
IPR-intensive industries and economic performance in the European Union

Industry-Level Analysis Report, September 2019
Third edition

A joint project between the European Patent Office and the
European Union Intellectual Property Office



Foreword

Innovation is a key component of the growth strategy adopted by the European Union (EU) and its Member States, as well as many other countries. The aim is to create a more competitive economy with higher employment. The achievement of this goal depends on several different factors, but an efficient system of intellectual property rights (IPR) undoubtedly ranks among the most important, given IP's capacity to encourage creativity and innovation throughout the economy.

In response to the clear need to provide policymakers and the public with accurate information, the European Union Intellectual Property Office (EUIPO) and the European Patent Office (EPO) joined forces in 2013 to carry out a study that quantified the economic contribution made to the EU economy by IPR-intensive industries.

This study has now been updated for the second time, demonstrating that in the intervening period IPR-intensive industries have become even more integral to GDP, employment and trade in Europe.

Europe already has a long tradition of encouraging creativity and innovation: the Member States of both the EU and the European Patent Organisation have played a major role in shaping a modern and balanced system of IPR which not only guarantees innovators their due reward but also stimulates a competitive market. In today's world of increasingly globalised markets and the knowledge economy, it is vital to ensure that this system remains effective for implementing new innovation policies. To assist us in that task, it is essential that the debate on IP's role in supporting innovation and creativity be based on sound evidence.

The first joint study, carried out in 2013, revealed that IPR-intensive industries accounted for 39% of the EU's economic output and 26% of employment during the period 2008-2010, attesting to the value of IP to the European economy. The study was repeated in 2016, covering the period 2011-2013, and showed that, even during a severe financial crisis and recession in much of Europe, the IPR-intensive sectors coped better with the difficult conditions than did the rest of the economy.

To safeguard the enduring value of the study, the third edition includes new elements which provide a substantially improved overview of the situation of IPR industries in Europe. Firstly, the database matching used to identify IPR-intensive industries has been refreshed, resulting in an updated list of the sectors concerned. Secondly, the report matches the contemporary focus of policymakers in Europe and beyond with a specific chapter on the economic importance of climate change mitigation technologies (CCMTs) and the information technology sectors that are driving the Fourth Industrial Revolution (4IR). Finally, in addition to providing data for the EU Member States, this report also includes information for Iceland, Norway and Switzerland.

This new edition of the report shows that the shares of these industries in EU employment and GDP are higher than in the 2016 study, and confirms the increasing centrality of intellectual assets in modern economies.

These are significant findings that serve to underline further the contribution of IPR-intensive industries to the prosperity and competitiveness of Europe. Equipped with this updated study, it is our hope that readers can draw upon this information to ensure the continuing strength not just of our intellectual property system, but also of the European economy in which it has been found to play such a vital part.

A handwritten signature in black ink, appearing to read 'Archambeau', with a long horizontal stroke extending to the right.

Christian Archambeau
Executive Director, EUIPO

A handwritten signature in black ink, appearing to read 'António Campinos', with a large initial 'A' and a long horizontal stroke extending to the right.

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About this study

One of the mandates of the EUIPO through its European Observatory on Infringements of Intellectual Property Rights ("the Observatory")¹ is to provide evidence-based data on the impact, role and public perception of intellectual property in the economy of the European Union (EU). In order to meet that objective, the Observatory is conducting a programme of socio-economic studies.

Similarly, the Strategic Plan 2023 of the European Patent Office (EPO) prioritises the conduct of economic studies to meet the increasing demand among stakeholders for greater awareness of the impact of the European patent system and its development.

The present report, drawn up as a joint project between the EUIPO and the EPO and benefiting from input from other IP offices, European Commission services and international organisations, is the third major study resulting from this collaboration, following a first study published by the two offices in 2013² and an update released in 2016.³ It aims to provide an updated assessment of the combined contribution of industries that make intensive use of the various types of intellectual property rights (IPRs) to the economy of the EU as a whole as well as those of individual European countries. Although this report quantifies the collective contribution of IPR-intensive industries, it does not claim to show causal relationships between IP rights and economic variables.

The study covers a broad range of IP rights⁴ — trade marks, patents, designs, copyright, geographical indications (GIs) and plant variety rights (PVRs) — and considers a variety of economic indicators, in particular gross domestic product (GDP), employment, external trade and wages. It makes no policy recommendations, as this is not within its scope. Instead, it is designed to provide evidence that can be used by policymakers in their work, and to serve as a basis for raising IP awareness throughout Europe.

The 2013 study covered the period 2008-2010, and the 2016 update the period 2011-2013. The present study looks at the period 2014-2016. In order to ensure comparability between the three studies, the same methodology has been used as before. However, a number of improvements have been made as regards the underlying data and the methodology. In particular, the matching exercise used to identify IPR-intensive industries has been updated to ensure that the selection reflects recent developments. In addition, to complement the data for the EU member states, Iceland, Norway and Switzerland have been included in this study.

Given the increasing focus of policymakers and business leaders in Europe and beyond on developing technologies to deal with climate change, a chapter on the economic importance of climate change mitigation technologies (CCMTs) was added in the 2016 study and has been updated for the present edition. In this chapter, the economic weight of industries engaged in the development of those technologies is analysed in greater detail, based on data on patent filings at the EPO. In addition, a new section on the Fourth Industrial Revolution (4IR), also based on patent data, has

¹ The Observatory was transferred to the Office for Harmonization in the Internal Market (OHIM) under Regulation (EU) No 386/2012 of the European Parliament and of the Council of 19 April 2012, which entered into force on 5 June 2012. OHIM was renamed the European Union Intellectual Property Office (EUIPO) following the entry into force of Regulation (EU) 2015/2424 on 23 March 2016. Except in bibliographical references, its new name is used throughout this report.

² OHIM/EPO: "Intellectual property rights intensive industries: contribution to economic performance and employment in the European Union", September 2013.

³ EPO/EUIPO: "Intellectual property rights intensive industries and economic performance in the European Union", October 2016.

⁴ "IP" is usually, but not always, a result of innovation. However, it is a broader term than "IPR", as it includes other types of knowledge, such as trade secrets and business methods. In this study, "IPR" is used to refer to the six rights included in the analysis: patents, trade marks, registered designs, copyright, geographical indications and plant variety rights.

been introduced in the present report to account for the deep impact of digital transformation in a large array of industries.

Executive Summary

Main findings

- There are now 353 IPR-intensive industries in the EU economy, compared with the 342 identified in the previous (2016) study. Approximately two thirds of these industries are intensive in respect of more than one IP right.
- IPR-intensive industries generated 29.2% of all jobs in the EU during the period 2014-2016. On average over this period, they employed almost 63 million people in the EU. In addition, another 21 million jobs were generated in industries that supply goods and services to IPR-intensive industries. Taking indirect jobs into account, the total number of IPR-dependent jobs rises to 83.8 million (38.9%).
- Over the same period, IPR-intensive industries generated almost 45% of total economic activity (GDP) in the EU, worth €6.6 trillion. They also accounted for most of the EU's trade with the rest of the world and generated a trade surplus, thus helping to keep the EU's external trade broadly balanced.
- IPR-intensive industries pay significantly higher wages than other industries, with a wage premium of 47% over other industries. This is consistent with the fact that the value added per worker is higher in IPR-intensive industries than elsewhere in the economy.
- A comparison of the results of this study with those of the 2016 edition reveals that the relative contribution of IPR-intensive industries to the EU economy has increased between the two periods 2011-2013 (2016 study) and 2014-2016 (the present study), even after taking into account the change in the number of IPR-intensive industries.
- Among IPR-intensive industries, the economic weight of industries engaged in the development of climate change mitigation technologies (CCMTs) and those related to the Fourth Industrial Revolution (4IR) has increased in recent years. CCMT industries accounted for 2.5% of employment and 4.7% of GDP in the EU in 2014-2016, while the 4IR sectors made up 1.9% of employment and 3.9% of GDP during the same period.
- For the first time, comparable results on the contribution of IPR-intensive industries to GDP and employment are also shown for Iceland, Norway and Switzerland. The contribution of IPR-intensive industries to GDP was above the EU average in Norway and below it in Iceland and Switzerland. The contribution to employment was at or above the EU average in Iceland and Switzerland, but below it in Norway.

IPR-intensive industries in the EU economy

IPR-intensive industries are defined⁵ as those having an above-average ownership⁶ of IPRs per employee, as compared with other IPR-using industries. In principle, this means that an industry is identified as IPR-intensive in the EU if for at least one of the IP rights under consideration, the number of those IPRs per employee exceeds the average of all EU industries that make use of that same IP right. As is shown in Chapters 6 and 7, these industries are concentrated in the manufacturing, technology and business services sectors.

⁵ See Chapter 5 on methodology. Due to the particular nature of copyright, GIs and PVRs, different approaches had to be applied to them.

⁶ In this report, the expressions "use of IPRs" and "ownership of IPRs" are used interchangeably and should be understood to refer to ownership of IPRs in all cases.

It should be emphasised, however, that most industries use IP rights, often in combination, to some extent. By focusing exclusively on IPR-intensive industries, this study covers that part of the European economy in which IP rights are most prominent.⁷

The contribution of IPR-intensive industries to the two principal economic indicators - employment and output - is summarised in Tables 1 and 2.^{8,9}

IPR-intensive industries are shown to have generated 29.2% of all jobs in the EU during the period 2014-2016, with 22% in trade-mark-intensive industries, 14% in design-intensive industries, 11% in patent-intensive industries, 5.5% in copyright-intensive industries, and smaller proportions in GI-intensive and PVR-intensive industries.¹⁰ On average over this period, nearly 63 million Europeans were employed by IPR-intensive industries, out of a total employment figure of approximately 216 million. In addition to their direct employment contribution, IPR-intensive industries also generate employment in other, non-IPR-intensive industries which supply them with goods and services as inputs to their production processes. Using the EU input-output tables¹¹ published by Eurostat, it is possible to calculate this indirect effect on employment in non-IPR-intensive industries. Taking this indirect effect into account, the total number of IPR-dependent jobs rises to almost 84 million (38.9%).

The results are summarised in Table 1, which shows a breakdown by direct and indirect employment.

Table 1: Direct and indirect contribution of IPR-intensive industries to employment, 2014-2016 average

IPR-intensive industries	Employment (direct)	Share of total employment (direct)	Employment (direct+indirect)	Share of total employment (direct+indirect)
Trade-mark-intensive	46 700 950	21.7%	65 047 936	30.2%
Design-intensive	30 711 322	14.2%	45 073 288	20.9%
Patent-intensive	23 571 234	10.9%	34 740 674	16.1%
Copyright-intensive	11 821 456	5.5%	15 358 044	7.1%
GI-intensive	n/a	n/a	399 324	0.2%
PVR-intensive	1 736 407	0.8%	2 618 502	1.2%
All IPR-intensive	62 962 766	29.2%	83 807 505	38.9%
Total EU employment			215 520 333	

Note: Due to overlapping use of IP rights, the sum of the figures for the individual IPRs exceeds the total figure for IPR-intensive industries.

Besides employment, IPR-intensive industries contribute to economic output, as measured by gross domestic product (GDP). Table 2 shows that, overall, almost 45% of EU GDP is generated in IPR-

⁷ The industries identified as IPR-intensive in this report accounted for 73% of the European Union Trade Marks (EUTMs), 83% of the Registered Community designs (RCDs), 86% of the European patents and 96% of the Community Plant Variety Rights registered during the period covered.

⁸ In order to minimise the impact of data gaps in the economic statistics and avoid attaching undue importance to a particular year, the economic indicators were calculated as an average for the years 2014-2016.

⁹ It should be noted that the shares in GDP and employment shown do not necessarily reflect the degree to which a country is innovative, but rather the importance of these industries in its economy.

¹⁰ The total contribution of IPR-intensive industries is less than the sum of the individual contributions of trade-mark-intensive, patent-intensive, design-intensive, copyright-intensive, PVR-intensive and GI-intensive industries because many industries are intensive in respect of more than one IP right. However, the study methodology ensures that there is no double-counting of industry contributions.

¹¹ Input-output tables show the flow of goods and services between all industries in the economy.

intensive industries, with trade-mark-intensive industries accounting for 37%, design-intensive industries 16%, patent-intensive industries 16%, copyright-intensive industries 7% and GI-intensive and PVR-intensive industries for smaller percentages. Chapter 7 provides a more detailed breakdown of these industries' contributions to the national economies of the EU Member States as well as the three non-EU member countries included in this study.

Table 2: Contribution of IPR-intensive industries to GDP, 2014-2016 average

IPR-intensive industries	Value added/GDP (€ million)	Share of total EU GDP
Trade-mark-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 IPR-intensive	6 551 768	44.8%
Total EU GDP	14 621 518	

Note: Due to overlapping use of IP rights, the sum of the figures for the individual IPRs exceeds the total figure for IPR-intensive industries.

A comparison of the results of this study with those of the 2016 edition reveals that the contribution of IPR-intensive industries to the EU economy was higher in the 2014-2016 period than in 2011-2013. However, the comparison is complicated by the fact that certain key components of the European system of national and regional accounts (ESA) used by Eurostat were updated between these two periods. In addition, in order to ensure that this study reflects the current structure of the EU economy, the matching exercise used to identify IPR-intensive industries was updated, resulting in an increase of the number of these industries from 342 in the 2016 study to 353 in the present one. These updates had the effect of increasing the contribution to GDP and employment of IPR-intensive industries. In Table 3, the 2011-2013 figures have been re-calculated using the new definitions so as to illustrate the impact of these changes.

Table 3: Comparison of the main results: 2016 vs. 2019 study

Contribution of IPR-intensive industries	2016 study (original)	2016 study (new national account calculations, new IPR-intensive industries)	2019 study (new national account calculations, new IPR-intensive industries)
Employment (direct)	27.8%	28.6%	29.2%
GDP	42.3%	44.0%	44.8%
Total trade in goods	89.3%	88.8%	92.5%
Total trade in goods and services	<i>not calculated</i>	78.1%	81.0%

The first column contains the results reported in the 2016 study for the period 2011-2013. The second column re-calculates the 2016 results for the same period, taking into account the new national accounting calculations and the new list of IPR-intensive industries. The third column shows the results of the present study (for the period 2014-2016) and is therefore directly comparable with the second column.

Thus, even after the effects of the statistical revisions have been taken into account, the contribution of IPR-intensive industries has increased between the two periods 2011-2013 (2016 study) and 2014-2016 (2019 study).

There are also indications that during the difficult economic conditions that prevailed in 2014-2016, employment in IPR-intensive industries held up significantly better than overall employment. Total employment in the EU declined slightly from 215.8 million in 2011-2013 to 215.5 million in 2014-2016, a fall of 0.1%, while employment in the 353 IPR-intensive industries rose from 61.7 million to 63 million (+1%).

Given that 44.8% of GDP (value added) in the economy and 29.2% of employment is generated in IPR-intensive industries, the value added *per employee* is higher in IPR-intensive industries than in the rest of the economy. Economic theory suggests that, all else being equal, industries in which the average worker produces more value added can be expected to pay their workers higher wages than other industries. It is therefore interesting to examine whether this higher value added is reflected in wages in IPR-intensive industries.

As shown in Table 4, wages in IPR-intensive industries are indeed higher than in non-IPR-intensive industries. The average weekly wage in IPR-intensive industries is €801, compared with €544 in non-IPR-intensive industries – a difference of 47%. This "wage premium" is 29% in GI-intensive industries, 40% in design-intensive industries, 48% in trade-mark-intensive industries, 59% in copyright-intensive industries and 72% in patent-intensive industries.

Table 4: Average personnel costs in IPR-intensive industries, 2016

IPR-intensive industries	Average personnel costs (€ per week)	Premium (compared with non-IPR-intensive industries)
Trade-mark-intensive	805	48%
Design-intensive	761	40%
Patent-intensive	934	72%
Copyright-intensive	867	59%
GI-intensive	705	29%
PVR-intensive*	n/a	n/a
All IPR-intensive industries	801	47%
Non-IPR-intensive industries	544	
All industries (included in SBS**)	654	

*Not calculated because of lack of wage statistics for agriculture.

**Structural Business Statistics published by Eurostat.

Compared with the situation in 2013 (re-calculated using the new set of IPR-intensive industries), the wage premium has increased slightly from 45% to 47%, reflecting particularly strong increases in wage premiums for patent-intensive and design-intensive industries.

The role played by IPR-intensive industries in the EU's external trade is also examined. In the 2016 report, only trade in goods was reported. Since then, Eurostat has begun to provide data on trade in services as well, so in the present report the two types of trade are treated separately. The bulk of EU trade is in IPR-intensive industries. It may be somewhat surprising at first glance that such a high share of trade is IPR-intensive. This is because even some industries producing commodities such as energy are IPR-intensive,¹² while on the other hand, many non-IPR-intensive activities are also non-tradable.¹³ For that reason, 89% of EU goods imports consist of products of IPR-intensive industries. However, an even higher share of EU goods exports - 96% - is accounted for by IPR-

¹² NACE class 0610 (*Extraction of crude petroleum*) is patent-intensive.

¹³ For example, service industries such as those included in NACE divisions 86 (*Human health activities*) and 96 (*Other personal service activities*). Such services are generally consumed at the point of production.

intensive industries. In the case of trade in services, the share of IPR-intensive industries is lower, with imports accounting for 57.4% of total services imports, and exports at 53.7% of total services exports. Taking both goods and services trade into account, in 2016 80% of EU imports and 82% of EU exports were generated by IPR-intensive industries.

The EU as a whole had an overall trade surplus in 2016 of approximately €166 billion, or 1.1% of GDP. The trade surplus in IPR-intensive industries was even greater, at €182 billion, thus counterbalancing a small deficit in non-IPR intensive trade.

Table 5 summarises trade volumes in IPR-intensive industries based on data from 2016.¹⁴

Table 5: EU external trade in IPR-intensive industries, 2016

IPR-intensive industries	Exports (€ million)	Imports (€ million)	Net exports (€ million)
Trade-mark-intensive	1 613 366	1 600 703	12 663
Design-intensive	1 261 774	1 194 885	66 889
Patent-intensive	1 438 117	1 307 850	130 267
Copyright-intensive	294 856	202 738	92 119
GI-intensive*	12 490	1 360	11 130
PVR-intensive*	7 552	3 885	3 667
Total IPR-intensive	2 122 465	1 940 510	181 955
TOTAL EU TRADE	2 590 889	2 425 202	165 687

Note: Due to overlapping use of IP rights, the sum of the figures for the individual IPRs exceeds the total figure for IPR-intensive industries.

*Goods only.

Patent-intensive industries have the highest trade surplus, followed by the copyright-intensive and design-intensive sectors.

A closer look at the activity of IPR-intensive industries within the EU Single Market reveals a division of labour between EU Member States. Countries such as Austria, Denmark, Finland, Germany, Luxembourg, Malta and Sweden are above the EU average in terms of IPR creation per employee. IPR-intensive industries in other EU member states, such as Romania, Slovakia, Hungary and the Czech Republic, have the highest proportion of jobs that are attributed to companies based in other countries. As shown in Table 6, overall, 22.7% of EU jobs in IPR-intensive industries are generated in subsidiaries of foreign companies, a majority of which originate from another EU member state. Only in Estonia, the Netherlands, Great Britain and Ireland do non-EU companies create more jobs than companies from other EU member states.

¹⁴ As with the employment and GDP calculations, the figures for the individual IP rights do not add up to the overall figure for IPR-intensive industries due the fact that many industries are intensive in more than one IP right. However, the study methodology ensures that there is no double-counting of industry contributions.

Table 6: Share of employment in IPR-intensive industries attributed to foreign companies 2014-2016, EU average

IPR-intensive industries	EU share	Non-EU share	Total non-domestic share
Trade-mark-intensive	11.5%	9.2%	20.6%
Design-intensive	13.0%	9.8%	22.8%
Patent-intensive	14.5%	12.0%	26.5%
All IPR-intensive	12.9%	9.8%	22.7%

Note: "Foreign" companies are companies whose headquarters are located in another country.

Finally, patent data are used to identify IPR-intensive industries that are active in climate change mitigation technologies (CCMTs) aimed at reducing or preventing the emission of greenhouse gases¹⁵, and Fourth Industrial Revolution technologies (4IR), both of which are pervasive to many sectors and of particular importance for the EU economy. Overall, 9.4% of the total European patents considered in 2010-2014 related to CCMTs, while 1.9% related to 4IR technologies.

The 25 CCMT-intensive industries are of particular interest, since CCMTs will play an important role in achieving the goals set out in the Paris Agreement on Climate Change, and European companies are among the world leaders in many of those technologies. These sectors account for 2.5% of employment and 4.7% of economic output in the EU, and have seen their contribution increase since the period 2011-2013. Employees in those industries also receive a far higher remuneration than those in other industries. At 93.3% compared with non-IPR intensive industries, the "wage premium" in CCMT industries is almost double that of IPR-intensive industries in general (47%).

Driven by the emergence of the Internet of Things, 4IR encompasses a number of other technologies, such as cloud computing and artificial intelligence (AI). The 16 4IR-intensive industries (concentrated in advanced manufacturing sectors) account for 1.9% of EU employment and 3.9% of EU GDP, and have also seen their contribution increase since the period 2011-2013. The wage premium in 4IR industries is even higher than in CCMT industries, at 104.3% (compared with non-IPR intensive industries).

These figures are a subset of the patent-intensive industries and are thus already included in the overall figures in Tables 1-5.

¹⁵ The CCMT identification is based on the EPO's Y02/Y04S tagging scheme, which is part of the Cooperative Patent Classification (CPC). It covers selected technologies which control, reduce or prevent anthropogenic emissions of greenhouse gases [GHG] within the framework of the Kyoto Protocol and the Paris Agreement. For example, it includes technologies that help reduce greenhouse gas emissions related to energy generation, transmission or distribution and technologies that allow the capture, storage, sequestration or disposal of greenhouse gases, as well as information and communication technologies aimed at reducing their own energy use.

IPR-intensive industries in the economies of Iceland, Norway and Switzerland

In addition to the 28 EU Member States, the study also includes basic results for the EFTA countries Iceland, Norway and Switzerland.¹⁶ The contribution to employment and GDP of IPR-intensive industries in those countries is shown in Table 7 below. The EU average is included for reference purposes.

Table 7: Contribution of IPR-intensive industries to employment and GDP in EFTA countries, 2014-2016 average

IPR-intensive industries	Employment (direct)	Share of total employment (direct)	GDP (€ million)	Share of GDP
Trade-mark-intensive				
IS	40 029	23.0%	5 267	33.1%
NO	477 143	18.8%	150 312	42.5%
CH	1 023 493	23.4%	200 892	34.4%
Design-intensive				
IS	14 542	8.3%	1 060	6.7%
NO	256 256	10.1%	83 443	23.6%
CH	657 143	15.0%	114 456	19.6%
Patent-intensive				
IS	11 561	6.6%	1 499	9.4%
NO	284 366	11.2%	100 543	28.4%
CH	583 563	13.5%	123 513	21.1%
Copyright-intensive				
IS	13 547	7.8%	1 017	6.4%
NO	146 977	5.8%	18 210	5.1%
CH	252 252	5.8%	37 902	6.5%
All IPR-intensive				
IS	50 939	29.2%	6 294	39.6%
NO	669 540	26.3%	173 460	49.1%
CH	1 341 482	30.7%	241 518	41.3%
All IPR-intensive (EU)	62 962 766	29.2%	6 551 768	44.8%

Note: Due to overlapping use of IP rights, the sum of the figures for the individual IPRs exceeds the total figure for IPR-intensive industries.

Norway has an above-EU average contribution to its GDP from IPR-intensive industries, while Switzerland lies above the EU average when it comes to the employment contribution of those industries.

¹⁶ In calculating the contribution of IPR-intensive industries in those countries, it was assumed that industries that are IPR-intensive in the EU28 are also IPR-intensive in these three countries. In addition, due to lack of data coverage, it was not possible to calculate the contribution of GI-intensive and PVR-intensive industries for these three countries.

Methodology and data

The basic methodology of this study is the same as that used in the previous studies. Nevertheless, to make this report self-contained, a large part of it, specifically Chapter 5 and Appendix 11, is devoted to documenting this methodology. There are two main reasons for this:

- (1) Given the complexity of dealing with a large amount of data from 28 Member States, contained in several large databases, a novel and sophisticated data matching methodology was needed.
- (2) In the interests of transparency, it was important to provide as thorough a description of the methodology as possible.

Another distinguishing feature of this study is the wide variety of databases and other data sources used to determine which industries are IPR-intensive and to assess the contribution of these industries to employment, GDP and other economic indicators. A full list is given in Chapter 5.

In addition, industry-specific third-country data was used where needed, in particular in connection with the estimate of trade in GI products.

In order to determine which industries are IPR-intensive, the register databases of the EUIPO, EPO and CPVO were matched with the commercial database ORBIS.¹⁷ The resulting matched database contains data on approximately 345 000 companies, including the number of EU trade marks, registered Community designs, patents and CPVRs applied for by each company and subsequently granted, along with the industry classification and various financial and economic variables for each one, providing a set of data that can be used in future, more detailed studies.

Using this database, the number of trade marks, designs, patents and PVRs per employee was calculated for each industry, and the industries which were above average according to this measure were considered to be IPR-intensive. This calculation was performed at EU level, no account being taken of national filings by the companies in the database. This approach, made necessary in part by data limitations, is nevertheless justified by the assumption that an industry which is defined as IPR-intensive based on its registration of EU-level IP rights would also be deemed IPR-intensive if national IP rights per employee were included as well.

The matching methodology was improved and automated for this study, and new data from ORBIS was used. In addition, the method for identifying PVR-intensive industries was modified, resulting in the identification of three additional such sectors. As a result, 353 IPR-intensive industries were identified, compared with 342 in the previous study. For copyright and GIs, the same industries were considered intensive as in the earlier study.

A fundamental assumption behind the methodology is that the degree to which an industry is IPR-intensive is an intrinsic characteristic of that industry, regardless of where it is located.¹⁸ In assessing the contribution of each industry to the economy, what is being measured are the jobs and GDP generated by that industry in each Member State and in the EU, and not the origin of the underlying IPR.

For example, if a car company based in country A builds an assembly plant in country B, then the jobs and value added created as a result accrue to the economy of country B. Therefore, no conclusions as to how innovative a particular country is can be drawn on the basis of the country-level contributions of IPR-intensive industries alone. In the above example, the higher contribution

¹⁷ ORBIS is a database of financial information on European companies, provided by Bureau van Dijk and based on data obtained from company filings in company registers or similar records in the various countries. It includes data on all companies, whether listed on a stock exchange or not (the latter being typically the case for SMEs).

¹⁸ The exception is GI, which is analysed on a country-by-country basis.

of patent-intensive industries in country B is the result of decisions on where to site the production of vehicles, but the underlying R&D could have been performed in country A or indeed another country altogether.

To shed some light on this issue, Chapter 8 shows which countries the patents, trade marks, designs and PVRs in the database used for this study originate in and presents statistics on the proportion of jobs in IPR-intensive industries in each Member State that are created in companies based in other Member States or outside the EU.

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