is correlated with a higher Bulgarian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Bulgaria (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010-2019)



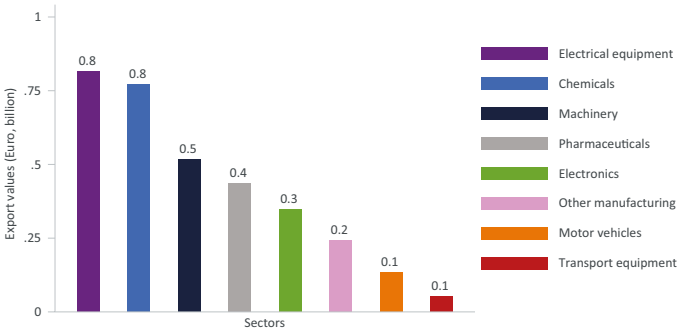
For Bulgaria, the share of IP-intensive exports outside the EU has gone up from 10% in 2010 to 12% in 2019, but of those exports only 52% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



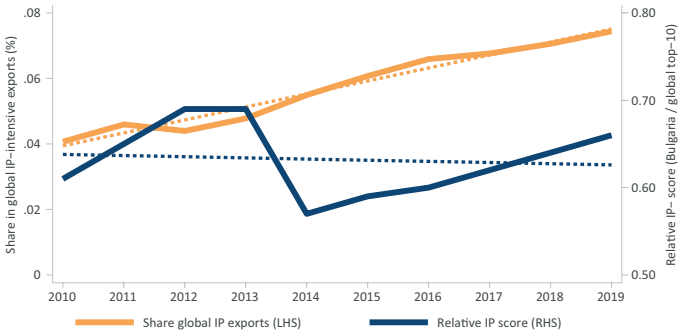
Turkey (€ 2 bn), China (€ 0.9 bn), Serbia (€ 0.6 bn), the US (€ 0.6 bn) and Russia (€ 0.5 bn) are the main Bulgarian export destinations. For these markets IP-intensive exports constitute 33% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



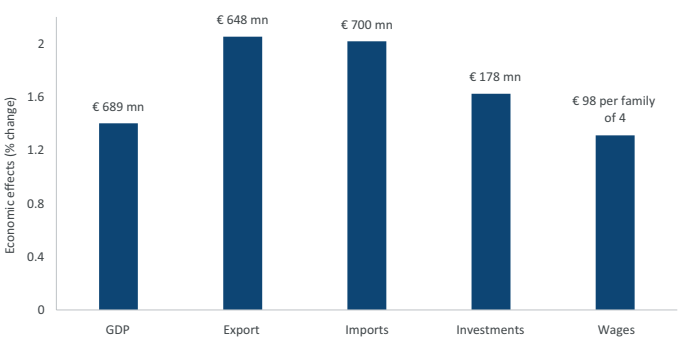
The top-8 IP-intensive manufacturing sectors together export € 3.3 bn in 2019 and contribute significantly to Bulgaria's trade surplus. The largest Bulgarian export sectors that depend on IP are electrical equipment (€ 0.8 bn) and chemicals (€ 0.8 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010-2019)



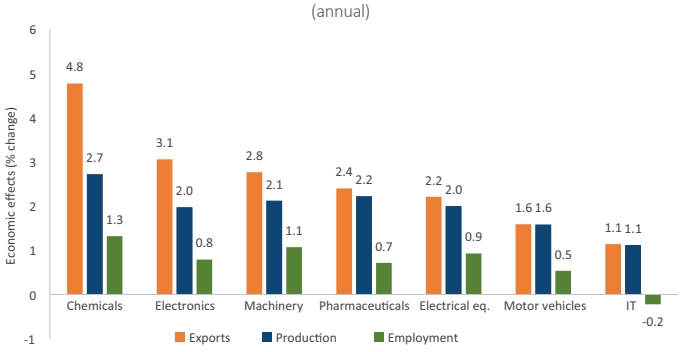
In recent years, Bulgaria reports an increase in its relative IP score compared to the global top-10. This corresponds to an increase in Bulgaria's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Bulgaria. Bulgaria's GDP, exports, and investments will be between 1.4% and 2.0% higher each year. The average Bulgarian family of four would benefit by €98 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Bulgarian's IP-intensive sectors would support growth in exports (by 1.1 to 4.8%), increase resilience by boosting domestic production (by 1.1 to 2.7%), and create high value-added jobs for the Bulgarian economy.

CROATIA

Intellectual property matters for an economy like the Croatian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Croatia. In Figure 2, we show how relevant different types of IP are for the Croatian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Croatia as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

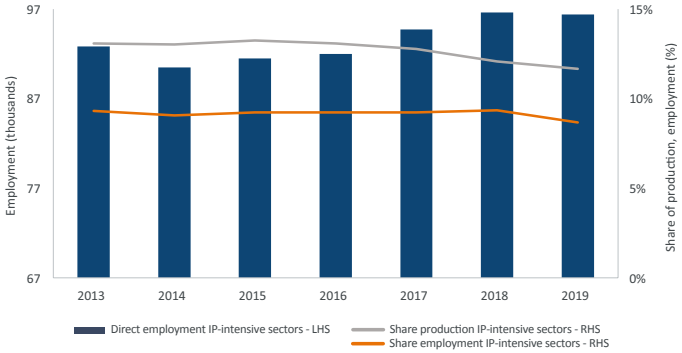


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

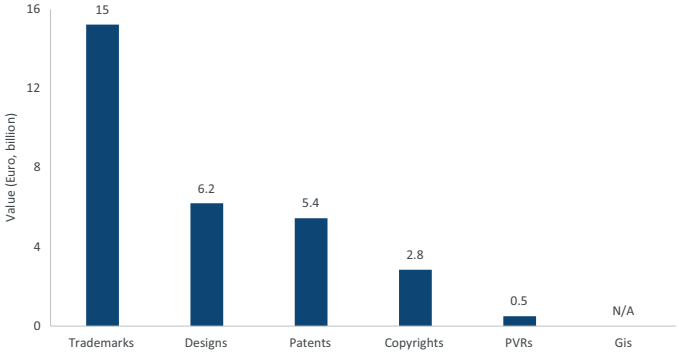


Figure 3: Value-added for IP-intensive sectors (2019)

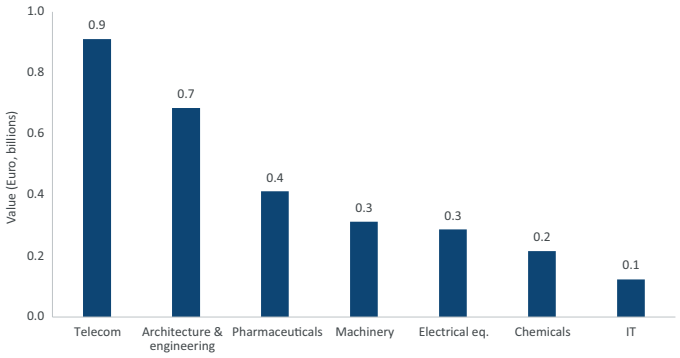


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

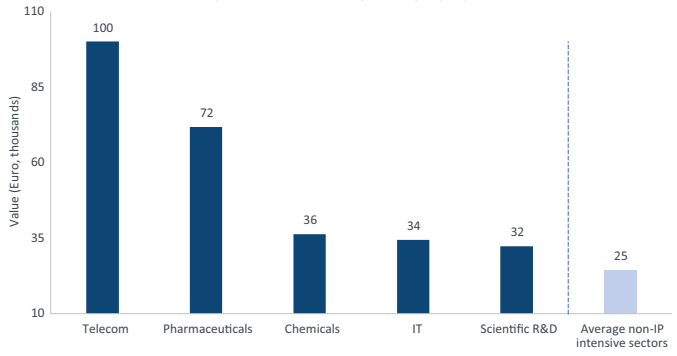


Figure 5: Index of SME R&D potential (2019)

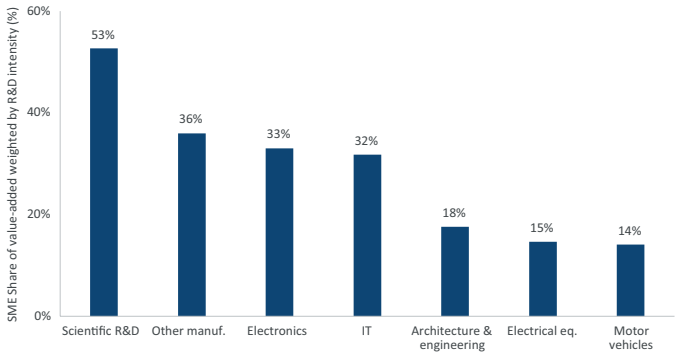
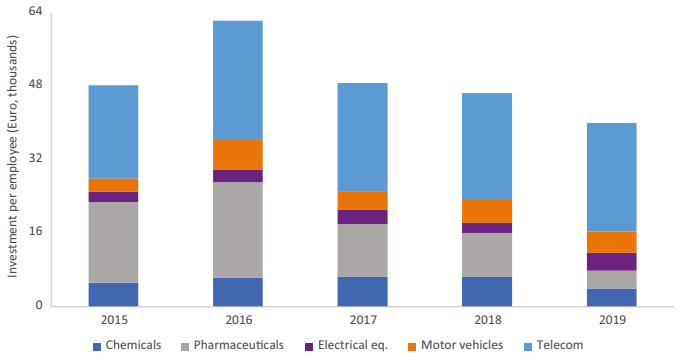


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

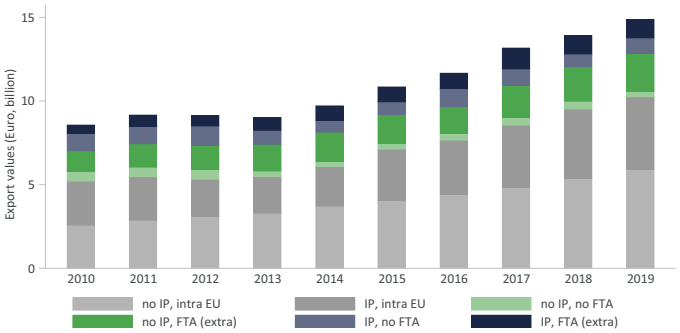


Intellectual Property is highly relevant for the Croatian economy. The IP-intensive sectors in Croatia employ more than 96 thousand workers directly and represent 12% of total Croatian production (Figure 1). Trademarks (€15 bn), designs (€6 bn), and patents (€5 bn) are the most important types of IP for the Croatian economy (Figure 2). Most economic value in Croatia is created by the telecom (€0.9 bn), architecture & engineering (€0.7 bn) and pharmaceuticals (€0.4 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Croatian economy (telecom, pharmaceuticals, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Croatia is up to four times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, chemicals, and motor vehicles are the IP-intensive sectors with the highest levels of investment per employee in Croatia (Figure 6). Croatian SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and other manufacturing, but also electronics and IT services (Figure 5).

CROATIA

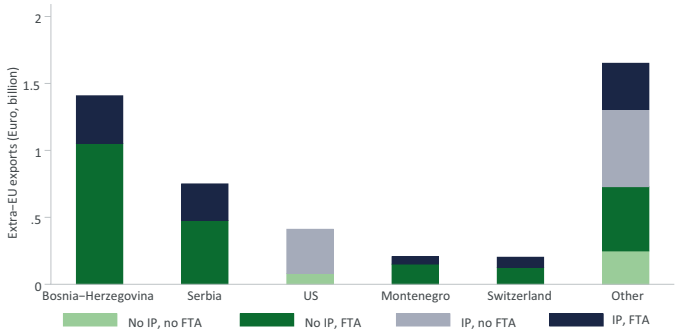
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Croatian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Croatian IP framework is related with the Croatian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Croatia (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010-2019)



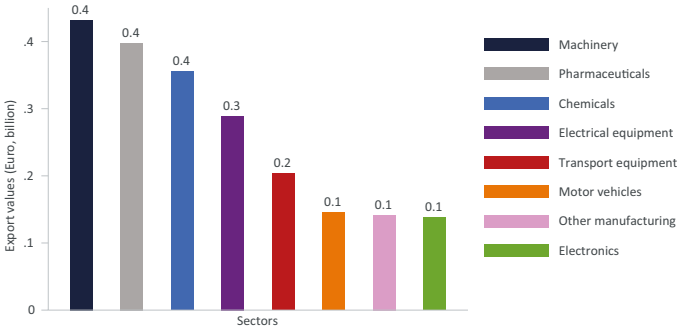
For Croatia, the share of IP-intensive exports outside the EU has decreased from 18% in 2010 to 14% in 2019. Of those exports only 55% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



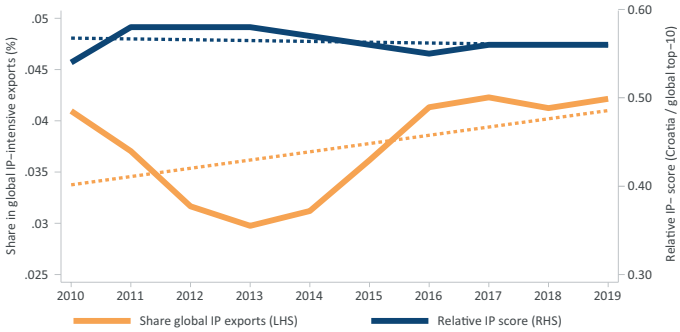
Bosnia and Herzegovina (€ 1.4 bn), Serbia (€ 0.8 bn), the US (€ 0.4 bn), Montenegro (€ 0.2 bn) and Switzerland (€ 0.2bn) are the main Croatian export destinations. For these markets IP-intensive exports constitute 37% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



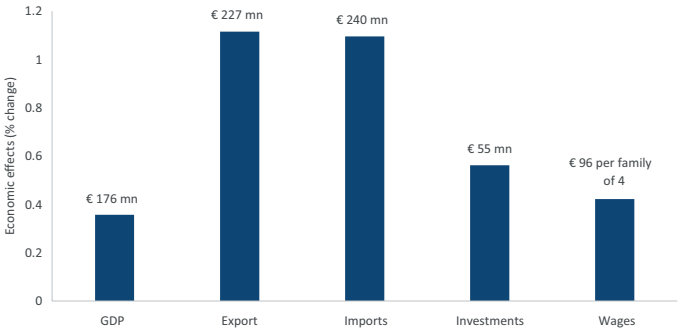
The top-8 IP-intensive manufacturing sectors together export € 2.1 bn in 2019 and contribute significantly to Croatia's trade surplus. The largest Croatian export sectors that depend on IP are machinery (€ 0.4 bn) and pharmaceuticals (€ 0.4 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010-2019)



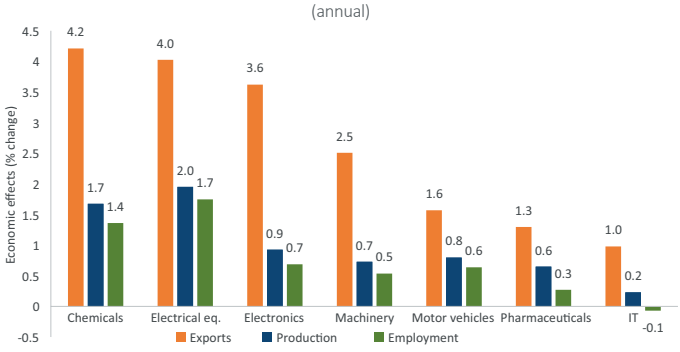
In recent years, Croatia reports a stable pattern in its relative IP score compared to the global top-10. This corresponds to a small increase in Croatia's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Croatia. Croatia's GDP, exports, and investments will be between 0.4% and 1.1% higher each year. The average Croatian family of four would benefit by €96 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Croatian's IP-intensive sectors would support growth in exports (by 1.0 to 4.2%), increase resilience by boosting domestic production (by 0.2 to 2.0%), and create high value-added jobs for the Croatian economy.

INSERT 1:

THE EU'S INDUSTRIAL STRATEGY: BLESSING OR CURSE FOR EUROPE'S KNOWLEDGE- AND INTELLECTUAL PROPERTY-INTENSIVE INDUSTRIES?

By Dr. Matthias Bauer, ECIPE

In March 2020, the European Commission published a White Paper outlining the cornerstones of a new "European Industrial Strategy" for a "globally competitive, green and digital Europe".[56] The Commission acknowledges that *"Europe has always been home to industry"*. It declared to be "ready to do what it takes to make sure European businesses remain fit to achieve their ambitions and cope with increasing global competition". The updated industrial policy from May 2021 reinforces these claims, stressing the need for a *"strong and well-functioning single market – while strengthening our global competitiveness through open markets and a level playing field."*[57]

From an economic point of view, such ambitions are generally warranted. At the same time, some of the EU's policy documents are not always consistent regarding concrete policy objectives and legislative initiatives. If the EU is to remain attractive to knowledge-intensive industries in the future, Europe's policymakers need to embrace a consistent and, at the same time, more holistic and strategic approach to industrial policymaking.

Europe can thrive if it remains attractive to research- and knowledge-intensive industries. At the same time, European citizens and businesses can only be successful if they can access new technologies as well as innovative products and services from EU as well as non-EU suppliers, enabling a broad societal update. EU-first, protectionist or isolationist approaches towards industrial policymaking would make it harder for Europe's knowledge-intensive industries to compete on international markets. European leadership in the realm of knowledge-intensive industries requires intensified regulatory cooperation in trade and investment policymaking, reinforced commitment to strong intellectual property rights (IPR) and the protection of trade secrets, and leadership in creating a real European Single Market. To become a "leader" in a global economy, Europe need to focus on becoming a global driver for economic innovation – not just in regulation. Mercantilist or protectionist ideas will have an adverse effect on EU Member States' access to modern technologies, slow adoption of new business models and reduce the EU's attractiveness to foreign investment.[58]

[56] European Commission (2020). A New Industrial Strategy for Europe. 10 March 2020. Available at https://ec.europa.eu/info/sites/default/files/communication-eu-industrial-strategy-march-2020_en.pdf.

[57] European Commission (2021). Updating the 2020 New Industrial Strategy: Building a stronger Single Market for Europe's recovery. 5 May 2021. Available at https://ec.europa.eu/info/sites/default/files/communication-new-industrial-strategy.pdf.

[58] ECIPE (2020). Europe's Quest for Technology Sovereignty: Opportunities and Pitfalls. May 2020. Available at https://ecipe.org/wp-content/uploads/2020/05/ECI_20_OccPaper_02_2020_Technology_LY02.pdf.

Principles for Industrial Policymaking Towards Industrial and Technology Sovereignty

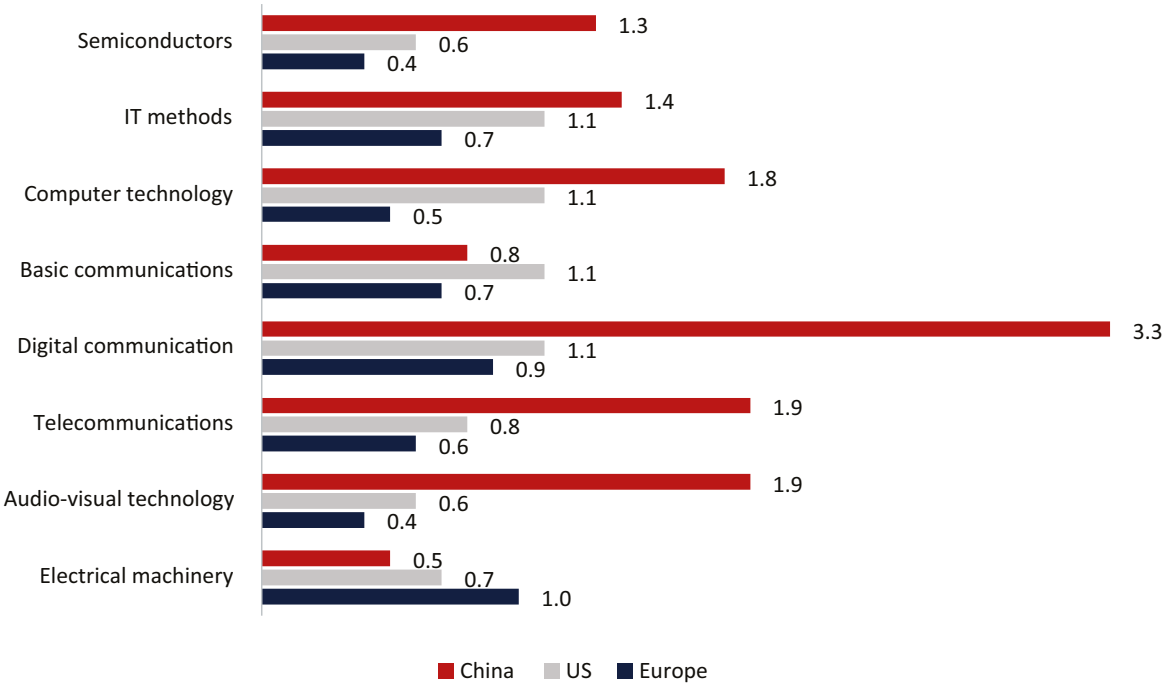
The European Commission's key motivation for a new industrial strategy is guided by the ambition to master Europe's ecological and digital transition, for which "new technologies, with investment and innovation" are needed. Beyond this challenge, the Commission refers to increasing geopolitical pressures and implications for European businesses' international competitiveness. It is stated that *"[t]hese transitions will take place in a time of moving geopolitical plates."* [59] Regarding competitive pressures and the need for investment and innovation, the European Commission has a point. EU businesses are at the moment lagging behind in terms of their innovative capacities in ICT technologies. Data for patents, trademarks and scientific publications of the world's top corporate R&D investors demonstrate that businesses in the EU (and Switzerland) are still specialised in largely the same fields of technology as in 2010 – 2012. Many US and Chinese companies currently outperform European companies in new ICT technologies, including those that are increasingly important for more traditional sectors.

In Figure 1.1, we show the revealed technology advantage (RTA) of world's top R&D investors for 2014-16, by field of technology and geographical location of headquarters.[60] Digital technologies, such as Big Data and Artificial Intelligence, can be broadly applied in many sectors of the economy, which is why Europe's current technology gap in ICT/digital technologies may put at risk the international competitiveness of companies that are still strong in traditional, IP-intensive, but less digitalised industries, such as Europe's carmakers and machinery, chemicals and pharmaceutical manufacturers. In general, the RTA gap in most service sectors should be a concern for EU policy makers that needs to be addressed if Europe is to remain at the forefront of services innovation.

[59] European Commission (2020).

[60] RTA indices were compiled for the major economic areas where the top R&D investors worldwide have their headquarters. The index value is computed using the IP5 patent families. The RTA is defined as the share of patents in a field of technology for an economic area, divided by the share of patents in the same field at the global level. The index number is zero of companies headquartered in an economic area hold no patent in a given technology. The index value grows with the increase of the patent share in the given technology.

FIGURE 1.1 REVEALED TECHNOLOGY ADVANTAGE FOR THE US, CHINA AND EUROPE (2014-2016)



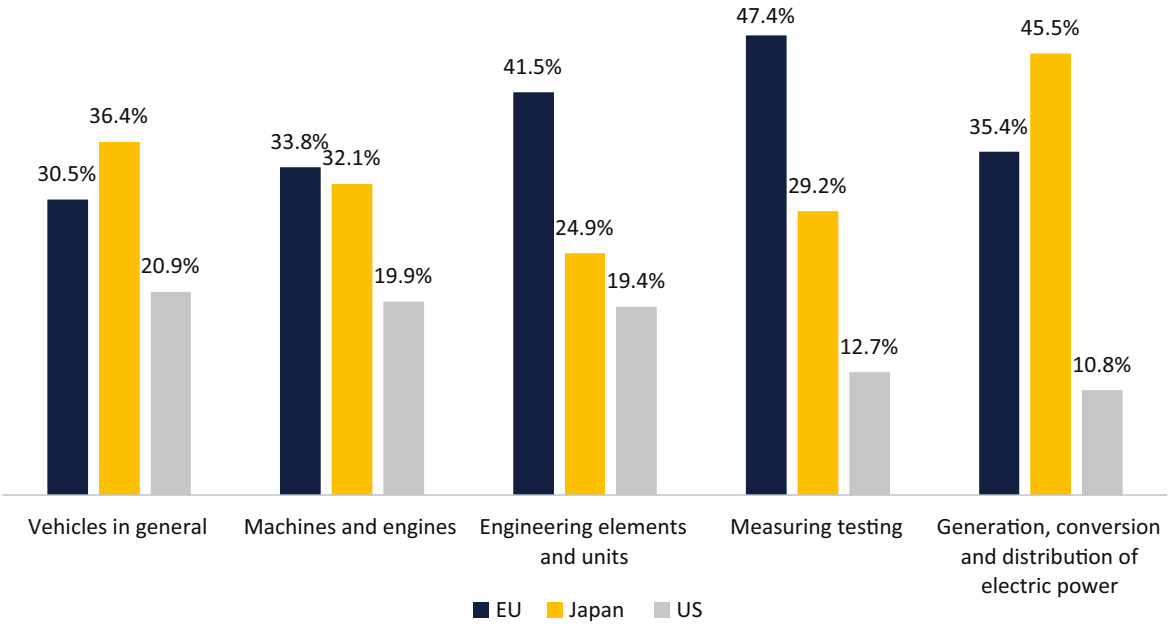
Source: JRC-OECD (2019, p. 30).

Large research-intensive European companies still hold a relatively strong position in automobiles and parts, pharmaceuticals, environmental technologies and machinery equipment. Europe's automotive and other transport sectors, for example, perform the largest proportion of their R&D activities within the EU. Based on the strong past performance of the EU's automotive sector and the high specialisation of the EU, more than 90% of the research activities still take place in the EU. The same still holds for the innovative pharmaceutical industry, although the European leadership in pharmaceutical innovation of the 1990s has been surpassed by the US and soon China in terms of investments in R&D as well as in first launches of new medicines. Large European companies show a significant technological disadvantage in semiconductors, IT methods, general computer technologies, basic communication technologies, digital communication technologies, telecommunication technologies, audio-visual technologies, and (though less pronounced) electrical machinery.

Regarding "green technologies", European companies (still) perform relatively well compared to companies in other jurisdictions, including China and the US. In environmental technologies, EU companies are still strong innovators. According to the distribution of patent families on environmental technologies, EU-based firms own 27% of the respective patents. US companies hold 23%, while Japanese companies hold 37% in total. As shown in Figure 1.2, compared to Japan and the US, EU businesses are relatively strong in environmental technologies in the automotive sector, machines and engines, engineering elements and units, measuring testing, and the generation, conversion and distribution of

electric power. An increasing proportion of patents refer to electric and autonomous vehicles and newer components such as novel batteries and fuel cells.

FIGURE 1.2: SHARE OF PATENT FAMILIES BY WORLD REGION (BY NUMBER OF PATENTS)



Source: EU R&D Investment Scoreboard 2019.

Industrial Leadership from Future-oriented Trade and Investment Policymaking

International trade is a powerful force for technological, economic and societal transformation. Free trade agreements have stimulated trade and investment. They have improved the quality and integrity of domestic economic and political institutions, which are important for investments in knowledge-intensive industries, including the protection of property rights and, more generally, the rule of law.

The EU has seen strong growth in patent-intensive sector exports. European businesses have climbed the value-added chain through trade and investment relationships with partners outside the EU, including for the EU's major patent-intensive sectors – chemicals, pharmaceuticals, and motor vehicles. However, compared to China and the US, in recent years EU businesses have witnessed a relative worsening of their export positions in these sectors. In many instances, these deteriorations are not the result of the EU's industrial mix. The under-performance in EU exports can be ascribed to both EU domestic factors and local factors in export destinations, which artificially depress EU corporate competitiveness in these markets (e.g. trade and investment barriers in Brazil and India). It can also be ascribed – for strong export performing sectors – to other factors than economic competitiveness: tariffs, regulatory barriers to trade and inadequate levels of protection of trade secrets and weaker and sub-optimally enforced IPR.

With regard to investment policymaking, the design of an EU investment screening framework needs to focus on supporting the EU's ambitions for knowledge- and technology-intensive industries. EU policymakers need to recognise that investment screening can easily become a tool that is used for unfair discrimination against non-EU investors. Arbitrary enforcement practices would severely undermine the international system of fair and equitable treatment. At the same time, state-ownership of global competitors should be combatted in order to maintain a global level playing field. The injection of features of state capitalism into European economies would stand in opposition of the EU's trade and internal market policies. In its relations with non-EU governments, the EU needs to insist on an open and non- discriminatory investment- and trading system. A reversal of such a stance could lead to severing of global value chains (GVC). Because the EU is at the global heart of many of these GVC, this would be detrimental for the EU's industrial and competitive outlooks. The EU should also continue to demonstrate a clear commitment to multilateralism to further level the playing field, e.g. regulatory approval procedures and equivalence testing, between EU and foreign competitors.

Industrial Leadership via the Protection of Intellectual Property Rights and Trade Secrets
Europe needs to remain attractive to agile minds and companies which invest substantially in R&D. This is largely recognised by the Commission's Industrial Policy White Paper from 2020, which highlights that *"[t]he EU also needs to ensure that its Intellectual Property policy helps to uphold and strengthen Europe's tech sovereignty and promote global level playing field. IP helps to determine the market value and competitiveness of Europe's firms."* The Commission also acknowledges that it is companies' *"intangibles, such as brands, designs, patents, data, know-how, and algorithms",* which impact on their activities and value. *"Smart IP policies are essential to help all companies to grow, create jobs and to protect and develop what makes them unique and competitive."*[61] However, the Commission's industrial policy update from May 2021 does not explicitly mention IP incentives for investment and R&D in Europe.[62]

The EU's commitment to strong IP protection is warranted. Economic research, including the econometric findings in this study, demonstrates that strong protection of IPR is essential for the creation of high value-added, high wages and investment in education and professional qualifications (skilled labour). Across the board of knowledge-intensive industries, including manufacturing and services sectors, the creation of value-added is not evenly distributed along different stages of the value chain. The highest value-added is generally generated in the beginning and at the end of value chains, i.e. in R&D, branding, marketing and sales, with much lower value added generated in mere production and distribution activities. This is the so-called smiling curve.[63]

[61] European Commission 2020.

[62] European Commission 2021.

[63] Shih (2006), Dedrick, J.; K. Kraemer, and G. Linden (2010) and Baldwin, R. (2011)

Despite the importance of IPR for investment and the creation of high value-added, IPRs have frequently been under attack in the past, with the pharmaceutical industry being a key target in the EU. Under the Juncker Commission, policymakers implemented new regulation for pharmaceutical innovation that undermined Europe's attractiveness as an investment hub for pharmaceutical research-intensive industries.[64] The EU's trade and investment policy has been to get other countries to allow patent term extension to compensate for revenue shortfalls due to the length of regulatory approval processes. Continuing this policy is important to avoid the EU's innovative companies as well as foreign investors to reconsider whether they want to maintain research and manufacturing capacity in EU Member States long-term. This is an effect that would only become visible over time as new long-term investment decisions have to be taken, but it would reduce innovative capacities and the number of research clusters in the EU and, as a result, cause a transition of high value-added jobs to other jurisdictions that offer a more attractive mix of IP protection and research and production costs.

Data sharing obligations undermine the EU's commitment to protect IPRs and trade secrets and have the opposite effect of what the obligations intend to achieve. In the European Commission's White Paper on data, it is argued that "data should be available to all". Full data availability would end up as a deterrent to future investment in R&D in the EU. Companies' incentives to invest in research in the EU would vanish if they knew that they would have to share data with competitors and everybody else. They would move to jurisdictions outside the EU. It is more encouraging, however, that a few lines below the rather radical vision for data accessibility, it is argued that data should be "as open as possible, and as closed as necessary". Thierry Breton, Commissioner for the Internal Market, also stated: *"[w]hen we talk about data sharing, we're not talking about essential data, because companies would never do it – and rightly so".*[65] Indeed, many companies are unwilling to give away data that are essential for their survival and very costly to generate.

An EU trade policy in support of European industrial and technology sovereignty should promote non-discriminatory trade and investment and create a global level playing field based on stronger levels of intellectual property rights and trade secrets, including appropriate enforcement.

Increasing EU Strategic Resilience via a Real European Single Market

China and the US are outperforming individual EU Member States as investment hubs.[66] A large body of economic research demonstrates that country size matters most for foreign

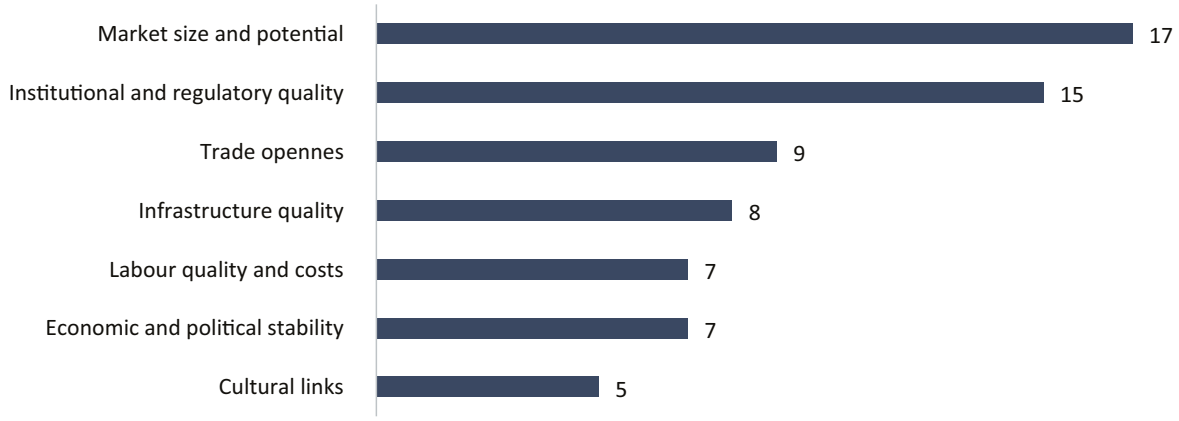
[64] Regulation (EU) 2019/933 of the European Parliament and of the Council of 20 May 2019 amending Regulation (EC) No 469/2009 concerning the supplementary protection certificate for medicinal products.

[65] Politico (2020). The Achilles' heel of Europe's AI strategy. 13 March 2020. Available at https://www.politico.eu/article/europe-ai-strategy-weakness/.

[66] OECD (2020). FDI in figures. October 2020. Available at https://www.oecd.org/investment/investment-policy/FDI-in-Figures-October-2020.pdf.

investors. Market size is the key determinant of FDI, as firms can expect to benefit from stronger economies of scale as well as a larger potential demand. Compared to the EU, the internal markets of China and the US are more complete, which is still fragmented by national regulations, preventing businesses to scale to their potential (hence also the smaller number of really large, global players in the EU compared to the US or China). The key determinants of foreign investment according to the World Bank (2011) are depicted in Figure 1.3.

FIGURE 1.3: KEY DETERMINANTS OF FOREIGN INVESTMENT



Source: World Bank (2011).

Business statistics indicate that companies in the EU find it harder to grow compared to companies in the US. The average number of employees of a large US company is about twice as high as the average number of employees of a large company that is based in the EU. These numbers indicate that in the past it was generally easier for US companies to scale up than for companies in the EU. This situation seems to persist: of the top 10 companies in the US, five are less than 20 years old, while all of the top 10 companies in Europe are more than a century old. Compared to companies in the EU, US businesses benefit from less legally restricted and therefore easier access to a greater US consumer base.

Similarly, most companies in the EU are SMEs (99%), but despite a much smaller population, the US is home to a far greater number of SMEs than the EU. Adjusted by the size of the labour force, EU's "SME deficit" in large SMEs (50 to 249 employees) is 36%, while the EU's SME deficit in medium-sized SMEs (20 to 49 employees) is 25%. From the EU Member State 2-page statistics it becomes clear that for several sectors in a range of EU Member States, SMEs are significantly contributing to R&D driven by intellectual property protection. There is, therefore, a clear link between stronger IP protections and supporting EU SMEs going forward. Allowing SMEs to benefit from the EU's trade strategy is also a key priority for the EU.[67]

[67] European Commission (2021). Trade Policy Review - An Open, Sustainable and Assertive Trade Policy. 18 February 2021. Available at https://trade.ec.europa.eu/doclib/docs/2021/february/tradoc_159438.pdf.

The European Commission is aware of EU's rather systemic "Single Market Disease". Referring to the EU's current ICT gap vis-à-vis other jurisdictions, Commissioner Vestager said in February 2020 that *"[o]ne of the reasons why we don't have a Facebook and we don't have a Tencent is that we never gave European businesses a full single market where they could scale up […] Now when we have a second go, the least we can do is to make sure that you have a real single market."*[68]

The EU can improve its global leadership and competitiveness by reducing the barriers to cross-border supply products and services in its own Single Market. An EU27 market that is more single will directly (more investment in innovation) and indirectly (more adoption of innovation) reduce the gaps in investment, innovation and productivity across industries. A more complete single market would also close the gap between European firms at the international technology frontier and those that are distant from it. It would better allow European companies and start-ups to innovate and scale to international competitiveness. It would encourage entrepreneurship would increase the likelihood of more radical innovation in the EU.

Conclusions

The European Commission is generally right in arguing that a strong regulatory framework and new policies are needed to support the competitiveness of key European sectors, including ICT/digital and green industries. However, Europe's policymakers should not expect to encourage European companies to become more innovative by embracing dirigiste – government-directed – policies or by undermining IPR and trade secrets. Instead, the EU should focus on a strong IP framework, an open and rules-based global trading system, and strengthening the EU Internal Market.

Current perceptions on a European technological or innovative lead-role are unlikely to remain static. The next wave of technological innovation holds the potential to reverse the EU's 20-year productivity growth lag and may alter political attitudes towards sector priorities and policies respectively. A focus on prescriptive policies would distract political capital away from the EU's main challenge: multiple layers of EU and national legislations which impede cross-border commerce in the EU and prevent EU companies from scaling to international competitiveness. A focus on dirigiste approaches targeted at digital companies and technology-enabled business models would further undermine the EU's global economic clout.

[68] Politico (2020). Vestager touts AI-powered vision for Europe's tech future. 17 February 2020. Available at https://www.politico.eu/article/margrethe-vestager-touts-ai-artificial-intelli-gence-powered-vision-for-europe-tech-future/

The EU has traditionally been a leader in technological, regulatory and trade openness (linking industrial policy firmly to trade policy), supported by high-quality regulatory frameworks. Stronger protection of IPR, and ongoing deepening and strengthening of the EU Single Market are key policies to ensure globally competitive European knowledge- and IP-intensive industries are active in the EU. These will result in more strategic resilience, which can thus indeed be a useful ambition for policymakers to let Europe's highly diverse economies thrive on new investments in knowledge-intensive industries and the adoption of innovation and innovative business models. If anchored in protectionist ideas, industrial and technology sovereignty would make it harder for EU Member States to attract foreign investment and access modern technologies – with adverse implications on future international competitiveness, economic renewal and economic convergence.

CYPRUS

Intellectual property matters for an economy like the Cypriot one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Cyprus. In Figure 2, we show how relevant different types of IP are for the Cypriot economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Cyprus as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

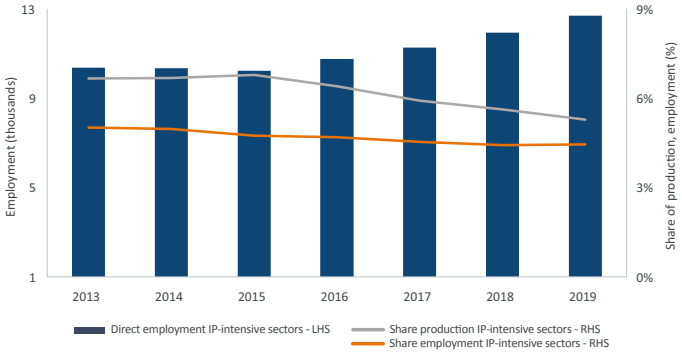


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

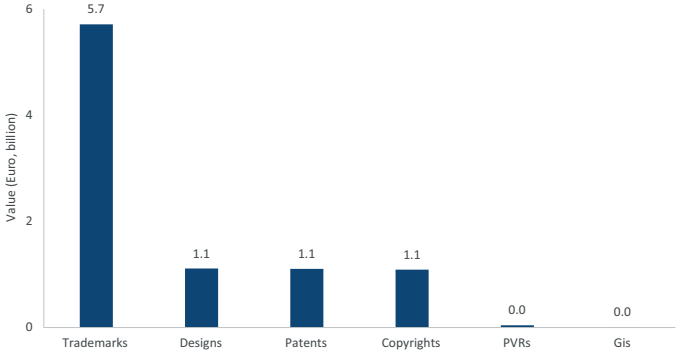


Figure 3: Value-added for IP-intensive sectors (2019)

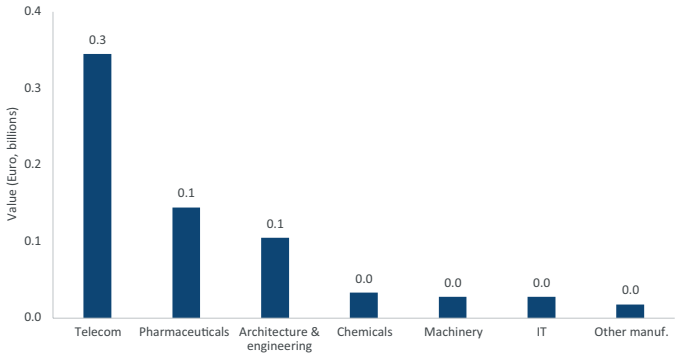


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

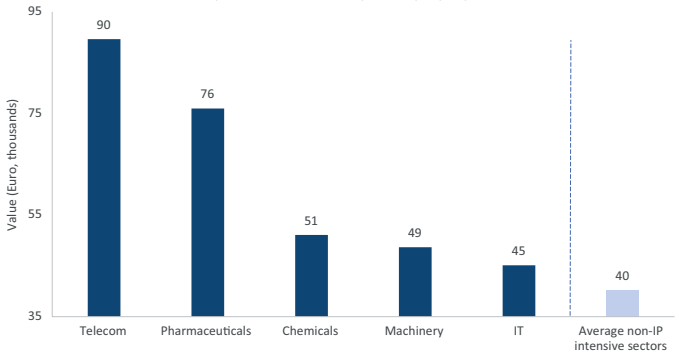


Figure 5: Index of SME R&D potential (2019)

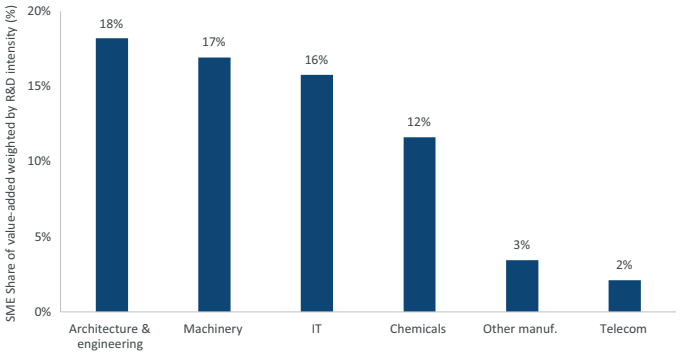
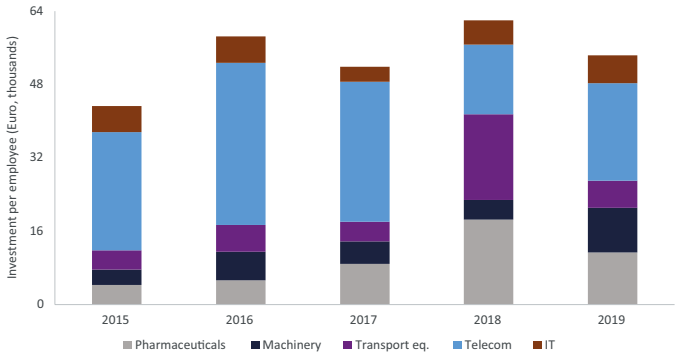


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

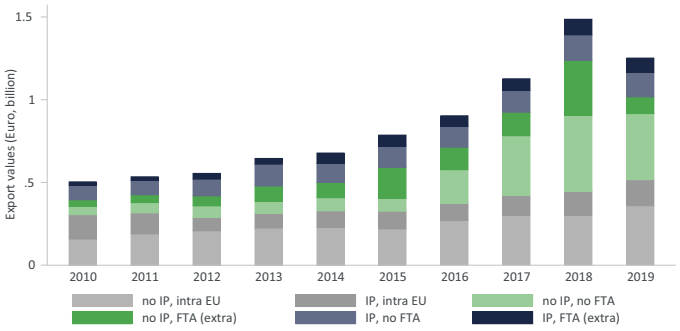


Intellectual Property is highly relevant for the Cypriot economy. The IP-intensive sectors in Cyprus employ close to 13 thousand workers directly, increasing since 2013, and represent 5% of total Cypriot production (Figure 1). Trademarks (€6 bn), designs (€1.1 bn), and patents (€1.1 bn) are the most important types of IP for the Cypriot economy (Figure 2). Most economic value in Cyprus is created by the telecom (€0.3 bn), pharmaceuticals (€0.1 bn) and architecture & engineering (€0.1 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Cypriot economy (telecom, pharmaceuticals, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Cyprus is up to two times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, pharmaceuticals, and machinery are the IP-intensive sectors with the highest levels of investment per employee in Cyprus (Figure 6). Cypriot SMEs make a significant contribution to value-added in sectors with high R&D spending such as architecture & engineering, machinery, but also IT services and Chemicals (Figure 5).

CYPRUS

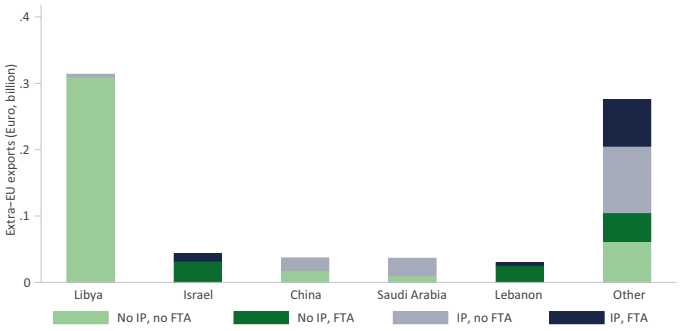
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Cyprian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Cyprian IP framework is related with the Cyprian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Cyprus (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



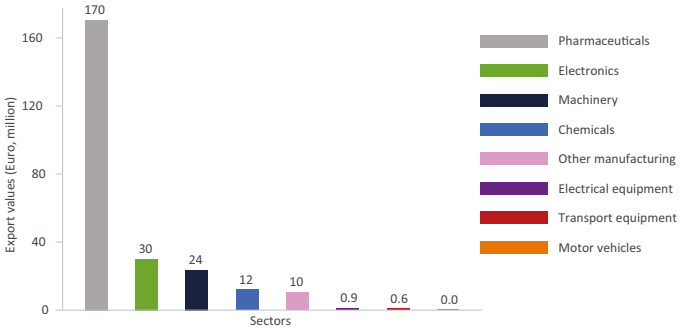
For Cyprus, the share of IP-intensive exports outside the EU has decreased from 22% in 2010 to 19% in 2019. Of those exports only 37% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



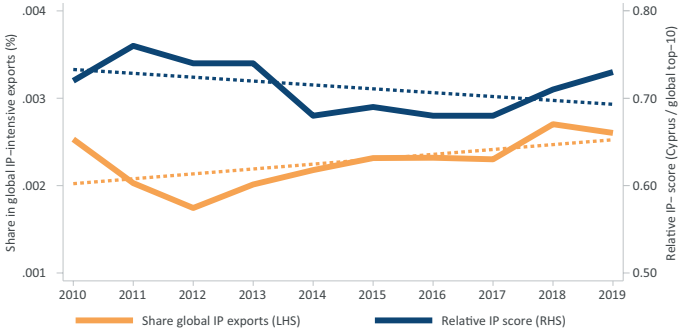
Libya (€ 0.3 bn), Israel (€ 0.04 bn), China (€ 0.04 bn), Saudi Arabia (€ 0.04 bn) and Lebanon (€ 0.03 bn) are the main Cyprian export destinations. For these markets IP-intensive exports constitute 14% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



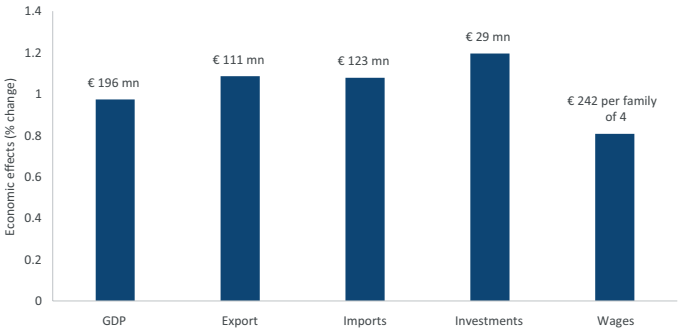
The top-8 IP-intensive manufacturing sectors together export € 248 mn in 2019 and contribute significantly to Cyprus' trade surplus. The largest Cyprian export sectors that depend on IP are pharmaceuticals (€ 170 mn) and electronics (€ 30 mn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



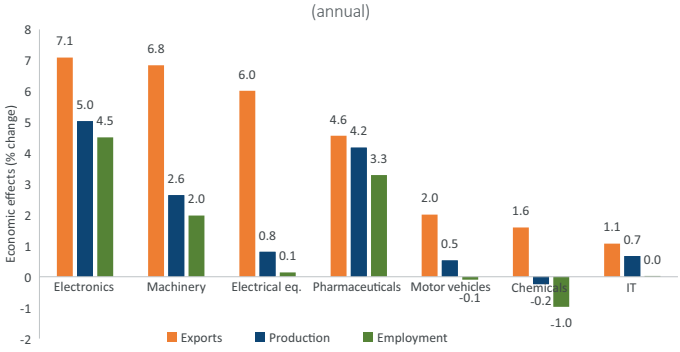
In recent years, Cyprus reports a slight increase in its relative IP score compared to the global top-10. This corresponds to a small increase in Cyprus' share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Cyprus. Cyprus' GDP, exports, and investments will be between 1.0% and 1.2% higher each year. The average Cyprian family of four would benefit by €242 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Cyprus' IP-intensive sectors would support growth in exports (by 1.1 to 7.1%), increase resilience by boosting domestic production (by -0.2 to 5.0%), and create high value-added jobs for the Cyprian economy.

CZECHIA

Intellectual property matters for an economy like the Czech one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Czechia. In Figure 2, we show how relevant different types of IP are for the Czech economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Czechia as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

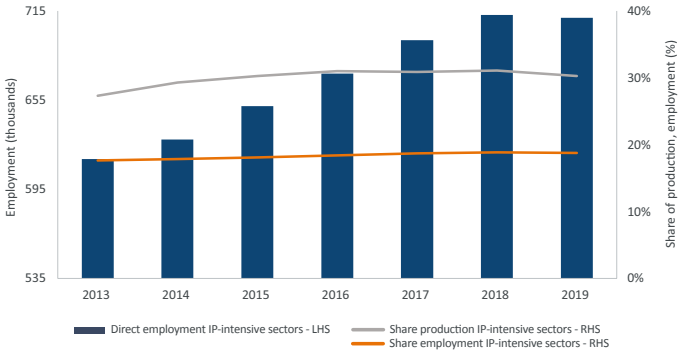


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

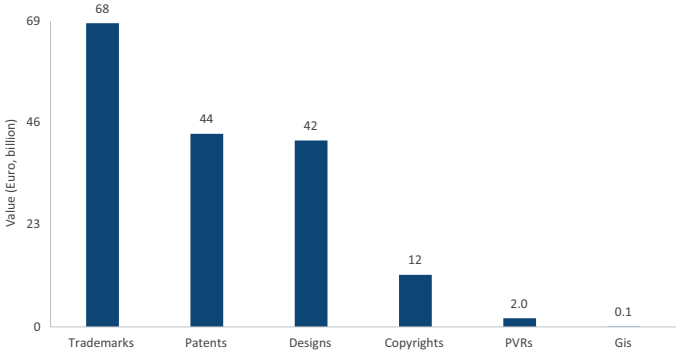


Figure 3: Value-added for IP-intensive sectors (2019)

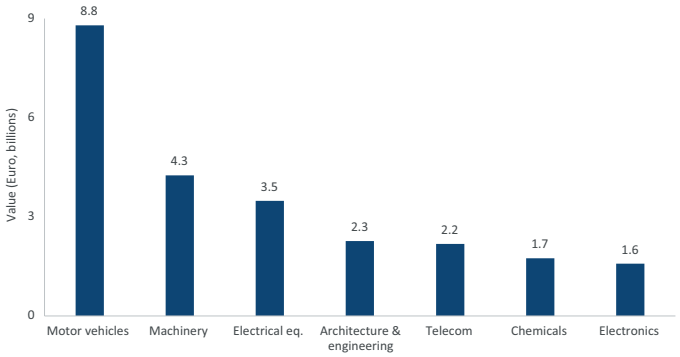


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

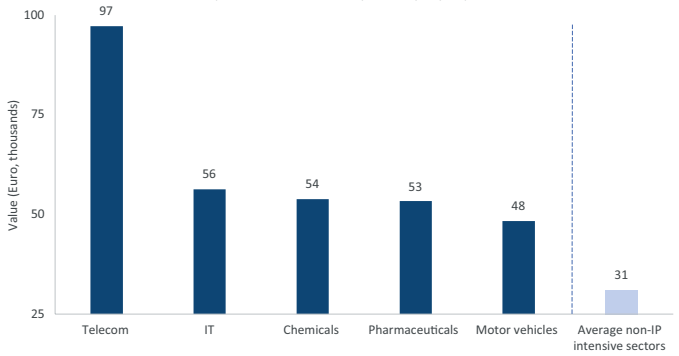


Figure 5: Index of SME R&D potential (2019)

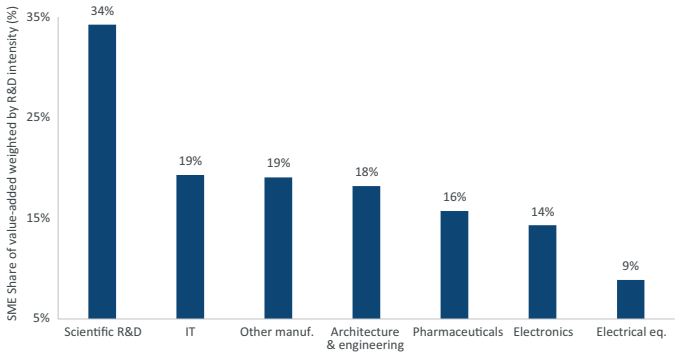
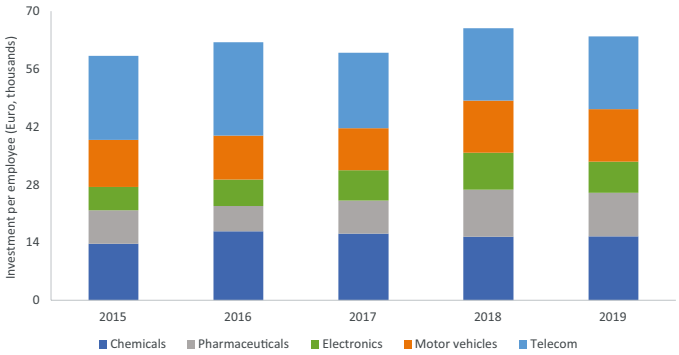


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

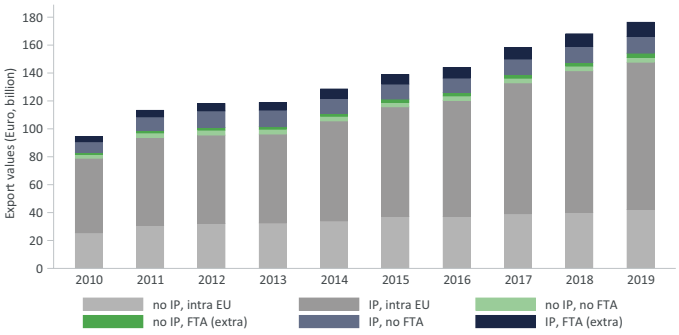


Intellectual Property is highly relevant for the Czech economy. The IP-intensive sectors in Czechia employ more than 710 thousand workers directly, increasing since 2013, and represent 30% of total Czech production (Figure 1). Trademarks (€68 bn), patents (€44 bn), and designs (€42 bn) are the most important types of IP for the Czech economy (Figure 2). Most economic value in Czechia is created by the motor vehicles (€9 bn), machinery (€4 bn) and electrical equipment (€3 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Czech economy (telecom, IT services, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Czechia is up to three times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, chemicals, and pharmaceuticals are the IP-intensive sectors with the highest levels of investment per employee in Czechia (Figure 6). Czech SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and IT services, but other manufacturing and architecture & engineering (Figure 5).

CZECHIA

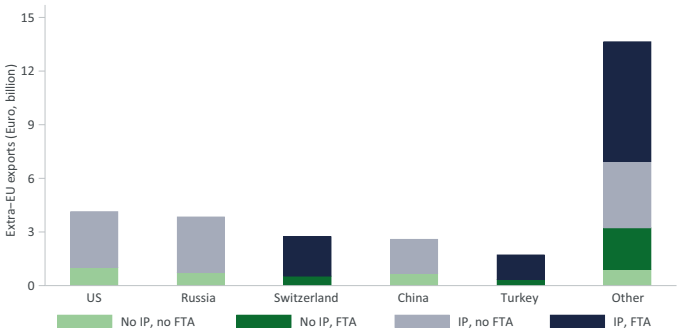
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Czech exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Czech IP framework is correlated with a higher Czech share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in the Czech Republic (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010-2019)



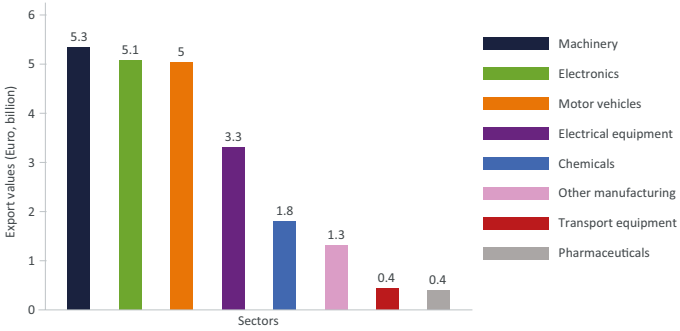
For the Czech Republic, the share of IP-intensive exports outside the EU has gone up from 12% in 2010 to 13% in 2019, but of those exports only 46% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



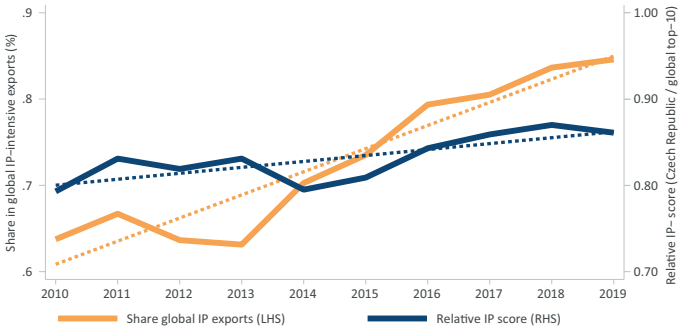
The US (€ 4.1 bn), Russia (€ 3.8 bn), Switzerland (€ 2.7 bn), China (€ 2.6 bn) and Turkey (€ 1.7 bn) are the main Czech export destinations. For these markets IP-intensive exports constitute 78% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



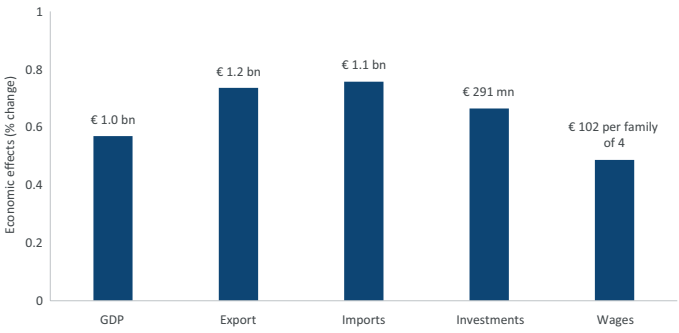
The top-8 IP-intensive manufacturing sectors together export € 23 bn in 2019 and contribute significantly to Czech trade surplus. The largest Czech export sectors that depend on IP are machinery (€ 5.3 bn) and electronics (€ 5.1 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010-2019)



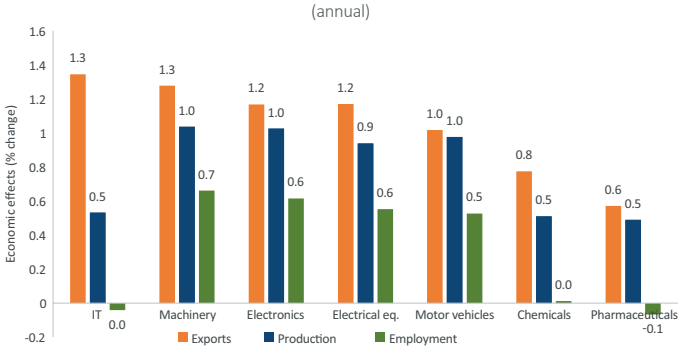
In recent years, the Czech Republic reports a slight increase in its relative IP score compared to the global top-10. This corresponds to an increase in the Czech Republic's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for the Czech Republic. the Czech Republic's GDP, exports, and investments will be between 0.5% and 0.8% higher each year. The average Czech family of four would benefit by €102 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



The Czech Republic's IP-intensive sectors would support growth in exports (by 0.6 to 1.3%), increase resilience by boosting domestic production (by 0.5 to 1.0%), and create high value-added jobs for the Czech economy.

DENMARK

Intellectual property matters for an economy like the Danish one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Denmark. In Figure 2, we show how relevant different types of IP are for the Danish economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Denmark as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

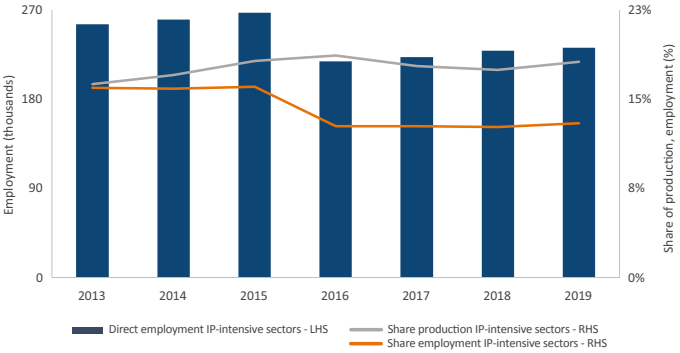


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

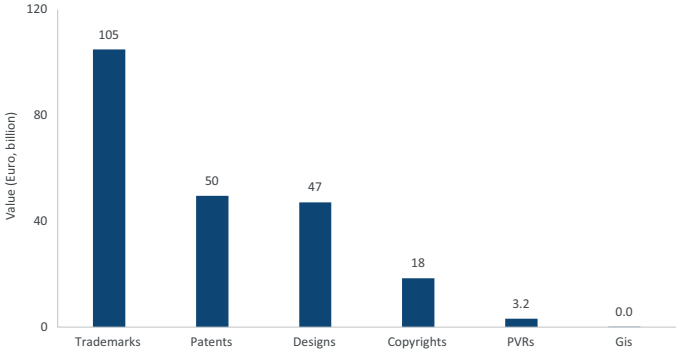


Figure 3: Value-added for IP-intensive sectors (2019)

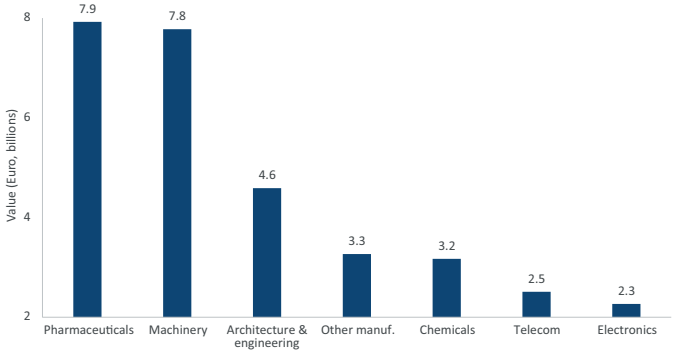


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

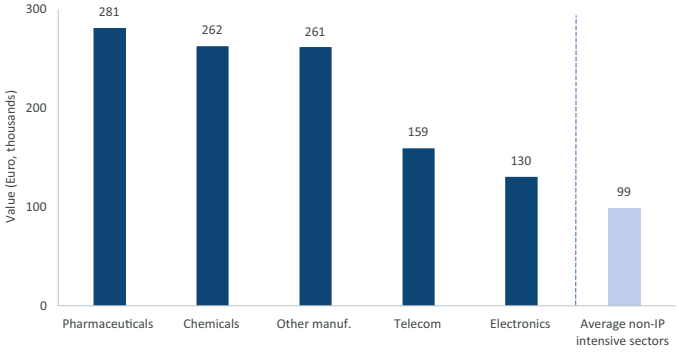


Figure 5: Index of SME R&D potential (2019)

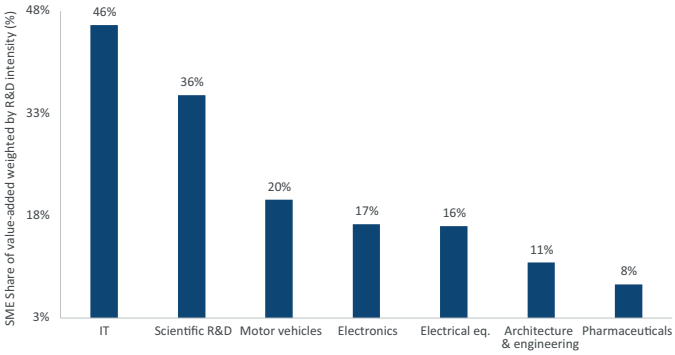
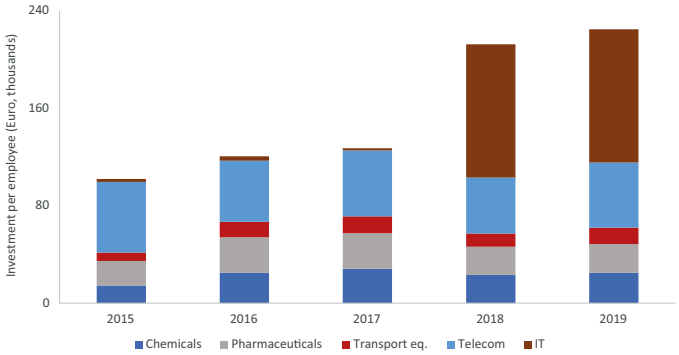


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)



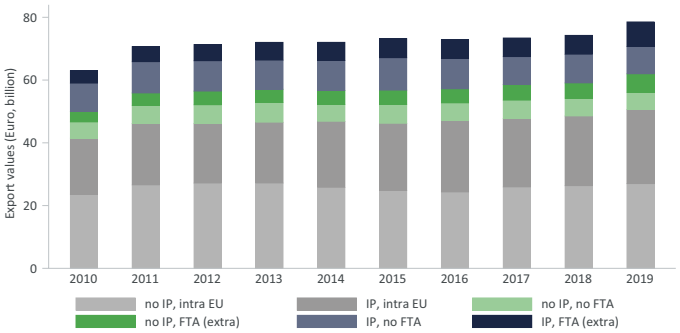
Source for employment data in the pharmaceutical sector Statistics Denmark. Authors' calculations.

Intellectual Property is highly relevant for the Danish economy. The IP-intensive sectors in Denmark employ more than 232 thousand workers directly and represent 18% of total Danish production (Figure 1). Trademarks (€105 bn), patents (€50 bn), and designs (€47 bn) are the most important types of IP for the Danish economy (Figure 2). Most economic value in Denmark is created by the pharmaceuticals (€8 bn), machinery (€8 bn) and architecture & engineering (€5 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Danish economy (pharmaceuticals, chemicals, other manufacturing) creating the highest value jobs. Labour productivity in IP-intensive sectors in Denmark is almost three times higher than for the average of sectors that are not IP-intensive (Figure 4). IT services, telecom, and chemicals are the IP-intensive sectors with the highest levels of investment per employee in Denmark (Figure 6). Danish SMEs make a significant contribution to value-added in sectors with high R&D spending such as IT services and scientific R&D, but also motor vehicles and electronics (Figure 5).

DENMARK

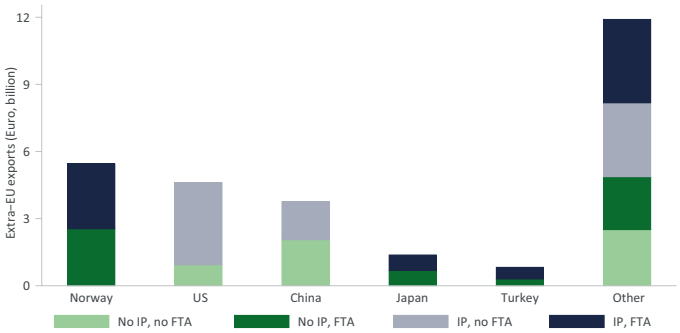
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Danish exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Danish IP framework is related with the Danish share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Denmark (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010-2019)



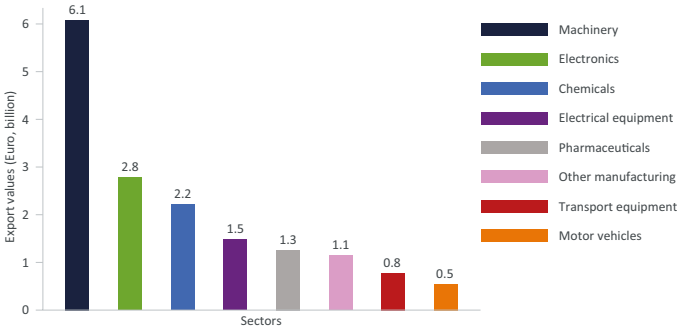
For Denmark, the share of IP-intensive exports outside the EU has remained stable at 21% in 2010 and 21% in 2019. Of those exports only 48% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



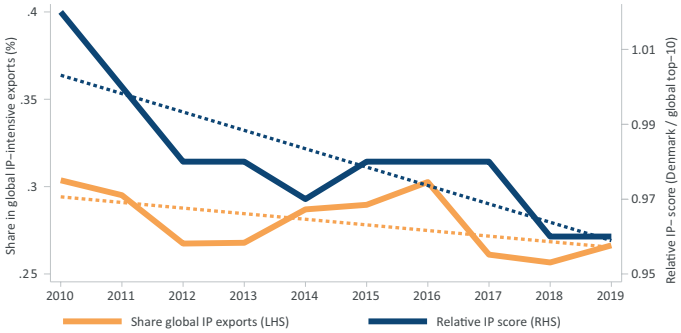
Norway (€ 5.4 bn), the US (€ 4.6 bn), China (€ 3.8 bn), Japan (€ 1.4 bn) and Turkey (€ 0.8 bn) are the main Danish export destinations. For these markets IP-intensive exports constitute 59% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



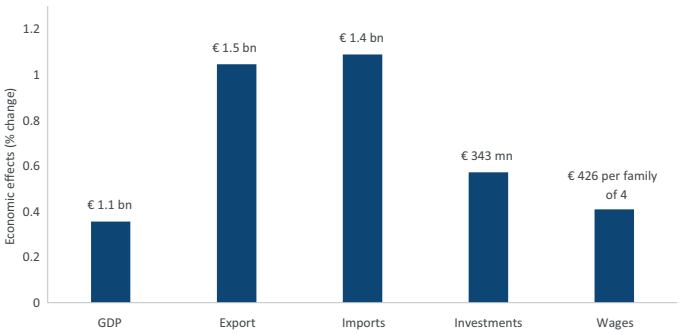
The top-8 IP-intensive manufacturing sectors together export € 16 bn in 2019 and contribute significantly to Danish trade surplus. The largest Danish export sectors that depend on IP are machinery (€ 6.1 bn) and electronics (€ 2.8 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010-2019)



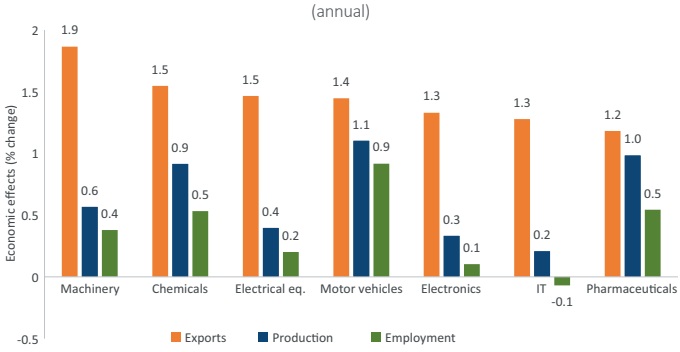
In recent years, Denmark reports a decline in its relative IP score compared to the global top-10. This corresponds to a decline in Denmark's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Denmark. Denmark's GDP, exports, and investments will be between 0.4% and 1.1% higher each year. The average Danish family of four would benefit by €426 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Denmark's IP-intensive sectors would support growth in exports (by 1.2 to 1.9%), increase resilience by boosting domestic production (by 0.2 to 1.1%), and create high value-added jobs for the Danish economy.

ESTONIA

Intellectual property matters for an economy like the Estonian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Estonia. In Figure 2, we show how relevant different types of IP are for the Estonian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Estonia as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

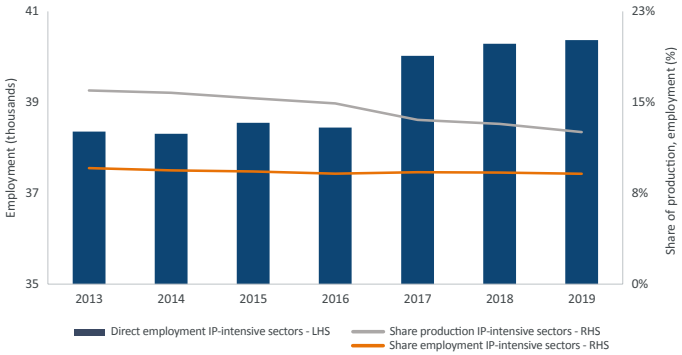


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

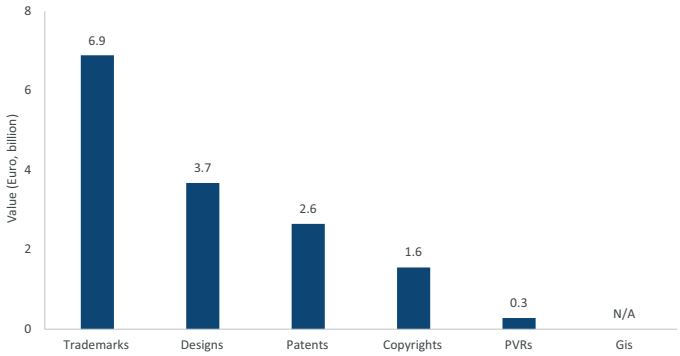


Figure 3: Value-added for IP-intensive sectors (2019)

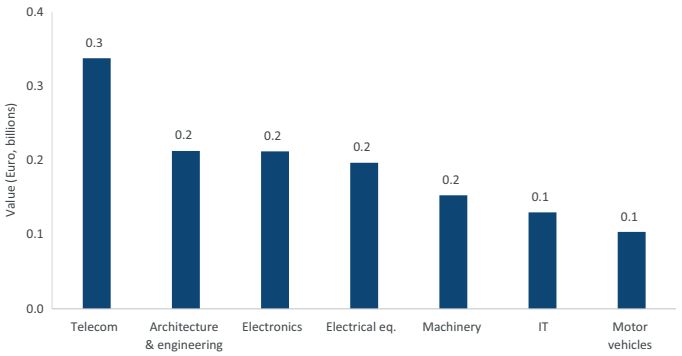


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

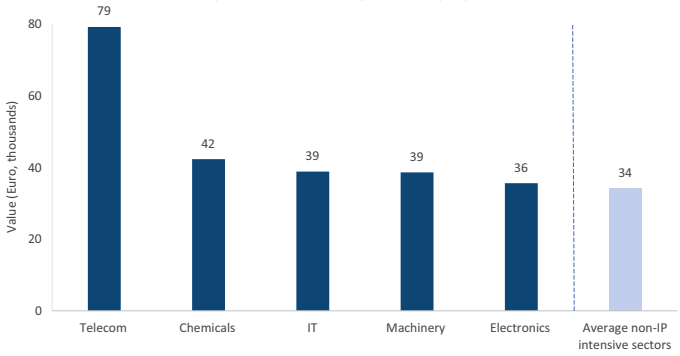


Figure 5: Index of SME R&D potential (2019)

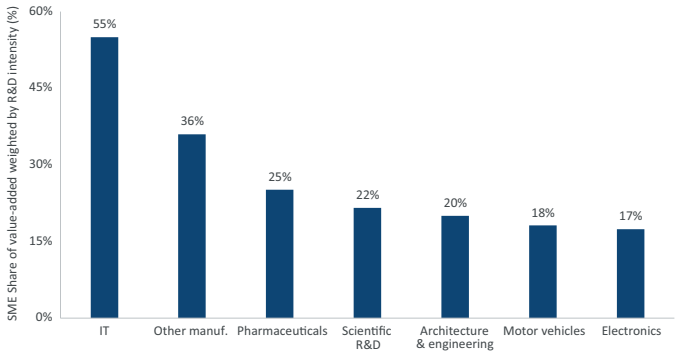
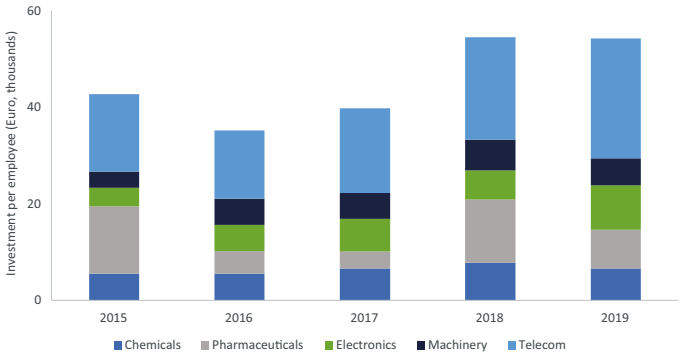


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

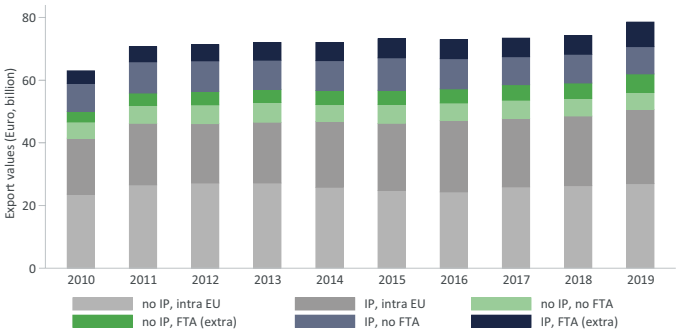


Intellectual Property is highly relevant for the Estonian economy. The IP-intensive sectors in Estonia employ more than 40 thousand workers directly, increasing since 2013, and represent 13% of total Estonian production (Figure 1). Trademarks (€7 bn), designs (€4 bn), and patents (€3 bn) are the most important types of IP for the Estonian economy (Figure 2). Most economic value in Estonia is created by the telecom (€0.3 bn), architecture & engineering (€0.2 bn) and electronics (€0.2 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Estonian economy (telecom, chemicals, IT services) creating the highest value jobs. Labour productivity in IP-intensive sectors in Estonia is more than two times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, electronics, and pharmaceuticals are the IP-intensive sectors with the highest levels of investment per employee in Estonia (Figure 6). Estonian SMEs make a significant contribution to value-added in sectors with high R&D spending such as IT services and other manufacturing, but also pharmaceuticals and scientific R&D (Figure 5).

ESTONIA

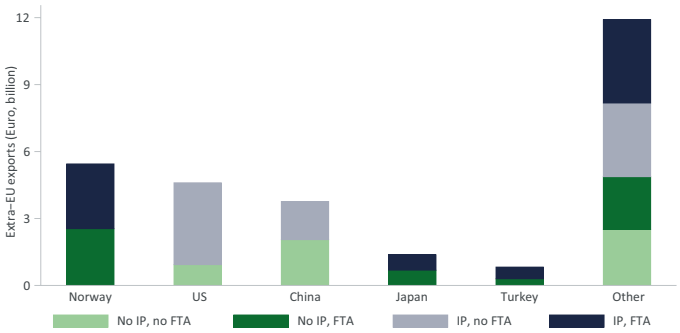
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Estonian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Estonian IP framework is related with the Estonian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Estonia (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



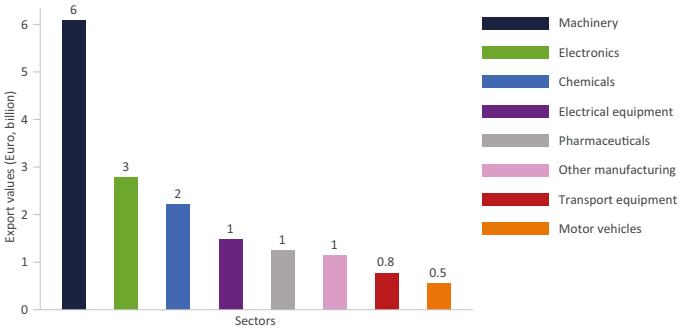
For Estonia, the share of IP-intensive exports outside the EU has gone up from 15% in 2010 to 17% in 2019, but of those exports only 21% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



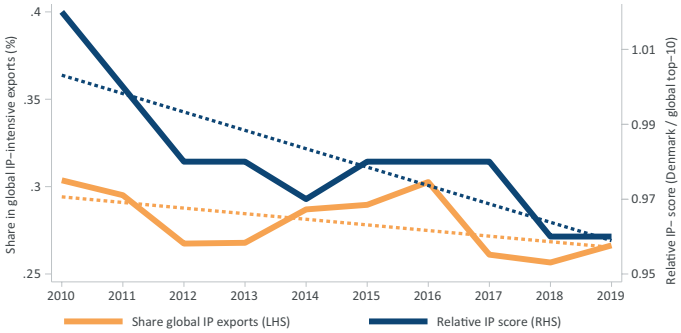
Russia (€ 0.8 bn), the US (€ 0.8 bn), Norway (€ 0.5 bn), China (€ 0.2 bn) and Turkey (€ 0.1 bn) are the main Estonian export destinations. For these markets IP-intensive exports constitute 64% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



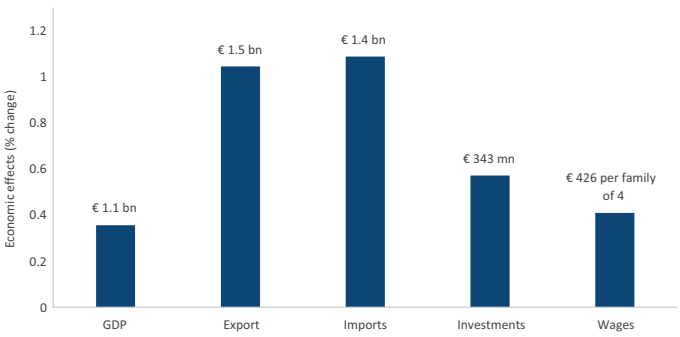
The top-8 IP-intensive manufacturing sectors together export € 2 bn in 2019 and contribute significantly to Estonian trade surplus. The largest Estonian export sectors that depend on IP are electronics (€ 0.7 bn) and machinery (€ 0.6 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



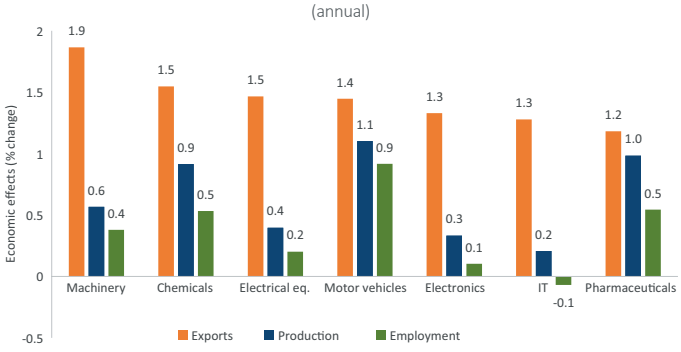
In recent years, Estonia reports an increase in its relative IP score compared to the global top-10. This corresponds to a somewhat stable pattern in Estonia's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Estonia. Estonian's GDP, exports, and investments will be between 0.5% and 1.0% higher each year. The average Estonian family of four would benefit by €168 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Estonia's IP-intensive sectors would support growth in exports (by 0.9 to 3.3%), increase resilience by boosting domestic production (by 0.4 to 2.9%), and create high value-added jobs for the Estonian economy.

INSERT 2:

RELEVANCE OF INTELLECTUAL PROPERTY FOR PHARMACEUTICAL INNOVATION

By Mr. Maarten Meulenbelt, Sidley Austin LLP[69]

In the pharmaceutical industry, the role of Intellectual Property (IP) as an incentive for product development is particularly important: each investor considering to invest in the development of a medicinal product must assess the risks and costs incurred, compared to the risks and costs associated with investment in other sectors[70]; the timing, scope and duration of expected global or regional revenues; and the likelihood that IP and regulatory rights, existing at the start of product development will still be available at the time when the product might obtain a marketing authorisation (MA) and enter the market.[71]

The EU has not been gaining ground recently in terms of pharmaceutical innovation, research and development, whether measured in terms of headquartering R&D companies or originating new treatments[72], clinical trials (China became the country with the most registered CAR-T trials already in 2017)[73] or access to new medicinal products (several products have been reported as launching years later than in the United States).

There are key distinguishing factors making the pharmaceutical sector riskier compared to other industries, including the lengthy marketing authorisation ("MA") process, and the high rates of attrition and failure.[74] Moreover, there is often a high risk of products being copied after an MA has been obtained. For example, in many cases medicinal products can be physically copied using patent applications published for the originator product and/or pharmacopoeia monographs. In addition, the evidence of safety and efficacy information confidentially submitted to obtain an MA (or published in summarised form by authorities granting MAs) can be used or relied on by follow-on applicants, both within the same jurisdiction or in other jurisdictions, unless appropriate restrictions are in place.

To mitigate these long-standing risks, and to ensure that the pharmaceutical sector remains attractive for investors, several international treaties such as the TRIPS Agreement lay down minimum protection levels for patent rights (Articles 28 et seq.), and for the protection

[69] The views expressed in this article are the author's own, and do not necessarily reflect the views of Sidley Austin LLP or any of its clients.

[70] The methodology used most commonly in the pharmaceutical sector for comparing expected risks, costs and revenues across sectors is the risk-adjusted Net Present Value (rNPV) model.

[71] See E. Neez et al, Estimated impact of EU Orphan Regulation on incentives for innovation, available at https://dolon.com/dolon/wp-content/uploads/2020/10/Estimated-impact-of-EU-Orphan-Regulation-on-incentives-for-innovation.pdf; and M. Berdud et al, Economic and Financial Challenges of Developing Orphan Medicinal Products, https://www.eucope.org/wp-content/uploads/2020/04/ohe-omp-regulation-28-feb-2020-fv.pdf

[72] See the Pharmaprojects RD Annual Review reports for 2019 , 2020 and 2021.

[73] See J. Wei et al, Clinical development of CAR T cell therapy in China: 2020 update, https://www.nature.com/articles/s41423-020-00555-x.pdf

[74] J. Jacobs et al, The cost of opportunity, A study on pharmaceutical R&D costs, available at https://gupta-strategists.nl/studies/the-cost-of-opportunity.

information confidentially submitted to regulatory authorities (Article 39.3 TRIPS); and some jurisdictions such as the EU have introduced incentives not directly required by TRIPS, e.g., patent term restoration legislation such as the EU SPC Regulation, as well as legislation to incentivise the development of orphan medicinal products.

The EU has, with different degrees of success[75], pursued the maintenance or creation of IP and regulatory rights in third countries, e.g. provisions on patent term restoration (PTR) – called supplementary protection certificates (SPC) in the EU – and regulatory data protection (RDP).

The policy basis for IP and regulatory protections such as patents and RDP is not always fully reflected, even in decisions and acts of EU institutions. For example, few opinions and judgements of the Court of Justice of the European Union (CJEU) mention the most fundamental quid pro quo of patent law – the disclosure of the knowledge allowing the reproduction of the invention by publishing the patent application, as a condition for a time-limited right to exclude others from practicing the invention. Similarly, there has been little mention of the efforts involved in compiling evidence of quality, safety and efficacy in MA dossiers, which can serve as the basis for future biosimilars and generics which, thanks to those efforts, can be put on the market without submitting full results of pre-clinical and clinical tests and trials.

The need for strong international and EU IP protection to encourage product development appears to be greater than ever given recent developments, including the following:

1. Economic reports have shown that the MA process has become longer in recent years (12 years)[76], more expensive (USD 2.6 billion per molecule), and riskier (12% approval rate for drugs entering clinical development).[77]

2. The race to bring COVID-19 vaccines to the market has confirmed the high costs of drug and manufacturing capacity development[78]; the risks of failure, shown by relatively high attrition rates[79]; and the need to invest in a broad portfolio of vaccines based on different technological approaches to maximise the chances of safe and effective products being brought to market[80].

[75] Depending on the economic and political context.

[76] M. Kyle, https://ec.europa.eu/info/publications/economic-analysis-supplementary-protection-certificates-europe_en.

[77] DiMasi JA, Grabowski HG, Hansen RA. Innovation in the pharmaceutical industry: new estimates of R&D costs. Journal of Health Economics 2016;47:20-33, available at https://www.sciencedirect.com/science/article/abs/pii/S0167629616000291?via%3Dihub.

[78] According to analysis conducted by kENUP Foundation, the public sector alone spent EUR 93 billion on vaccine development in the course of 2020.

[79] The WHO candidate vaccine landscape and tracker, consulted on 23 April 2021, shows The COVID-19 tracker of Regulatory Focus, consulted on 23 April 2021, shows 91 vaccines in clinical development, and 184 vaccines in pre-clinical development. Clearly, only a modest proportion of these vaccines will obtain a marketing authorisation and generate meaningful sales. See https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines.

[80] https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/public-health/eu-vaccines-strategy_en.

3. Regulatory Data Protection (RDP) can be undermined where countries allow follow-on marketing authorisation applications to be based on public assessment reports reflecting regulatory data that should still be protected.[81]

4. For some market segments, it is recognised that current incentives are not sufficient: investment in research and development has led to 2,121 designations of new "orphan" (rare) diseases and 164 authorised new treatments for about 90 rare diseases between 2000 and 2018.[82] However, despite the adoption of the EU Orphan Medicinal Products Regulation in 2000, 95% of the thousands of rare diseases have no authorised treatment[83]; only one-tenth of products that have received an orphan drug designation (ODDs) achieve a marketing authorization; and market failures affect the development of new antimicrobials.[84]

5. The demand side is more concentrated than in other industries, with purchasing power strong and getting stronger, and, in the EU, growing requests to disclose historical cost components permitting authorities to set prices ex-post, on a "cost-plus" basis, and without taking full account of development risks.[85]

6. There are growing calls for temporary IP waivers[86] or compulsory licensing (CL), especially in times of health crises.[87]

The EU is at a crossroads, due to the unintended confluence of COVID-19 (which has shown the value of having new medicinal products developed, and the costs and risks involved) as well as the Commission's Pharmaceutical Strategy, which could undermine IP and regulatory incentives by linking them to launch obligations and R&D cost transparency in future.[88]

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[81] See European Commission reference to a 2016 Russian Supreme Court judgment stating that regulatory data protection (RDP) does not apply to data made available by the European Medicines Agency. See European Commission Staff Working Document SWD(2019)452 final/2, p. 27, available at https://trade.ec.europa.eu/doclib/docs/2020/january/tradoc_158561.pdf.

[82] https://www.efpia.eu/about-medicines/development-of-medicines/intellectual-property/help-us-make-rare-disease-even-rarer/

[83] https://eur-lex.europa.eu/legal-content/EN/AUTO/?uri=pi_com:Ares%282020%297081640

[84] https://ec.europa.eu/health/sites/health/files/files/paediatrics/docs/orphan-regulation_eval_swd_2020-163_part-1.pdf.

[85] The WHO noted that it has been suggested that "an undesirable effect of cost-plus pricing might be reduced incentive for manufacturers to invest in R&D, as only investments in a small proportion of pharmaceuticals actually reaching the market would be recovered, whereas costs of failed R&D efforts would not be compensated". WHO, Systematic reviews for the update of the WHO Guideline on country pharmaceutical pricing policies, https://apps.who.int/iris/bitstream/handle/10665/335704/9789240011892-eng.pdf, p. 67.

[86] See proposal by South Africa and India, available at https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/W669.pdf&Open=True

[87] See Report on the feasibility and analysis of "Impact Licensing Initiative" (ILI) for technology access during a health crisis, available at https://op.europa.eu/en/publication-detail/-/publication/8576381e-2ece-11eb-b27b-01aa75ed71a1/language-en.

[88] In its Combined Evaluation Roadmap/Inception impact Assessment of 7 April 2021, the Commission stated that it might seek to "establish a new system of incentives that links rewards with possible obligations, including the placing on the market of the products in most/all Member States, or more transparency on R&D costs". See https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12963-Evaluation-and-revision-of-the-general-pharmaceutical-legislation.

Hopefully, the 'shock to the system' provided by COVID-19 will ultimately result in a confirmation of the value of IP rights as a driver for new product development and an element needed for future pandemic preparedness, rather than an erosion, permitting the EU to remain attractive as a basis for R&D. There is some reason for hope: some of the Member States entering the COVID market as an investor are now experiencing first-hand how success requires long-term investment, risk-taking, and pursuit of drugs that will not make it to market, or that face challenges remaining on the market.

FINLAND

Intellectual property matters for an economy like the Finish one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Finland. In Figure 2, we show how relevant different types of IP are for the Finish economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Finland as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

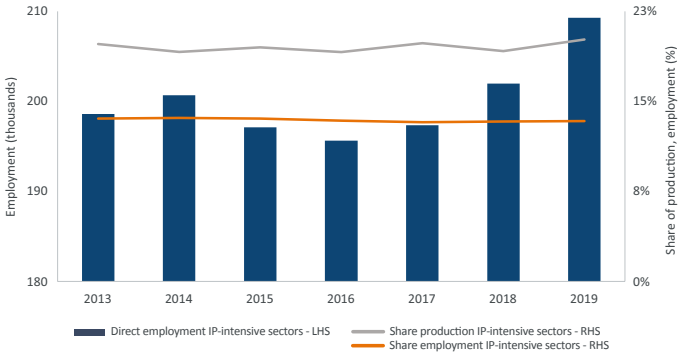


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

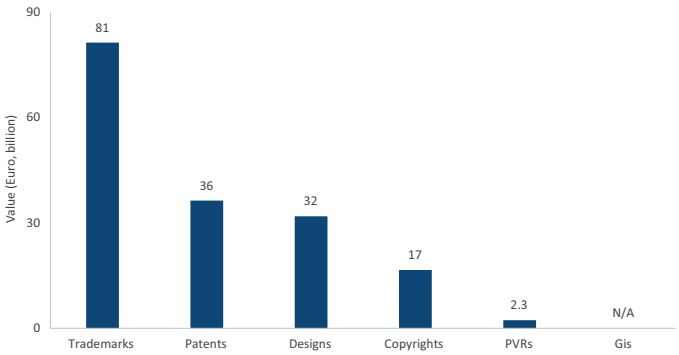


Figure 3: Value-added for IP-intensive sectors (2019)

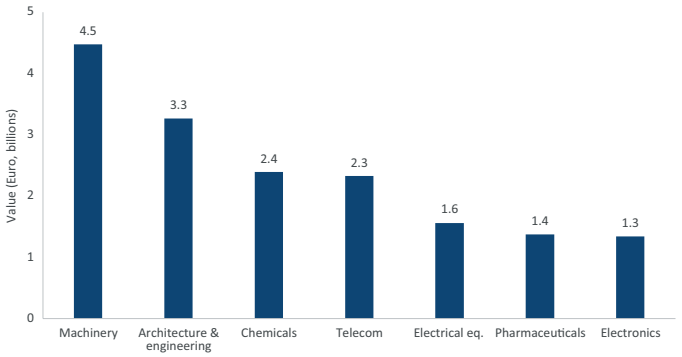


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

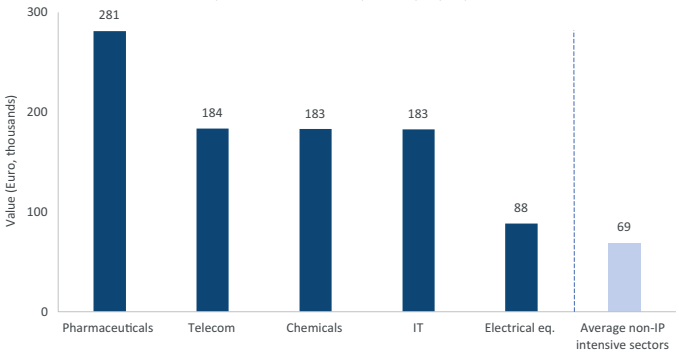


Figure 5: Index of SME R&D potential (2019)

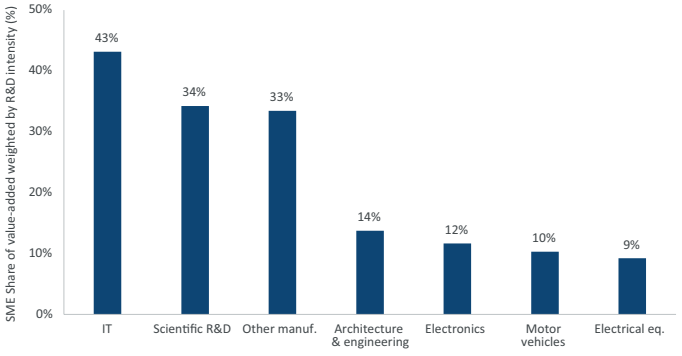
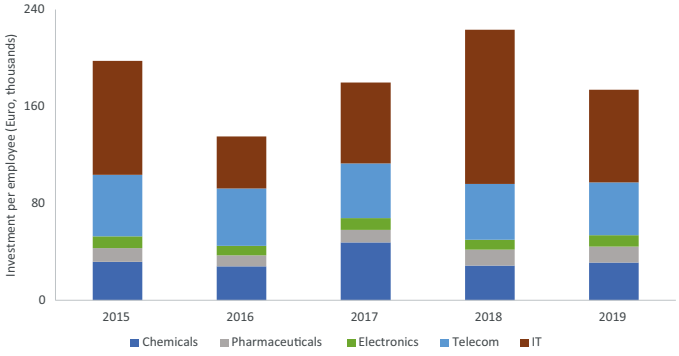


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

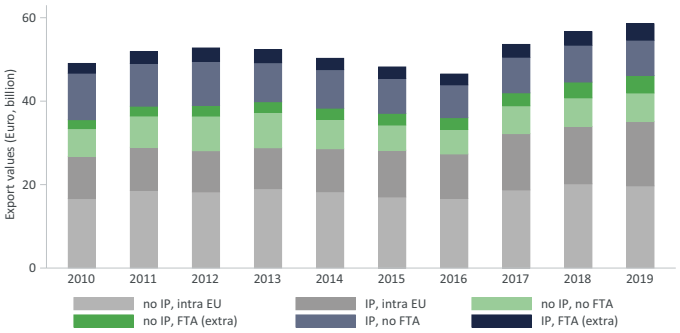


Intellectual Property is highly relevant for the Finish economy. The IP-intensive sectors in Finland employ more than 209 thousand workers directly, increasing since 2016, and represent 20% of total Finish production (Figure 1). Trademarks (€81 bn), patents (€36 bn), and designs (€32 bn) are the most important types of IP for the Finish economy (Figure 2). Most economic value in Finland is created by the machinery (€4 bn), architecture & engineering (€3 bn) and chemicals (€2 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Finish economy (pharmaceuticals, telecom, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Finland is up to four times higher than for the average of sectors that are not IP-intensive (Figure 4). IT services, telecom, and chemicals are the IP-intensive sectors with the highest levels of investment per employee in Finland (Figure 6). Finish SMEs make a significant contribution to value-added in sectors with high R&D spending such as IT services and scientific R&D, but also other manufacturing (Figure 5).

FINLAND

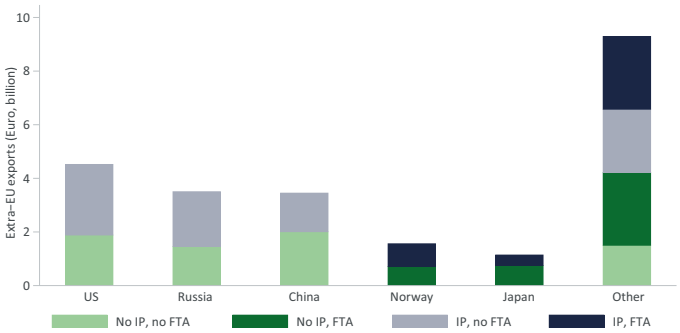
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Finnish exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Finnish IP framework is related with the Finnish share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Finland (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



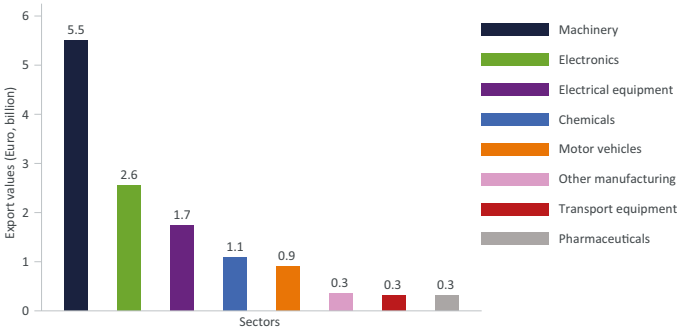
For Finland, the share of IP-intensive exports outside the EU has decreased from 28% in 2010 to 21% in 2019. Of those exports only 32% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



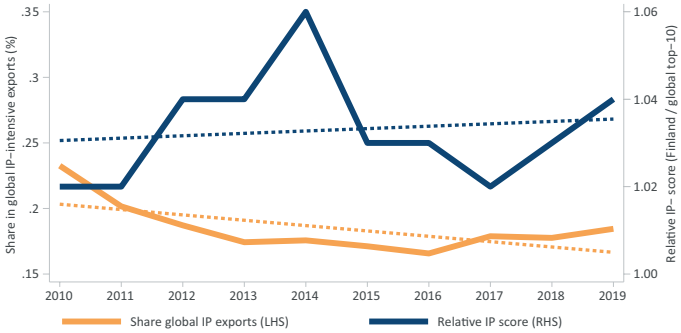
The US (€ 4.5 bn), Russia (€ 3.5 bn), China (€ 3.5 bn), Norway (€ 1.6 bn) and Japan (€ 1.1 bn) are the main Finnish export destinations. For these markets IP-intensive exports constitute 52% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



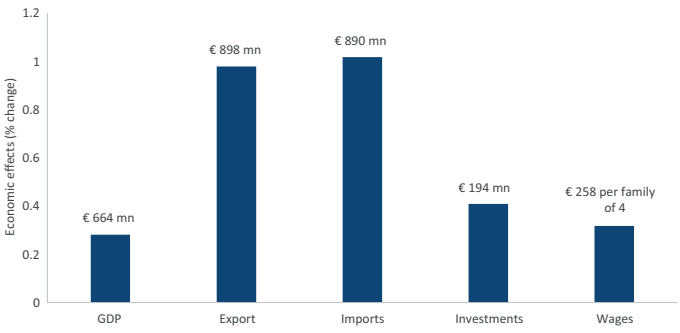
The top-8 IP-intensive manufacturing sectors together export € 13 bn in 2019 and contribute significantly to Finnish trade surplus. The largest Finnish export sectors that depend on IP are machinery (€ 5.5 bn) and electronics (€ 2.6 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



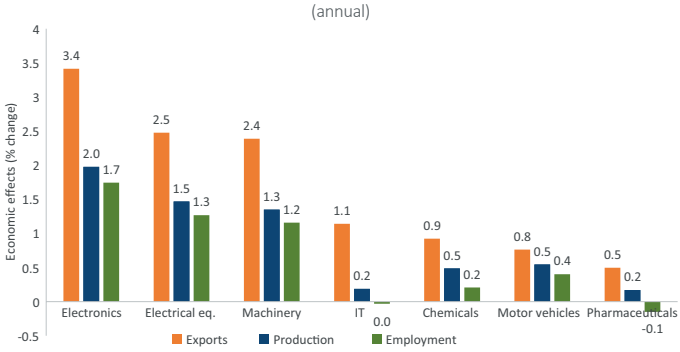
In recent years, Finland reports a slight increase in its relative IP score compared to the global top-10. This corresponds to an also small increase in Finland's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Finland. Finland's GDP, exports, and investments will be between 0.3% and 1.0% higher each year. The average Finnish family of four would benefit by €258 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Finland's IP-intensive sectors would support growth in exports (by 0.5 to 3.4%), increase resilience by boosting domestic production (by 0.2 to 2.0%), and create high value-added jobs for the Finnish economy.

FRANCE

Intellectual property matters for an economy like the French one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in France. In Figure 2, we show how relevant different types of IP are for the French economy in terms of value-added. Figure 3 shows the economic value of goods and services created in France as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

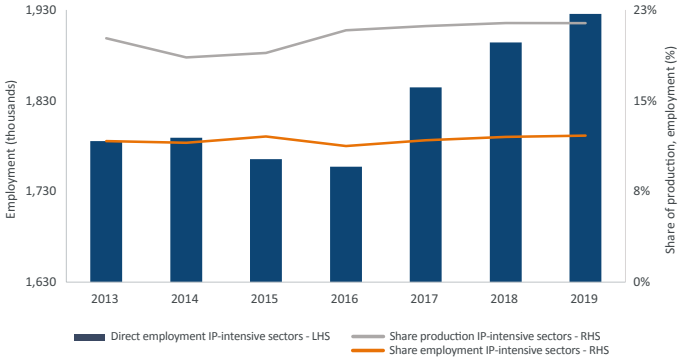


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

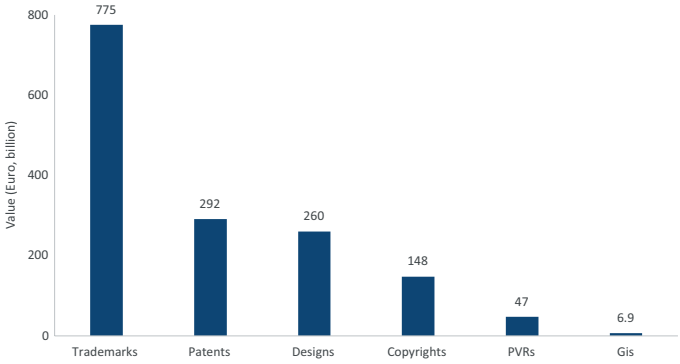


Figure 3: Value-added for IP-intensive sectors (2019)

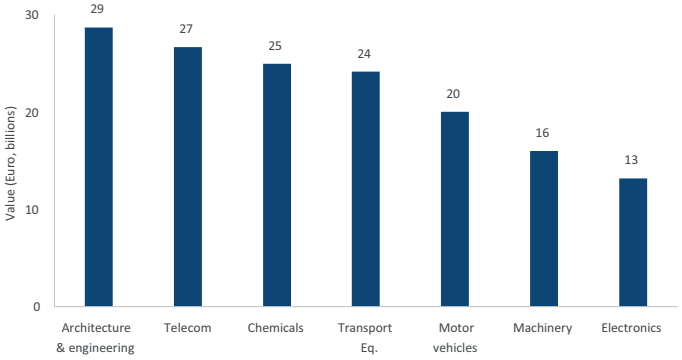
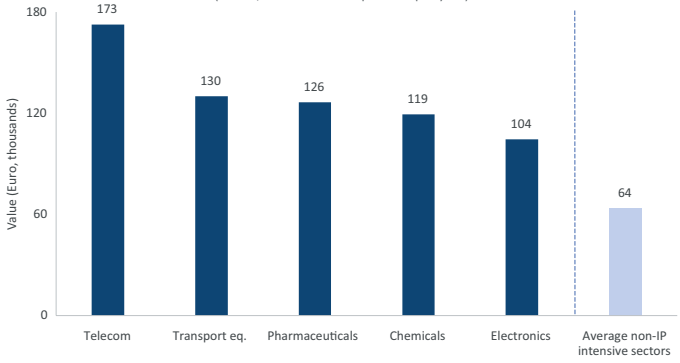


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)



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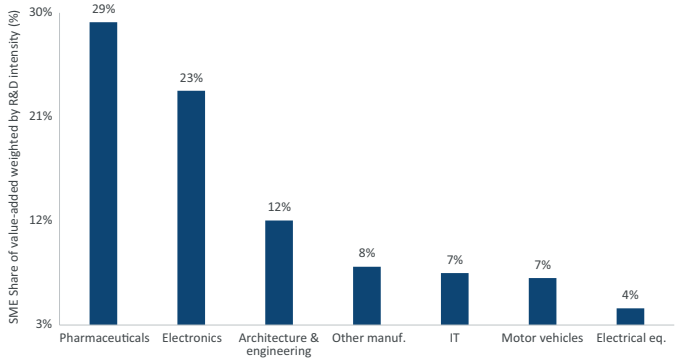

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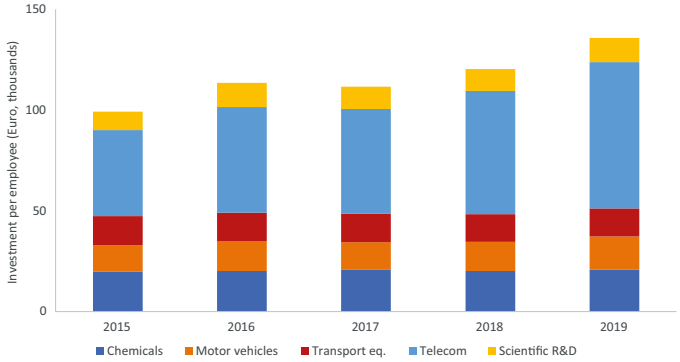


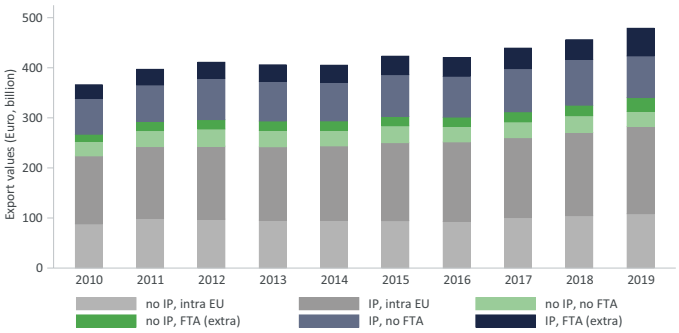
Source for employment data in the pharmaceutical sector Les Entreprises du médicament (Leem). Authors' calculations.

Intellectual Property is highly relevant for the French economy. The IP-intensive sectors in France employ more than 1.9 million workers directly, increasing since 2013, and represent 21% of total French production (Figure 1). Trademarks (€775 bn), patents (€292 bn), and designs (€260 bn) are the most important types of IP for the French economy (Figure 2). Most economic value in France is created by the architecture & engineering (€29 bn), telecom (€ 27 bn) and chemicals (€25 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the French economy (telecom, transport equipment, pharmaceuticals) creating the highest value jobs. Labour productivity in IP-intensive sectors in France is up to 3 times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, chemicals, and motor vehicles are the IP-intensive sectors with the highest levels of investment per employee in France (Figure 6). French SMEs make a significant contribution to value-added in sectors with high R&D spending such as pharmaceuticals and electronics, but also architecture & engineering and other manufacturing (Figure 5).

FRANCE

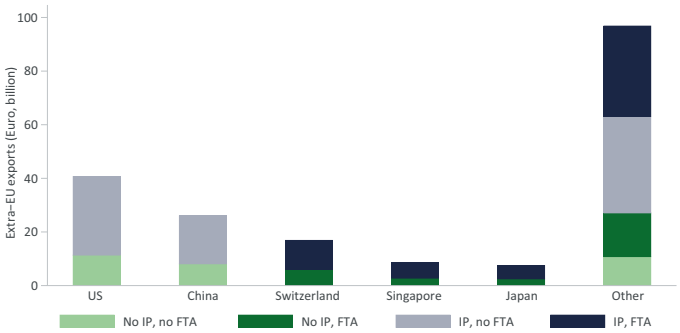
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and French exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the French IP framework is related with the French share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in France (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



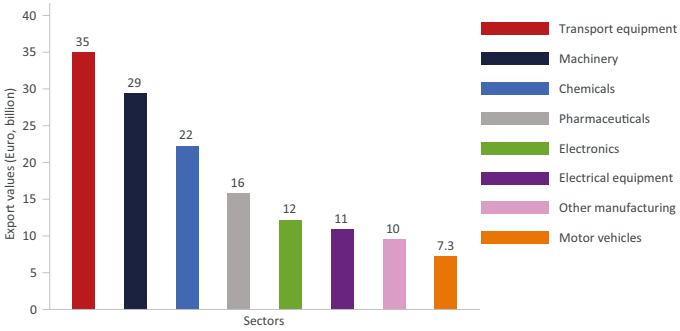
For France, the share of IP-intensive exports outside the EU has gone up from 27% in 2010 to 29% in 2019, but of those exports only 40% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



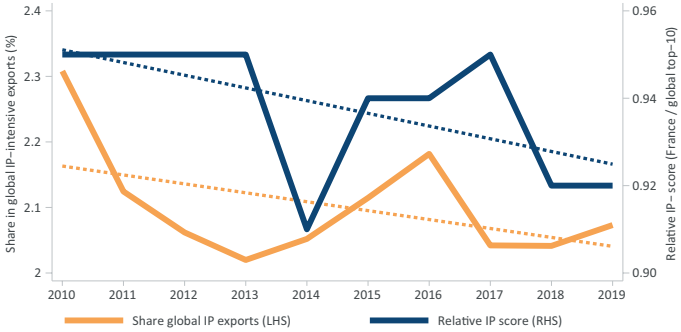
The US (€ 41 bn), China (€ 26 bn), Switzerland (€ 17 bn), Singapore (€ 8.6 bn) and Japan (€ 7.5 bn) are the main French export destinations. For these markets IP-intensive exports constitute 69% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



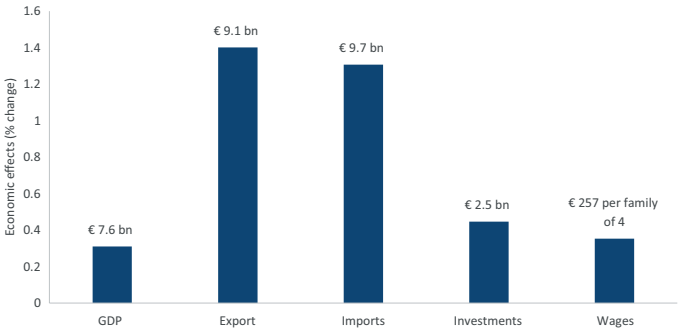
The top-8 IP-intensive manufacturing sectors together export € 143 bn in 2019 and contribute significantly to French trade surplus. The largest French export sectors that depend on IP are transport equipment (€ 35 bn) and machinery (€ 29 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



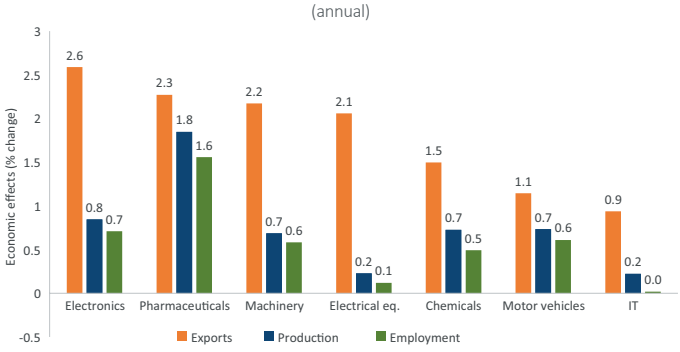
In recent years, France reports a decline in its relative IP score compared to the global top-10. This corresponds to an also small decline in France's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for France. France's GDP, exports, and investments will be between 0.3% and 1.4% higher each year. The average French family of four would benefit by €257 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



France's IP-intensive sectors would support growth in exports (by 0.9 to 2.6%), increase resilience by boosting domestic production (by 0.2 to 1.8%), and create high value-added jobs for the French economy.

GERMANY

Intellectual property matters for an economy like the German one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Germany. In Figure 2, we show how relevant different types of IP are for the German economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Germany as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2012-2018)

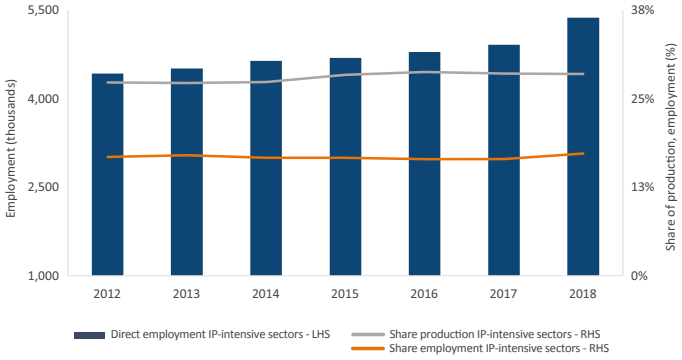


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

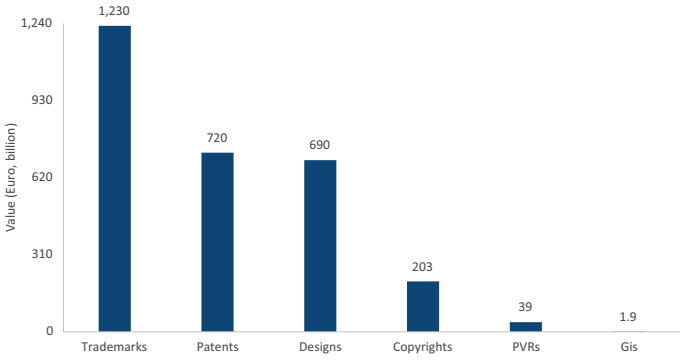


Figure 3: Value-added for IP-intensive sectors (2018)

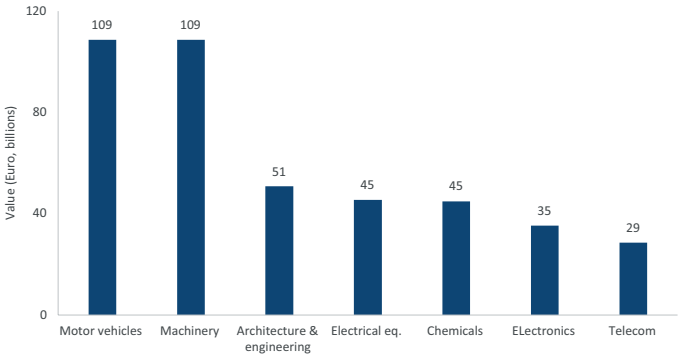


Figure 4: Labour productivity for IP-intensive sectors
(2018, value added per employee)

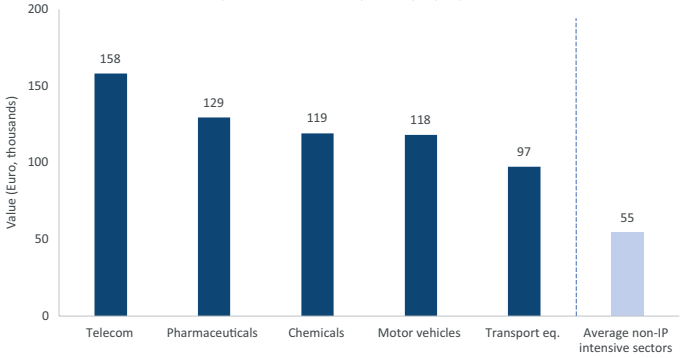


Figure 5: Index of SME R&D potential (2018)

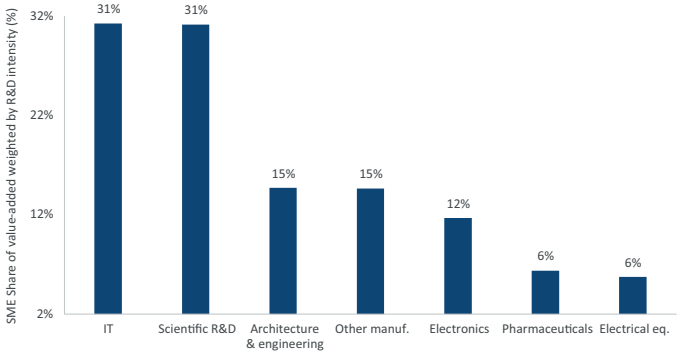
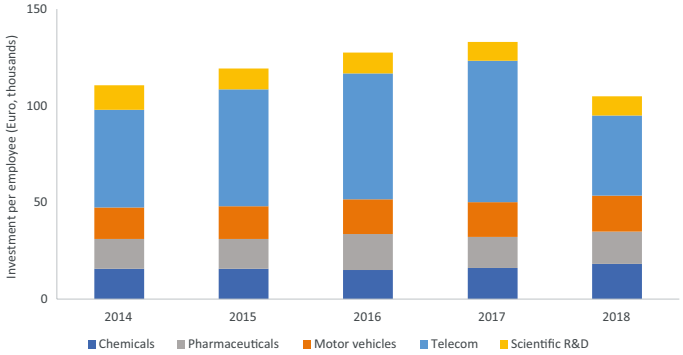


Figure 6: Investment per employee for IP-intensive sectors (2014-2018)



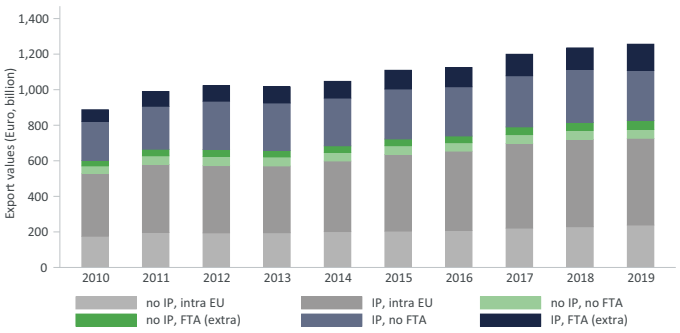
Note: Eurostat 2019 data not available at the time of the analysis.

Intellectual Property is highly relevant for the German economy. The IP-intensive sectors in Germany employ more than 5 million workers directly, increasing since 2012, and represent 28% of total German production (Figure 1). Trademarks (€1,230 bn), patents (€720 bn), and designs (€690 bn) are the most important types of IP for the German economy (Figure 2). Most economic value in Germany is created by the motor vehicles (€109 bn), machinery (€109 bn), architecture & engineering (€51 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the German economy (telecom, pharmaceuticals, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Germany is up to three times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, motor vehicles, and chemicals are the IP-intensive sectors with the highest levels of investment per employee in Germany (Figure 6). German SMEs make a significant contribution to value-added in sectors with high R&D spending such as IT services and scientific R&D, but also architecture & engineering and other manufacturing (Figure 5).

GERMANY

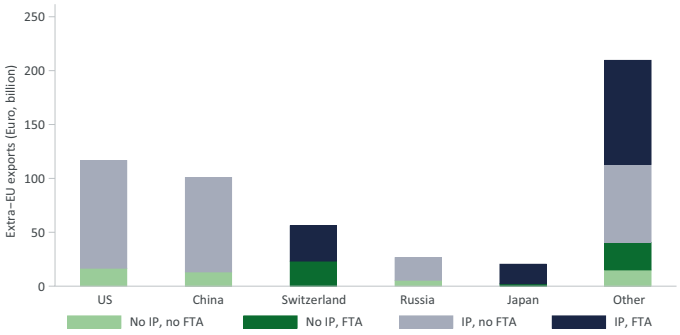
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and German exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the German IP framework is related with the German share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Germany (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



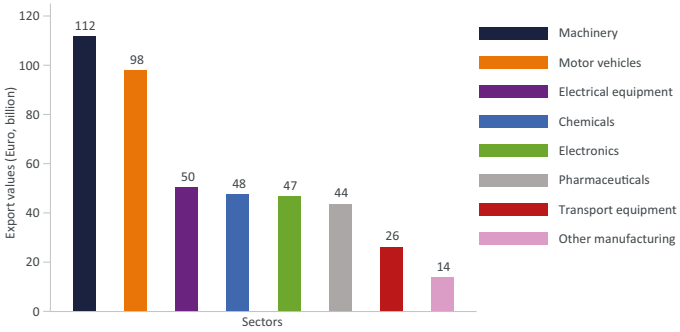
For Germany, the share of IP-intensive exports outside the EU has gone up from 32% in 2010 to 34% in 2019, but of those exports only 34% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



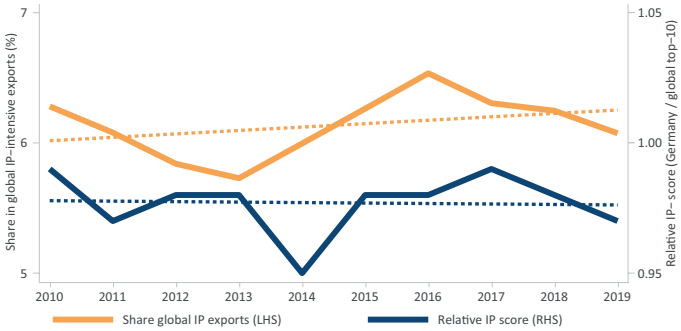
The US (€ 117 bn), China (€ 101 bn), Switzerland (€ 56 bn), Russia (€ 27 bn) and Japan (€ 20 bn) are the main German export destinations. For these markets IP-intensive exports constitute 81% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



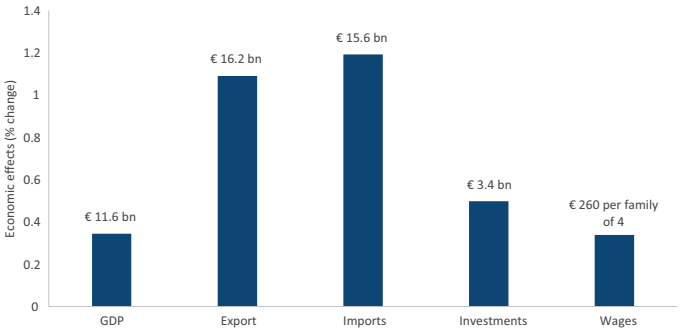
The top-8 IP-intensive manufacturing sectors together export € 438 bn in 2019 and contribute significantly to Germany's trade surplus. The largest German export sectors that depend on IP are machinery (€ 112 bn) and motor vehicles (€ 98 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



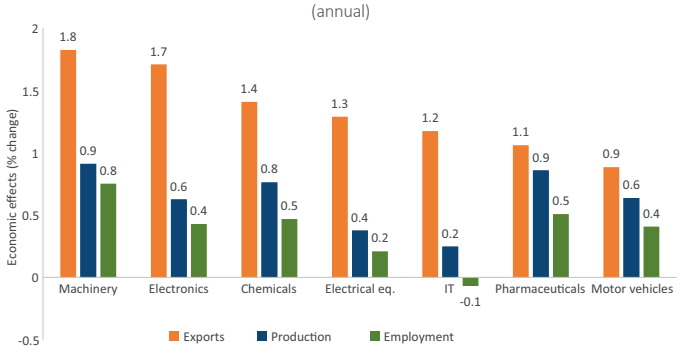
In recent years, Germany reports a slight decline in its relative IP score compared to the global top-10. This corresponds to an also small decline in Germany's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Germany. Germany's GDP, exports, and investments will be between 0.3% and 1.2% higher each year. The average German family of four would benefit by €260 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)

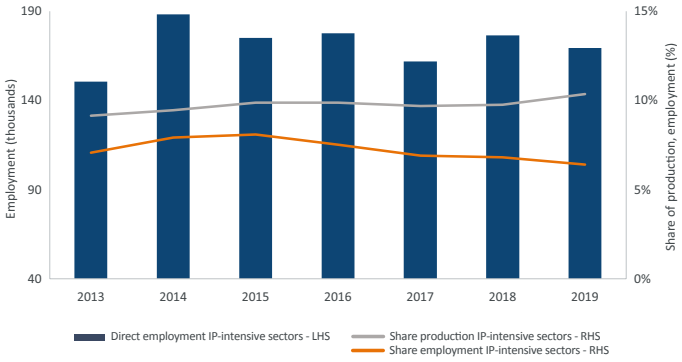


Germany's IP-intensive sectors would support growth in exports (by 0.9 to 1.8%), increase resilience by boosting domestic production (by 0.2 to 0.9%), and create high value-added jobs for the German economy.

GREECE

Intellectual property matters for an economy like the Greek one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Greece. In Figure 2, we show how relevant different types of IP are for the Greek economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Greece as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)



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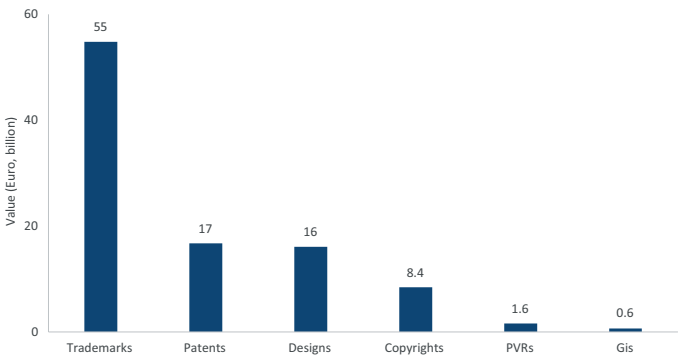


Figure 3: Value-added for IP-intensive sectors (2019)

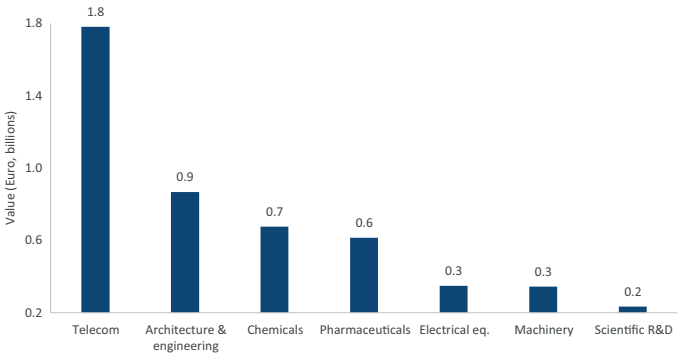


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

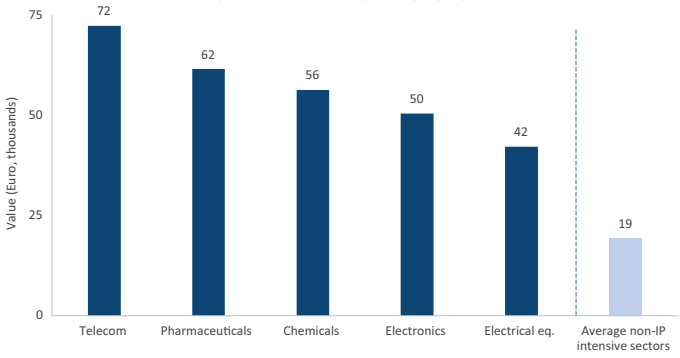


Figure 5: Index of SME R&D potential (2019)

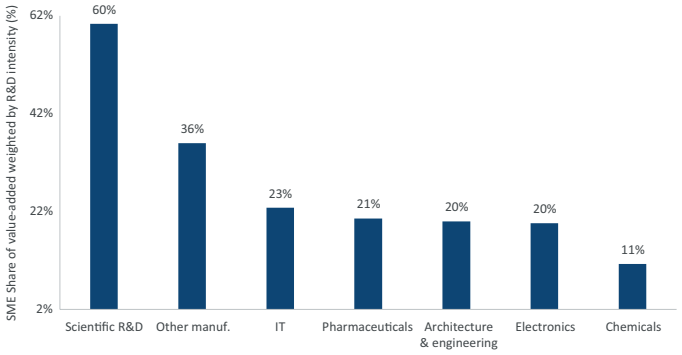
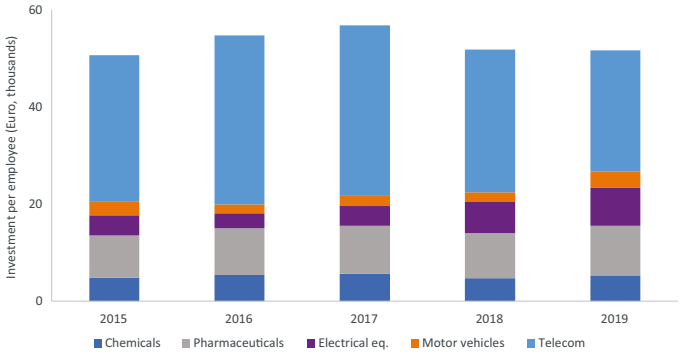


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

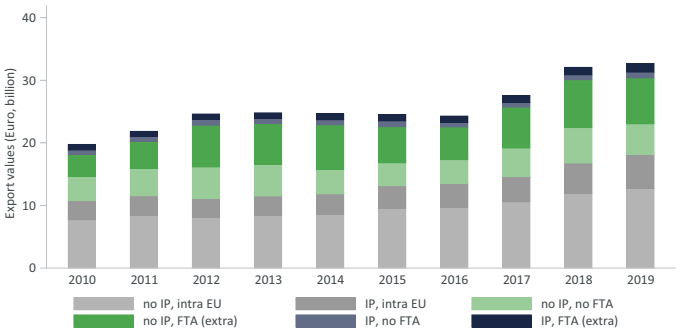


Intellectual Property is highly relevant for the Greek economy. The IP-intensive sectors in Greece employ more than 170 thousand workers directly and represent 10% of total Greek production (Figure 1). Trademarks (€55 bn), patents (€17 bn), and designs (€16 bn) are the most important types of IP for the Greek economy (Figure 2). Most economic value in Greece is created by the telecom (€2 bn), architecture & engineering (€0.9 bn) and chemicals (€0.7 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Greek economy (telecom, pharmaceuticals, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Greece is up to four times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, pharmaceuticals, and electrical equipment are the IP-intensive sectors with the highest levels of investment per employee in Greece (Figure 6). Greek SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and other manufacturing, but also IT services and pharmaceuticals (Figure 5).

GREECE

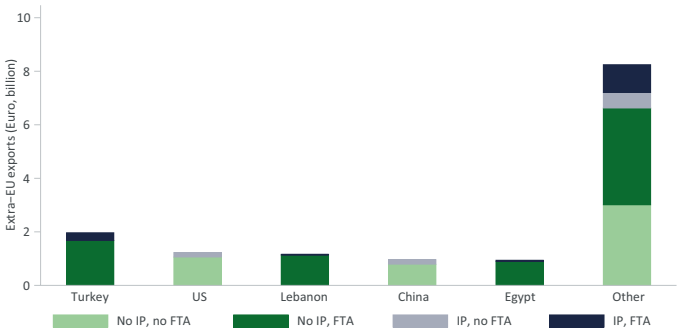
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Greek exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Greek IP framework is related with the Greek share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Greece (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



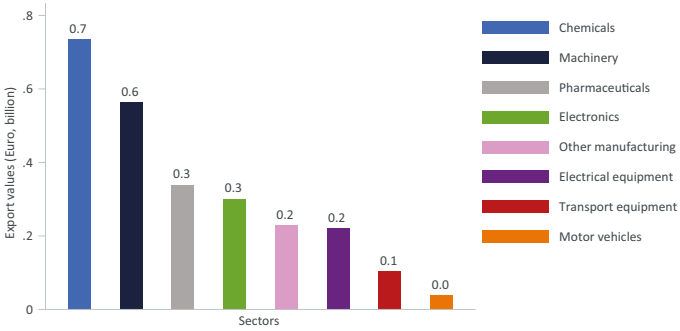
For Greece, the share of IP-intensive exports outside the EU has decreased from 8% in 2010 to 7% in 2019. Of those exports 60% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



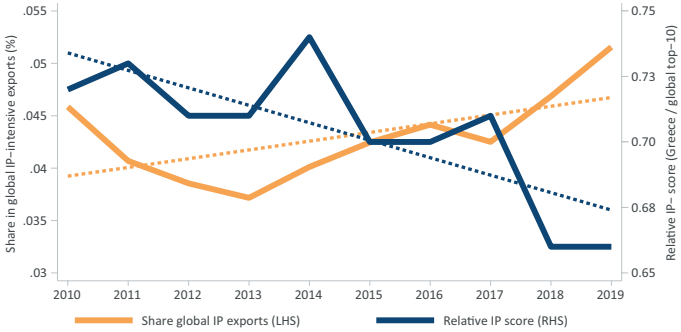
Turkey (€ 2 bn), the US (€ 1.2 bn), Lebanon (€ 1.2 bn), China (€ 1 bn) and Egypt (€ 0.9 bn) are the main Greek export destinations. For these markets IP-intensive exports constitute 11% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



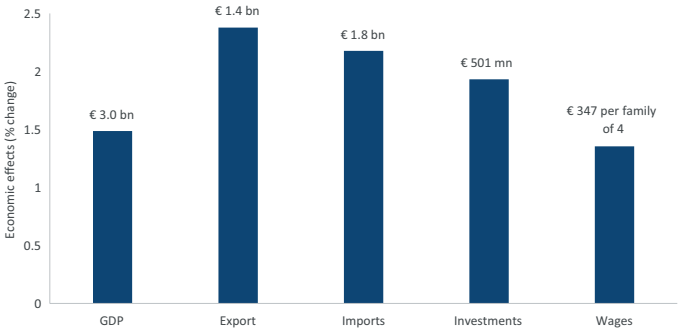
The top-8 IP-intensive manufacturing sectors together export € 3 bn in 2019 and contribute significantly to Greek trade surplus. The largest Greek export sectors that depend on IP are chemicals (€ 0.7 bn) and machinery (€ 0.6 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



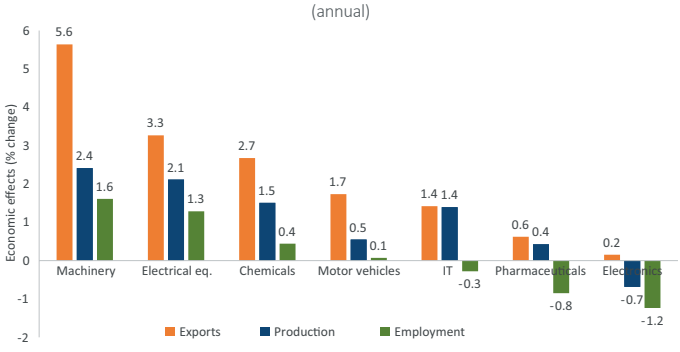
In recent years, Greece reports a decline in its relative IP score compared to the global top-10. This corresponds to an increase in Greece's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Greece. Greece's GDP, exports, and investments will be between 1.4% and 2.4% higher each year. The average Greek family of four would benefit by €347 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Greece's IP-intensive sectors would support growth in exports (by 0.2 to 5.6%), increase resilience by boosting domestic production (by -0.7 to 2.4%), and create high value-added jobs for the Greek economy.

INSERT 3:

INTELLECTUAL PROPERTY AND THE EUROPEAN GREEN DEAL

By Mr. Fredrik Erixon, ECIPE

Greening Society with New Technology

Reducing carbon emissions and the risk of runaway climate change need to include several types of policies – mitigation, adaptation and behavioural change policies are certainly among them. Ultimately, change will need to happen in many parts of society and the most important changes will have to come from energy generation, transportation and heavy industries – sectors that emit high levels or carbon dioxide. Since all these sectors – and others – are essential parts of a modern society, effective and realistic policies to address climate change cannot start from the assumption that these activities can be banned or regulated away. The main and overarching task for effective climate policies is to take away the pollution, not the activity itself.

Inevitably, innovation and technological change are central parts of the policy that will reduce carbon emissions. This is also an important lesson from history. Other environmental problems – such as the thinning ozone layer – have effectively been reduced by innovation, for instance in refrigerator technology.[89] The catalytic converter, to take another example, reduced exhaust gas emissions from cars and their levels of toxic gases and pollutants. After its introduction in vehicles in the 1980s, air quality improved substantially.[90] Governments can do a lot to stimulate innovation and new technologies that improve the environment. Taxes and regulation, for example, can increase the cost of current pollutions, and the experience from the way societies addressed many past environmental problems is that good regulation and incentives are needed to achieve successful outcomes.[91] There is also another key point from that experience: government actions that also respond to innovation and patent needs in industry will find that there are stronger economic and private benefits emerging from environmental innovation.

The European Green Deal and Intellectual Property

The European Green Deal encompass many different ambitions and policy strategies. It includes a strong focus on moving energy systems away from fossil fuels and making industry sustainable. Moreover, it established new ambitions for the circular economy, buildings, and transport systems – all focused at changing practices and technology with the view of reducing the carbon intensity in production and consumption. It builds on the European Emission Trading System (ETS) and market mechanisms to gradually incentivise cleaner technology and behaviour by making it more expensive to use polluting energy sources.

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[89] Mulder, K. F., 2005, 'Innovation by Disaster: The Ozone Catastrophe as Experience of Forced Innovation', International Journal of Environment and Sustainable Development, vol. 4:1.

[90] Dey, S. & Mehta, N.S., 2020, 'Automobile Pollution Control using Catalysis', Resources, Environment and Sustainability. 2020

[91] Mulder, K. F., 2005, 'Innovation by Disaster: The Ozone Catastrophe as Experience of Forced Innovation', International Journal of Environment and Sustainable Development, vol. 4:1.

Importantly, the European Green Deal acknowledges the critical role that new technology and innovation will play for achieving the goal of net-zero emissions by 2050. A key target of the entire programme is to decouple economic growth from environmental resource use – basically to make economic activity less dependent on finite resources and, ultimately, emit no carbon dioxides. This is not an impossible mission. On the contrary, the decoupling of growth from natural resources has been happening for quite some time. Western societies now use less metal, paper, timber, and fertilizer that they did in the past – despite continued economic expansion.[92] It is highly likely that man-made greenhouse gas emissions will continue to decouple from economic output in the decades to come. Intellectual property rights are a component part of Europe's strategy to green the economy. As this strategy builds on market mechanisms to increase the price of carbon emissions, firms and industries will have to do some heavy lifting to wean themselves of fossile fuels. Their investments in new technology and production structures will have to increase substantially. They will also have to spend more on innovation to develop products that are less energy demanding. Governments can support that quest by improving the incentive structure for firms to invest in technology, innovation and less polluting products.

Intellectual property rights will play an important role in that development, because the new technologies and innovations that are necessary to replace current emissions and practices will to a large extent be developed in environments where intellectual property protection is necessary for innovation investments to be made. Patents, for instance, have a significant and positive effect on firm innovation and investment in innovation.[93] Furthermore, one of the consequences of patents is that they allow for diffusion of new technologies, making sure that new technologies can be spread widely and adopted by many economic operators. Technology transfer through trade and investment is one such channel, allowing for effective resource allocation.[94] An effective system of intellectual property protection does not just give an incentive to firms, investors and governments to spend resources on research and development, it also helps to create a market for new technologies as the patented knowledge becomes public. In the language of economics, intellectual-property protection enables significant spill-over effects from research and technology to the rest of the economy.

There is another important dimension: the patent system is an important part of achieving environmental goals while also stimulating economic growth. Inevitably, policies to reduce carbon emissions will infer costs on the economy – for instance, higher fuel prices for the

[92] McAffe, Andrew, 2019, More from Less: The Surprising Story of How We Learned to Prosper Using Fewer Resources – and What Happens Next. New York: Simon & Schuster, 2019.

[93] See, for instance, Allered, B. & Park, W., 2007, 'The Influence of Patent Protection on Firm Innovation Investment in Manufacturing Industries', Journal of International Management, vol. 13:2; Park, W. & Ginarte, J.C., 1997, 'Intellectual Property Rights and Economic Growth', Contemporary Economic Policy, vol. 15:3; Yang, C-H., Huang, Y-J., and Lin, H-Y., 2014, 'Do Stronger Intellectual Property Rights Induce more Innovations? A Cross-Country Analysis', Hitotsubashi Journal of Economics, vol. 55.

[94] Lippoldt, D. & Park, W., 2008, 'Technology Transfer and the Economic Implications of the Strengthening of Intellectual Property Rights in Developing Countries', OECD Trade Policy Papers No. 62; Javorcik, B., 2010, 'Foreign Direct Investment and International Technology Transfers', Encyclopedia of Financial Globalisation.

consumer or, at the firm level, the forced retiring of polluting production methods. On the other side of the ledger, however, there can be commercial and economic benefits. New technologies and innovation can help to unleash more investment and economic activity, and even start entire new (sustainable) industries – provided that those who innovate and invest can tap some of the benefits of their investment and risk-taking.

Other intellectual property rights are also of great importance for the Green New Deal and the general transition into a low-carbon economy. Trademarks are central to companies that are consumer-facing and that invest resources into offering products that are friendlier to the climate. Firms in sectors such as food and retail rely on such protection to communicate with consumers that there are alternative products and supply that allow consumers to make a conscious choice. Generally, the food and agriculture sector are intensive users of trademarks and geographical indicators to protect their intellectual property and investments in new ways of producing, packaging and marketing food. The same conclusion holds for sectors such as textiles and clothing. Along with copyrights and design patents, producers of textiles and clothing are dependent on strong trademark protection for their investment in new fabrics, technology and design.

Moreover, the Green New Deal hang together with the digitalisation of society and shifting patterns of production and consumption. A good part of the investments made in new digital technologies and online business models are sensitive to intellectual property theft. Hence, many firms that are leading the way for these new technologies and ways of doing business are crucially dependent on intellectual property protection such as copyrights, trademarks and design patents.

Intellectual Property and Benefits from Environmental Innovation

The experience from the catalytic converter is informative. Governments in Europe and North America changed regulations with the intent of forcing more innovation to address pollution problems with vehicles. However, regulations varied – over time and in geography – and had different effects on both regulated firms (automobile producers) and input producers.[95] They also stimulated different types of technologies to reduce exhaust emissions.[96] The net result is that some of these regulations forced costs but few economic benefits on the economy, while other forms of regulations achieved far greater economic benefits.[97] In first instance, the result of some of these policies was that expenditures on innovation and R&D declined, but in second instance these expenditures went up.

[95] Lee, J., Veloso, F.M. and Hounshell, D., 2004, 'Innovation in Automotive Emission Control Technologies: Government Actions and Inventive Activities', Academy of Management Annual Meeting Proceedings 2004:1

[96] Hascic, I., de Vries, F., Johnstone, N. and Medhi, N., 2009, Effects of Environmental Policy on the Type of Innovation: The Case of Automotive Emission Control Technologies. OECD Journal: Economic Studies

[97] Erixon, F. & Weigel, B., 2016, The Innovation Illusion: How so Little is Created by so Many Working so Hard. New Haven: Yale University Press

Intellectual property protection is an important institution to achieve economic gains from environmental innovation. This is the case also today and with the European Green Deal. A robust system for intellectual property protection will allow firms to invest and reap the benefits from their investment, incentivising them to work together in partnership with the public institutions and their policies to make the EU carbon neutral by 2050. Governments that work to protect intellectual property can, together with industry, tailor their regulations to achieve these outcomes, a transformed society by 2050.

HUNGARY

Intellectual property matters for an economy like the Hungarian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Hungary. In Figure 2, we show how relevant different types of IP are for the Hungarian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Hungary as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

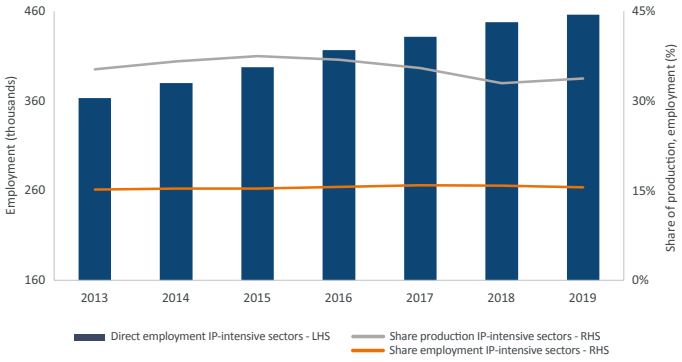


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

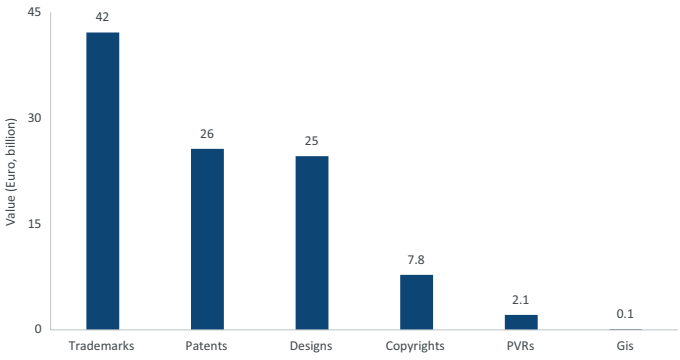


Figure 3: Value-added for IP-intensive sectors (2019)

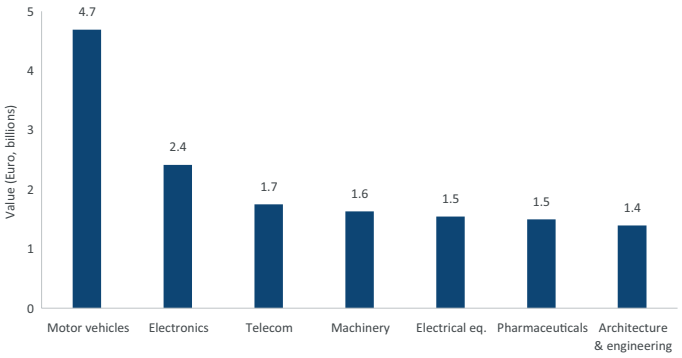


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

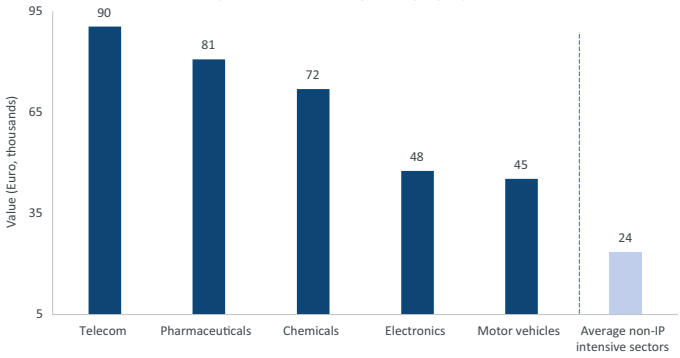


Figure 5: Index of SME R&D potential (2019)

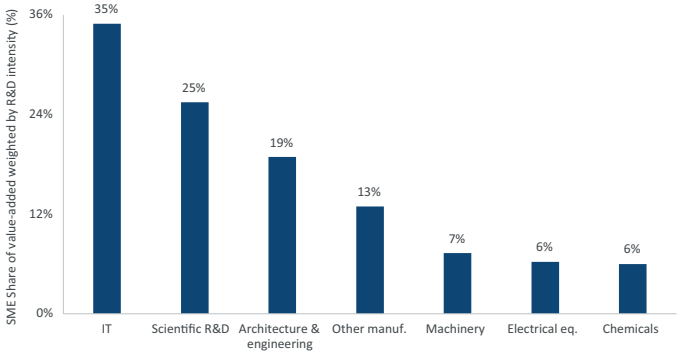
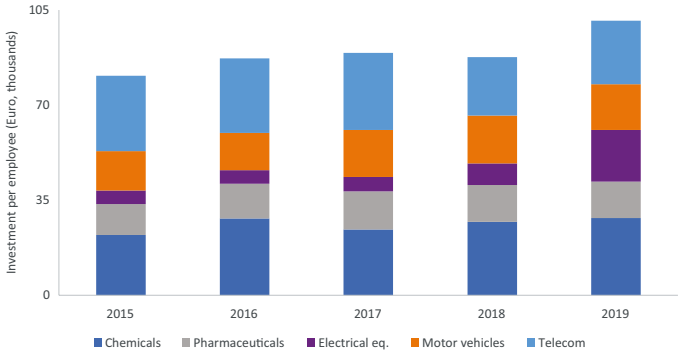


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

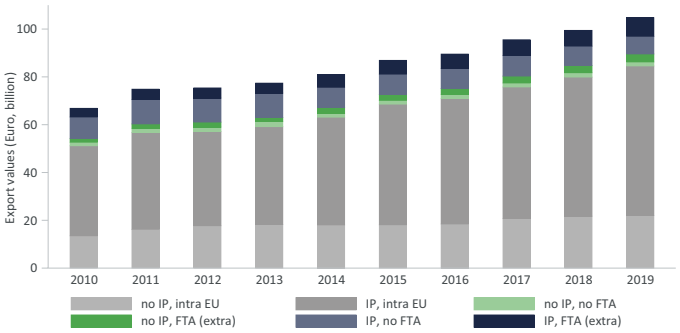


Intellectual Property is highly relevant for the Hungarian economy. The IP-intensive sectors in Hungary employ more than 456 thousand workers directly and represent 34% of total Hungarian production (Figure 1). Trademarks (€42 bn), patents (€26 bn), and designs (€25 bn) are the most important types of IP for the Hungarian economy (Figure 2). Most economic value in Hungary is created by the motor vehicles (€5 bn), electronics (€2 bn) and telecom (€2 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Hungarian economy (telecom, pharmaceuticals, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Hungary is up to four times higher than for the average of sectors that are not IP-intensive (Figure 4). Chemicals, telecom, and electrical equipment are the IP-intensive sectors with the highest levels of investment per employee in Hungary (Figure 6). Hungarian SMEs make a significant contribution to value-added in sectors with high R&D spending such as IT services and scientific R&D, but also architecture & engineering and other manufacturing (Figure 5).

HUNGARY

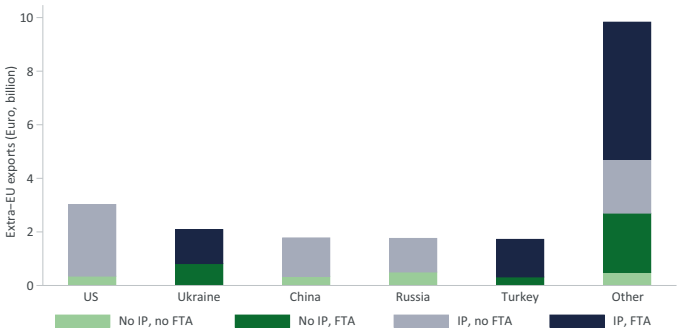
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Hungarian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Hungarian IP framework is related with the Hungarian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Hungary (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



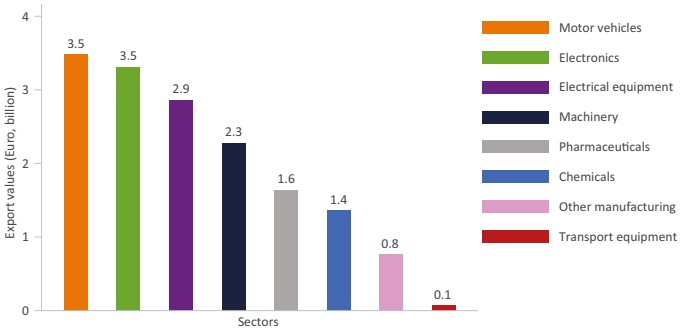
For Hungary, the share of IP-intensive exports outside the EU has decreased from 19% in 2010 to 15% in 2019. Of those exports only 51% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



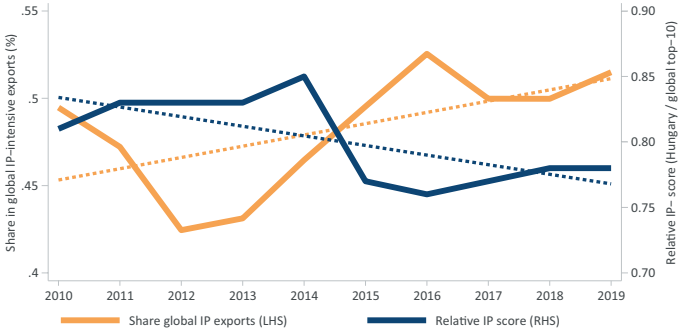
The US (€ 3 bn), Ukraine (€ 2.1 bn), China (€ 1.8 bn), Russia (€ 1.8 bn) and Turkey (€ 1.7 bn) are the main Hungarian export destinations. For these markets IP-intensive exports constitute 78% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



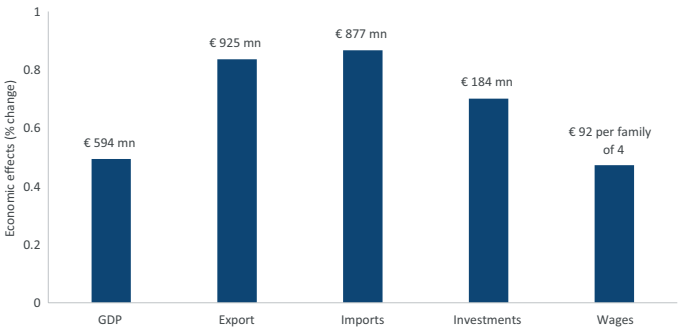
The top-8 IP-intensive manufacturing sectors together export € 16 bn in 2019 and contribute significantly to Hungarian trade surplus. The largest Hungarian export sectors that depend on IP are motor vehicles (€ 3.5 bn) and electronics (€ 3.3 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



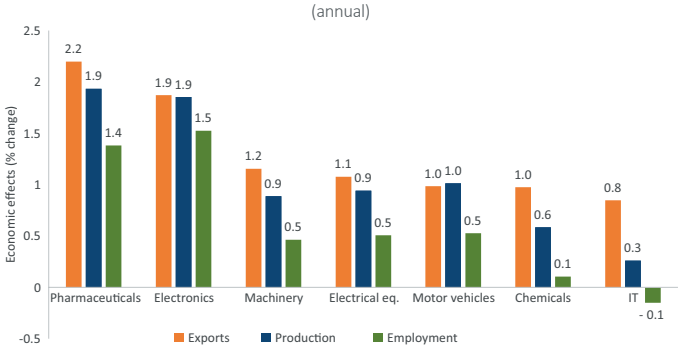
In recent years, Hungary reports a slight increase in its relative IP score compared to the global top-10. This corresponds to an also increase in Hungary's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Hungary. Hungary's GDP, exports, and investments will be between 0.4% and 0.9% higher each year. The average Hungarian family of four would benefit by €92 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)

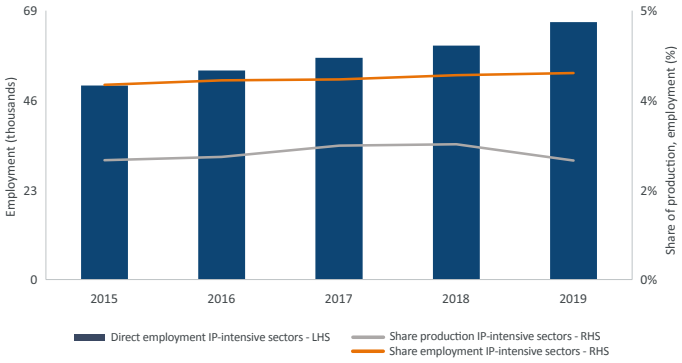


Hungary's IP-intensive sectors would support growth in exports (by 0.8 to 2.2%), increase resilience by boosting domestic production (by 0.3 to 1.9%), and create high value-added jobs for the Hungarian economy.

IRELAND

Intellectual property matters for an economy like the Irish one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Ireland. In Figure 2, we show how relevant different types of IP are for the Irish economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Ireland as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2015-2019)



Note: machinery, chemicals, electronics, IT other manufacturing, and pharmaceuticals sectors not included due to missing data.

Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

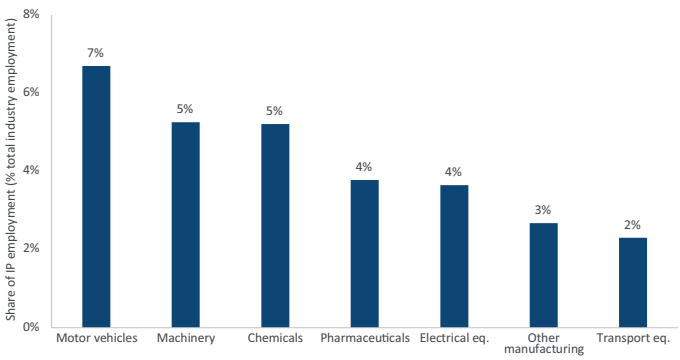
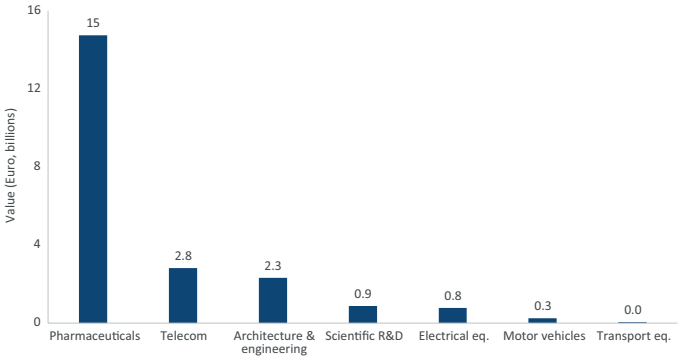
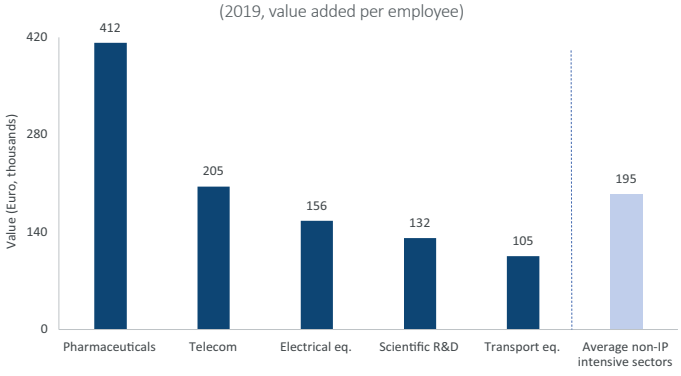


Figure 3: Value-added for IP-intensive sectors (2019)



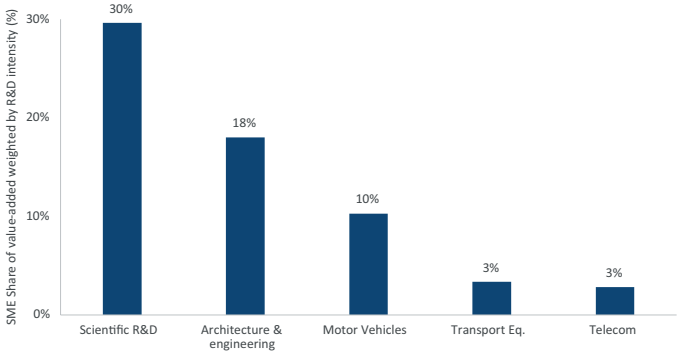
Note: chemicals, electronics, IT, machinery, other manufacturing not included due to missing data. Source for the pharmaceutical sector IDA and Enterprise Ireland. Authors' calculations.

Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)



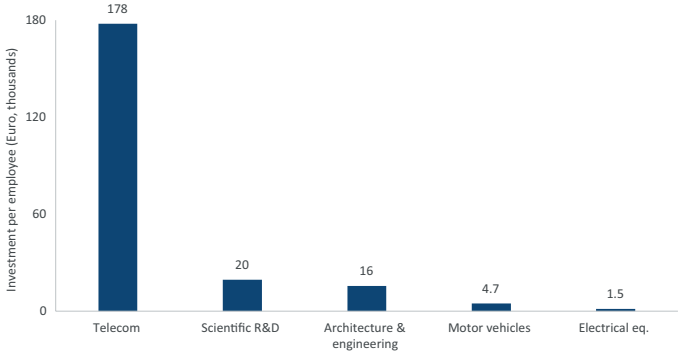
Note: electronics, motor vehicles, transport equipment, telecom, scientific R&D, chemicals, IT, machinery, other manufacturing not included due to missing data. Source for the pharmaceutical sector IDA and Enterprise Ireland. Authors' calculations.

Figure 5: Index of SME R&D potential (2019)



Note: chemicals, pharmaceuticals, electronics, machinery, transport equipment, other manufacturing, IT, scientific R&D not included due to missing data.

Figure 6: Investment per employee for IP-intensive sectors (2019)



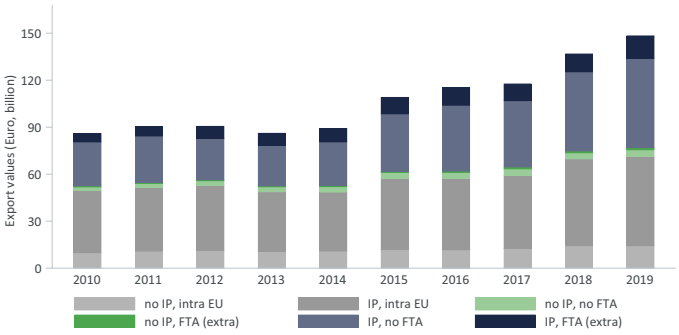
Note: chemicals, pharmaceuticals, electronics, machinery, IT, other manufacturing not included due to missing data.

Intellectual Property is highly relevant for the Irish economy. The IP-intensive sectors in Ireland employ more than 66 thousand workers directly, increasing since 2013, and represent 2% of total Irish production (Figure 1). Trademarks (€145 bn), patents (€63 bn), and designs (€45 bn) are the most important types of IP for the Irish economy (Figure 2). Most economic value in Ireland is created by the pharmaceuticals (€15 bn), telecom (€3 bn), and architecture & engineering (€2 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Irish economy (pharmaceuticals, telecom, electrical equipment) creating the highest value jobs. Labour productivity in IP-intensive sectors in Ireland is more than two times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, scientific R&D, and architecture & engineering are the IP-intensive sectors with the highest levels of investment per employee in Ireland (Figure 6). Irish SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and architecture & engineering, but also motor vehicles and transport equipment (Figure 5).

IRELAND

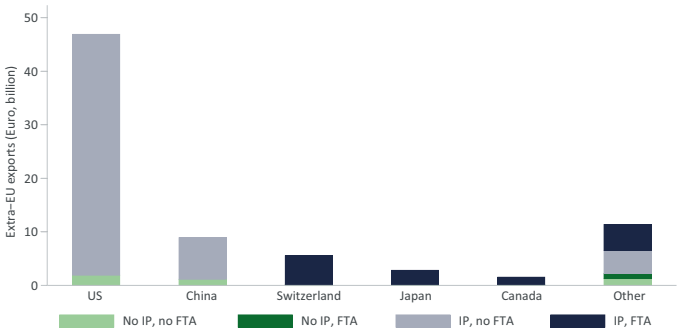
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Irish exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Irish IP framework is related with the Irish share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Ireland (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



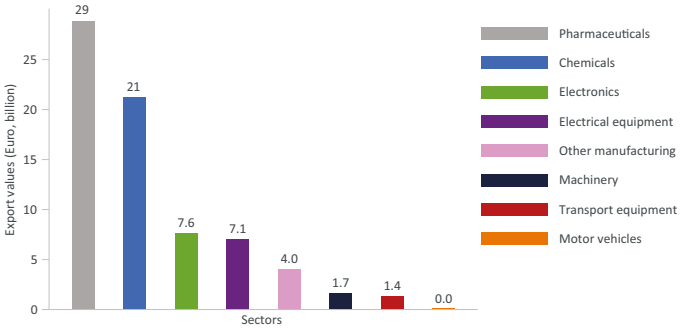
For Ireland, the share of IP-intensive exports outside the EU has gone up from 39% in 2010 to 48% in 2019, but of those exports only 20% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



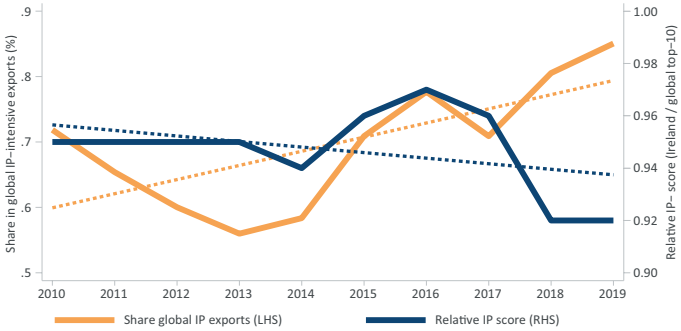
The US (€ 47 bn), China (€ 8.9 bn), Switzerland (€ 5.5 bn), Japan (€ 2.8 bn) and Canada (€ 1.5 bn) are the main Irish export destinations. For these markets IP-intensive exports constitute 95% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



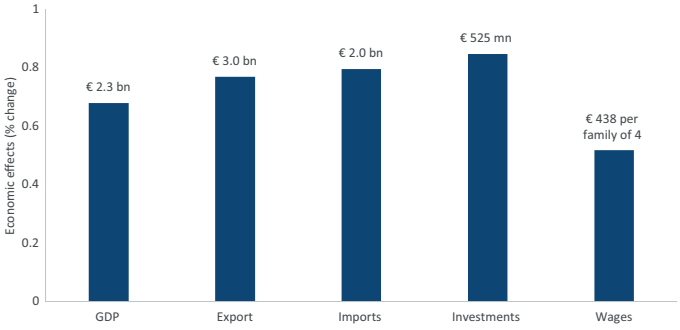
The top-8 IP-intensive manufacturing sectors together export € 72 bn in 2019 and contribute significantly to Irish trade surplus. The largest Irish export sectors that depend on IP are pharmaceuticals (€ 29 bn) and chemicals (€ 21 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



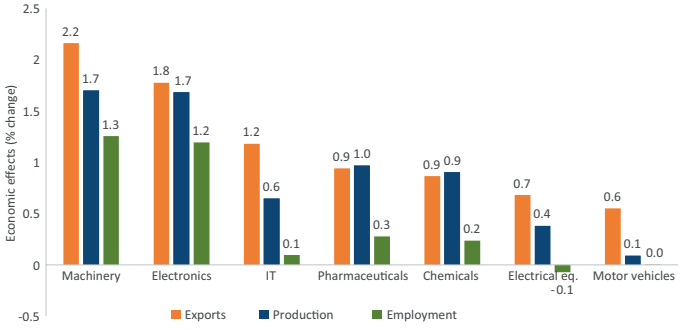
In recent years, Ireland reports a decline in its relative IP score compared to the global top-10. This corresponds to an increase in Ireland's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Ireland. Ireland's GDP, exports, and investments will be between 0.5% and 0.9% higher each year. The average Irish family of four would benefit by €438 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Ireland's IP-intensive sectors would support growth in exports (by 0.6 to 2.2%), increase resilience by boosting domestic production (by 0.1 to 1.7%), and create high value-added jobs for the Irish economy.

ITALY

Intellectual property matters for an economy like the Italian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Italy. In Figure 2, we show how relevant different types of IP are for the Italian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Italy as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

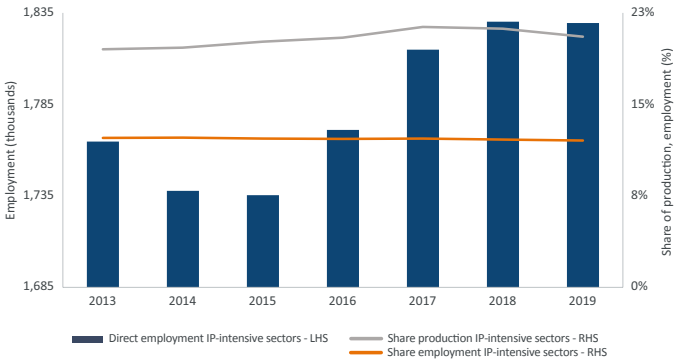


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

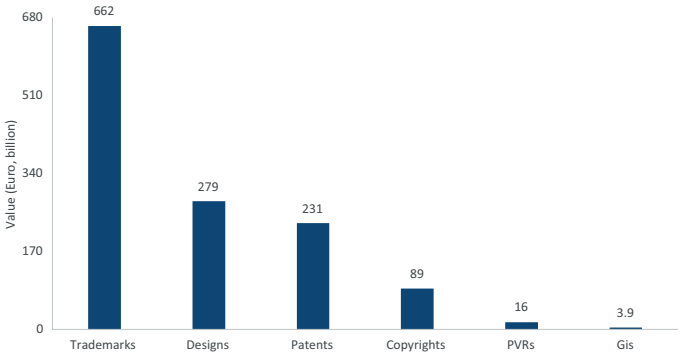


Figure 3: Value-added for IP-intensive sectors (2019)

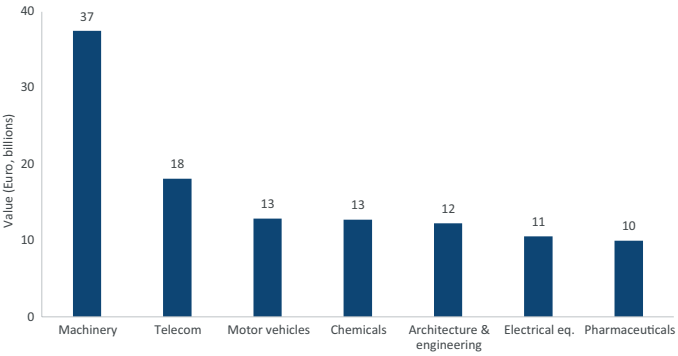


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

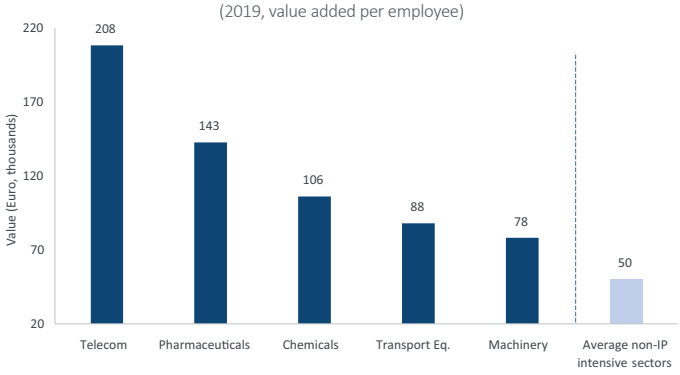


Figure 5: Index of SME R&D potential (2019)

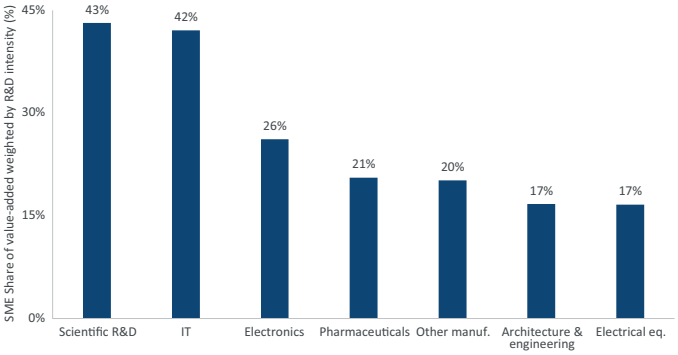
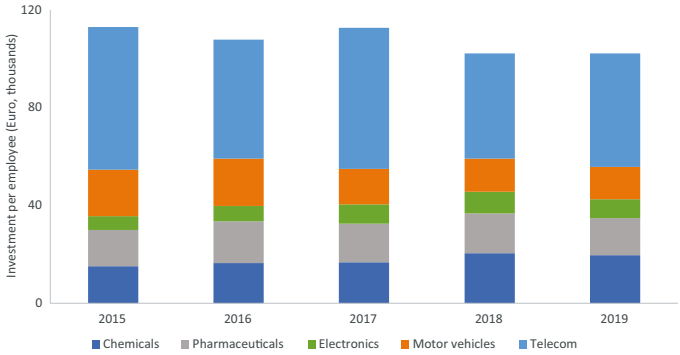


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

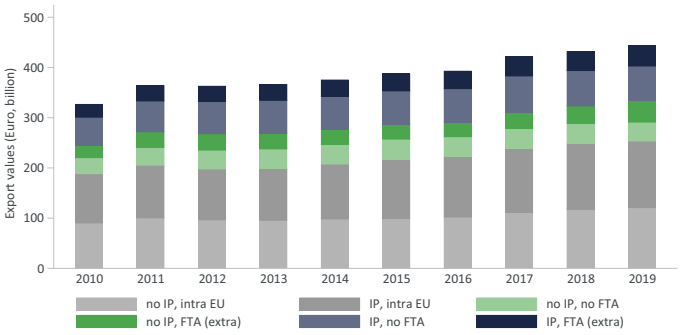


Intellectual Property is highly relevant for the Italian economy. The IP-intensive sectors in Italy employ more than 1.8 million workers directly and represent 21% of total Italian production (Figure 1). Trademarks (€662 bn), designs (€279 bn), and patents (€231 bn) are the most important types of IP for the Italian economy (Figure 2). Most economic value in Italy is created by the machinery (€37 bn), telecom (€18 bn) and motor vehicles (€13 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Italian economy (telecom, pharmaceuticals, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Italy is up to four times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, chemicals, and pharmaceuticals are the IP-intensive sectors with the highest levels of investment per employee in Italy (Figure 6). Italian SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and IT services, but also electronics and pharmaceuticals (Figure 5).

ITALY

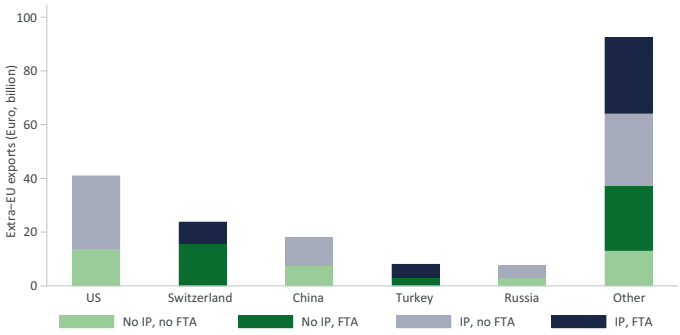
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Italian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Italian IP framework is related with the Italian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Italy (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



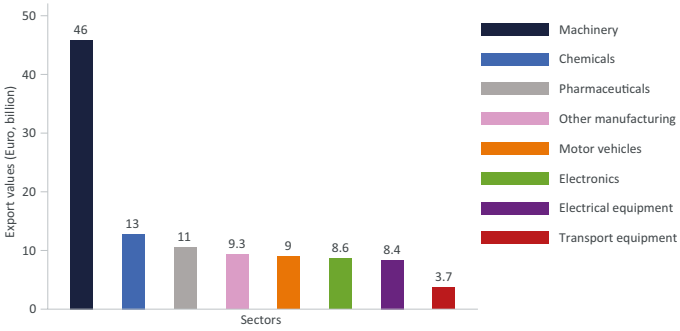
For Italy, the share of IP-intensive exports outside the EU has remained stable at 25% in 2010 and 25% in 2019, but of those exports only 37% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



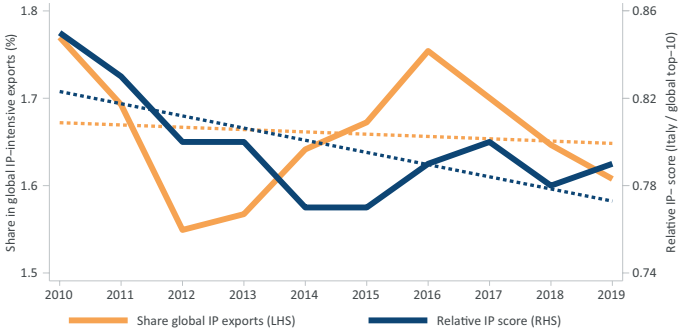
The US (€ 41 bn), Switzerland (€ 24 bn), China (€ 18 bn), Turkey (€ 8 bn) and Russia (€ 7.4 bn) are the main Italian export destinations. For these markets IP-intensive exports constitute 56% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



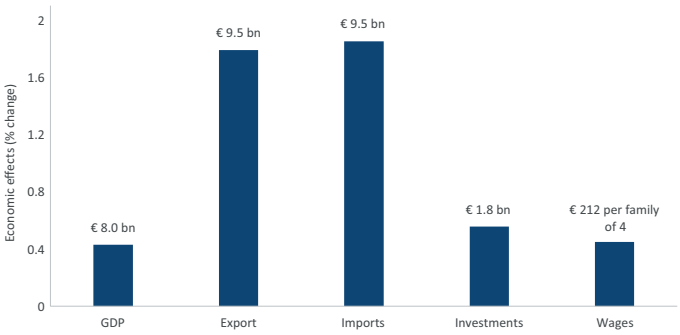
The top-8 IP-intensive manufacturing sectors together export € 108 bn in 2019 and contribute significantly to Italian trade surplus. The largest Italian export sectors that depend on IP are machinery (€ 46 bn) and chemicals (€ 13 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



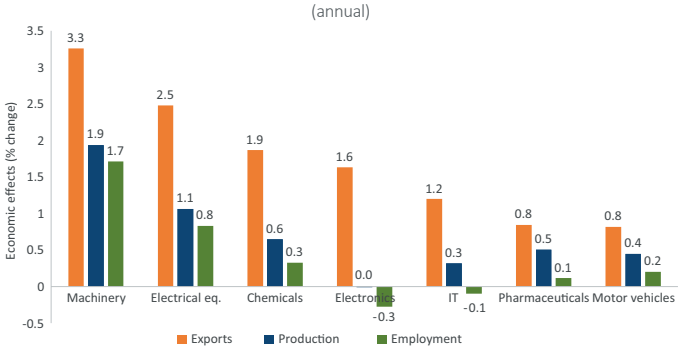
In recent years, Italy reports a slight increase in its relative IP score compared to the global top-10. This corresponds to a decline in Italy's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Italy. Italy's GDP, exports, and investments will be between 0.4% and 1.9% higher each year. The average Italian family of four would benefit by €212 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Italy's IP-intensive sectors would support growth in exports (by 0.8 to 3.3%), increase resilience by boosting domestic production (by 0.0 to 1.9%), and create high value-added jobs for the Italian economy.

LATVIA

Intellectual property matters for an economy like the Latvian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Latvia. In Figure 2, we show how relevant different types of IP are for the Latvian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Latvia as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

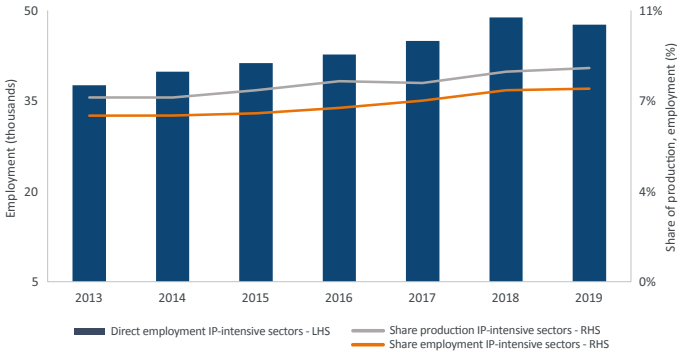


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

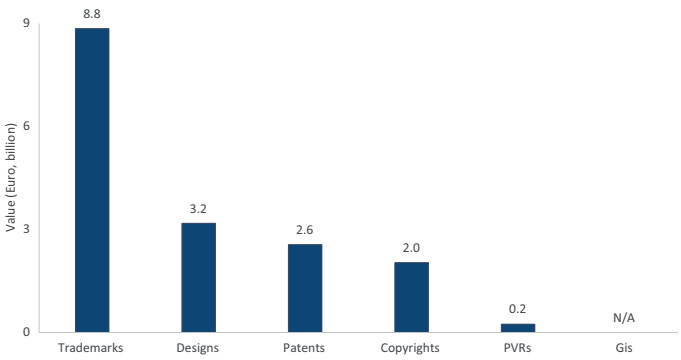


Figure 3: Value-added for IP-intensive sectors (2019)

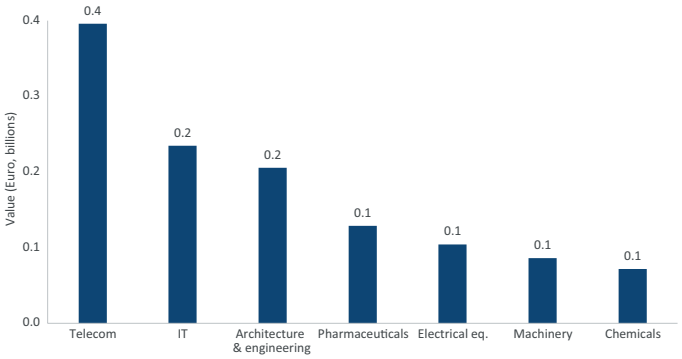


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

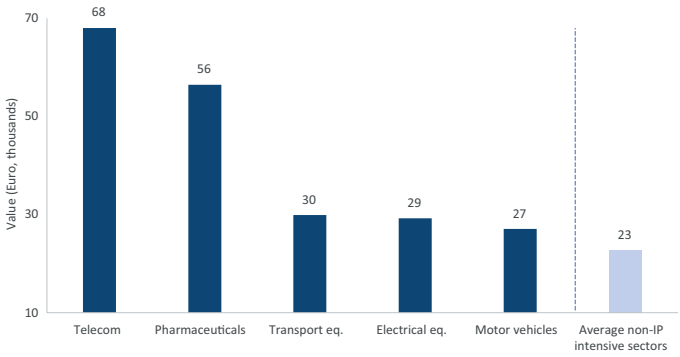


Figure 5: Index of SME R&D potential (2019)

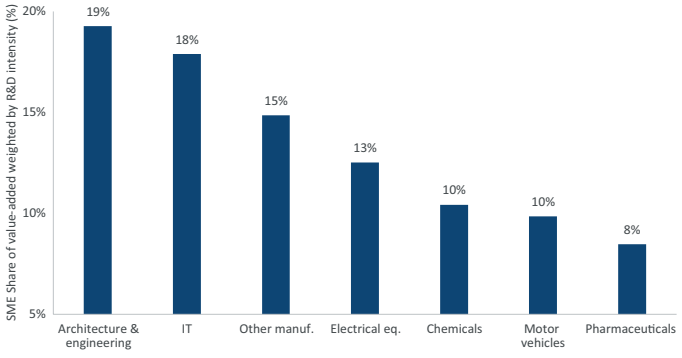
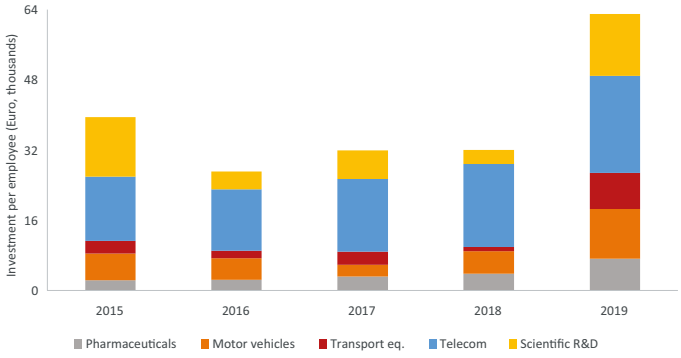


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

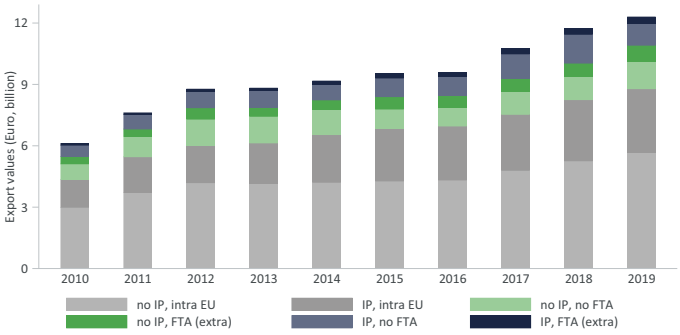


Intellectual Property is highly relevant for the Latvian economy. The IP-intensive sectors in Latvia employ more than 48 thousand workers directly and represent 8% of total Latvian production (Figure 1). Trademarks (€9 bn), designs (€3 bn), and patents (€3 bn) are the most important types of IP for the Latvian economy (Figure 2). Most economic value in Latvia is created by the telecom (€0.4 bn), IT services (€0.2 bn) and architecture & engineering (€0.2 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Latvian economy (telecom, pharmaceuticals, transport equipment) creating the highest value jobs. Labour productivity in IP-intensive sectors in Latvia is up to three times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, scientific R&D and motor vehicles are the IP-intensive sectors with the highest levels of investment per employee in Latvia (Figure 6). Latvian SMEs make a significant contribution to value-added in sectors with high R&D spending such as architecture & engineering and IT services, but also other manufacturing and electrical equipment (Figure 5).

LATVIA

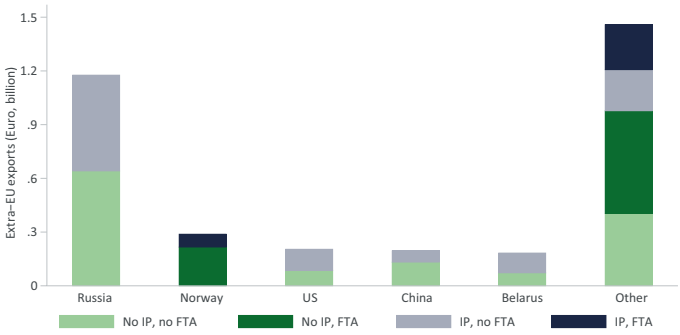
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Latvian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Latvian IP framework is correlated with a higher Latvian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Latvia (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



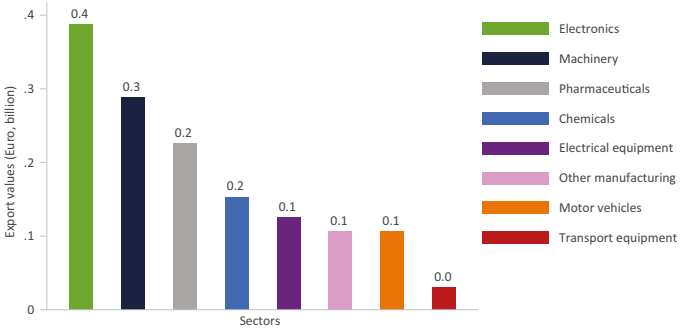
For Latvia, the share of IP-intensive exports outside the EU has gone up from 10% in 2010 to 11% in 2019, but of those exports only 23% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



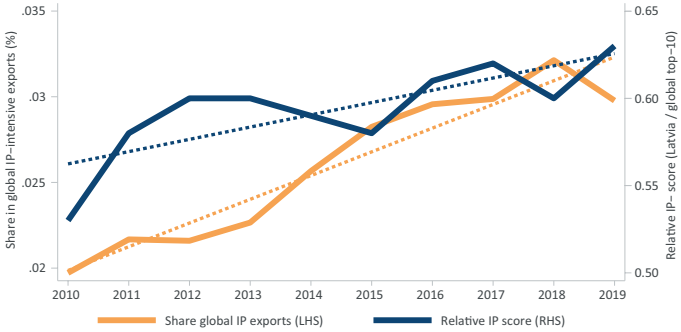
Russia (€ 1.2 bn), Norway (€ 0.3 bn), the US (€ 0.2 bn), China (€ 0.2 bn) and Belarus (€ 0.2 bn) are the main Latvian export destinations. For these markets IP-intensive exports constitute 44% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



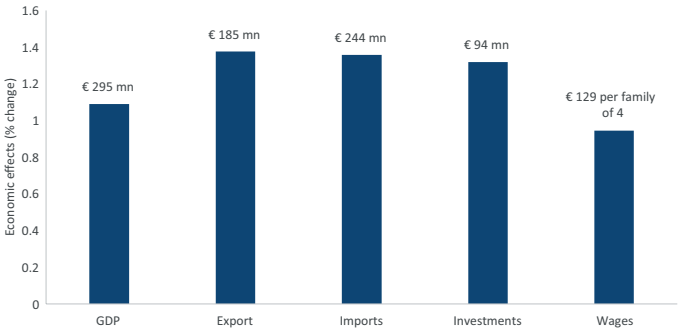
The top-8 IP-intensive manufacturing sectors together export € 1.4 bn in 2019 and contribute significantly to Latvian trade surplus. The largest Latvian export sectors that depend on IP are electronics (€ 0.4 bn) and machinery (€ 0.3 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



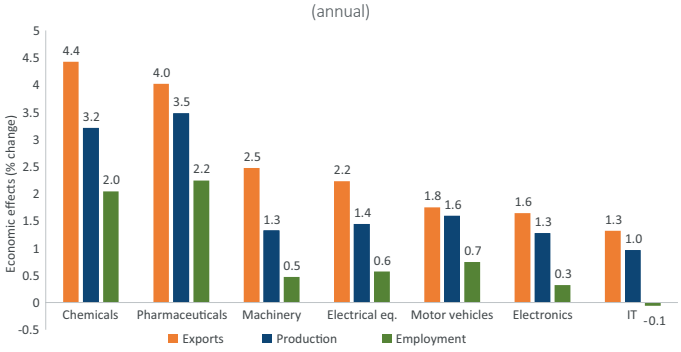
In recent years, Latvia reports an increase in its relative IP score compared to the global top-10. This corresponds to a rise in Latvia's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Latvia. Latvia's GDP, exports, and investments will be between 1.1% and 1.4% higher each year. The average Latvian family of four would benefit by €129 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Latvia's IP-intensive sectors would support growth in exports (by 1.3 to 4.4%), increase resilience by boosting domestic production (by 1.0 to 3.5%), and create high value-added jobs for the Latvian economy.

INSERT 4:

THE ROLE OF INTELLECTUAL PROPERTY FOR THE SINGLE MARKET AND SMES

By Mr. Fredrik Erixon, ECIPE

IP is Everywhere in the EU Single Market

Goods and services that have been granted the protection of their intellectual property are everywhere in Europe's single market. Most of the goods and services that form part of our everyday life have some form of intellectual property protection – most products that we consume, for instance, have trademark protection – and it follows that most goods and services that cross borders in Europe also enjoy the same protection. There would not be a single market unless intellectual property could be traded freely.

Since the single market works better for goods than services, and since goods generally have a higher degree of intellectual property protection than services, it is also the case that intra-EU trade has a higher IP-intensity than ordinary commerce in a country. Furthermore, given the sectoral profile of trade in the single market for goods, the strong role of IP is accentuated. The vehicles sector is the largest sector in intra-EU trade, followed by other manufactured goods, chemicals and pharmaceuticals. These sectors and goods do not just have trademark protection, they also represent production with a high patent intensity.[98] Together with pharmaceuticals, the chemicals sector is the most patent intense sector in Europe. And the automotive sector files the highest number of patents of all sectors.[99] Moreover, the single market has encouraged specialisation among Europe's firms and economies, and specialization tends to be stronger in sectors that are highly IP intensive.[100]

However, the single market for services is still heavily dependent on sectors with high IP intensity. The biggest services sector for internal trade within the EU are for R&D, professional management and consulting, and technical services – a category that represented 24 percent of all intra-EU exports in 2019. It is followed by transport, travel, telecommunication and computer information, and intellectual property services. While sectors are different in what IPRs they utilize, they are all big users of intellectual property rights.[101] Notably, the fifth largest sector for trade in services in the single market is trade in the use of IP rights.

Scale Advantages for Innovators and SMEs

There is an intimate relation between the single market and intellectual property. One of the advantages of the single market is that it reduces the cost of trading across borders: exporters – big and small – can access customers and markets abroad by following a common rulebook and without having to pay tariffs and customs cost. For SMEs, these benefits also

[98] Data is from Eurostat – Comext DS-018995

[99] WIPO, 2019, World Intellectual Property Report 2019 – The Geography of Innovation: Local Hotspots, Global Networks. Geneva: WIPO

[100] WIPO, 2019, World Intellectual Property Report 2019 – The Geography of Innovation: Local Hotspots, Global Networks. Geneva: WIPO, chapter 5.

[101] Data is from Eurostat, online data set BOP_ITS6_DET

arrive indirectly as they often prosper from cross-border trade by large firms and the general internationalisation of a country's business sector. While a relatively small portion of SMEs is engaged in direct exports, it is more common that they supply to larger firms within their countries that are internationally active. Hence, bigger market leads to better opportunities for smaller firms to use economies of scale – meaning that there is a larger pool of customers that share fixed development and production costs; this makes products cheaper.

These benefits are substantial. A recent estimate suggests that, without the single market, intra-EU trade would have been 25-35 percent smaller and EU countries would have lost on average 8.7 percent in Gross Domestic Product (GDP).[102] It also has been firmly established that the participation by small and medium-sized enterprises (SMEs) in European trade has been helped by the removal of intra-EU trade barriers.[103] Unlike their larger peers, SMEs usually lack staff with a knowledge of trade and trade costs, and most of them don't have resources to purchase knowledge or services that would help them to deal with complex customs administration. In other words, reducing barriers to trade encourage both scale economies and SME participation.

Intellectual property, and its protection, is also based on the same economies of scale. For innovation and technological breakthroughs to happen, there must be a big market of potential customers. Normally, the costs of R&D are both high and fixed. There is also a strong element of risk in these expenditures: it is not guaranteed that expenditures on development and innovation will generate the desired outcome of more innovation, let alone spurn more sales. Therefore, few companies would bother to make investments in research, development and innovation if the number of consumers was limited and there are no scale advantages. To become affordable, innovation and investment in intellectual property is greatly benefitted by having access to a larger market. Consequently, securing patents in and access to the largest markets in the world is a key strategy for most innovative businesses. It is for this reason that the Unitary Patent System, expected to start in 2022, will be a major change for SMEs who then do not have to file patents in each EU Member State, but can use the European system for all participating EU Member states together.[104]

Unfinished Business

Both the EU single market and intellectual property protection in Europe are work in progress. They are also getting more intimate as a faster pace of innovation makes the single market more dependent on intellectual property and products that are protected by IP. Moreover, technological change has spurred new opportunities for infringing on intellectual

[102] Veld, Jan in 't, 2019, 'The economic benefits of the EU single market in goods and services', Journal of Policy Modelling, vol 41:5.

[103] Dana, L-P., Bajramovic, M.B. and Wright, R.W. (2005) 'The new paradigm of multipolar competition and its implications for entrepreneurship research in Europe', in A. Fayolle, P. Kyro and J. Ulijn (Eds.) Entrepreneurship Research in Europe: Outcomes and Perspectives, Cheltenham: Edward Elgar.

[104] Industry associations consulted during the research process of this study indicated that a some opposition to the Unitary Patent System remains in a minority of industries and business associations, and hence that not all parts of European industry are convinced about its benefits.

property and a growing part of single-market regulations attempt to reduce the theft of intellectual property, including trade secrets.

Strengthening Patents

Trademarks, copyrights and Geographical Indications have been anchored in the EU framework for some time. There is also a continuous agenda to update these regulations, and to protect the value and integrity of the intellectual property that can get enjoy copyright and GI protection. For instance, there is work to improve copyright protection online and strengthen the rights of copyright holders. Europe's list of GIs has been gradually expanded, and new trade agreements include longer list of goods. The trade agreement between the EU and Mercosur includes GI protection of 250 European GIs.[105]

Patents have had a more distant relation to the EU. With a new framework for a single and unitary patent, EU Member States have launched a new format of cooperation that will reduce the costs for patent applications: after a patent has been granted, it will immediately be effective in all participating member states. Fundamentally, the unitary patent aims to bring together the European patent system – through the European Patent Convention and the European Patent Office – and national patent systems.

The European Commission has set out a path to make further changes in policies for patents and other intellectual properties.[106] This includes:

- Strengthening the protection for Geographical indications (GIs) and the system for plant variety protection, leading to stronger intellectual property protection in the agricultural sector;
- Optimisation of Supplementary Protection Certificates;
- Better enforcement of IP infringements; and
- Facilitating the sharing and licensing of intellectual property.

Small- and Medium Sized Enterprises

There is also a new initiative to boost the use of intellectual property and intellectual property protection by SMEs. The SME sector in Europe make little use of IP rights: only 9 percent of all SMEs have registered an intellectual property.[107] No more than 0.3 percent of all SMEs have registered a patent with the European Patent Office, and a chief reason behind the low use of patents in particular is the perceived costs and complexity of registering a patent.[108] Since the economy is getting ever more dependent on both SMEs and innovation, and with the desire to spur more firm growth in Europe, there is some new attention again on bolstering the IP use by SMEs.

[105] European Commission, 2020, EU-MERCOSUR trade agreement: Creating opportunities while respecting the interests of European farmers. https://trade.ec.europa.eu/doclib/docs/2019/july/tradoc_158059.pdf

[106] European Commission, 2020, Making the most of the EU's innovative potential. An intellectual property action plan to support the EU's recovery and resilience. COM(2020) 760 final

[107] EUIPO, 2015, Intellectual Property Rights and Firm Performance in Europe: an Economic Analysis. Firm-level Analysis Report, June 2015.

[108] EUIPO, Intellectual Property SME Scoreboard.

In the EU's IP Action Plan (2020), the Commission has set out some ambitions regarding SME-focused work. The Commission wants to:

- Establish an IP voucher to co-finance 'IP scans' (initial comprehensive and strategic IP advice) and trademark and design basic registration fees.
- Further roll out the availability of strategic IP advice: making IP scans available to all participants of Horizon programmes and the expansion of this to other EU research and investment programmes.
- Pilot strategic advice combined with financial support to develop strategic IP portfolios.
- A European IP Information Centre and a simplified trademark application system for applicants that do not use professional representatives (e.g. SMEs), both provided by the European Intellectual Property Office (EUIPO). The information centre will be linked to the 'Single Digital Gateway' and will offer access to all relevant information on IP formalities and related services (e.g. filing for domain name protection, registration of company names); and
- To make it easier for SMEs to leverage their IP when trying to get access to finance, the Commission wants to work with the financial community what IP valuation and capacity building can help them to better take into account SMEs' intellectual assets. The Commission will test IP evaluation in a broader context in the 'tech due diligence' pilot. It will also build upon existing bank guarantee mechanisms, such as the InnovFin SME Guarantee Facility.

Future of IP and the Single Market

The EU will need to continue its work on spurring and protecting intellectual property beyond the current ambitions. The importance of intangible capital – like intellectual property – has grown fast in the past 30 years, not least driven by specialisation and the rise of global value chains.[109] It will become even more influential for firm decisions and economic performance in the future. New ideas and innovation are increasingly becoming strategic assets and, without sufficient and improved protection, value generation in the economy will be smaller than what it could be. Continued and progressive IP reforms will need to be at the heart of a policy for growth and jobs.

The same conclusion holds for SMEs and policies to encourage the growth of SMEs. The SME sector would benefit substantially from reforms that make it easier for smaller firms to become bigger producers and users of intellectual property rights. Having SMEs more closely integrated in international supply and value chains is one step to making them more intimate to intangible capital, R&D, and other assets that are the basis for IPRs. Easing the costs and improving the protection of IPRs for SMEs would also increase the chances of SMEs internationalising their businesses and moving closer to the innovation frontier.

[109] WIPO, 2017, World Intellectual Property Report 2017 – Intangible Capital in Global Value Chains. Geneva: WIPO.

LITHUANIA

Intellectual property matters for an economy like the Lithuanian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Lithuania. In Figure 2, we show how relevant different types of IP are for the Lithuanian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Lithuania as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

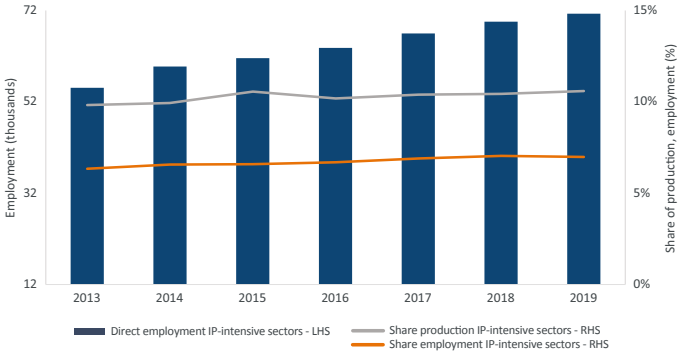


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

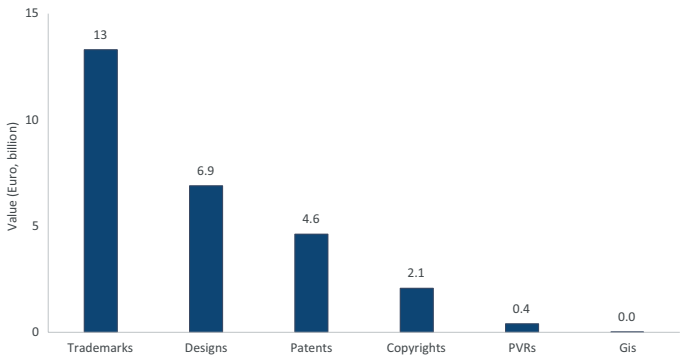


Figure 3: Value-added for IP-intensive sectors (2019)

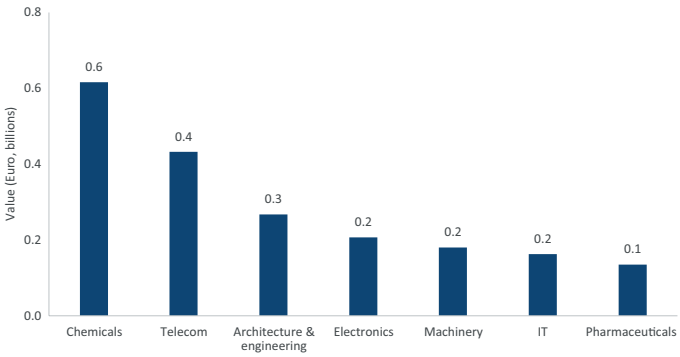


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

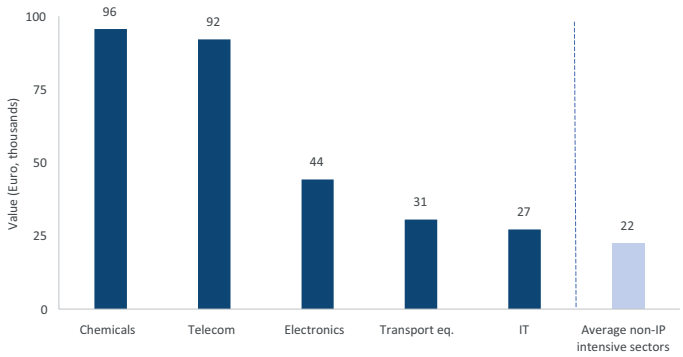


Figure 5: Index of SME R&D potential (2019)

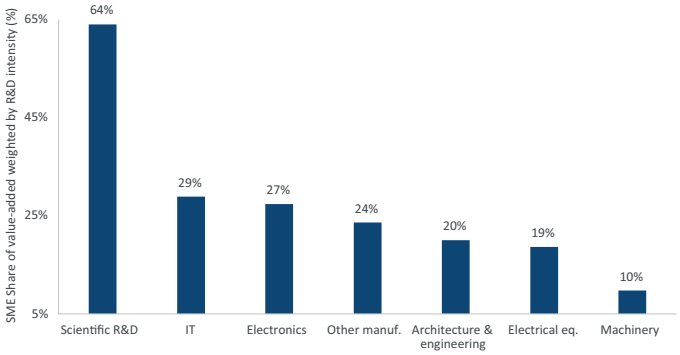
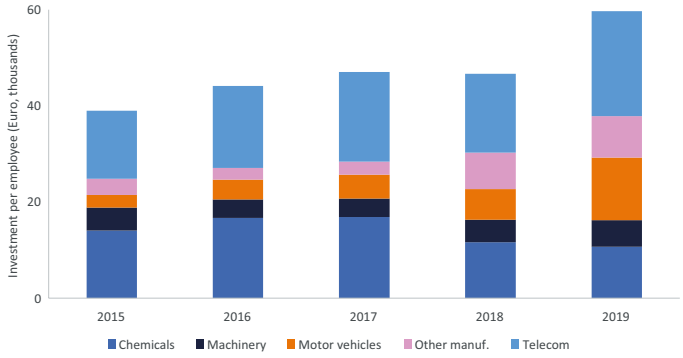


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

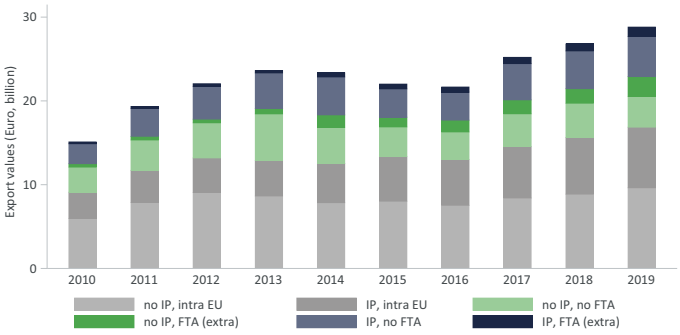


Intellectual Property is highly relevant for the Lithuanian economy. The IP-intensive sectors in Lithuania employ more than 71 thousand workers directly, increasing since 2013, and represent 11% of total Lithuanian production (Figure 1). Trademarks (€13 bn), designs (€7 bn), and patents (€5 bn) are the most important types of IP for the Lithuanian economy (Figure 2). Most economic value in Lithuania is created by the chemicals (€1 bn), telecom (€0.4 bn), and architecture & engineering (€0.3 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Lithuanian economy (chemicals, telecom, electronics) creating the highest value jobs. Labour productivity in IP-intensive sectors in Lithuania is more than four times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, motor vehicles, and chemicals are the IP-intensive sectors with the highest levels of investment per employee in Lithuania (Figure 6). Lithuanian SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and IT services, but also electronics and other manufacturing (Figure 5).

LITHUANIA

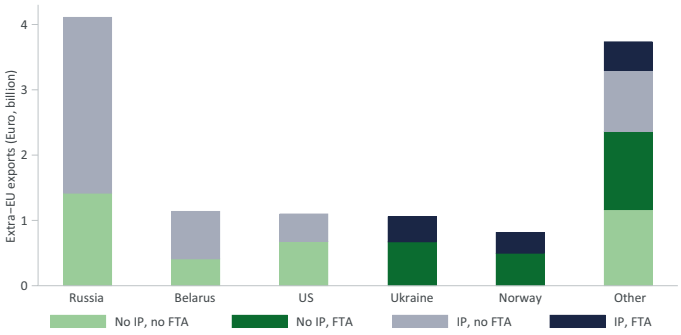
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Lithuanian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Lithuanian IP framework is correlated with a higher Lithuanian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Lithuania (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



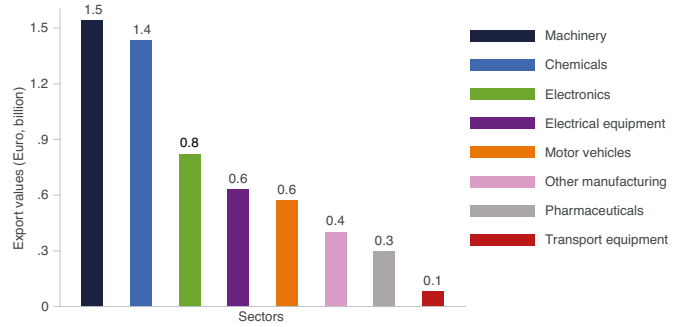
For Lithuania, the share of IP-intensive exports outside the EU has gone up from 17% in 2010 to 21% in 2019, but of those exports only 19% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



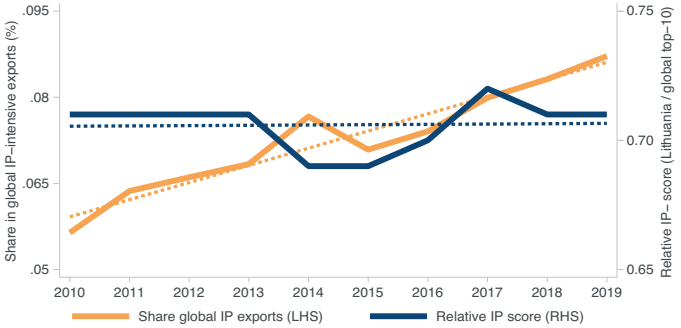
Russia (€ 4.1 bn), Belarus (€ 1.1 bn), the US (€ 1.1 bn), Ukraine (€ 1.1 bn) and Norway (€ 0.8 bn) are the main Lithuanian export destinations. For these markets IP-intensive exports constitute 55% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



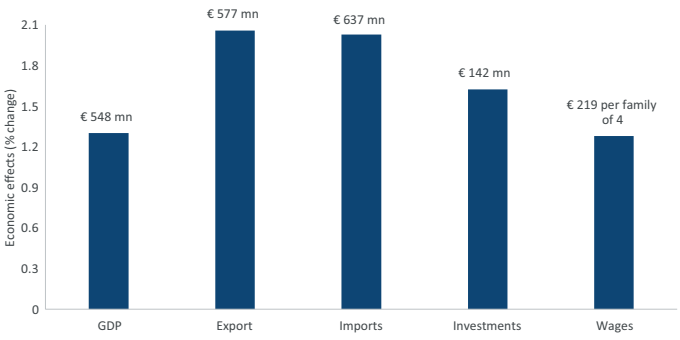
The top-8 IP-intensive manufacturing sectors together export € 5.8 bn in 2019 and contribute significantly to Lithuanian trade surplus. The largest Lithuanian export sectors that depend on IP are machinery (€ 1.5 bn) and chemicals (€ 1.4 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



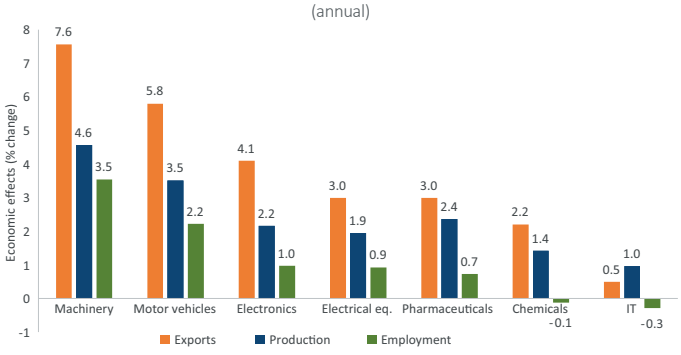
In recent years, Lithuania reports a slight increase in its relative IP score compared to the global top-10. This corresponds to an increase in Lithuania's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Lithuania. Lithuania's GDP, exports, and investments will be between 1.3% and 2.1% higher each year. The average Lithuanian family of four would benefit by €219 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Lithuania's IP-intensive sectors would support growth in exports (by 0.5 to 7.6%), increase resilience by boosting domestic production (by 1.0 to 4.6%), and create high value-added jobs for the Lithuanian economy.

LUXEMBOURG

Intellectual property matters for an economy like the Luxembourgian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Luxembourg. In Figure 2, we show how relevant different types of IP are for the Luxembourgian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Luxembourg as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

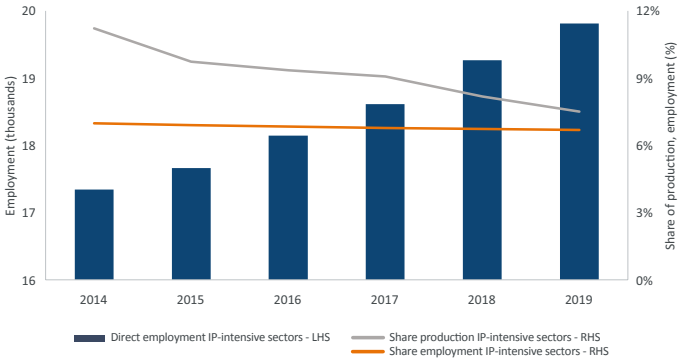


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

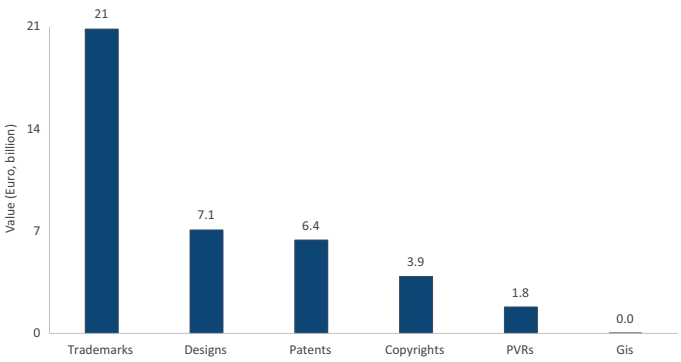


Figure 3: Value-added for IP-intensive sectors (2019)

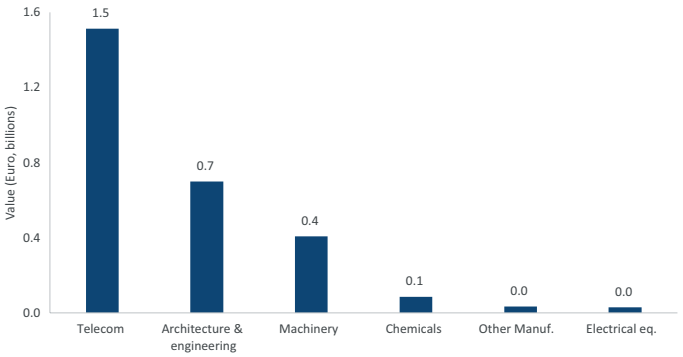


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

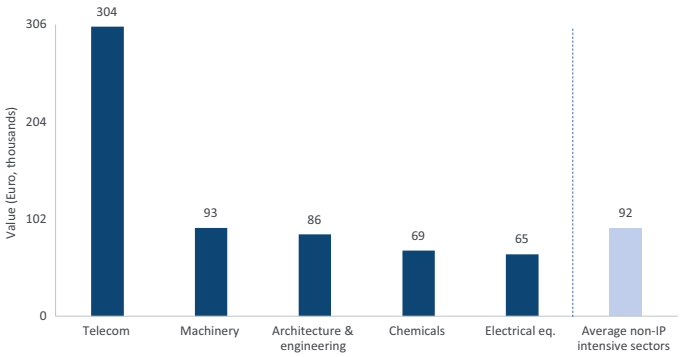


Figure 5: Index of SME R&D potential (2019)

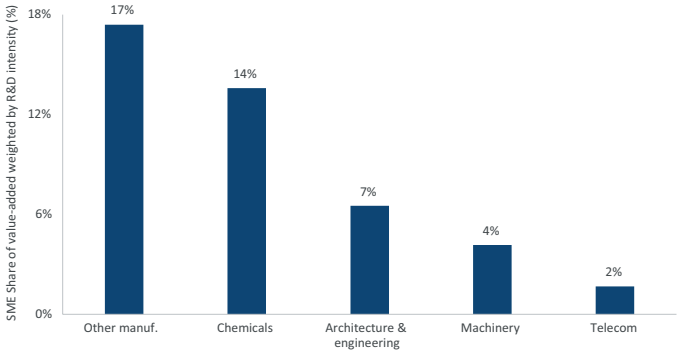


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

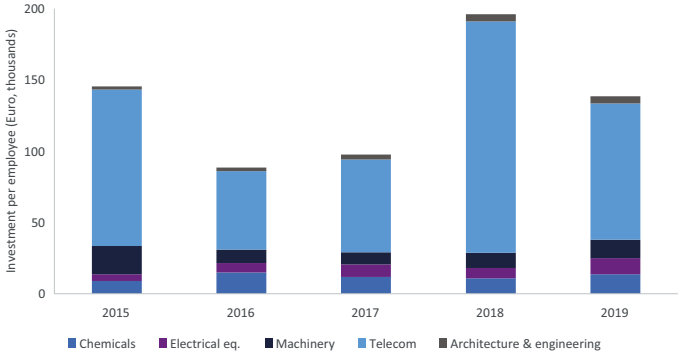


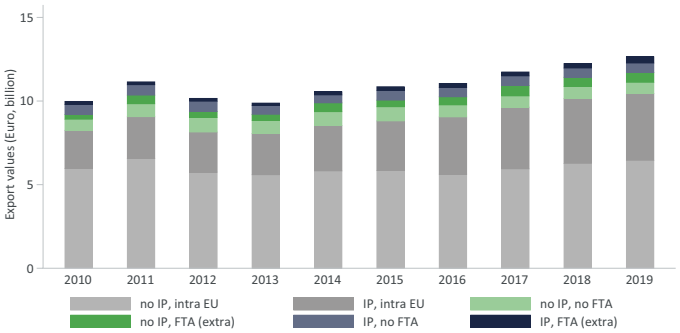
Figure 1, 3, 4, 6: electronics, IT, motor vehicles, pharmaceuticals, scientific R&D, and transport equipment not included due to missing data. Figure 5: Missing data across several sectors.

Intellectual Property is highly relevant for the Luxembourgian economy. The IP-intensive sectors in Luxembourg employ close to 20 thousand workers directly, increasing since 2013, and represent 7% of total Luxembourgian production (Figure 1). Trademarks (€21 bn), designs (€7 bn), and patents (€6 bn) are the most important types of IP for the Luxembourgian economy (Figure 2). Most economic value in Luxembourg is created by the telecom (€2 bn), architecture & engineering (€1 bn), and machinery (€0.4 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Luxembourgian economy (telecom, machinery, architecture & engineering) creating the highest value jobs. Labour productivity in IP-intensive sectors in Luxembourg is more than three times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, chemicals, and machinery are the IP-intensive sectors with the highest levels of investment per employee in Luxembourg (Figure 6). Luxembourgian SMEs make a significant contribution to value-added in sectors with high R&D spending such as other manufacturing and chemicals, but also architecture & engineering and machinery (Figure 5).

LUXEMBOURG

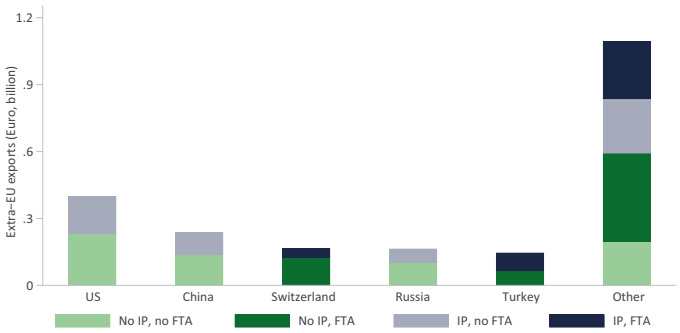
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Luxembourgish exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Luxembourgish IP framework is related with the Luxembourgish share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Luxembourg (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



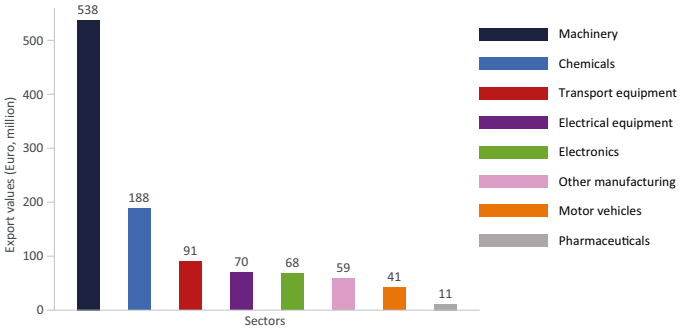
For Luxembourg, the share of IP-intensive exports outside the EU has decreased from 8% in 2010 to 7% in 2019. Of those exports only 40% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



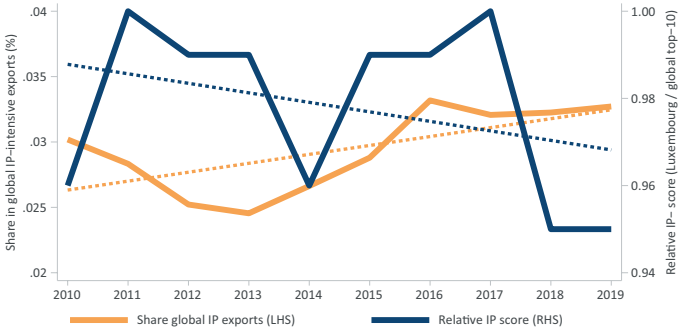
The US (€ 0.4 bn), China (€ 0.2 bn), Switzerland (€ 0.2 bn), Russia (€ 0.2 bn) and Turkey (€ 0.1 bn) are the main Luxembourgish export destinations. For these markets IP-intensive exports constitute 40% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



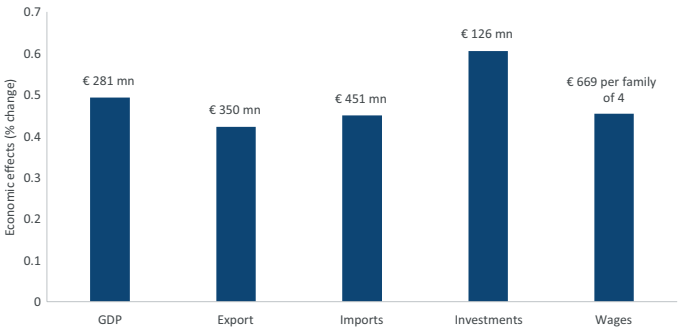
The top-8 IP-intensive manufacturing sectors together export € 1.1 bn in 2019 and contribute significantly to Luxembourgish trade surplus. The largest Luxembourgish export sectors that depend on IP are machinery (€ 538 mn) and chemicals (€ 188 mn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



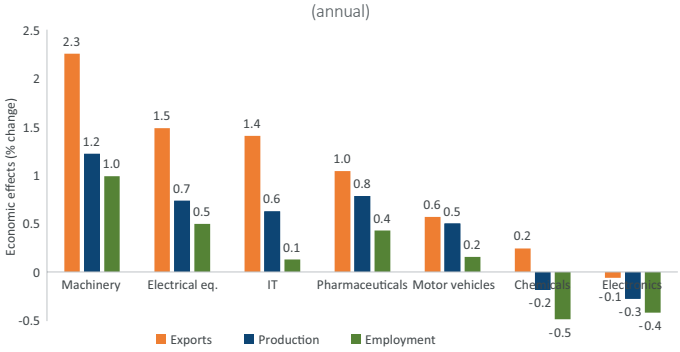
In recent years, Luxembourg reports a decline in its relative IP score compared to the global top-10. This corresponds to an increase in Luxembourg's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Luxembourg. Luxembourg's GDP, exports, and investments will be between 0.4% and 0.6% higher each year. The average Luxembourgish family of four would benefit by €669 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Luxembourg's IP-intensive sectors would support growth in exports (by -0.1 to 2.3%), increase resilience by boosting domestic production (by -0.3 to 1.2%), and create high value-added jobs for the Luxembourgish economy.

MALTA

Intellectual property matters for an economy like the Maltese one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Malta. In Figure 2, we show how relevant different types of IP are for the Maltese economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Malta as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

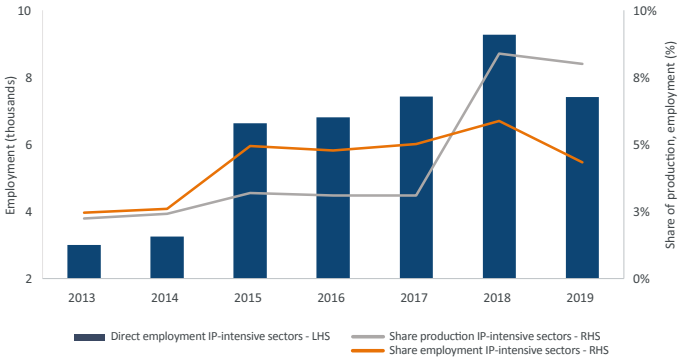


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

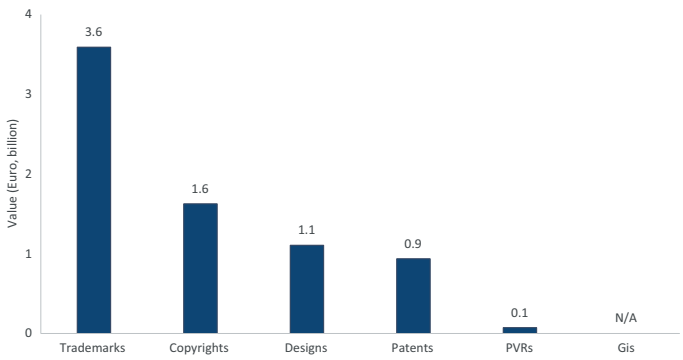


Figure 3: Value-added for IP-intensive sectors (2019)

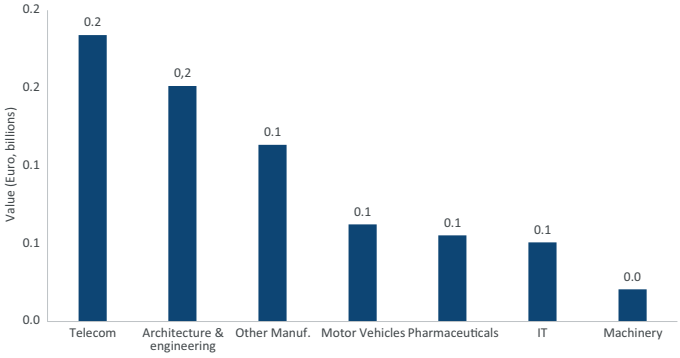


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

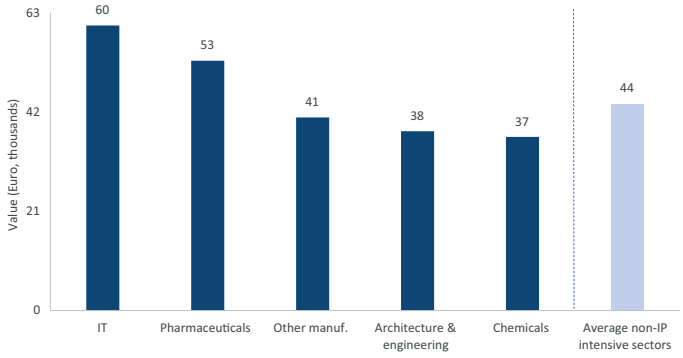


Figure 5: Index of SME R&D potential (2019)

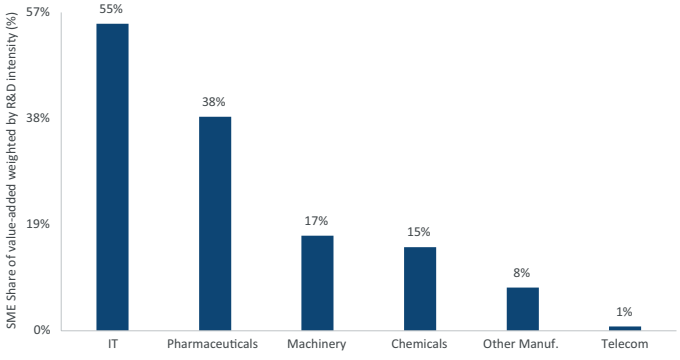


Figure 6: Investment per employee for IP-intensive sectors (2015)

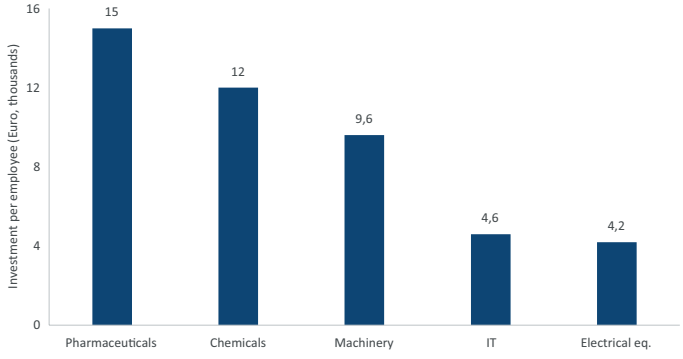


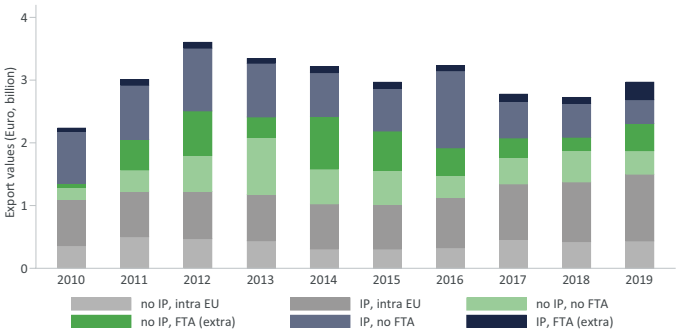
Figure 1: electronics, machinery, motor vehicles, other manufacturing, pharmaceuticals, telecom, transport equipment not included due to missing data. Figure 3: Note: electronics, transport equipment not included due to missing data. Figure 4: electronics, transport equipment, motor vehicles, telecom, scientific R&D not included due to missing data. Figure 5: electronics, electrical equipment, motor vehicles, transport equipment not included due to missing data. Figure 6: electronics, motor vehicles, other manufacturing, telecom, transport equipment not included due to missing data.

Intellectual Property is highly relevant for the Maltese economy. The IP-intensive sectors in Malta employ more than 7 thousand workers directly and represent 8% of total Maltese production (Figure 1). Trademarks (€4 bn), copyrights (€2 bn), and designs (€1 bn) are the most important types of IP for the Maltese economy (Figure 2). Most economic value in Malta is created by the telecom (€0.2 bn), architecture & engineering (€0.2 bn), and other manufacturing (€0.1 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Maltese economy (IT services, pharmaceuticals, other manufacturing) creating the highest value jobs. Labour productivity in IP-intensive sectors in Malta is close to 1.5 times higher than for the average of sectors that are not IP-intensive (Figure 4). Pharmaceuticals, chemicals, and machinery are the IP-intensive sectors with the highest levels of investment per employee in Malta (Figure 6). Maltese SMEs make a significant contribution to value-added in sectors with high R&D spending such as IT services and pharmaceuticals, but also machinery and chemicals. (Figure 5).

MALTA

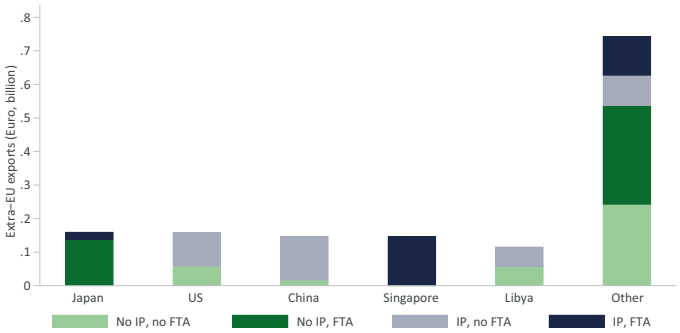
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Maltese exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Maltese IP framework is related with the Maltese share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Malta (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



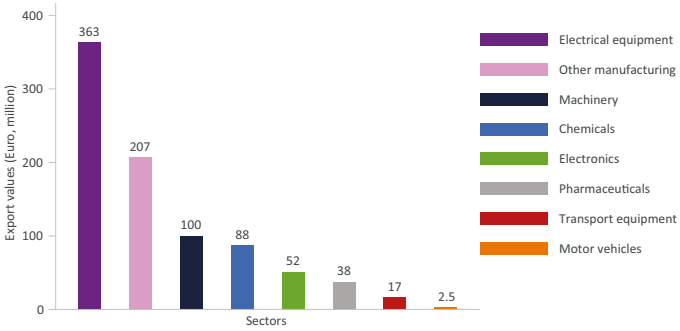
For Malta, the share of IP-intensive exports outside the EU has decreased from 39% in 2010 to 22% in 2019. Of those exports only 43% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



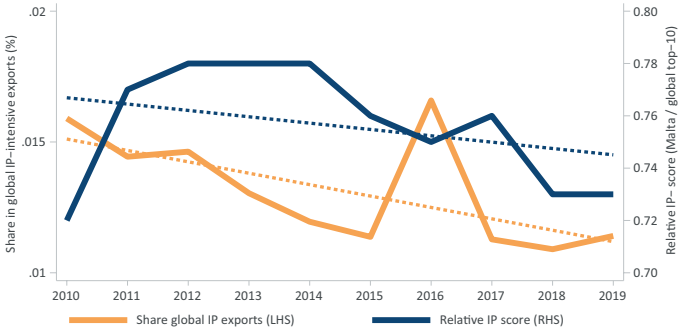
Japan (€ 0.2 bn), the US (€ 0.2 bn), China (€ 0.1 bn), Singapore (€ 0.1 bn) and Libya (€ 0.1 bn) are the main Maltese export destinations. For these markets IP-intensive exports constitute 62% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



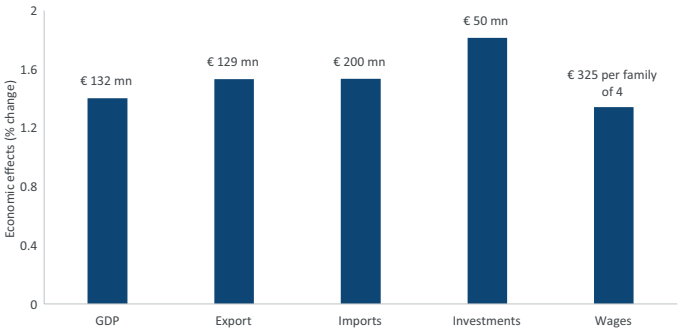
The top-8 IP-intensive manufacturing sectors together export € 867 mn in 2019 and contribute significantly to Maltese trade surplus. The largest Maltese export sectors that depend on IP are electrical equipment (€ 363 mn) and other manufacturing (€ 207 mn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



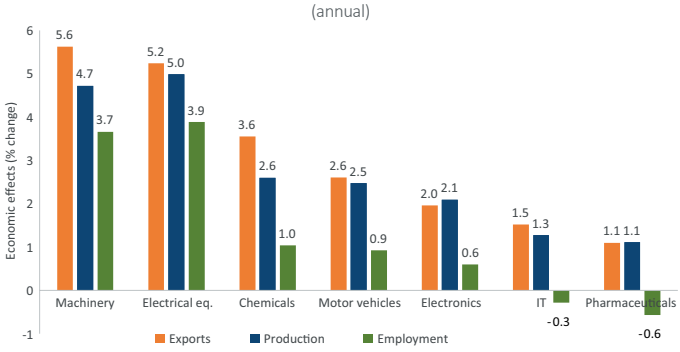
In recent years, Malta reports a decline in its relative IP score compared to the global top-10. This corresponds to a decline in Malta's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Malta. Malta's GDP, exports, and investments will be between 1.3% and 1.8% higher each year. The average Maltese family of four would benefit by €325 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Malta's IP-intensive sectors would support growth in exports (by 1.1 to 5.6%), increase resilience by boosting domestic production (by 1.1 to 5.0%), and create high value-added jobs for the Maltese economy.

NETHERLANDS

Intellectual property matters for an economy like the Dutch one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Netherlands. In Figure 2, we show how relevant different types of IP are for the Dutch economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Netherlands as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

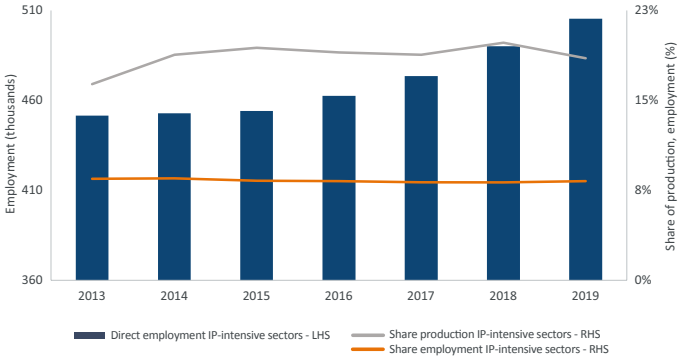


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

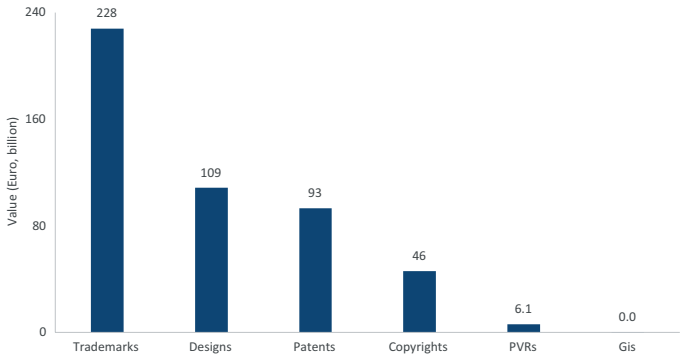


Figure 3: Value-added for IP-intensive sectors (2019)

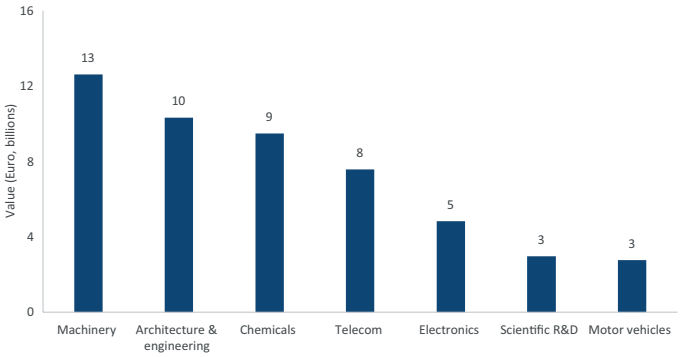


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

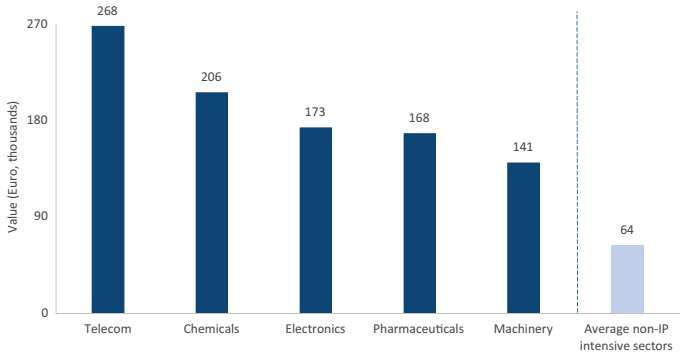


Figure 5: Index of SME R&D potential (2019)

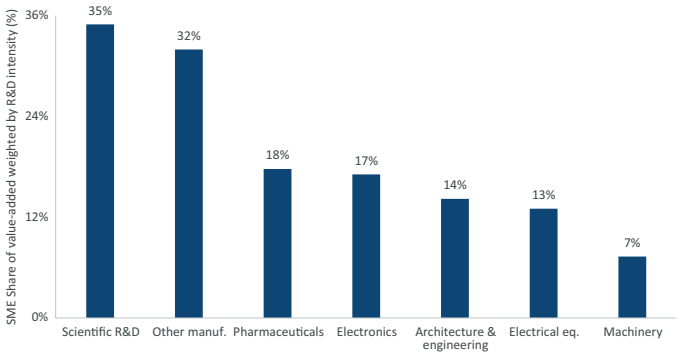
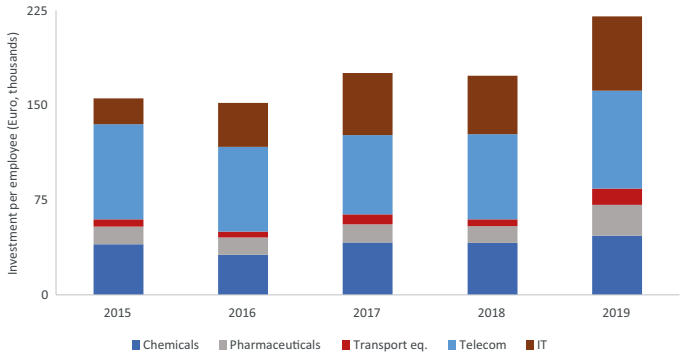


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

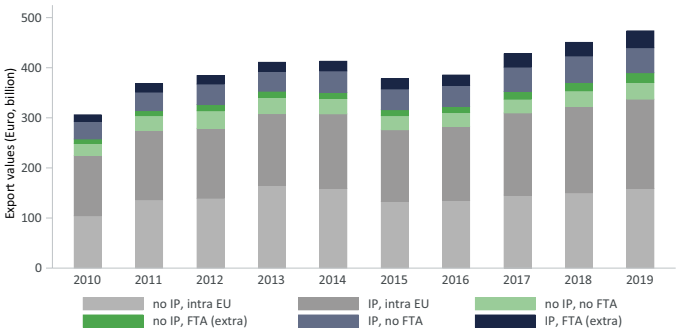


Intellectual Property is highly relevant for the Dutch economy. The IP-intensive sectors in Netherlands employ more than 505 thousand workers directly, increasing since 2013, and represent 18% of total Dutch production (Figure 1). Trademarks (€228 bn), designs (€109 bn), and patents (€93 bn) are the most important types of IP for the Dutch economy (Figure 2). Most economic value in Netherlands is created by the machinery (€13 bn), architecture & engineering (€10 bn) and chemicals (€9 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Dutch economy (telecom, chemicals, electronics) creating the highest value jobs. Labour productivity in IP-intensive sectors in Netherlands is more than four times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, chemicals, and IT services are the IP-intensive sectors with the highest levels of investment per employee in Netherlands (Figure 6). Dutch SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and other manufacturing, but also pharmaceuticals and electronics (Figure 5).

NETHERLANDS

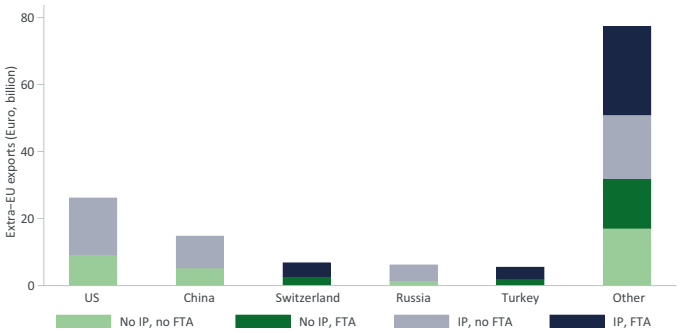
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Dutch exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Dutch IP framework is correlated with a higher Dutch share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in the Netherlands (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



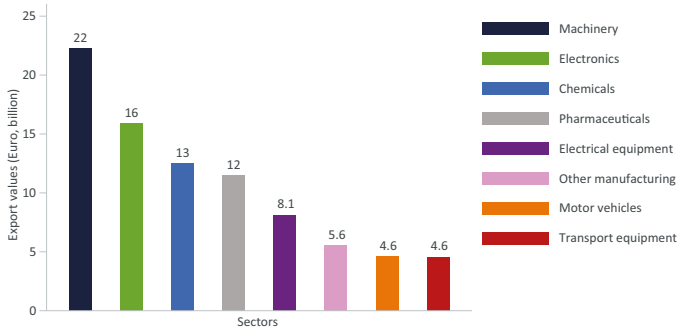
For the Netherlands, the share of IP-intensive exports outside the EU has gone up from 16% in 2010 to 18% in 2019, but of those exports only 40% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



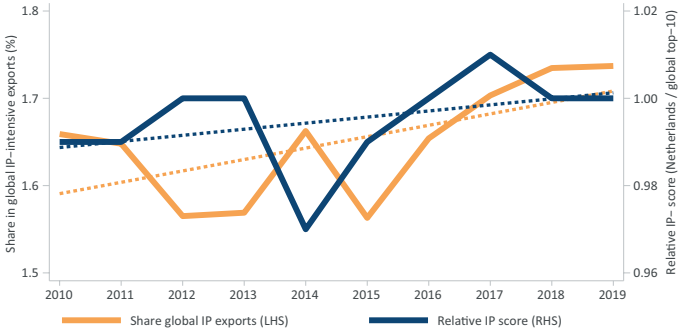
The US (€ 26 bn), China (€ 15 bn), Switzerland (€ 6.8 bn), Russia (€ 6.2 bn) and Turkey (€ 5.5 bn) are the main Dutch export destinations. For these markets IP-intensive exports constitute 65 % of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



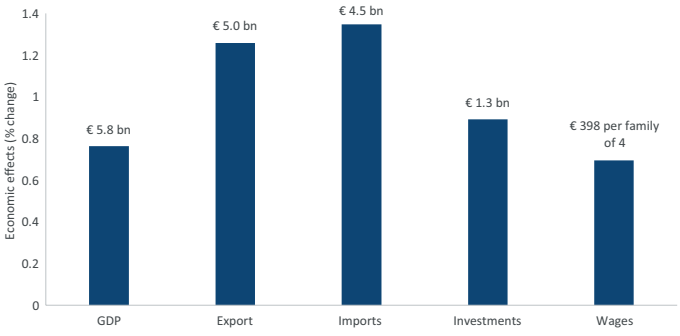
The top-8 IP-intensive manufacturing sectors together export € 85 bn in 2019 and contribute significantly to Dutch trade surplus. The largest Dutch export sectors that depend on IP are machinery (€ 22 bn) and electronics (€ 16 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



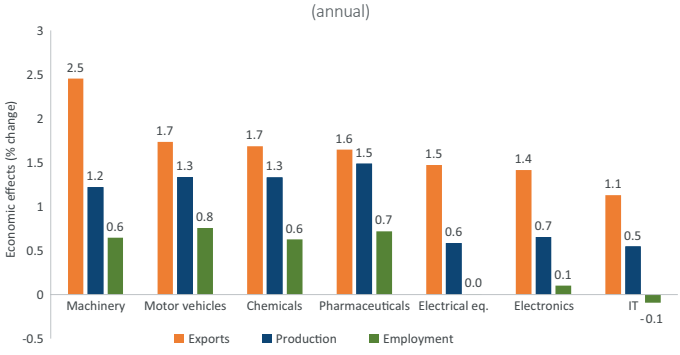
In recent years, the Netherlands reports a slight increase in its relative IP score compared to the global top-10. This corresponds to an increase in the Netherlands' share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for the Netherlands. The Netherlands' GDP, exports, and investments will be between 0.7% and 1.4% higher each year. The average Dutch family of four would benefit by €398 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



The Netherlands' IP-intensive sectors would support growth in exports (by 1.1 to 2.5%), increase resilience by boosting domestic production (by 0.5 to 1.5%), and create high value-added jobs for the Dutch economy.

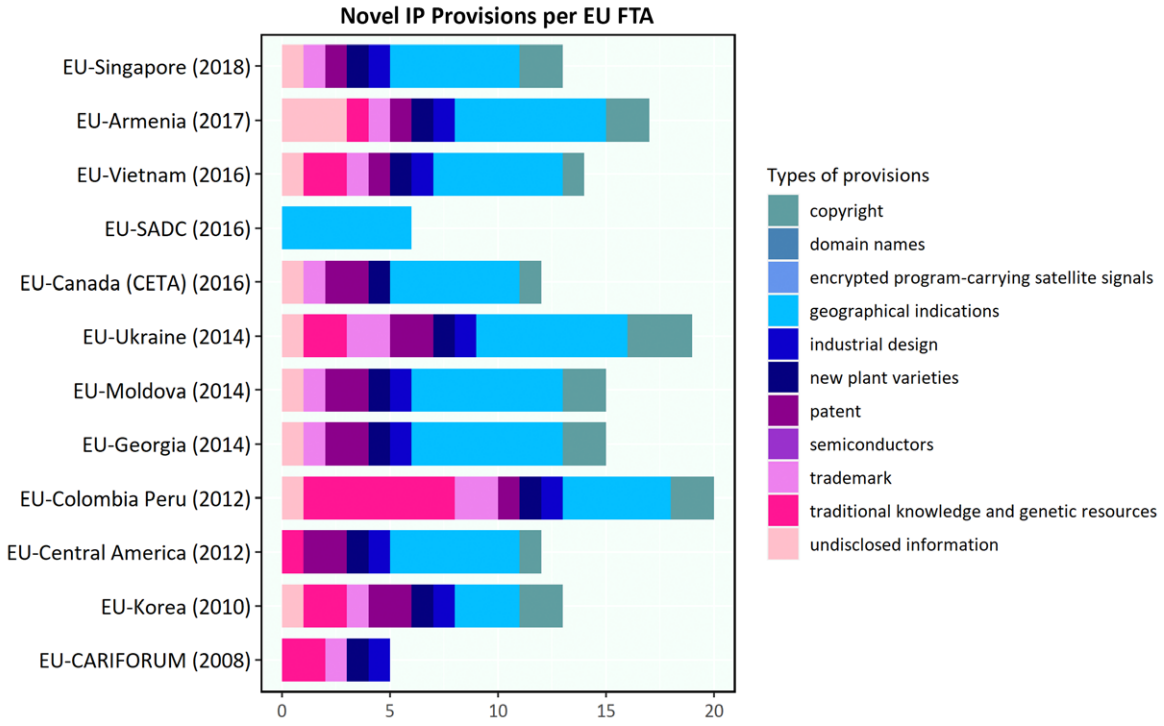
INSERT 5:

INTELLECTUAL PROPERTY AND BIODIVERSITY

By Dr. Philipp Lamprecht, ECIPE

The EU-Colombia, Peru, Ecuador FTA is the EU FTA that contains most intellectual property provisions of all EU FTAs regarding the protection of 'traditional knowledge and genetic resources' (DESTA, 2020) as shown in Figure 5.1, detailed under Title VII (Intellectual Property), Chapter 2, "Protection of biodiversity and traditional knowledge". The big question is whether this approach could work to help strengthen and preserve biodiversity, also from a trade-impact perspective.

FIGURE 5.1: TYPES OF NOVEL IP PROVISIONS IN EU FREE TRADE AGREEMENTS



Source: DESTA database (2020)

Tragedy of the Commons

Traditional knowledge and genetic resources are at risk of what is called the 'tragedy of the commons'; the phenomenon whereby individuals or individual companies neglect the well-being of society at large in the pursuit of individual gains. If everyone pursues a private goal, the result is over-consumption and ultimately depletion of the common resource (in this case the wide variety of genetic resources and traditional knowledge) to everyone's detriment.

Historical Context

The risk of the tragedy of the commons applying to biodiversity and traditional knowledge has led to increased awareness and recognition of the need for sustainable development and the role of traditional knowledge therein. The Brundtland Report (i.e. the World Commission on Environment and Development called "Our Common Future") first established sustainable development as a policy objective, which was endorsed by the Rio Earth Summit in 1992, opening the UN Convention on Biological Diversity (CBD). In 1994 the WTO, including the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) was established. Combined with the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization, the CBD constitutes the international framework for the recognition and protection of traditional knowledge. Article 8(j) of the CBD specifies that "Parties are required to respect and maintain knowledge held by indigenous people and local communities and to encourage wider application of traditional knowledge based on fair and equitable benefit-sharing".[110] The Nagoya Protocol (2014) builds on the CBD to establish a regime that governs access and benefit-sharing (ABS) of traditional knowledge.[111] In addition, the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGFRA), under the FAO, entered into force in 2004. And the Intergovernmental Committee on Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore under WIPO was established in 2000, providing a forum for negotiations on issues underlying development of a binding international instrument on traditional knowledge, flanked by the UN declaration on the Rights of Indigenous Peoples (UNDRIP).[112]

The Societal and Economic Importance of Traditional Knowledge and Genetic Resources

Traditional knowledge and genetic resources a play key role in the lives and livelihoods of indigenous communities around the world. But it is also important to note that 44% of vascular plants and 35% of all species of the four vertebrae groups are found in 25 biodiversity hotspots that comprise only 1.4% of the earth's surface (Meyers et al, 2000), mostly in least developed and/or developing countries.[113] According to Belisario et al. (2020) the use of biological resources to generate solutions to various (health and other) challenges faced by society have led to broader societal and economic benefits, but these have not accrued to the countries and populations which are the real owners of those natural assets and traditional knowledge, because they do not have their rights recognised and are not part of global value chains around these resources.

[110] Convention on Biological Diversity (adopted 5 June 1992, entered into force 29 December 1993) 1760 UNTS 79 (CBD) art 8(j).

[111] Greiber T. et al. 'An Explanatory Guide to the Nagoya Protocol on Access and Benefit-sharing' (2012) IUCN Environmental Policy and Law Paper No 83, 48–58.

[112] George, A. (2012), "Constructing Intellectual Property", CUP 2012, pp. 279–281.

[113] Myers, N. et al. (2000), "Biodiversity Hotspots for Conservation Priorities" (2000) 403 (6772) Nature 853.

The Relevance of Intellectual Property Rights for Biodiversity

At first sight, there could be tensions between the concept of IP and biodiversity and traditional knowledge. For example, IP is a concept that – for many developing countries – has come from the former colonial regimes and is – like TRIPS – grounded in western property assumptions, not shared by many indigenous groups.[114] Currently many developing countries accept IP, based on pragmatism to avoid further cultural and knowledge erosion, while not endorsing the essential principle. However, from the perspective of preserving the planet for future generations ('seventh generation') the Western IP concept and indigenous communities' come together: while foreign to indigenous communities, IP also combats the tragedy of the commons and helps preserve biodiversity.

Another perceived tension is that IP could be seen as going against the philosophy of indigenous and local communities that knowledge and information should be shared. While it is true that IP protects the unauthorised commercial use of knowledge that is patented by the patent-holder, IP does not prevent the spread of the information or knowledge – in fact sharing the knowledge so it becomes publicly available is part of a patent application.

An important legal argument in favour of the use of IPR to protect biodiversity lies in the argument of Fuller (2005) that protections for traditional knowledge under IPRs fit substantially the principles for legality.[115] This proves helpful in considering the recognition of traditional knowledge under the IP regimes. *"The [Nagoya] Protocol may be seen as complementing the recognition of rights of indigenous communities to the maintenance, control, protection and development of traditional knowledge and IP relating to traditional knowledge"* (Phillips, 2016).[116] This is even more important when sequencing, cataloguing and characterising the genomes of viruses and eucaryotes on the planet takes digital flight (e.g. through the Earth BioGenome Project and the Global Virome Project).[117] [118] These projects allow resulting sequences to be used for R&D purposes and to be made publicly available through online databases without ever requiring access to the physical-biological resources from which the sequences were obtained.[119]

In addition, Article 27 of the Universal Declaration on Human Rights (UDHR) relating to the protection of moral and material interest in intellectual creations applies as much to traditional knowledge as to other creations. In this way IPR give indigenous and local

[114] Phillips, F.-K. (2016). Intellectual Property Rights in Traditional Knowledge: Enabler of Sustainable Development. Utrecht Journal of International and European Law, 32(83), pp.1–18. DOI: http://doi.org/10.5334/ujiel.283

[115] Fuller, L. Morality of Law 39, 46–90; Colleen Murphy, 'Lon Fuller and the Moral Value of the Rule of Law' (2005) 24 Law and Philosophy 239, 240–241.

[116] Phillips, F.-K. (2016). Intellectual Property Rights in Traditional Knowledge: Enabler of Sustainable Development. Utrecht Journal of International and European Law, 32(83), pp.1–18. DOI: http://doi.org/10.5334/ujiel.283

[117] Lewin, H.A. et al., 'Earth BioGenome Project: Sequencing Life for the Future of Life' (2018) 115 (17) Proceedings of the National Academy of Sciences 4325.

[118] Carroll, D. et al., 'The Global Virome Project' (2018) 359 (6378) Science 872.

[119] Belisario Zorzal, P., R. Curi Hauegen, F. Pires Pimenta, (2020), "Biodiversity and the patent system: the Brazilian case", Journal of Intellectual Property Law & Practice, 2020, Vol. 15, No. 10.

communities – via procedural obligations that require the engagement of these indigenous communities – a say and strengthen their case for forms of self-governance and consent (Phillips, 2016). This would allow developing countries to defend themselves better against bio-piracy.[120]

Phillips (2016) does argue, however, that patent and copyright systems are not sufficiently adequate to address several forms of traditional knowledge, so should be complemented by including pre-existing community protocols or customary law into the IP framework. This includes the use of integrated definitions like 'commercialisation' (including filing, obtaining or transferring IPRs domestically or abroad), 'community intellectual property rights' that recognise community rights over traditional knowledge, 'community protocols' that incorporate indigenous communities' customary law into the IP framework as procedural norms.

EU Impact Assessment, Enforcement and Technical Assistance

From the above review, it becomes clear that IPR could work to help strengthen and preserve biodiversity in the areas where it is concentrated. However, for IP – via EU Free Trade Agreements – to work in support of biodiversity, it is important that three other aspects related to EU FTAs and biodiversity are looked into:

1. The impact (both ex ante and ex post) of an EU FTA on biodiversity on the ground needs to be adequately assessed and measured, in particular in terms of whether IP supports biodiversity and whether there is a fair distribution of economic benefits. An elaborate system of ex ante and ex post trade sustainability impact assessments (Trade SIA) has been set up. A DG Environment project called *"Methodology for improved assessments of the impact of Trade Agreements on biodiversity"* has suggested ways forward to focus the Trade SIA assessments more on biodiversity effects.

2. The Chief Trade Enforcement Officer (CTEO), appointed in 2020 in order to follow-up on the implementation of the FTA commitments, based on the impact assessment work, should also focus on whether the EU FTAs achieve their goals – for example regarding the impact of EU FTAs on biodiversity.

[120] Tobin, B. (2009) 'Setting Traditional Knowledge Protection to Rights: Placing Human Rights and Customary Law at the Center of Traditional Knowledge Governance' in Evanson Kamau and Gerd Winer (eds), Genetic Resources, Traditional Knowledge and the Law: Solutions for Access and Benefit Sharing (2009) 107.

3. For IP provisions in EU FTAs to strengthen biodiversity, developing countries also need to have appropriate capacities and resources in the form of an adequately educated and equipped court system with sufficient knowledge of IP law and biodiversity. Peru is an example in case. Peru has taken a strong stance against biopiracy.[121] And the Peruvian Anti-Biopiracy Commission has resolved various cases of claims related to native plants, invalidating several patents. However, the number of patent filings is much larger than the number of cases the Commission can deal with. The EU should therefore also consider flanking the IP provisions on traditional knowledge and genetic resources in its FTAs with other forms of support.

[121] Peru Is Leader Against Biopiracy - Intellectual Property – Peru (mondaq.com)

POLAND

Intellectual property matters for an economy like the Polish one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Poland. In Figure 2, we show how relevant different types of IP are for the Polish economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Poland as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

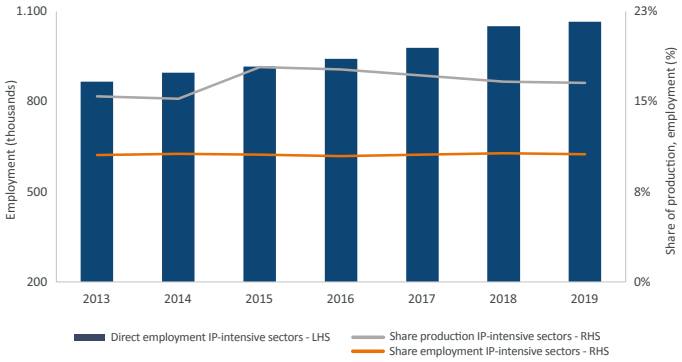


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

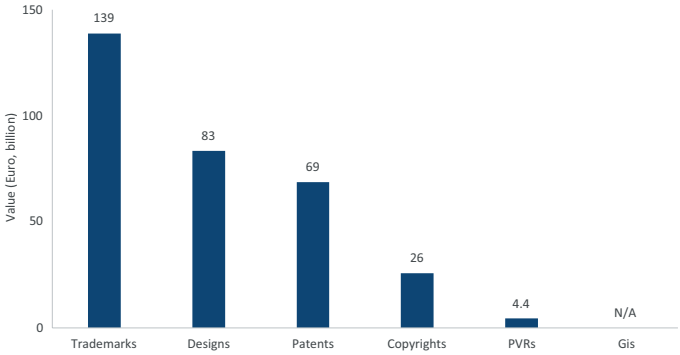


Figure 3: Value-added for IP-intensive sectors (2019)

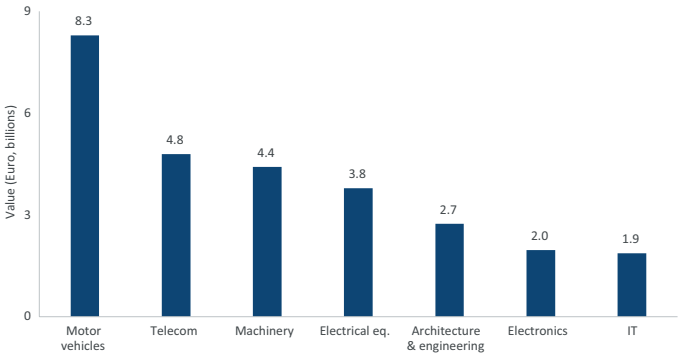


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

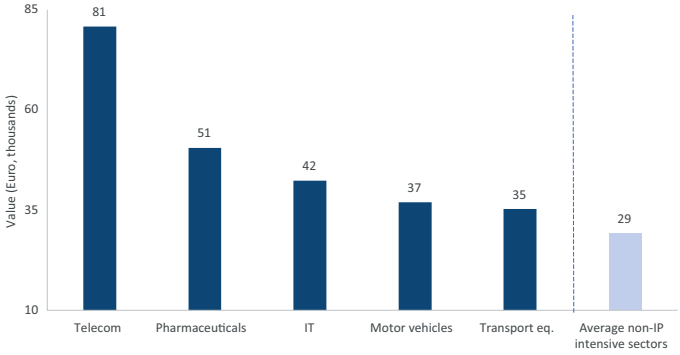


Figure 5: Index of SME R&D potential (2019)

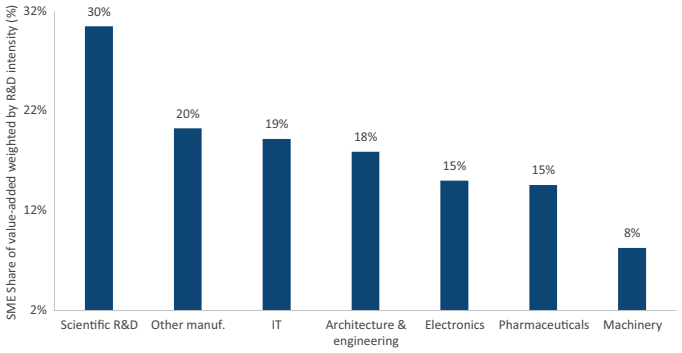
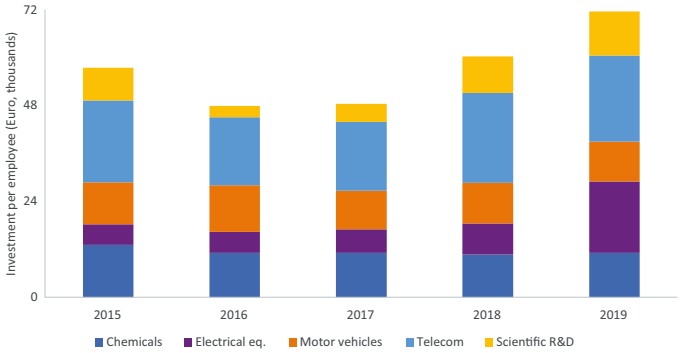


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

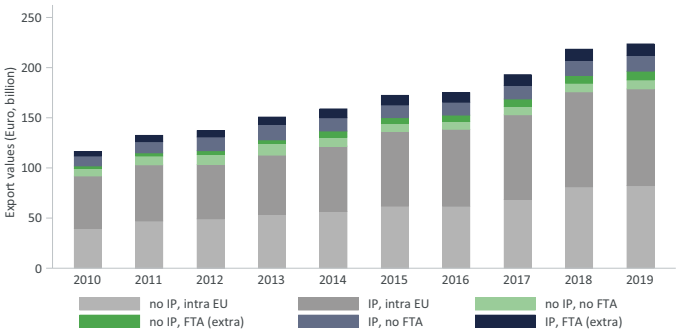


Intellectual Property is highly relevant for the Polish economy. The IP-intensive sectors in Poland employ close to 1 million workers directly, increasing since 2013, and represent 17% of total Polish production (Figure 1). Trademarks (€139 bn), design (€83 bn), and patents (€69 bn) are the most important types of IP for the Polish economy (Figure 2). Most economic value in Poland is created by the motor vehicles (€8 bn), telecom (€5 bn), and machinery (€4 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Polish economy (telecom, pharmaceuticals, IT services) creating the highest value jobs. Labour productivity in IP-intensive sectors in Poland is close to three times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, electrical equipment, and scientific R&D are the IP-intensive sectors with the highest levels of investment per employee in Poland (Figure 6). Polish SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and other manufacturing, but also IT services and architecture & engineering (Figure 5).

POLAND

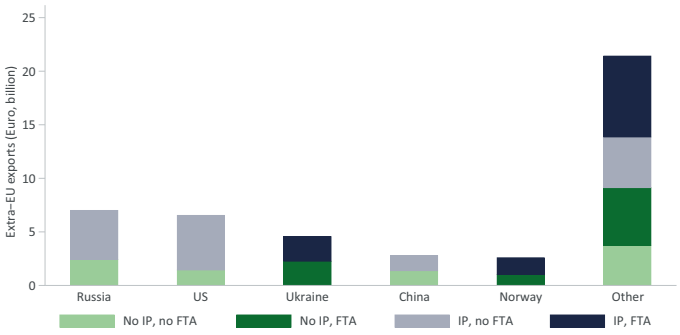
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Polish exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Polish IP framework is related with the Polish share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Poland (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



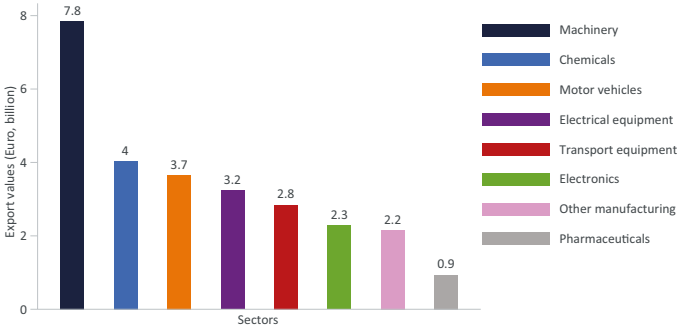
For Poland, the share of IP-intensive exports outside the EU has remained stable at 12% in 2010 and 12% in 2019, but of those exports only 42% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



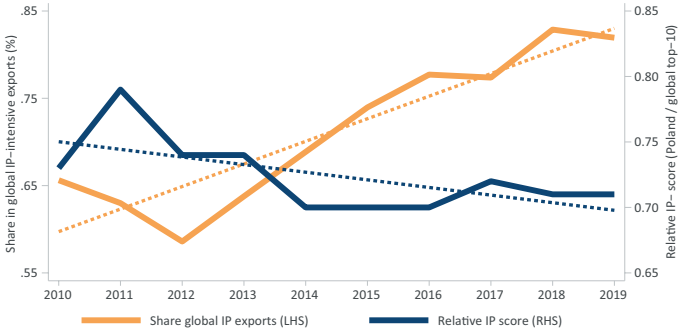
Russia (€ 7 bn), the US (€ 6.5 bn), Ukraine (€ 4.6 bn), China (€ 2.8 bn) and Norway (€ 2.6 bn) are the main Polish export destinations. For these markets IP-intensive exports constitute 64% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



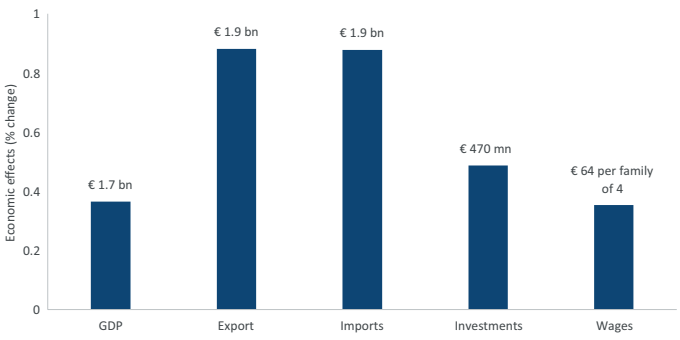
The top-8 IP-intensive manufacturing sectors together export € 27 bn in 2019 and contribute significantly to Polish trade surplus. The largest Polish export sectors that depend on IP are machinery (€ 7.8 bn) and chemicals (€ 4 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



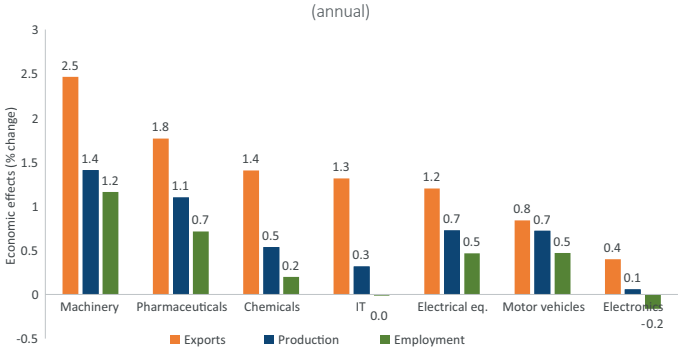
In recent years, Poland reports a decrease in its relative IP score compared to the global top-10. This corresponds to an increase in Poland's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Poland. Poland's GDP, exports, and investments will be between 0.4% and 0.9% higher each year. The average Polish family of four would benefit by €64 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)

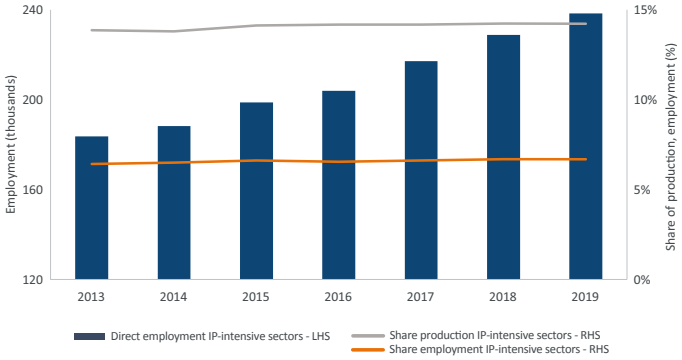


Poland's IP-intensive sectors would support growth in exports (by 0.4 to 2.5%), increase resilience by boosting domestic production (by 0.1 to 1.4%), and create high value-added jobs for the Polish economy.

PORTUGAL

Intellectual property matters for an economy like the Portuguese one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Portugal. In Figure 2, we show how relevant different types of IP are for the Portuguese economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Portugal as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)



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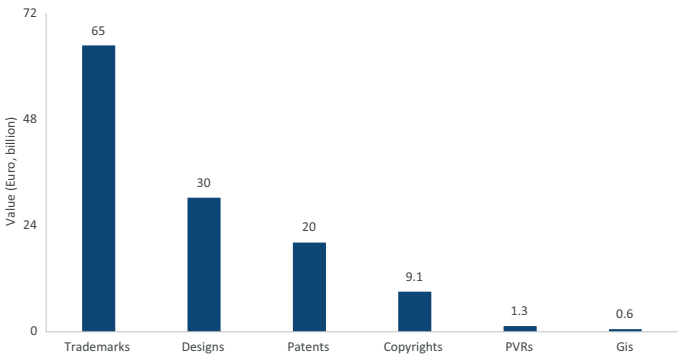


Figure 3: Value-added for IP-intensive sectors (2019)

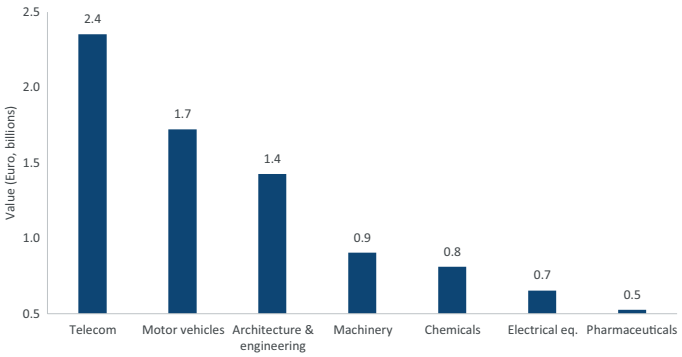


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

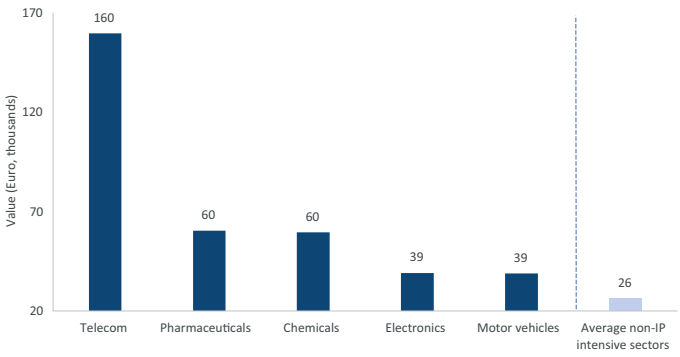


Figure 5: Index of SME R&D potential (2019)

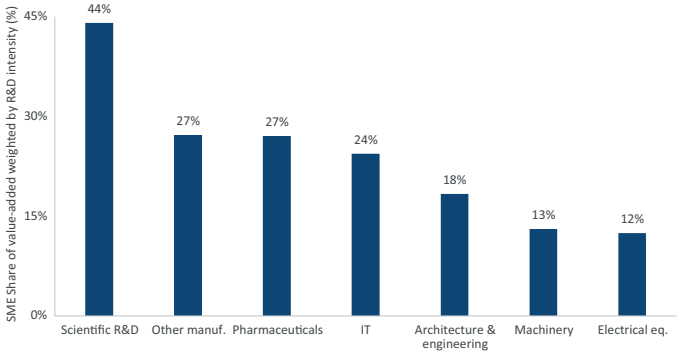
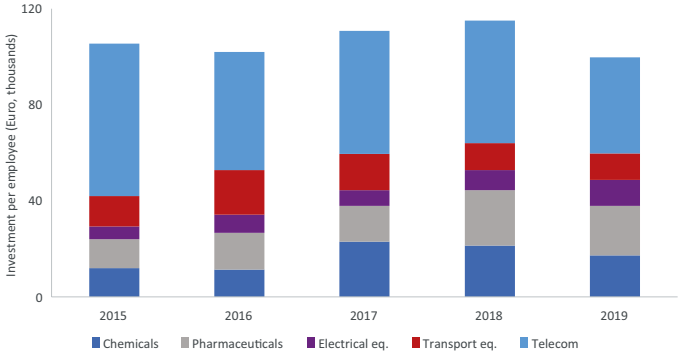


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

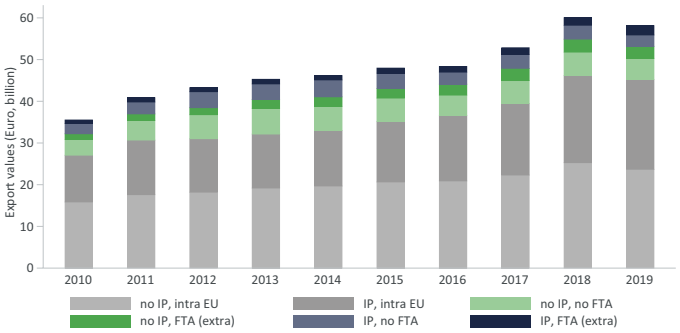


Intellectual Property is highly relevant for the Portuguese economy. The IP-intensive sectors in Portugal employ 238 thousand workers directly, increasing since 2013, and represent 14% of total Polish production (Figure 1). Trademarks (€65 bn), design (€30 bn), and patents (€20 bn) are the most important types of IP for the Portuguese economy (Figure 2). Most economic value in Portugal is created by the telecom (€2 bn), motor vehicles (€2 bn), and architecture & engineering (€1 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Portuguese economy (telecom, pharmaceuticals, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Portugal is close to six times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, chemicals, and pharmaceuticals are the IP-intensive sectors with the highest levels of investment per employee in Portugal (Figure 6). Portuguese SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and other manufacturing, but also pharmaceuticals and IT services (Figure 5).

PORTUGAL

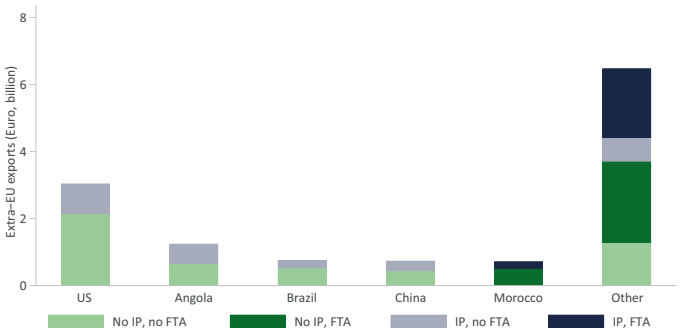
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Portuguese exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Portuguese IP framework is related with the Portuguese share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Portugal (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



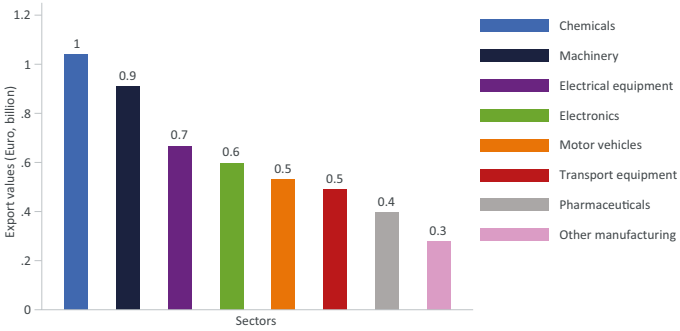
For Portugal, the share of IP-intensive exports outside the EU has remained stable at 9% in 2010 and 9% in 2019, but of those exports only 45% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



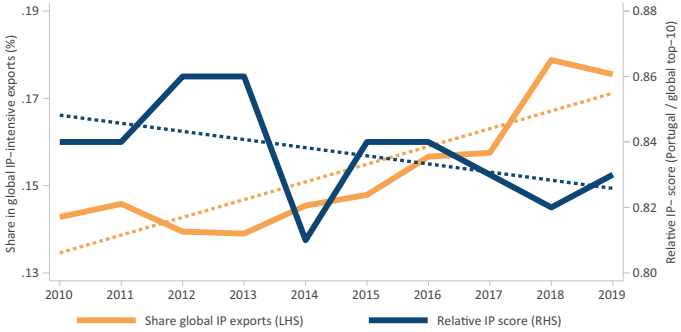
The US (€ 3 bn), Angola (€ 1.2 bn), Brazil (€ 0.8 bn), China (€ 0.7 bn) and Morocco (€ 0.7 bn) are the main Portuguese export destinations. For these markets IP-intensive exports constitute 34% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



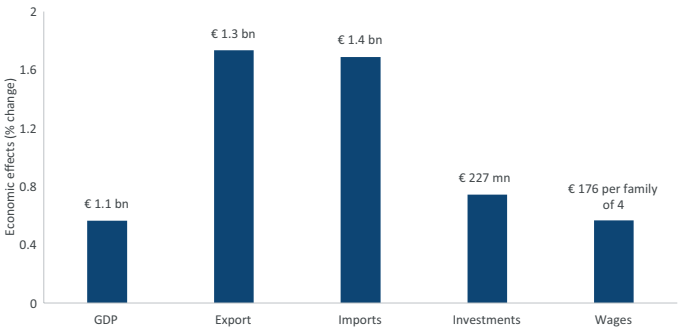
The top-8 IP-intensive manufacturing sectors together export € 4.9 bn in 2019 and contribute significantly to Portuguese trade surplus. The largest Portuguese export sectors that depend on IP are chemicals (€ 1 bn) and machinery (€ 0.9 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



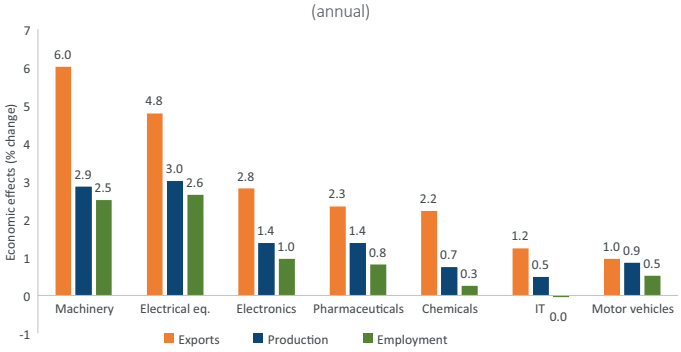
In recent years, Portugal reports a slight decline in its relative IP score compared to the global top-10. This corresponds to an increase in Portugal's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Portugal. Portugal's GDP, exports, and investments will be between 0.6% and 1.7% higher each year. The average Portuguese family of four would benefit by €176 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Portugal's IP-intensive sectors would support growth in exports (by 1.0 to 6.0%), increase resilience by boosting domestic production (by 0.5 to 3.0%), and create high value-added jobs for the Portuguese economy.

ROMANIA

Intellectual property matters for an economy like the Romanian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Romania. In Figure 2, we show how relevant different types of IP are for the Romanian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Romania as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

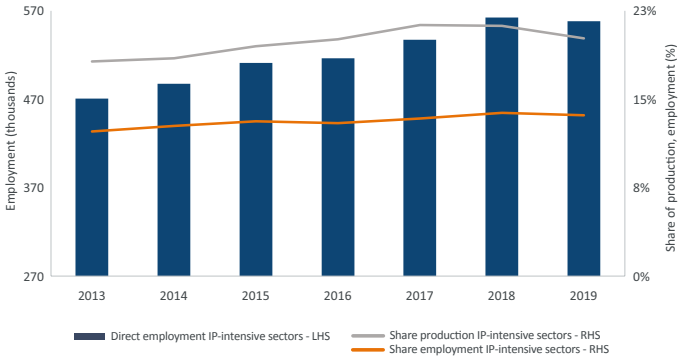


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

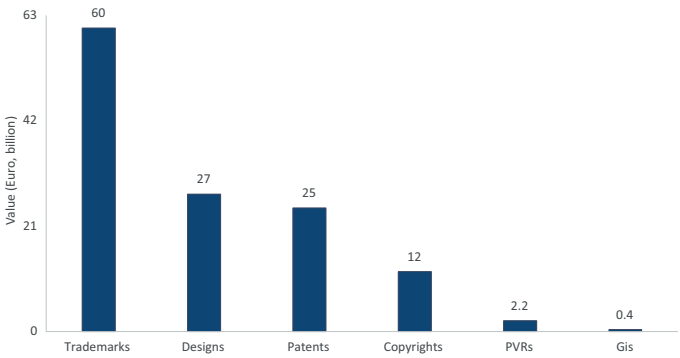


Figure 3: Value-added for IP-intensive sectors (2019)

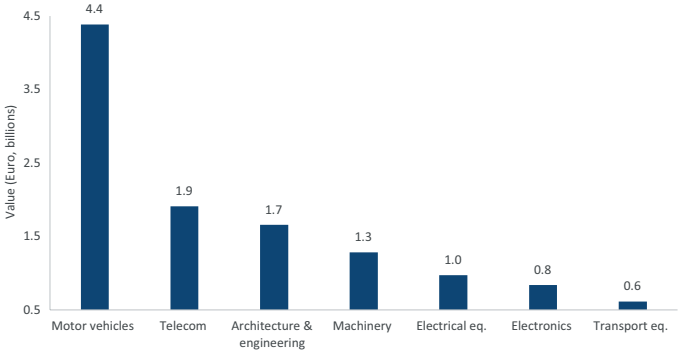


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

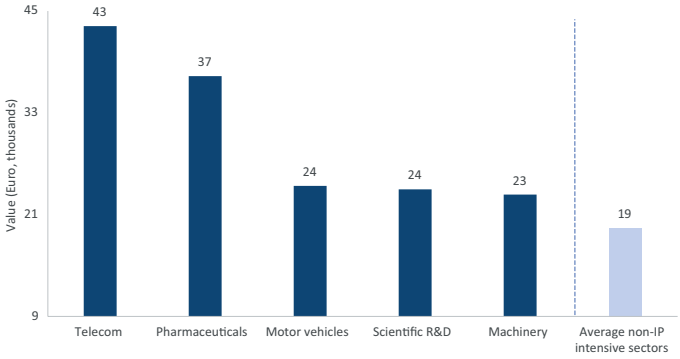


Figure 5: Index of SME R&D potential (2019)

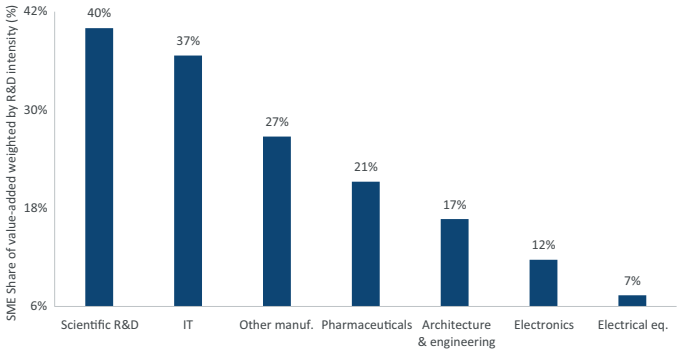
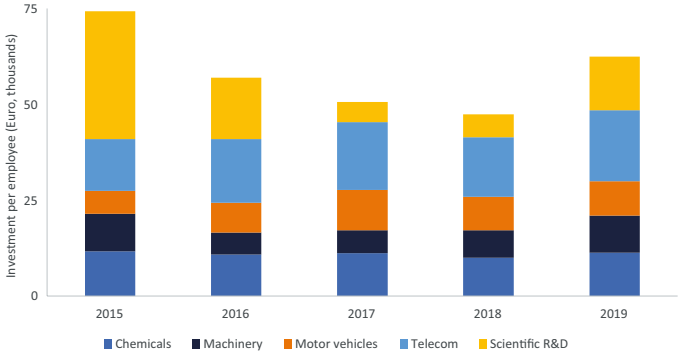


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

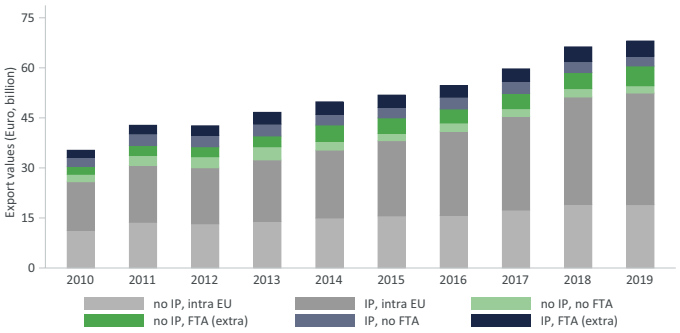


Intellectual Property is highly relevant for the Romanian economy. The IP-intensive sectors in Romania employ 558 thousand workers directly and represent 20% of total Romanian production (Figure 1). Trademarks (€60 bn), design (€27 bn), and patents (€25 bn) are the most important types of IP for the Romanian economy (Figure 2). Most economic value in Romania is created by the motor vehicles (€4 bn), telecom (€2 bn), and architecture & engineering (€2 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Romanian economy (telecom, pharmaceuticals, motor vehicles) creating the highest value jobs. Labour productivity in IP-intensive sectors in Romania is more than two times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, scientific R&D, and chemicals are the IP-intensive sectors with the highest levels of investment per employee in Romania (Figure 6). Romanian SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and IT services, but also other manufacturing and pharmaceuticals (Figure 5).

ROMANIA

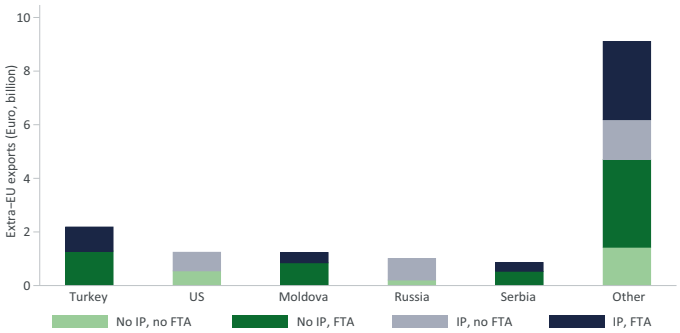
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Romanian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Romanian IP framework is correlated with a higher Romanian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Romania (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



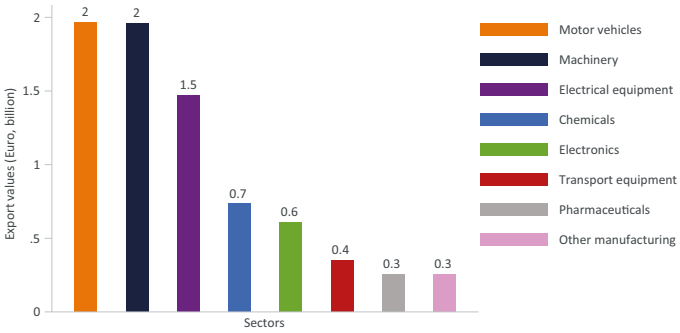
For Romania, the share of IP-intensive exports outside the EU has decreased from 14% in 2010 to 11% in 2019. Of those exports 60% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



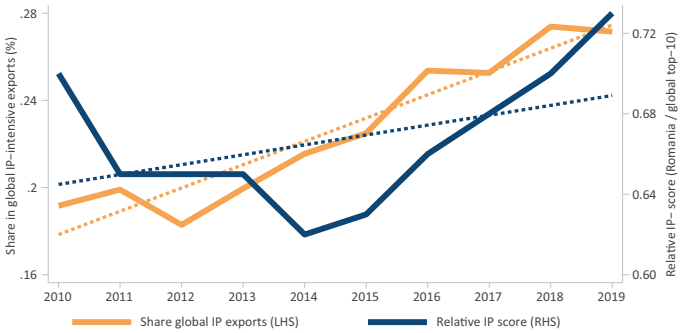
Turkey (€ 2.2 bn), the US (€ 1.2 bn), Moldova (€ 1.2 bn), Russia (€ 1 bn) and Serbia (€ 0.9 bn) are the main Romanian export destinations. For these markets IP-intensive exports constitute 48% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



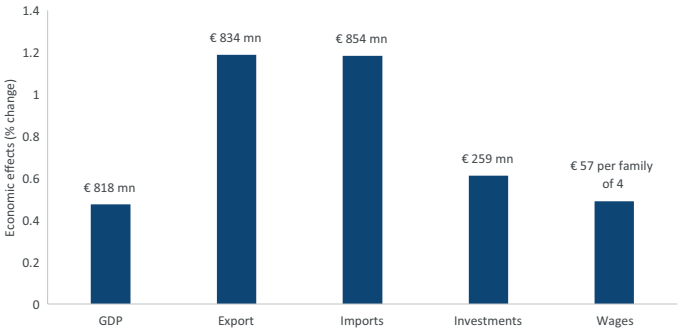
The top-8 IP-intensive manufacturing sectors together export € 7.6 bn in 2019 and contribute significantly to Romanian trade surplus. The largest Romanian export sectors that depend on IP are motor vehicles (€ 2 bn) and machinery (€ 2 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



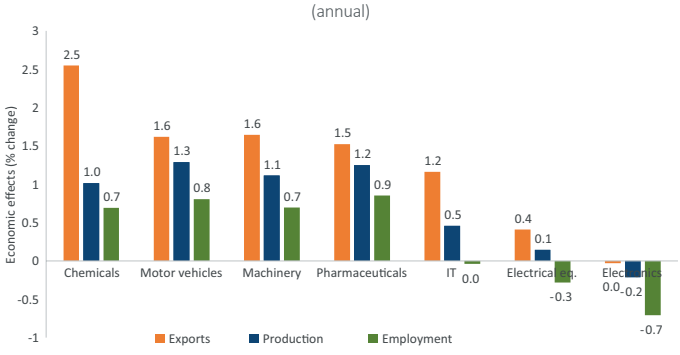
In recent years, Romania reports a significant increase in its relative IP score compared to the global top-10. This corresponds to an also significant rise in Romania's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Romania. Romania's GDP, exports, and investments will be between 0.5% and 1.2% higher each year. The average Romanian family of four would benefit by €57 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)

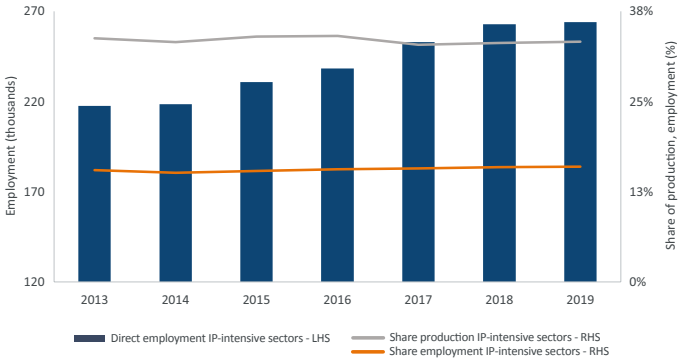


Romania's IP-intensive sectors would support growth in exports (by 0.0 to 2.5%), increase resilience by boosting domestic production (by -0.2 to 1.3%), and create high value-added jobs for the Romanian economy.

SLOVAKIA

Intellectual property matters for an economy like the Slovakian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Slovakia. In Figure 2, we show how relevant different types of IP are for the Slovakian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Slovakia as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)



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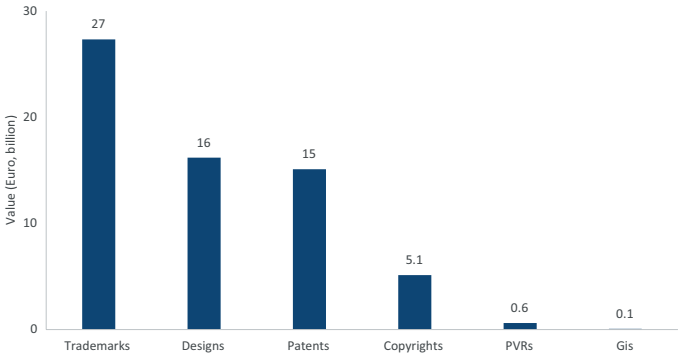


Figure 3: Value-added for IP-intensive sectors (2019)

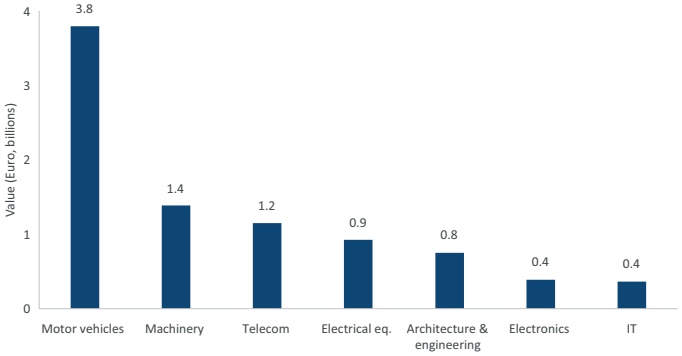


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

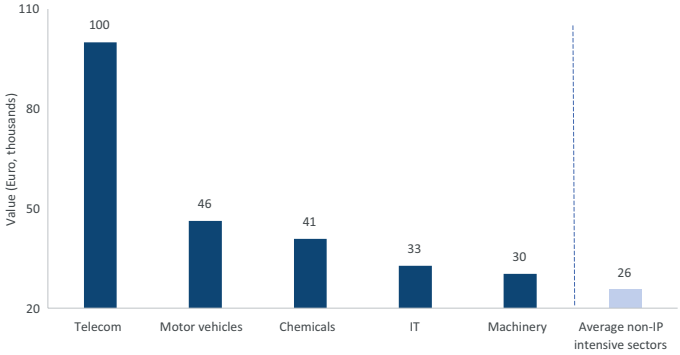


Figure 5: Index of SME R&D potential (2019)

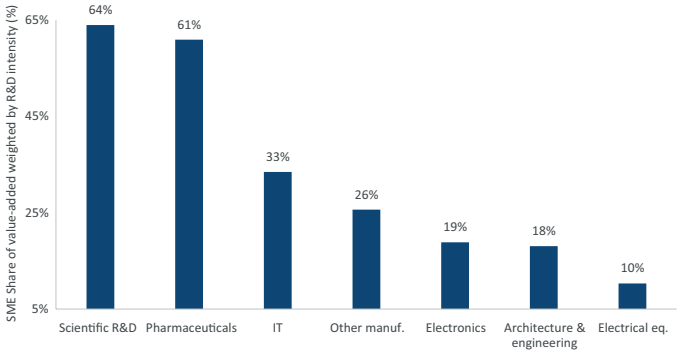
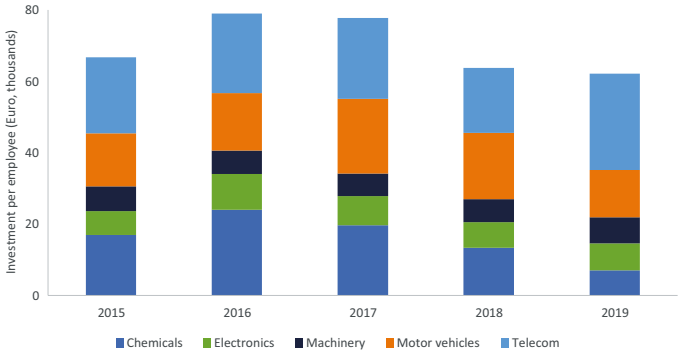


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

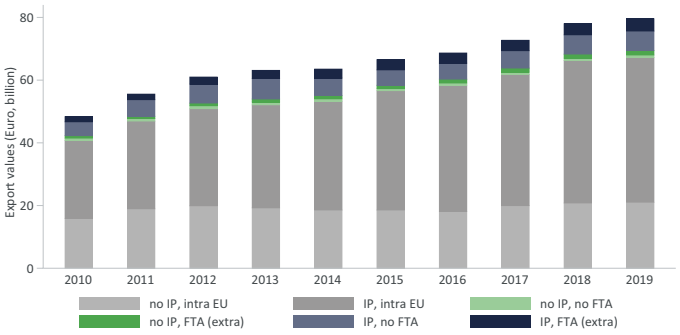


Intellectual Property is highly relevant for the Slovakian economy. The IP-intensive sectors in Slovakia employ 264 thousand workers directly, increasing since 2013, and represent 33% of total Slovakian production (Figure 1). Trademarks (€27 bn), design (€16 bn), and patents (€15 bn) are the most important types of IP for the Slovakian economy (Figure 2). Most economic value in Slovakia is created by the motor vehicles (€4 bn), machinery (€1 bn), and telecom (€1 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Slovakian economy (telecom, motor vehicles, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Slovakia is close to four times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, motor vehicles, and electronics are the IP-intensive sectors with the highest levels of investment per employee in Slovakia (Figure 6). Slovakian SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and pharmaceuticals, but also IT services and other manufacturing (Figure 5).

SLOVAKIA

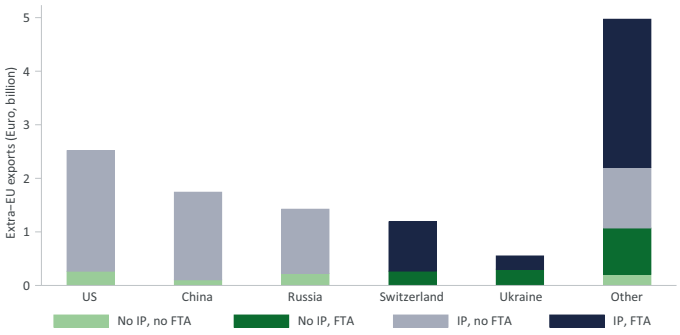
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Slovakian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Slovakian IP framework is correlated with a higher Slovakian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Slovakia (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



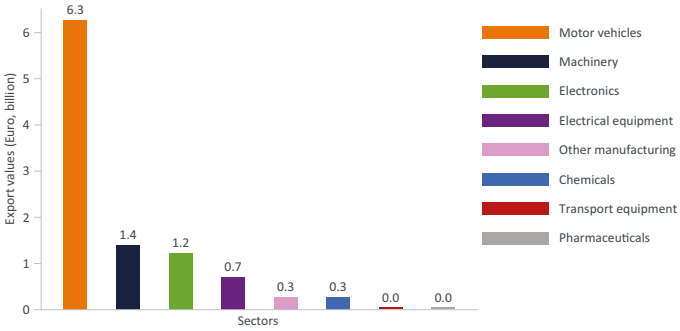
For Slovakia, the share of IP-intensive exports outside the EU has remained stable at 13% in 2010 and 13% in 2019, but of those exports only 39% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



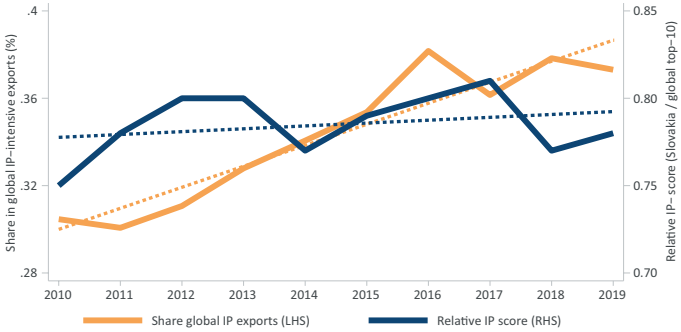
The US (€ 2.5 bn), China (€ 1.7 bn), Russia (€ 1.4 bn), Switzerland (€ 1.2 bn) and Ukraine (€ 0.6 bn) are the main Slovakian export destinations. For these markets IP-intensive exports constitute 84% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



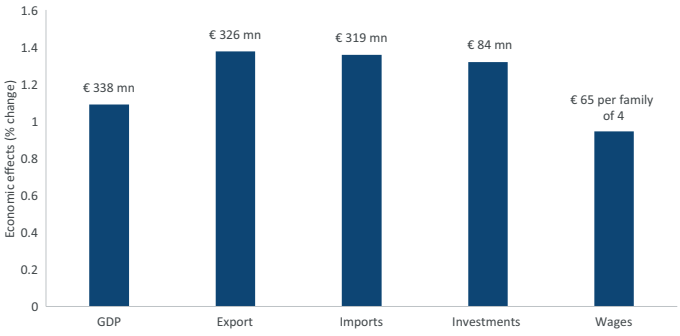
The top-8 IP-intensive manufacturing sectors together export € 10 bn in 2019 and contribute significantly to Slovakian trade surplus. The largest Slovakian export sectors that depend on IP are motor vehicles (€ 6.3 bn) and machinery (€ 1.4 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



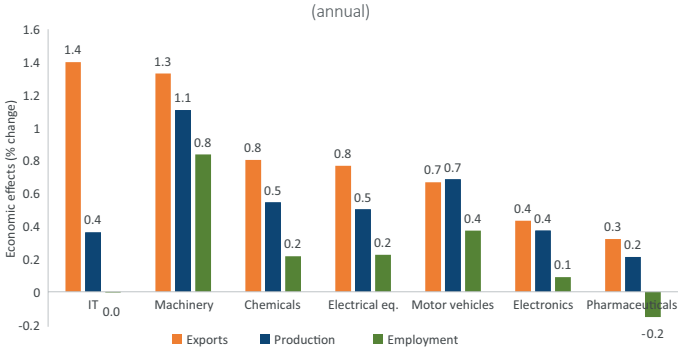
In recent years, Slovakia reports a slight increase in its relative IP score compared to the global top-10. This corresponds to an also increase in Slovakia's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Slovakia. Slovakia's GDP, exports, and investments will be between 0.9% and 1.4% higher each year. The average Slovakian family of four would benefit by €65 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Slovakia's IP-intensive sectors would support growth in exports (by 0.3 to 1.4%), increase resilience by boosting domestic production (by 0.2 to 1.1%), and create high value-added jobs for the Slovakian economy.

INSERT 6:

INTELLECTUAL PROPERTY IN SERVICES SECTORS

By Mr. Pascal Kerneis, European Services Forum

Introduction and Summary

As expected, the present report focusses a lot on the IPR intensive sectors in the manufacturing world (pharmaceutical, car industry, etc.). It remains difficult for many reasons to identify the importance of Intellectual Property in services sectors, and whether this lack of knowledge, and lack of action thereof, might have an impact on the EU FTAs.

For a start, I would like to thank the authors of this important study to give this opportunity to recognise this lack of data on IP in the Services Sectors, by inviting this insert.

It is well accepted that the use of the CGE model - which is largely referred to in this study - does put the figures and performance of the services sectors and of Foreign Direct Investments in underestimated position. The lack of statistical data on services trade is also making the task of analysts even more complicated. It is unfortunate that there are no efforts made to collect in a more systematic way data on Intellectual Property in Services Sectors.

From what we can understand so far with the poor information available, it is not clear whether more information on services sectors related IPR would bring much different conclusion in terms of IP provisions in the EU free trade agreements, although that would probably merit a deeper analysis. But for the sake of interest in that area, and for possible future research, it would be interesting that future studies on this matter would further analyse the dimension of intellectual property in the services sectors. In the meanwhile, let's share some thoughts on the matter.

The Classification Issue:

The current survey does refer to some services sectors, but it might be sometimes a bit confusing on what is exactly covered. Indeed, the distinction between goods sectors and services sectors is becoming artificial in many sectors. Goods and manufacturing sectors in general are consuming and providing more and more services, and many services sectors do need goods and manufactured products to function properly. Let's take for instance digital services, which needs computers, but a computer without software is not of much value. Telecom services needs antennas and terminals; international maritime transports need ships to carry goods, waste or water management services needs appropriate collection and cleaning tools and technology, etc. On the other hand, an automobile is full of services from the Research & Development, the designing, the

logistics, the advertising to the distribution in showrooms, the leasing, the insurance and the after-sale services, and now the digital services embedded into the vehicle (navigation, emergency assistance, internet connection, and much more). And this is valid for nearly all manufacturing products that are now "connected", i.e. with some digital and telecommunication services attached to them.

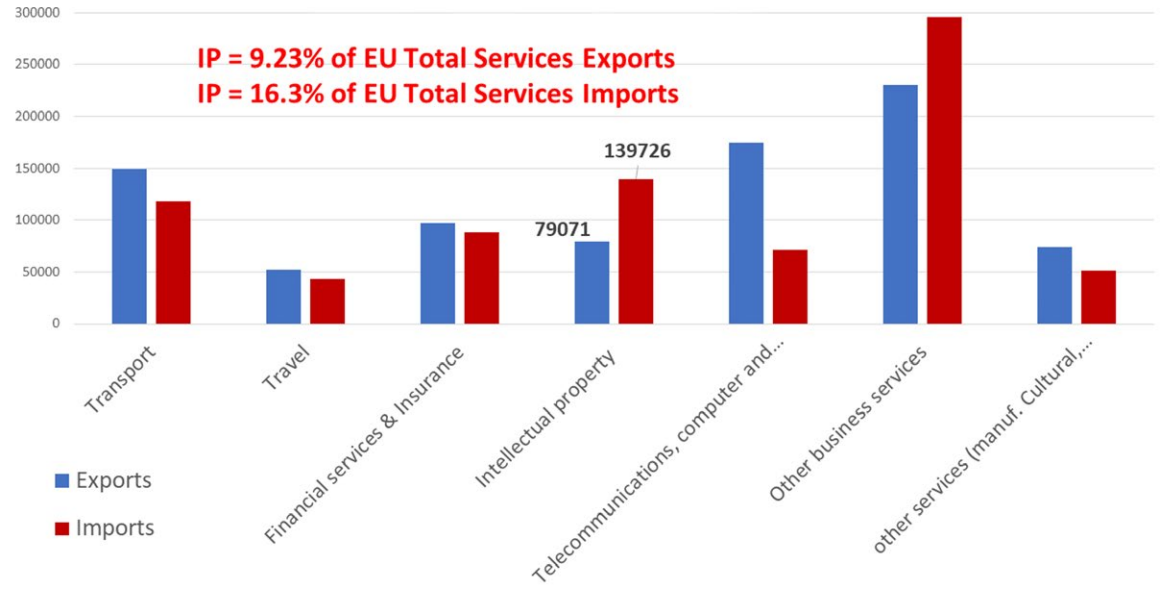
Architecture and engineering services, as well as Information services (i.e. IT) and Telecoms sector are mentioned in the report, but it is not clear whether these figures come from the patents and innovations made in products/goods from those sectors ("licence for the use of outcome of research and development"), or whether it comes from the license fees/ revenues generated to "reproduce and/or distribute (for instance) computer software" (i.e. a services!), etc.

And to complicate the matter, let's don't forget that "Research & Development" are also services and registered as such in CPC Services Classification used by trade negotiators and economists (see WTO MTN.GNS/W/120 – CPC n° 851, 852 & 853 are described as Business Services – I C a), b) and c)).

The Statistical Issue (or Lack of Statistical Data):
The services sectors that are mentioned in the survey do represent significant amounts of revenues generated by the protection of the IP (e.g. "Most value-added for the EU economy is created by […] architecture & engineering (€145k); Telecom (€161k) […] create the most productive and highest value-added jobs.". But unfortunately, beyond these figures, it is difficult to find any reference at all in the remaining part of the survey to these services sectors.

It needs to be well recognised that the value and volume of *international trade of IP is accounted as a service,* and hence are listed of the exports and imports of services in trade statistics. This is simply because a manufacturing company or a services company which is selling the right to use a licence or a patent do effectively provide a service to the seller. The detailed figures can be found on Eurostat [bop_its6_det].

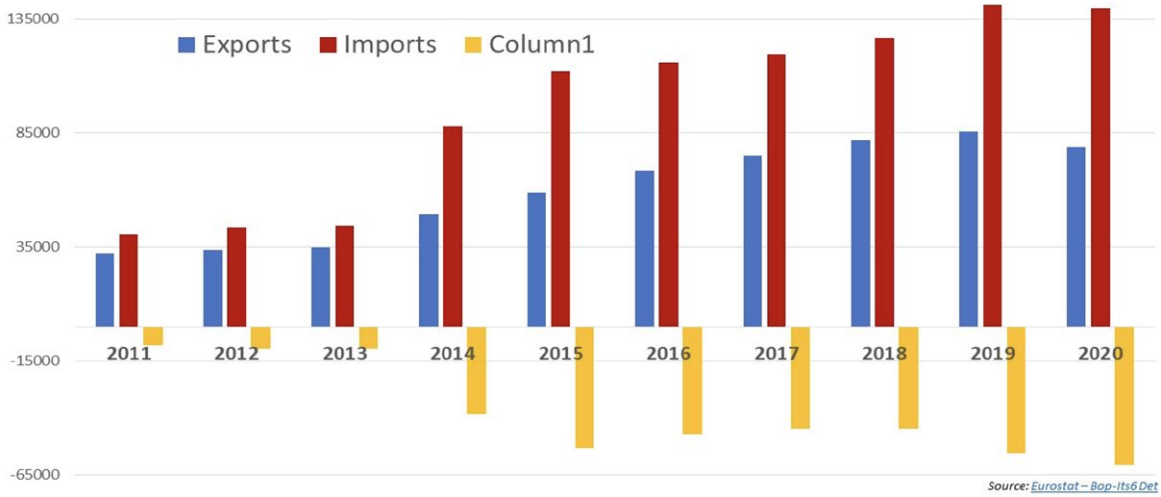
FIGURE 6.1: EU27 SERVICES EXPORTS AND IMPORTS TO WORLD PER SECTORS (2020, MILLION EUR)



The figures of EU exports of "Services: Charges for the use of intellectual property" are as follow: 85,743 Mio€ in 2019 and 79,071 Mio€ in 2020. EU Imports of IP: 141,091 Mio€ in 2019 and 139,726 Mio € in 2020. This makes the EU deficit in IP of 55,348 Mio in 2019 and of 60,655 Mio € in 2020. This deficit has widened over the last decade more than seven times. It would be interesting to study the reasons of this increasing deficit, and to identify the sectors which contributed to it.

But unfortunately, there are very few data available on the details of that category per sectors. The IPR intensive sectors do have specific information that are well documented in this survey.

FIGURE 6.2: TREND OF EU27 EXPORTS AND IMPORTS IN INTELLECTUAL PROPERTIES (2011-2020, MILLION EUR)



IP in Services: Which Sectors?

It would be also interesting to find out whether there are other services sectors – other than those which have been mentioned here above and, in the survey, - that do make some part of their revenues from the licence fees, and what would be the share of these revenues in their total turnover. These services sectors are not often well identified, but one can look for instance to the following ones:

- The *Retail* sector (distribution services) heavily relies on the franchise system, like for instance the textile & apparel shops in shopping malls, or luxury shops in airports. In this sector of Distribution Services, the supermarket chains also use the franchise system. This is also the case for the tourism sector (with the franchise of hotel names), *Pharmacies' network,* etc. The question is whether the revenues are considered as "royalties" or may be accounted as income from simple ordinary contracts.

- The *Audio-visual sector* is a major user of copyrights for distribution of music, films and TV series, etc. The telecom companies are becoming themselves producers and distributors of AV services… AV services are important sectors in terms of jobs. But the survey barely touches upon that growing sector, which includes the video on demands and the gaming industry. The statistics in Eurostat database Bop-its6-Det are very sporadic.

- The *accounting and auditing sector* also uses IP as a mean to allow access to the network and knowhow of the big firms, where independent practices and partnerships pay an annual fee to be allowed to be part of the network: Are these fees to be labelled Royalties? This model is also similar for some *law firms.*

- The *environmental services* companies also have invented new technologies and software to perform the cleaning of water, of sewage, the reduction of noise, the detection of water leakages, etc. Are the revenues of the licences already included in under the IP for the "engineering services"?

- We have seen that the Computer services sector was mentioned in the survey, but revenues from the use of computer licences can go beyond the IT sector, as digital services are now present in nearly all field of the economy, and in particular in *financial services sectors,* with the development of FinTech, the copyrights for apps, etc.

Further research would be of high interest here to better understand the role of intellectual property rights in the services sectors, and to better assess whether the EU free trade agreements do sufficiently protect these rights.

SLOVENIA

Intellectual property matters for an economy like the Slovenian one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Slovenia. In Figure 2, we show how relevant different types of IP are for the Slovenian economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Slovenia as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

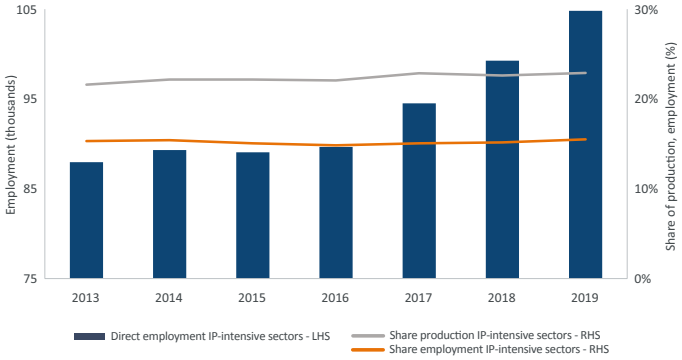


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

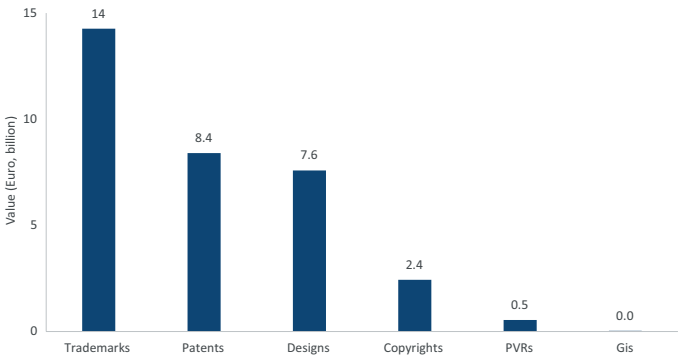


Figure 3: Value-added for IP-intensive sectors (2019)

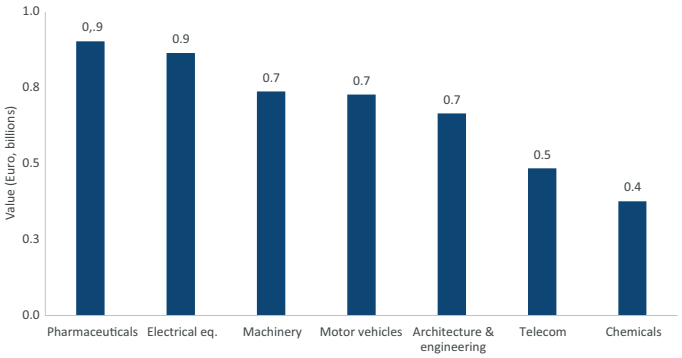


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

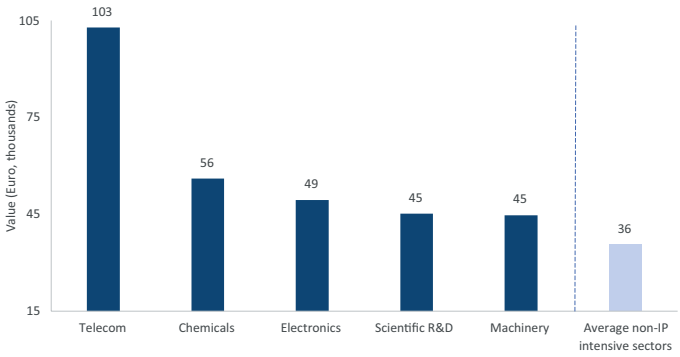


Figure 5: Index of SME R&D potential (2019)

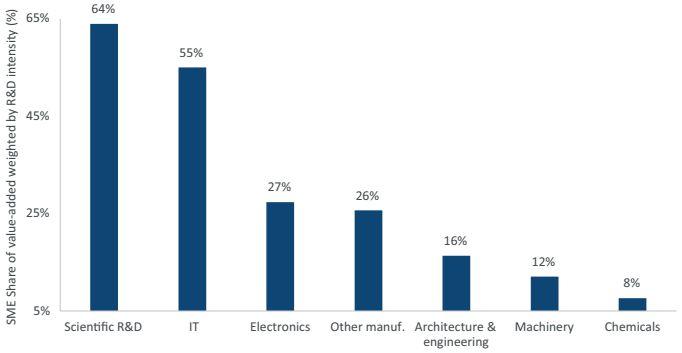
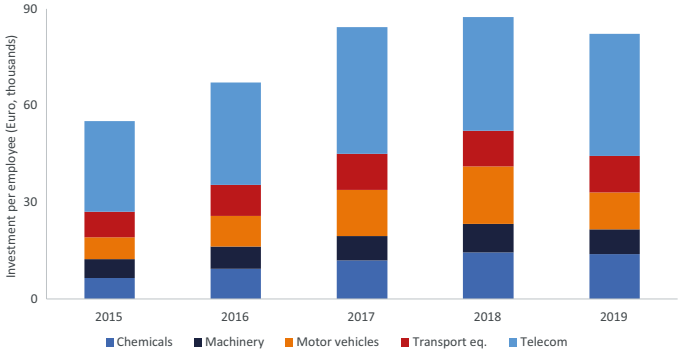


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

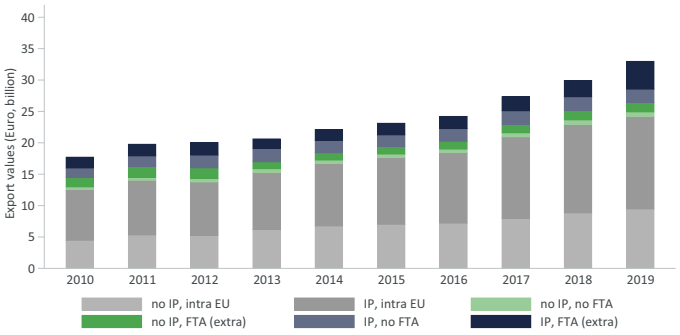


Intellectual Property is highly relevant for the Slovenian economy. The IP-intensive sectors in Slovenia employ close to 105 thousand workers directly, increasing since 2013, and represent 23% of total Slovenian production (Figure 1). Trademarks (€14 bn), patents (€8 bn), and designs (€8 bn) are the most important types of IP for the Slovenian economy (Figure 2). Most economic value in Slovenia is created by the pharmaceutical (€1 bn), electrical equipment (€1 bn), and machinery (€1 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Slovenian economy (telecom, chemicals, electronics) creating the highest value jobs. Labour productivity in IP-intensive sectors in Slovenia is close to three times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, chemicals, and motor vehicles are the IP-intensive sectors with the highest levels of investment per employee in Slovenia (Figure 6). Slovenian SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and IT services, but also electronics and other manufacturing (Figure 5).

SLOVENIA

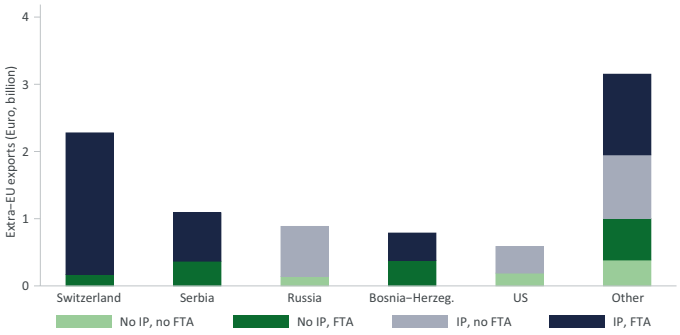
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Slovenian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Slovenian IP framework is correlated with a higher Slovenian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Slovenia (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



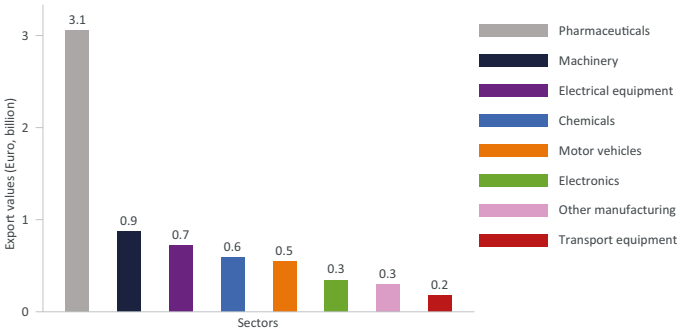
For Slovenia, the share of IP-intensive exports outside the EU has gone up from 18% in 2010 to 20% in 2019. Of those exports 68% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



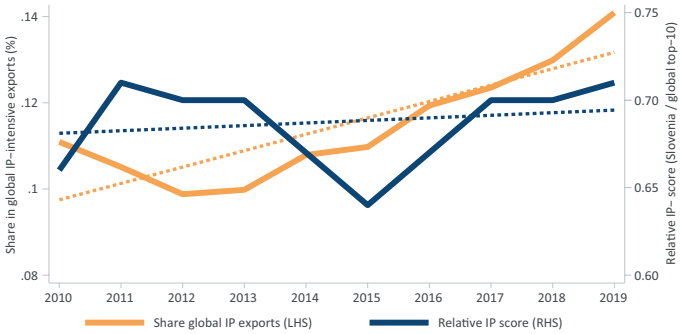
Switzerland (€ 2.3 bn), Serbia (€ 1.1 bn), Russia (€ 0.9 bn), Bosnia and Herzegovina (€ 0.8 bn) and the US (€ 0.6 bn) are the main Slovenian export destinations. For these markets IP-intensive exports constitute 78 % of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



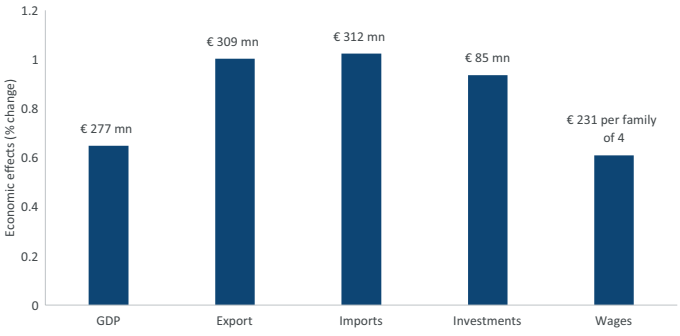
The top-8 IP-intensive manufacturing sectors together export € 6.6 bn in 2019 and contribute significantly to Slovenian trade surplus. The largest Slovenian export sectors that depend on IP are pharmaceuticals (€ 3.1 bn) and machinery (€ 0.9 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



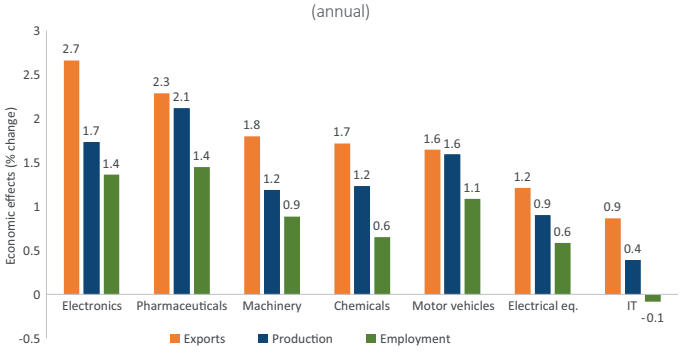
In recent years, Slovenia reports an increase in its relative IP score compared to the global top-10. This corresponds to a rise in Slovenia's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Slovenia. Slovenia's GDP, exports, and investments will be between 0.6% and 1.0% higher each year. The average Slovenian family of four would benefit by €231 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Slovenia's IP-intensive sectors would support growth in exports (by 0.9 to 2.7%), increase resilience by boosting domestic production (by 0.4 to 2.1%), and create high value-added jobs for the Slovenian economy.

SPAIN

Intellectual property matters for an economy like the Spanish one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Spain. In Figure 2, we show how relevant different types of IP are for the Spanish economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Spain as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

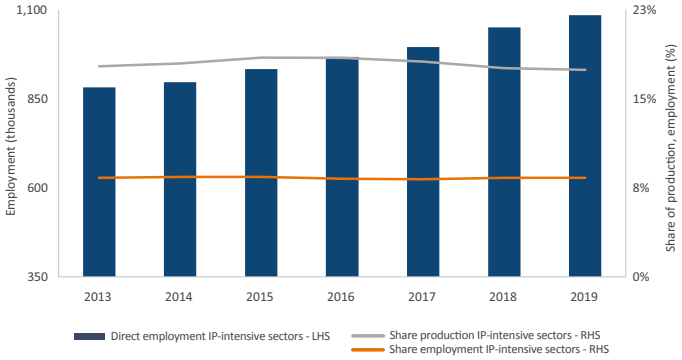


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

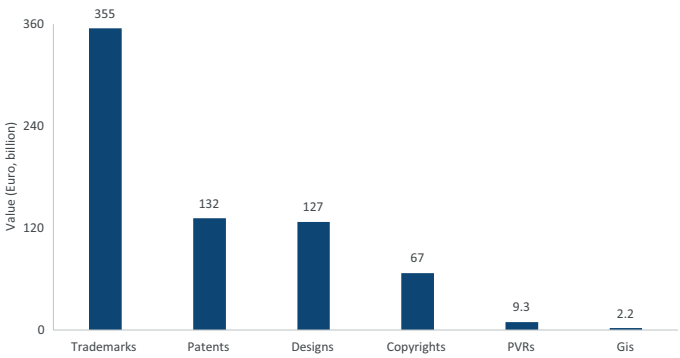


Figure 3: Value-added for IP-intensive sectors (2019)

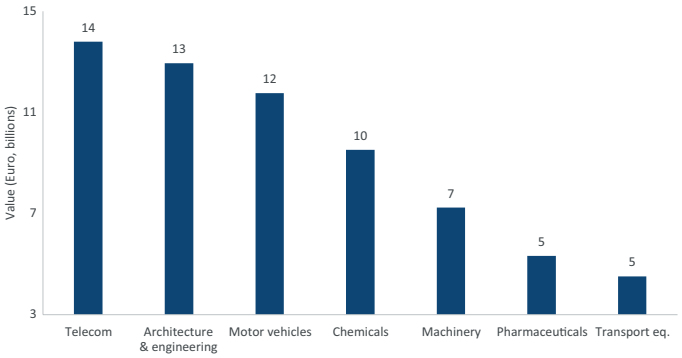


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

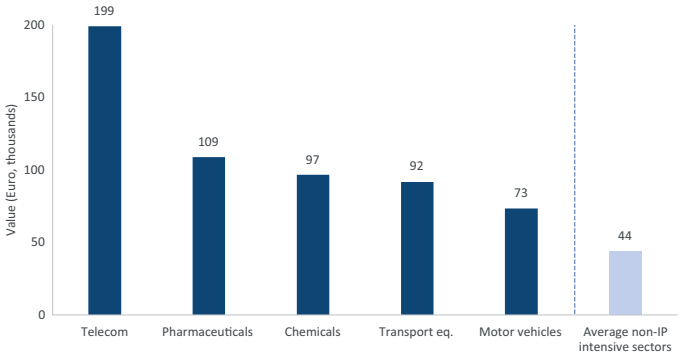


Figure 5: Index of SME R&D potential (2019)

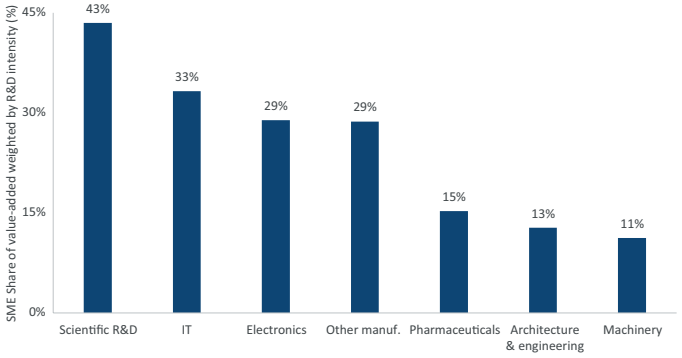
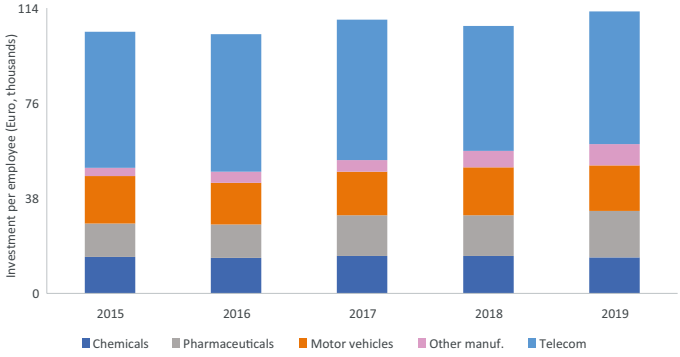


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

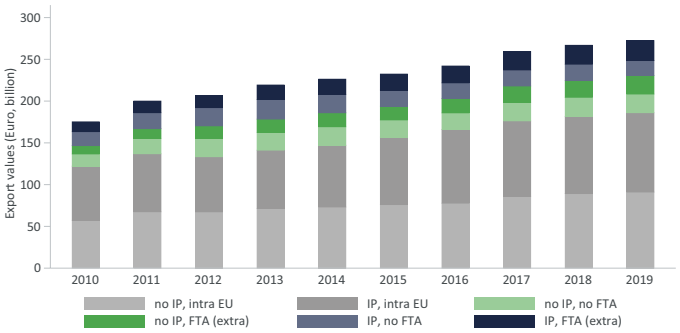


Intellectual Property is highly relevant for the Spanish economy. The IP-intensive sectors in Spain employ more than 1 million workers directly, increasing since 2013, and represent 17% of total Spanish production (Figure 1). Trademarks (€355 bn), patents (€132 bn), and designs (€127 bn) are the most important types of IP for the Spanish economy (Figure 2). Most economic value in Spain is created by the telecom (€14 bn), architecture & engineering (€13 bn), and motor vehicles (€12 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Spanish economy (telecom, pharmaceuticals, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Spain is more than four times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, pharmaceuticals, and motor vehicles are the IP-intensive sectors with the highest levels of investment per employee in Spain (Figure 6). Spanish SMEs make a significant contribution to value-added in sectors with high R&D spending such as scientific R&D and IT services, but also electronics and other manufacturing (Figure 5).

SPAIN

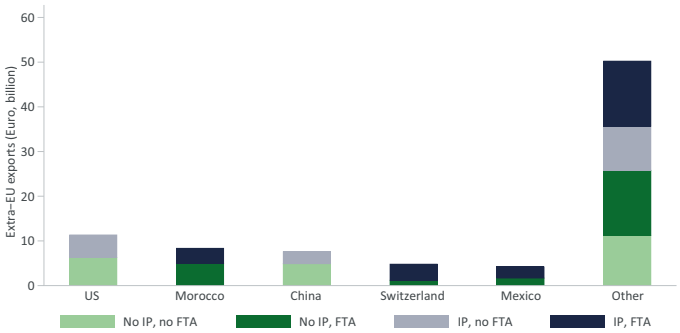
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Spanish exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Spanish IP framework is related with the Spanish share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Spain (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



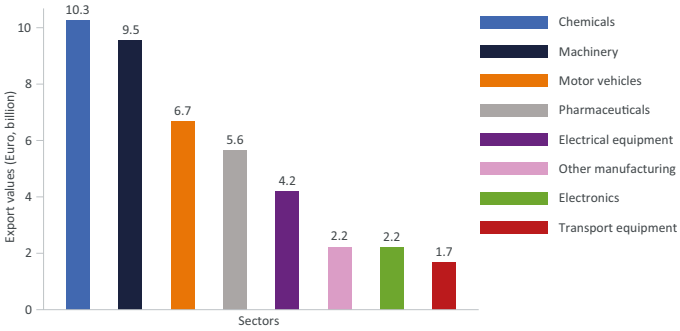
For Spain, the share of IP-intensive exports outside the EU has decreased from 16% in 2010 to 15% in 2019. Of those exports only 58% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



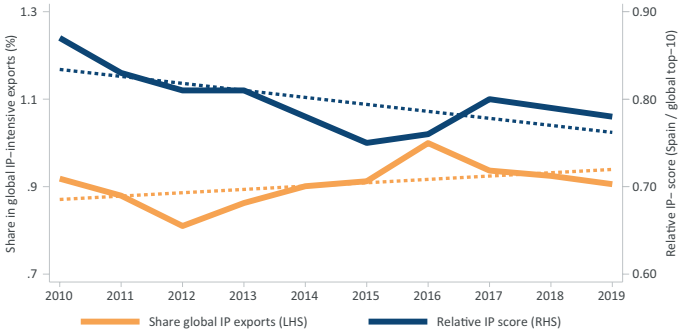
The US (€ 11 bn), Morocco (€ 8.4 bn), China (€ 7.6 bn), Switzerland (€ 4.8 bn) and Mexico (€ 4.2 bn) are the main Spanish export destinations. For these markets IP-intensive exports constitute 48% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



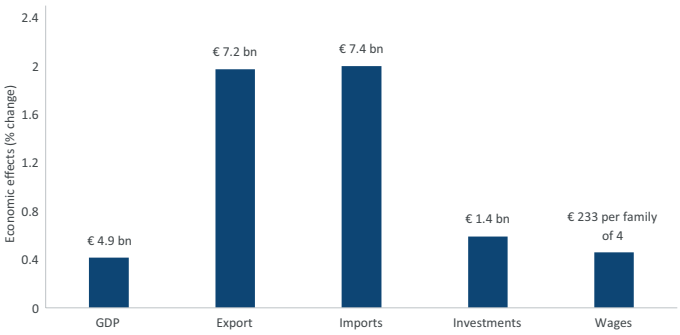
The top-8 IP-intensive manufacturing sectors together export € 42 bn in 2019 and contribute significantly to Spanish trade surplus. The largest Spanish export sectors that depend on IP are chemicals (€ 10 bn) and machinery (€ 9.5 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



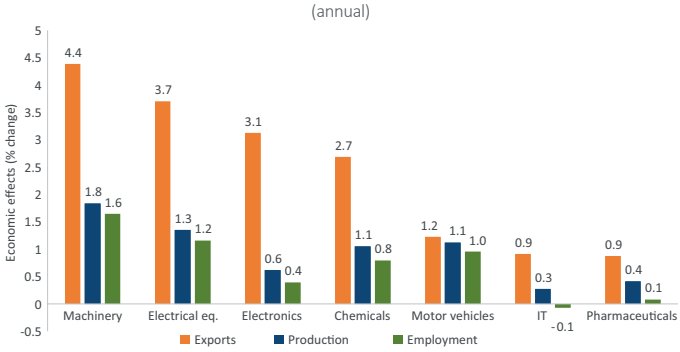
In recent years, Spain reports a decrease in its relative IP score compared to the global top-10. This corresponds to decrease Spain's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Spain. Spain's GDP, exports, and investments will be between 0.4% and 2.0% higher each year. The average Spanish family of four would benefit by €233 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Spain's IP-intensive sectors would support growth in exports (by 0.9 to 4.4%), increase resilience by boosting domestic production (by 0.3 to 1.8%), and create high value-added jobs for the Spanish economy.

SWEDEN

Intellectual property matters for an economy like the Swedish one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Sweden. In Figure 2, we show how relevant different types of IP are for the Swedish economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Sweden as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2013-2019)

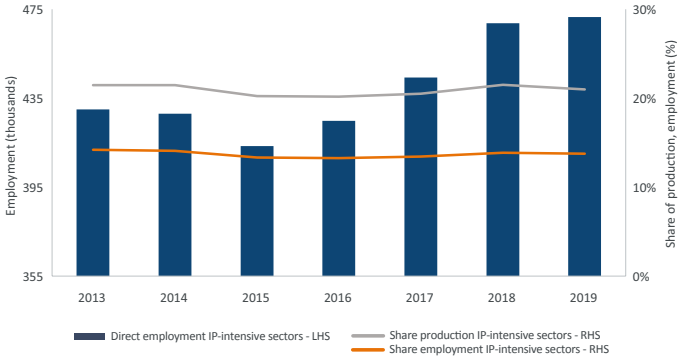


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

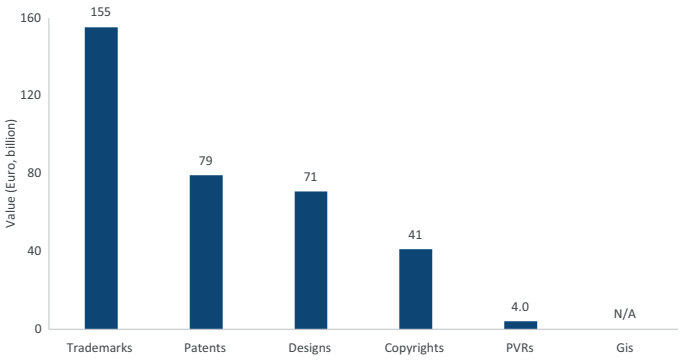


Figure 3: Value-added for IP-intensive sectors (2019)

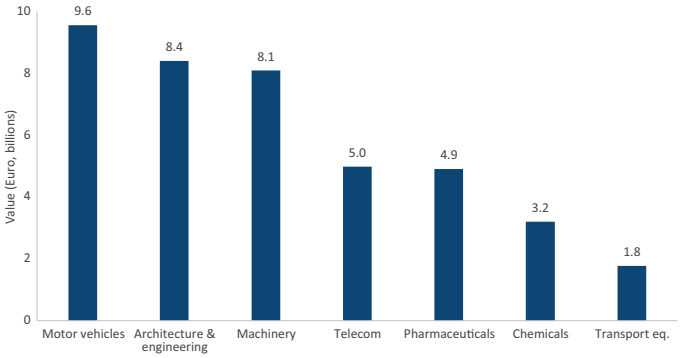


Figure 4: Labour productivity for IP-intensive sectors
(2019, value added per employee)

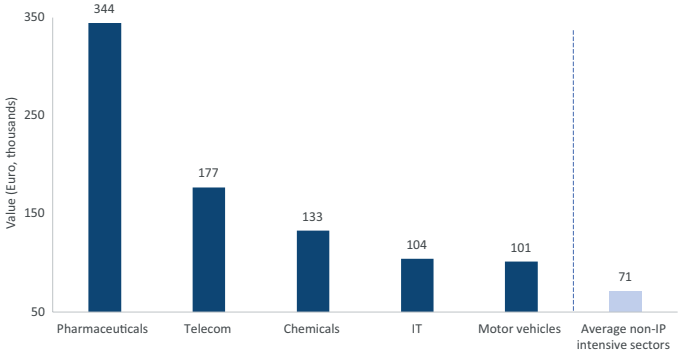


Figure 5: Index of SME R&D potential (2019)

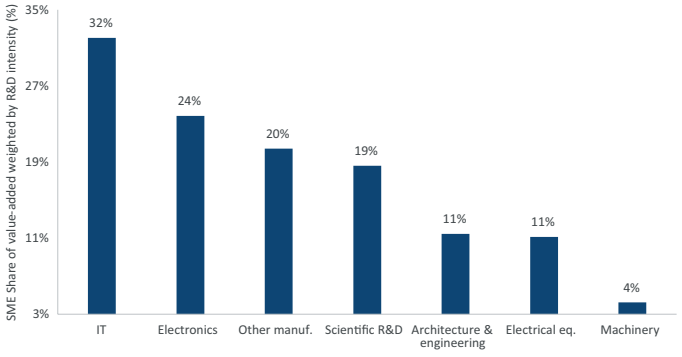
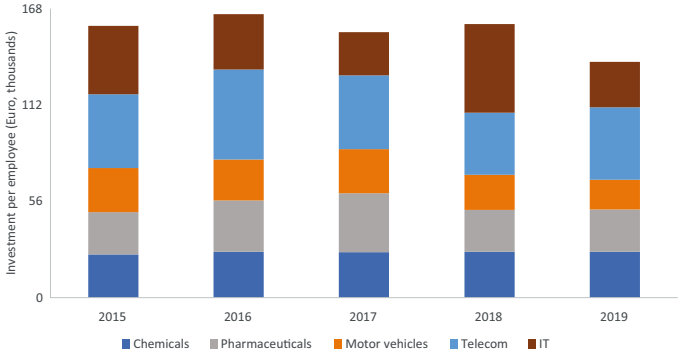


Figure 6: Investment per employee for IP-intensive sectors (2015-2019)

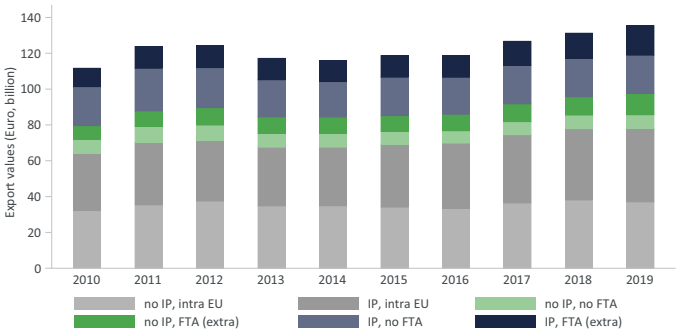


Intellectual Property is highly relevant for the Swedish economy. The IP-intensive sectors in Sweden employ more than 472 thousand workers directly, increasing since 2016, and represent 21% of total Swedish production (Figure 1). Trademarks (€155 bn), patents (€79 bn), and designs (€71 bn) are the most important types of IP for the Swedish economy (Figure 2). Most economic value in Sweden is created by the motor vehicles (€10 bn), architecture & engineering (€8 bn) and machinery (€8 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Swedish economy (pharmaceuticals, telecom, chemicals) creating the highest value jobs. Labour productivity in IP-intensive sectors in Sweden is clos to five times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, chemicals, and IT services are the IP-intensive sectors with the highest levels of investment per employee in Sweden (Figure 6). Swedish SMEs make a significant contribution to value-added in sectors with high R&D spending such as IT services and electronics, but also other manufacturing and scientific R&D (Figure 5).

SWEDEN

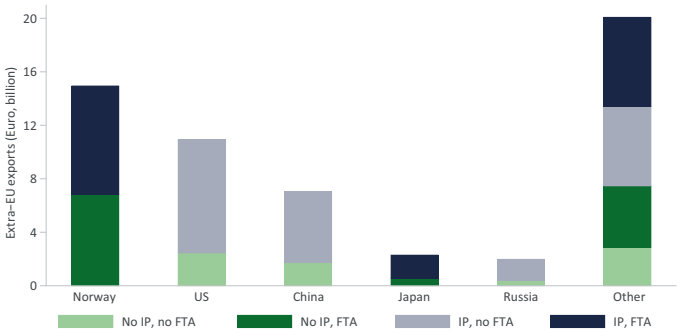
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Swedish exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Swedish IP framework is related with the Swedish share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Sweden (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



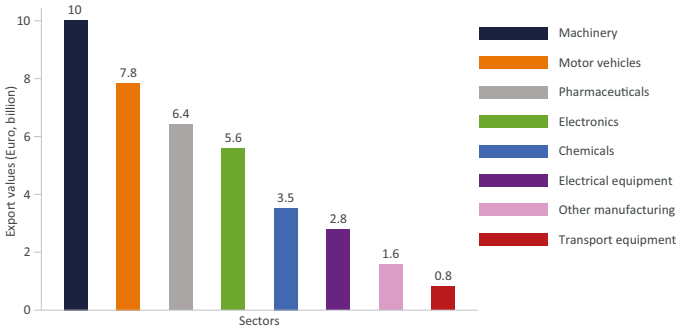
For Sweden, the share of IP-intensive exports outside the EU has decreased from 29% in 2010 to 28% in 2019. Of those exports only 44% is covered by an EU FTA.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



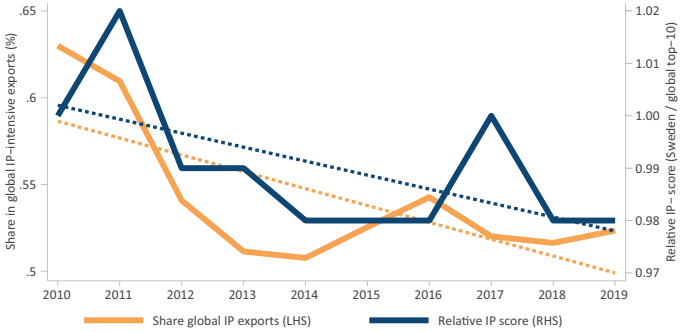
Norway (€ 15 bn), the US (€ 11 bn), China (€ 7 bn), Japan (€ 2.3 bn) and Russia (€ 2 bn) are the main Swedish export destinations. For these markets IP-intensive exports constitute 68% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



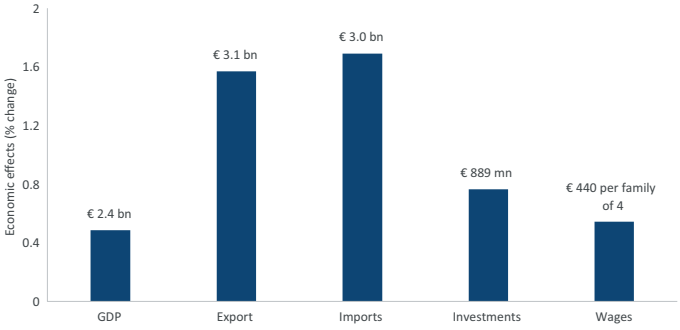
The top-8 IP-intensive manufacturing sectors together export € 39 bn in 2019 and contribute significantly to Swedish trade surplus. The largest Swedish export sectors that depend on IP are machinery (€ 10 bn) and motor vehicles (€ 7.8 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



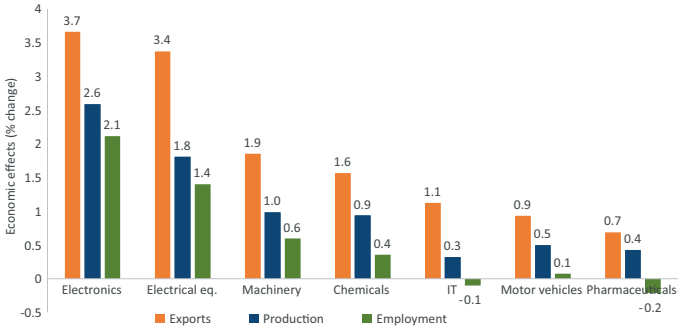
In recent years, Sweden reports a decrease in its relative IP score compared to the global top-10. This corresponds to a decrease in Sweden's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The economic effects of stronger IP provisions in EU FTAs are very positive for Sweden. Sweden's GDP, exports, and investments will be between 0.5% and 1.7% higher each year. The average Swedish family of four would benefit by €440 annually.

Figure 6: Sectoral exports, production and employment effects of stronger IP in EU FTAs (annual)



Sweden's IP-intensive sectors would support growth in exports (by 0.7 to 3.7%), increase resilience by boosting domestic production (by 0.3 to 2.6%), and create high value-added jobs for the Swedish economy.

INSERT 7:

THE ROLE OF INTELLECTUAL PROPERTY IN ACHIEVING THE HEALTH SUSTAINABLE DEVELOPMENT GOAL

By Prof. Dr. David Taylor, University College London

Introduction

HIV/AIDS still kills over half a million people a year in Africa and elsewhere. The battle against the disease is not yet won, especially in the poorest parts of the world. Yet the burdens that AIDS currently imposes are far less than was once feared they would become. In 2000 over 1.5 million people were dying annually and its incidence seemed set to rise exponentially.

In the absence of a vaccine much of the positive progress recorded in the last 20 years has been due to the availability of effective anti-viral drugs. Seen from this perspective the process of drug innovation underpinned by IPRs, that in global public interest terms exist to encourage research investment and the open communication of useful findings, has been a clear success. But the history of the HIV global epidemic also reveals major problems related to supplying what were when they were first marketed some of the world's most advanced medicines to the world's least economically developed communities.

Concerns about the high prices of AIDS therapies led to extensive questioning of the role of intellectual property protection in relation to world development. In 2001 the Doha Declaration highlighted the ability of nations to circumvent IPRs when public health requires low cost access to new products. In reality, world-wide improvements in the use of anti-HIV drugs have stemmed more from advances in aid policies and pharmaceutical purchasing and delivery strategies than they have from suspending patent rights. Nevertheless, anxieties about the relationships between granting IPRs and achieving sustainable development live on in many spheres.

Trade, Innovation and Prosperity

The origins of patents, trademarks and copyrights go back to ancient Greece, Imperial Rome and medieval Venice. However, the foundations of modern IP law are normally attributed to British legal reforms in the early 1600s which stopped the then King, James I, from granting monopolies to his favourites as an arbitrary act of patronage. This meant that what were in effect patents could only be awarded for temporary periods to those introducing genuinely original innovations. Advances in areas such as copyright law followed at the start of the 1700s as a prelude to the industrial revolution, which in part hinged on the existence of IPRs. As nineteenth century economic thought developed, there was an early emphasis on the value of international free trade as a means of allowing countries to exploit their relative advantages in order to build wealth. In the short term this benefited those most able to adapt: in the longer term everyone's standard of living has risen.

It is more explicitly realised today that innovative capacity underpins successful trading and wealth creation, which in turn links to better health and increased wellbeing. In that IPRs foster innovation by enhancing investor confidence, continuing to grant them will contribute to achieving the Sustainable Development Goals identified by the United Nations in 2015. In practical terms enhanced global wellbeing is critically dependent on the existence of intellectual property law.

However, this is not to deny that those whose occupations and ways of life are made redundant by new technologies could suffer as a result, unless effective social 'safety nets' exist to shield them. Likewise, in the case of biomedical innovations the poorest in the world will not benefit if these innovations are not also affordable and accessible, for example via rebates in prices of medicines for developing countries (which also means that high- and middle-income countries should pay their shares in order to afford the poor country rebates). A caveat to add, therefore, is that harvesting the full benefits of IPRs depends on the effective pursuit of all forms of social justice, nationally and internationally; as well as willingness to pay for new innovations by those who are most able to. Enlightened innovators and governments care for not only their own rights but those of all their customers.

Policy Choices

Different forms of industrial, scientific and artistic progress are impacted by intellectual property provisions in different ways. The funding of pharmaceutical advances is unusually dependent on patents, together with marketing exclusivities associated with the use of original research data in licensing new treatments. This is because products such as medicines are typically very expensive and difficult to develop, but do not have multiple parts (like, say, jet engines) and have low marginal production costs. They are therefore relatively easy to copy and sell at low cost. It is also the case that due to safety and allied concerns their manufacturers cannot regularly update them as software producers or fast moving electrical good makers are able to do.

Added to this, the nature of health care is such that across the world those most in need of effective medicines, vaccines and diagnostics are often least able to pay. Although with most forms of vascular and neurological disease and the cancers rising prevalence is associated with population ageing following the first key stages of human development, there are likely to be more conflicts ahead as poorer communities seek world-class treatments for their citizens.

Some commentators seem to believe that the funding of pharmaceutical research and development could in future be dis-linked from products' prices via measures such as separate State funding for R&D programmes. However, the realism and desirability of such suggestions is questionable. More viable ways forward are likely to require adequately resourced universal health care systems linked to international agreements which both

protect the integrity of IPRs and enable differential pricing to ensure that poorer nations only pay affordable amounts for access to vital technologies.

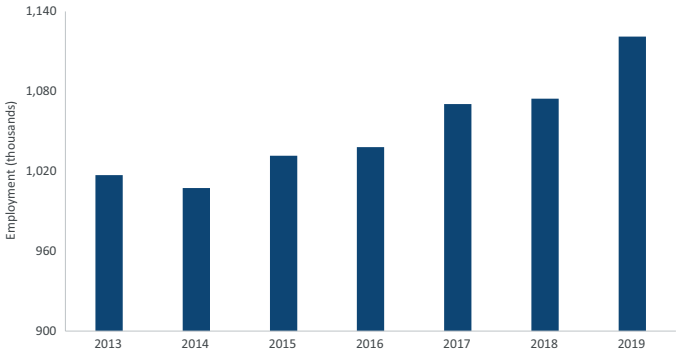
The positive news from a pharmaceutical standpoint is that low marginal production costs make so-called 'Ramsey pricing' a viable way forward, providing vested interests in both the emerging and established economies permit it. Alongside this, as medicines mature they become more valuable to patients as their appropriate use is better understood, while prices fall to commodity levels when generic competition ensues. Hence the ultimate goal of effective and affordable pharmaceutical care for all will be attainable, given sufficient political will and respect between stakeholders for each other and the endpoint of sustainable global freedom from disease.

References available from the author at David.G.Taylor@ucl.ac.uk. For an introduction see *Affording the Future?* at https://www.ucl.ac.uk/pharmacy/sites/pharmacy/files/affording-the-future_0.pdf

CANADA

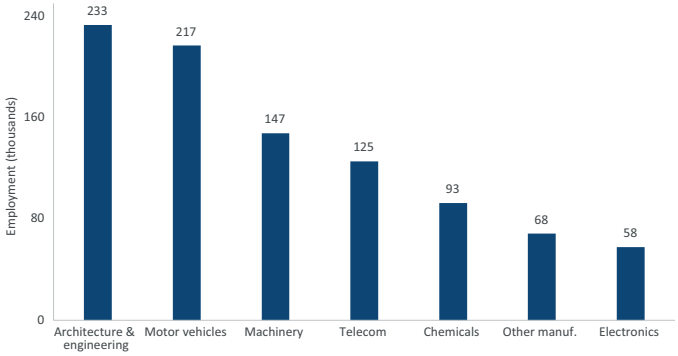
Intellectual Property (IP) is very important for Canada economically, socially, and more broadly for society. This summary shows the relevance of IP-intensive sectors for Canadian employment overall (Figure 1) and employment per sector (Figure 2), as well as for the economic value created in Canada overall (Figure 3) and per sector (Figure 4). Economic value matters because Canada is an open economy that is integrated in global supply chains and higher productivity also translates into higher wages and thus higher-paid jobs. Figure 5 shows the level of labour productivity per sector in Canada, and in Figure 6, we show the level of investments over time, focusing on the five main Canadian sectors.

Figure 1: Total employment for IP-intensive sectors (2013-2019)



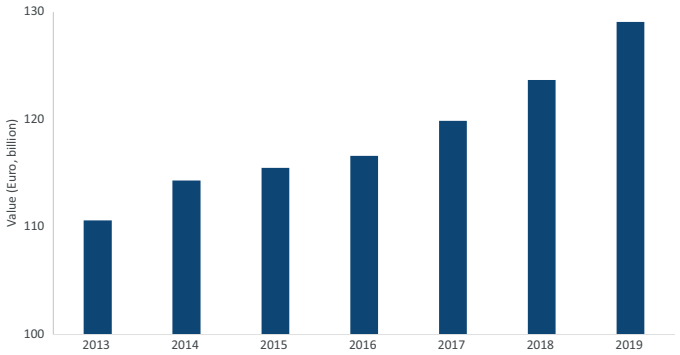
Source: Statistics Canada. Authors' Calculations

Figure 2: Employment for IP-intensive sectors (2019)



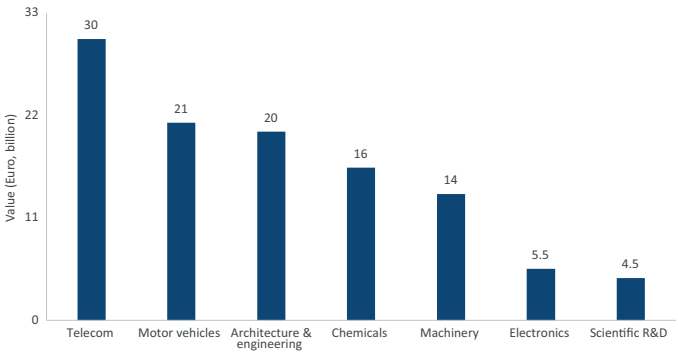
Source: Statistics Canada. Authors' Calculations

Figure 3: Total real value-added for IP-intensive sectors (2013-2019)



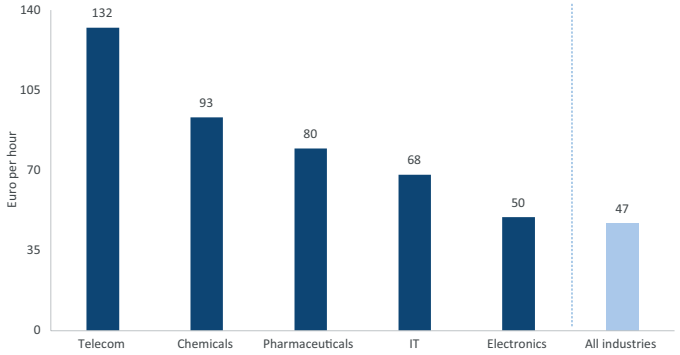
Source: Statistics Canada. Authors' Calculations

Figure 4: Real value-added for IP-intensive sectors (2019)



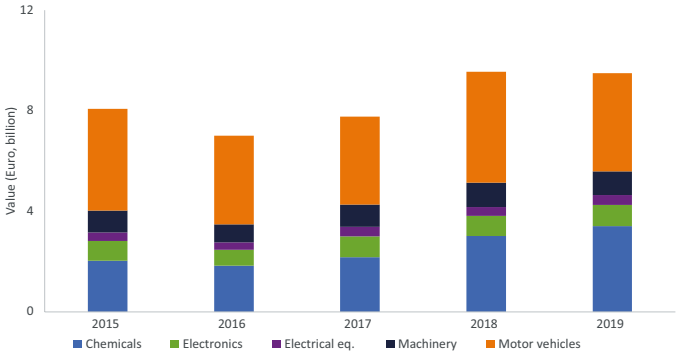
Source: Statistics Canada. Authors' Calculations

Figure 5: Labour productivity for IP-intensive sectors
(2019, real value-added per employee)



Source: Statistics Canada. Authors' Calculations

Figure 6: Investment in IP-intensive sectors
(2015-2019, Gross Fixed Caital Formation)



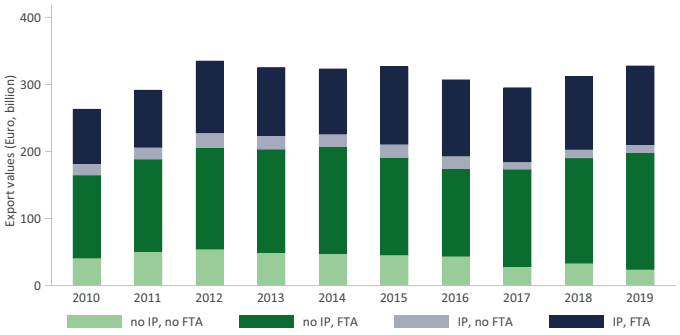
Source: OECD. Authors' Calculations.

Intellectual Property is very important for the Canadian economy. The IP-intensive sectors in Canada employ around 1.12 million workers directly, increasing since 2014 (Figure 1). The main IP-intensive sectors in terms of employment are architectural & engineering services (233,000 jobs), motor vehicles (217,000 jobs) and machinery (147,000 jobs) as shown in Figure 2. The Canadian economy has shown a remarkable growth in value added created by IP-intensive sectors between 2013 and 2019, from €111 bn in 2013 to €129 bn in 2019 (Figure 3). The main sectors contributing to Canadian value added are telecom (€30 bn), motor vehicles (€21 bn) and architecture & engineering (€20 bn) as shown in Figure 4. The economic sectors which are more intensive in IP are also more productive than the rest of the Canadian economy (telecom, chemicals, and pharmaceuticals) creating the highest-value jobs. Labour productivity in IP-intensive sectors in Canada is up to three times higher than for the average of sectors that are not IP-intensive (Figure 5). Finally, when looking at investments, we see that motor vehicles, chemicals, and machinery are the top-3 sectors in Canada (Figure 6).

CANADA

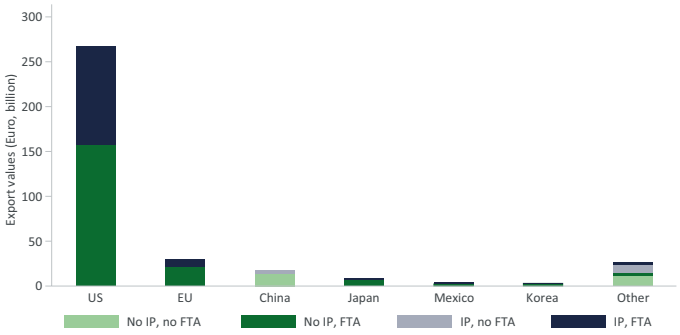
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Canadian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Canadian IP framework is related with the Canadian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Canada (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



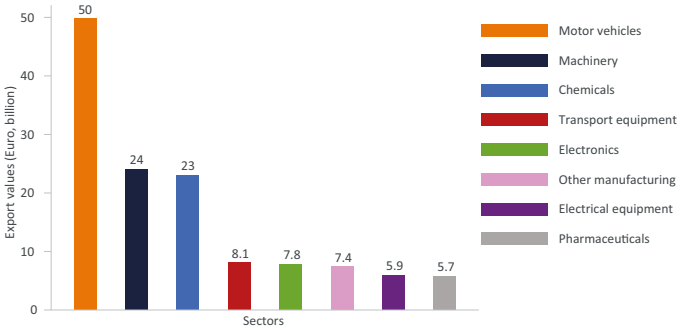
For Canada, the share of IP-intensive exports outside the EU has decreased from 37% in 2010 to 36% in 2019.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



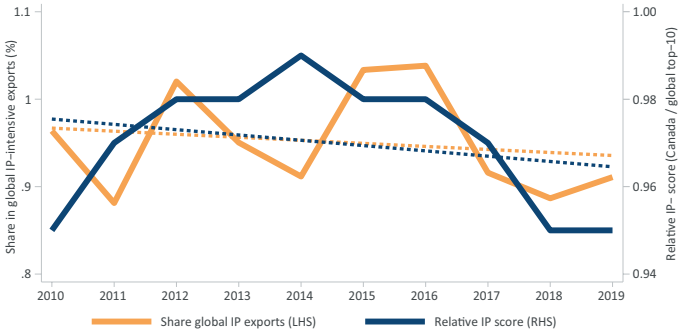
The US (€ 267 bn), the EU (€ 30 bn), China (€ 17 bn), Japan (€ 8.3 bn) and Mexico (€ 4.6 bn) are the main Canadian export destinations. For these markets IP-intensive exports constitute 38% of total exports.

Figure 3: Total exports by IP-intensive sectors (2019)



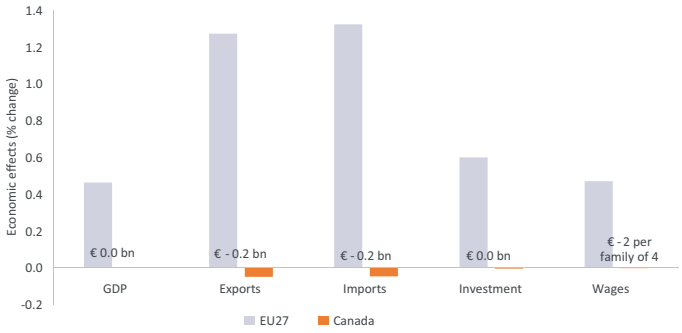
The top-8 IP-intensive manufacturing sectors together export € 132 bn in 2019 and contribute significantly to Canadian trade surplus. The largest Canadian export sectors that depend on IP are motor vehicles (€ 50 bn) and machinery (€ 24 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



In recent years, Canada reports a decline in its relative IP score compared to the global top-10. This corresponds to a decline in Canada's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



Because the EU- Canada FTA (CETA) already includes strong IP provisions, the additional gains are limited and some degree of trade diversion occurs to countries that would really strengthen the IP provisions in their FTAs with the EU.

INDIA

Intellectual Property (IP) is important for India economically, socially, and more broadly for society. This summary shows the relevance of IP-intensive sectors for Indian employment share (Figure 1) and employment share per sector (Figure 2) over Indian total industrial employment, as well as for the share of economic value of IP-intensive sectors over total industry value added (Figure 3) and per sector (Figure 4). Economic value matters because part of the Indian economy is linked to global supply chains and higher productivity also translates into higher wages and thus higher-paid jobs. Figure 5 shows the level of labour productivity per sector in India, and in Figure 6, we show the level of investments over time for the five most important Indian sectors as a share of total industry investment.

Figure 1: Total employment in IP-intensive sectors over total industry (2014-2019)

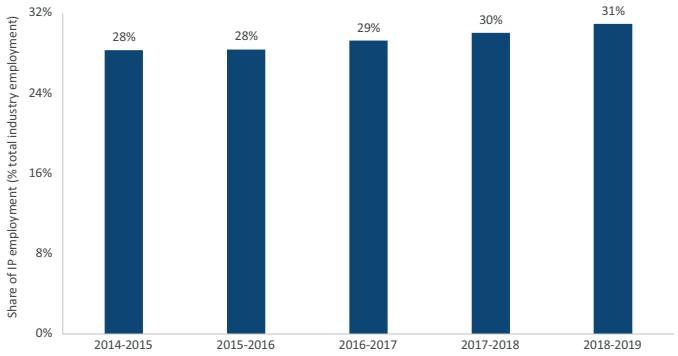


Figure 2: Employment for IP-intensive sectors over total industry (2018-19)

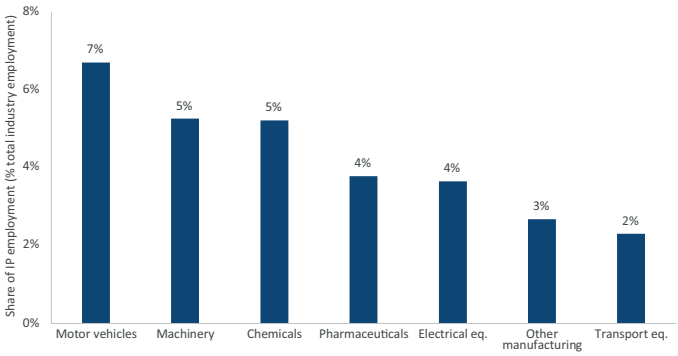


Figure 3: IP-intensive sector value-added over total industry (2014-2019)

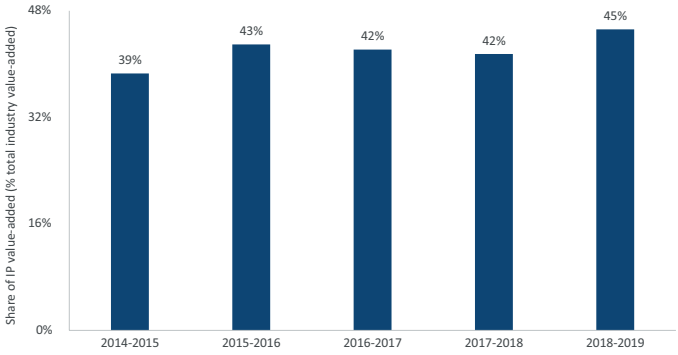


Figure 4: Value-added for IP-intensive sectors over total industry (2018-2019)

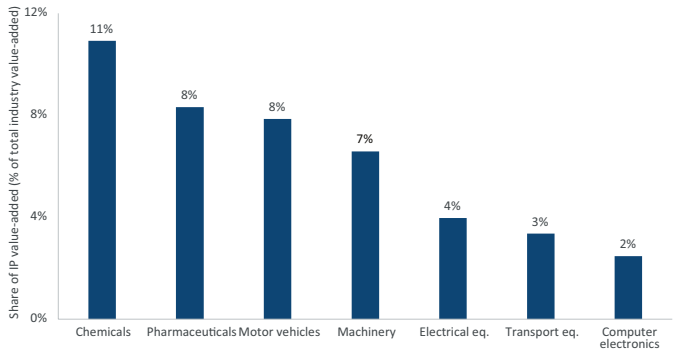


Figure 5: Labour productivity for IP-intensive sectors (2018-19)

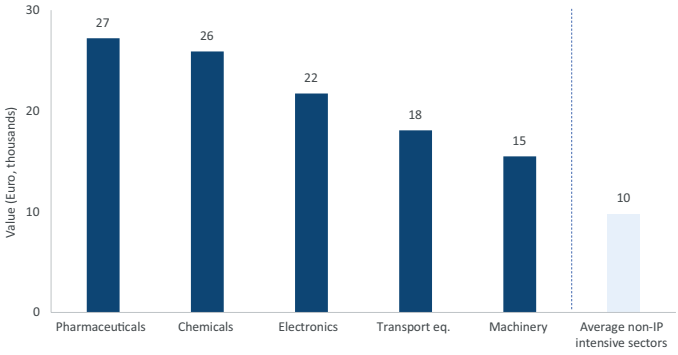
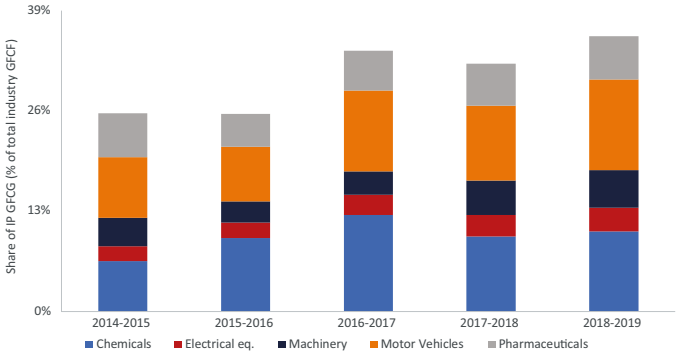


Figure 6: Gross Fixed Capital Formation (GFCF) over total industry (2014-2019)



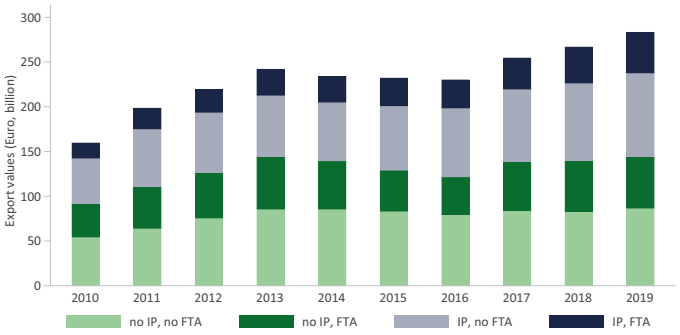
Source: India Annual Survey of Industry, National Data Archive. Authors' Calculations.

Intellectual Property is important for the Indian economy. The IP-intensive sectors in India employ close to one third of Indian industrial workers directly, which has increased slightly from 28% in 2014 to 31% in 2019 (Figure 1). The main IP-intensive sectors in terms of employment are motor vehicles, machinery, chemicals, and pharmaceuticals as shown in Figure 2. The Indian economy creates around 45% of industrial value added through its IP-intensive sectors, a share that has increased between 2014 and 2019 (Figure 3). The main sectors contributing to Indian value added (as a share of total industry value added) are chemicals (11%), pharmaceuticals (8%) and motor vehicles (8%) as shown in Figure 4. The economic sectors which are more intensive in IP are also more productive than the rest of the Indian industrial economy (pharmaceuticals, chemicals, electronics) creating the highest-value jobs. Labour productivity in IP-intensive sectors in India is up to three times higher for IP-intensive sectors than the average sectors that are not IP-intensive (Figure 5). Finally, when looking at investments, we see that investments in IP-intensive sectors have been highest in motor vehicles, chemicals, and pharmaceuticals, as shown in Figure 6.

INDIA

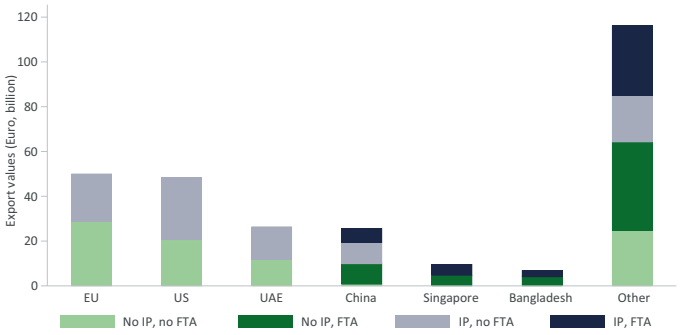
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Indian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Indian IP framework is correlated with a higher Indian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in India (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



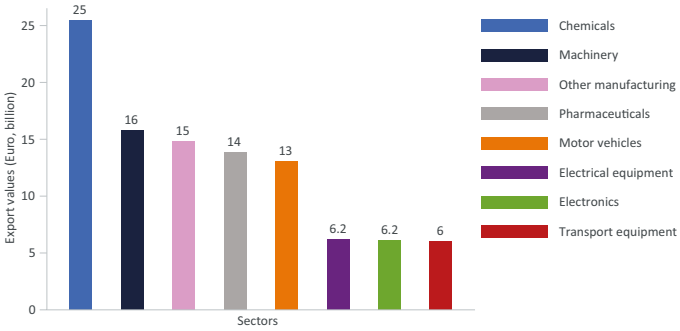
For India, the share of IP-intensive exports outside the EU has gone up from 42% in 2010 to 49% in 2019.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



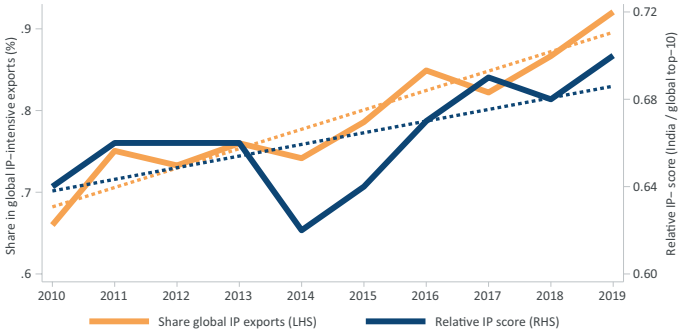
The EU (€ 50 bn), the US (€ 48 bn), the United Arab Emirates (UAE) (€ 26 bn), China (€ 26 bn) and Singapore (€ 9.6 bn) are the main Indian export destinations. For these markets IP-intensive exports constitute 52% of total exports.

Figure 3: Total exports by IP-intensive sectors (2019)



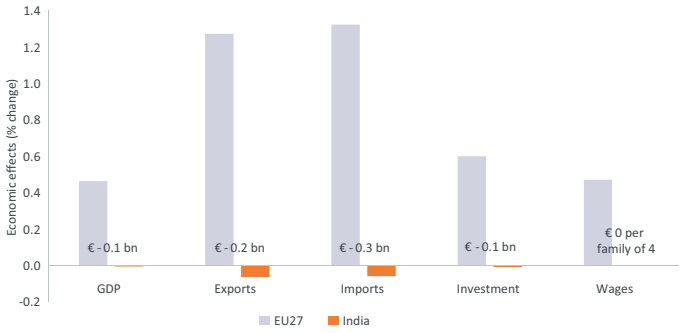
The top-8 IP-intensive manufacturing sectors together export € 101 bn in 2019 and contribute significantly to Indian trade surplus. The largest Indian export sectors that depend on IP are chemicals (€ 25 bn) and machinery (€ 16 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



In recent years, India reports an increase in its relative IP score compared to the global top-10. This corresponds to an increase in India's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



Because the EU does not have an FTA with India, stronger IP provisions in EU FTAs will not impact this country. In fact, because IP is strengthened with competitor countries, the effect of not having an FTA with the EU becomes more negative.

JAPAN

Intellectual Property (IP) is very important for Japan economically, socially, and more broadly for society. This summary shows the relevance of IP-intensive sectors for Japanese economic value created in Japan overall (Figure 1) and per sector (Figure 2). Economic value matters because Japan is an open economy that is integrated in global supply chains and higher productivity also translates into higher wages and thus higher-paid jobs. Figure 3 shows that IP-intensive sectors invest heavily in IP products such as research, development, and innovation, and in Figure 4, we show the level of investments over time, focusing on the five main Japanese sectors.

Figure 1: Total value-added for IP-intensive sectors (2013-2019)

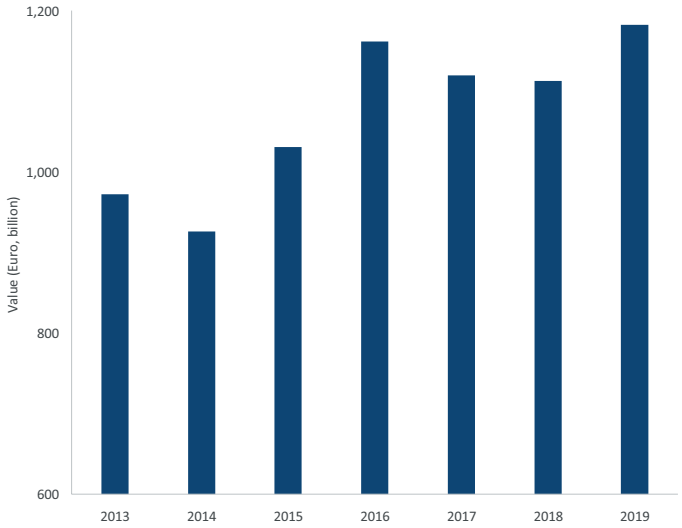


Figure 2: Value-added for IP-intensive sectors (2019)

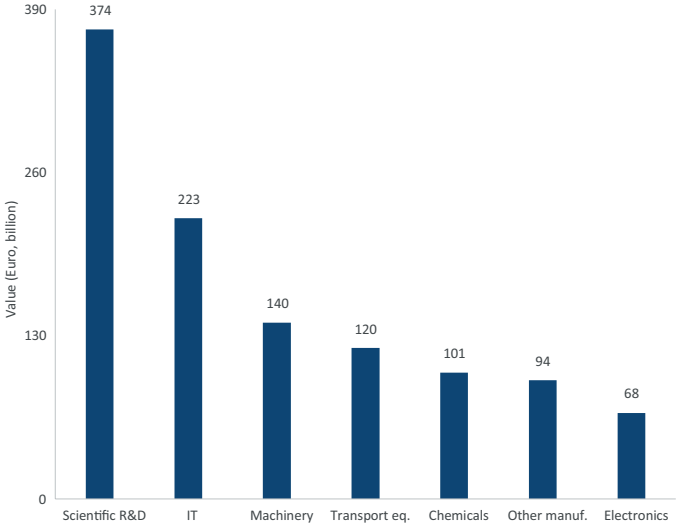


Figure 3: Investment in IP-products (2018)

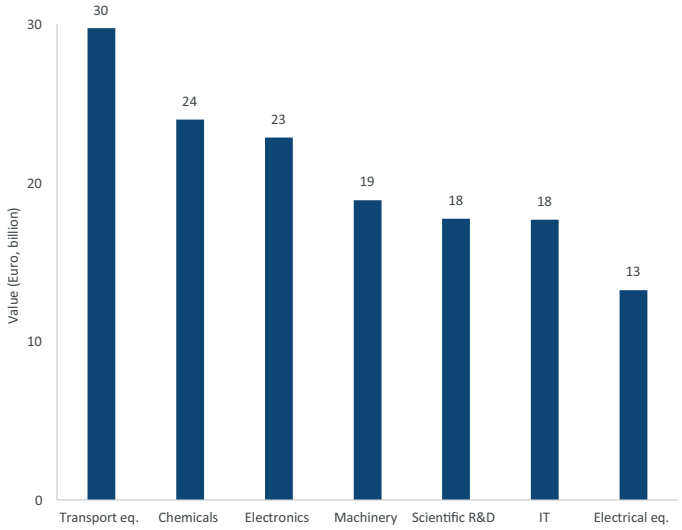
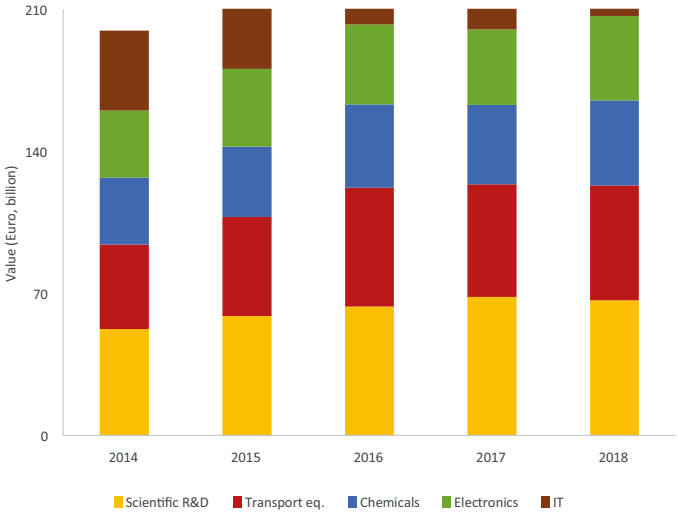


Figure 4: Investment in IP-intensive sectors
(2014-2018, Gross Fixed Capital Formation)



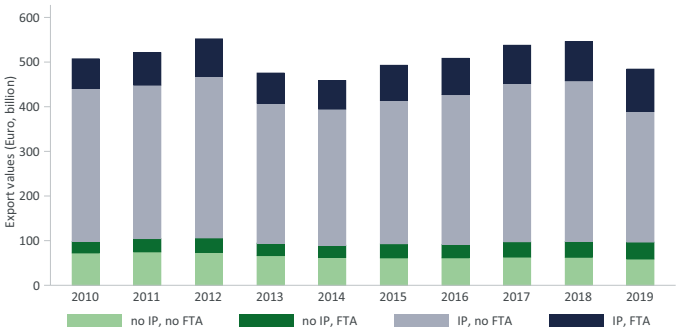
Source: OECD. Authors' Calculations

Intellectual Property is very important for the Japanese economy. The Japanese economy has shown a remarkable growth in value added created by IP-intensive sectors between 2013 and 2019, from €972 bn in 2013 to more than €1,183 bn in 2019 (Figure 1). The main sectors contributing to Japanese value added are scientific R&D (€374 bn), IT (€223 bn) and machinery (€140 bn) as shown in Figure 2. When looking at investments, we see that transport equipment, chemicals, and the electronics sector have made significant investments in IP products such as research, development, and innovation which lead to knowledge that can be marketed or used in production (Figure 3). Figure 4 shows that overall investments in IP-intensive sectors have gone up from €266 bn in 2014 to €327 bn in 2018 and scientific R&D, transport equipment, and chemicals are the top-3 sectors in Japan.

JAPAN

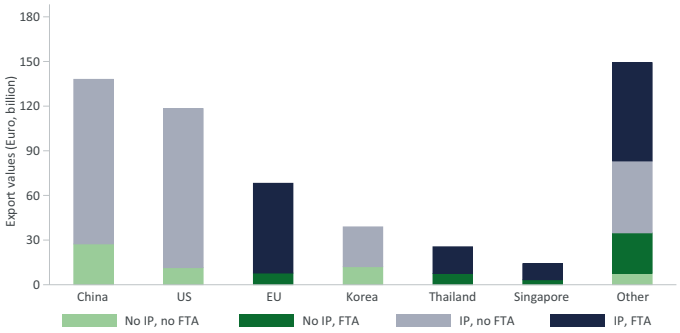
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Japanese exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the Japanese IP framework is related with the Japanese share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Japan (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



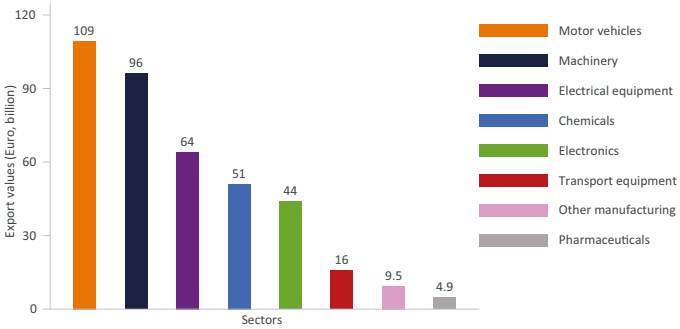
For Japan, the share of IP-intensive exports outside the EU has decreases from 81% in 2010 to 70% in 2019.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



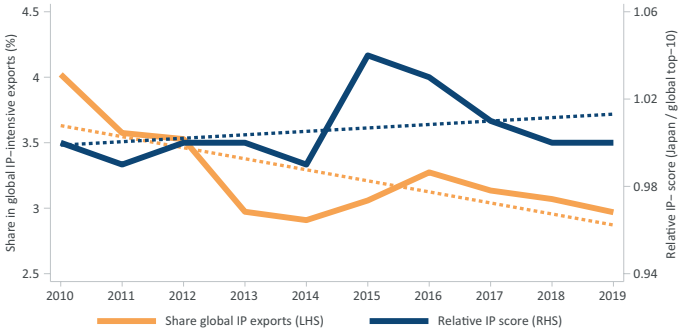
China (€ 138 bn), the US (€ 118 bn), the EU (€ 68 bn), South Korea (€ 39 bn) and Thailand (€ 26 bn) are the main Japanese export destinations. For these markets IP-intensive exports constitute 83% of total exports.

Figure 3: Total exports by IP-intensive sectors (2019)



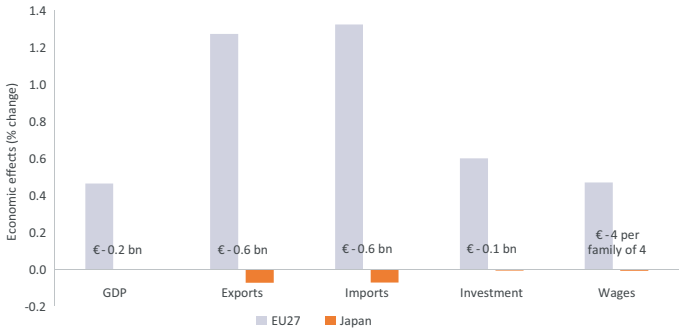
The top-8 IP-intensive manufacturing sectors together export € 395 bn in 2019 and contribute significantly to Japanese trade surplus. The largest Japanese export sectors that depend on IP are motor vehicles (€ 109 bn) and machinery (€ 96 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



In recent years, Japan reports a decline in its relative IP score compared to the global top-10. This corresponds to a small decline in Japan's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



Because the EU-Japan FTA (EPA) already includes strong IP provisions, the additional gains are limited and some degree of trade diversion occurs to countries that would really strengthen the IP provisions in their FTAs with the EU.

INSERT 8:

IP IN EU AGRICULTURE: GEOGRAPHICAL INDICATIONS

By Dr. Christian Häberli, World Trade Institute

Introduction and Summary

Products with Geographical Indications (GI) are a common feature of everyday life, from Parma hams to Georgian wine appellations, Swiss Gruyère, Mexican Tequila, and French Cognac. GIs are a specific IP right that enables producers with the exclusive right to use the indication to prevent its use by a third party whose product does not conform to the applicable standards or is not produced within the same region. A protected GI does not enable the holder to prevent someone from making a product using the same production methods as those set out in the standards for that indication. Most, but not all, GIs are related to the agricultural and food industry.

In the following sections we focus on the GIs as regulated and administered domestically and protected in treaties by the European Union (EU). We start with an overview of the development of this legal instrument and the EU's GI policy as it stands today. We then focus on the economic and cultural reasons, and on the political economy of GIs in the EU. Finally, we discuss the potential of and the limits to a further expansion of GIs in FTAs, and the conflicts and returns of "names" shared by different countries. In-between, three stories help to understand GIs in their context: protecting Budweiser Beer and Café de Colombia in Europe, GIs in the Pacific, and African chicken against factory hens. The conclusions recall the ultimate condition for the commercial success of GI protected agri-food – the consumer.

The Legal History of GIs in EU Trade Policy

The EU in its trade policy has been a strong proponent of GIs as a new agricultural policy tool – at a time when border protection and domestic subsidy rules were adjusted under the World Trade Organization (WTO). Producers henceforth had an opportunity to increase returns on their investment along the food value chain, and to defend their names against imitations and usurpations in other regions, or with different recipes.

Like for organic production, added value and income depend on credible consumer information. This in turn requires verifiable and independently monitored compatibility with the GI registered, based on a transparent approval procedure laid down by the EU.

Obviously, a successful GI registration does not ensure added economic value, let alone direct such value equally to all operators along the food value chain regardless of their own investment. In many cases, initial marketing efforts, especially by producers, require carefully designed state support and appropriate regulations.

STORY 8.1: THE BUDWEISER CASE – AND CAFÉ DE COLOMBIA

GIs are not monopolies escaping international competition simply by registration in the EU. The non-discrimination rules of the WTO, and the explicit protection afforded to GIs by the TRIPS Agreement and in three other international agreements, soon came under scrutiny in trade disputes. The US and Australia claimed that the EU's Trademarks and Geographical Indications were not in all respects compliant with these rules, namely in respect of the GI for Budweiser, added to its list together with the EU accession of the Czech Republic, in 2004. The two complainants argued that EC Regulation 2081/92 violated the *national treatment* obligation prescribed by GATT-Article III:4 and TRIPS-Article 3.1, and did "not provide sufficient protection to *pre-existing trademarks that are similar or identical* to geographical indications (ex. *Budweiser*)"[122] The key findings of the Panel, adopted by the Dispute Settlement Body (DSB) on 20 April 2005, confirmed that (i) the "only formally identical" *availability of protection* modified the "effective equality of opportunities" between different nationals and products; (ii) the *application and objection procedures for non-EC nationals provided formally less favourable treatment to other nationals* and products; (iii) the Regulation's requirement that third-country governments provide a declaration that *structures to inspect compliance with GI registration* were established on its territory provided an "extra hurdle" to applicants for GIs in third countries and their products; (iv) third countries could not be required to adopt a *GI protection system equivalent* to that in the European Communities and provide *reciprocal protection* to products from the European Communities.[123]

To comply with these findings, the EC adopted Council Regulation (EC) No 510/2006 of 20 March 2006 on the protection of geographical indications and designations of origin for agricultural products and foodstuffs. The Regulation was published in the Official Journal of the European Union on 31 March 2006. The European Communities therefore considered that this "fully complied with the DSB rulings and recommendations in this dispute."[124] At the DSB meeting on 21 April 2006 Australia and the US disagreed that the European Communities had fully implemented the DSB's

[122] European Commission Summary, at https://trade.ec.europa.eu/wtodispute/show.cfm?id=185&code=2 (accessed 13 September 2021) (emphasis added)

[123] Panel Reports DS174 and DS250: European Communities — Protection of Trademarks and Geographical Indications for Agricultural Products and Foodstuffs. Available on 12 September 2021 at https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds174_e.htm (emphasis added)

[124] Status Report of the European Communities Regarding Implementation of the DSB Recommendations and Rulings in the Dispute European Communities – Protection of Trademarks and Geographical Indications for Agricultural Products and Foodstuffs (WT/DS174, WT/DS290). Documents WT/ WT/DS174/25/Add.3 and WT/DS290/23/Add.3 dated 11 April 2006.

recommendations and rulings and invited the European Communities to take account of their comments and revise the newly promulgated regulation.[125]

Notwithstanding these objections – not followed by a compliance complaint – the EU's GI System has become the new GI protection standard for many countries, for the registration of non-EU GIs, and for many treaties with a mutual recognition both of GIs and of their respective approval and registration procedures. The first such product recognized by the EU in 2007 as a Protected Geographical Indication (PGI) was Café de Colombia. Interestingly, the rights accruing from this registration led the EU Office for Harmonization in the Internal Market (OHIM), responsible for protecting creativity and innovation in the EU, to deny registration to the communitarian Spanish brand "Colombueno", considering that it damaged the reputation of Café de Colombia.[126]

GIs in EU Trade Policy Today

Legal protection of 'names' in national legislations and, consequently, in trade agreements, is possible under a multitude of IP provisions, and trade agreements, as shown in Figure 8.2. GIs today figure most prominently in FTAs of the EU, but also in national regulations and FTAs concluded in other 'old' parts of the world, such as Asia and Africa. On the other side, 'new' countries such as the US, Australia, and New Zealand, favour different IP systems such as patents, brands, licenses, and private and collective trademarks such as "Idaho Potatoes". The EU needs to take into account the global and the particular level of IP protection when negotiating trade agreements.[127] With the US,[128] New Zealand,[129] Australia,[130] and Canada[131], specific, reciprocal and sometimes elegant ad hoc solutions could be found in bilateral negotiations, mainly for wines and spirits.

[125] Panel Reports DS174 and DS250: European Communities – Protection of Trademarks and Geographical Indications for Agricultural Products and Foodstuffs (op.cit.supra)

[126] Colombian Coffee Growers Federation 2021, Bogotá, FNC Press Office, Press Release dated 12 February 2015, at https://federaciondecafeteros.org/wp/listado-noticias/eu-protects-cafe-de-colombia-and-prevents-registration-of-misleading-chain-brand/?lang=en

[127] On a global level, the Geneva Act of the Lisbon Agreement on Appellations of Origin and Geographical Indications adopted on 20 May 2015 improves the protection of GIs registered within the jurisdiction of each Contracting Party, enlarges the scope to all GIs, ensures full compatibility with the WTO/TRIPS Agreement, and allows the EU to be a contracting party on its own.

[128] The EU-US Wine Agreement commits the US to protect a list of "names of quality wines produced in specified regions and names of table wines with geographical indications"; on its side, the EU accepts to only use "names of viticultural significance listed in Annex V […] as names of origin for wine […] indicated by such name". Cf. Agreement between the European Community and the United States of America on trade in wine, Official Journal of the European Union, L/872, dated 24 March 2006, Article 7 ("Names of origin")

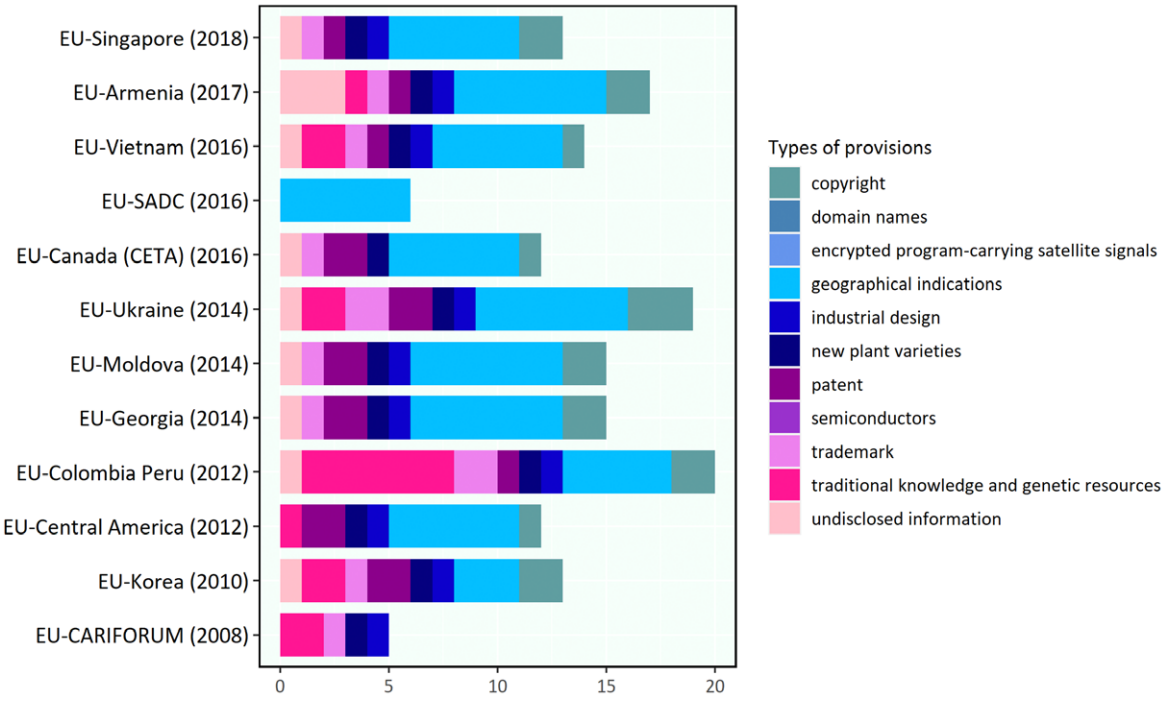
[129] Under New Zealand's domestic law, only GIs for wines and spirits can be protected, since 2016 (GI Act). The GI Register lists all geographical indications registered in New Zealand – both New Zealand and foreign. However, until today New Zealand has no bilateral GI agreement with the EU. Cf. New Zealand Intellectual Property Office, accessed on 14 September 2021 at https://www.iponz.govt.nz/about-ip/geographical-indications/using-the-gi-register/

[130] The Agreement between Australia and the European Community on Trade in Wine, dated 1 December 2008, protects GIs for wines and spirits and lays down production and labelling standards. There is no bilateral agreement for other GIs.

[131] In the CETA, signed on 30 October 2016, the relationship between GIs and trademarks has been clarified for several EU names including Parma Ham, Black Forest Ham or Roquefort Cheese. They are now protected in their original language (but not as translations). However, CETA does not define this relationship more generally, and there are no conflict resolution principles for specific cases.

In the below DESTA overview of various EU FTAs, it becomes clear that GIs are the most prominent type of IP in EU FTAs from the EU-Korea FTA in 2010 onwards. For the EU-SADC (2016) FTA, GI provisions were even the only novel IP provisions. On average, EU FTAs contain 6 provisions on GIs per FTA.[132] This demonstrates the strong level of protection enjoyed by GIs, albeit only as a niche type of IP. According to a former UK trade negotiator, "EU geographical indications are the number one 'ask' of the EU in all trade talks."[133]

FIGURE 8.1: IP PROVISIONS IN EU FTAS (INCLUDING FOR GIS)



Source: DESTA Trips+ PTA Dataset

GIs enjoy a higher degree of prominence in EU FTAs than in any other major country FTAs. Table 8.1 shows the number of GIs agreed upon in the EU's FTAs since the EU-Korea FTA in 2010.[134]

[132] DESTA (2020) [https://www.designoftradeagreements.org/ accessed 1 February 2021]

[133] Foster, P., and J. Brunsden, UK pushes back on Brexit promises on EU regional trademarks. Financial Times 2 April 2020.

[134] Huysmans, M. (2020) "Exporting protection: EU trade agreements, geographical indications, and gastronationalism", Review of International Political Economy, 2020, pp. 1-28. URL: https://doi.org/10.1080/09692290.2020.1844272

TABLE 8.1: OVERVIEW OF EU FTAS AND THE NUMBER OF FOOD GIS PROTECTED

EU trade partner	FTA signed	Provisional application	Number of GIs
South Korea	2010	2011	60
ANDEAN	2012	2013	34
Central America	2012	2013	88
Ukraine	2014	2016	811
Georgia	2014	2014	805
Moldova	2014	2014	852
South Africa	2016	2016	110
Canada	2017	2017	143
Singapore	2019	2019	83
Vietnam	2020	2020	59
Japan	2019	2019	78

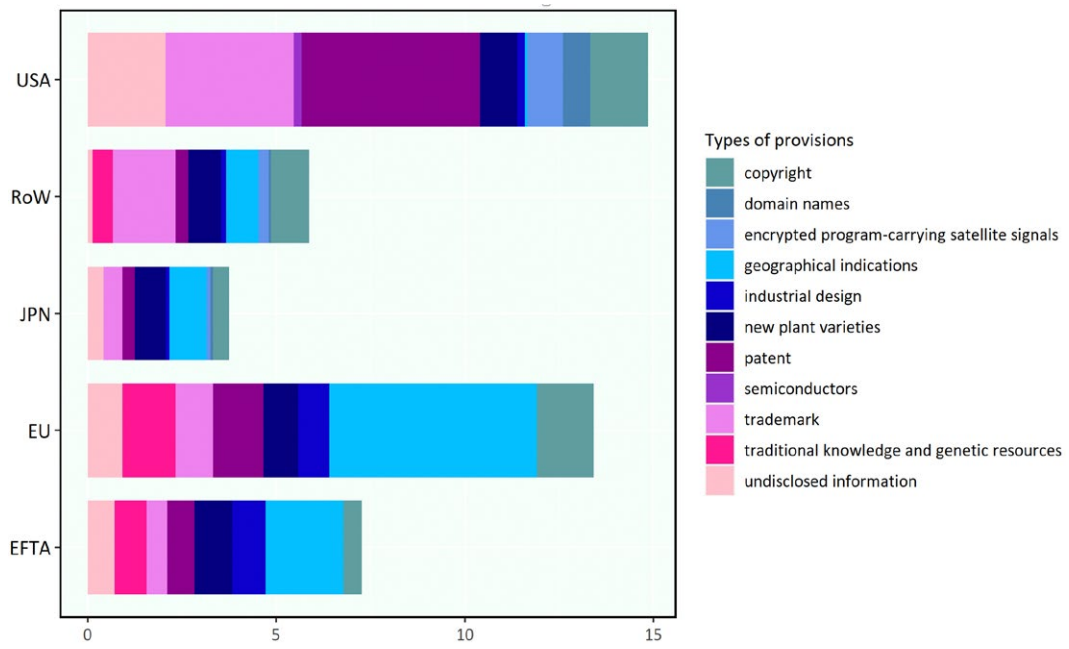
Source: Huysmans (2020)

On the other side, as is shown in Figure 8.2., US FTAs do not contain GI provisions. The US disagrees fundamentally with the EU approach to GIs, arguing that they limit competition and are an unnecessary form of protectionism given the possibility of using private trademarks instead (Osgood and Feng, 2018).[135] Part of the EU-US tension during the Transatlantic Trade & Investment Partnership (TTIP) negotiations also stemmed from this disagreement.[136] However, as pointed out above, at the end of their 20 years negotiation on a Wine Agreement, the US and the EU did find specific solutions for the protection of disputed wine names under different IP instruments.

[135] Osgood, I., and Y. Feng (2018). Intellectual property provisions and support for US trade agreements. The Review of International Organizations, 13 (3), 421–455. https://doi.org/10.1007/s11558-017-9279-y

[136] Matthews, A. (2016). What outcome to expect on geographical indications in the TTIP free trade negotiations with the United States. In F. Arfini, M. Mancini, M. Veneziani, & M. Donati (Eds.), Intellectual property rights for geographical indications: What is at stake in the TTIP? (pp. 2–18). Cambridge Scholars Publishing.

FIGURE 8.2: GEOGRAPHICAL INDICATIONS FEATURING IN FTAS



Source: DESTA Trips+ PTA Dataset

Today, the EU recognises four types of GIs[137]: 1) Protected Designation of Origin (DPO); and 2) Protected Geographical Indication (PGI); 3) Geographical Indication of spirits, drinks and aromatised wines (GI); and 4) Traditional specialty guaranteed (TSG). Through its trade policy, both multilaterally and bilaterally, the EU supports better protection of GIs, in response to increasing numbers of violations.

GIs in EU FTAs: Economic and Cultural Reasons, and Political Economy Aspects

There are various reasons for the EU to promote GIs in Europe and overseas.[138] The sales value of products with EU GIs amounts to €74.8 bn, of which 20% (€ 15.0 bn) comes from extra-EU27 exports.

In a recent publication (AND and Ecorys, 2019), several reasons for GIs are covered.[139]

- First of all, the study finds that the sales value of a food product with a protected name is on average double the sales value of similar products without a GI.[140] So there is a strong economic (sales) argument in support of EU GIs.

[137] Ungphakorn, P. (2020), 'Technical note: The EU's database of geographical indications', Trade Beta Blog, 2020. URL accessed 14 September 2021: https://tradebetablog.wordpress.com/technical-note-gi-view/

[138] WIPO (2017), 'Geographical Indications: An Introduction', 2017: URL: https://www.wipo.int/publications/en/details.jsp?id=272 [accessed 24 April 2021]

[139] AND and Ecorys, Study on economic value of EU quality schemes, geographical indications (GIs) and traditional specialities guaranteed (TSGs) – Country Fiches, 2019.

[140] Ibidem

- Second, GIs allow EU farmers and businesses to leverage value of geographically unique products and develop their brand names into globally recognised ones. This leads to higher sales premiums for protected products. According to the study, the premium rate stood at 2.85 for wines, 2.52 for spirits and 1.5 for agricultural products and foodstuffs.
- The third argument in support of GIs is that EU food is famous for being safe, nutritious and of high quality. Traditional production methods, protected by GIs, support sustainable agriculture and food production. GIs thus protect EU quality schemes (as IP does) against imitation and misuse.[141]
- Fourth, protected products are part of EU Member States' traditional culinary heritage – at regional level – and are economic drivers for national and regional agri-food sectors, contributing not only culturally but also economically in terms of regional economic development.
- Fifth, for consumers looking for quality produce – branded if possible – GIs promote tendencies towards what may be called both in the GI producing countries as well as in export destinations.[142]
- Finally, GIs are granted when products meet the qualities, characteristics or reputation linked to the place of origin. This helps to inform and attract consumers about the characteristics, production methods and overall quality of a product.

It is these economic and cultural factors that explain the demand for GI being recognised as a specific IP in EU FTAs. Of course, creating and operating a GI involves cooperation, investment, and marketing efforts along the whole food value chain. These costs can be very important, and demand a long-term effort, especially on markets where such names are less than well-known. Small producer groups, not only in developing countries, may wonder whether these costs, and the necessary self-control mechanisms, will meet their expectations of a return on investment within a reasonable timespan.

There is also an important political economy argument pertaining to the ratification process for concluding EU trade deals. GIs are a key part of EU FTAs also because of the EU and EU Member States' political economy. In Figure 8.3, we show the number of food GIs per EU Member State for the EU28 (as per September 2020). The Figure clearly shows the concentration of food GIs in southern Europe (Portugal, Spain, France, Italy, Greece). These countries have 80% of wine GIs and 70% of all EU food GIs (Huysmans and Swinnen, 2019).[143] For this reason, these countries are also strong supporters of geographical indications both on the EU Internal Market and in EU FTAs (Wanat and Hanke Vela, 2019).[144]

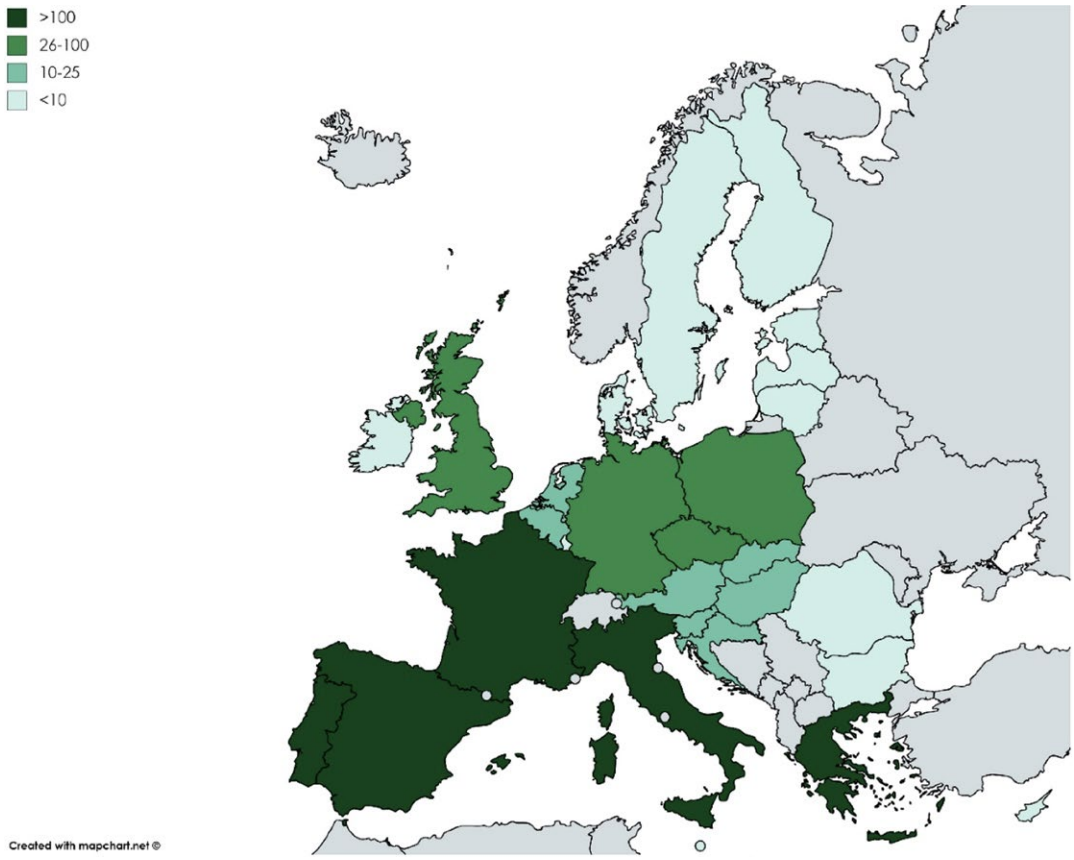
[141] European Commission (2020) "Geographical Indications – a European treasure worth €75 billion", European Commission Press Release, April 2020. URL: https://ec.europa.eu/commission/presscorner/detail/en/IP_20_683

[142] Huysmans, M. (2020) "Exporting protection: EU trade agreements, geographical indications, and gastronationalism", Review of International Political Economy, 2020, pp. 1-28. URL: https://doi.org/10.1080/09692290.2020.1844272

[143] Huysmans, M., and J. Swinnen (2019), "No terroir in the cold? A note on the geography of geographical indications". in 70 (2) Journal of Agricultural Economics 550–559. https://doi.org/10.1111/1477-9552.12328

[144] Wanat, Z., and J. Hanke Vela (2019, December 23). The rise of the gastronationalists: Europe's South looks to protect its feta and its fetuccinne. URL: https://www.politico.eu/article/origin-labels-europe-the-rise-of-the-gastronationalists/

FIGURE 8.3: EU28 FOOD GEOGRAPHICAL INDICATIONS (2020)



Source: Huysmans (2020)

Accordingly, the European Commission, in negotiating bilateral FTAs, has to make sure EU Member States (especially those with ample GIs in Southern Europe) are satisfied and will ratify the negotiated trade deal. This threat is real. For example, Greece and Italy threatened not to ratify CETA because of insufficient GI protection (Malkoutzis, 2016; Reuters, 2018). In 2020, the Cypriot parliament voted against the ratification of CETA because of its failure to protect Halloumi cheese (Moens et al., 2020).[145],[146],[147] Even German media reported on the lack of protection of Bavarian Beer in CETA (Uken, 2015).[148] This non-ratification threat by EU Member States also means that the EU's negotiating partners know that the EU's insistence on including GIs in its trade agreements is credible.[149] On the other side, EU Commission delegates may wonder whether negotiating capital spent on GIs

[145] Malkoutzis, N. (2016, October 23). CETA, feta and trade deal difficulties. Ekathimerini. https://www.ekathimerini.com/213096/article/ekathimerini/business/ceta-feta-and-trade-deal-difficulties

[146] Reuters (2018, July 13). Hard cheese: Italy vows to scupper EU free trade deal with Canada. The Guardian. URL: https://www.theguardian.com/world/2018/jul/13/say-cheese-why-italy-wont-ratify-eu-free-trade-deal-with-canada

[147] Moens, B., G. Leali, and E. Mears (2020). Halloumi cheese puts EU's Canada trade deal to the test. Politico.eu. URL: https://www.politico.eu/article/halloumi-cheese-puts-eu-trade-policy-to-the-test/

[148] Huysmans, M. (2020) "Exporting protection: EU trade agreements, geographical indications, and gastronationalism", Review of International Political Economy, 2020, pp. 1-28. URL: https://doi.org/10.1080/09692290.2020.1844272

[149] Huysmans, M. (2020) "Exporting protection: EU trade agreements, geographical indications, and gastro-nationalism", Review of International Political Economy, 2020, pp. 1-28. URL: https://doi.org/10.1080/09692290.2020.1844272

will bear fruit if GI owners fail to make use of these marketing opportunities through their own, additional, production and processing efforts.

Potential and Limits to Further GI Extensions

GIs in new EU FTAs are likely to involve countries without specific national GI regulations. Depending on the (potential) market value of such GIs and their competitors protected by other IP instruments, this can be a daunting task for EU negotiators.

Here, we first look at the GI situation in the Pacific area, before shedding light on a small GI project with a "gastro-nationalist" connotation and a potential intra-African conflict of interest.

STORY 8.2: GIs IN THE PACIFIC

The *Transpacific Partnership Agreement* (TPPA) is a comprehensive, all-encompassing agreement FTA, establishing a basically duty-free area in the world's most dynamic economic zone, and numerous non-tariff barrier abolitions going well beyond comparable WTO rules. After the refusal of the Trump Administration to ratify the TPPA, the 11 remaining Asia-Pacific countries (Australia, Brunei, Canada, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam) replaced it with the Comprehensive and Progressive Agreement for *Trans-Pacific Partnership* (CPTPP).

The negotiating history of GIs under Chapter 18 (Intellectual Property) was marked by the proponents of collective trademarks and amateurs of generic brands. It sheds an interesting light on the fate of GIs in treaties where only a minority of partners have their own GI regulation.

As pointed out in an ex-ante impact study of the *EU-Australia* and *EU-New Zealand trade and investment agreements,* the general transparency and due process safeguards in Chapter 18 of the TPPA/CPTPP also apply to GIs. In respect of the relationship between trademarks and GIs, it disallows commonly used terms and the use of GIs for goods for which the trademark is registered. Article 18.19 acknowledges that "signs that may serve as geographical indications are capable of protection under its trademark system." Notwithstanding this opening, obtained in the last Ministerial negotiation round in Maui (Hawaii), Article 18.20 allows trademark owners to *refuse* the registration of "confusing" GIs in their countries: "Each Party shall provide that the owner of a registered trademark has the exclusive right to prevent third parties that do not have the owner's consent from using in the course of trade identical or similar signs, including subsequent geographical indications, for goods or services that are related to those goods or services in respect of which the owner's trademark is

> registered, where such use would result in a likelihood of confusion. In the case of the use of an identical sign for identical goods or services, a likelihood of confusion shall be presumed."[150]

The IP provisions in the TPPA / CPTPP indicate the difficulties for protection of GIs à la EU in the "new world", especially in respect of (collective or certification) trademark rights. Only GIs originating in the territory of a Party fall under these provisions. Nevertheless, registration, for instance of EU GIs in each CPTPP Party, is available according to national prescriptions and based on the TRIPS Agreement. TRIPS-Article 22.3 provides that "A Member shall, ex officio if its legislation so permits or at the request of an interested party, refuse or invalidate the registration of a trademark which contains or consists of a geographical indication with respect to goods not originating in the territory indicated, if use of the indication in the trademark for such goods in that Member is of such a nature as to mislead the public as to the true place of origin."

This is not the place for a detailed examination of GIs in the "new world". What seems clear, however, is that negotiations could be extremely difficult when GI proponents like the EU27 (or the UK) try to secure GIs through an accession to the CPTPP, or with specific countries. However, thanks to the WTO/TRIPS Agreement and the non-contested right accruing to all WTO Members to protect their GIs, there is room for flexibilities and creative solutions.

What is in a Name?

GI negotiations often imply emotions, and deals, for mutually acceptable solutions. After long and protracted negotiations, the EU granted protection to the Swiss cheese Gruyère against French, German, Finnish and Austrian imitations; but for Emmental, a cheese originating in a valley only existing in Switzerland, the generic producers in many EU countries successfully prevented such a protection. As a result of this deal, only Gruyère from the region with that name in Switzerland is protected without a localiser, whereas Swiss and any other Emmental require a "localiser" indicating the country of origin.

No such problems arise for common names in use in many countries and for centuries. When Vietnam decided to protect its own fish sauce GIs produced in three different regions, nobody objected. Wines and cheeses protected by brands, such as the Swiss "Appenzeller" produced in the bordering canton of St. Gall, completely escape competition from other countries and can be marketed freely all over the cheese-loving world.

The situation changes when one country tries to protect the name for its long-legged chicken against foreign competitors by establishing a GI or a collective trademark for its broilers. In

[150] Ex-ante study of the EU-Australia and EU-New Zealand trade and investment agreements – Final Report Prepared by LSE Enterprise Ltd. April – 2017, Section 4.2.2 (also available at the EU Publications Office, short URL https://op.europa.eu/s/skQh)

this very recent case, it so happened that the same name is also used in several neighbouring countries.

STORY 8.3: A GI OR A COLLECTIVE TRADEMARK FOR BICYCLE CHICKEN?

On 5 July 2021, Burkina Faso announced the launch of a project to provide a label for "bicycle chicken". In reply to a question from the international NGO "grains", the Director-General of the National Centre for Industrial Property, at the Ministry of Commerce, confirmed on 3 August 2021 that the legal protection of "bicycle chicken" will take the form of either a GI or a collective trademark.

According to the government, the aim of this label is to protect traditional Burkina Faso chicken from imported broiler chickens which in addition, when crossed with the domestic chickens, threaten to wipe out the local breed. The application was to be filed with the OAPI (African Intellectual Property Organisation) to be directly applicable in its 16 member countries.

The proposal has raised eyebrows in many countries and producer organisations. The GI-friendly "grains" summarised its objections and questions in a written format, starting by recalling applicable EU and WTO rules:

1. It should be "bicycle chicken from one region or another". The name must be linked to a well-defined area, which gives the product its qualities, due to the soil, the climate or topography, or its reputation, based on the expertise of the producers.
2. Poultry known as bicycle chickens exist throughout Western and Central Africa, from the Central African Republic to Senegal. It is a generic, common name, which represents a very broad heritage.
3. Would a certain breed be protected? If so, which breed? Is bicycle chicken a breed, in terms of genetics, a population, a strain, or something else?
4. This initiative taken by the government is an example of the system operating the wrong way round. The basic concept of the GI and trademark system is to protect producers, i.e., local farmers. The idea is that it is these people who are supposed to organise, propose, and claim a GI."

For good measure, "grains" recalled its views on the relevant difference between GIs and collective trademarks: "A GI is a collective right which protects the name of a product (linked to a region) to prevent counterfeiting. It is accessible by all producers who are part of an association or other group in the region and comply with the standards. A GI cannot be sold, and it has

> unlimited duration. A trademark, however, is a private right belonging to a specific group of producers, used to distinguish a specific product in order to protect the consumer. It lasts for a renewable 10-year period, and can be transferred or sold."[151]

Labels are not subject to the same rules as GIs, or trademarks, or brands. The interesting question here is whether they can prevent or reduce imports, and how they access export markets where similar names prevail. This only apparently consumer choice issue involves many different trade rules, beyond the purview of this paper.

The attitude of third parties, however, may be of a political and economic interest. In the classic case of Pisco – a city located in Peru where a traditional version of grape distillates is produced – the US and the EU recognised both the Peruvian and the competing Chilean name "Pisco" – with a localiser.[152] Will they adopt the same position for *bicycle chicken*? And, regardless of their (foreseeable) decision, what will that change (i) for the "hybridisation" of African chicken, and (ii) for the cheap, non-subsidised imports of frozen poultry from Brazil and Thailand – landing alike on poor and rich plates in West Africa?

Conclusions

One of the main objectives of EU agri-food trade policy is to promote regional specialty foods in the Common Market and internationally. For this purpose, the EU aims at protecting a specific type of IP, namely its geographical indications (GI), in multilateral and regional trade agreements. EU GIs come in four forms: (1) Protected Designations of Origin (DPO), (2) Protected Geographical Indications (PGI), (3) Geographical Indications of spirits, drinks and aromatised wines (GI), and (4) Traditional specialty guaranteed (TSG). Since the EU-Korea FTA, concluded in 2010, strong IP provisions are a common feature in all EU FTAs.

While FTAs do not ensure sales, there are strong economic reasons why GIs matter for the EU: 20% of total sales of GI protected food products are exported outside the EU - and sold at twice the price of similar products without GIs. In other words, even though production and marketing involves extensive, costly, and additional investment and cooperation from producers to processors and retailers, GIs can lead to higher sales premiums for agri-food producers. Moreover, GIs protect traditional production methods and support agricultural sustainability. They also matter culturally: GIs protect traditional sectors in many regions in the EU, supporting regional culinary heritage, thus they encourage consumer trends towards "gastro-nationalism".

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[151] GRAIN, September 2021. GRAIN's coordination office: Girona 25, pral., 08010 Barcelona (Spain). https://grain.org/

[152] Pisco is made from grapes that are grown and selected solely for pisco production. The grape juice is collected after crushing and then fermented before distillation. Skins, pips, and stalks of Peruvian pisco grapes are discarded before distillation, unlike the grapes used for Grappa in Italy, San Marino, and in the italophone parts of Switzerland, where the berries are crushed and used to make wine; after winemaking, the leftover skins, seeds, and stalks are repurposed, turning the pomace into grappa via bain-marie or steam distillation. Source: Piscologia, accessed on 15 September 2021 at https://piscologia.com/pisco-vs-grappa/

Registered GIs are disproportionately important in Southern EU Member States; political economy therefore ensures that GIs are a key element for all EU FTA negotiations.

The break-down of the Doha Round negotiations, in 2007, where, inter alia, GIs for wines and spirits were to obtain protection under the TRIPS agreement, in a multilateral register for these products already foreseen in Art.23.4, is not helpful for the further extension of GIs.

Despite this lack of multilateral progress, governments increasingly establish and protect their GIs in trade agreements with other countries, along the EU concept or in mutual recognition agreements. Nonetheless, end-consumers alone can buy into the GI idea, believe in the quality of the production and processing monitoring, and then perhaps pay a price premium.

MEXICO

Intellectual Property (IP) is very important for Mexico economically, socially, and more broadly for society. This summary shows the relevance of IP-intensive sectors for Mexican employment overall (Figure 1) and per sector (Figure 2), as well as for the economic value created in Mexico overall (Figure 3) and per sector (Figure 4). Economic value matters because Mexico is part of global value chains and higher productivity also translates into higher wages and thus higher-paid jobs. Figure 5 shows the level of labour productivity per sector and in Figure 6, we show the level of investments over time, focusing on the five main sectors in Mexico.

Figure 1: Total employment for IP-intensive sectors (2013-2019)

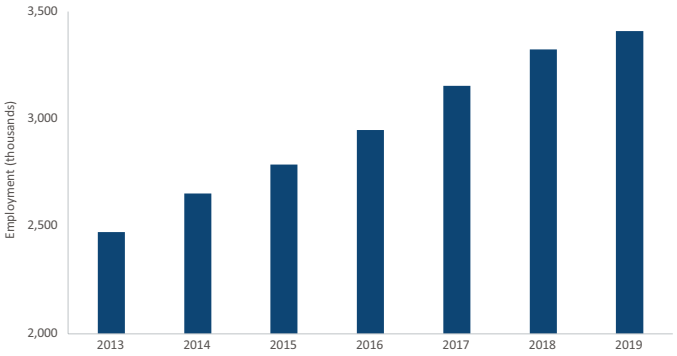


Figure 2: Employment for IP-intensive sectors (2019)

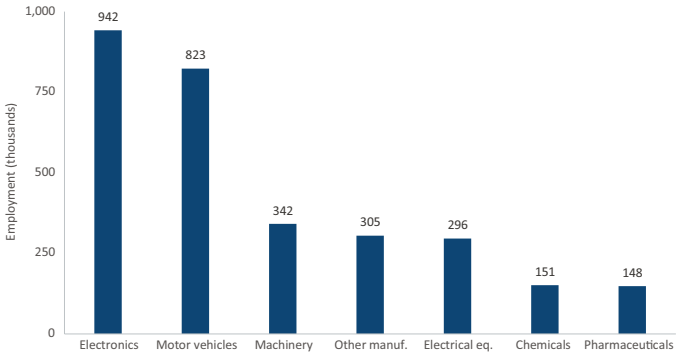


Figure 3: Total value-added for IP-intensive sectors (2013-2019)

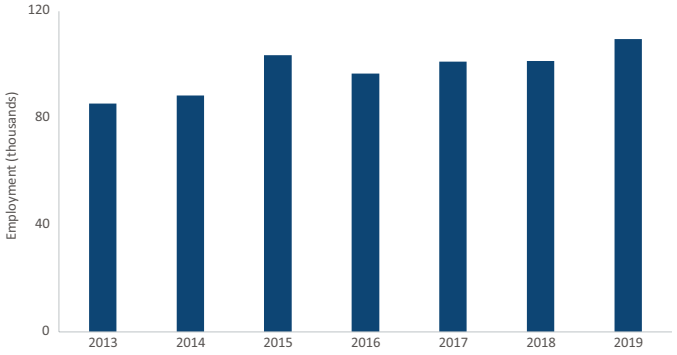


Figure 4: Value-added for IP-intensive sectors (2019)

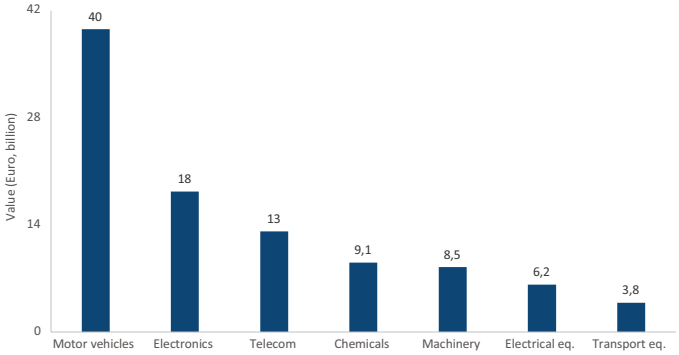


Figure 5: Labour productivity for IP-intensive sectors
(2019, value-added per employee)

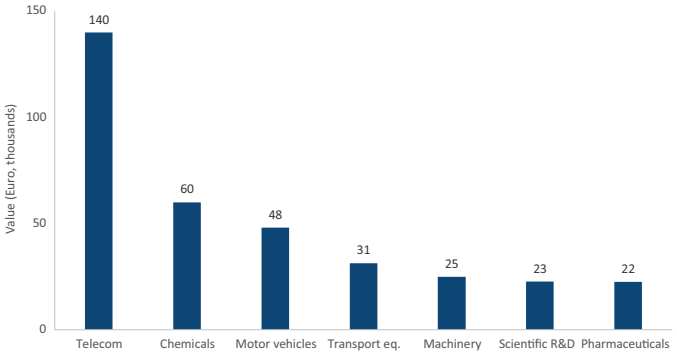
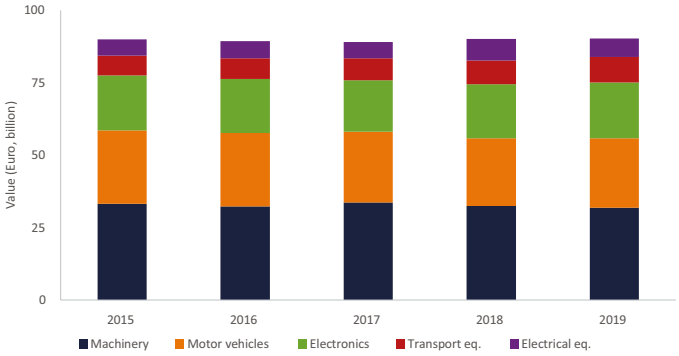


Figure 6: Investment in IP-intensive sectors
(2015-2019, Gross Fixed Capital Formation)



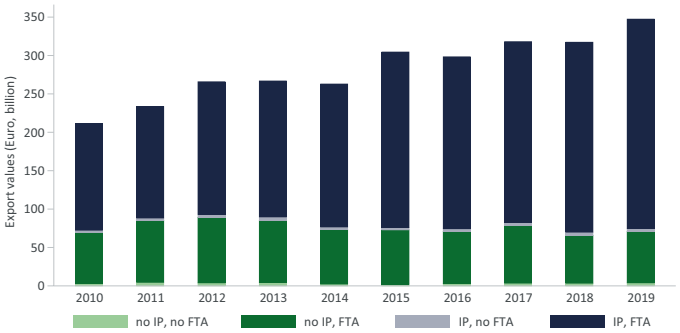
Source: OECD. Authors' Calculations

Intellectual Property is very important for the Mexican economy. The IP-intensive sectors in Mexico employ around 3.4 million workers directly, increasing significantly since 2013 (Figure 1). The main IP-intensive sectors in terms of employment are electronics (942.000 jobs), motor vehicles (823.000 jobs) and machinery (342.000 jobs) as shown in Figure 2. The Mexican economy has shown a remarkable growth in value added created by IP-intensive sectors between 2013 and 2019, from €85 bn in 2013 to €110 bn in 2019 (Figure 3). The main sectors contributing to Mexican value added are motor vehicles (€40 bn), electronics (€18 bn) and telecom (€13 bn) as shown in Figure 4. The economic sectors which are more intensive in IP are also more productive than the rest of the Mexican economy (telecom, chemicals, motor vehicles) creating the highest-value and highest-paid jobs (Figure 5). Finally, when looking at investments, we see that machinery, motor vehicles, and electronics are the top-3 sectors in Mexico (Figure 6).

MEXICO

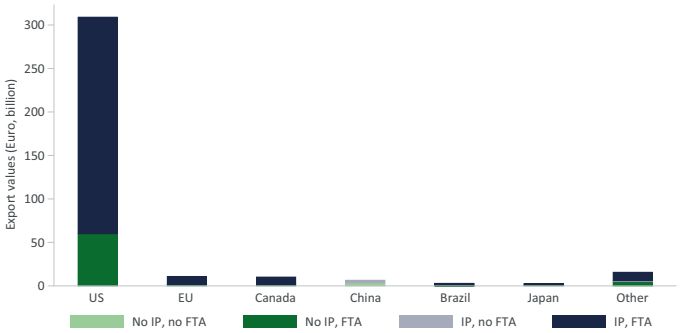
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Mexican exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Mexican IP framework is correlated with a higher Mexican share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Mexico (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



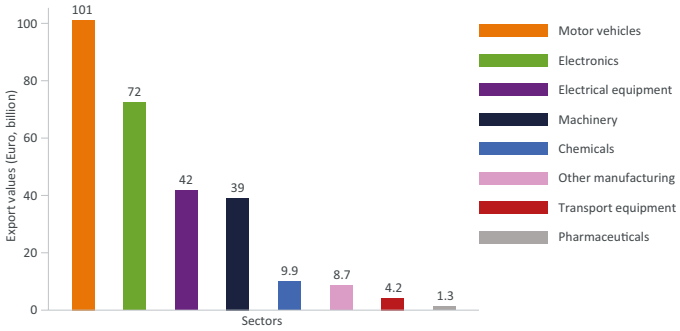
For Mexico, the share of IP-intensive exports outside the EU has gone up from 64% in 2010 to 77% in 2019.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



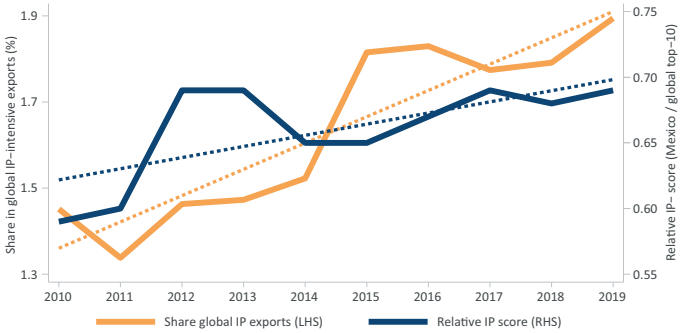
The US (€ 309 bn), the EU (€ 11 bn), Canada (€ 10 bn), China (€ 6.6 bn) and Brazil (€ 3 bn) are the main Mexican export destinations. For these markets IP-intensive exports constitute 80% of total exports.

Figure 3: Total exports by IP-intensive sectors (2019)



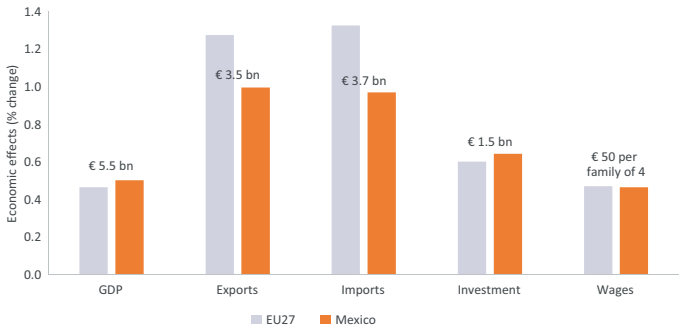
The top-8 IP-intensive manufacturing sectors together export € 278 bn in 2019 and contribute significantly to Mexican trade surplus. The largest Mexican export sectors that depend on IP are motor vehicles (€ 101 bn) and electronics (€ 72 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



In recent years, Mexico reports an increase in its relative IP score compared to the global top-10. This corresponds to an increase in Mexico's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)

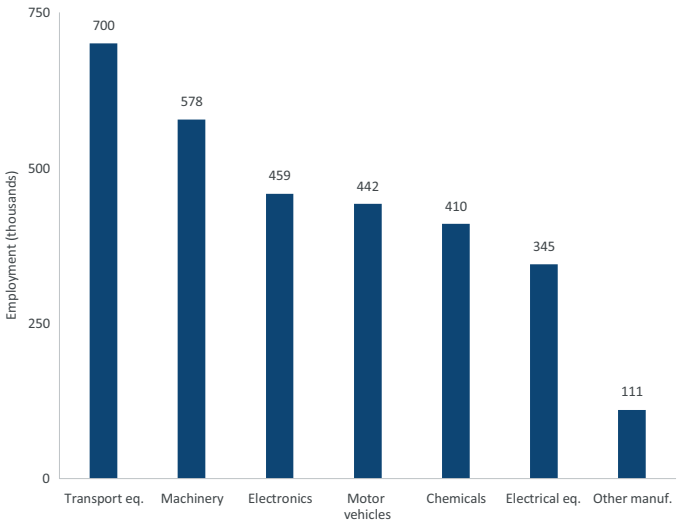


Because the EU has an FTA with Mexico that allows ample room for stronger IP provisions, if these are agreed upon in a future update of the EU-Mexico FTA, stronger IP provisions will have a significant positive impact on Mexico.

THE RUSSIAN FEDERATION

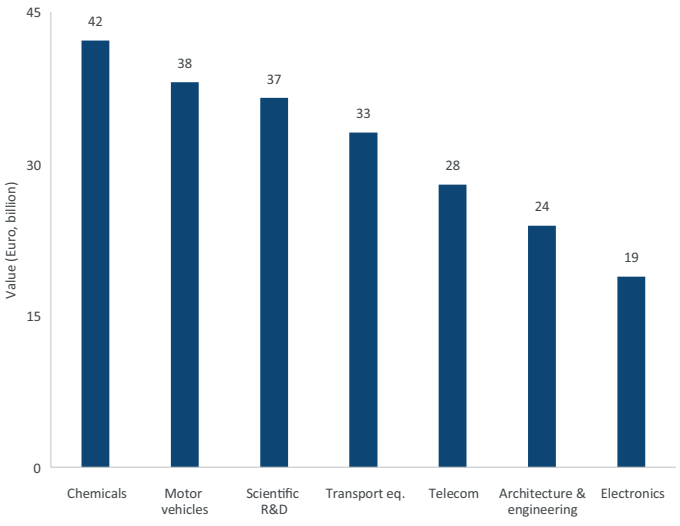
Intellectual Property (IP) is very important for the Russian economy economically, socially, environmentally, and more broadly for society. Focusing on some key quantitative economic indicators, IP is a key driver for job creation (Figure 1) and production (Figure 2) in the Russian Federation. Regarding value added, the contribution of IP-intensive sectors to the Russian economy is significant (Figure 3). The IP-intensive sectors are also the sectors with the highest output per employee. The higher the labour productivity, the more value is created per employee which also translates into higher wages (Figure 4).

Figure 1: Employment for IP-intensive sectors (2019)



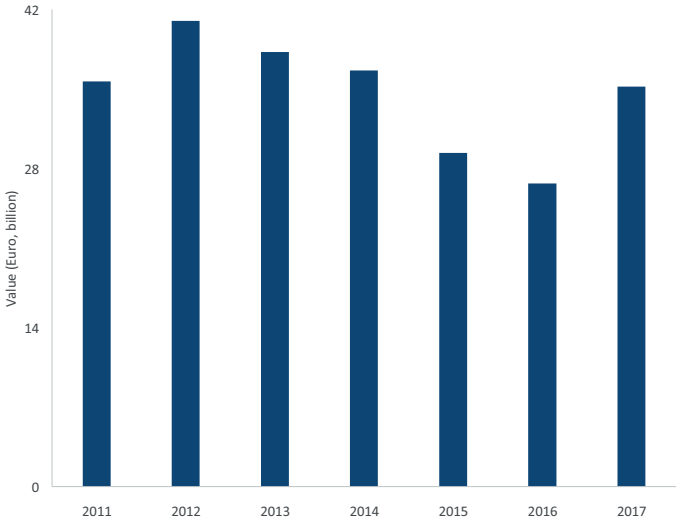
Source: OECD. Authors' Calculations.

Figure 2: Production for IP-intensive sectors (2019)



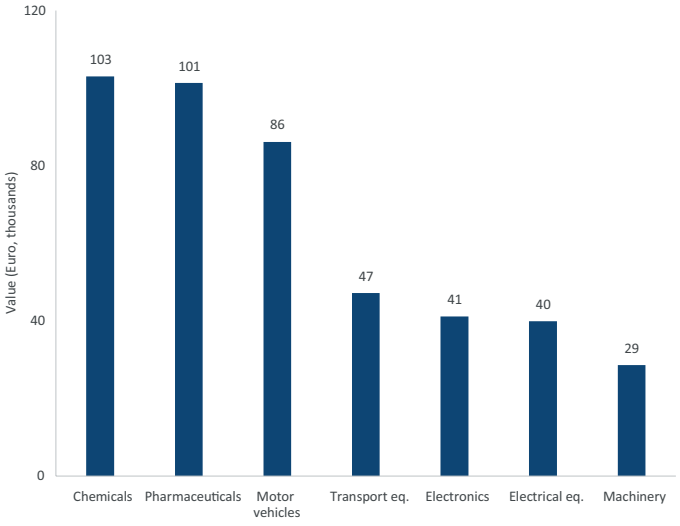
Source: OECD. Authors' Calculations.

Figure 3: Total value-added for IP-intensive sectors (2011-2017)



Source: UNIDO. Authors' Calculations.

Figure 4: Labour productivity for IP-intensive sectors (2019, production per employee)



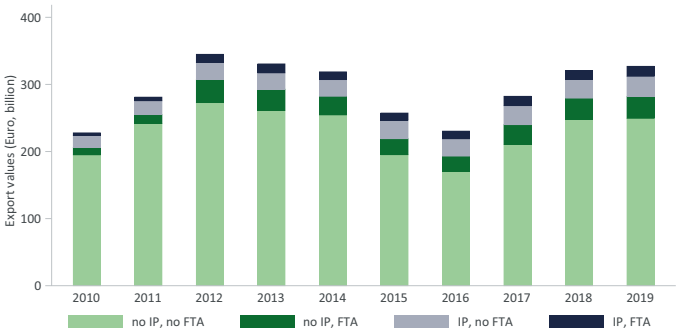
Source: OECD. Authors' Calculations.

Intellectual Property is highly relevant for the Russian economy. The IP-intensive sectors are significant contributors to economic production and jobs. Looking at jobs (Figure 1), transport equipment and machinery support 700.000 and 578.000 jobs respectively, while the electronics and motor vehicle sectors employing around 450.000 persons each. In terms of production, the chemical industry contributed €42 bn, while the motor vehicles industry added €38 bn and the scientific R&D sector €37 bn to Russian overall production – as shown in Figure 2. When we look at value-added, Figure 3 shows that chemicals, electrical equipment, machinery, and motor vehicles added €35 bn to the Russian economy. Figure 4 shows that the sectors with the highest labour productivity in the Russian Federation are chemicals (€103 thousand per employee), pharmaceuticals (€101 thousand per employee) and motor vehicles (€86 thousand per employee).

THE RUSSIAN FEDERATION

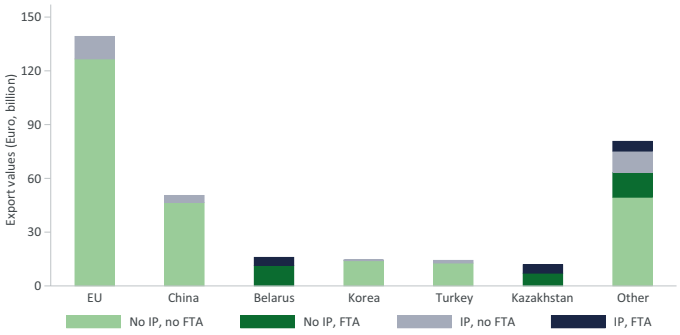
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Russian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Russian IP framework is correlated with a higher Russian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Russia (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



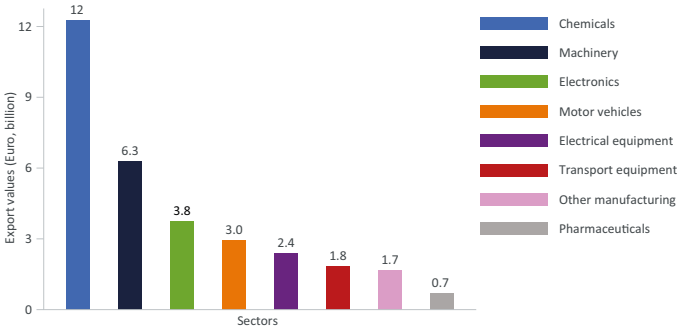
For Russia, the share of IP-intensive exports outside the EU has gone up from 10% in 2010 to 14% in 2019.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



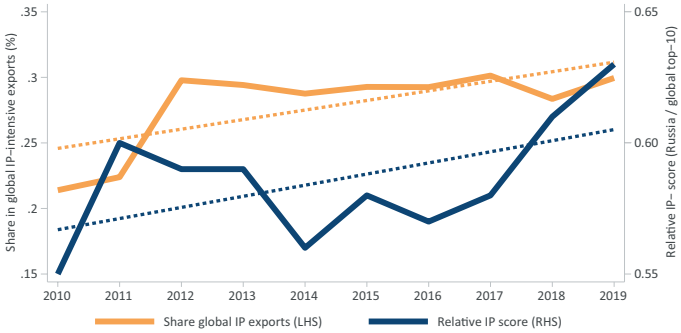
The EU (€ 139 bn), China (€ 51 bn), Belarus (€ 16 bn), Korea (€ 14 bn) and Turkey (€ 14 bn) are the main Russian export destinations. For these markets IP-intensive exports constitute 11% of total exports.

Figure 3: Total exports by IP-intensive sectors (2019)



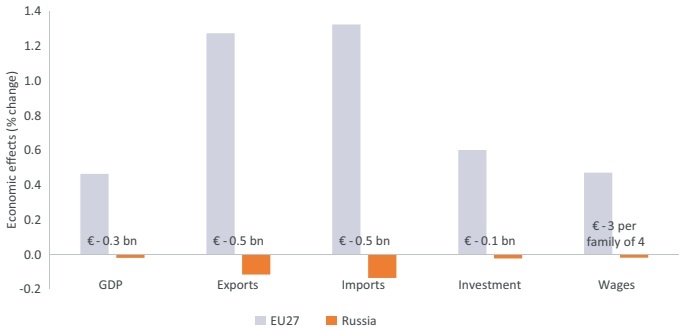
The top-8 IP-intensive manufacturing sectors together export € 32 bn in 2019 and contribute significantly to Russian trade surplus. The largest Russian export sectors that depend on IP are chemicals (€ 12 bn) and machinery (€ 6.3 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



In recent years, Russia reports an increase in its relative IP score compared to the global top-10. This corresponds to a slight increase in Russia's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



Because the EU does not have an FTA with Russia, stronger IP provisions in EU FTAs will not impact this country. In fact, because IP is strengthened with competitor countries, the effect of not having an FTA with the EU becomes more negative.

SOUTH KOREA

Intellectual Property (IP) is very important for South Korea economically, socially, and more broadly for society. This summary shows the relevance of IP-intensive sectors for South Korean employment overall (Figure 1) and employment per sector (Figure 2), as well as for the economic value created in South Korea overall (Figure 3) and per sector (Figure 4). Economic value matters because South Korea is an open economy that is integrated in global supply chains and higher productivity also translates into higher wages and thus higher-paid jobs. Figure 5 shows the level of labour productivity per sector in South Korea, and in Figure 6, we show the level of investments in intellectual property products over time.

Figure 1: Total employment for IP-intensive sectors (2013-2019)

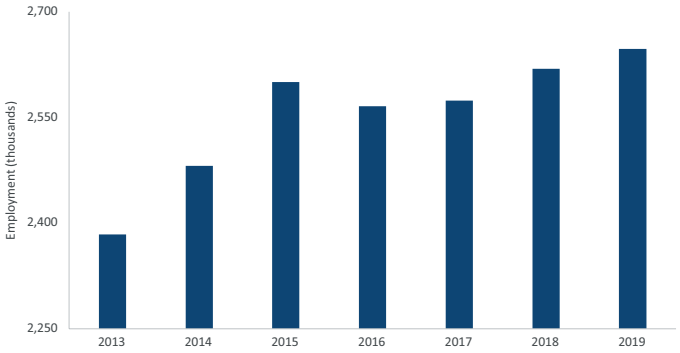


Figure 2: Employment for IP-intensive sectors (2019)

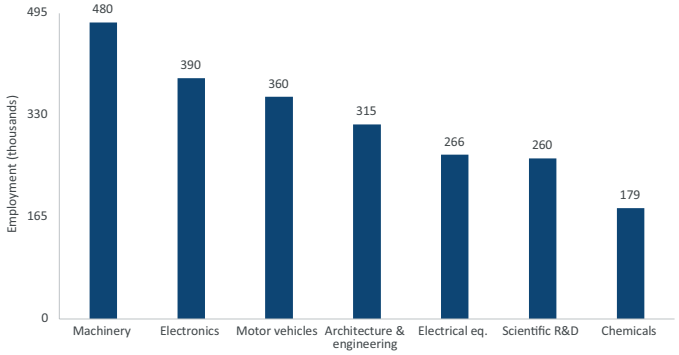


Figure 3: Total value-added for IP-intensive sectors (2013-2019)

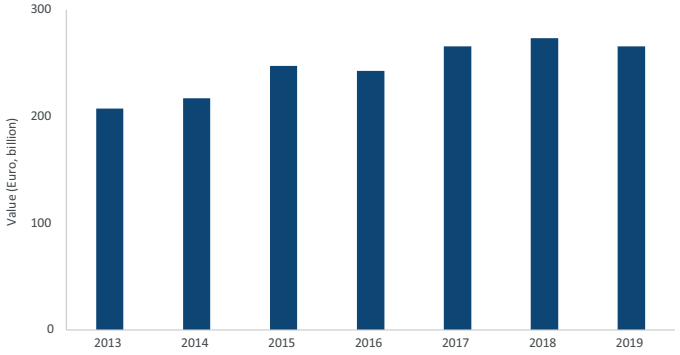


Figure 4: Value-added for IP-intensive sectors (2019)

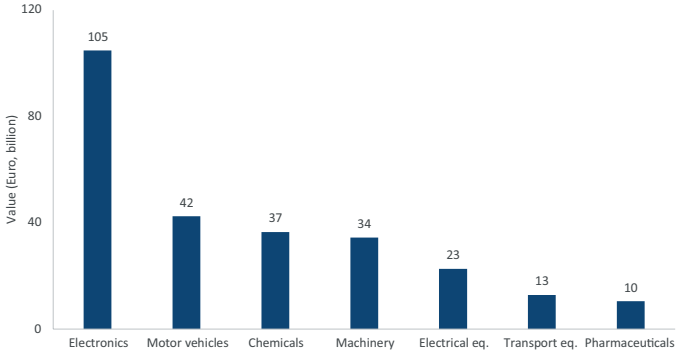


Figure 5: Labour productivity for IP-intensive sectors
(2019, value added per employee)

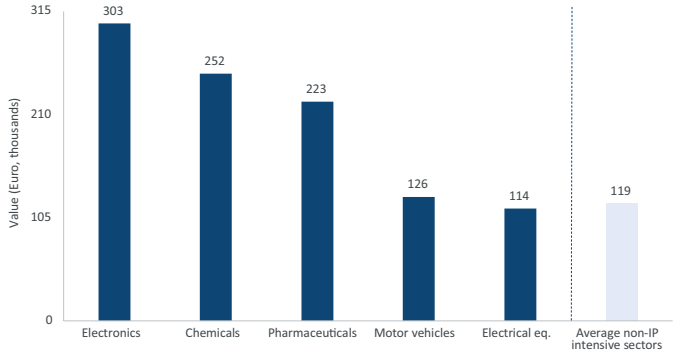
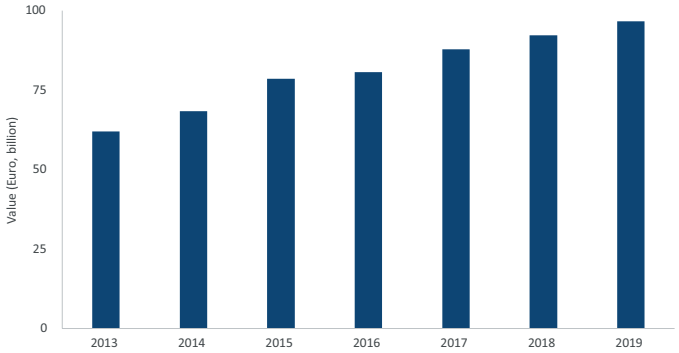


Figure 6: Investment in IP Products (2013-2019)



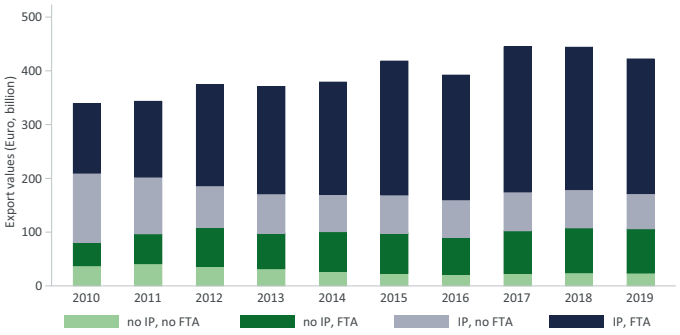
Source: Korean Statistical Information Service. Authors' Calculations.

Intellectual Property is very important for the South Korean economy. The IP-intensive sectors in South Korea employ around 2.6 million workers directly, increasing since 2013 (Figure 1). The main IP-intensive sectors in terms of employment are machinery (480.000 jobs), electronics (390.000 jobs), and motor vehicles (360.000 jobs) as shown in Figure 2. The South Korean economy has shown a remarkable growth in value added created by IP-intensive sectors between 2013 and 2019, from €207 bn in 2013 to €266 bn in 2019 (Figure 3). The main sectors contributing to South Korean value added are electronics (€105 bn), motor vehicles (€42 bn) and chemicals (€37 bn) as shown in Figure 4. The economic sectors which are more intensive in IP are also more productive than the rest of the South Korean economy (electronics, chemicals, pharmaceuticals) creating the highest-value jobs. Labour productivity in IP-intensive sectors in South Korea is up to 2.5 times higher than for the average of sectors that are not IP-intensive (Figure 5). Finally, when looking at investments, we see that investments in IP products such as research, development, and innovation which lead to knowledge that can be marketed or used in production has increased from €62 bn in 2013 to €97 bn in 2019 – as shown in Figure 6.

SOUTH KOREA

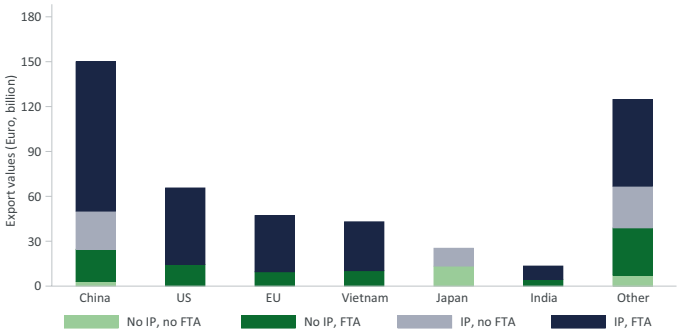
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Russian exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Russian IP framework is correlated with a higher Russian share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Russia (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



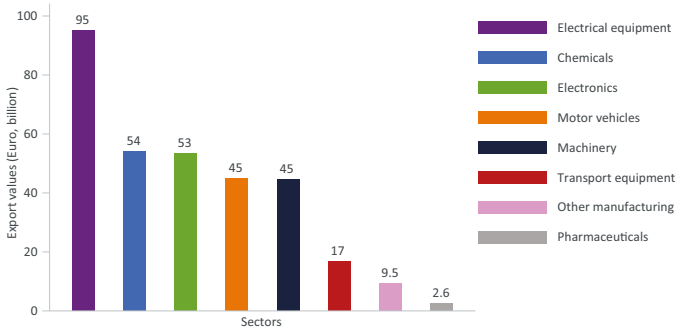
For Russia, the share of IP-intensive exports outside the EU has gone up from 10% in 2010 to 14% in 2019.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



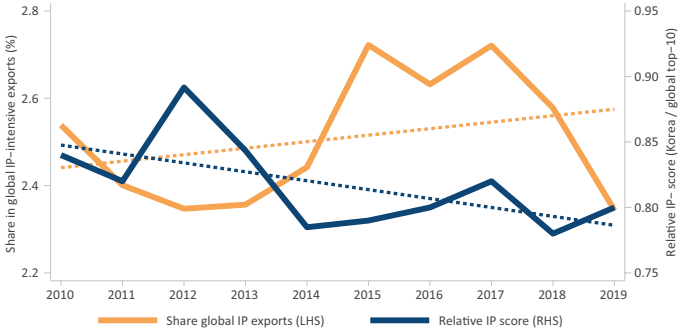
The EU (€ 139 bn), China (€ 51 bn), Belarus (€ 16 bn), Korea (€ 14 bn) and Turkey (€ 14 bn) are the main Russian export destinations. For these markets IP-intensive exports constitute 11% of total exports.

Figure 3: Total exports by IP-intensive sectors (2019)



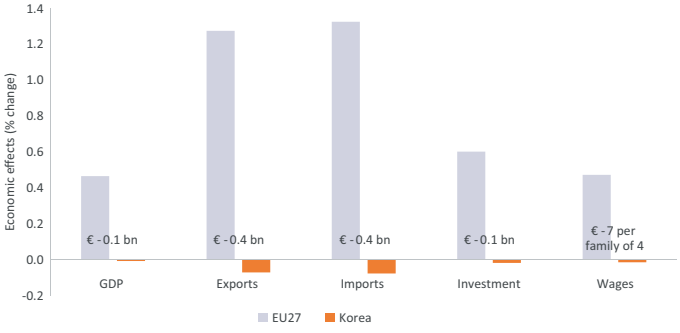
The top-8 IP-intensive manufacturing sectors together export € 32 bn in 2019 and contribute significantly to Russian trade surplus. The largest Russian export sectors that depend on IP are chemicals (€ 12 bn) and machinery (€ 6.3 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



In recent years, Russia reports an increase in its relative IP score compared to the global top-10. This corresponds to a slight increase in Russia's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



Because the EU-Korea FTA already includes strong IP provisions, the additional gains are limited and some degree of trade diversion occurs to countries that would really strengthen the IP provisions in their FTAs with the EU.

SWITZERLAND

Intellectual property matters for an economy like the Swiss one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in Switzerland. In Figure 2, we show how relevant different types of IP are for the Swiss economy in terms of value-added. Figure 3 shows the economic value of goods and services created in Switzerland as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2012-2018)

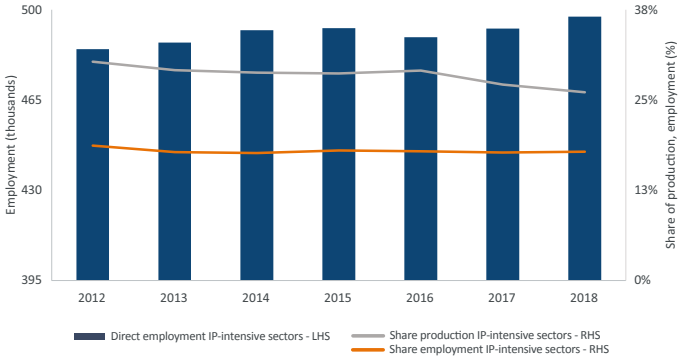


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

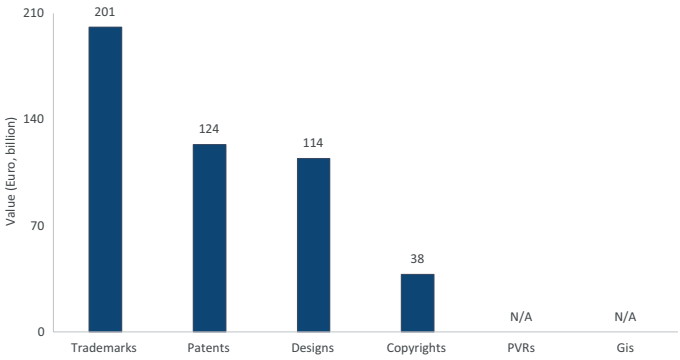


Figure 3: Value-added for IP-intensive sectors (2018)

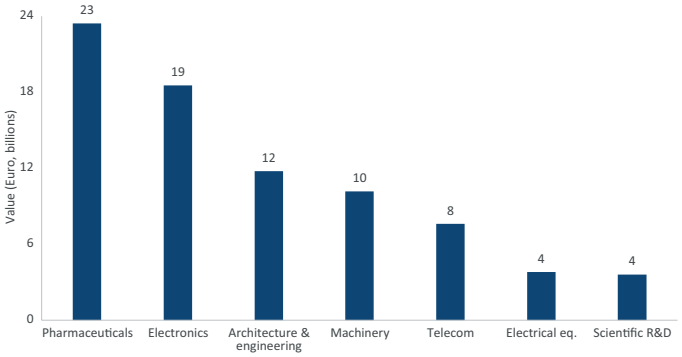


Figure 4: Labour productivity for IP-intensive sectors
(2018, value added per employee)

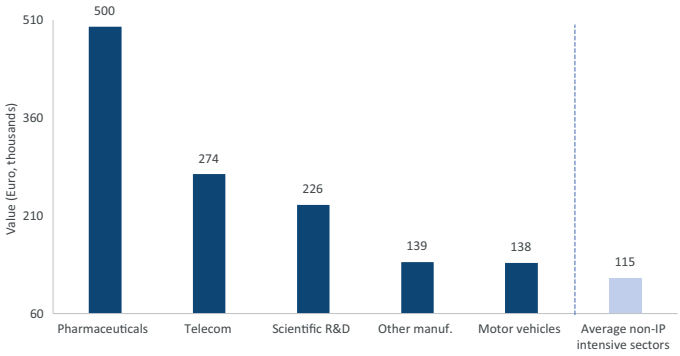


Figure 5: Index of SME R&D potential (2018)

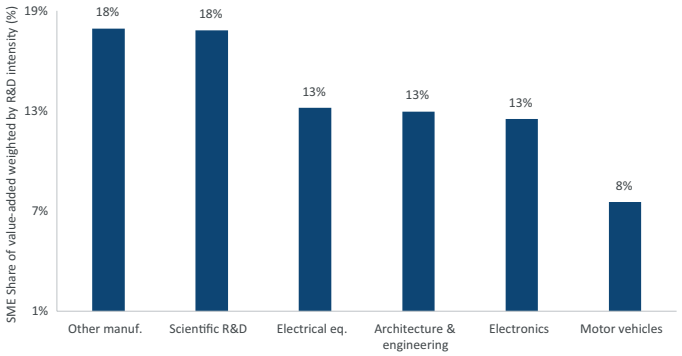
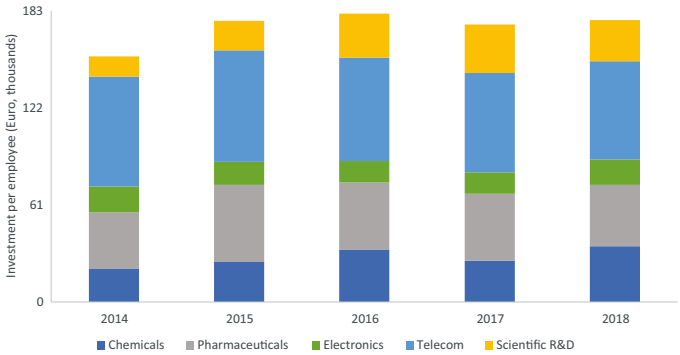


Figure 6: Investment per employee for IP-intensive sectors (2014-2018)



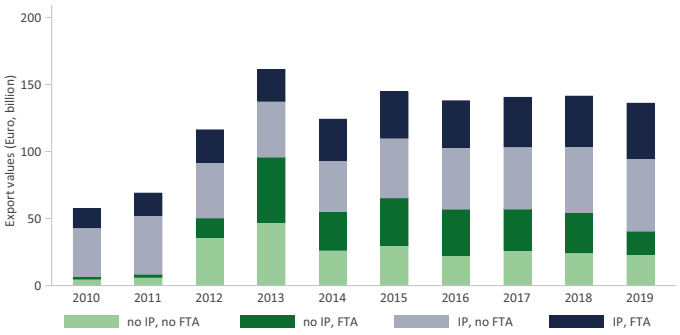
Note: Eurostat 2019 data not available at the time of the analysis.

Intellectual Property is highly relevant for the Swiss economy. The IP-intensive sectors in Switzerland employ close to 500 thousand workers directly and represent 26% of total Swiss production (Figure 1). Trademarks (€201 bn), patents (€124 bn), and designs (€114 bn) are the most important types of IP for the Swiss economy (Figure 2). Most economic value in Switzerland is created by the pharmaceuticals (€23 bn), electronics (€19 bn), and architecture & engineering (€12 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the Swiss economy (pharmaceuticals, telecom, scientific R&D) creating the highest value jobs. Labour productivity in IP-intensive sectors in Switzerland is up to four times higher than for the average of sectors that are not IP-intensive (Figure 4). Telecom, pharmaceuticals, and chemicals are the IP-intensive sectors with the highest levels of investment per employee in Switzerland (Figure 6). Swiss SMEs make a significant contribution to value-added in sectors with high R&D spending such as other manufacturing and scientific R&D, but also electrical equipment and architecture & engineering (Figure 5).

SWITZERLAND

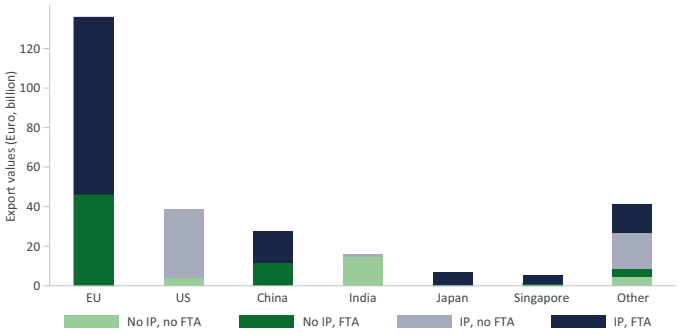
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Swiss exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Swiss IP framework is correlated with a higher Swiss share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Switzerland (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



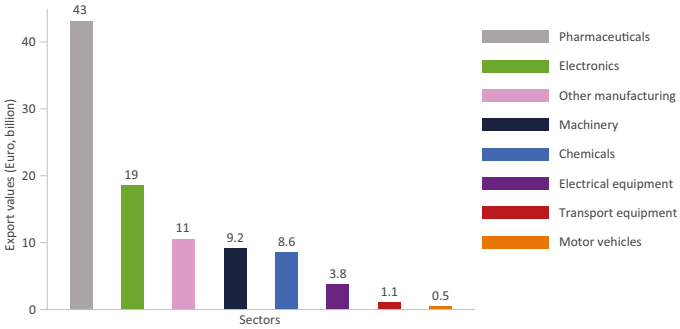
For Switzerland, the share of IP-intensive exports outside the EU has gone decreaesd from 37% in 2010 to 35% in 2019.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



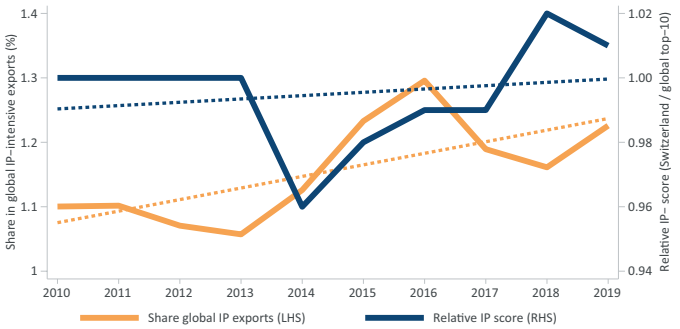
The EU (€ 136 bn), the US (€ 39 bn), China (€ 28 bn), India (€ 16 bn) and Japan (€ 7.2 bn) are the main Swiss export destinations. For these markets IP-intensive exports constitute 66% of total extra-EU exports.

Figure 3: Total exports by IP-intensive sectors (2019)



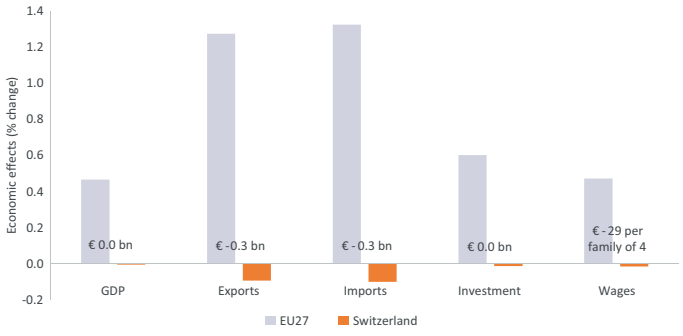
The top-8 IP-intensive manufacturing sectors together export € 96 bn in 2019 and contribute significantly to Swiss trade surplus. The largest Swiss export sectors that depend on IP are pharmaceuticals (€ 43 bn) and electronics (€ 19 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



In recent years, Switzerland reports an increase in its relative IP score compared to the global top-10. This corresponds to an also increase in Switzerland's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



Because the EU-Switzerland FTA already includes strong IP provisions, the additional gains are limited and some degree of trade diversion occurs to countries that would really strengthen the IP provisions in their FTAs with the EU.

INSERT 9:

INTELLECTUAL PROPERTY AND COVID-19

By Dr. Kevin E. Noonan, McDonnell Boehnen Hulbert & Berghoff LLP

The current SARS-CoV-2 and the COVID pandemic is the greatest global health threat caused by a virus since the influenza pandemic of 1918 (and, before that, innumerable smallpox outbreaks throughout history). So far, the number of infections and deaths has not reached levels seen during the "Spanish flu" pandemic. However, modern travel and global trade (and new factors such as social media, whether for good or ill) have increased risks, and awareness of those risks, throughout the world.

Throughout most of the world, and particularly in the United States, Europe and Japan, patents provide incentives for the development of medicines, including vaccines, and protect the developers' investments of time and resources. These benefits are illustrated by the quickness with which vaccines for COVID-19 have been developed; the most recent major vaccine against an infectious disease, mumps, took about three years to develop in the mid- to late-1960's. The mRNA technology that is the basis for the BioNTech/Pfizer and Moderna vaccines is the product of many years of research supported by the prospect of patents to protect the investment they represent, and similar investment in basic research and its applications to human health were important for other anti-COVID vaccines now being deployed against the virus. This long view of biomedical research and development reflects the reality that innovation cannot be turned on and off like a faucet.

The severity of the COVID pandemic, and the concomitant need for both treatments and vaccines, has increased the need for the global patent system to respond to the disruptions created by the pandemic. But some have voiced concerns that intellectual property (IP) protection for COVID-19 vaccines and therapies would inhibit their development or availability. Advocates for IP protection for COVID-19 vaccines and therapies counter that IP protection will be vital to the development of innovative treatments, tests and vaccines. This article will focus on the pros, cons, and considerations of IP protection for treatments, vaccines, tests and other technologies. As with any subject of significant public interest and concern, opinions may differ, but public spiritedness should prevail, as it has so far in the face of the dangers posed by the SARS-CoV-2 virus.

The potential for intellectual property issues or disputes to inhibit development or distribution of COVID-19 vaccines or treatment have been voiced in some quarters. A number of critics believe that IP issues or disputes would inhibit development or distribution of COVID vaccines or treatments.[153] Some have called for individuals or organizations that develop

[153] Koons, C. (2020) "The Vaccine Scramble is Also a Scramble for Patents: Intellectual property disputes throughout the drug supply chain could hold back a Covid-19 shot," Bloomberg Business Week, August 12, 2020.

COVID-19 treatments, tests, vaccines, or technology to voluntarily (or under duress) refrain from asserting IP rights. For example, in spring 2020, several universities and companies in the high-tech sector proposed the "Open COVID Pledge," to "make our intellectual property available free of charge for use in ending the COVID-19 pandemic and minimizing the impact of the disease."[154]

This pledge and other efforts to prevent IP protection for COVID technology failed to gain traction and were rebutted by several pharmaceutical industry executives, government leaders, and politicians who understand the cost and challenge entailed by drug development.[155] For example, Jon Soderstrom, managing director of Yale University's Office of Cooperative Research noted, *"the system is working. Dozens of companies and universities are now investigating COVID-19 vaccines, and many more are researching treatments. If we strip away intellectual property rights, the system will break down, and we'll find ourselves farther from ending our global health crisis…".*[156]

Indeed, those in favour of IP protection for COVID-19 vaccines, treatments, tests and technologies argued that IP protection laws should be strengthened to provide incentives for innovation and investment in products such as vaccines which are, by definition, unpredictable, risky, and expensive to develop. For example, Jan Fischer, former Prime Minister of the Czech Republic stated that, if a COVID-19 vaccine is produced, "robust IP laws" should be given some credit.[157]

The facts have not borne out these earlier arguments that patents would inhibit vaccine development. To date, over 3.8 billion individuals in more that 180 countries have been fully vaccinated with one of the sixteen available vaccines. Twelve billion doses have been produced by the end of 2021. This is not to say that there are no challenges to global vaccination, including the need for more doses, the risk of new variants emerging and the need for booster vaccines, but it does rebut the argument (really a presumption) that patents would impede vaccine development.

More recently, the rationale has changed to be directed to access to current vaccines and COVID treatments. Most significantly, India and South Africa have proposed that the

[154] See https://opencovidpledge.org

[155] For example, Pfizer CEO Albert Bourla called the pledge and similar proposals "nonsense" and "dangerous," tantamount to saying "If you have a discovery, we are going to take your [intellectual property]." E. Silverman, "Pharma Leaders Shoot Down WHO Voluntary Pool for Patent Rights on Covid-19 Products," statnews.com, May 28, 2020; Francis Gurry, former director general of the World Intellectual Property Organization (WIPO) stated that the main barriers to a vaccine were scientific and technical, that no vaccine has been identified, and that there was no evidence that IP protection was a barrier to vaccine development. F. Gurry, "Intellectual Property, Innovation, Access and COVID-19," www.wipo.int/wipo_magazine, June 2020.

[156] Soderstrom, J. (2020) "Intellectual property makes sure drug makers deliver," Hartford Courant, June 28, 2020.

[157] Fischer, J. (2020) "When Researchers Discover A COVID-19 Cure, Credit Should Go To Robust IP Laws, Says Former Czech PM," International Business Times, Aug. 15, 2020.; leaders from the International Chamber of Commerce (ICC) also voiced support for strong IP protection, which, they noted, already protects the public from counterfeit and adulterated drugs and from stockpiling medicines in developing countries. ICC, "How Intellectual Property Can Strengthen Our Response to Climate Change and COVID-19," Press Release, April 24, 2020.

World Trade Organization (WTO) suspend the IP enforcement provisions of the GATT/TRIPS treaty for any IP related to COVID, including vaccines and treatments.[158] This proposal is not limited to patents but includes copyright and trade secrets. The impact of this proposal, if adopted, is much more threatening to development of effective vaccines and treatments. This is because, unlike patents which are published and which disclosed technologies are dedicated to the public when their term has expired, relaxing other IP protections will destroy the intellectual property rather than share it. The available evidence supports the conclusion that, even if there might be circumstances under which intellectual property negatively affects vaccine availability (of which there is no evidence to date), suspending patent protection is not an effective answer because the rate-limiting step for COVID vaccine production (at least for the mRNA-based vaccines) involves proprietary machines and methods for making the vaccine that are, more than likely, not covered by patents and never will be.[159] And that raises the specter of an even more dangerous attack on intellectual property. Because the technological circumstances involve trade secrets regarding formulation of vaccines are what can be the bottleneck in the process. But trade secrets are the type of property the rights to which cannot be suspended; disclosure destroys the secret and thus the property. These policy proposals have been challenged by many of the same actors who have responded to earlier IP-limiting proposals.[160] For example, the Director-general of the International Federation of Pharmaceutical Manufacturers and Associations, argues that scaling up manufacturing is the best way to inoculate the world and end the pandemic. *"IP protections are not a barrier to access. Waiving them wouldn't deliver a single extra dose."*[161] Although details are unclear, the Biden administration supports a waiver of patent protections for COVID-19 vaccines,[162] and also the European Parliament has voted in favor of a temporary COVID-19 vaccine patent waiver.[163]

This "moveable feast" of policy rationales illustrates the political fact that the aim and goal of this and other proposals by India, South Africa, and other countries is to escape the TRIPS requirement for recognizing and enforcing IP protections, imposed as part of the requirements for WTO membership. When these facts are considered, the call by these governments (and others) should be understood for what it is: an attempt to use the pandemic to achieve a goal of status quo ante (prior to the establishment of the GATT/TRIPS/WTO global trade and patent regime), which was imposed upon these and other

[158] Communication IP/C/W/669, "Waiver from certain provisions of the TRIPS agreement for the prevention, containment and treatment of COVID-19, 2 October 2020. URL: https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/IP/C/W669.pdf&Open=True

[159] Lowe, D. (2021) "Myths of Vaccine Manufacturing," Science Translational Medicine, February 2021. URL: https://blogs.sciencemag.org/pipeline/archives/2021/02/02/myths-of-vaccine-manufacturing

[160] Soderstrom, J. (2021) "Patents don't hamper access to drugs and vaccines", Boston Herald, April 26, 2021; Andrei Iancu, former U.S. Patent and Trademark Office Director, stated that there is "no evidence that patents slow access to vaccines" and "In fact, the push by India and South Africa appears to be disingenuous, aimed not at curbing the pandemic but at allowing domestic companies to make money off of others' intellectual property. First Opinion, Statnews, 13 April 2021, https://www.statnews.com/2021/04/13/no-evidence-patents-slow-vaccine-access/; Reto Hilty, Director at the Max Planck Institute for Innovation and Competition, stated that "interfering with patent protection means playing with fire." https://www.mpg.de/16579491/patent-protection-vaccines-covid-10-reto-hilty

[161] Cueni, T. (2021) "Waiving IP rules will not deliver more Covid vaccines," Financial Times 25 April 2021.

[162] See: https://www.cnbc.com/2021/05/05/us-backs-covid-vaccine-intellectual-property-waivers-to-expand-access-to-shots-worldwide.html

[163] See: https://www.europarl.europa.eu/news/en/press-room/20210604IPR05514/parliament-calls-for-temporary-covid-19-vaccine-patent-waiver

countries a generation ago. The COVID pandemic provides the humanitarian excuse for a solution that isn't a solution but that resonates with uninformed (albeit generally well-meaning) politicians, humanitarians, and religious and non-governmental organizations.

Potential Real Solutions for the Manufacturing, Financing and Distribution Challenges

Much bigger barriers to widespread (if not universal) vaccination are the manufacturing, distribution, financing, and infrastructure required to support these efforts.[164] [165] For example, the European Commission imposed a temporary export mechanism for vaccines in February 2021 and has since prolonged it (though it is set to end by the end of 2021 and be transformed in a type of customs-system). This scheme leads to delays in exporting vaccines outside the EU, and which also includes non-commercial clinical trial samples and testing materials.[166] [167] The US did not have a formal export ban, but only recently saw the start of de facto exports to other countries. It is undeniable that there are significant issues regarding availability of drugs in low-income countries that need to be addressed. But there are ways to achieve these valid goals without challenging IP that got us to the vaccines we now need to produce and distribute. More productive routes to achieving these solutions would be better focused on 1) open and resilient global supply chains; 2) further cooperation between industry players to ramp up production; 3) strengthened financing and sharing of vaccines for middle- and low-income countries; 4) continued regulatory approval of new vaccines; 5) improving the strength of healthcare systems in lower-middle- and low-income countries; 6) tackle the issue of vaccine hesitancy.

The first of these approaches is what the EU is trying to achieve with the 'Trade and Health Initiative' (TAHI) initiative at the WTO as part of the Ottawa group – success would be to have much faster cross-border trade of final vaccines but also intermediate products that could help to scale up production.

The second is what is happening to an unparalleled level between traditional pharmaceutical companies (for example, Merck working with Johnson & Johnson, Novartis with Pfizer/BioNTech, Sanofi with Pfizer/BioNTech, GSK with Curevac, Rovi with Moderna, and Novavax with Baxter). Partnering between pharmaceutical companies can increase the number of doses of the vaccine necessary for global vaccination. In addition, many voluntary licenses are concluded between vaccine producers and those (generic) producers with the right facilities and quality levels to produce in license. For example, Astra Zeneca has signed over 20 such agreements in 15 different countries. Currently, 329 voluntary licensing agreements are in place with over 225 involving voluntary technology transfers.

[164] Callaway, E. (2020) "The unequal scramble for coronavirus vaccines – by the numbers," Nature 584, 506-507 (2020).

[165] Evenett, S. (2021) "Export Controls on COVID-19 Vaccines: Has the EU Opened Pandora's Box?", 31 January 2021.

[166] Nawrat, A. (2021) "EU/AZ Covid-19 vaccine row: what is the exit strategy", Pharmaceutical Technology, 4 February 2021

[167] Evenett, S., B. Hoekman, N. Rocha, and M. Ruta (2021) "The COVID-19 Vaccine Production Club: Will Value Chains Temper Nationalism?", World Bank Policy Research Working Paper 9565, 2021.

Regarding the third approach, groups like Gavi ("a Geneva-based funder of vaccines for low-income countries"), the WHO, and the Coalition for Epidemic Preparedness Innovations (CEPI), "a fund based in Oslo that was created to finance and coordinate vaccines for outbreaks" can be involved in a concerted effort obtain vaccine supplies for the rest of the world. Western governments with "excess" vaccine reserves can use the auspices of these groups to send doses to low- and middle-income countries and economies and even some "wealthier" countries having the economic capacity to defray some or all of the costs. Indeed, on 1 May 2021 the Biden Administration announced it would make available "excess" vaccine doses to countries in need, amounting to 60 million doses. Also, G7 countries have pledged doses and the EU in April announced it had exported as many vaccines are were administered.

Fourth – is expedited regulatory approval (e.g., under Emergency Use Authorizations by the FDA in the US) of more vaccines that are in clinical trial Phase 3, if they meet the regulatory criteria. Such action would allow other vaccines to contribute to global vaccinations efforts. Currently 16 vaccines have been approved, 5 are authorized for early / limited use and 32 are in clinical trial Phase 3.

The fifth argument is shifting focus to making sure that when by the end of 2021 and early 2022, sufficient quantities of vaccines are produced globally to vaccinate the world, these vaccines also reach citizens in lower-middle and low-income countries where the healthcare system infrastructure and capacities are much weaker. Will a healthcare system in Mozambique or in the Democratic Republic of Congo be able to rapidly administer available vaccines before they expire? According to GAVI, between June 2021 and September 24, 2021, 385.000 doses of the Oxford/AstraZeneca COVID-19 vaccine delivered by COVAX to middle- and low-income countries were thrown away.[168] Of those 385.000, 294.000 were discarded in Africa, 52.000 in the Eastern Mediterranean, and 39.000 in the Americas. The reasons for this waste were: product hesitancy, preference for other vaccine products, late introduction, slow roll-out and limited vaccination access sites. The latter two arguments illustrate the challenge some healthcare systems have in terms of their infrastructure and distributional capacities.

Finally, sixth, vaccine hesitancy is a challenge. A poll by Gallup (2020) has shown that vaccine willingness varies tremendously between countries – from 96% of citizens in Myanmar willing to take a vaccine, down to 30% for Hungary, 29% for Gabon and 25% for Kazakhstan. Also, in several high-income and higher-middle income countries vaccine hesitancy is pervasive. Addressing vaccine hesitancy, by explaining what vaccines do, and by explaining the differences in chances of survival between vaccinated and non-vaccinated people are key strategies to address vaccine hesitancy.

[168] Politico (15 October 2021), "Countries throw away 385.000 expired COVAX coronavirus vaccines", Ashleigh Furlong, October 2021.

The motivations for such efforts need not rely exclusively on altruism. As has become evident, recently the virus has the capacity to mutate in ways that variants of unknown resistance to current vaccines can arise. Vaccines may be less effective against these variants[169] and thus it is in everyone's interest to extend vaccination globally (regardless of how daunting that challenge may be) to reduce the probability of such variants arising.

The efforts being applied globally to develop vaccines, treatments, and better tests and technology in response to COVID-19 have been impressive. We can hope that, ultimately, these efforts will prove to be successful. Intellectual property protection has a role to play in these efforts. Past experience and recent developments suggest that protecting IP for vaccines, therapies, and technologies to fight COVID-19 will have a positive impact, and advance the cause of eradicating, or at least treating, and preventing this disease. IP is part of the solution, not part of the problem.

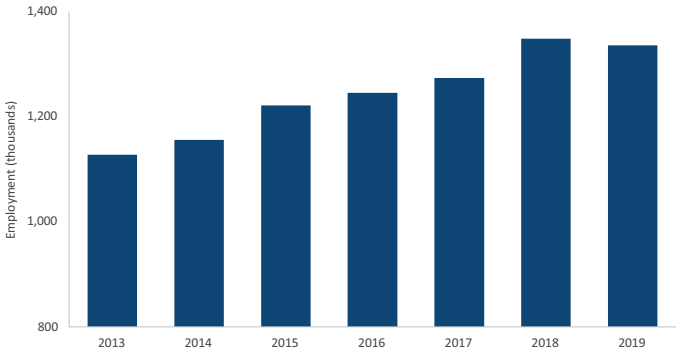
The current outcry calls for governments and the rest of us to heed Kipling's admonition regarding the aspiration to "keep your head when all about you/Are losing theirs and blaming it on you." Let's hope they can do so.

[169] Noonan, K. (2021) Do mRNA-based COVID Vaccines Have an Achilles Heel?, Patent Docs weblog, January 26, 2021. URL: https://www.patentdocs.org/2021/01/do-mrna-based-covid-vaccines-have-an-achilles-heel.html

TURKEY

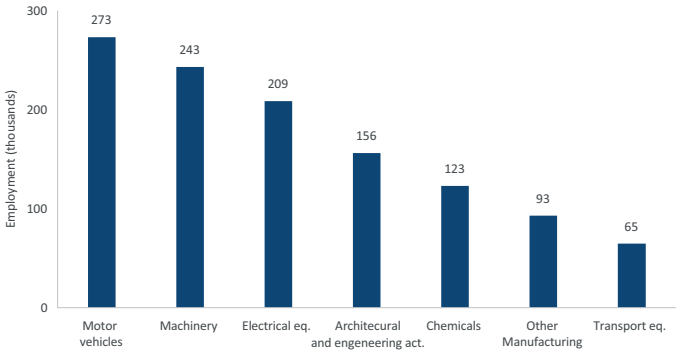
Intellectual Property (IP) is very important for Turkey economically, socially, and more broadly for society. This summary shows the relevance of IP-intensive sectors for Turkish employment overall (Figure 1) and employment per sector (Figure 2), as well as for the production of IP-intensive sectors in Turkey overall (Figure 3) and per sector (Figure 4). Higher production per person overall and at sector level translates into higher wages and thus higher-paid jobs. Figure 5 shows how the level of labour productivity in Turkey has evolved over time, while in Figure 6, we show the level of labour productivity at sector level.

Figure 1: Total employment for IP-intensive sectors (2013-2019)



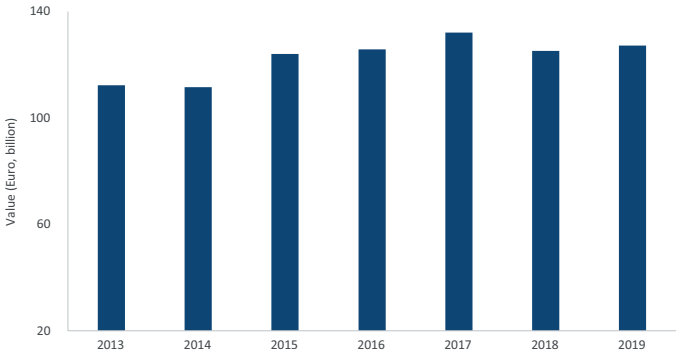
Source: ILO. Authors' Calculations.

Figure 2: Employment for IP-intensive sectors (2019)



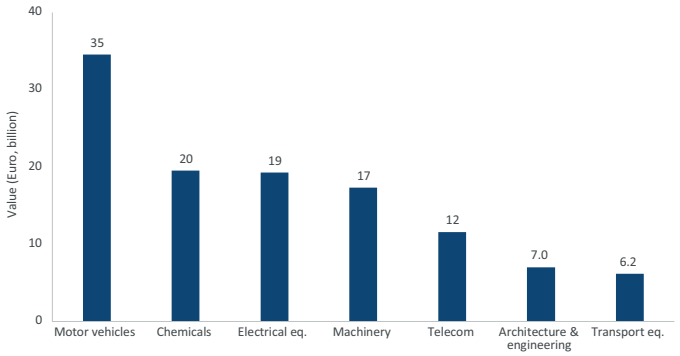
Source: ILO. Authors' Calculations.

Figure 3: Total production for IP-intensive sectors (2013-2019)



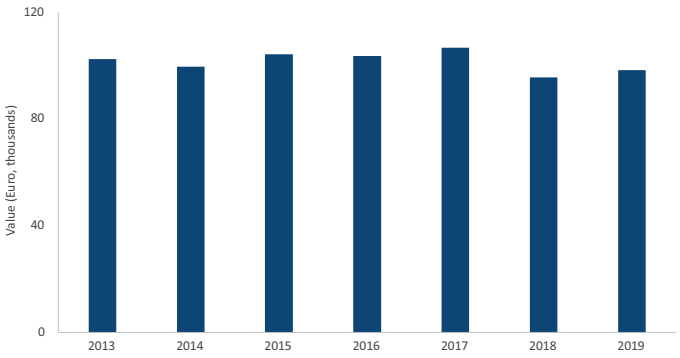
Source: OECD. Authors' Calculations.

Figure 4: Production for IP-intensive sectors (2019)



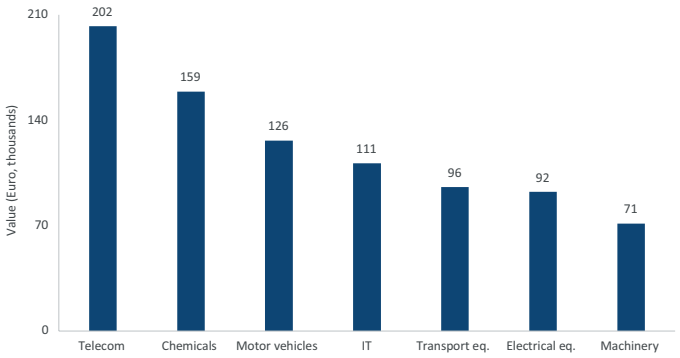
Source: OECD. Authors' Calculations.

Figure 5: Labour productivity for IP-intensive sectors (2013-2019)



Source: ILO, OECD. Authors' Calculations.

Figure 6: Labour productivity for IP-intensive sectors (2019, production per employee)



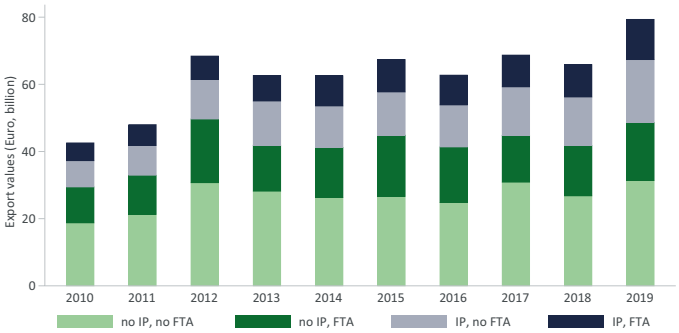
Source: ILO, OECD. Authors' Calculations.

Intellectual Property is important for the Turkish economy. The IP-intensive sectors in Turkey employed 1.1 million workers in 2013 and 1.3 million in 2019, a significant annual increase as shown in Figure 1. The main IP-intensive sectors in terms of employment are motor vehicles, machinery, and electrical equipment as shown in Figure 2. IP-intensive sectors have rapidly become increasingly important for the Turkish economy. Production of IP-intensive sectors rose from €112 bn to over €127 bn from 2013 to 2019 (Figure 3). The main IP-intensive sectors contributing to Turkish production are motor vehicles, chemicals, but also electrical equipment, and machinery (Figure 4). Turkish labour productivity in IP-intensive sectors has risen between 2013 and 2019 although as a result of the devaluation of the Turkish lira against the euro, the trend in euros shown in Figure 5 is mostly flat – from €102 to €98 thousand per employee. Finally, in Figure 6, we see that the sectors with the highest levels of labour productivity are telecom (€202 thousand per employee), chemicals (€159 thousand per employee) and motor vehicles (€126 thousand per employee).

TURKEY

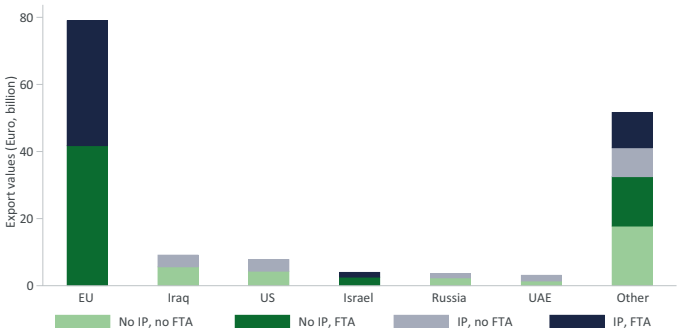
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and Turkish exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, a stronger Turkish IP framework is correlated with a higher Turkish share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in Turkey (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



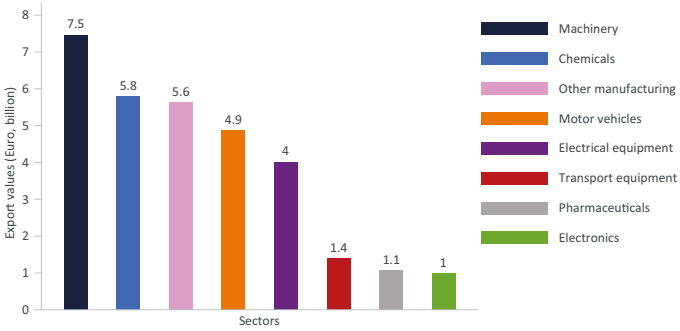
For Turkey, the share of IP-intensive exports outside the EU has gone up from 16% in 2010 to 19% in 2019.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



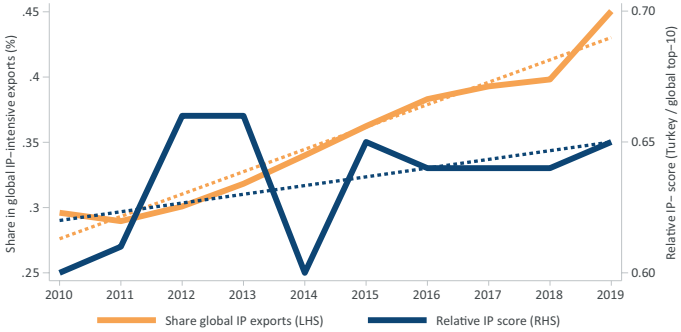
The EU (€ 79 bn), Iraq (€ 9.1 bn), the US (€ 7.8 bn), Israel (€ 4 bn) and Russia (€ 3.7 bn) are the main Turkish export destinations. For these markets IP-intensive exports constitute 46% of total exports.

Figure 3: Total exports by IP-intensive sectors (2019)



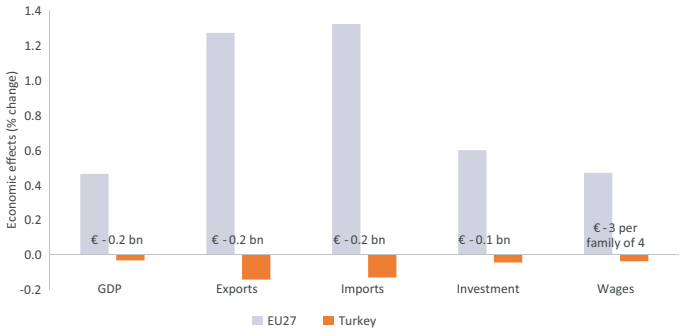
The top-8 IP-intensive manufacturing sectors together export € 31 bn in 2019 and contribute significantly to Turkish trade surplus. The largest Turkish export sectors that depend on IP are machinery (€ 7.5 bn) and chemicals (€ 5.8 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



In recent years, Turkey reports an increase in its relative IP score compared to the global top-10. This corresponds to a rise in Turkey's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



Because the EU has a CU with Turkey that allow ample room for stronger IP provisions, if these are agreed upon in a future update of the EU-Turkey CU, stronger IP provisions will have a significant positive impact on Turkey.

UNITED KINGDOM

Intellectual property matters for an economy like the British one. Figure 1 shows the role of the subset of 12 most IP-intensive sectors in producing goods and services and creating jobs in the United Kingdom. In Figure 2, we show how relevant different types of IP are for the British economy in terms of value-added. Figure 3 shows the economic value of goods and services created in the United Kingdom as part of global value chains, because a final product these days contains inputs from many different countries. The level of labour productivity (Figure 4) is an indication of the quality of jobs created. If workers produce more, they are in better paid jobs of higher quality. The SME R&D index (Figure 5) shows how crucial R&D is for SMEs: a higher index indicates more SMEs for which R&D is important. Finally, Figure 6 shows the main levels of investment for IP-intensive sectors.

Figure 1: IP-intensive sector production and employment (2012-2018)

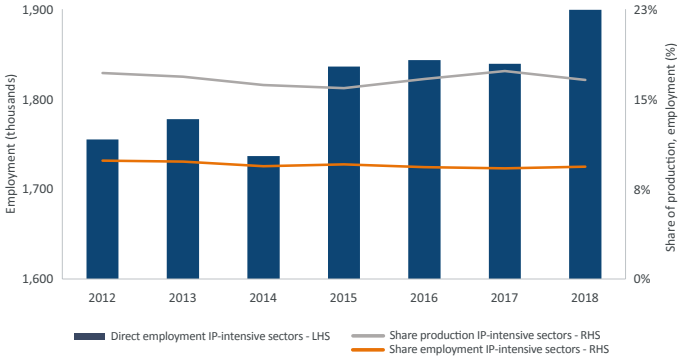


Figure 2: Economic relevance of each type of IP (2014-2016, EUIPO)

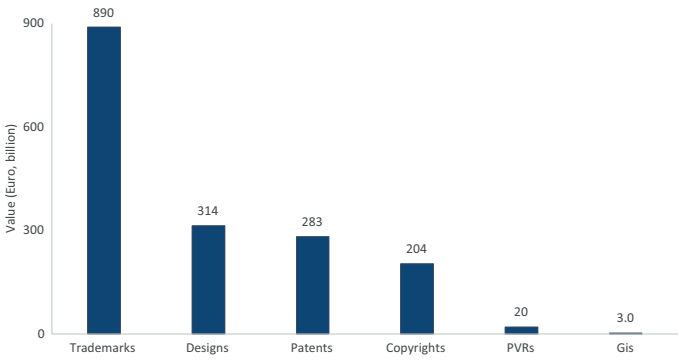


Figure 3: Value-added for IP-intensive sectors (2018)

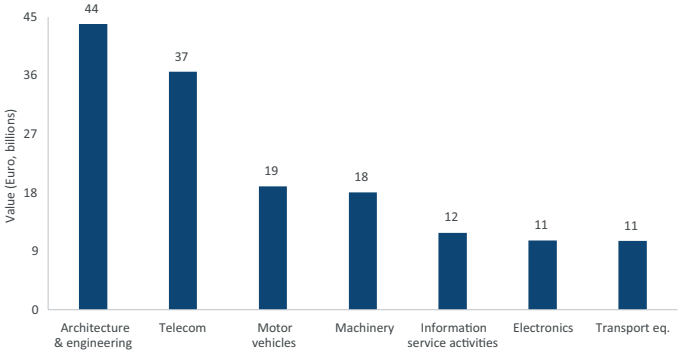


Figure 4: Labour productivity for IP-intensive sectors
(2018, value added per employee)

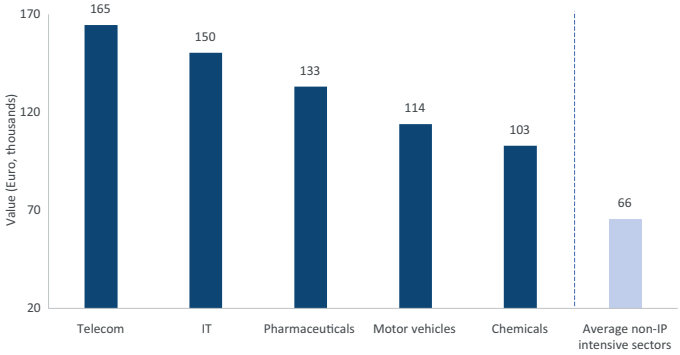


Figure 5: Index of SME R&D potential (2018)

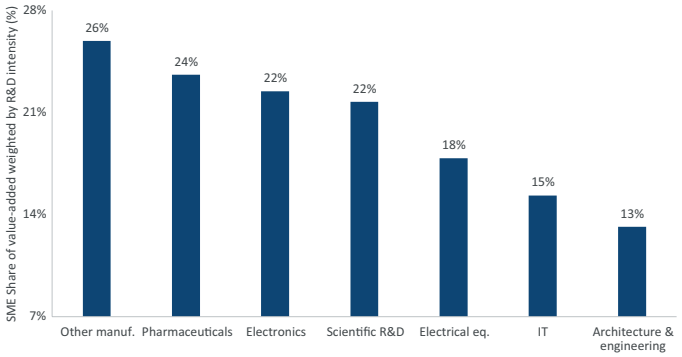
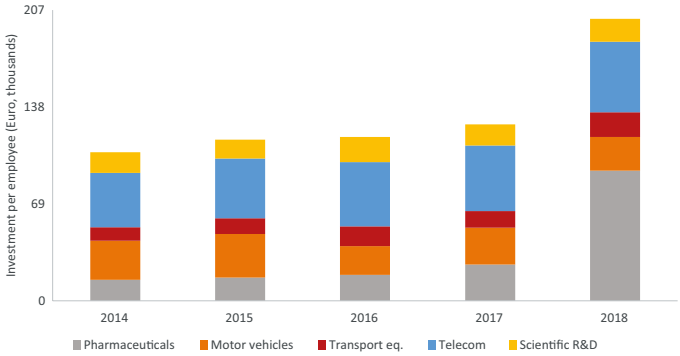


Figure 6: Investment per employee for IP-intensive sectors (2014-2018)



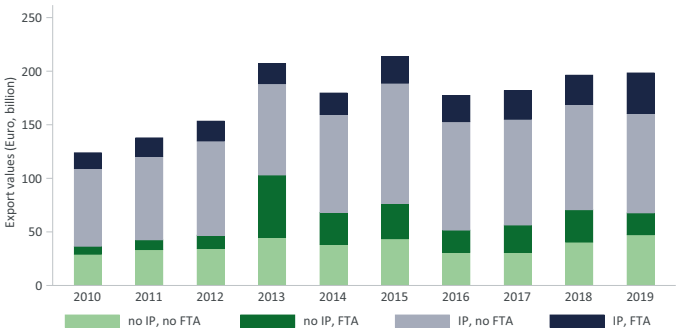
Note: Eurostat 2019 data not available at the time of the analysis.

Intellectual Property is highly relevant for the British economy. The IP-intensive sectors in the United Kingdom employ close to 2 million workers directly and represent 17% of total British production (Figure 1). Trademarks (€890 bn), designs (€314 bn), and patents (€283 bn) are the most important types of IP for the British economy (Figure 2). Most economic value in the United Kingdom is created by the architecture & engineering (€44 bn), telecom (€37 bn), and motor vehicles (€19 bn) industries (Figure 3). The economic sectors which are more intensive in IP are also more productive than the rest of the British economy (telecom, IT services, pharmaceuticals) creating the highest value jobs. Labour productivity in IP-intensive sectors in the United Kingdom is up to 2.5 times higher than for the average of sectors that are not IP-intensive (Figure 4). Pharmaceuticals, telecom, and motor vehicles are the IP-intensive sectors with the highest levels of investment per employee in the United Kingdom (Figure 6). British SMEs make a significant contribution to value-added in sectors with high R&D spending such as other manufacturing and pharmaceuticals, but also electronics and scientific R&D (Figure 5).

UNITED KINGDOM

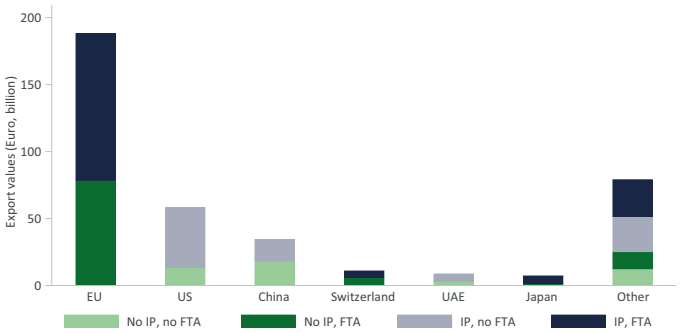
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and British exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the British IP framework is related with the British share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in the United Kingdom (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



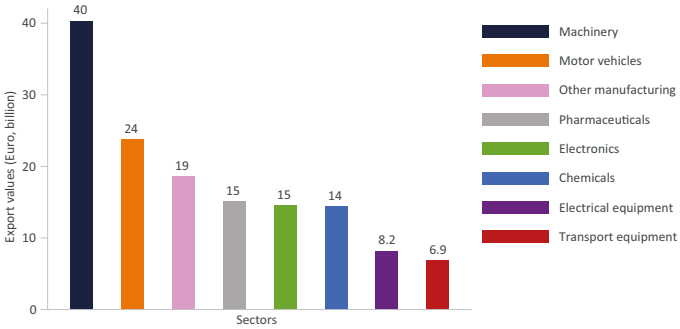
For the United Kingdom, the share of IP-intensive exports outside the EU has gone up from 31% in 2010 to 34% in 2019.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



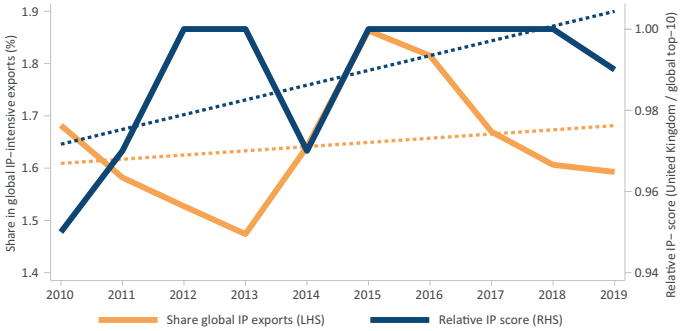
The EU (€ 188 bn), the US (€ 58 bn), China (€ 34 bn), Switzerland (€ 11 bn) and the United Arab Emirates (UAE) (€ 8.7 bn) are the main British export destinations. For these markets IP-intensive exports constitute 81% of total exports.

Figure 3: Total exports by IP-intensive sectors (2019)



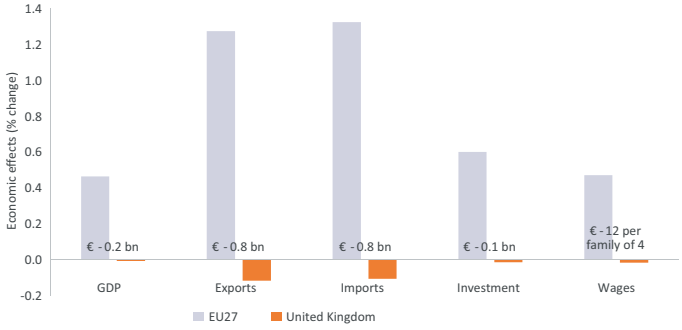
The top-8 IP-intensive manufacturing sectors together export € 142 bn in 2019 and contribute significantly to British trade surplus. The largest British export sectors that depend on IP are machinery (€ 40 bn) and motor vehicles (€ 24 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



In recent years, the United Kingdom reports an increase in its relative IP score compared to the global top-10. This corresponds to a decline in the United Kingdom's share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



The EU-UK FTA does not include a meaningful IP chapter which was modelled at the time the econometric work was done. If also the EU-UK FTA would – in the future – include stronger IP provisions to the level of EU law, positive effects would occur.

UNITED STATES

Intellectual Property (IP) is very important for the United States economically, socially, and more broadly for society. This summary shows the relevance of IP-intensive sectors for US employment overall (Figure 1) and per sector (Figure 2), as well as for the economic value created in the US overall (Figure 3) and per sector (Figure 4). Economic value matters because the US is a key actor in global value chains and higher productivity also translates into higher wages and thus higher-paid jobs. Figure 5 shows the level of labour productivity per sector in the US, and in Figure 6, we show the level of investments over time, focusing on the five main US sectors.

Figure 1: Total employment for IP-intensive sectors (2013-2019)

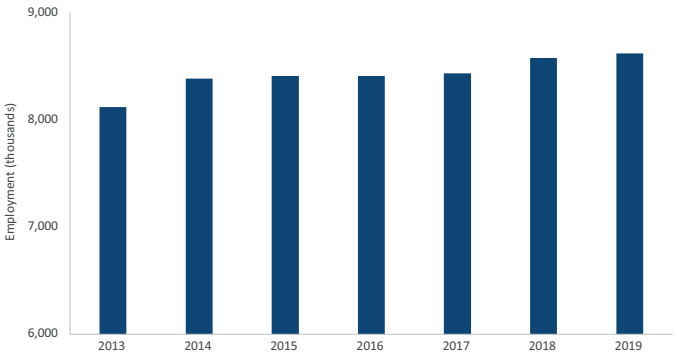


Figure 2: Employment for IP-intensive sectors (2019)

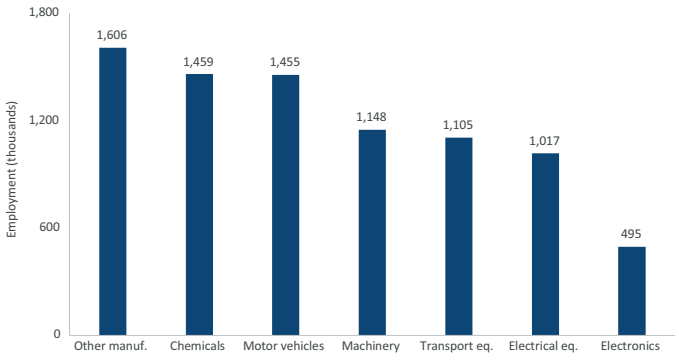


Figure 3: Total value-added for IP-intensive sectors (2013-2019)

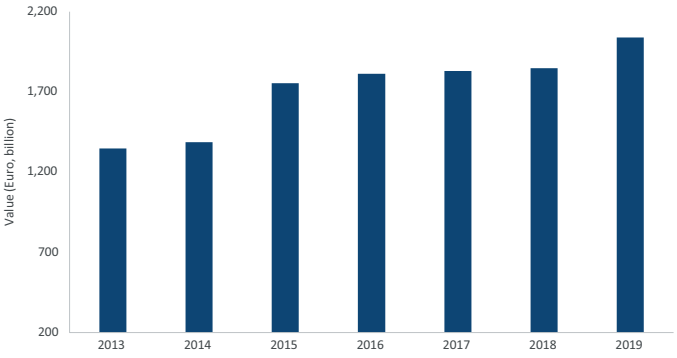


Figure 4: Value-added for IP-intensive sectors (2019)

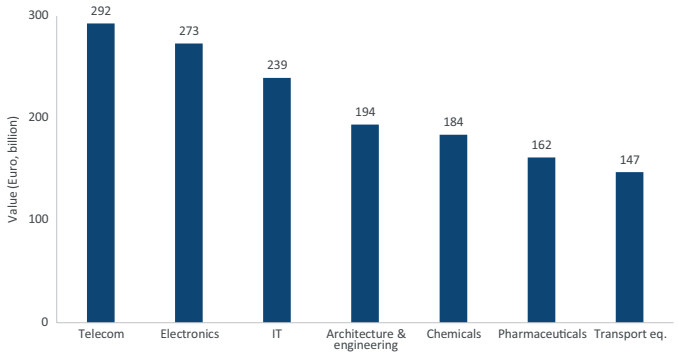


Figure 5: Labour productivity for IP-intensive sectors
(2019, value-added per employee)

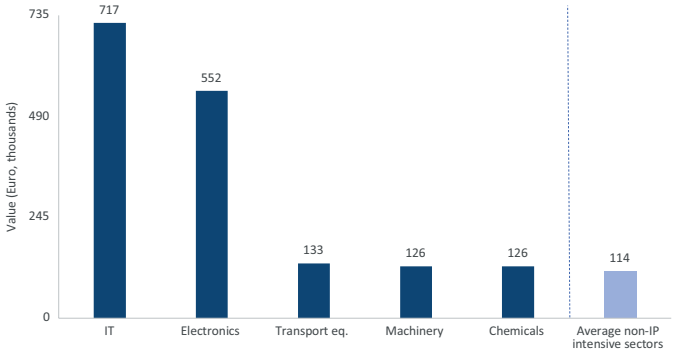
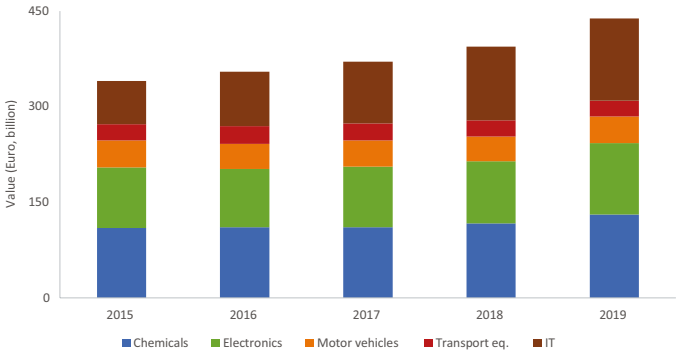


Figure 6: Investment in IP-intensive sectors
(2015-2019, Gross Fixed Capital Formation)



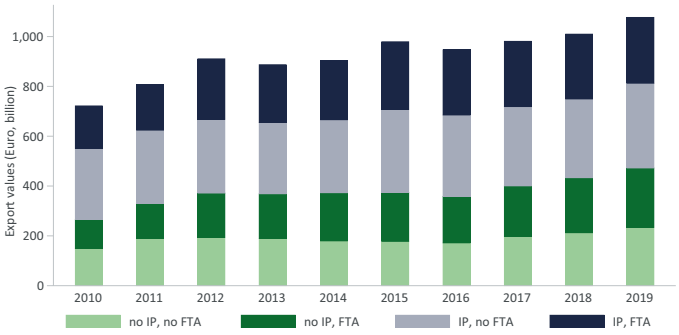
Source: OECD. Authors' Calculations.

Intellectual Property is hugely important for the US economy. The IP-intensive sectors in the US employ around 8.6 million workers directly, increasing significantly since 2013 (Figure 1). The main IP-intensive sectors in terms of employment are other manufacturing (1.6 million jobs), chemicals (1.5 million jobs), and motor vehicles (1.5 million jobs) as shown in Figure 2. The US economy has shown a remarkable growth in value added created by IP-intensive sectors between 2013 and 2019, from €1.35 trn in 2013 to €2.04 trn in 2019 (Figure 3). The main sectors contributing to US value added are telecom (€292 bn), electronics (€273 bn) and IT (€239 bn) as shown in Figure 4. The economic sectors which are more intensive in IP are also more productive than the rest of the US economy (IT, electronics, and transport equipment) creating the highest-value and highest-paid jobs (Figure 5). The IT industry is six times as productive as the average level of non-IP intensive industries. Finally, when looking at investments, we see that chemicals, IT, and electronics are the top-3 sectors in the US (Figure 6).

UNITED STATES

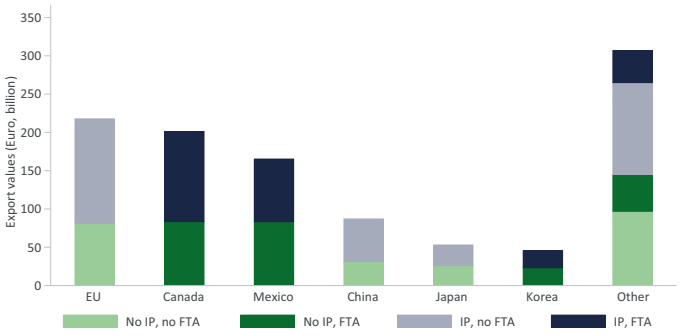
The EU's Free Trade Agreements (FTAs) are important for IP-intensive industries because of how they impact EU and American exports overall (Figures 1, 2 and 4) and at sector level (Figure 3). Moreover, the American IP framework is related with the American share in global IP-intensive exports (Figure 4) and stronger IP provisions in EU FTAs lead to higher GDP, exports, imports, investments, and family incomes in the United States (Figure 5). IP-intensive sectors benefit in terms of exports and production and create more jobs as a result (Figure 6).

Figure 1: Total exports by IP intensity and FTA coverage (2010- 2019)



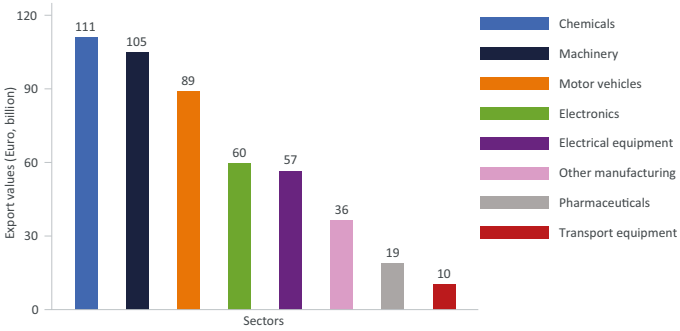
For the United States, the share of IP-intensive exports outside the EU has decreased from 63% in 2010 to 56% in 2019.

Figure 2: Main extra-EU export destinations by IP intensity and FTA coverage (2019)



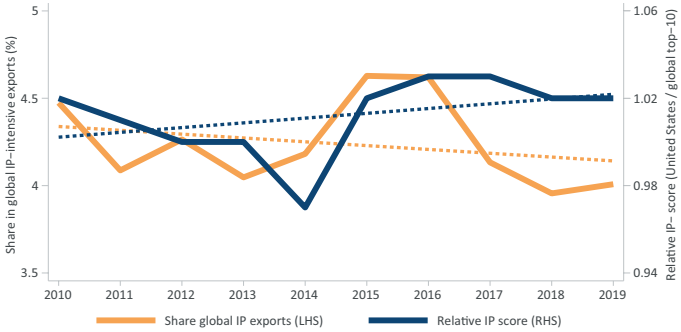
The EU (€ 218 bn), Canada (€ 201 bn), Mexico (€ 165 bn), China (€ 87 bn) and Japan (€ 53 bn) are the main American export destinations. For these markets IP-intensive exports constitute 58% of total exports.

Figure 3: Total exports by IP-intensive sectors (2019)



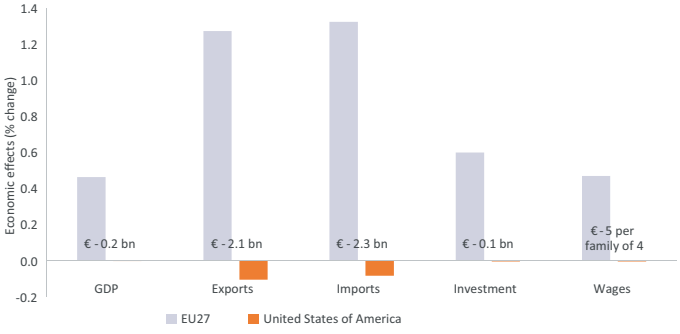
The top-8 IP-intensive manufacturing sectors together export € 487 bn in 2019 and contribute significantly to American trade surplus. The largest American export sectors that depend on IP are chemicals (€ 111 bn) and machinery (€ 105 bn).

Figure 4: Relative IPR score and share in global IP-intensive exports (2010- 2019)



In recent years, the United States reports an increase in its relative IP score compared to the global top-10. This corresponds to a decrease in the United States' share in global IP-intensive exports in recent years.

Figure 5: Macro-economic effects of stronger IP in EU FTAs (annual)



Because the EU does not have an FTA with United States, stronger IP provisions in EU FTAs will not impact this country. In fact, because IP is strengthened with competitor countries, the effect of not having an FTA with the EU becomes more negative.