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Intellectual property rights and firm performance in the European Union

Firm-level analysis report, February 2021
Executive summary

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

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

In 2013, the two offices published a joint study which assessed the combined contribution of industries that make intensive use of the various types of intellectual property right (IPR) to the economies of the EU as a whole and to the individual EU Member States.[1] The study was updated in 2016 and again in 2019.[2] Among the main findings of the 2019 edition was that industries that make above-average use of IPRs contributed 29% of employment and 45% of GDP in the EU, with these proportions having risen since the previous study in 2016.

The present report is a follow-up study that delves deeper into the role of IPRs by analysing a large representative sample of over 127 000 European firms in order to compare the economic performance of firms that own IPRs with those that do not. In 2015, the EUIPO (then known as OHIM) published a similar study[3] which showed that companies that own IPRs have higher revenue per employee and pay higher wages than companies that do not. The present joint EPO/EUIPO study is an update of the 2015 EUIPO study, with improved data and methodology. In contrast with the earlier study, which was based on data from 12 Member States, this new study includes data from companies in all 28 Member States.[4]

The IPRs included in the study are **patents, trade marks** and **designs** (or any combination of the three). Because of their nature, copyright, plant variety rights and geographical indications, which were part of the industry-level studies, are not included here.[5] On the other hand, the present study includes both European and national IPRs, an important enhancement to the data, and provides a complete view of each company's IPR portfolio, both European and national.

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1 Intellectual property rights intensive industries: Contribution to the economic performance and employment in the European Union. Industry-Level Analysis Report, September 2013.

2 Intellectual property rights intensive industries and economic performance in the European Union. Industry-Level Analysis Report, October 2016. Second edition; IPR-intensive industries and economic performance in the European Union. Industry-Level Analysis Report, September 2019. Third edition.

3 Intellectual property rights and firm performance in Europe: an economic analysis. Firm-Level Analysis Report, June 2015.

4 The UK left the EU on 31 January 2020. However, the period covered by this study is 2007-2019, during which the UK was a member state, so data on UK companies is included.

5 Copyright is not always registered, while geographical indications are not registered by individual companies, so data on the ownership of those IPRs at company level does not exist. Plant variety rights are the subject of a separate research project at the EUIPO.

The data on each company's IPR portfolio was matched with information contained in the commercial database ORBIS. This database provides financial and other information on millions of European companies, collected from the filings and accounting reports made by companies in the commercial registers of the EU Member States. The study uses financial and other information about companies that are registered as formal owners of patents, trade marks and/or designs. Some companies that are part of a larger group structure may not be the formal owners of IPRs (their headquarters may have the formal ownership), but they may still use IPRs in their commercial activities.

There are various ways to measure the economic performance of a company. Because of data constraints and the need for like-for-like comparisons (eliminating the effect of firm size on the statistical results), **"revenue per employee"** was chosen as the **main indicator of firm performance.**

The dataset was constructed in such a way that the sample is representative of the general populations of firms in the EU. This allows a comparison of the performance of companies that own IPRs with companies that do not, while controlling for relevant factors such as country, sector or size of company. To our knowledge, the coverage of the dataset is significantly larger than that of any other data source of this type currently available, ensuring a sample sufficiently large to draw robust and representative conclusions.

The study makes no policy recommendations, as this is not within its scope. Instead, it provides evidence that can be used by policymakers in their work, and serves as a basis for raising awareness of IP among Europe's citizens in general, and small and medium-sized enterprises (SMEs) in particular.

Methodology

The data was analysed using two types of methodology.

First, **descriptive statistics** were compiled to illustrate the differences between owners and non-owners of IPRs in terms of economic characteristics. Differences were tested for statistical significance. Chapter 4 presents the results of this analysis.

Chapter 5 reports the findings of an **econometric analysis** of the data. It allows for an in-depth examination of the relationship between firms' ownership of IPRs and their economic performance. While causality cannot be proven in the strict sense of the word, given the available data, econometric analysis allows researchers to control for several additional factors that affect economic performance and to "isolate" the relationship between IPR ownership and firm performance. The results of the analysis strongly suggest that there is a systematic, positive relationship between ownership of IPRs and economic performance at individual firm level.

Key findings

Table E1 summarises the main financial and firm variables for the most recent years in the sample.

Table E1:
Average values of selected variables by IPR ownership, 2015-2018

		Number of employees	Revenue per employee (EUR '000/year)	Wages per employee (EUR '000/year)
Non-IPR owners		5.1	148.6	29.8
IPR owners	**Any IPRs**	13.5	178.6	35.6
	% difference compared with non-owners	163.8%	20.2%	19.3%
	Patent owners	28.7	202.4	45.5
	% difference compared with non-owners	460.1%	36.3%	52.6%
	Trade mark owners	13.5	179.6	35.0
	% difference compared with non-owners	164.3%	20.9%	17.4%
	Design owners	29.1	196.3	38.7
	% difference compared with non-owners	467.9%	32.2%	29.7%

Note: The figures are based on available observations of 127 199 firms. All differences are statistically significant at the 1% level. The "Any IPR owners" group is defined as firms that own at least one patent, trade mark or design, or any combination thereof. The "Patent owners", "Trade mark owners" and "Design owners" groups are defined as firms that own at least one of these particular IPRs. Since many firms own combinations of the three, the owners of the various IPRs overlap.

As Table E1 shows, firms that own IPRs tend to be larger than firms that do not, as measured by the number of employees (13.5 vs. 5.1 employees on average). For this reason, economic performance metrics such as revenue, profits and wages are expressed on a per-employee basis.

Thus, firms that own IPRs have on average 20% higher revenue per employee than firms that do not. In terms of individual IPRs, the average performance premium experienced by IPR-owning firms is 36% for patents, 21% for trade marks and 32% for designs.

Table E1 also indicates that firms that own IPRs pay on average 19% higher wages than firms that do not. Here, the strongest effect is associated with owning patents (53%), followed by designs (30%) and trade marks (17%). Both in terms of revenue per employee and wages paid, patents, compared with trade marks and designs, are the IPR type that on average generates the highest rewards for firms and their employees. This is also consistent with the results of the industry-level IP Contribution Study (EPO/EUIPO, 2019), which looked into the contribution of IPR-intensive industries to the EU economy in terms of gross domestic product, employment, wages and international trade. In that study, patent-intensive industries were found to have the highest wage premium as well.

Table E2 shows that the most IPR-intensive sectors are information and communication, with 18% of firms in that sector owning IPR, followed by manufacturing, with 14% of such companies being IPR owners, and other service activities (14%). Professional services firms ("professional, scientific and technical activities") are also relatively IPR-heavy (13% of such companies own IPR).

Given that SMEs account for the vast majority of companies in the sample (as is the case in the population of European firms), the overall distribution of IPR owners between countries is similar to the results for SMEs. Firms from Malta, Portugal, Cyprus, Germany, Austria, Spain, France, Poland and the UK are most likely to be IPR owners. In those countries, more than 10% of all SMEs own at least one of the three IPRs.

Table E2: Top 10 NACE categories[6] for IPR ownership

NACE section	IPR ownership (%)
J: Information and communication	17.67
C: Manufacturing	14.42
S: Other service activities	14.40
M: Professional, scientific and technical activities	12.97
N: Administrative and support service activities	10.66
E: Water supply; sewerage, waste management and remediation activities	9.60
G: Wholesale and retail trade, repair of motor vehicles and motorcycles	8.95
D: Electricity, gas, steam and air conditioning supply	5.90
L: Real estate activities	5.75
I: Accommodation and food service activities	5.51

Note: The table illustrates the share of IPR owners within the total population of firms representing each NACE section. Only NACE sections with 100 or more firms in the sample are shown.

6 Established in 1970, NACE ("Nomenclature statistique des activités économiques dans la Communauté européenne") is the classification of economic activities used by the European Commission. Its current legal basis is Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the statistical classification of economic activities NACE Revision 2.

The econometric analysis presented in chapter 5 makes it possible to isolate the effect of IPR ownership from other factors such as the size of a firm or the countries and sectors in which it operates. The results, which are summarised in Table E3, confirm the positive association between IPR ownership and economic performance, with revenue per employee 55% higher for IPR owners than for non-owners. This can be regarded as one of the central results of this study.

In addition, the analysis shows that this relationship is particularly pronounced for SMEs.[7] SMEs that own IPRs have 68% higher revenue per employee than SMEs that do not own any IPRs at all. Thus, while the majority of SMEs in Europe do not own IPRs, those that do have significantly higher revenue per employee. In the case of large companies, revenue per employee is 18% higher for IP owners than for non-owners. Here the analysis shows that almost six out of ten large firms in Europe own IPRs, although the association with higher revenue per employee is less pronounced than in the case of SMEs.

Table E3: Main results of the econometric analysis

	Difference in revenue per employee between IPR owners and non-IPR owners
Large companies	+18%
SMEs	+68%
Total	**+55%**

Note: Based on observations of a total of 120 983 firms. Differences are statistically significant at the 99% confidence level.

The econometric analysis in chapter 5 further shows that increases in firm performance depend on the type and combination of IPRs. The highest revenue-per-employee increases are linked to combined trade mark and design owners and combined patent, trade mark and design owners, with performance premiums of 63% and 60% respectively. Patent-only owners have 43% higher revenue per employee, trade mark-only owners 56%, design-only owners 31%, patent and trade mark owners 58%, and patent and design owners 39%.

7 Article 2 of the annex to the Commission Recommendation of 6 May 2003 concerning the definition of micro, small and medium-sized enterprises (2003/361/EC) defines an SME as a company with fewer than 250 employees and a turnover not exceeding EUR 50 million and/or an annual balance sheet total not exceeding EUR 43 million.

Discussion and conclusions

The analysis presented in this study confirms that there is a strong positive relationship between the ownership of different types of IPR and firm performance as measured by revenue per employee and average wages paid. This finding is consistent with the earlier 2015 study (OHIM, 2015), as well as with the industry-level IP contribution studies and the 2019 study of high-growth firms, which found a positive relationship between a company's IPR activity and the likelihood of achieving high growth in subsequent years (EPO/EUIPO, 2019).

As with every statistical analysis, these results must be interpreted with care. They do not constitute conclusive proof that encouraging firms to make greater use of IPRs will cause their performance to increase. The study shows a positive relationship between firms that own IPRs and their performance (as measured by revenue per employee). Indeed, there may be several mechanisms through which the link between the ownership of IPRs and firm performance may work. However, given the available data, it is not possible to disentangle these in the analysis.

The positive association between IPR ownership and economic performance is particularly strong for SMEs. At the same time, less than 9% of SMEs in the sample own one of the three IP rights included in the study. The reasons for the low uptake are explored in the EUIPO survey of European SMEs (EUIPO, 2019). This study (as well its earlier edition from 2015) indicated that barriers faced by SMEs include lack of knowledge about IPRs, a perception that registration procedures are complex and costly, and the high cost of enforcement of those rights, a particular burden for SMEs (EUIPO, 2017). Given this, and the importance of SMEs in the European economy, the EPO and the EUIPO are taking steps as IP offices to address those concerns so as to enable European SMEs to take full advantage of their innovation and intellectual property, in the context of the EPO's Strategic Plan 2023, the EUIPO Strategic Plan 2025 and the European Commission's SME strategy formulated in early 2020 (EC, 2020).

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