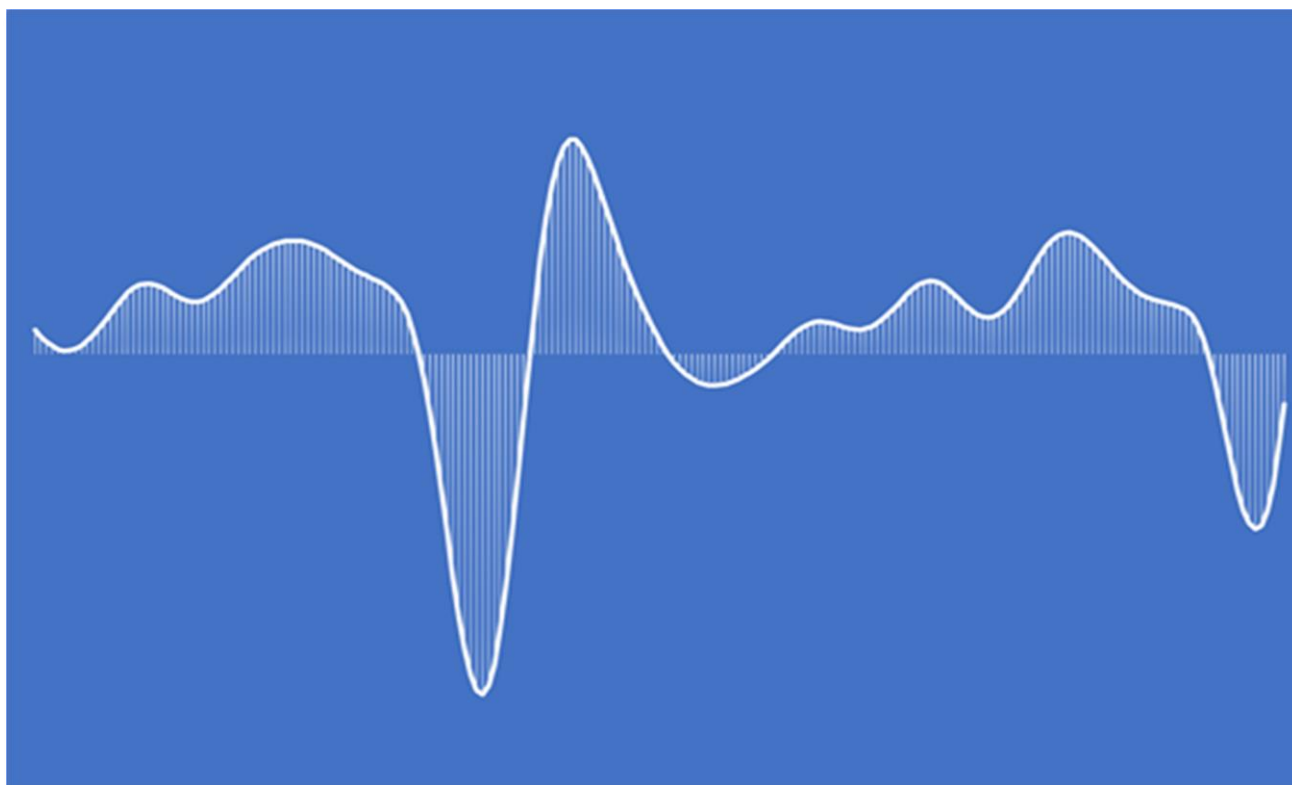


## **Economic impact of COVID-19 crisis in IPR-intensive industries**



May 2021

## ECONOMIC IMPACT OF COVID-19 CRISIS IN IPR- INTENSIVE INDUSTRIES

THE VIEWS EXPRESSED IN THIS DISCUSSION PAPER DO NOT REPRESENT THE OFFICIAL POSITION  
OF THE EUIPO

ISBN 978-92-9156-295-4 doi: 10.2814/57651 TB-02-21-666-EN-N

© European Union Intellectual Property Office

Reproduction is authorised provided the source is acknowledged

## Acknowledgements

---

This paper was prepared by Carolina Arias Burgos, Economist in the Observatory Department at the EUIPO, and Nathan Wajsman, Chief Economist, EUIPO.

The authors are grateful for comments on a previous version of this paper from Ilja Rudyk, European Patent Office (EPO) and Zsolt Volfinger, Statistical Office of the European Union, (Eurostat).

# Table of Contents

<b>Acknowledgements .....</b>	<b>3</b>
<b>Table of Contents .....</b>	<b>4</b>
<b>Acronyms and abbreviations.....</b>	<b>6</b>
<b>Abstract.....</b>	<b>7</b>
<b>1 Introduction .....</b>	<b>8</b>
<b>2 IPR-intensive industries.....</b>	<b>9</b>
<b>3 Economic performance of IPR-intensive industries during 2020 ...</b>	<b>12</b>
3.1 Industry (manufacturing) sector .....	13
3.2 Wholesale and retail trade sector .....	22
3.3 Service sector .....	26
3.4 Indicators for IPR-intensive industries .....	32
<b>4 IPR-intensive industries and GDP: comparative development .....</b>	<b>40</b>
<b>5 IPR-intensive industries: medium-term development .....</b>	<b>46</b>
<b>6 Conclusions.....</b>	<b>54</b>
<b>References .....</b>	<b>56</b>
<b>Appendix: Data sources and methods.....</b>	<b>57</b>
1.1 Short Term business Statistics .....	57
1.2 Structural Business Statistics .....	58
1.3 Sectorial indicators for IPR-intensive industries.....	58
1.4 Indicators for IPR-intensive industries .....	60
1.5 Cyclical analysis .....	61
1.6 List of IPR-intensive industries .....	61

**List of tables ..... 72**

**List of figures ..... 73**

## Acronyms and abbreviations

COVID-19	Coronavirus disease 2019
CR	Copyright
DES	Design
DG AGRI	Directorate-General for Agriculture and Rural Development
ECB	European Central Bank
EPO	European Patent Office
EU	European Union
EUIPO	European Union Intellectual Property Office
GDP	Gross Domestic Product
GI	Geographical Indications
GVA	Gross Value Added
IP	Intellectual Property
IPR	Intellectual Property Right
IMF	International Monetary Found
NACE	Nomenclature statistique des activités économiques dans la Communauté Européenne
OECD	Organisation for Economic Cooperation and Development
PT	Patent
PVR	Plant Variety Rights
SBS	Structural Business Statistics
STS	Short Term Business Statistics
TM	Trade Mark
VA	Value Added
WIPO	World Intellectual Property Organization

### Country codes

DE	Germany
ES	Spain
FR	France
IT	Italy

## Abstract

This paper analyses the economic impact of the COVID-19 crisis on industries that intensively use different intellectual property rights (IPRs) including trade marks, designs, patents and copyright. The analysis is based on the most timely available data from Eurostat, the Short-Term business Statistics (STS) covering all sectors of the economy during 2020 and on previous research from the European Union Intellectual Property Office (EUIPO) and the European Patent Office (EPO).

Economic performance in the European Union as well as in some of the bigger Member States of industries that use IPRs more intensively than the rest of the economy is monitored on a monthly basis with a 2 month delay and compared with the change in Gross Domestic Product (GDP). A medium-term analysis follows to study the impact of the 2009 financial crisis to better understand the cyclical behaviour of IPR-intensive industries.

JEL : O34, O47, O52,

Keywords: Intellectual Property, COVID-19, EU economy

# 1 Introduction

2020 started with a health crisis caused by the appearance and rapid worldwide spread of COVID-19. Besides the tragic number of lives lost, all regions suffered from economic recessions to different degrees, leading international organisations such as the IMF to consider it as the worst economic downturn since the Great Depression<sup>1</sup>. The global impact of this crisis should not hide the differences among countries and territories, depending on their economic structure, as recognised by institutions such as the OECD<sup>2</sup>. The last issue of the ECB Economic Bulletin<sup>3</sup> acknowledges the uneven developments among sectors and a renewed significant decline of economic activity in the eurozone in the last quarter of 2020 due to the second wave of the pandemic.

Most countries have implemented urgent containment measures including in many cases lockdowns, quarantines and social distancing practices which unavoidably collapsed many sectors of the economy. Governments also provided unprecedented support to households and firms to mitigate, at least partially, the dramatic economic consequences of such containment measures. In early 2021 there are some signs of partial recovery of the European economies but the uncertainty is still high. The IMF and the ECB project that the United States and Japan will regain pre-crisis levels in the second half of 2021 and in the eurozone by mid-2022.

The need for objective and timely data to help policy makers in taking decisions has resulted in the publication of data and research, generated faster than ever, such as Eurostat's Recovery Dashboard<sup>4</sup> or the update of the ECB's analytical toolkit<sup>5</sup> to forecast eurozone GDP, just to mention two in the European Union (EU) and eurozone context.

The EUIPO, through the Observatory on Infringement of Intellectual Property Rights, has been tracking the impact of the COVID-19 pandemic in industries with above-average use of IPRs, the so called IPR-intensive industries. Although industries that use more IPR than the average have suffered the consequences of the lockdown in the EU more than the rest of the economy, they also

---

<sup>1</sup> <https://blogs.imf.org/2020/04/14/the-great-lockdown-worst-economic-downturn-since-the-great-depression/>

<sup>2</sup> <http://www.oecd.org/coronavirus/policy-responses/the-territorial-impact-of-covid-19-managing-the-crisis-across-levels-of-government-d3e314e1/#section-d1e950>

<sup>3</sup> ECB (2021)

<sup>4</sup> <https://ec.europa.eu/eurostat/cache/recovery-dashboard/>

<sup>5</sup> ECB (2020)



show a higher resilience to economic downturn. Therefore, a quicker recovery could be expected for these industries, as occurred in the 2009 financial crisis, and this justifies close monitoring of their economic performance during 2021.

## 2 IPR-intensive industries

The EUIPO and the EPO have carried out several EU-wide studies on the contribution of IPRs to the EU economy. These studies assessed the combined contribution of industries that make intensive use of the various types of IPRs (trade marks, designs, patents, copyrights, plant varieties and geographical indications) in the EU as a whole and in individual EU Member States<sup>6</sup>.

The IPR-intensive industries are defined in the EUIPO/EPO IP Contribution report<sup>7</sup> as those industries with a number of registered IPRs per 1 000 employees above the EU average. This is valid for registered IPRs such as trade marks (TM), designs (DES), patents (PT) and plant variety rights (PVR). Copyright (CR) registries exist in some EU countries but their use is not mandatory so that copyright-intensive industries are defined based on the methodology developed by the World Intellectual Property Organization (WIPO)<sup>8</sup>. Geographical Indications (GIs) are typically applied and managed by producer associations, not by individual companies, and the selection of industries that use GIs intensively is based on data from the European Commission (DG AGRI).

In the last EUIPO/EPO report<sup>9</sup> 353 NACE<sup>10</sup> classes were considered IPR-intensive industries of which two thirds were intensive in more than one IPR. A total of 280 industries with more than 4.7 trade marks per 1,000 employees were selected as trade mark-intensive industries. A total of 184 industries registering more than 1.7 designs per 1 000 thousand employees are considered design-intensive and 148 industries with more than 0.9 patents per 1,000 employees are in the list of

---

<sup>6</sup> In the last EUIPO/EPO report the United Kingdom, Iceland, Switzerland, and Norway were also covered

<sup>7</sup> EUIPO/EPO (2019)

<sup>8</sup> WIPO (2003).

<sup>9</sup> EUIPO/EPO (2019).

<sup>10</sup> NACE stands for *Nomenclature statistique des activités économiques dans la Communauté Européenne* and it is the official classification system of economic activity used in the EU.

patent-intensive industries<sup>11</sup>. A total of 79 industries are considered copyright-intensive, while the number of GI and PVR-intensive industries is less than 10.

These industries are spread throughout the economy. The manufacturing sector has a higher representation in patent and design-intensive industries, while there is a higher concentration of copyright-intensive industries in the service sector.

Table 1 shows the allocation of IPR/intensive industries considered in this paper along the main economic sectors.

Table 1: Number of IPR-intensive industries by economic sector<sup>12</sup>.

	<b>IPRs</b>	<b>Trade marks</b>	<b>Designs</b>	<b>Patents</b>	<b>Copyright</b>	<b>Total</b>
<b>Agriculture*</b>	1	0	0	0	0	39
<b>Industry**</b>	216	173	138	129	18	270
<b>Construction</b>	1	1	0	0	0	23
<b>Trade</b>	63	55	33	10	11	91
<b>Services</b>	72	51	13	9	50	207
<b>Total</b>	<b>353</b>	<b>280</b>	<b>184</b>	<b>148</b>	<b>79</b>	<b>629</b>

Source: EUIPO/EPO

\* Agriculture, forestry and fishing

\*\*Industry includes manufacture, mining, energy and other industry and is usually referred to as manufacturing in the remainder of this report.

The economic importance of IPRs in the EU economy as well as in the Member States is estimated by the EUIPO/EPO as the share of the main economic indicators generated in the selected IPR-intensive industries. The contribution of IPR-intensive industries to GDP in the three periods covered by the EUIPO/EPO reports has increased continuously since 2008, especially between the last two periods, as shown in Table 2 with homogeneous and comparable data<sup>13</sup>:

<sup>11</sup> Thresholds for trade mark, design and patent-intensive industries were calculated based on successful applications granted in the period 2010-2019.

<sup>12</sup> One industry in the agriculture sector is only intensive in PVR. The remaining 8 PVR-intensive industries as well as all GI-intensive industries are also intensive in other IPRs. The complete list of IPR-intensive industries is included in the appendix.

<sup>13</sup> The figures presented in Table 2 have been re-calculated considering the 2019 report definition of IPR-intensive industries and the updated figures from Eurostat's National Accounts statistics.

Table 2: Contribution of IPR-intensive industries to EU28 GDP.

(% GDP)	2008-2010	2011-2013	2014-2016
<b>IPRs</b>	43.9	44.0	44.8
<b>Trade marks</b>	36.4	36.5	37.3
<b>Designs</b>	16.0	15.8	16.2
<b>Patents</b>	15.4	15.6	16.1
<b>Copyright</b>	6.9	6.8	6.9

Source: EUIPO/EPO

In general, the structures of big economies such as the EU do not change dramatically in the short term, but the recent economic crisis affected every region in the world as a consequence of the COVID-19 pandemic, and this has completely changed the picture.

The purpose of this paper is to use short-term data to monitor the behaviour during 2020 of the IPR-intensive industries. The analysis is based on Eurostat's STS for manufacturing, wholesale trade and service sectors. The next section presents the results of the sectorial indicators for all IPRs as well as individual indicators for trade marks, designs, patents and copyright separately for the EU<sup>14</sup> and selected Member States. Section 4 compares the economic performance of IPR-intensive industries with the whole economy. Section 5 shows the medium-term development of all IPRs since 2003 and Section 6 presents the conclusions. Finally, the appendix includes some methodological notes as well as a detailed description of data sources.

<sup>14</sup> Unless otherwise is indicated, the acronym EU refers to the 27 Member States of the European Union since 2020.

### 3 Economic performance of IPR-intensive industries during 2020

In order to monitor the economic performance of IPR-intensive industries, an indicator is built for each of the following IPRs: trade marks, designs, patents and copyright and an additional indicator for all IPR-intensive industries analysed in the EUIPO/EPO reports.

Indicators are frequently used to summarise the performance of the economy in a territory or a selected list of industries in a territory. The most well-known indicator of the economy is GDP which combines economic information from every sector of the economy to measure the value of all goods and services produced in a territory in a year. Its development is analysed based on the real GDP which is an indicator built with a value of 100 in a base year. The value of the indicator in a period represents the relation between the GDP in that period and the base period once the influence of prices has been removed. Other economic indicators measure the change of a specific sector such as retail trade or industrial production indicators.

To analyse the economic performance of IPR-intensive industries during 2020, Eurostat's STS are used to build the mentioned indicators, trying to cover as much as possible all the industries classified as intensive in the use of different IPRs.

As indicated in Table 1, the IPR-intensive industries are spread throughout the different economic sectors, so that one indicator covering all 353 industries should reflect the joint development of all of them.

STS indicators are published monthly as indices, showing the changes of an industry in comparison with a reference year (2015), and in terms of growth rates, but not in absolute values. Different STS are published for the industry (manufacturing, energy, and mining), trade and service sectors industries with different disaggregation levels.

The most detailed indices were used to estimate indicators for trade marks, designs, patents, copyright and for the aggregate of these four IPRs plus plant varieties and GIs. The sectorial indicators for the industry, trade and service sectors are presented, as well as the aggregation of

them to include all IPR-intensive industries. Some indicators at country level are estimated when there is sufficient available data.

The sectorial indicators are calculated as a weighted sum using Value Added (VA) from Eurostat's 2015 Structural Business Statistics (SBS) which is the base year of the STS indices. Afterwards, the three sectorial indicators are aggregated based on the contribution of the three sectors to the GVA of IPR-intensive industries as estimated in the last EUIPO/EPO report. Detailed methods and sources of data are explained in the appendix as well as the complete list of IPR-intensive industries.

### 3.1 Industry (manufacturing) sector

Eurostat's STS provides data at NACE class (4-digit) level for the production indices in the industry sector, including manufacturing, mining and energy (Sections B to D<sup>15</sup>). STS indicators are published monthly at month m+2. These indicators can be used in combination with SBS statistics which estimate the VA by country and NACE class. The weighted indicators for IPR-intensive industries in the manufacturing sector<sup>16</sup> use VA by industry in 2015 as weights for the EU. Some Member State indicators are calculated for the aggregation of all six IPRs as well as for each of the four individual IPRs considered: trade marks, designs, patents and copyright.

Figure 1 shows the level of the indicator for the manufacturing, mining and energy sectors (B-D) and the indicators built including only IPR-intensive industries in those sectors since 2019. As a reference, an indicator for non-IPR-intensive industries is presented as a weighted difference between the manufacturing sector and the IPR-intensive industries indicator<sup>17</sup>. All indicators take the value 100 in 2015 and are based on indices corrected for seasonal and calendar effects<sup>18</sup>.

---

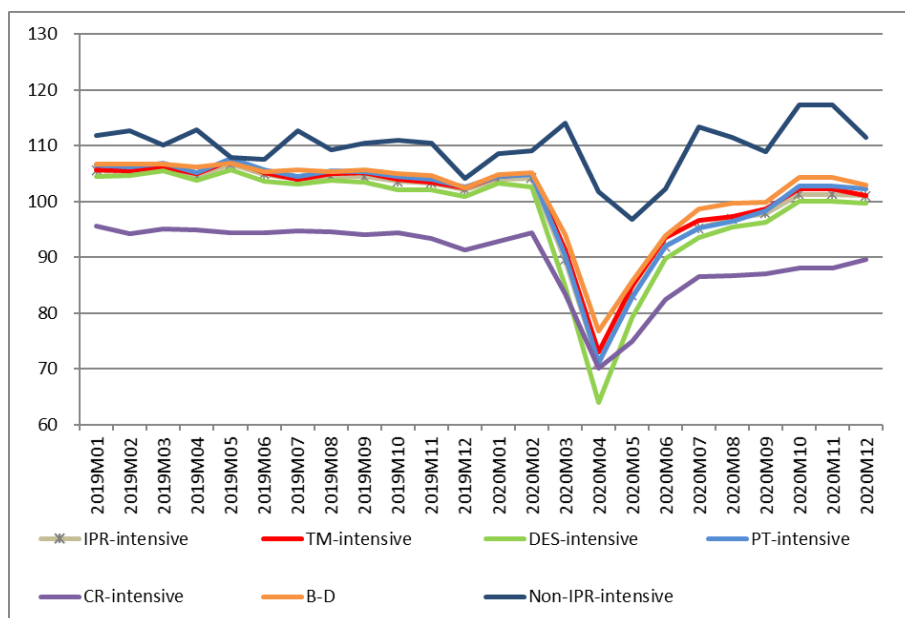
<sup>15</sup> B "Mining and quarrying"; C "Manufacturing" and D "Electricity, gas, steam and air conditioning supply"

<sup>16</sup> As used in this report, "manufacturing" refers to NACE sections B, C and D.

<sup>17</sup> IPR intensive industries represent 81% of the total GVA of the manufacturing sector.

<sup>18</sup> More details on the methods applied are included in the Appendix.

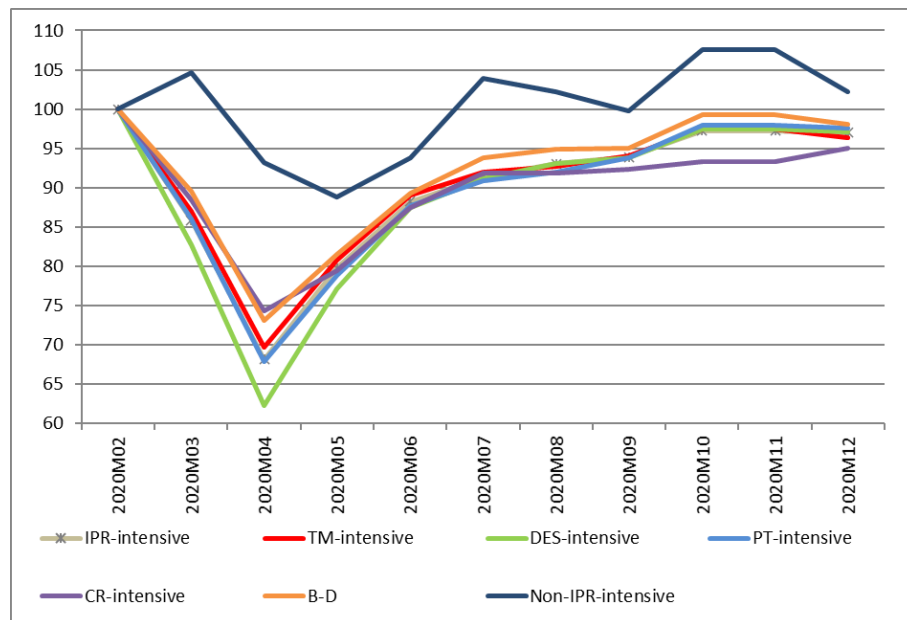
Figure 1: Indicators of IPR-intensive industries and total manufacturing sector in the EU (2019 and 2020).



The indicators are quite stable until February 2020 with an average value of 94 for copyright-intensive industries, 105 for all IPRs, trade mark, design and patent-intensive industries, 106 for the whole manufacturing sector and an average value for non-IPR-intensive industries of 113. A steep slump of all indicators occurs in March and April when the trough is reached at a value of 64 for designs, 70 for copyrights, 71 for patents and all IPRs and 73 for the trade mark-intensive industries. The manufacturing sector trough value is 77 and the non-IPR-intensive indicator trough is dated one month later at a value of 97. This is followed by a rebound in all indicators that are close but still 3 points below the pre-crisis level with the exception of the non-IPR-intensive industries which is above its February 2020 level in and copyright which is 5 points below its pre-crisis level.

Figure 2 shows the development of the IPR indicators during 2020 now re-based so that all of them have a value of 100 in February and the level in December can be compared with the pre-crisis situation.

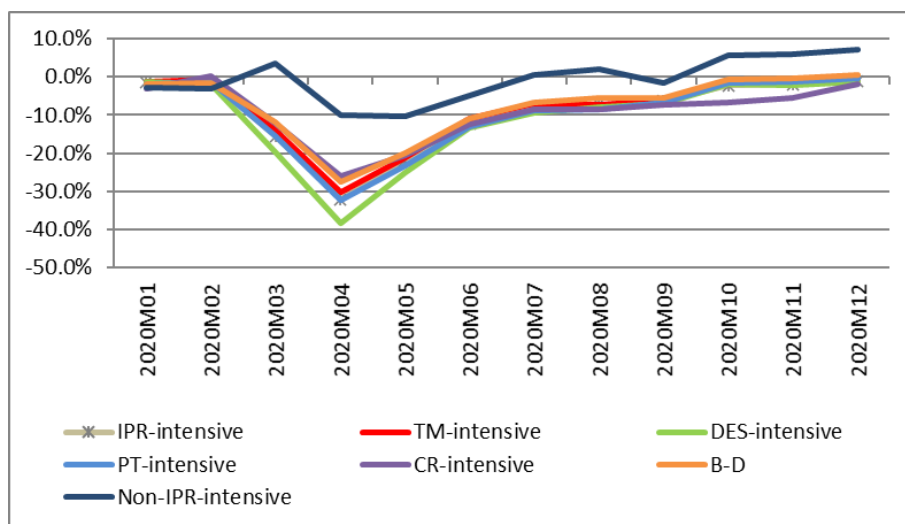
Figure 2. Indicators of IPR-intensive industries in manufacturing in the EU, based on February 2020.



Annual rates of change of monthly IPR indicators are calculated as the percentage change on the same month of the previous year starting in January 2020 and using seasonally and calendar adjusted data<sup>19</sup>.

<sup>19</sup> Rates calculated on the same month of the previous year (annual rates) do not need to be seasonally adjusted so our analysis could be based on annual rates on calendar adjusted indices, while the analysis of levels (Figures 1 and 2) are on seasonally and calendar adjusted indices. Nevertheless, for the sake of simplicity and to avoid the use of two different indices both analyses are based on seasonally and calendar adjusted indices. Moreover, annual rates of indicators based on both types of indices were compared, and the differences are negligible in the aggregates.

Figure 3: Annual rates of change (%) of IPR indicators of the manufacturing sector in the EU.



The chart suggests a V-shaped recovery (a sharp decline followed by a sharp rise) in May and June. However, the indicators' recovery slows down after June with rates still negative for the rest of the year in all IPR indicators. This shows an asymmetric V-shaped recovery (the recovery phase is not as vigorous as the preceding fall).

Table 3 shows the annual rates of the indicators of IPR-intensive industries in the manufacturing sector for the EU as well as the rates for the total sector and for the non-IPR-intensive industries within the sector.

It is remarkable that the development of non-IPR-intensive industries since February 2020 has only registered negative rates in four months while the average change is negative but close to zero.



Table 3: Annual rates of change (%) of IPR indicators of the manufacturing sector in the EU<sup>20</sup>.

(in %)	IPR	TM	DES	PT	CR	B-D	Non-IPR
<b>2020M01</b>	-1.5	-1.2	-1.2	-1.8	-3.0	-1.8	-2.8
<b>2020M02</b>	-1.1	-0.6	-2.0	-1.2	0.1	-1.5	-3.1
<b>2020M03</b>	-15.6	-14.1	-19.6	-15.6	-12.2	-11.8	3.7
<b>2020M04</b>	-32.1	-30.4	-38.4	-32.4	-26.0	-27.6	-9.9
<b>2020M05</b>	-22.1	-21.1	-25.1	-23.2	-20.6	-19.8	-10.3
<b>2020M06</b>	-12.3	-11.0	-13.4	-13.0	-12.6	-10.9	-4.9
<b>2020M07</b>	-8.4	-7.1	-9.3	-8.8	-8.5	-6.6	0.5
<b>2020M08</b>	-7.2	-7.3	-8.0	-8.5	-8.4	-5.4	2.1
<b>2020M09</b>	-6.4	-6.1	-7.0	-6.7	-7.4	-5.4	-1.5
<b>2020M10</b>	-2.2	-1.7	-2.0	-1.6	-6.8	-0.7	5.6
<b>2020M11</b>	-2.0	-1.1	-2.1	-1.2	-5.7	-0.4	6.1
<b>2020M12</b>	-1.1	-1.2	-1.2	-0.3	-1.9	0.5	7.1
<b>2020</b>	<b>-9.4</b>	<b>-8.6</b>	<b>-10.8</b>	<b>-9.6</b>	<b>-9.4</b>	<b>-7.7</b>	<b>-0.7</b>

All IPR indicators of the manufacturing, mining and energy sectors registered significant negative annual rates in March with decreases between 12% and 20%, even larger negative rates in April (in some cases double those of March) and continued with negative values until December. An incipient recovery phase started in July but rates then stabilise and are still negative between October and December.

Considering the four IPRs separately (trade marks, designs, patents and copyright) as well as the aggregate of them plus plant varieties and GIs (IPR) in the manufacturing sector the indicators for design-intensive industries fell the most, with annual declines between -20% and -40% in the period

<sup>20</sup> All tables containing annual rates of change of IPR indicators are designed with the same colour code: white cells when the annual rate is positive; yellow if it is negative until -10 %; rose for negative rates between -10 % and -20 % and red for rates of change below -20 %.

March-May. At the end of 2020 the economic recovery is still tentative, with all the indicators showing negative rates of change and average rates between -9% and -11%.

### Results in four Member States

This section presents the indicators of the four biggest EU Member States<sup>21</sup>, covering 56% of the total EU contribution of IPR-intensive industries to the Gross Value Added (GVA) in the manufacturing sector.

Table 4. Contribution (%) of the four largest Member States to the GVA of IPR-intensive industries of the manufacturing sector to the EU total.

(in %)	Germany	France	Italy	Spain
<b>IPRs</b>	23.2	14.3	11.8	6.6
<b>TM</b>	22.6	14.2	12.1	6.5
<b>DES</b>	29.1	11.0	11.8	5.4
<b>PT</b>	30.6	12.4	9.8	5.6
<b>CR</b>	20.2	14.7	8.9	6.6

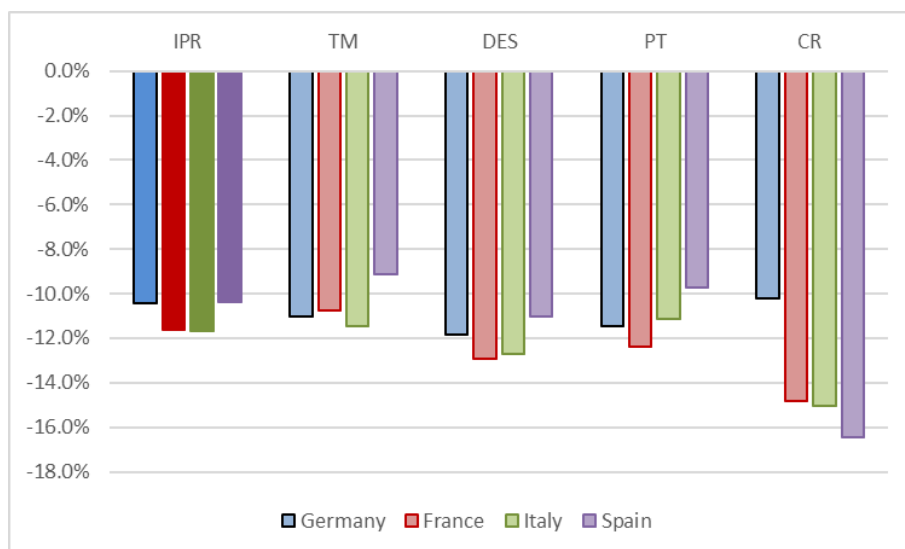
Source: EUIPO/EPO

Germany represents 23% of the contribution of the GVA generated in the manufacturing sector by EU IPR-intensive industries. The contribution of France to the EU total is 14%; Italy represents almost 12%; and the contribution of Spain is below 7%. For example, the contribution of German patent and design-intensive industries in the manufacturing sector is 30% of the EU total, 5 percentage points higher than the German contribution to the overall EU GDP<sup>22</sup>.

<sup>21</sup> STS are available at country level but only a few countries publish complete data. Therefore, the estimation of IPR indicators is only possible for these four Member States.

<sup>22</sup> GDP is the sum of the GVA in all sectors plus taxes on products minus subsidies. The latter are estimated only for the whole economy so that GDP is the indicator used for comparisons of the size of the economy of a country and GVA is the indicator used to make comparisons of specific sectors.

Figure 4: Average rates of change (%) of IPR indicators of the manufacturing sector by Member State, 2020.



The magnitude of the decline of the German and Spanish IPR-intensive industries as a consequence of the COVID-19 crisis is slightly lower than in France and Italy. The average decline during 2020 in IPR-intensive industries in Italy and France is about -11.6%, one point higher than in Germany and Spain.

The comparison among the different IPRs shows some differences in the four Member States with those at EU level: copyright-intensive industries suffered the hardest hit in the four countries except Germany (-16.5% in Spain and almost -15% in France and Italy). However, the manufacturing sector represents a little share of the copyright-intensive industries and therefore has a small impact on the copyright indicator discussed below. Trade mark-intensive industries registered the lowest decrease in Spain and France while in Italy the patent-intensive industries recovered very quickly and finally show the better economic performance as an average in 2020.

Germany shows similar rates of change in all indicators, between -10.2% in copyright-intensive industries to -11.9% in design-intensive industries.

As shown in Table 5, Germany is the Member State with the smallest decreases in March to June. Since June, and also for 2020 as a whole, Spain registered the lowest decrease in all indicators except copyright-intensive manufacturing industries, which suffered the most.

What is most surprising in the Spanish indicators are some positive rates reached in October and November so that the final average rates are the best among the four biggest EU Member States, with the exception of copyright-intensive industries.

Italy is the first EU Member State that imposed a lockdown at the beginning of March and saw the largest decrease among the largest EU countries in March and April and the best rates of change in August (rates between -1% and -2%), except in copyright, followed by a new decrease in September with rates closer to those of other EU Member States. Overall, France and Italy are the two countries with the greatest deterioration of the IPR indicators in the manufacturing, mining and energy sectors during 2020. The apparent quick recovery of all indicators that started in May seems to have come to a standstill.

In comparison with the whole sector (Sections B to D), in general the IPR indicators dropped furthest in all four countries, with only three indicators with slightly better (or identical) rates than the B-D aggregate: copyright in Germany, trade mark in Spain and patent in Italy.

Table 5: Annual rates of change (%) of IPR indicators of the manufacturing sector in the four largest EU Member States.

(in %)	Germany						France					
	IPR	TM	DES	PT	CR	B-D	IPR	TM	DES	PT	CR	B-D
2020M01	-2.9	-2.8	-3.4	-3.4	-3.2	-3.3	-3.1	-3.2	-3.8	-3.4	-4.4	-3.0
2020M02	-2.9	-2.7	-4.0	-3.2	-0.1	-2.5	-1.8	-2.0	-1.6	-2.1	-0.1	-1.3
2020M03	-13.7	-15.0	-16.3	-15.4	-12.3	-13.5	-21.9	-20.1	-27.2	-22.1	-20.7	-17.8
2020M04	-29.8	-31.1	-35.0	-32.3	-20.2	-28.9	-42.3	-40.8	-48.8	-43.9	-41.6	-35.3
2020M05	-23.5	-24.2	-26.4	-25.4	-21.5	-22.9	-27.1	-25.6	-29.1	-29.3	-27.7	-23.5
2020M06	-13.4	-12.4	-14.3	-14.7	-14.9	-13.3	-12.7	-11.0	-14.3	-14.0	-22.7	-11.4
2020M07	-11.1	-10.8	-11.7	-12.3	-12.5	-11.5	-8.5	-7.7	-8.5	-9.8	-10.1	-8.2
2020M08	-12.0	-13.4	-13.0	-13.2	-11.3	-10.9	-6.1	-5.8	-5.1	-7.7	-9.6	-6.4
2020M09	-8.9	-9.8	-10.3	-9.8	-8.5	-8.4	-5.0	-3.6	-5.0	-5.4	-8.9	-5.9
2020M10	-3.0	-3.6	-2.7	-3.2	-6.9	-2.8	-3.8	-3.0	-3.6	-4.2	-13.6	-4.7
2020M11	-3.3	-4.0	-3.3	-3.5	-6.2	-3.6	-3.6	-2.2	-4.0	-3.7	-10.2	-4.5
2020M12	-0.6	-1.8	-1.0	-0.7	-5.3	-1.4	-2.6	-2.6	-2.4	-2.3	-7.4	-3.1
2020	-10.5	-11.0	-11.9	-11.5	-10.2	-10.3	-11.6	-10.7	-12.9	-12.4	-14.8	-10.5

(in %)	Italy						Spain					
	IPR	TM	DES	PT	CR	B-D	IPR	TM	DES	PT	CR	B-D
2020M01	0.0	-0.3	0.0	-0.2	-3.0	-0.9	-1.5	-0.4	-1.7	-1.3	-7.3	-2.1
2020M02	-0.4	-0.6	-1.4	-0.1	6.4	-2.9	-0.3	1.0	-0.1	1.3	-3.2	-2.4
2020M03	-33.9	-32.4	-37.1	-34.9	-20.7	-29.5	-17.9	-15.4	-21.6	-20.5	-13.5	-14.9
2020M04	-44.0	-40.2	-48.6	-42.6	-37.9	-43.3	-38.4	-35.3	-47.2	-40.4	-53.0	-34.3
2020M05	-21.3	-21.5	-23.5	-22.2	-24.3	-20.5	-27.1	-25.4	-32.6	-28.4	-34.7	-25.0
2020M06	-13.8	-13.8	-14.5	-14.5	-18.1	-13.7	-14.6	-13.0	-16.1	-14.7	-16.3	-14.8
2020M07	-8.0	-7.7	-8.7	-7.5	-13.0	-7.5	-6.8	-4.3	-6.7	-5.4	-12.3	-6.0
2020M08	-1.1	-2.1	-1.4	-1.7	-11.6	-0.1	-5.6	-5.5	-3.8	-6.7	-17.5	-5.2
2020M09	-5.7	-5.8	-6.1	-5.3	-12.6	-4.8	-7.9	-8.4	-1.8	-1.2	-11.7	-3.7
2020M10	-3.6	-3.9	-3.5	-1.2	-15.7	-3.6	-0.6	0.4	1.4	1.8	-10.1	-2.4
2020M11	-4.2	-4.8	-4.2	-1.7	-21.3	-4.2	-1.5	-0.1	-0.1	0.5	-5.7	-2.8
2020M12	-2.8	-3.4	-2.1	-0.1	-8.0	-1.9	-1.7	-1.5	-0.6	-0.3	-8.3	-1.0
2020	-11.7	-11.5	-12.7	-11.1	-15.1	-11.1	-10.4	-9.1	-11.0	-9.7	-16.5	-9.6

In summary, the average rates in 2020 conceal timing differences: France, Italy and Spain suffered higher decreases from March to May but also a more pronounced recovery than Germany in July. Germany shows the lowest decreases in the spring and the highest in the summer.

The indices covering manufacturing, mining and energy industries are only partial, as they include 217 out of the 353 classes classified as IPR-intensive. These classes represent 34% of the GVA generated by IPR-intensive industries in the period 2014-2016, 30% of the GVA generated by trade mark-intensive industries, 62% of GVA of design-intensive industries, 72% of the GVA of patent-intensive industries and 7% of the GVA of copyright-intensive industries.

The indices for the trade and service sectors are analysed below to complete the picture of IPR-intensive industries' trends in 2020.

## 3.2 Wholesale and retail trade sector

For the trade sector, short-term statistics are available at the 3-digit level of NACE (groups). The complete division of wholesale trade (46) is trade mark-intensive. Design-intensive industries include the following groups: 461, 464, 467 and 469<sup>23</sup>. Only a few classes of wholesale trade are intensive in patents and copyright and are spread among different groups. Therefore, the indicators for these two IPRs do not include trade indicators, missing all classes belonging to the trade sector which represent 10% of the GVA generated by patent-intensive industries<sup>24</sup> and 3% of the GVA generated by copyright-intensive industries<sup>25</sup>. Only a few classes of the retail trade sector (division 47) are included in the list of IPR-intensive industries and no group of this division is included in the IPR indicators of the trade sector.

Turnover indices<sup>26</sup>, corrected for calendar effects and seasonality, are used in the IPR-intensive industries indicators of the trade sector. The design-intensive industries indicator is estimated as a weighted average using VA in 2015 from SBS for each group as weights.

---

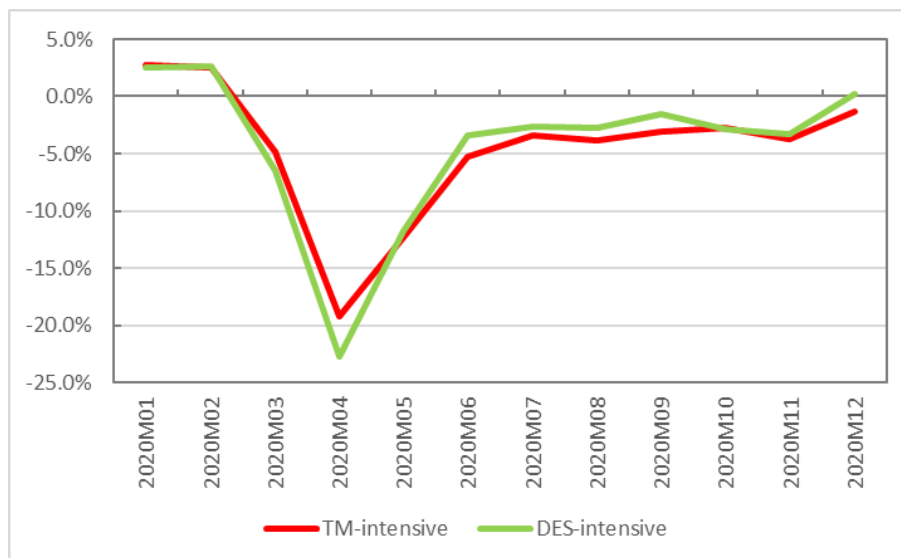
<sup>23</sup> 'Wholesale on a fee or contract basis', 'wholesales of household goods', 'other specialised wholesales', 'non-specialised wholesale trade', respectively.

<sup>24</sup> Some patent-intensive missing classes are 4646 'Wholesale of pharmaceutical products'; 4669 'Wholesale of other machinery and equipment'; and 4531 'Wholesale trade of motor vehicle parts and accessories'. The complete list of IPR-intensive industries is included in the appendix.

<sup>25</sup> Some NACE classes in the wholesale division that are partially copyright-intensive are 4651 'Wholesale of computers, computer peripheral equipment and software' and 4652 'Wholesale of electronic and telecommunication equipment and parts'.

<sup>26</sup> Even though turnover and production differ in trade more than in other sectors, the turnover indicator is the only one available for the trade sector and it is expected not to distort results when only wholesale trade sector indicators are compared.

Figure 5: Annual rates of change (%) of trade mark and design indicators of the trade sector in the EU, 2020.



The drop of the activity in the trade mark and design-intensive industries of the wholesale sector is much lower than in the manufacturing, mining and energy sectors, with an average annual decrease in 2020 of 4.5% in comparison with the manufacturing indicator's decrease of over 10%. Design-intensive trade industries declined more than trade mark-intensive trade industries during the lockdown but they recovered faster and during the summer they performed slightly better so that the average rates of change in 2020 are very similar.

Table 6: Annual rates of change (%) of IPR indicators of the trade sector in the EU

(in %)	TM	DES
2020M01	2.7	2.5
2020M02	2.6	2.7
2020M03	-4.9	-6.5
2020M04	-19.2	-22.7
2020M05	-12.3	-11.7
2020M06	-5.2	-3.5
2020M07	-3.4	-2.7
2020M08	-3.9	-2.7
2020M09	-3.1	-1.6
2020M10	-2.7	-2.8
2020M11	-3.7	-3.3
2020M12	-1.3	0.3
2020	-4.5	-4.3

### Results at Member State level

The contribution of trade mark and design-intensive industries in the wholesale sector in Germany, France and Spain represent 41% of total EU GVA of the IPR-intensive industries in this sector, with Germany representing 20%. STS indices for the trade sector are not available for Italy.



Table 7: Annual rates of change (%) of IPR indicators of the trade sector by Member State.

(in %)	Germany		France		Spain	
	TM	DES	TM	DES	TM	DES
<b>2020M01</b>	2.6	3.0	3.0	3.6	3.6	2.2
<b>2020M02</b>	2.5	3.3	0.8	0.5	2.6	3.0
<b>2020M03</b>	0.8	0.5	-12.4	-13.5	-15.3	-19.2
<b>2020M04</b>	-9.8	-11.1	-27.3	-34.1	-36.7	-43.9
<b>2020M05</b>	-4.8	-3.9	-13.5	-15.5	-26.2	-29.8
<b>2020M06</b>	-3.1	-1.5	-0.4	-0.5	-15.8	-17.4
<b>2020M07</b>	-3.0	-1.9	0.4	-0.2	-10.7	-11.4
<b>2020M08</b>	-0.4	-0.6	-1.7	-0.6	-13.5	-14.3
<b>2020M09</b>	-1.1	-0.4	-2.1	-1.4	-10.7	-9.8
<b>2020M10</b>	-0.3	0.1	-1.7	-2.1	-8.0	-7.4
<b>2020M11</b>	-1.2	0.2	-4.1	-4.6	-10.7	-10.2
<b>2020M12</b>	2.7	4.2	-1.6	1.5	-9.2	-10.8
<b>2020</b>	<b>-1.2</b>	<b>-0.7</b>	<b>-5.1</b>	<b>-5.6</b>	<b>-12.6</b>	<b>-14.2</b>

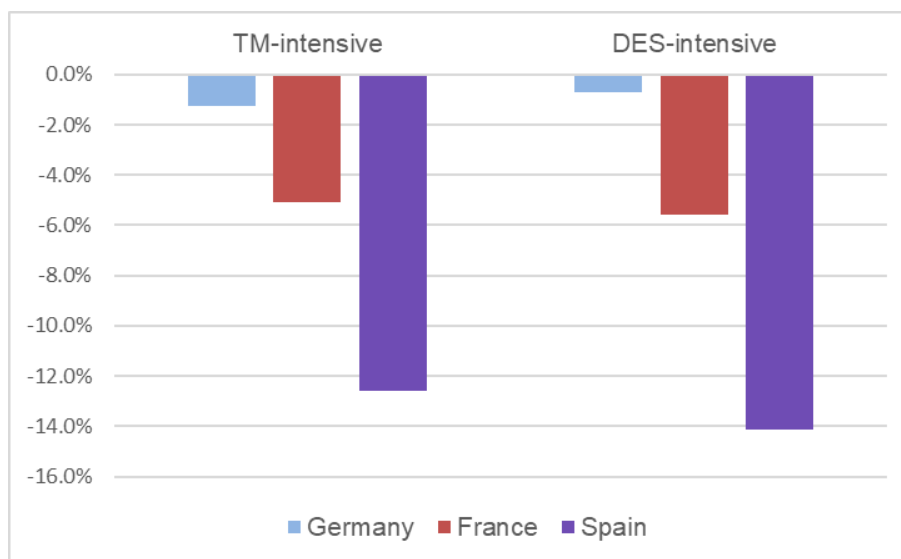
Trade mark and design-intensive industries in Germany registered a modest decrease of 1.2% and 0.7% respectively in 2020, compared with a decrease of about 5% in France (similar to the EU average) and a decrease of between 12% and 14% in the Spanish indicators.

The German indicators annual rate in April is -10% and -11% but since August both German indicators registered decreases of less than 1% including positive and significant growth in December in both indicators and already reaching pre-crisis levels.

The French indicators rebounded in June after three months of double-digit negative rates, resulting in an average annual rate in 2020 of -5.1% for the trade mark indicator and the aggregated IPR indicator and -5.6% for design-intensive industries. November rates show a renewed fall so that at the end of 2020 the indicator for designs has reached the pre-crisis level and the trade mark indicator is close to the February 2020 value.

In Spain, the trend is quite different due to the persistent double-digit negative rates, resulting in annual average rates in 2020 that are more than twice as large as the French rates and a continuous deterioration of both IPR indicators.

Figure 6: Average rates of change (%) of trade mark and design indicators of the trade sector by Member State, 2020.



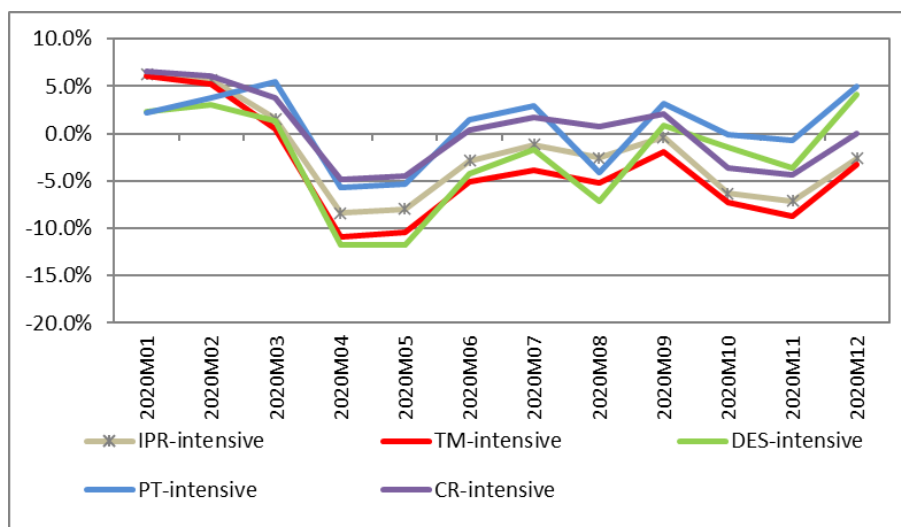
The two groups in wholesale trade with the best performance are 465 'Wholesale of information and communication equipment' and 462 'Wholesale of agricultural raw materials and live animals', while the group showing the highest fall is 467 'Other specialised wholesale' which includes mainly distribution of intermediate products. In Germany the only two groups registering negative average rates are 466 'Wholesale of other machinery, equipment and supplies' and 467.

### 3.3 Service sector

For the service sector, the short-term statistics are available at the 2-digit level of NACE (divisions). The divisions considered IPR intensive (fully or in part) are: J section, 'Information and communication' (divisions 58 to 63); division 73 'Advertising and market research'; division 74 'Other professional, scientific and technical activities' and division 79 'Travel agency, tour operators and other reservation agencies and related activities'. The most important missing industries are: 'Activities auxiliary to financial services and insurance activities' (division 66) and 'Real estate activities' (division 68).

The IPR indicator includes the nine divisions mentioned but some of these divisions are only partially included in the individual IPR indicators, as shown in the appendix. The turnover indices<sup>27</sup> corrected for seasonality and calendar effects are used, weighted by the SBS VA in 2015.

Figure 7: Annual rates of change (%) of IPR indicators of the service sector in the EU, 2020.



The development of IPR-intensive industries of the service sector in the EU is quite different from the manufacturing and trade sectors. The first difference is the 2-month duration of the first trough during April and May at rates of -10% for trade marks and designs and -5% for patents and copyright. After two months of tentative recovery there was a second decline in the rates of change in August, that was more pronounced in the design and patent indicators, showing a W-shaped recovery. Nevertheless, the service sector represents only a small share of patent and design-intensive industries. In November there was a third decline that was more pronounced in the trade mark and copyright-intensive industries.

As a result of these up and down movements, the patent and copyright indicators ended 2020 with very small but positive average annual rates. The highest average decline is registered by trade mark-intensive industries in the service sector that, jointly with the IPR-intensive industries, registered negative rates in every month from April to December. These two indicators have not yet

<sup>27</sup> Production indices are available only for the EU total and France and are less complete than turnover indices

reached the pre-crisis levels, but are quite close to them, while patent and design indicators are now 6 points above their February 2020 levels and copyright is at the end of the year at its pre-crisis level.

Table 8: Annual rates of change (%) of IPR indicators of the service sector in the EU

(in %)	IPR	TM	DES	PT	CR
<b>2020M01</b>	6.2	6.1	2.4	2.2	6.5
<b>2020M02</b>	5.7	5.2	3.0	3.7	6.1
<b>2020M03</b>	1.6	0.6	1.3	5.5	3.8
<b>2020M04</b>	-8.4	-10.9	-11.8	-5.7	-4.9
<b>2020M05</b>	-8.0	-10.4	-11.8	-5.3	-4.5
<b>2020M06</b>	-2.9	-5.1	-4.3	1.5	0.4
<b>2020M07</b>	-1.2	-3.9	-1.6	2.9	1.8
<b>2020M08</b>	-2.6	-5.2	-7.2	-4.1	0.7
<b>2020M09</b>	-0.4	-1.9	0.8	3.1	2.1
<b>2020M10</b>	-6.3	-7.3	-1.4	-0.1	-3.7
<b>2020M11</b>	-7.1	-8.7	-3.6	-0.7	-4.3
<b>2020M12</b>	-2.6	-3.3	4.1	4.9	0.0
<b>2020</b>	<b>-2.2</b>	<b>-3.8</b>	<b>-2.5</b>	<b>0.6</b>	<b>0.3</b>

## Results at Member State level

France and Spain contribute 21% of the EU total of the GVA generated by IPR-intensive industries of the service sector; 16% of the GVA generated by EU trade mark-intensive industries; 12% of the GVA generated by EU design-intensive industries; 17% of the GVA generated by EU patent-intensive industries; and 22% of the GVA generated by EU copyright-intensive industries.

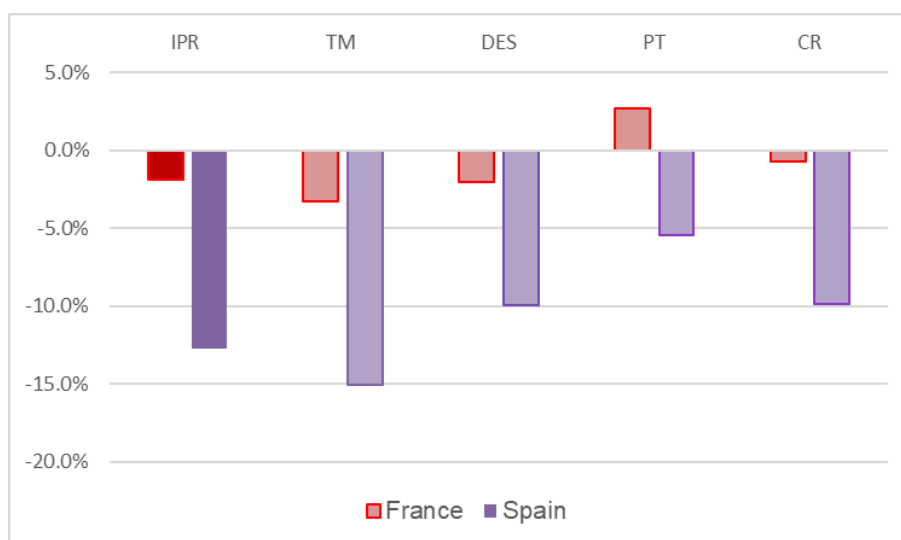
STS data for Germany and Italy are not available.

The average rates of change in France and Spain differ from the overall EU rates, with the trade mark indicator the hardest hit and patent-intensive services registering the lowest decrease in Spain and a positive 2020 average growth in France.

In contrast to the economic performance of IPR-intensive industries in the manufacturing sector, the Spanish service sector indicators perform significantly worse than their French counterparts. This reflects an economic structure dependent on tourism which is a contact-intense sector more affected by social distancing practices. The average rates of change in Spain in 2020 range from -5.5% for the patent indicator to -15% for the trade mark indicator, while the latter showed the best behaviour of the manufacturing sector among the four biggest EU Member States.

In France, the rates of change of IPR-intensive service industries' indicators range from +2.7% for the patent indicator to -3.3% for the trade mark indicator.

Figure 8: Average rates of change (%) of IPR indicators of the service sector by Member State, 2020.



The annual rates of change shown in Table 9 illustrate the different impact of the COVID-19 crisis in the IPR-intensive industries in France and Spain compared with the EU average. Besides the higher impact in trade mark-intensive industries, the trough is dated one month later in all indicators, with declines in May between -10% and -30%.

Table 9: Annual rates of change (%) of IPR indicators of the service sector by Member State.

(in %)	France					Spain				
	IPR	TM	DES	PT	CR	IPR	TM	DES	PT	CR
<b>2020M01</b>	4.5	4.3	3.2	4.6	4.4	0.9	0.7	1.3	2.9	0.9
<b>2020M02</b>	2.4	1.2	1.7	2.6	2.6	0.4	0.3	0.6	1.0	0.4
<b>2020M03</b>	-0.6	-2.0	-3.3	1.1	0.5	-14.6	-16.5	-14.0	-10.0	-12.1
<b>2020M04</b>	-8.5	-10.9	-11.7	-6.8	-6.9	-24.2	-29.1	-26.4	-13.4	-20.2
<b>2020M05</b>	-10.9	-12.4	-12.7	-8.4	-9.3	-25.4	-30.0	-28.8	-14.5	-20.9
<b>2020M06</b>	-2.1	-4.3	-1.4	6.4	-0.6	-19.9	-23.0	-17.4	-8.4	-16.3
<b>2020M07</b>	-3.9	-6.7	-2.3	7.3	-2.5	-12.7	-15.0	-6.1	-1.9	-9.5
<b>2020M08</b>	-1.4	-3.8	-0.2	10.7	0.1	-13.2	-15.1	-8.5	-5.6	-10.0
<b>2020M09</b>	-3.9	-4.4	-3.4	-1.0	-3.0	-14.6	-16.7	-7.5	-4.9	-11.4
<b>2020M10</b>	-0.9	-2.1	1.0	4.1	0.4	-11.6	-13.4	-4.6	-3.8	-8.1
<b>2020M11</b>	-1.1	-1.7	-1.2	1.8	0.3	-9.0	-11.3	-4.2	-3.5	-5.2
<b>2020M12</b>	3.9	3.6	6.1	10.1	5.5	-9.3	-11.1	-3.2	-3.1	-6.0
<b>2020</b>	<b>-1.9</b>	<b>-3.3</b>	<b>-2.0</b>	<b>2.7</b>	<b>-0.7</b>	<b>-12.8</b>	<b>-15.0</b>	<b>-9.9</b>	<b>-5.5</b>	<b>-9.9</b>

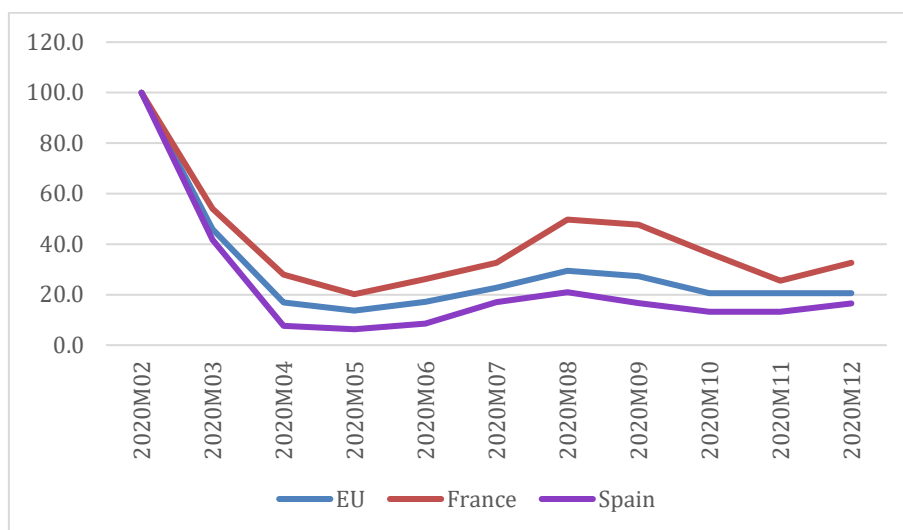
Spain shows a slump in March with rates of change significantly worse than in the EU and France, especially in the trade mark indicator which registered double-digit negative rates from March onwards and is still 15 points below the pre-crisis level.

Each individual index (as well as all the aggregates) has an average value of 100 in 2015. Division 79 (tourism related services) reflects the almost complete standstill of this industry since April, reaching a trough in May with a value of 16 in the EU, 20 in France and 8 in Spain. This division is included in the trade mark indicator but not in the design and patent indicators, while the copyright indicator includes it with a ratio of 0.15<sup>28</sup>. Added to this, the relative weight of this activity in Spain is double that in France, contributing to the final rate of change in the Spanish trade mark indicator of

<sup>28</sup> Meaning that the influence of division 79 is minor in copyright-intensive industries. It does not affect patent and designs indicators at all, but it has a big impact on the trade mark indicator. See the appendix for more details on the methodology applied for all the IPR indicators.

the service sector with 4 negative percentage points (the rate of change of the trade mark indicator of the service sector would be 4 percentage points higher if this division were just stable with a 0 growth rate). The development of division 79 is shown in Figure 9 for the EU, France and Spain, with all indices re-based with value 100 in February 2020.

Figure 9: Indices for division 79 (Travel agencies, tour operators and other reservation service and related activities), based on February 2020. EU, France and Spain.



Other industries reflecting the higher deterioration of STS indices in Spain are divisions 59 'Motion picture, video, TV and music' and 60 'Programming and broadcasting activities'. The only division reaching the pre-crisis level in Spain is 63 'Information service activities'.

Finally, the drop of the copyright indicator in Spain is also remarkable, with an average rate of change of -10% compared with a positive average rate in the EU and close to no change in France. Some copyright-intensive industries are missing in the STS for the service sector, such as arts, entertainment, recreation and personal services. These activities are among the most affected by lockdown measures<sup>29</sup> so that the availability of short-term indices for them would make the copyright indicator even more negative.

In France, division 63 shows a surprising increase in 2020 with its index 25 points above the average in 2019. The resilience of the French indices of divisions 62 'Computer programming, consultancy

<sup>29</sup> The growth rates of the GVA of sections R to U (Arts, entertainment and recreation and other services activities) in the third quarter of 2020 in National Accounts, is -13% for the EU and France and -21% in Spain.

and related services' and 74 'Other professional, scientific and technical activities' is also remarkable, with both above their pre-crisis levels since September. Division 79 has the highest decline in activity in 2020 in France, with a value of about 20 since April, as shown in Figure 9.

### 3.4 Indicators for IPR-intensive industries

Overall indicators for IPR-intensive industries are estimated based on the three sectorial indicators representing industries that cover 59% of GDP generated by IPR-intensive industries (56% for trade mark-intensive industries, 87% for design-intensive industries, 86% for patent-intensive industries and 90% for copyright-intensive industries). The lower coverage of the trade mark indicator is explained by some missing industries in the service sector such as real estate<sup>30</sup> and auxiliary activities to financial and insurance services.

The IPR indicators are calculated as weighted averages of the three sectorial indicators using GVA in the period 2014-2016 from the EUIPO/EPO as weights, with different weights by country as shown in the table below.

More than half of the trade mark-intensive industries indicator for the EU stems from the manufacturing sector indicator, with wholesale and service sectors accounting for roughly one quarter each. The design indicator has similar weight in the wholesale sector but a lower one for the service sector, with three-quarters coming from manufacturing. The patent and copyright indicators only include manufacturing and service sectors, with more than 90% of the weight of the manufacturing sector in the patent indicator and similar levels of importance for services in the copyright indicator.

---

<sup>30</sup> The GVA generated by imputed rents from owner-occupied dwellings represents 17% of trade mark-intensive industries total GVA and is included in the real estate sector.



Table 10: Weights (%) applied to sectorial indicators of IPR-intensive industries by Member State.

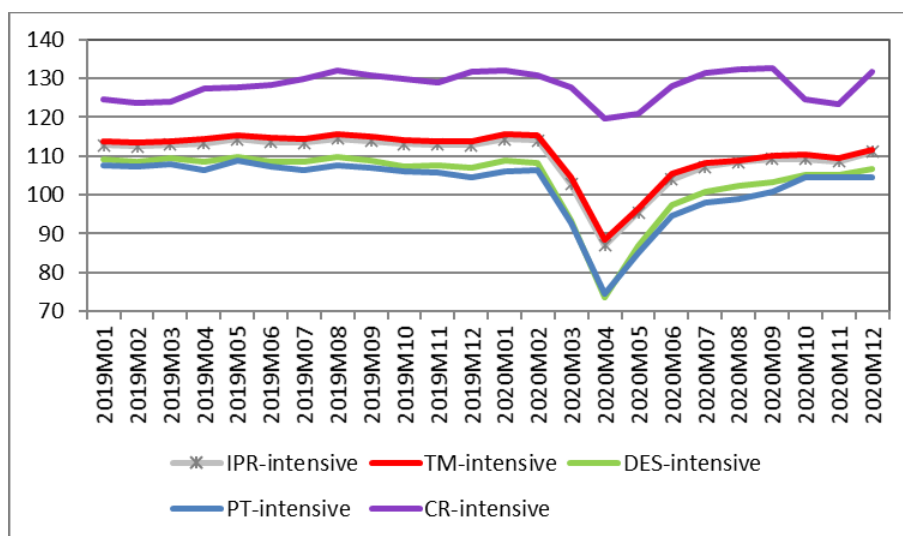
(in %)		IPR	TM	DES	PT	CR
<b>EU27</b>	Manufacturing	58.0	54.9	71.4	93.0	7.5
	Wholesale	18.5	22.9	20.0		
	Services	23.5	22.2	8.6	7.0	92.5
<b>Germany</b>	Manufacturing	68.3	63.9	81.4	97.1	9.1
	Wholesale	13.9	17.5	13.6		
	Services	17.8	18.5	5.0	2.9	90.9
<b>France</b>	Manufacturing	51.0	50.2	64.2	91.5	5.0
	Wholesale	21.0	27.9	29.6		
	Services	28.0	21.9	6.2	8.5	95.0
<b>Italy</b>	Manufacturing	60.3	57.3	73.6	94.1	9.3
	Wholesale	19.8	24.2	19.1		
	Services	19.8	18.6	7.3	5.9	90.7
<b>Spain</b>	Manufacturing	56.0	54.9	70.3	95.1	8.3
	Wholesale	21.2	26.7	22.5		
	Services	22.8	18.4	7.2	4.9	91.7

Source: EUIPO/EPO

The French and Spanish indicators have higher weights in the wholesale indicator and lower weights in the manufacturing sector indicator. The opposite is the case for the German and Italian indicators with higher weights in the manufacturing sector indicator. The German patent indicator is the extreme case with a 97% weight in the manufacturing sector. Due to the limited data available for Italy and Germany, only the patent and design indicators are estimated for Germany and only the patent indicator for Italy. The missing data in the service sector represent a maximum of 6% of the Italian patent indicator.

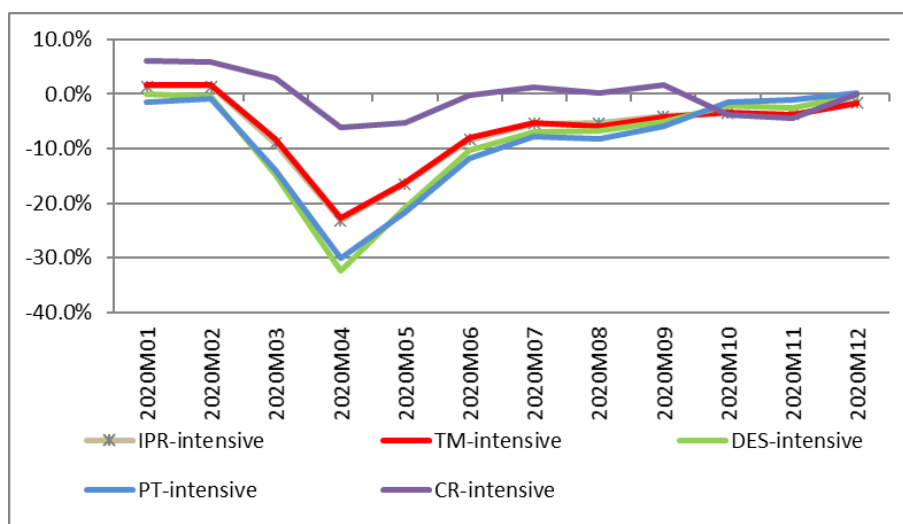
The wholesale and service sectors indices counteract to some degree the deterioration of the manufacturing, mining and energy industries in the EU. The copyright indicator is the only one that has already reached the pre-crisis level while the rest of the IPR indicators are still between 2 and 4 points below their levels in February 2020.

Figure 10: IPR indicators in the EU (2019 and 2020).



All indicators register a trough in April, with a recovery in May and June and a stabilisation between July and September but still show negative rates of change. The patent and design indicators suffered the highest drops, with a trough in April of -30% annual rates in both indicators. This is explained by the different composition of each IPR indicator with patent and design-intensive industries affected by the sharp decline in manufacturing industries.

Figure 11: Annual rates of change (%) of IPR indicators in the EU, 2020.



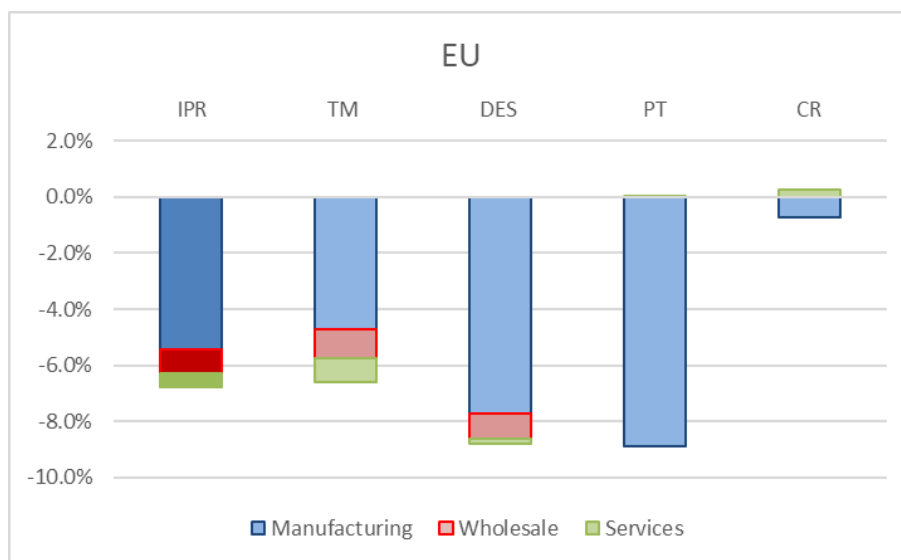
As a result, the average rates in 2020 are close to -9% in design and patent indicators, -6.5% in trade mark and overall IPR indicators and negative but close to zero in the copyright indicator.

Table 11: Annual rates of change (%) of IPR indicators in the EU.

(in %)	IPR	TM	DES	PT	CR
<b>2020M01</b>	1.3	1.6	-0.0	-1.5	6.0
<b>2020M02</b>	1.4	1.6	-0.5	-0.8	5.8
<b>2020M03</b>	-9.0	-8.2	-14.7	-13.9	2.9
<b>2020M04</b>	-23.2	-22.7	-32.3	-30.2	-6.0
<b>2020M05</b>	-16.4	-16.3	-20.9	-21.8	-5.4
<b>2020M06</b>	-8.4	-8.1	-10.4	-11.8	-0.3
<b>2020M07</b>	-5.5	-5.4	-7.1	-7.8	1.2
<b>2020M08</b>	-5.3	-6.0	-6.8	-8.1	0.2
<b>2020M09</b>	-4.1	-4.3	-5.0	-5.9	1.6
<b>2020M10</b>	-3.4	-3.4	-2.1	-1.5	-3.8
<b>2020M11</b>	-3.7	-3.7	-2.5	-1.1	-4.4
<b>2020M12</b>	-1.6	-1.8	-0.3	0.1	-0.1
<b>2020</b>	<b>-6.5</b>	<b>-6.4</b>	<b>-8.6</b>	<b>-8.7</b>	<b>-0.2</b>

The average rates of change are now decomposed to understand the role of the three sectorial indicators in the IPR indicators. We can approximate the 2020 average rates of change of the IPR indicators as a weighted sum of the rates of each sectorial indicator (manufacturing, trade and service sectors). The weights of each sector in the IPR indicators are those presented in Table 10.

Figure 12: Sectorial decomposition of IPR indicators' 2020 average rates of change (%) in the EU.



Although the trade mark and IPR indicators register similar average rates of change in 2020, the manufacturing indicator is responsible for 5.3 out of the 6.5 percentage points of decrease in the IPR indicator and 4.6 percentage points in the trade mark indicator. The latter shows a negative contribution of the wholesale and service sectors indicators in the average rate of almost 1 percentage point for each sector, while the contribution of those two sectors to the IPR indicator is 0.7 and 0.5 percentage points respectively.

The small difference between the average rates in the design and patent indicators increases if we look at the impact of the manufacturing sector. The patent indicator's negative rate of change is entirely explained by the manufacturing sector, while this sector's impact on the design indicator is 7.6 percentage points. The wholesale sector is responsible for almost an additional percentage point, with a much smaller impact of the service sector.

Finally, the copyright indicator's rate of change, close to zero, is the result of a positive rate in the service sector industries and a decline in the manufacturing sector.

### Results at Member State level

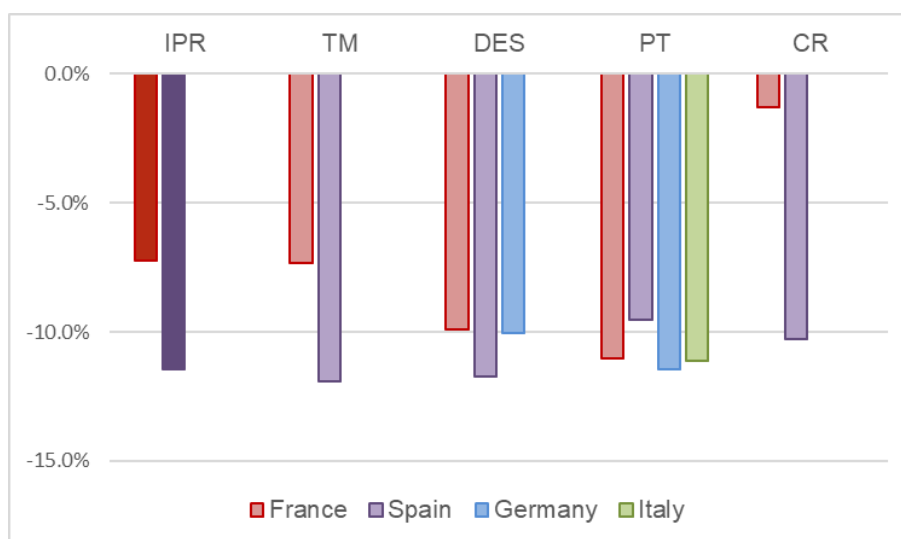
Due to data availability issues, all IPR indicators are estimated for France and Spain, but only the patent and design indicators could be estimated for Germany and only the patent indicator for Italy.

The behaviour of the French indicators in 2020 for the different IPRs is similar to the EU indicators, with patent and design indicators the most affected and the copyright indicator showing a quick recovery. However, the decreases are higher in France for all indicators than the EU average.

The results for Spain are also below the EU average, except for patents. The most remarkable result is the poor performance of the trade mark indicator with an average rate of change of -11.9%. This is mainly explained by the deterioration of the trade and service sectors indicators. The Spanish patent-intensive industries show the best results of the four countries, as explained in the discussion of the manufacturing sector indicator above. The copyright indicator in Spain declines sharply due to the poor performance of the service sector.

As a result of these annual rates, only the French copyright indicator has regained the pre-crisis level. In France the IPR indicators are still about 5 points below the average level in 2019. In Spain they are still about 7 points below the pre-crisis level, except for the patent indicator which is only 2 points below the pre-crisis level. This is explained by the higher weight of manufacturing sector in these IPR indicators. In addition, the Spanish manufacturing sector has performed better than the EU average.

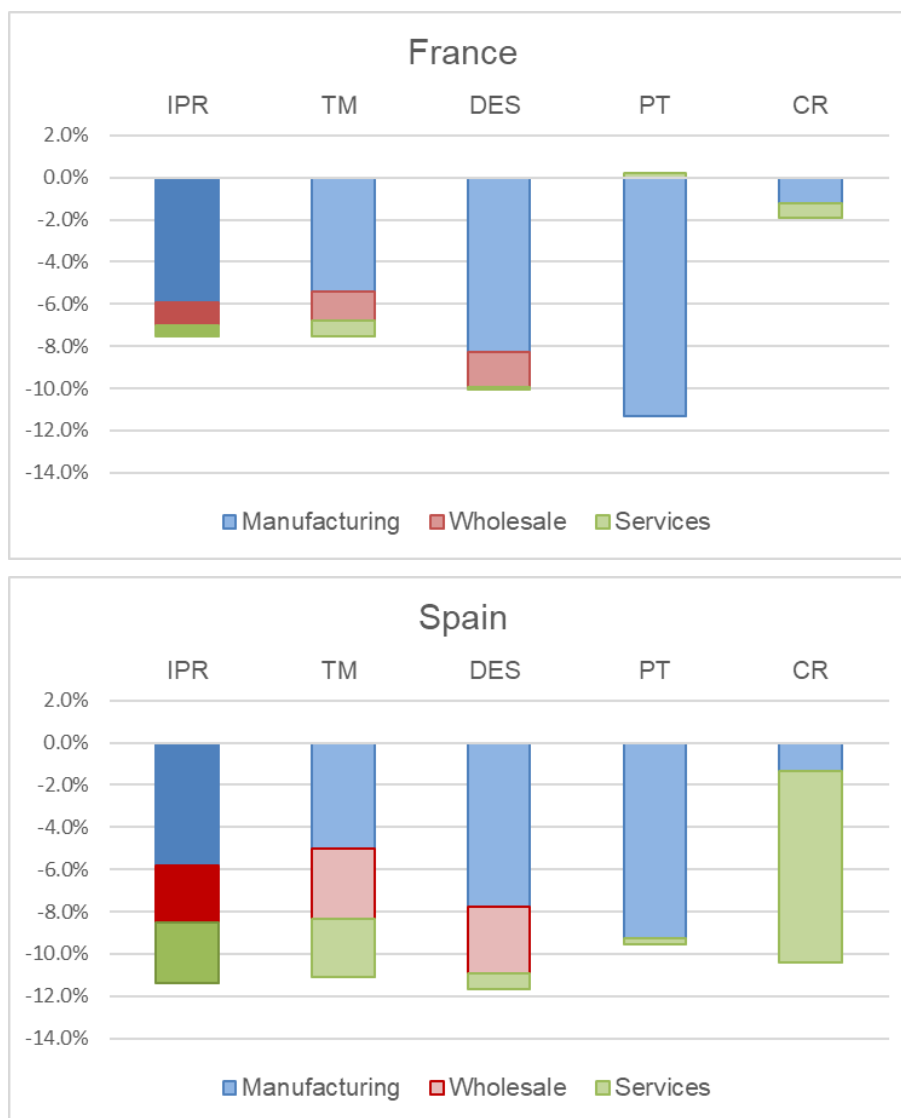
Figure 13: Average rates of change (%) of IPR indicators by Member State, 2020.



The decomposition of the average rates of change shows the role of each sector in the overall rates of change in Spain and France.

For Germany, the designs indicator can also be decomposed although practically the entire decrease of this indicator is explained by the manufacturing sector.

Figures 14a and 14b: Sectorial decomposition of IPR indicators' 2020 average rates of change (%) in France and Spain.



As shown in Figures 14a and 14b, if we limit the analysis to the blue bars representing the manufacturing sector's impact on the IPR indicators, both countries would have had similar average rates. Once the negative impacts of the wholesale and service sectors are added, the Spanish rates of change are more negative than the French ones, with trade mark and copyright indicators heavily influenced by the deterioration of the wholesale and service sectors in Spain.

The annual rates of change in France and Spain during the lockdown in April and May are similar, with annual decreases between 20% and 40% with the exception of the copyright indicator which fell even further in Spain. During the summer, the recovery in both countries was still weak, with

negative annual rates continuing during the rest of the year with few exceptions. Data for the coming months will be crucial to confirm whether a recovery phase has begun, or whether the situation will stabilise on low level rates.

In Germany and Italy the indicators for patent-intensive industries are identical to the ones in the manufacturing sector while the German design indicator also includes the development of the wholesale sector's design-intensive industries.

Table 12: Annual rates of change (%) of IPR indicators by Member State.

(in %)	France					Spain				
	IPR	TM	DES	PT	CR	IPR	TM	DES	PT	CR
<b>2020M01</b>	0.4	0.3	-1.1	-2.7	4.1	0.3	0.4	-0.5	-1.1	0.3
<b>2020M02</b>	0.0	-0.5	-0.8	-1.7	2.4	0.5	0.6	0.8	1.3	0.1
<b>2020M03</b>	-13.5	-13.6	-21.4	-20.0	-0.4	-16.5	-16.9	-20.4	-20.0	-12.2
<b>2020M04</b>	-29.0	-29.9	-41.9	-40.6	-8.4	-34.6	-36.1	-44.8	-39.1	-22.3
<b>2020M05</b>	-19.3	-19.1	-23.8	-27.4	-10.1	-26.5	-27.4	-31.6	-27.7	-21.8
<b>2020M06</b>	-6.8	-6.4	-9.2	-12.1	-1.6	-16.1	-16.6	-16.6	-14.4	-16.3
<b>2020M07</b>	-5.2	-5.2	-5.6	-8.3	-2.8	-9.1	-9.5	-7.9	-5.2	-10.0
<b>2020M08</b>	-3.7	-4.1	-3.4	-6.0	-0.3	-9.2	-9.7	-6.8	-6.6	-10.4
<b>2020M09</b>	-4.0	-3.4	-3.8	-5.0	-3.2	-10.1	-10.4	-4.3	-1.4	-11.4
<b>2020M10</b>	-2.5	-2.4	-2.8	-3.4	-0.2	-5.0	-5.3	-1.4	1.5	-8.2
<b>2020M11</b>	-2.9	-2.6	-4.0	-3.2	-0.2	-5.5	-6.1	-3.0	0.3	-5.2
<b>2020M12</b>	-0.4	-0.8	-0.6	-1.1	4.9	-5.3	-5.7	-3.5	-0.5	-6.1
<b>2020</b>	<b>-7.2</b>	<b>-7.3</b>	<b>-9.9</b>	<b>-11.0</b>	<b>-1.3</b>	<b>-11.5</b>	<b>-11.9</b>	<b>-11.7</b>	<b>-9.5</b>	<b>-10.3</b>

(in %)	Germany		Italy
	DES	PT	PT
2020M01	-2.4	-3.4	-0.2
2020M02	-2.8	-3.2	-0.1
2020M03	-13.6	-15.4	-34.9
2020M04	-31.1	-32.3	-42.6
2020M05	-22.8	-25.4	-22.2
2020M06	-12.2	-14.7	-14.5
2020M07	-10.1	-12.3	-7.5
2020M08	-11.0	-13.2	-1.7
2020M09	-8.7	-9.8	-5.3
2020M10	-2.2	-3.2	-1.2
2020M11	-2.7	-3.5	-1.7
2020M12	-0.2	-0.7	-0.1
2020	-10.0	-11.5	-11.1

## 4 IPR-intensive industries and GDP: comparative development

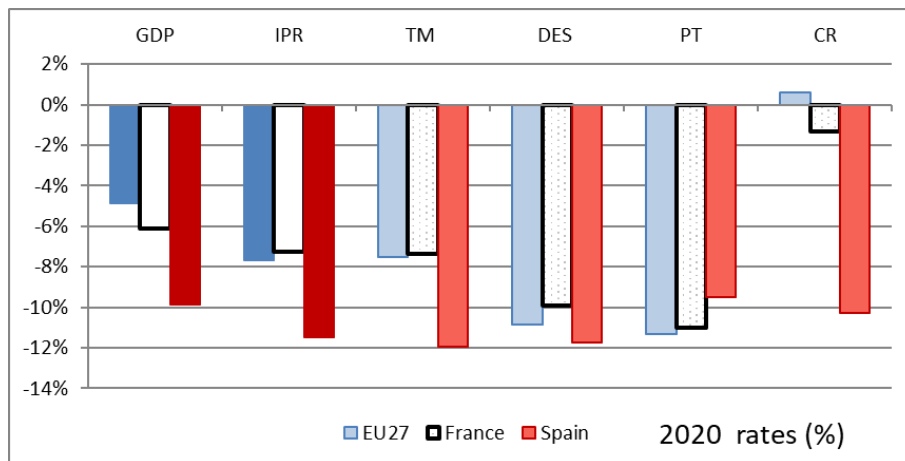
As a summary of the economic impact of the COVID-19 economic crisis in 2020, the average rates of GDP at current prices<sup>31</sup> as well as all IPR indicators for the EU, France and Spain are shown in Figure 15<sup>32</sup>.

<sup>31</sup> GDP data published by Eurostat and updated on 3 May 2021

<sup>32</sup> The data analysed in Sections 4 and 5 are available upon request.



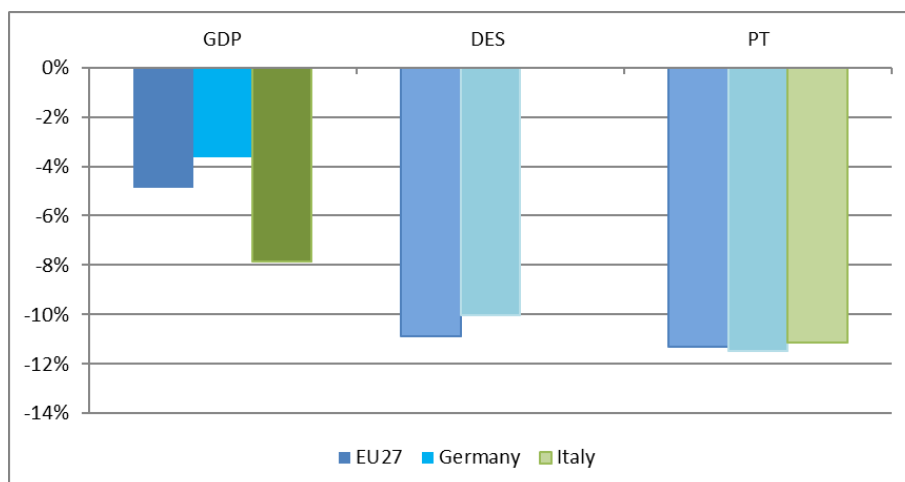
Figure 15: Average rates of change (%) of GDP and IPR indicators. EU, France and Spain, 2020.



Trade mark, design and patent-intensive industries, as well as the aggregated indicator for all IPRs showed larger decreases than the whole economy in 2020 in the EU (represented by GDP at current prices), as well as in France and Spain (except the Spanish patent-intensive industries with better performance than the GDP). Copyright-intensive industries performed better than GDP in the EU and France and slightly worse in Spain. Spain registers the worst rates in all indicators except in patent-intensive industries which are dominated by the manufacturing sector.

The same occurred in Germany and Italy, with GDP rates of change in 2020 of -3.6% and -7.8% respectively. Both patent and design-intensive industries registered larger decreases than GDP during the same period, between 10% and 11%.

Figure 16: Average rates of change (%) of GDP and some IPR indicators. EU, Germany and Italy, 2020.



One of the explanations for a better performance of GDP during the recession in 2020 in comparison with IPR-intensive industries, is the countercyclical behaviour of public services which are non-IPR-intensive. In fact, as published by Eurostat, the 2020 annual growth rate of GVA of Sections O to Q (Public administration, defence, education, human health and social work activities) is 1.1% in the EU, 3.7% in Spain and a smaller increase of 0.4% in France. The public sector counterbalances the overall economy, acting as an automatic stabiliser.

Additionally, as explained in the EUIPO/EPO report (2019), the bulk of EU trade is in IPR-intensive industries. They are responsible for 82% of extra-EU exports generated in the period 2014-2016. With international trade contracting more sharply than GDP<sup>33</sup> due, among other reasons, to travel restrictions, and the disruption of global value chains, the initial collapse of IPR-intensive industries shown in Section 3 is not surprising. Due to the procyclicality of IPR-intensive industries, the rebound in 2021/2022 can also be expected to be stronger than for non-IPR-intensive industries, although this will depend on the degree to which the pandemic is brought under control.

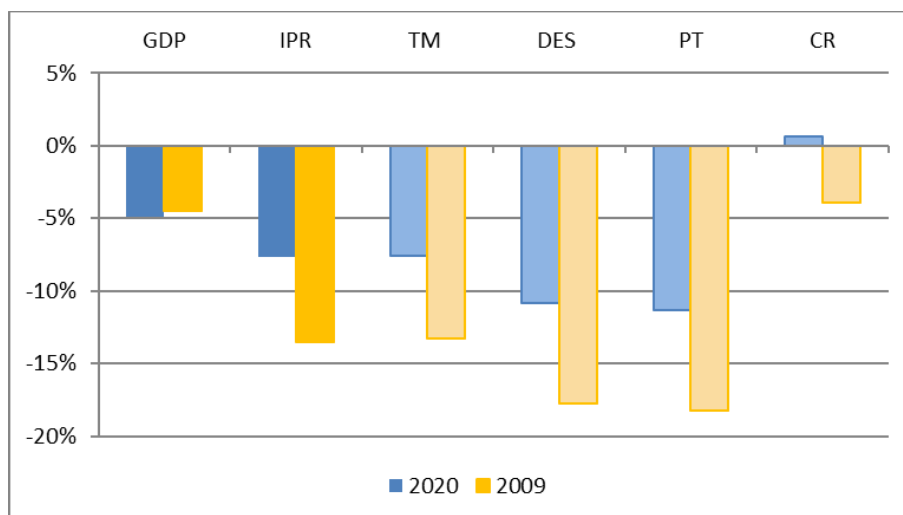
The development of these economic indicators in the current crisis is compared with the 2009 financial crisis. The behaviour of the different aggregates in 2020<sup>34</sup> replicates those of the 2009

<sup>33</sup> ECB (2020-b) 'Global trade (excluding the euro area) has contracted more sharply than real GDP in 2020, but the rebound in 2021 is likewise expected to be stronger'. It is estimated that global trade contracted in 2020 by 9.2 % (excluding the eurozone) compared with a decrease of real GDP in the eurozone of 7.3 %. The ECB projects that exports in 2020 will be down by 11 %.

<sup>34</sup> The financial crisis is technically dated for the EU since 2Q2008 to 2Q2009. Nevertheless, as we prefer to base our comparison on GDP at current prices that registered negative rates since 4Q2008 to 4Q2009 we decided to compare natural years 2020 and 2009.

crisis: patent and design-intensive industries suffered the sharpest fall and copyright-intensive industries performed better than the overall economy.

Figure 17: Average rates of change (%) of GDP and IPR indicators. EU, 2020 and 2009.



The origin of the two crises is completely different. The banking and real estate industries were the trigger of a crisis that started in 2007 in the United States and subsequently spread among different sectors and countries. In 2020 a sudden lockdown was the response to a health crisis simultaneous in almost all countries in the world<sup>35</sup>. The profound downturn in March and April 2020 was followed by a strong rebound but the subsequent recovery in 2021 is still weak and will depend on the effectiveness of the vaccines campaign and the lifting of the containment measures.

The average rates of the GDP declines in 2009 and 2020 are similar, with a -4.4% rate in 2009 and -4.9% in 2020. Notwithstanding, the IPR-intensive industries dropped relatively more in 2009 than in 2020, with almost 7 percentage points of difference in the patent and design-intensive industries and 4.5 percentage points in the copyright-intensive industries.

Besides, the trough of GDP and IPR-intensive industries is dated in June or July 2009. Nevertheless, the conclusions considering other timelines are identical.

<sup>35</sup> IMF Blog April 2020: 'This year 170 countries will see income per capita go down-only months ago we were projecting 160 economies to register positive per capita income growth', <https://blogs.imf.org/2020/04/20/a-global-crisis-like-no-other-needs-a-global-response-like-no-other/>

As a result, the decline in IPR-intensive industries in the current crisis is almost 3 percentage points deeper than the overall GDP decline, while it was 9 percentage points deeper during the 2009 financial crisis.

### **Results at Member State level**

France, Spain and Italy show a steeper decrease of GDP in the current crisis<sup>36</sup> than in 2009. The half percentage point of difference in the EU GDP rate between the two crises increases to 3.4 percentage points of difference in France, 4 percentage points in Italy and 6.3 percentage points in Spain. In Germany the GDP decline is 0.3 percentage points smaller in 2020 than in 2009.

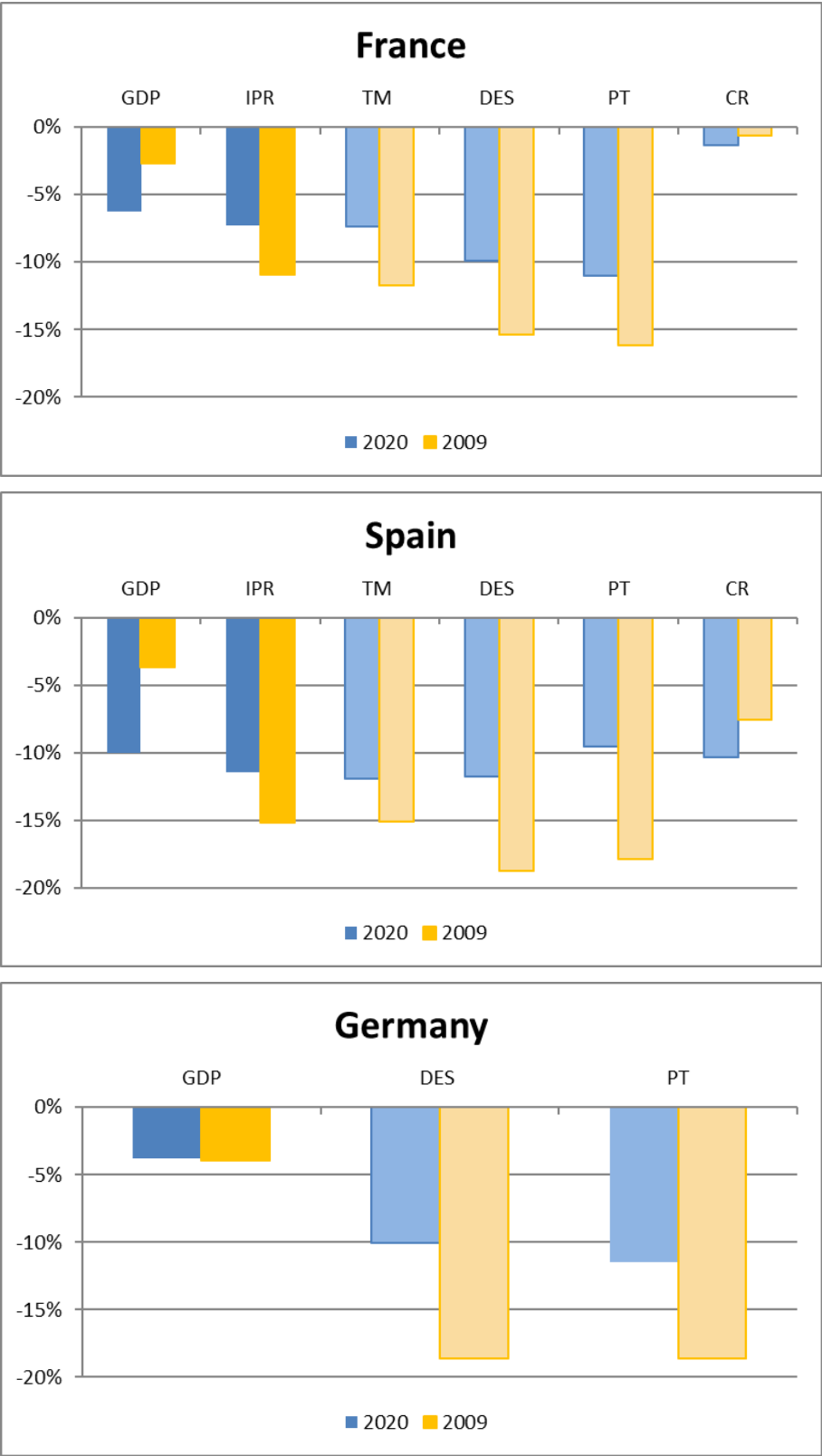
In all four countries the decrease registered in the IPR indicators in 2009 is higher than in 2020 with the copyright indicators in France and Spain as the only exception.

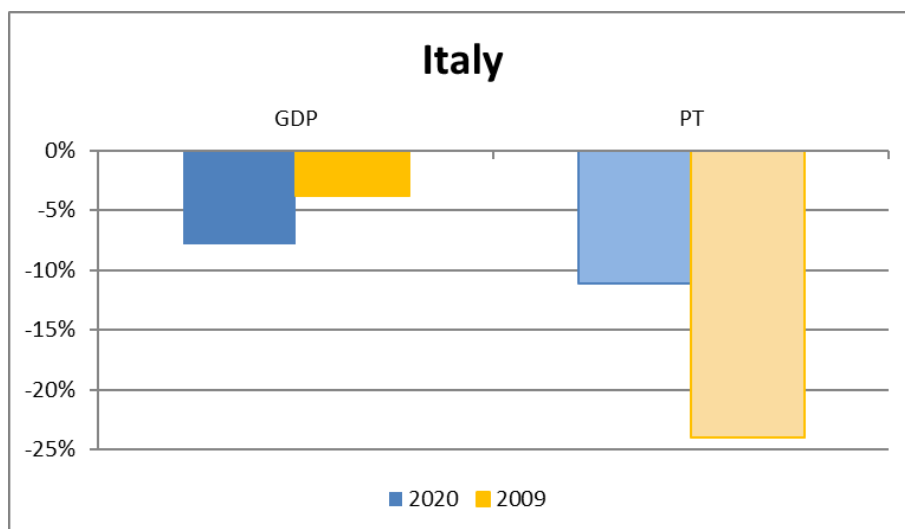
In France, the differences in the average rates of the IPR-intensive industries between the two crises are lower than in the EU with 5 percentage points of difference in the patent and design-intensive industries, 4 percentage points of difference in the trade mark-intensive industries and less than 1 percentage point in the French copyright indicator, the only one less impacted in 2009 than 2020. The Spanish trade mark and IPR indicators have also lower differences between both crises, with 3 percentage points higher decreases in 2009 but higher differences in design and patent-intensive industries with 7 and 8 percentage points of difference. The Spanish copyright indicator was also less impacted in 2009 than 2020 as it was the case with the French indicator. In Germany the difference in the decrease registered between the two crises is 8.6 and 7 percentage points in the design and patent-intensive industries. The biggest difference between indicators in both crises is in the Italian patent-intensive industries which registered in 2009 a decrease of 24%, twice the decrease registered in 2020.

---

<sup>36</sup> IMF World Economic Outlook update in January 2021 projected the highest decline in GDP in Spain and the third and fourth highest declines in Italy and France respectively. Germany GDP decline in 2020 is almost 2 percentage points below the eurozone average.

Figures 18a to 18d: Average rates of change (%) of GDP and IPR indicators. France, Spain, Germany and Italy, 2020 and 2009.





To summarise, all IPR-intensive industries suffered higher decreases in 2009 than in the current crisis, with the exception of the copyright-intensive industries, while overall GDP registered worse decreases in France, Spain and Italy in the 2020 crisis than in 2009 and closer declines in both crises in Germany.

It is worth analysing the recession and recovery phases of IPR-intensive industries in more detail. The next section will introduce a cyclical analysis to understand the similarity and differences between 2009 and 2020 crises.

## 5 IPR-intensive industries: medium-term development

In this section, the medium-term development of the IPR-intensive industries since 2003 is analysed based on smoothed annual rates (SAR), calculated after the elimination of irregular movements of the series<sup>37</sup>. This section has a double purpose: first to look at the 2009 recession phase and the

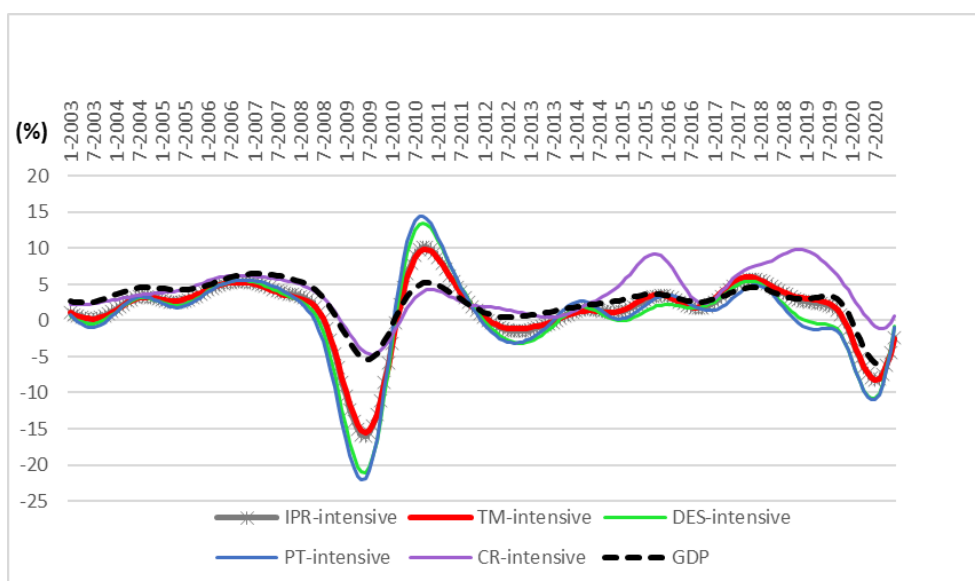
<sup>37</sup> The programs <F>, <G> and <FDESC>, developed by the Spanish National Statistical Office (INE) for cyclical analysis, filter time series eliminating noise and irregular movements to obtain the SAR. These programs also detect turning points and classify the series with regards to their cyclical signal.

subsequent recovery and secondly to analyse the cyclical behaviour of GDP and the IPR-intensive industries during 2020 and compare it with 2009 crisis.

For all IPR indicators, the SAR confirms a deeper recession in 2009 than in 2020. Another important finding is that all IPR indicators have already signalled the end of the recession but in different months: patent and design-intensive industries started recovering in June 2020; one month later the IPR and trade mark-intensive industries reached a trough and finally copyright-intensive industries flagged a trough in September. For reference, with updated data published by Eurostat in 3 May 2021, GDP reached the end of the recession in August.

What is also noticeable is the sharper slump in patent and design-intensive industries in both troughs (2009 and 2020) as well as the higher rates of both indicators in the peak in 2010. Copyright-intensive industries follow a different and less volatile trend during the period analysed.

Figure 19: Smoothed annual rates (SAR) of IPR indicators and GDP. EU 2003-2020.

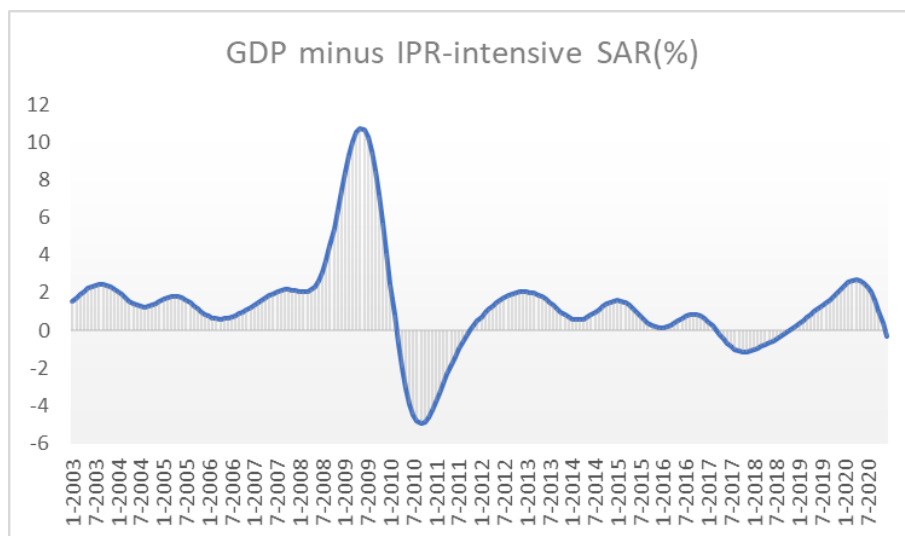


The difference between GDP and IPR-intensive industries rates in Figure 20 shows peaks in recession phases when non-IPR-intensive industries smooth the rates of IPR-intensive industries with the highest difference in 2009 (GDP lower rate of -5% vs IPR indicator trough of -16%) and only 2 percentage points of difference in 2020 (similar rate of GDP and half decrease of IPR indicator).

After the recession phases, IPR-intensive industries grow faster than GDP and it is reflected in Figure 20 with negative values. The first period of 19 month starting in March 2010, reached a minimum in September with a higher rate by 5 percentage points in IPR-intensive industries than GDP (10% and

5% annual rates respectively). A second period with higher rates of IPR-intensive industries is shown from April 2017 with the same duration but a smaller maximum difference of 1 percentage point. Data until the end of 2020 has shown that the IPR indicator has just surpassed GDP SAR in December and a new period of higher rates in IPR indicators than GDP is expected for 2021.

Figure 20. Difference between GDP and IPR indicator's SAR for the EU, 2003-2020.



The cyclical analysis is now based on the turning points of the series which are the points where the series moves from an acceleration phase to a deceleration one (peak) or vice versa (trough). A peak is then the last period of an expansion, while a trough is the last period of a recession.

The amplitude of a phase is defined as the difference between the SAR in the trough (peak) and the previous peak (trough). It serves as a measure of the volatility of the cycle. The duration of a phase is the distance, in months, between two consecutive turning points of opposed sign. The amplitude and duration of the last recession phase that ended in 2020 is compared with the same indicators in the 2009 financial crisis for all IPR indicators.



Table 13: Trough dates, amplitude (%) and duration (in months) of 2009 and 2020 recession and recovery phases in IPR indicators in the EU.

EU	Recession phases		Trough date	Recovery phases	
	Amplitude	Duration		Amplitude	Duration
IPR	21.37	32	2009.06	26.14	15
	14.00	32	2020.07		
Trade mark	20.84	33	2009.06	25.44	16
	14.22	33	2020.07		
Design	26.60	32	2009.06	34.61	15
	16.32	32	2020.06		
Patent	27.75	30	2009.05	36.62	16
	15.92	30	2020.06		
Copyright	10.92	35	2009.08	9.00	15
	11.00	22	2020.09		

The duration of the two recession phases (2009 and 2020) is identical for all IPR indicators with the only exception being the copyright indicator. Nevertheless, again with the only exception being copyright, the amplitude is consistently higher in the 2009 financial crisis with a difference of more than 10 percentage points between the amplitude of the 2009 recession phase in comparison with the 2020 recession in patent and design-intensive industries, 6 percentage points of difference in the trade mark-intensive industries and 7 in the IPR-intensive industries overall. The higher amplitude is explained by a deeper fall of rates in 2009 because the SAR in the previous peak was similar in both recession phases with a value close to 5%.

The recovery phase after the 2009 recession shows an asymmetric cycle with higher amplitude and lower duration of the acceleration phase in all IPR indicators except copyright. The patent-intensive industries show the highest amplitude in both the recession and the subsequent recovery phase, followed closely by design-intensive industries.

It can be confirmed that IPR-intensive industries contracted more sharply than GDP in both recessions analysed and also that the rebound in 2010 is stronger and faster. Industries whose fluctuations are of broader amplitude are procyclical as is the case with IPR and especially patent and design-intensive industries. Therefore, the recovery phase following the current recession can be expected to be stronger and faster in patent and design-intensive industries even though precisely

when the pre-crisis levels will be reached is still uncertain and depends on future restrictions (even though those restrictions tend to affect the service sector more than the manufacturing sector).

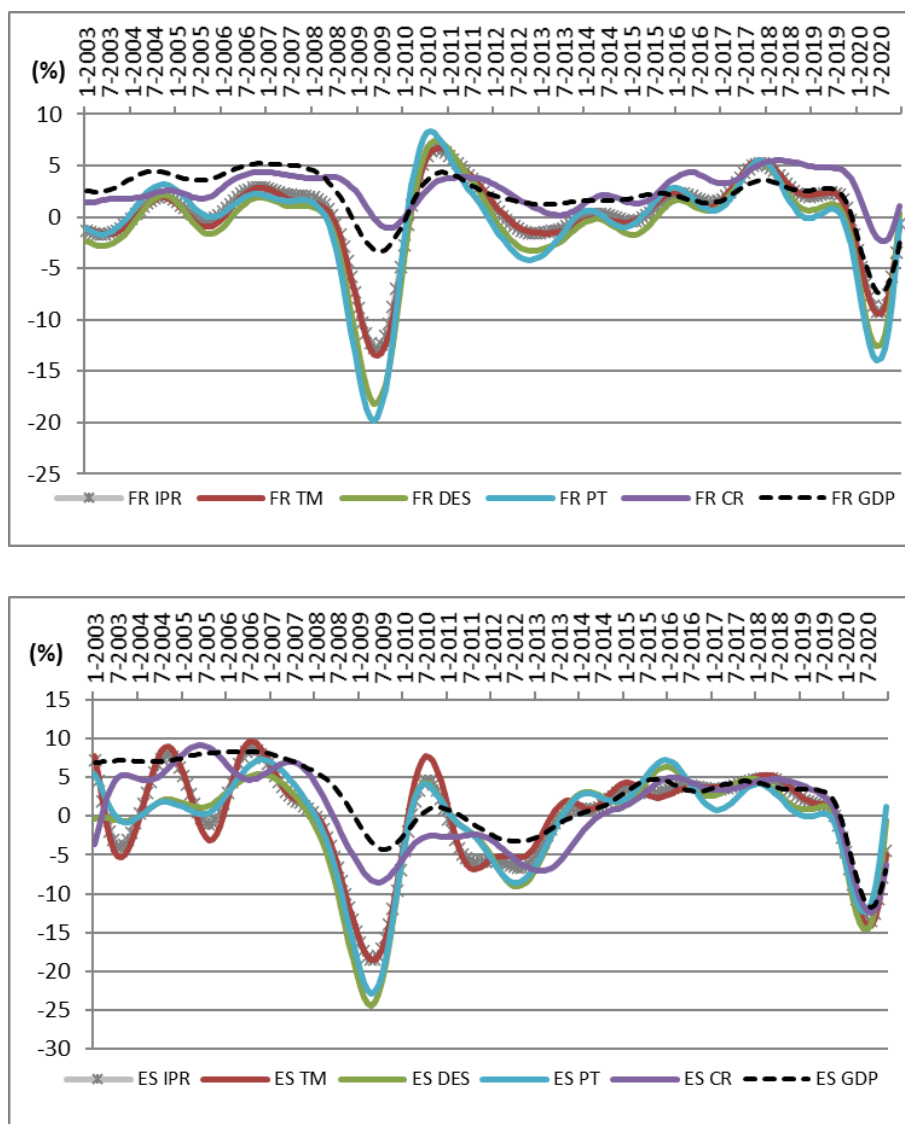
All the indicators have already signalled a trough dated in June (designs and patents), July (trade marks and all IPRs) and copyright again the last indicator flagging the trough in September, in the same way as in 2009. Once the current recession is over, the subsequent recovery phase could be analysed to have a complete picture of the cyclical characteristics of different IPR-intensive industries.

### **Results at Member State level**

The SAR of the IPR indicators in Spain and France show a similar trend to that for the EU, with patent and design indicators more volatile than trade mark and IPR-intensive industries and copyright indicators exhibiting quite a different shape. Nevertheless, the Spanish IPR indicators registered a deeper slump in 2009, reaching rates of change close to -25% in patent and design-intensive industries and -20% in trade mark and IPR-intensive industries. The rates of change in the 2020 trough are similar in both countries for patent and design-intensive industries and lower (deeper decreases) in Spain in trade mark, copyright and IPR-intensive industries.

Finally, the peaks signalled after the 2009 financial crisis in both countries and all IPR indicators show lower growth rates in comparison with the EU, with values below 10% in all cases, while EU indicators reached 10% growth rates in trade mark and IPR-intensive industries and 15% in the patent and design-intensive industries. The recovery of the trade mark-intensive industries was strong in Spain in 2010, with the peak at about 2 percentage points higher growth rate than the design and patent-intensive industries.

Figures 21a and 21b: Smoothed annual rates (SAR) of IPR indicators and GDP. France and Spain 2003-2020.

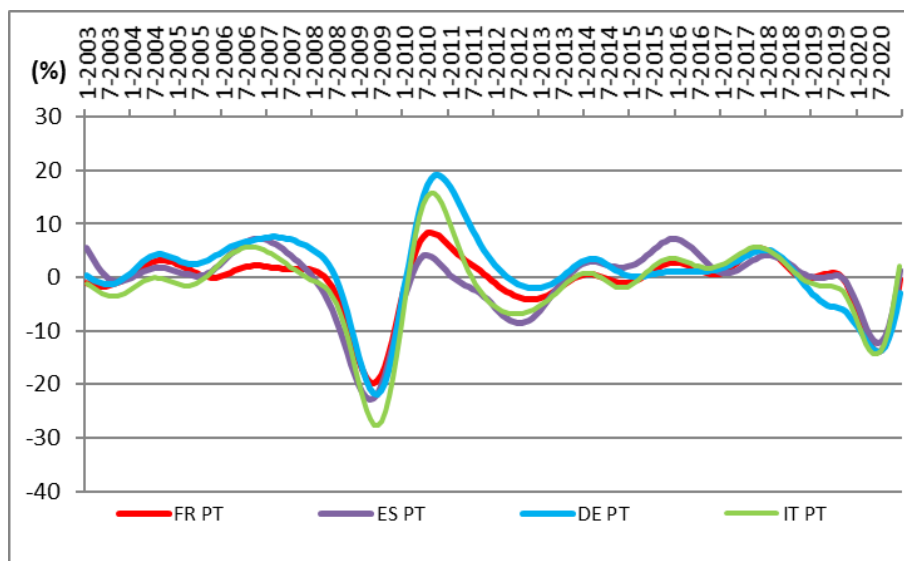


The two indicators calculated for Germany are almost identical since 2010 and very volatile in the 2009 financial crisis. Both indicators show a sharp fall in 2009 with almost 30 percentage points of amplitude in the recession phase and an even higher amplitude in the subsequent recovery phase with 40 percentage points of difference between the trough in 2009 and the peak in 2010. The amplitude of the last recession is also higher than the EU average with almost 20 points of difference between the last peak and the trough in 2020.

The Italian patent indicator registers higher amplitudes of both phases: the 2009 recession (33 points) and 2010 recovery phase (43 points). This is explained by the sharper fall of all patent indicators as shown in Figure 22.

Nevertheless, the trough in 2020 shows similar values in the patent indicators of the four countries.

Figure 22: Smoothed annual rates (SAR) of patent indicators. France, Spain, Germany and Italy, 2003-2020.



The date of the troughs in 2009 and 2020 and the amplitude and duration of the recession phases in the four countries show some differences with EU cycles. The main difference is the presence of an additional cycle in France and Spain between 2017 and 2018. This is also clear in Figure 22 when the patent-intensive industries' trends of the four countries are compared.

Table 14: Trough dates, amplitude (%) and duration (in months) of 2009 and 2020 recession and recovery phases in IPR indicators in four largest EU Member States.

		Recession phases		Trough date	Recovery phases	
		Amplitude	Duration		Amplitude	Duration
France	IPR	15.71	31	2009.06	19.44	16
		11.61	13	2020.07		
	Trade mark	16.36	31	2009.06	20.25	16
		14.91	31	2020.06		
	Design	18.74	14	2009.05	25.56	16
		13.87	12	2020.06		
	Patent	20.93	15	2009.05	28.20	15
		14.73	12	2020.06		
	Copyright	5.45	34	2009.09	4.96	20
		7.88	28	2020.08		
Spain	IPR	27.17	32	2009.04	23.11	15
		18.59	28	2020.07		
	Trade mark	28.17	32	2009.04	26.23	15
		19.48	27	2020.07		
	Design	29.73	30	2009.04	28.70	15
		19.39	32	2020.07		
	Patent	30.03	30	2009.04	26.98	15
		16.43	29	2020.06		
	Copyright	15.58	24	2009.06	5.02	10
		17.19	26	2020.08		
Germany	Design	28.17	31	2009.06	39.94	16
		17.76	31	2020.06		
	Patent	29.39	27	2009.06	40.97	16
		19.01	30	2020.06		
Italy	Patent	33.34	33	2009.06	43.44	14
		20.06	32	2020.06		

The amplitude of the phases is determined by both the magnitude of the slump but also the rates reached in the previous peak. In France, the amplitude of both recessions is lower than in the EU for all IPR indicators while in Spain it is the opposite: 30 percentage points of difference between the trough in 2009 and the previous peak and almost 20 points of difference in the last trough dated in 2020.

In France as well as in the EU, the recovery phase that followed the 2009 financial crisis had a higher amplitude than the recession in all IPR-intensive industries except copyright. The duration of the recovery phase is higher in design-intensive industries, identical in patent-intensive industries and lower in the other IPR indicators.

The Spanish indicators show a different asymmetry with a lower amplitude and duration of the recovery phase than the previous recession.

In Germany and Italy, the amplitudes of the 2010 recovery phases are even higher than the amplitudes of the previous recession, with more than 10 percentage points of difference in the patent and design indicators estimated for these countries.

A common characteristic across all countries is the higher duration and amplitude of the 2009 recession in comparison with the 2020.

## 6 Conclusions

1. The analysis of the STS for the IPR-intensive industries shows that the manufacturing, mining and energy sectors were hit strongest as a result of the lockdown of the EU economies in the first wave of the pandemic in March 2020.
2. The renewed contraction of the economies in the last months of 2020 (second wave) is primarily affecting tourism and travel-related service sectors which are more contact-intensive.
3. When different IPRs are analysed separately, patent and design-intensive industries are the most affected from March to June, due to the higher weight of manufacturing industries in these indicators. From July to September, the growth rates stabilised at similar levels in trade mark, design and patent-intensive industries, resulting in annual decreases between 6% and 9%.
4. The improvement in the IPR-intensive manufacturing industries in May and June is very pronounced, showing initially a V-shaped recovery (a sharp decline followed by a sharp

rise). In July and August, the pace of the expansion phase slows down resulting in an asymmetric V-shaped recovery (the recovery phase is not as vigorous as the decline). In contrast, the service sector indicators show a W-shaped recovery with a second slump in August, most noticeable in the design and patent indicators and a third decline in November that is most pronounced in the trade mark and copyright indicators. At the end of the year, only the copyright indicator has reached its pre-crisis levels.

5. The behaviour of IPR-intensive industries in the four biggest EU Member States show a similar trend but with different magnitudes in their growth rates. Spain and Germany are the countries in which the manufacturing industries perform better compared with France and Italy.
6. When the IPR-intensive industries of the wholesale and service sectors are added, Spain is the country with the biggest decline, except in the patent indicator. This is due to its economic structure, but also to the behaviour of some important service sector industries included in the IPR indicators, such as divisions 79 'Travel agencies, tour operators and other reservation service and related activities'; 59 'Motion picture, video and television programme production, sound recording and music publishing activities'; and 60 'Programming and broadcasting activities'.
7. IPR-intensive industries declined more than the overall GDP in the EU in 2020. However, these industries are procyclical so higher fluctuations are expected in recessions but also during recovery phases.
8. When economic indicators in 2020 and 2009 are compared, the GDP decline is higher in the current crisis, but all IPR indicators, except copyright, suffered steeper declines during the 2009 financial crisis. As a consequence, the decline in IPR-intensive industries in the current crisis is only 3 percentage points higher than the GDP rate while it was 9 percentage points higher in the 2009 financial crisis. This is confirmed by a medium-term analysis of the SAR.
9. The medium-term trend also shows that the 2010 recovery was stronger and faster in IPR-intensive industries than in the rest of the economy, confirming the procyclical character of IPR-intensive industries.
10. The EUIPO will closely monitor the development of IPR-intensive industries during 2021 to confirm the recovery to pre-crisis levels and to anticipate risks of a new decline due to the weakness of some of the IPR-intensive industries, with special attention on the service sector. Future research will examine leader indicators that signal turning points of the IPR-intensive industries based on the STS presented in this paper.

## References

- Abad A. and Quilis E.M (2004) Program for Cyclical Analysis <F> <G> <FDESC>. Users' guide.
- Antonakakis N, Scharler J (2012). The Synchronization of GDP Growth in the G7 During US Recessions. Applied Economics Letters.
- Baxter M, Kouparitsas MA (2005). Determinants of Business Cycle Co-movement: A Robust Analysis. Journal of Monetary Economics.
- Cristobal A. and Quilis E.M. (1994). Tasas de variación, filtros y análisis de la coyuntura. Boletín Trimestral de Coyuntura nº52, INE.
- EUIPO and EPO (2019) IPR-intensive industries and economic performance in the European Union. Industry-level analysis report. Third edition.
- European Central Bank, ECB (2020-a). Economic Bulletin Issue 8/2020.
- European Central Bank, ECB (2020-b). Macroeconomic projections. December 2020.
- European Central Bank, ECB (2021). Economic Bulletin Issue 1/2021.
- European Commission (2002) Towards improved methodologies for Eurozone statistics and indicators.
- Eurostat (2006) Methodology of short-term business statistics. Interpretation and guidelines.
- IMF (2021) World Economic Outlook updated January 2021.
- INE (1995) La elaboración del Índice de Difusión de Empleo. Boletín Trimestral de Coyuntura nº58.
- Maravall A. and Gómez V. (1996) Programs TRAMO and SEATS. Instructions for the user.
- OECD (2008) Handbook on Constructing Composite Indicators: methodology and user guide.
- WIPO (2003) Surveying the Economic Contribution of the Copyright-based Industries.



## Appendix: Data sources and methods

### 1.1 Short Term business Statistics<sup>38</sup>

STS are the earliest statistics released by Eurostat to show emerging trends in the European economy. STS provide data for the major economic domains: industry, construction, trade and services (excluding financial and public services).

The major advantage of the monthly released STS data is that they are available very shortly after the end of the reference month. For example, data on retail trade turnover are published as early as 30 days after the reference month and data on industrial production are published after 60 days. STS are available for the EU, the euro area, the Member States and also for some third countries.

Basically, STS data are derived from surveys of businesses. Use is also made of administrative data or other sources outside the national statistical systems. STS describes economic developments by a series of indicators such as production, turnover, prices, and several more. STS indicators facilitate monitoring and decision-making and are also used in conjunction with other economic datasets, such as the national accounts.

STS indicators are published as indices which show the changes of the indicator in comparison with a fixed reference year and in terms of growth rates, but not in absolute values. The index average is 100 for the base year. An index of 110 means that there has been a 10 % increase since the base period. An index of 90 means that there has been a 10 % decrease since the base period.

A seasonally adjusted series is a time-series from which the effects of regular seasonal influences have been removed. Seasonal effects usually reflect the influence of the seasons themselves or social conventions (such as Christmas). In general, the seasonally adjusted series is smoother than the gross series and this further facilitates month-to-month comparisons. For example, gross figures for retail sales are higher in December than in November; the seasonally adjusted series allows for generally higher sales at Christmas and makes it possible to compare the December figures with those of preceding months.

---

<sup>38</sup> This note has been extracted from the Eurostat website: <https://ec.europa.eu/eurostat/web/short-term-business-statistics/overview>

For some economic activities, the number of particular days in a month has a significant impact on the level of the series. For example, monthly activity in retail trade depends on the number of Saturdays during the reference month. Series are calendar adjusted when the effects linked to the number of days of different types occurring in the reference month are removed from the series.

Most STS indicators are adjusted for calendar effects and/or seasonally adjusted by using TRAMO and SEATS software<sup>39</sup>, once the influence of working days or seasonal variations has been detected. During these adjustments, other calendar effects such as Easter or leap years are also taken account of.

## 1.2 Structural Business Statistics

In contrast to the STS that are available quickly but provide only the changes in the indicators without absolute numbers, for the aggregation of indices in sectorial indicators of selected industries a measure of the size of each industry is needed to be used as weights as explained in the Section 1.3 of this appendix.

The SBS describe the economic structure of the EU and Member States in monetary terms and at a very detailed level. The results from the SBS in the base year of the STS indices are used to weight the indices and obtain the correspondent aggregates. The indicator used is the Value Added (VA) which is calculated as the sector's production minus its purchases from other sectors. VA is the most appropriate economic indicator to evaluate a long list of industries from different sectors.

## 1.3 Sectorial indicators for IPR-intensive industries

The sectorial indicators are based on Eurostat's STS and estimated for the six IPRs included in the EUIPO/EPO reports and separately for trade mark (TM), designs (DES), patents (PT) and copyright (CR) -intensive industries, showing different responses to lockdown in the EU countries. The list of industries included in each IPR aggregate can be found in EUIPO/EPO report (2019) and it is reproduced in Section 1.4 of this appendix including those industries with available data for the calculation of the IPR indicators.

At the time of writing this paper, some STS indices were not published for the EU and the months October to December. This affected three groups of design-intensive industries in the wholesale

---

<sup>39</sup> Maravall and Gomez (1996).

sector and eight out of nine divisions of the service sector IPR-intensive industries. These missing indices were imputed based on data from the available 9 Member States for the wholesale sector and 15 Member States for the service sector. The weights for wholesale groups are based on SBS VA in 2015 and for the service sector the weights published by Eurostat at section level.

For each sector (manufacturing, trade and services) the sectorial indicators are estimated as a weighted average of STS indices of industries classified as intensive in each IPR following the equation:

$$\text{Eq. I.1} \quad I_t = \sum_{i=1}^n W_i * I_{it}$$

Where  $I_{it}$  is the production indicator for the manufacturing sector and turnover<sup>40</sup> indicator for trade and service sectors, for the NACE class, division or group  $i$  and month  $t$ .  $I_{it}$  are base 2015 STS indices corrected for seasonality and calendar effects.

$W_i$  is the relative weight of VA of  $i$  NACE class, division or group among all the IPR-intensive industries of each indicator from SBS 2015 :

$$\text{Eq. I.2} \quad W_i = \frac{VA_i}{\sum_{i=1}^n VA_i}$$

Where  $VA_i$  is the VA of class/group/division  $i$  in 2015.

The number of indicators  $n$  used in each aggregate varies depending on the IPR and the sector. Due to the higher aggregation of the indices published for the service sector, some divisions are only partially IPR-intensive and a ratio is applied representing the share of employment in IPR-intensive classes included in each division.

---

<sup>40</sup> Even though turnover is not comparable to production in the trade sectors, the use of this indicator is justified because it presents the most complete data and results are not distorted when only trade sectors are compared.

Table A1: Ratios applied to NACE divisions of the service sector IPR indicators

Division's ratio	TM	DES	PT	CR
58	1	0.25	0.2	1
59	0.8	0	0	1
60	1	0	0	1
61	0.5	0.3	0.3	1
62	0.6	0	0	1
63	1	0.1	0	1
73	1	0.7	0	0.8
74	0.75	0.75	0.5	0.5
79	1	0	0	0.15

As a consequence, the service sector indicator is the only one with two weights: the relative weight of SBS VA in 2015 and the divisions' ratios representing the employment in IPR intensive classes in each division as from Table A1.

Eq. I.3 
$$I_t = \sum_{i=1}^n W_i * D_i * I_{it}$$

Where  $D_i$  are the divisions' ratios and  $W_i$  and  $I_{it}$  have the same meaning as in the equation I.1 and  $n=9$ .

## 1.4 Indicators for IPR-intensive industries

The IPR indicators are finally estimated for each IPR based on the three sectorial indicators:

Eq. I.4 
$$IPR_t = \sum_{j=1}^3 S_j * I_{jt}$$

Where  $I_{jt}$  are the three indicators for the manufacturing, wholesale and service sector in month  $t$  and  $S_j$  are the weights presented in the Table 10 for each IPR and territory.

## 1.5 Cyclical analysis

The medium-term analysis of the IPR indicators presented in Section 5 is carried out based on smoothed series to avoid cluttering the analysis with irregular and short-term movements.

The programs <F>, <G> and <FDESC> developed by the Spanish National Statistical Office (INE) for cyclical analysis filter time series by eliminating noise and irregular movements to obtain the SAR. These programs also detect turning points and classify the series with regards to their cyclical signal.

The detection of final turning points requires a minimum cycle and phase duration:

- the duration of the cycle (distance between two consecutive turning points of the same sign) should not be lower than 15 months.
- the duration of the phase (distance between two consecutive turning points of opposed sign) should not be lower than 5 months.

To estimate the SAR, to eliminate irregular behaviour and noise, 20 observations are lost at the beginning of the time series, as well as 8 observations at the end. This means that eight forecasts are included in all the series. The forecasts are obtained using the TRAMO and SEATS programs from Banco de España and the automatic procedure for the identification and estimation of ARIMA models with calendar and outliers corrections.

## 1.6 List of IPR-intensive industries

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
0100	Crop and animal production, hunting and related service activities						y
0610*	Extraction of crude petroleum	y	y	y			
0710	Mining of iron ores	y					
0729	Mining of other non-ferrous metal ores			y			
0811	Quarrying of ornamental and building stone, limestone, gypsum, chalk and slate	y					
0891*	Mining of chemical and fertiliser minerals	y		y			
0892	Extraction of peat	y					
0893*	Extraction of salt	y					
0899	Other mining and quarrying n.e.c.	y	y	y			
0910	Support activities for petroleum and natural gas extraction	y		y			

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
1020*	Processing and preserving of fish, crustaceans and molluscs	y					
1031	Processing and preserving of potatoes	y					
1032*	Manufacture of fruit and vegetable juice	y	y				
1039*	Other processing and preserving of fruit and vegetables	y					
1041	Manufacture of oils and fats	y	y				
1042	Manufacture of margarine and similar edible fats	y					
1051*	Operation of dairies and cheese making	y	y			y	
1052*	Manufacture of ice cream	y	y				
1061*	Manufacture of grain mill products	y					y
1062	Manufacture of starches and starch products			y			
1072*	Manufacture of rusks and biscuits; manufacture of preserved pastry goods and cakes	y	y				
1073*	Manufacture of macaroni, noodles, couscous and similar farinaceous products	y	y				
1081	Manufacture of sugar	y					
1082*	Manufacture of cocoa, chocolate and sugar confectionery	y	y				
1083*	Processing of tea and coffee	y	y	y			
1084	Manufacture of condiments and seasonings	y					
1086*	Manufacture of homogenised food preparations and dietetic food	y	y	y			
1089*	Manufacture of other food products n.e.c.	y	y	y			y
1091*	Manufacture of prepared feeds for farm animals	y					
1092*	Manufacture of prepared pet foods	y	y				
1101*	Distilling, rectifying and blending of spirits	y	y			y	
1102*	Manufacture of wine from grape	y				y	
1103	Manufacture of cider and other fruit wines	y	y				
1104*	Manufacture of other non-distilled fermented beverages	y					
1105	Manufacture of beer	y				y	
1106	Manufacture of malt	y					y
1107*	Manufacture of soft drinks; production of mineral waters and other bottled waters	y	y				
1200*	Manufacture of tobacco products	y	y	y			
1310*	Preparation and spinning of textile fibres	y	y				
1320*	Weaving of textiles	y	y				
1330*	Finishing of textiles		y				
1391*	Manufacture of knitted and crocheted fabrics	y					
1392	Manufacture of made-up textile articles, except apparel	y	y				
1393	Manufacture of carpets and rugs	y	y	y			
1394	Manufacture of cordage, rope, twine and netting	y	y	y			

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
1395*	Manufacture of non-wovens and articles made from non-wovens, except apparel	y		y			
1396*	Manufacture of other technical and industrial textiles	y	y	y			
1399	Manufacture of other textiles n.e.c.	y	y	y			
1411	Manufacture of leather clothes	y	y				
1412	Manufacture of workwear	y	y				
1413*	Manufacture of other outerwear	y	y				
1414	Manufacture of underwear	y	y				
1419*	Manufacture of other wearing apparel and accessories	y	y				
1420	Manufacture of articles of fur	y					
1431*	Manufacture of knitted and crocheted hosiery	y	y				
1439*	Manufacture of other knitted and crocheted apparel	y	y				
1512*	Manufacture of luggage, handbags and the like, saddlery and harness	y	y				
1520*	Manufacture of footwear	y	y				
1621	Manufacture of veneer sheets and wood-based panels		y	y			
1622	Manufacture of assembled parquet floors	y	y				
1623	Manufacture of other builders' carpentry and joinery		y				
1629	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials	y	y				
1711	Manufacture of pulp				y		
1712*	Manufacture of paper and paperboard	y	y	y	y		
1721*	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard		y				
1722*	Manufacture of household and sanitary goods and of toilet requisites	y	y	y			
1723*	Manufacture of paper stationery	y	y				
1724	Manufacture of wallpaper	y					
1729	Manufacture of other articles of paper and paperboard	y					
1811*	Printing of newspapers	y			y		
1812*	Other printing				y		
1813*	Pre-press and pre-media services	y			y		
1814	Binding and related services				y		
1820*	Reproduction of recorded media	y	y		y		
1910*	Manufacture of coke oven products	y					
1920*	Manufacture of refined petroleum products	y					
2011	Manufacture of industrial gases	y		y			
2012*	Manufacture of dyes and pigments	y		y			
2013	Manufacture of other inorganic basic chemicals	y		y			
2014*	Manufacture of other organic basic chemicals			y			
2015	Manufacture of fertilisers and nitrogen compounds	y					
2016*	Manufacture of plastics in primary forms	y	y	y			

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
2017*	Manufacture of synthetic rubber in primary forms	y		y			
2020*	Manufacture of pesticides and other agrochemical products	y	y	y			
2030*	Manufacture of paints, varnishes and similar coatings, printing ink and mastics	y		y			
2041*	Manufacture of soap and detergents, cleaning and polishing preparations	y	y	y			
2042*	Manufacture of perfumes and toilet preparations	y	y	y			
2051*	Manufacture of explosives	y	y	y			
2052*	Manufacture of glues	y	y	y			
2053*	Manufacture of essential oils	y		y			
2059*	Manufacture of other chemical products n.e.c.	y	y	y	y		
2060*	Manufacture of man-made fibres	y		y			
2110*	Manufacture of basic pharmaceutical products	y	y	y			
2120*	Manufacture of pharmaceutical preparations	y		y			
2211	Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres	y	y	y			
2219*	Manufacture of other rubber products	y	y	y			
2221*	Manufacture of plastic plates, sheets, tubes and profiles	y	y	y			
2222*	Manufacture of plastic packing goods	y	y	y			
2223*	Manufacture of builders' ware of plastic	y	y	y			
2229*	Manufacture of other plastic products	y	y	y			
2311	Manufacture of flat glass	y	y	y			
2313*	Manufacture of hollow glass		y				
2314	Manufacture of glass fibres	y		y			
2319	Manufacture and processing of other glass, including technical glassware	y	y	y			
2320*	Manufacture of refractory products	y					
2331*	Manufacture of ceramic tiles and flags	y	y				
2332*	Manufacture of bricks, tiles and construction products, in baked clay	y	y				
2341*	Manufacture of ceramic household and ornamental articles	y	y				
2342	Manufacture of ceramic sanitary fixtures	y	y				
2343*	Manufacture of ceramic insulators and insulating fittings		y	y			
2344	Manufacture of other technical ceramic products	y		y			
2349*	Manufacture of other ceramic products	y	y	y			
2351	Manufacture of cement	y		y			
2352	Manufacture of lime and plaster			y			
2361	Manufacture of concrete products for construction purposes		y				



NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
2362*	Manufacture of plaster products for construction purposes	y					
2364	Manufacture of mortars	y					
2365	Manufacture of fibre cement	y		y			
2369*	Manufacture of other articles of concrete, plaster and cement	y	y				
2370*	Cutting, shaping and finishing of stone		y				
2391*	Production of abrasive products	y	y	y			
2399*	Manufacture of other non-metallic mineral products n.e.c.	y	y	y			
2432*	Cold rolling of narrow strip	y		y			
2433*	Cold forming or folding	y		y			
2434	Cold drawing of wire	y	y	y			
2441	Precious metals production	y		y			
2442*	Aluminium production			y			
2443	Lead, zinc and tin production	y					
2445	Other non-ferrous metal production	y	y	y			
2452*	Casting of steel			y			
2453*	Casting of light metals		y				
2454*	Casting of other non-ferrous metals	y					
2511*	Manufacture of metal structures and parts of structures		y	y			
2512*	Manufacture of doors and windows of metal		y				
2521	Manufacture of central heating radiators and boilers	y	y	y			
2530*	Manufacture of steam generators, except central heating hot water boilers			y			
2540*	Manufacture of weapons and ammunition	y		y			
2571*	Manufacture of cutlery	y	y	y			
2572*	Manufacture of locks and hinges	y	y	y			
2573*	Manufacture of tools	y	y	y			
2591*	Manufacture of steel drums and similar containers		y				
2592*	Manufacture of light metal packaging		y				
2593*	Manufacture of wire products, chain and springs	y	y	y			
2594*	Manufacture of fasteners and screw machine products			y			
2599*	Manufacture of other fabricated metal products n.e.c.	y	y	y			
2611*	Manufacture of electronic components	y	y	y			
2620*	Manufacture of computers and peripheral equipment	y	y	y	y		
2630*	Manufacture of communication equipment	y	y	y	y		
2640	Manufacture of consumer electronics	y	y	y	y		
2651*	Manufacture of instruments and appliances for measuring, testing and navigation	y	y	y			
2652*	Manufacture of watches and clocks	y	y	y			
2660*	Manufacture of irradiation, electromedical and electrotherapeutic equipment	y	y	y			

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
2670*	Manufacture of optical instruments and photographic equipment	y	y	y	y		
2680	Manufacture of magnetic and optical media	y	y	y			
2711	Manufacture of electric motors, generators and transformers	y		y			
2712*	Manufacture of electricity distribution and control apparatus		y	y			
2720*	Manufacture of batteries and accumulators	y	y	y			
2731	Manufacture of fibre optic cables				y		
2732*	Manufacture of other electronic and electric wires and cables		y	y			
2733*	Manufacture of wiring devices		y	y			
2740*	Manufacture of electric lighting equipment	y	y	y			
2751*	Manufacture of electric domestic appliances	y	y	y			
2752*	Manufacture of non-electric domestic appliances	y	y				
2790*	Manufacture of other electrical equipment	y	y	y			
2811*	Manufacture of engines and turbines, except aircraft, vehicle and cycle engines		y	y			
2812*	Manufacture of fluid power equipment			y			
2813*	Manufacture of other pumps and compressors	y	y	y			
2814*	Manufacture of other taps and valves	y	y	y			
2815*	Manufacture of bearings, gears, gearing and driving elements			y			
2821*	Manufacture of ovens, furnaces and furnace burners	y	y	y			
2822*	Manufacture of lifting and handling equipment	y	y	y			
2823	Manufacture of office machinery and equipment (except computers and peripheral equipment)	y	y	y	y		
2824	Manufacture of power-driven hand tools	y	y	y			
2825*	Manufacture of non-domestic cooling and ventilation equipment	y	y	y			
2829*	Manufacture of other general-purpose machinery n.e.c.	y	y	y			
2830*	Manufacture of agricultural and forestry machinery	y	y	y			
2841*	Manufacture of metal forming machinery	y	y	y			
2849*	Manufacture of other machine tools	y	y	y			
2891*	Manufacture of machinery for metallurgy	y	y	y			
2892*	Manufacture of machinery for mining, quarrying and construction	y	y	y			
2893*	Manufacture of machinery for food, beverage and tobacco processing	y	y	y			
2894*	Manufacture of machinery for textile, apparel and leather production	y		y			
2895	Manufacture of machinery for paper and paperboard production	y		y			

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
2896*	Manufacture of plastics and rubber machinery		y	y			
2899*	Manufacture of other special-purpose machinery n.e.c.	y	y	y			
2910*	Manufacture of motor vehicles	y	y	y			
2920*	Manufacture of bodies (coachwork) for motor vehicles; manufacture of trailers and semi-trailers		y	y			
2931*	Manufacture of electrical and electronic equipment for motor vehicles			y			
2932*	Manufacture of other parts and accessories for motor vehicles		y	y			
3011*	Building of ships and floating structures			y			
3012*	Building of pleasure and sporting boats	y	y				
3020*	Manufacture of railway locomotives and rolling stock			y			
3030*	Manufacture of air and spacecraft and related machinery			y			
3040*	Manufacture of military fighting vehicles		y	y			
3091*	Manufacture of motorcycles	y	y	y			
3092*	Manufacture of bicycles and invalid carriages	y	y	y			
3099*	Manufacture of other transport equipment n.e.c.	y	y	y			
3101*	Manufacture of office and shop furniture	y	y				
3102*	Manufacture of kitchen furniture		y				
3103*	Manufacture of mattresses	y	y				
3109*	Manufacture of other furniture		y				
3211*	Striking of coins	y		y	y		
3212*	Manufacture of jewellery and related articles	y	y	y	y		
3213*	Manufacture of imitation jewellery and related articles	y	y				
3220*	Manufacture of musical instruments	y	y		y		
3230*	Manufacture of sports goods	y	y	y			
3240*	Manufacture of games and toys	y	y	y	y		
3250*	Manufacture of medical and dental instruments and supplies	y	y	y			
3291*	Manufacture of brooms and brushes	y	y	y			
3299*	Other manufacturing n.e.c.	y	y	y			
3314*	Repair of electrical equipment			y			
3319*	Repair of other equipment	y					
3320*	Installation of industrial machinery and equipment			y			
3511	Production of electricity	y		y			
3512	Transmission of electricity	y					
3514	Trade of electricity	y					
3521	Manufacture of gas	y		y			
4110	Development of building projects	y					
4519	Sale of other motor vehicles		y	y			
4531	Wholesale trade of motor vehicle parts and accessories	y	y	y			
4540	Sale, maintenance and repair of motorcycles and related parts and accessories	y					

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
4611*	Agents involved in the sale of agricultural raw materials, live animals, textile raw materials and semi-finished goods	y	y				y
4612*	Agents involved in the sale of fuels, ores, metals and industrial chemicals	y		y			
4613*	Agents involved in the sale of timber and building materials	y	y				
4614*	Agents involved in the sale of machinery, industrial equipment, ships and aircraft	y	y	y			
4615*	Agents involved in the sale of furniture, household goods, hardware and ironmongery	y	y				
4616*	Agents involved in the sale of textiles, clothing, fur, footwear and leather goods	y	y				
4617*	Agents involved in the sale of food, beverages and tobacco	y					
4618*	Agents specialised in the sale of other particular products	y	y				
4619*	Agents involved in the sale of a variety of goods	y	y				
4621*	Wholesale of grain, unmanufactured tobacco, seeds and animal feeds	y					y
4622*	Wholesale of flowers and plants	y					
4624*	Wholesale of hides, skins and leather	y	y				
4631*	Wholesale of fruit and vegetables	y					
4632*	Wholesale of meat and meat products	y					
4633*	Wholesale of dairy products, eggs and edible oils and fats	y					
4634*	Wholesale of beverages	y					
4635*	Wholesale of tobacco products	y	y				
4636*	Wholesale of sugar and chocolate and sugar confectionery	y					
4637*	Wholesale of coffee, tea, cocoa and spices	y	y				
4638*	Wholesale of other food, including fish, crustaceans and molluscs	y					
4639*	Non-specialised wholesale of food, beverages and tobacco	y					
4641*	Wholesale of textiles	y	y				
4642*	Wholesale of clothing and footwear	y	y				
4643*	Wholesale of electrical household appliances	y	y	y	y		
4644*	Wholesale of china and glassware and cleaning materials	y	y				
4645*	Wholesale of perfume and cosmetics	y	y				
4646*	Wholesale of pharmaceutical goods	y		y			
4647*	Wholesale of furniture, carpets and lighting equipment	y	y				
4648*	Wholesale of watches and jewellery	y	y				
4649*	Wholesale of other household goods	y	y				

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
4651*	Wholesale of computers, computer peripheral equipment and software	y			y		
4652*	Wholesale of electronic and telecommunications equipment and parts	y	y		y		
4662*	Wholesale of machine tools	y					
4664*	Wholesale of machinery for the textile industry and of sewing and knitting machines	y		y			
4665*	Wholesale of office furniture	y	y				
4666*	Wholesale of other office machinery and equipment				y		
4669*	Wholesale of other machinery and equipment	y	y	y			
4671*	Wholesale of solid, liquid and gaseous fuels and related products	y					
4672*	Wholesale of metals and metal ores		y				
4673*	Wholesale of wood, construction materials and sanitary equipment	y	y				
4674*	Wholesale of hardware, plumbing and heating equipment and supplies	y	y				
4675*	Wholesale of chemical products	y		y			
4676*	Wholesale of other intermediate products	y	y		y		
4690*	Non-specialised wholesale trade	y	y				
4729	Other retail sale of food in specialised stores	y					
4741	Retail sale of computers, peripheral units and software in specialised stores	y			y		
4743	Retail sale of audio and video equipment in specialised stores	y			y		
4751	Retail sale of textiles in specialised stores	y					
4754	Retail sale of electrical household appliances in specialised stores		y	y			
4759	Retail sale of furniture, lighting equipment and other household articles in specialised stores		y				
4761	Retail sale of books in specialised stores				y		
4762	Retail sale of newspapers and stationery in specialised stores				y		
4763	Retail sale of music and video recording in specialised stores				y		
4764	Retail sale of sporting equipment in specialised stores	y					
4765	Retail sale of games and toys in specialised stores	y	y				
4772	Retail sale of footwear and leather goods in specialised stores	y	y				
4774	Retail sale of medical and orthopaedic goods in specialised stores	y					
4775	Retail sale of cosmetic and toilet articles in specialised stores	y					

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
4778	Other retail sale of new goods in specialised stores	y			y		
4791	Retail sale via mail order houses or via Internet	y	y				
5030	Inland passenger water transport	y					
5811*	Book publishing	y	y		y		
5812*	Publishing of directories and mailing lists	y			y		
5813*	Publishing of newspapers	y			y		
5814*	Publishing of journals and periodicals	y			y		
5819*	Other publishing activities	y	y		y		
5821*	Publishing of computer games	y			y		
5829*	Other software publishing	y		y	y		
5911*	Motion picture, video and television programme production activities	y			y		
5912*	Motion picture, video and television programme post-production activities	y			y		
5913*	Motion picture, video and television programme distribution activities	y			y		
5914*	Motion picture projection activities				y		
5920*	Sound recording and music publishing activities	y			y		
6010*	Radio broadcasting	y			y		
6020*	Television programming and broadcasting activities	y			y		
6110*	Wired telecommunications activities				y		
6120*	Wireless telecommunications activities	y			y		
6130*	Satellite telecommunications activities	y		y	y		
6190*	Other telecommunications activities	y	y	y	y		
6201*	Computer programming activities	y			y		
6202*	Computer consultancy activities				y		
6203*	Computer facilities management activities	y			y		
6209*	Other information technology and computer service activities	y			y		
6311*	Data processing, hosting and related activities	y			y		
6312*	Web portals	y			y		
6391*	News agency activities	y			y		
6399*	Other information service activities n.e.c.	y	y		y		
6600	Activities auxiliary to financial services and insurance activities	y					
6810	Buying and selling of own real estate	y	y				
6820	Rental and operating of own or leased real estate	y					
7021	Public relations and communication activities	y	y		y		
7022	Business and other management consultancy activities	y					
7112	Engineering activities and related technical consultancy			y			
7211	Research and experimental development on biotechnology	y	y	y			y

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
7219	Other research and experimental development on natural sciences and engineering	y	y	y			y
7220	Research and experimental development on social sciences and humanities	y		y			
7311*	Advertising agencies	y	y		y		
7312*	Media representation	y			y		
7320*	Market research and public opinion polling	y					
7410*	Specialised design activities	y	y		y		
7420*	Photographic activities				y		
7430*	Translation and interpretation activities				y		
7490*	Other professional, scientific and technical activities n.e.c.	y	y	y			
7721	Renting and leasing of recreational and sports goods	y					
7722	Rental of video tapes and disks				y		
7729	Rental and leasing of other personal and household goods				y		
7733	Rental and leasing of office machinery and equipment (including computers)	y			y		
7735	Rental and leasing of air transport equipment	y					
7739	Rental and leasing of other machinery, equipment and tangible goods n.e.c.	y			y		
7740	Leasing of intellectual property and similar products, except copyrighted works	y	y	y			y
7911*	Travel agency activities	y					
7912*	Tour operator activities	y					
7990*	Other reservation service and related activities	y			y		
8211	Combined office administrative service activities	y					
8219	Photocopying, document preparation and other specialised office support activities				y		
8230	Organisation of conventions and trade shows	y					
8291	Activities of collection agencies and credit bureaus	y					
8292	Packaging activities	y	y				
8552	Cultural education				y		
9001	Performing arts				y		
9002	Support activities to performing arts				y		
9003	Artistic creation				y		
9004	Operation of arts facilities				y		
9101	Library and archives activities				y		
9102	Museums activities				y		
9103	Operation of historical sites and buildings and similar visitors attractions				y		
9200	Gambling and betting activities	y					

NACE code	NACE description	TM	DES	PAT	CR	GI	PVR
9300	Sports activities and amusement and recreation activities excluding 9329 - Other amusement and recreation activities	y					
9321	Activities of amusement parks and theme parks				y		
9329	Other amusement and recreation activities				y		
9412	Activities of professional membership organisations				y		
9499	Activities of other membership organisations n.e.c.				y		

\*included in correspondent IPR indicators

Source: EUIPO/EPO

## List of tables

Table 1: Number of IPR-intensive industries by economic sector.....	10
Table 2: Contribution of IPR-intensive industries to EU28 GDP. ....	11
Table 3: Annual rates of change (%) of IPR indicators of the manufacturing sector in the EU. ....	17
Table 4. Contribution (%) of the four largest Member States to the GVA of IPR-intensive industries of the manufacturing sector to the EU total. ....	18
Table 5: Annual rates of change (%) of IPR indicators of the manufacturing sector in the four largest EU Member States. ....	20
Table 6: Annual rates of change (%) of IPR indicators of the trade sector in the EU .....	24
Table 7: Annual rates of change (%) of IPR indicators of the trade sector by Member State. ....	25
Table 8: Annual rates of change (%) of IPR indicators of the service sector in the EU.....	28
Table 9: Annual rates of change (%) of IPR indicators of the service sector by Member State. ....	30
Table 10: Weights (%) applied to sectorial indicators of IPR-intensive industries by Member State.....	33



Table 11: Annual rates of change (%) of IPR indicators in the EU.....	35
Table 12: Annual rates of change (%) of IPR indicators by Member State. ....	39
Table 13: Trough dates, amplitude (%) and duration (in months) of 2009 and 2020 recession and recovery phases in IPR indicators in the EU. ....	49
Table 14: Trough dates, amplitude (%) and duration (in months) of 2009 and 2020 recession and recovery phases in IPR indicators in four largest EU Member States. ....	53
Table A1: Ratios applied to NACE divisions of the service sector IPR indicators .....	60

## List of figures

Figure 1: Indicators of IPR-intensive industries and total manufacturing sector in the EU (2019 and 2020). ....	14
Figure 2: Indicators of IPR-intensive industries in manufacturing in the EU, based on February 2020. ....	15
Figure 3: Annual rates of change (%) of IPR indicators of the manufacturing sector in the EU. ....	16
Figure 4: Average rates of change (%) of IPR indicators of the manufacturing sector by Member State, 2020. ....	19
Figure 5: Annual rates of change (%) of trade mark and design indicators of the trade sector in the EU, 2020. ....	23
Figure 6: Average rates of change (%) of trade mark and design indicators of the trade sector by Member State, 2020. ....	26
Figure 7: Annual rates of change (%) of IPR indicators of the service sector in the EU, 2020. ....	27
Figure 8: Average rates of change (%) of IPR indicators of the service sector by Member State, 2020. ....	29
Figure 9: Indices for division 79 (Travel agencies, tour operators and other reservation service and related activities), based on February 2020. EU, France and Spain. ....	31
Figure 10: IPR indicators in the EU (2019 and 2020). ....	34

Figure 11: Annual rates of change (%) of IPR indicators in the EU, 2020. ....	34
Figure 12: Sectorial decomposition of IPR indicators' 2020 average rates of change (%) in the EU.....	36
Figure 13: Average rates of change (%) of IPR indicators by Member State, 2020. ....	37
Figures 14a and 14b: Sectorial decomposition of IPR indicators' 2020 average rates of change (%) in France and Spain. ....	38
Figure 15: Average rates of change (%) of GDP and IPR indicators. EU, France and Spain, 2020. ....	41
Figure 16: Average rates of change (%) of GDP and some IPR indicators. EU, Germany and Italy, 2020.....	42
Figure 17: Average rates of change (%) of GDP and IPR indicators. EU, 2020 and 2009.	43
Figures 18a to 18d: Average rates of change (%) of GDP and IPR indicators. France, Spain, Germany and Italy, 2020 and 2009. ....	45
Figure 19: Smoothed annual rates (SAR) of IPR indicators and GDP. EU 2003-2020.....	47
Figure 20. Difference between GDP and IPR indicator's SAR for the EU, 2003-2020.....	48
Figures 21a and 21b: Smoothed annual rates (SAR) of IPR indicators and GDP. France and Spain 2003-2020. ....	51
Figure 22: Smoothed annual rates (SAR) of patent indicators. France, Spain, Germany and Italy, 2003-2020.....	52