

NATIONAL/INTERNATIONAL REPORTS: ANALYSIS

Intellectual Property Rights and Firm Performance in the European Union - Firm - level analysis report

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INTRODUCTION

Intangible assets play an increasingly important role in the modern economy. As mentioned in the report various studies have established the growth of intangible investments (WIPO 2024, European Commission 2020). Intangible assets exhibit characteristics similar to public goods (Crouzet et al. 2022), and without implementing proper means of protection, innovative firms risk losing the most valuable outcomes of their creative endeavours to competitors in the market. Organisations can choose from various protective strategies, with specific approaches determined by factors such as financial resources, industry sector, and the operational practices of their regular business partners. Intellectual Property Rights (IPRs) play an important role in these considerations. The methods of protecting intellectual property can be divided into two broad categories: informal methods (e.g. speed to market and trade secrecy) and formal IPRs that include patents, trade marks, designs, copyright, geographical indications and plant variety rights. **This study focuses on patents, trade marks and designs, because firm-level data for the other formal types of IPR was not available.**

Table 1: Patents, trade marks and designs

	Patents	Trade marks	Designs
Subject-matter	Industrially applicable invention in all fields of technology, involving an inventive step	Distinctive signs that distinguish a company's goods or services from others	Ornamental and non-functional features of an article or product
Conferred rights	Exclusive right to make, use and sell the patented invention	Exclusive right to use the trade mark in trade and prevent its use by others for similar or identical goods or services	Exclusive right to use the design and prevent its use by others
Benefits	Incentive for innovation; protection of knowledge; full technical disclosure of invention	Promotes quality and competition between brands; provides the public with brand information and use in commerce	Ornamental and non-functional features of an article or product; provides a means for product differentiation and promotes competition between brands
Duration	Typically maximum 20 years from filing	Commonly 10 years from filing, but can be renewed indefinitely for successive periods	Commonly 5 years from filing, renewable, with a usual maximum term of 25 years

The study builds upon previous company-specific research carried out by the EUIPO 1 in 2015 (OHIM, 2015) and collaboratively by the EPO and EUIPO in 2021 (EPO/EUIPO, 2021). These firm-level analyses have served as a basis for further research in this field. The comprehensive datasets developed for these projects have enabled further investigations into various aspects of how IPR ownership relates to business performance. These additional studies examined the link between IPR ownership and subsequent company growth (EPO/EUIPO, 2019), as well as its impact on accessing financial resources for start-ups (EUIPO/EPO, 2023). Consequently, general firm-level analyses can be viewed as fundamental to understanding the broader implications of IPR ownership.

OBJECTIVES OF THE STUDY

- To provide insights on utilisation of IPRs in European companies.
- To identify the distinguishing features of IPR-owning firms compared to those that do not register such rights.
- To understand the impact on performance of companies due to ownership of IPRs.

DATA COLLECTION AND METHODOLOGY

The sample for the study represents large panel of over 119 000 European firms from all 27 Member States of the European Union over a 10-year period (2013- 2022). The analysis covers patents, trade marks and designs registered at the EPO, EUIPO and at the national and regional IP offices in the EU. The final dataset contains information extracted from the IPR registers and matched with data contained in the commercial database ORBIS. ORBIS draws upon the obligatory accounting information provided by millions of European firms to the commercial registers specific to their country of origin. As there are differences in accounting practices between countries, revenue per employee (rather than profitability measures such as EBIT) was chosen as the main indicator of firm performance. The dataset was constructed in such a way that the sample accurately reflects the characteristics of the EU firms' population and permits inferences about this population. The research presented here encompasses a larger and more comprehensive dataset than similar investigations, offering a robust basis for comprehending the characteristics of IPR owners. These insights can be valuable for guiding policy decisions and improving the general public's understanding of IPRs throughout the EU.

Table 2: Key Characteristics of the Methodological Approach

Type of IPR	• National patents • European patents • National trade marks • European Union trade marks • National designs • Registered Community designs
Level of analysis	Firm level
IPR metrics	• Whether or not the firm owns IPRs • Stocks of IPR per employee
Performance metrics	Revenue per employee
Methodological approach	• Descriptive statistics • Econometric panel analysis

DATA ANALYSIS AND INTERPRETATION

The data is analysed using descriptive statistics that explore the patterns of IPR ownership by firms in Europe. It studies comparisons that exists between IP owning firms and Non-IP owning firms with respect to the key financial and company variables such as revenue and number of employees. Further it investigates the association between IPR ownership with firm characteristics.

Employees of firms with IPR registrations earn higher wages (22% on average) than those who work for companies that do not register their IPRs. This is particularly the case for firms that register patents, followed by those that register trade marks or designs. In general, wages are higher in firms that registered European-level IPRs, with the exception of designs, where firms registering national designs paid slightly higher wages.

In the EU, IPR ownership is significantly lower among SMEs compared to large firms. In the sample analysed, fewer than 10% of SMEs hold any of the three types of IPR (patents, trade marks, or designs), whereas nearly 50% of large firms own at least one type of IPR or a combination thereof. The disparity is evident across individual IPR categories as well (see Table 2). Around 1.1% of SMEs own patents, compared to 12.3% of large firms. For trade marks, the ownership rates are 9.2% for SMEs and 46.1% for large firms. Similarly, design ownership stands at 1.1% among SMEs and 10.7% for large firms.

Table 3: IPR ownership by firm size

	Large (%)	SME (%)	Overall (%)
IPR non-owners	50.99	90.26	90.19
IPR owners	49.01	9.74	9.81
	100	100	100
Patent non-owners	87.28	98.91	98.89
Patent owners	12.72	1.09	1.11
	100	100	100
Trade mark non-owners	53.88	90.79	90.73
Trade mark owners	46.12	9.21	9.27
	100	100	100
Design non-owners	89.29	98.89	98.87
Design owners	10.71	1.11	1.13
	100	100	100

Table 4: Average values of selected variables by IPR ownership, 2019-2022

		Number of employees	Revenue per employee (EUR '000/year)	Wages per employee (EUR '000/year)
Non-IPR owners		4.17	147.23	25.43

IPR owners	Any IPRs	9.08	182.27	31.04
	% difference compared with non-owners	117.75%	23.79%	22.07%
	Patent owners	13	189.49	36.42
	% difference compared with non-owners	211.69%	28.7%	43.26%
	Trade mark owners	9.06	181.56	30.74
	% difference compared with non-owners	117.19%	23.32%	20.9%
	Design owners	11.67	190.44	31.73
	% difference compared with non-owners	179.91%	29.34%	24.79%

Note: Employment and performance indicators (revenue per employee and wages per employee) are calculated as the weighted mean value of the per-firm averages of variables over the period 2019-2022. The 'Non-IPR owners' group is defined as firms with no stock of any registered IPR (patent, trade mark or design). The 'IPR owners' group is defined as firms that owned 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 owned at least one of these particular IPRs. Since many firms own bundles of IPRs, the various groups of IPR owners overlap. 'Any' refers to ownership of either national or European-level IP rights of the respective IPR type.

Table 3 & 4 above presents the differences between owners of IPRs and those that do not register IPRs in several different categories such as size, revenue per employee and wages per employee for the 4 most recent years in the sample. Firms that own IPRs tend to be larger than firms that do not, as measured by the number of employees (9 versus 4 employees on average). For this reason, economic performance metrics are expressed on a per-employee basis.

Firms that own IPRs have on average 23.8% higher revenue per employee than firms that do not. In terms of types of IPR, owners of patents have 28.7% higher revenue per employee, trade mark owners 23.3% and designs owners 29.3%. The last column of Table E2 shows that firms that register IPRs pay on average 22% higher salaries than firms that do not. The highest salaries are paid by patent owners (43.3%), followed by design owners (24.8%) and trade mark owners (20.9%).

Table 5: Top 10 NACE* categories for IPR ownership

NACE section	IPR ownership (%)
J: Information and communication	14.79
C: Manufacturing	14.21
E: Water supply, sewerage, waste management and remediation activities	11.98
M: Professional, scientific and technical activities	10.68

G: Wholesale and retail trade, repair of motor vehicles and motorcycles	10.63
N: Administrative and support service activities	9.55
I: Accommodation and food service activities	9.39
L: Real estate activities	8.61
S: Other service activities	7.63
D: Electricity, gas, steam and air conditioning supply	7.24
B: Mining	6.36
F: Construction	5.82
H: Transporting and storage	5.2

***Note:** The table illustrates the share of IPR owners within the total number of firms in the sample representing each NACE section. NACE (Nomenclature statistique des activités économiques dans la Communauté européenne) is Eurostat's classification system for economic activity in the EU.

The econometric analysis presented in the study allows for a more precise investigation of the relationship between revenue per employee and the IPR status of firms, controlling other variables that might be correlated with performance and the likelihood to register IPRs, such as company size, country of origin, or sector of activity. While this analysis does not prove a causal relationship between IPR ownership and firm performance, it strongly suggests that there is a systematic, positive relationship between ownership of IPRs and the economic performance of firms.

Table 6: Main results of the econometric analysis

	Difference in revenue per employee between IPR owners and non-IPR owners
Large companies	+16%
SMEs	+44%
Total	+41%

Note: Based on observations of a total of 10 988 firms. Differences are statistically significant at the 99% confidence level.

Table 6 summarises the main findings from the econometric analysis. With corrections for other relevant factors, revenue per employee is 41% higher for IPR owners than for firms that do not register IPRs. For SMEs the difference in revenue per employee between owners of IPRs and firms without registered IPRs is 44%. While the rate of ownership among SMEs is relatively low at just under 10%, it seems those SMEs that do register IPRs perform much better than their counterparts without.

IPR owners among the large firms also perform better than the large firms without IPR registrations, but in this

group the difference is much smaller than among SMEs. Revenue per employee is 16% higher for large IPR-owning firms compared to non-owners.

The econometric analysis also shows that firm performance is not only associated with IPR ownership, but to the type and combination of IPRs a company registers. For SMEs, the highest revenue per employee premium (47%) is related to the ownership of trade marks and the combined ownership of patents, trade marks and designs (51%) and for the large firms to the combination of patents and designs (38%) and that of patents, trade marks and designs (27%).

DISCUSSION AND LIMITATIONS

This research, based on the analysis of the very large and representative sample of European firms, demonstrates that companies that own intellectual property rights outperform firms without these rights, specifically as regards per-employee revenue and average employee compensation. This finding is consistent with the earlier studies carried out in 2015 and 2021. The econometric analysis presented in the report confirms the findings from the descriptive statistics. In particular, it has shown that:

- **IPR owners** perform better than non-owners. Controlling the relevant factors, revenue per employee is 41% higher for IPR owners than for firms that do not own IPRs. This positive relationship between IPR owner status and performance is particularly true for SMEs. Small and medium-sized firms have, on average, 44% higher revenue per employee than SMEs that do not own any IPRs. In the case of large firms, revenue per employee is 16% higher for IPR owners than for non-owners.
- **There is quite a large variability** in the IPR premium depending on the type and combination of IPRs. For SMEs, the highest increases in revenue per employee are related to trade marks and a combination of trade marks with other types of IPRs. For large firms, the highest premiums in revenue per employee stem from patent registrations or registrations of bundles of rights, including patents.

The findings presented in this study should be approached with a degree of caution due to inherent constraints in data and methodology. The results of the econometric analysis do not definitively prove a causal relationship between registering IPRs and enhanced business performance. Other significant factors, which could not be accounted for in this analysis (for example, the company's strategy or the quality of its management), might influence both a company's performance and its propensity to register IPRs. Nevertheless, theoretical arguments support the crucial role of intangible assets and IPRs in fostering innovation, boosting productivity, and ultimately improving individual firm performance. The current study's empirical confirmation of a positive correlation between IPR ownership and economic performance lends support to these theoretical assumptions.

MAJOR FINDINGS AND CONCLUSIONS

The main conclusion of the series of firm-level studies, including the present one, is that ownership of registered IPRs, namely, patents, trade marks and designs, is strongly related to economic performance at individual firm level. This association is particularly strong in the case of SMEs. The descriptive statistics show the following trends:

- IPR owners employ on average more workers than firms that do not register IPR. This difference in employment between IPR owners and non-owners is most notable in the case of owners of registered Community designs and can reach 4 times more workers.
- The difference in revenue per employee between IPR owners and non-owners amounts to 24%. It is highest among design owners (29.3%), closely followed by patent owners (28.7%) and then trade mark owners (23.3%). The difference in revenue per employee is notably higher among IPR owners at European level than those whose rights are protected at national level. This difference in favour of EU rights owners is highest in the case of trade marks, where EU trade mark owners have double the revenue per employee than owners of national trade marks.
- Most firms (over 90%) do not register IPRs. The proportion of firms that register IPRs is particularly low in the case of SMEs at only 9.7%.
- Most IPR owners only register trade marks. This pattern is particularly visible among SMEs, where more than 80% of IPR owners are only trade mark owners. Bundling different IPRs is much more common among large IPR-owning firms. Large IPR-owning firms are much more likely to bundle patents with other IPRs, with more than 11% combining patents and trade marks, almost 10% combining trade marks and designs and 10% combining all the three types of registered IPRs covered in the current study. The proportion of owners bundling all three IPRs is 4 times higher among large firms than among SMEs. Large firms also own more IPRs than SMEs across all the IPR types.

The econometric analysis strengthens the findings from the descriptive statistics as regards the differences in revenue per employee between firms that register IPRs and those that do not. In general, firms that own IPRs have 41% higher revenue per employee, when other relevant factors such as sector, country and size are taken into account. This positive relationship between IPR ownership and performance is particularly strong in the case of SMEs, as SMEs that own IPRs have 44% higher revenue per employee than SMEs that do not.

The findings of the present study confirm the main outcomes of previous reports focusing on firm-level patterns of IPR ownership. Although the composition of samples varies across the various studies, and there were some methodological changes introduced to the preparation of the final datasets and analysis to improve their representativity as regards the

population of EU firms, all the studies found that IPR owners perform better in terms of revenue per employee and, in general, offer better pay than firms that do not register IPRs. The dataset prepared for the present study will be used in the future to further understand the factors that drive IPR ownership and the processes that help IPR owners use these valuable assets to benefit their firms and the EU economy as a whole.

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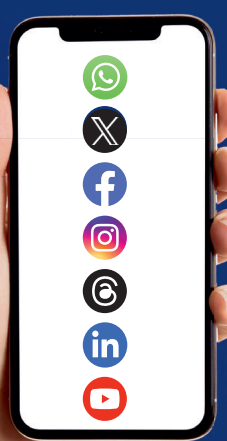

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