

# Licensing activities by SMEs: evidence from EU trade mark owners



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## FOREWORD

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The importance of intangible assets to the economy has become increasingly clear recently. Intellectual property (IP) is a category of intangible assets including creations of the human intellect that could be legally protected by registering the corresponding IP rights. Companies can improve their economic performance by exploiting their IP assets in the course of business, or by trading them in the marketplace.

The European Union Intellectual Property Office (EUIPO) is responsible for managing the EU trade mark (EUTM) and the registered Community design (RCD). The EUIPO also hosts the European Observatory on Infringements of Intellectual Property Rights (the Observatory), created to improve the understanding of the role of IP and the negative consequences of intellectual property right (IPR) infringement.

A study<sup>(1)</sup> carried out by the EUIPO, acting through the Observatory, compares the economic performance of European companies that own IPR with those that do not, finding that IPR owners' revenue per employee is 28 % higher on average than for non-owners, with a particularly strong effect for Small and Medium Sized enterprises (SMEs). Although only 9 % of SMEs own registered IPR, those that do have almost 32 % more revenue per employee than those that do not. While it should not be interpreted as establishing a causal link between the ownership of IPR and higher revenue per employee, there is nevertheless an indication of a relationship between them. A follow-up study, carried out in cooperation with the European Patent Office (EPO) in 2019, showed that SMEs that are active in IPR have an increased likelihood of experiencing high growth in subsequent years<sup>(2)</sup>. Finally, in 2016 and 2019, two surveys focused on SMEs, the SME Scoreboard, were carried out to examine in detail the use that those firms make of IPR, why they do or do not register their rights, as well as the problems encountered when registering and enforcing their IPR<sup>(3)</sup>. Among other findings, the 2019 edition of the study showed that only 13 % of the SMEs surveyed had attempted to monetise their IPR assets.

All these studies, taken together, carry an important message for businesses and policymakers, highlighting the virtuous cycle between IP and economic performance, with a special focus on SMEs. The present study contributes to this narrative by examining the revenues that SMEs can derive from their trade marks by licensing them to other companies.

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<sup>(1)</sup> EUIPO (2015).

<sup>(2)</sup> EPO/EUIPO (2019).

<sup>(3)</sup> EUIPO (2016 and 2019).

## EXECUTIVE SUMMARY

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Intellectual property assets play an increasingly important role in corporate strategy due to their potential to lead to higher profits and create value for the company. Thus, just like other assets owned by a company, IP assets have a value. However, quantifying that value can be a challenge, and the valuation of IP remains a major obstacle to IPR being considered as tradable assets. A trade mark (TM) is a type of IPR that helps establish a company's brand and underlines its distinctiveness in the marketplace. In the EUIPO/EPO report on the contribution of IPR-intensive industries to the EU<sup>(4)</sup>, industries that intensively use TMs make the highest contribution to the EU economy, with 30 % of EU employment (directly and indirectly) and 37 % of EU GDP generated by these industries.

The owner of the TM can use it to identify the goods or services produced, or it can grant permission to another company (licensee) to use the trade mark in exchange for an economic benefit. Trade mark licensing is thus one way to derive the economic benefit from the IPR. The present report values a firm's stock of TMs based on observable characteristics of a sample of SMEs that own EUTMs and license them to others. Subsequently, the capitalised value of the EUTM is estimated as the total licensing income expected to be realised during its economic lifespan.

A survey addressed to SME owners of EUTMs reveals that 7.5 % of SMEs owning EUTMs licensed them to others during the period 2013-2017. Additionally, this survey shows that the annual average revenue from licensing EUTMs is estimated at EUR 64 924 per firm (equivalent to 5.7 % of the average turnover of European SMEs) during the period 2013-2017, so that the estimated annual revenues from licensing out EUTMs by all SMEs in the EU is EUR 1.9 billion.

The average life of an EUTM registered by SMEs, based on the EUIPO register, is 20 years. Based on this and on the results of the survey, the gross capitalised value of EUTMs licensed by SMEs for their entire expected lifespan is estimated at EUR 38 billion, equivalent to EUR 1.3 million per licensing firm.

The survey also shows that SMEs in the service sector are more likely to license out their EUTMs and get higher revenues from licences, both in absolute terms and relative to the average turnover of all SMEs.

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<sup>(4)</sup> EUIPO/EPO 'IPR intensive industries and economic performance in the European Union. Industry-level analysis report, September 2019. Third edition'.

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## ACRONYMS AND ABBREVIATIONS

EPO	European Patent Office
ESA	European System of Accounts
EU	European Union
EUIPO	European Union Intellectual Property Office
Eurostat	Statistical Office of the European Union
EUTM	European Union Trade Mark
GDP	Gross Domestic Product
IP	Intellectual Property
IPR	Intellectual Property Right
NACE	Nomenclature statistique des activités économiques dans la Communauté Européenne
RCD	Registered Community Design
SBS	Structural Business Statistic
SME	Small to Medium-sized Enterprise
TM	Trade Mark
WIPO	World Intellectual Property Office

## List of country codes:

AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czech Republic
DE	Germany
DK	Denmark
EE	Estonia
EL	Greece
ES	Spain
FI	Finland
FR	France
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg
LV	Latvia
MT	Malta
NL	The Netherlands
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia
UK	United Kingdom

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## INTRODUCTION

Economic theory recognises intangible assets as one of the production factors sometimes named as entrepreneurship, knowledge assets, human, social or intellectual capital. Intangible assets include knowledge, intelligence, reputation, brand or experience, which are important for firms' success and economic growth and form part of the value of the firm. Nowadays it is recognised that intangible assets represent a major share of the value of many businesses, but there is a lack of commonly accepted valuation methods, especially for internally generated intangibles, for example, IP developed in-house.

An asset is a long-term resource with economic value, reported on a firm's balance sheet. Assets are bought or created to increase the value of a firm or to benefit the firm's operations. IP assets are economic resources that have no physical presence and can include patents, TMs, trade secrets, designs or copyrights. Such assets play an increasingly important role in corporate strategy due to their capacity to be converted into higher profits and value for the company. Nevertheless, the valuation of IP remains a major obstacle for it to be considered as a tradable asset, among other reasons because different accounting rules are applicable: a bought TM can be included in the firm's balance sheet but a TM created with own resources is not recognised as an asset (IAS 38 Intangible Assets<sup>(5)</sup>).

Eurostat publishes balance sheets<sup>(6)</sup> by product and institutional sector for 21 out of 28 EU Member States. The value of net IP products (AN117) of non-financial and financial corporation sectors<sup>(7)</sup> is estimated for 2017 at EUR 1.5 trillion and 9.7 % of total fixed assets<sup>(8)</sup> with an increase of 75 % since 2000.

The European Commission Expert Group on IP valuation<sup>(9)</sup> reports those limitations and concludes that it is difficult to recognise internally generated IP. Therefore, an important part of IP created by the firm is not recognised in the balance sheet, meaning that potential investors are not receiving complete information

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<sup>(5)</sup> International accounting standards, IAS 38 Intangible Assets outlines the accounting requirements for intangible assets, which are non-monetary assets without physical substance and unidentifiable (either being separable or arising from contractual or other legal rights).

<sup>(6)</sup> Balance sheets are included in national accounts statistics, which are regulated by the European system of accounts (ESA 2010). Paragraph 7.01 states that the 'balance sheet is a statement, drawn up for a particular point in time, of the values of assets economically owned and of liabilities owed by an institutional unit or group of units'.

<sup>(7)</sup> ESA 2010 distinguishes five sectors of which two refer to companies as producers of goods and services: non-financial corporations (S11) includes those units whose principal activity is the production of goods and non-financial services and financial corporations (S12) with those units producing financial services and including central banks and other private and public units.

<sup>(8)</sup> The official classification and coverage of economic assets is included in ESA 2010 Annex 7.1. Fixed assets consist of dwellings, other buildings and structures, machinery and equipment, weapons systems, cultivated biological resources, and intellectual property products. IP products (AN117) includes the results of research and development, mineral exploitation and evaluation, computer software and databases, entertainment, literary or artistic originals and other IP products whose use in production is restricted to the units that have established ownership rights over them or to other units licensed by such units.

<sup>(9)</sup> European Commission (2013).

about the company. This is especially important for SMEs<sup>(10)</sup> and may result in a disadvantage for firms that base most of their performance on IP.

In the present report, the value of a firm's stock of EUTMs is estimated based on observable characteristics of the company. While surveys of brand values are published periodically by consulting firms, those surveys tend to focus on the large global brands, ignoring the smaller firms, which are the backbone of the EU's economy. SMEs in general do not have a stock price or market valuation, this is why the valuation of TMs in this study is based on the objective results of a survey administered to SME owners of EUTMs<sup>(11)</sup>.

In the future the research could be extended to other registered IPR.

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<sup>(10)</sup> In this report, SMEs are defined as enterprises with less than 250 employees and less than EUR 50 million of turnover as an annual average in the period or reference.

<sup>(11)</sup> Almost 90 % of the owners of EUTMs identified by the EUIPO are SMEs.

## EUTM LICENCES SURVEY

TMs are intangible assets representing a benefit accruing to the economic owner by holding it over a period of time. The owner of the TM can use it to identify the goods and services produced or s/he can grant permission to another firm (licensee) to use the trade mark in exchange for an economic benefit: trade mark licensing. In that case, the economic benefit derived from licensing the IP right can be used to calculate the **capitalised value of the IPR as the total income expected to be realised over its economic lifespan**.

Any valuation method should be flexible, transparent and reliable. Three methods are generally used to value intangible assets <sup>(12)</sup>:

- **The income-based** approach requires an estimation of the value of a standard (unbranded) good or service and the value of the same branded good or service. The difference would be the premium profit generated by the brand.
- **The cost-based** approach considers the cost incurred in developing the asset, in this case the cost of the TM.
- **The market-based** valuation requires the knowledge of price information for some types of IP and the use of this information for similar assets.

The market-based approach is considered to be the most objective method by many researchers and this study relies on this approach. Information about the market value of EUTMs was obtained through a survey to SMEs <sup>(13)</sup> that have registered EUTMs. The survey is designed to determine the share of SMEs that have signed a TM agreement as licensor in relation with the EUTM it owns and the revenues generated from such licences.

The sampling frame is the matched EUIPO/ORBIS database including the universe of EU companies registering EUTMs and firm data from ORBIS <sup>(14)</sup>. The survey was addressed to EU SMEs with active EUTMs in 2017. Afterwards, the value of EUTMs registered by SMEs was analysed taking advantage of all the information about characteristics of the firms and the EUTMs included in the EUIPO register.

<sup>(12)</sup> European Commission (2013).

<sup>(13)</sup> The survey fieldwork has been commissioned by the EUIPO to KPMG.

<sup>(14)</sup> ORBIS is a database of financial information on European companies, provided by Bureau van Dijk and based on data obtained from company filings in company registers or similar records in the various countries. It thus includes data on all companies, whether listed on a stock exchange or not (as would typically be the case for SMEs). The matched database is limited to firms registering EUTM for which the EUIPO algorithm has been able to match a firm in ORBIS.

## 1.1 SAMPLE DESIGN

A total of 195 934 SMEs owners of EUTMs active in 2017 included in the EUIPO/ORBIS matched database compose the targeted population. The theoretical sample was a **stratified sample** of 6 111 SMEs with strata based on the country (28 EU Member States) and size (4 categories), with a minimum of 50 firms surveyed in countries with a lower number of SMEs in the EUIPO's register (Bulgaria, Estonia, Croatia, Latvia and Romania) and a maximum of 994 firms in Germany.

Stratified sampling is a common technique to optimise the sample size obtaining more precise results of the real value of a variable. A heterogeneous population is divided into strata, which are non-overlapping groups internally homogeneous in relation to the target variable. Therefore, strata are defined based on the expected behaviour of the variable of interest: share of SMEs licensing EUTMs. Considering that firms' behaviour is different among countries and size categories (micro, small, medium and firms for which size information is not available) the country of origin and size of the firm determine the strata.

The division of the population into strata allows for a gain in precision with the same sample size. The reason is that a smaller sampling fraction ( $f=n/N$ )<sup>(15)</sup> is needed in a homogeneous stratum because the variable of interest varies little from one unit to another within the stratum, so that a sufficiently precise estimate can be obtained from a smaller sample. In the extreme case of having strata with identical units, the sample size of each stratum  $h$  ( $n_h$ ) would be 1 unit. The precision required in some strata (for instance, countries) can also be controlled. Estimates in each stratum ( $h$ ) are combined to obtain the value for the whole population.

Annex I shows the sample size by strata as well as the formulae applied for the calculation of sampling errors and confidence intervals.

The coverage of the final sample is 70 % obtained with 4 290 answers out of 6 111 units in the theoretical sample designed. There are eight countries with a coverage above 80 % (Austria, Denmark, Estonia, Finland, Germany, Italy, Portugal and Romania) and eight countries below 50 % (Croatia, Cyprus, Greece, Ireland, Lithuania, Luxembourg, Malta, Slovenia). The coverage for other large countries is 51 % in Spain; 76 % in the United Kingdom and 62 % in France.

Due to the variable coverage at country level, in general the results are presented for all 28 EU Member States.

## 1.2 QUESTIONNAIRE

The complete questionnaire is shown in Annex II. The survey was conducted online between June and August 2018.

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<sup>(15)</sup> In sampling design  $n$  denotes the sample size and  $N$  the population size.

The key question is Q1: *'have you received any revenues from licensing out your EUTMs in the period 2013-2017?'.* The answer to this question is used to estimate the share of SME owners of EUTMs that license those EUTMs to others.

Those SMEs answering YES to Q1 are asked (section 1) if they license only one EUTM or several<sup>(16)</sup>, whether the licence agreement includes other IPR or additional services, and the country of the licensee in case of an exclusive licence agreement.

Another important piece of information included in the survey (section 2) is the distinction between different types of licence agreements and fees and the revenues received from each of them. WIPO's IP Panorama describes different ways of licensing TMs: franchising, merchandising, brand extension, co-branding, component or ingredient branding and standards. Because the target of the survey is to estimate the revenues from licensing EUTMs, and to avoid survey fatigue, three types of licence agreements are considered: annual agreements, multiannual agreements or royalties<sup>(17)</sup>. These three types of agreements allow for the calculation of annual average revenues.

Not all questionnaires received are complete, 226 of the firms declared having signed a licence agreement but without including the information on revenues received. To decide the validity of these incomplete questionnaires several econometric models (logit/probit) were run with a dummy variable for the response to Q1 as dependent variable. The models were run with complete and incomplete questionnaires separately and the coefficients of explanatory variables are identical in both subsamples (type of licence, sector and size of the firm, etc.).

Based on these results it was decided to retain all responses as the unfinished questionnaires also provide valuable information not only to estimate the ratio of SMEs licensing out but also about other characteristics of the licence agreement.

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<sup>(16)</sup> In the population of all SME owners of EUTMs the average number of TMs per firm is two, with half of SMEs owning only one TM.

<sup>(17)</sup> A royalty is a payment made by one party (licensee) to another party that owns a particular asset (licensor) that is typically agreed upon as a percentage of revenues derived from the use of the asset. The revenues asked about in the survey refer only to the right of use of the EUTM and not to any additional services that may be included in the agreement.

## DESCRIPTIVE ANALYSIS FROM THE SURVEY

The population of EU SMEs and the owners of EUTMs with an active TM in 2017 is shown in Table 1.

**Table 1: Total SMEs and targeted population of SME owners of EUTMs**

	SMEs (Eurostat SBS)	% SMEs SBS	POPULATION owners EUTM (EUIPO/ORBIS database)	% population	% SMEs owners
AT	323 783	1.4	6 151	3.1	1.9
BE	593 271	2.5	4 019	2.1	0.7
BG	324 077	1.4	787	0.4	0.2
CY	48 990	0.2	1 143	0.6	2.3
CZ	1 001 005	4.2	2 648	1.4	0.3
DE	2 416 782	10.2	39 159	20.0	1.6
DK	213 354	0.9	3 999	2.0	1.9
EE	68 236	0.3	1 160	0.6	1.7
EL	768 385	3.3	518	0.3	0.1
ES	2 508 402	10.6	28 021	14.3	1.1
FI	229 799	1.0	3 617	1.8	1.6
FR	2 991 174	12.7	13 036	6.7	0.4
HR	147 481	0.6	164	0.1	0.1
HU	534 433	2.3	1 138	0.6	0.2
IE	239 821	1.0	2 570	1.3	1.1
IT	3 722 183	15.8	25 229	12.9	0.7
LT	181 882	0.8	599	0.3	0.3
LU	31 597	0.1	2 012	1.0	6.4
LV	107 120	0.5	392	0.2	0.4
MT	27 065	0.1	772	0.4	2.9
NL	1 094 131	4.6	11 752	6.0	1.1
PL	1 586 057	6.7	5 395	2.8	0.3
PT	813 680	3.4	3 641	1.9	0.4
RO	453 934	1.9	763	0.4	0.2
SE	681 405	2.9	7 546	3.9	1.1
SI	134 531	0.6	521	0.3	0.4
SK	432 285	1.8	912	0.5	0.2
UK	1 920 172	8.1	28 270	14.4	1.5
<b>EU28</b>	<b>23 595 033</b>	<b>100.0</b>	<b>195 934</b>	<b>100.0</b>	<b>0.8</b>

SME owners of EUTMs matched with ORBIS financial and demographic data compose the sample frame with a population of 195 934 SMEs. The distribution of SMEs in the population of EUTM owners among Member States is different from the total distribution of SMEs in Eurostat's structural business statistics (SBS). This difference is due to the different propensity to register EUTMs by country and possibly to the different coverage of the ORBIS database by country resulting in an over-representation of German, British and Spanish SMEs in the sample frame and an under-representation of French, Polish, Greek, Italian and Czech SME owners of EUTMs in comparison with the total SME population. The different coverage of the ORBIS database by country and size could result in a biased sample, but this database is the most complete source of financial data for firms in the EU.

Descriptive analysis of the survey results is a first step to estimate the proportion of SME owners of EUTMs that derive revenues from licensing their TMs, to detect possible outliers and to identify variables to use in a deeper analysis of the data using other techniques such as econometric methods.

The results presented in this chapter are estimated using post-stratification techniques, which involves adjusting the sampling weights by strata to correct for different response rates and thereby obtain totals reflecting the actual SME owners' structure of the population of EUTM according to the EUIPO/ORBIS matched database. It also results in smaller sampling errors.

## 2.1 RATIO OF SMEs LICENSING OUT

### **7.5 % of SME owners of EUTMs derived revenues from licensing out their EUTM during the period 2013-2017**

The 95 % confidence interval of the estimated ratio of SME owners of EUTMs that receive revenues from licensing is 6.7 % to 8.3 %<sup>(18)</sup>.

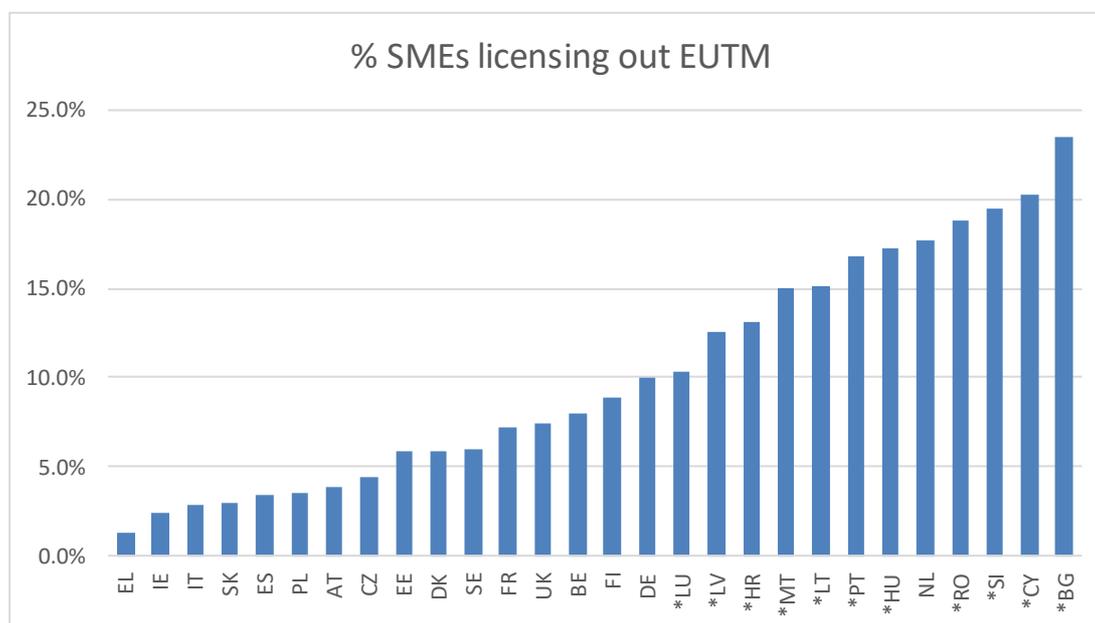
Among the larger Member States, in the Netherlands 17.7 % of SMEs receive revenues by licensing out EUTMs; the corresponding figure is 10 % in Germany. France and United Kingdom are close but just below the EU average (7.2 % and 7.4 %, respectively); Spain, Poland and Italy are below the EU average (3.5 %; 3.5 % and 2.9 %, respectively).

Figure 1 shows the ratio of SMEs that license EUTMs in EU Member States, with a caveat for 11 countries with higher sampling errors resulting in less accurate estimations.

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<sup>(18)</sup> The 95 % confidence interval is a statistical calculation that means that there is a 95 % probability that the true figure lies between the lower and upper bounds of that interval.

**Figure 1: Ratio of SMEs licensing EUTMs by country**



Note: Countries with a sampling error above 5 % for a 90 % confidence level are marked with an asterisk.

Table 2 shows the ratio of SMEs licensing out EUTMs by main sector of activity<sup>(19)</sup> as well as the share of SMEs registering EUTMs in each sector.

**Table 2: Licence ratio of SMEs by economic sector**

	% SMEs in sample	% licensing EUTM
<b>Manufacturing</b>	22	6.1
<b>Construction</b>	2	3.3
<b>Trade</b>	29	6.2
<b>Services</b>	35	7.6

The licence ratio by size is presented in Table 3. Among the three known size categories, medium and micro firms have the highest propensities to license out their EUTMs.

<sup>(19)</sup> Sector of activity is not identified for 9 % of the SMEs in the sample. There is also a smaller percentage of firms in the agriculture sector, which has not been included in any of the tables by economic sector.

**Table 3: Licence ratio of SMEs by size<sup>(20)</sup>**

	%SMEs in sample	% licensing EUTMs
<b>Micro</b>	30.1	8.5
<b>Small</b>	20.0	4.7
<b>Medium</b>	12.8	9.2
<b>Not available</b>	37.1	7.6

## 2.2 TYPE OF LICENCE AGREEMENT

The firms that license their EUTMs were asked about the type of licence agreement with three possible options, not mutually exclusive: annual, multiannual and royalties agreements. The frequency in the sample of each of the three types of agreements is approximately one-third (49, 48, 54 firms declaring each type of licence agreement) with some overlap: 16 firms (13 %) have two or three different agreements. The average duration of the multiannual licence agreements is 7.1 years and for the royalties' agreements 14.3 years.

Some licence agreements include the use of other IPR besides EUTMs (such as patents or designs) or other services. Only 4.3 % of the SMEs licensing out EUTMs include patents in the licence agreement, 5 % include designs, 9 % another IPR and 5 % other services. Among all SMEs that license out EUTMs, 65 % have only one EUTM and 10% license all the EUTMs they own.

Looking at the countries of the licensee, 11 % are from another EU country, 3 % are from non-EU countries and 5 % are from the United States. Other countries were also reported in the survey but only by a smaller number of firms. The purpose of this question was to examine the geographical reach of the licence agreements, not including the home country of the licensor, because it was expected that the TM was protected at EU level to extend the market outside that country.

## 2.3 REVENUES FROM EUTM LICENCES

The questions about revenues from licence agreements have the lowest response rate of all the questions in the survey, but aggregated results for the EU are still statistically valid. The estimated average annual

<sup>(20)</sup> Micro enterprises are defined in this report as SMEs with 0 to 9 employees, small enterprises have 10 to 49 employees and medium enterprises are those SMEs with 50 or more employees.

revenue from any type of licence agreement is calculated based on the 89 observations with a value of revenues above EUR 1 000<sup>(21)</sup> and as an annual average for the period 2013-2017, discarding an outlier with an average revenue of EUR 6 240 000. The **average total annual revenue from licence agreements** (some firms declare more than one type of agreement) is **EUR 68 929 per firm** during the period 2013-2017.

Considering different type of agreements, the weighted average revenues are shown in Table 4. Annual agreements are associated with the highest annual revenue, followed by multiannual agreements and royalty contracts.

**Table 4: Average revenues by type of licence agreement**

	Average annual revenues from licences 2013-2017 (EUR)
Annual agreement	76 392
Multiannual agreement	59 170
Royalties	41 563

The average royalty rate estimated is 11.6 % of the licensee's sales.

The average revenues of license agreements including other IPR or services besides the EUTM are shown in Table 5. Only agreements that include TMs and designs have higher revenue than agreements that include only TMs.

**Table 5: Average revenues of licences including other IPR or services**

	Average annual revenues from licences 2013-2017 (EUR) including TMs and ...
Patents	41 235
Designs	93 727
Other IPR	33 537
Other services	68 060
Only EUTMs	72 900

<sup>(21)</sup> After the analysis of the results, it was concluded that some firms reporting very small revenues seem to consider as unit thousand euros or other currencies. For this reason, 10 questionnaires with values of less than EUR 1 000 of total revenue per firm and year were discarded from the calculation of average revenues.

The revenues from licensing EUTMs by SMEs are compared with the average turnover by enterprise as published by Eurostat in the SBS. **The estimated average revenue from licensing EUTMs represents 6 % of the average turnover for all SMEs** (EUR 1 146 020) and the ratios by size are shown in Table 6.

**Table 6: Average revenues of licences by size of the SMEs**

	Revenues licences (EUR)	Average turnover (EUR)	Licence/Turnover (%)
<b>Micro</b>	63 804	219 412	29.1
<b>Small</b>	87 817	3 412 134	2.6
<b>Medium</b>	171 534	23 439 816	0.7
<b>All SMEs</b>	<b>68 929</b>	<b>1 146 020</b>	<b>6.0</b>

The average revenue from licensing EUTMs for micro enterprises is below the average for all SMEs but these revenues represent almost 30 % of their average turnover. As indicated in Table 3, the ratio of micro enterprises licensing their EUTMs (8.5 %) is above the overall average and these enterprises represent the highest share of SMEs among EUTM owners.

Results by sectors, comparing average revenues from licences with average turnover (SBS) are presented for the three main sectors in Table 7.

**Table 7: Average revenues of licences by sector of activity**

	Revenues licences (EUR)	Average turnover (EUR)	Licence/Turnover (%)
<b>Manufacturing</b>	34 209	4 010 696	0.9
<b>Trade</b>	24 859	1 591 313	1.6
<b>Services</b>	118 562	541 038	7.5
<b>TOTAL</b>	<b>68 929</b>	<b>1 146 259</b>	<b>6.0</b>

SMEs in service sectors derive a far higher share of their total revenue from licensing out their EUTMs than those in manufacturing or trade.

## ECONOMETRIC ANALYSIS OF SMEs LICENSING EUTMs

The second stage of this research consists of two econometric models designed to examine the determinants of the probability of licensing EUTMs by SMEs and of the revenues received from those licence agreements.

The probability of licensing EUTMs by SMEs is analysed with an econometric model using as dependent variable question Q1 from the survey: *Have you received any revenues from licensing out your EUTMs in the period 2013-2017?* The answer to this question is binary: YES or NO. Types of model known as the logit and probit models allow estimating the probability (p) for an SME of answering YES. This model is estimated based on all observations from the survey and using as explanatory variables various characteristics of the firms available in the matched EUIPO/ORBIS database.

A second model tries to determine which variables explain the level of revenues derived from licence agreements. For this model, the dependent variable is a combination of questions Q4.1, Q4.2 and Q4.3, providing the yearly average revenues from the three types of licence agreements. Some of the firms have revenues from more than one type of agreement; in those cases, the value used is the total. This variable is continuous and the model estimated is an econometric model based on the valid responses to these questions (89 observations) and using as explanatory variables several characteristics of the firms as well as characteristics of the licence agreements.

Based on the second econometric model the coefficients of the variables detected as significant in explaining differences in licensing revenues are used to impute a value to all EUTMs registered by SMEs and (using the proportion answering YES to Q1) to calculate the total market value of EUTM licences. The imputed value is based on the estimated market value of TMs owned by similar firms. The accumulated value of revenues from licences during the average expected life of EUTMs is the value of the intangible asset.

Explanatory variables for both models originate from the survey as well as from several databases:

- EUIPO register: characteristics of the TM, such as Nice<sup>(22)</sup> classes or registration year, and ownership of RCDs;
- ORBIS database: characteristics of the TM owner, including sector of activity, size and age of the firm, country of origin, relationship of the firm with other companies (dependent or independent firm) and physical or legal entity;
- PATSTAT<sup>(23)</sup> information about the ownership of patents.

<sup>(22)</sup> The Nice Classification is an international classification of goods and services applied for the registration of marks.

<sup>(23)</sup> PATSTAT is a dataset containing bibliographical and legal status patent data extracted from the EPO's databases.

### 3.1 CHARACTERISTICS OF SMEs LICENSING EUTMs

Several logit and probit models were estimated based on all the surveyed firms (4 285), including results from the survey as well as the matched EUIPO/ORBIS/PATSTAT database.

These econometric models (logit and probit) try to define the **characteristics of SMEs licensing out** their EUTMs. The dependent variable is a dummy for the answer to Q1, taking value 1 if the answer is YES and 0 otherwise. Explanatory variables are the characteristics of the firm such as size, sector, age and ownership of EPO patents and EUIPO designs.

Annex III describes the methodology applied and the results of the best model estimated to explain the probability of licensing EUTMs by SMEs. Among all explanatory variables used, the sector of activity (considering dummies for manufacturing, trade and service sectors) and the size of the firm (only significant for small firms) are significant.

Nevertheless, no model provides acceptable predictions of the probability for an SME owner of EUTMs to license it to other entities. The conclusion from this part of the research is, therefore, that with the available information it is not possible to explain why some firms choose to license their EUTMs and others do not.

### 3.2 REVENUES FROM LICENSING EUTMs BY SMEs

A second econometric model seeks to explain the **revenues derived from licensing out EUTMs**. A set of models are estimated based in 89 observations with valid responses to questions Q4.1, Q4.2 and Q4.3<sup>(24)</sup>. The methodology applied and the results of six models estimated are included in Annex IV.

The best model includes the sector of activity and the type of licence agreement as explanatory variables with higher than expected average revenue for SMEs in the service sector and with annual licence agreements. The coefficients of the explanatory variables are expressed in logarithms and the relation among them is multiplicative, not additive. To simplify the interpretation of the results, Table 8 shows the predicted revenues from licences of the different combinations of sector and type of licence agreement based on model 2 in Annex IV.

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<sup>(24)</sup> Two firms were discarded from the total sample of firms answering those questions: one large firm that was included by mistake, and an outlier with more than EUR 6 million of annual average revenue from licences, which is also an influential observation, meaning that the coefficients change when it is discarded from the regression models.

**Table 8: Predicted revenues based on sector of activity and type of licence agreement (in EUR)**

	Annual	Multiannual	Royalties
<b>Manufacturing</b>	31 206	14 287	17 356
<b>Trade</b>	38 655	17 697	21 498
<b>Services</b>	138 082	63 219	76 797
<b>Other sector*</b>	33 196	15 198	18 462

\*Other sector includes agriculture, construction and 'not available'.

Some SMEs in the sample have declared that they have licensed out the EUTM and the type of licence agreement but they have not indicated the revenues received. For these 45 firms the values presented in Table 8 are used to impute the revenues from licences based on the sector of activity and the type of licence agreement.

Additionally, 225 firms in the sample declare having received revenues from licensing out their EUTMs without providing information about the type of licence agreement. For those firms the results from model 1 in Annex IV using only sector of activity as explanatory variables are used to impute the revenues shown in Table 9.

**Table 9: Predicted revenues based on sector of activity (in EUR).**

<b>Manufacturing</b>	50 955
<b>Trade</b>	32 912
<b>Services</b>	111 576
<b>Other sector</b>	43 205

\*Other sector includes agriculture, construction and 'not available'.

The imputed data for 270 observations based on econometric models added to the 89 actual revenues as declared in the survey are used to calculate the average revenue estimated from licensing EUTMs.

**The average estimated revenue for all SME owners of EUTMs licensing out their EUTMs during the period 2013-2017 is EUR 64 924 per year, corresponding to 5.7 % of the average turnover for all SMEs in the EU**

**The annual estimated revenues for all SME owners of EUTMs licensing out their EUTMs (7.5 %) during the period 2013-2017 is EUR 1 888 million.**

The estimated revenues for all SME owners of EUTMs licensing out is calculated based on the total SMEs registering EUTMs, almost 30 000 firms, not only the approximately 50 % that were matched with ORBIS.

### 3.3 CAPITALISED VALUE OF EUTMs OWNED BY SMEs

The revenues obtained from licensing any IPR is an annual flow received by a firm and can be used to estimate the value of the intangible asset represented by the ownership of the IPR. The capitalised value of an asset is the total income expected to be realised over its economic lifespan. Even though the theoretical economic life of a TM is infinite, the average life of an EUTM has been calculated based on the EUIPO registers including the dates of registration, expiry and renewals (every 10 years) of all EUTMs owned by SMEs <sup>(25)</sup>.

The first step is to estimate the probability of expiration for an EUTM owned by an SME that theoretically could have been renewed twice, that is, those TMs filed before March 1999 <sup>(26)</sup>. For this subset of IPR, the probability of expiring at the age of 10 years is 38.8 % and at 20 years it is 20.3 % for those that survived the first 10 years.

The expected life of all EUTMs is calculated using the actual life of expired EUTMs (18.4 % of all EUTMs filed by SMEs are expired with an average life of 10.51 years). For active EUTMs a maximum of 40 years of life is assumed with the following probabilities of lifespan: probabilities of expiration at 10 and 20 years are the actual ones for EUTMs filed before March 1999 (38.8 % and 20.3 %, respectively) while the probability of expiration at 30 and 40 years are set to 20.4 % each. This results in an expected average life for active EUTMs registered by SMEs of 22.2 years.

The expected life of all EUTMs owned by SMEs (active or expired) is then 20.09 years, which is in line with lifetime assumptions from acquired brands <sup>(27)</sup>.

The gross value of an EUTM licensed by SMEs is calculated based on the simple aggregation of annual revenues along its expected economic life without applying any discount rate.

<sup>(25)</sup> A discussion about trade mark economic life can be found in Binder and Rüssli (2014).

<sup>(26)</sup> The complete database of EUTMs owned by SMEs consists of almost 900 000 TMs, of which 155 000 are already expired and the rest are still active. Of those TMs, 40 000 had the possibility of being renewed twice, those registered between April 1996 and March 1999, so that the probability of first and second renewal is estimated based on those TMs.

<sup>(27)</sup> Binder and Rüssli (2014).

**The gross value of the intangible asset represented by EUTMs licensed by EU SMEs amounts to EUR 1 304 321 per firm. The aggregated value for all SMEs in the EU licensing their EUTMs is estimated at EUR 37 937 million.**

## CONCLUSIONS

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- 7.5 % of SMEs owning EUTMs have licensed those EUTMs to other companies during the period 2013-2017.
- Available data (EUTM survey and EUIPO/ORBIS matched database) does not provide useful information to predict the probability for an SME to license out its EUTMs. It appears that additional data on the EUTMs and firm characteristics would be required to obtain a good model that explains the probability of licensing out by SMEs.
- SMEs in the service sector are more likely to license out their EUTMs and earn higher revenues from those licences, both in absolute terms and relative to average turnover, than firms in the manufacturing and trade sectors.
- Licences by micro firms represent a high share of their average turnover (29 %) and are thus an important revenue source for such firms.
- The annual licence agreement is the type of licence associated with the highest annual revenue, followed by multiyear agreements and royalty deals.
- The annual estimated average revenue from licensing an EUTM during the period 2013-2017 is EUR 64 924, equivalent to 5.7 % of the average turnover for SMEs in the EU.
- The estimated annual revenues from licensing out EUTMs during the period 2013-2017 by all SMEs is EUR 1.9 billion.
- The gross capitalised value of EUTMs licensed by SMEs along their entire expected life is EUR 38 billion, equivalent to EUR 1.3 million per firm.

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## ANNEX I: SAMPLE DESIGN

The purpose of the survey is to determine the share of SMEs licensing out their EUTMs, the characteristics of such licence agreements and the revenues obtained from those licences.

To minimise the sample size required for a specific sample error, a stratified sample with optimum allocation was designed with the size of the firm (micro, medium, small and not available) and country (28 Member States) defining the 112 (4\*28) strata. The optimum allocation is used with a measure of the variance in each stratum  $h$  based on the 2016 SME Scoreboard results on the proportion of firms licensing out in each stratum<sup>(28)</sup>.

For total sample and strata sample size the usual formulae were applied:

$$n = \frac{(\sum_{h=1}^{112} W_h * \sqrt{p_h * q_h})^2}{V + \frac{1}{N} * \sum_{h=1}^{112} W_h * p_h * q_h}$$

$$n_h = n * \frac{N_h * \sqrt{p_h * q_h}}{\sum_{h=1}^{112} N_h * \sqrt{p_h * q_h}}$$

Where  $W_h$  is the stratum weight ( $N_h/N$ ) and  $V$  the required variance for the total population proportion. The size of the population was calculated based on matched the EUIPO/ORBIS database of owners of EUTMs. The  $p_h$  ratio is the proportion of firms that license out among all TM owners in stratum  $h$  and  $q_h$  is the probability of not licensing out ( $q_h=1-p_h$ ). For the missing data  $p_h$  was set to 0.5 as this is the value for which the sample size is maximum and for NA (not available, for unknown size) strata the sample size is equal to the one in micro firms as in general the NA stratum is composed of micro firms for which data to assign the employment interval is not available.

The theoretical sample designed was 6 111 but only 4 285 answers were received, resulting in a 70 % response rate. The final weights were adjusted to take into account different response rates by country and size of the firms.

<sup>(28)</sup> Results used from the 2016 SME Scoreboard include all firms licensing out with a TM licensing agreement. A total of 362 firms are in that situation in the EU out of 1 523 firms that are TM owners (both EU and national TMs) resulting in a 23 % total ratio.

Finally, in the calculation of the totals for the whole population of SMEs registering EUTMs, the fact that only 50.4 % of all SMEs are included in the matched database EUIPO/ORBIS used as sample framework has been considered.

**Table AI.1 Final sample received by strata:**

	NA	micro	small	medium	TOTAL
AT	47	118	21	6	192
BE	51	26	9	2	88
BG	1	23	10	2	36
CY	24		1	1	26
CZ	8	49	15	6	78
DE	103	540	155	61	859
DK	67	32	9	2	110
EE	10	37	3		50
EL	6	16	8	6	36
ES	77	182	67	27	353
FI	16	63	8	6	93
FR	18	150	55	19	242
HR	1	17		1	19
HU	18	45	5	1	69
IE	17	11	7	3	38
IT	22	293	124	61	500
LT	1	23	9	3	36
LU	27	9	1	1	38
LV	4	26	5	1	36
MT	19	13	3	1	36
NL	36	111	12	4	163
PL	11	50	38	19	118
PT	9	73	27	9	118
RO	9	32	9	5	55
SE	4	120	21	5	150
SI	8	25	9	1	43
SK	4	41	10	1	56
UK	502	84	29	32	647
<b>EU28</b>	<b>1 120</b>	<b>2 209</b>	<b>670</b>	<b>286</b>	<b>4 285</b>

## ANNEX II: QUESTIONNAIRE

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The first question is a filter to determine whether the firm has licensed out any EUTMs in the period 2013-2017 so that only those SMEs that answer YES have to continue the survey.

Subsequently, there are some questions about the type of licence agreement (which EUTMs are licensed, country of the licensee, duration of the agreement) and final revenues received.

### Section 0. EUTM data

1. Have you received any revenues from licensing out your EUTM in the period 2013-2017?  
(single choice) (if the answer is 'Yes', continue to question 2; if the answer is 'No', end of the survey)
  - a) Yes
  - b) No
2. (If the answer to question 1 is 'Yes') From which EUTMs have licence revenues been received? (single choice)
  - a) From just one EUTM
  - b) From some EUTMs (in the event that you have more than one EUTM)
  - c) From all EUTMs (in the event that you have more than one EUTM)

## Section 1. Licence fees

3. What type of licence has been granted? Please select all that apply. (multiple choice)

- a) Only EUTM
- b) EUTM and other IPR and/or services  If the answer is 'EUTM and other IPR and/or services', continue to question 3.1
- c) Exclusive licence agreement  If the answer is 'Exclusive licence agreement', continue to questions 3.2.1 and 3.2.2

3.1 (If the answer to question 3 is 'EUTM and other IPR and/or services') For what other type of IPR and/or service has the licence been granted? Please select all that apply. (multiple choice)

- a) Patents
- b) Designs
- c) Other IPR  Please specify \_\_\_\_\_
- d) Other services  Please specify \_\_\_\_\_

3.2.1 (If the answer to question 3 is 'Exclusive licence agreement') In which country(ies) has the exclusive licence agreement been granted? (multiple choice)

- a) EU countries
- b) Switzerland
- c) USA
- d) Singapore
- e) China
- f) Japan
- g) South Korea
- h) Africa
- i) Oceania
- j) Rest of Europe
- k) Rest of America

l) Rest of Asia

3.2.2 (If the answer to question 3 is 'Exclusive licence agreement') What are the terms of the exclusive licence agreement? (Years) \_\_\_\_\_

## Section 2. Type of licence agreement and fees

4. What type of licence agreement has been granted? Please select all that apply. (multiple choice)

- a) Annual licence fees  If the answer is 'Annual licence fees' continue to question 4.1
- b) Multiannual agreement  If the answer is 'Multiannual agreement' continue to question 4.2
- c) Royalties  If the answer is 'Royalties' continue to question 4.3

4.1 (If the answer to question 4 is 'Annual licence fees') Please indicate the revenues from the annual licence agreement. (number field + currency drop-down list: EURO value by default. Other values shown are: BGN-LEV, HRK-KUNA, CZK-KORUNA, DKK-KRONE, HUF-FORINT, PLN-ZLOTY, RON-LEU, SEK-KRONA, GBP-POUND STERLING, and US-DOLLAR)

- a) Revenues from licence 2013 \_\_\_\_\_
- b) Revenues from licence 2014 \_\_\_\_\_
- c) Revenues from licence 2015 \_\_\_\_\_
- d) Revenues from licence 2016 \_\_\_\_\_
- e) Revenues from licence 2017 \_\_\_\_\_

4.2 (If the answer to question 4 is 'Multiannual agreement') Please indicate the following information regarding the multiannual licence agreement (as long as it includes one of the years in the period 2013-2017).

4.2.1 Revenues from the multiannual licence agreement \_\_\_\_\_   
(number field + currency drop-down list: EURO value by default. Other values shown are: BGN-LEV, HRK-KUNA, CZK-KORUNA, DKK-KRONE, HUF-FORINT, PLN-ZLOTY, RON-LEU, SEK-KRONA, GBP-POUND STERLING, and US-DOLLAR).

4.2.2 Duration of the multiannual licence agreement (years) \_\_\_\_\_

4.3 (If the answer to question 4 is 'Royalties') Please indicate the following information regarding the royalties agreement (as long as it includes one of the years in the period 2013-2017).

4.3.1 Duration of the royalties agreement (years) \_\_\_\_\_

4.3.2 Royalty rate (%) \_\_\_\_\_

4.3.3 Royalty revenues for the period 2013-2017? \_\_\_\_\_  (number field + currency drop-down list). (number field + currency drop-down list: EURO value by default. Other values shown are: BGN-LEV, HRK-KUNA, CZK-KORUNA, DKK-KRONE, HUF-FORINT, PLN-ZLOTY, RON-LEU, SEK-KRONA, GBP-POUND STERLING, and US-DOLLAR)

## ANNEX III: LOGIT AND PROBIT MODELS

The logit and probit models are used when the dependent variable is binary with 0 and 1 values. These models consider that there is an unobservable latent variable ( $y_i^*$ ) defined as the propensity or ability for observation  $i$  of result 1 with values in the interval (0,1).

The regression model is:

$$y_i^* = \beta_0 + \sum_{j=1}^k \beta_j x_{ij} + u_i$$

Where the latent variable  $y_i^*$  is explained by  $k$  explanatory variables  $x_{ij}$  and the residual  $u_i$  or error term.

What we observe is:

$$Y_i = \begin{cases} 1 & \text{if } Y_i^* > z \\ 0 & \text{otherwise} \end{cases}$$

With threshold  $z$  that could be determined a posteriori depending on the desired level of errors.

The logit and probit models differ in the specification of the distribution of the error term  $u$  but in general the results are quite similar. If the distribution of  $u_i$  is logistic the model is known as a logit model and if the errors follow a normal distribution the model is a probit model.

The dichotomous realisation of the latent variable with a binomial distribution is observed with probability  $P_i = \text{prob}(Y_i=1)$ . The model will estimate the coefficients of explanatory variables and for each observation  $i$  the predicted value  $\hat{Y}_i$  is the probability  $P_i$  and the actual values  $Y_i$  are either 0 or 1. If the probability estimated is higher than  $z$  ( $\hat{Y}_i > z$ ) it classifies the  $i$  observation in group 1 (licensing) and in group 0 (not licensing) otherwise. Then we can compare the predictions with the actual values for each realisation  $i$  to calculate a goodness-of-fit measure and fix the appropriate  $z$  threshold that minimises prediction errors.

The best model estimated to predict the probability for an SME of licensing the EUTM is a logit model including as explanatory variables four dummies for small firms and sector of activity considering trade, manufacturing and service. All the coefficients are significant with 99 % significance and a Pseudo- $R^2$  of 1 %.

Considering the default threshold  $z=0.5$ , this model provides a naïve prediction with probabilities estimated for all observations below 0.14, as shown in Table AIII.3. The prediction is  $Y_i=0$  for all observations (not licensing) resulting in 91.66 % observations correctly classified. Exactly the same predictions would be estimated for any  $z \geq 0.14$ .

The results of the logit model estimated are presented in tables 1 to 3:

**Table AIII.1: Results of the logit model: coefficients and significance levels**

	Coefficient.
Constant	-1.87002***
Small	-0.53837***
Manufacturing	-0.57896***
Trade	-0.59312***
Services	-0.46015***

Note: \* =  $p < 0.1$ ; \*\* =  $p < 0.05$ ; \*\*\* =  $p < 0.01$  based on robust standard errors

**Table AIII.2: Goodness-of-fit results of the logit model**

Logistic model for Q1 revenues licensing out 1317

Classified	Q1=1	Q1=0	Total
+	0	0	0
-	358	3 932	4 290
Total	358	3 932	4 290

Classified + if predicted  $\Pr(Q1) \geq 0.5$

Sensitivity	$\Pr(+ Q1=1)$	0.00 %
Specificity	$\Pr(- Q1=0)$	100.00 %
Positive predictive value	$\Pr(Q1=1 +)$	0 %
Negative predictive value	$\Pr(Q1=0 -)$	91.66 %

False + rate for true 0	$\Pr(+ Q1=0)$	0.00 %
False - rate for true 1	$\Pr(- Q1=1)$	100.00 %
False + rate for classified +	$\Pr(Q1=0 +)$	0 %
False - rate for classified -	$\Pr(Q1=1 -)$	8.34 %

**Correctly classified 91.66 %**

The apparent goodness-of-fit of the model is not real and the explanatory variables used are in practice not suited for predicting the probability of an SME licensing out (which is reflected in the low Pseudo-R<sup>2</sup> statistic). The use of different thresholds  $z$  (0.05; 0.07; 0.10; 0.12) results in worse predictions with a much lower percentage of observations correctly classified so the prediction of all observations  $Y_i=0$  presents the highest goodness-of-fit results.

**Table AIII.3: Propensity to license EUTMs by SMEs ( $p$ ) predicted by the logit model:**

$p_i$ (%)	Small	Other size
<b>Manufacturing</b>	4.80	7.95
<b>Trade</b>	4.74	7.85
<b>Services</b>	5.37	8.87
<b>Other sector</b>	8.25	13.35

## ANNEX IV: ECONOMETRIC MODELS

An econometric model with the total revenues obtained as the dependent variable explains the level of revenues from licence agreements from a combination of answers to questions Q4.1, Q4.2 and Q4.3 in the survey. The explanatory variables available include information from the survey as well as information from each firm included in the EUIPO/ORBIS matched database. There are 89 observations with valid values of revenues (although not all explanatory variables are complete).

Several parsimonious models were run to explain the total revenues from licensing out using generalised linear models (GLM) with Gaussian family and logistic link function allowing non-linearity and correcting the heteroscedasticity of the dependent variable.

**Table AIV.1: Results of six econometric models using as dependent variable the revenues obtained from licensing EUTMs by SMEs:**

	(1)	(2)	(3)	(4)	(5)	(6)
Constant	10.6737***	9.058165***	8.96642***	10.6183***	9.730867***	9.209784***
Manufacturing	0.1650066	-0.0618229	0.2420793			
Trade	-0.2721016	0.1522386	0.1464015			
Services	0.9487641**	1.425422***	1.570801***			
TM intensive				0.92393***	0.8892149**	1.163426**
Q4. Annual		1.352016***	1.39909***		0.9557816**	1.286733***
Q4. Multiannual		0.5707688	0.5422265		0.6556175	0.689789
Q4. Royalties		0.7653314***	0.6985314**		0.3179303	0.7759392**
Q3.1. Patents			-0.6372024			-1.601396**
Q3.1. Designs			0.2782957			-0.1509217
Q3.1. Other IPR			-1.98592*			-0.9268503
Q3.1 Other services			0.4619829			0.4038865
AIC	26.29493	26.1461	26.19707	26.26389	26.24424	26.2435

Note: \* =  $p < 0.1$ ; \*\* =  $p < 0.05$ ; \*\*\* =  $p < 0.01$  based on robust standard errors and GLM.

The six models shown have significant and stable coefficients, and based on the Akaike Information Criteria (AIC) the selected model is model 2.

Based on previous analyses and attempts to find significant explanatory variables, three groups of variables explain differences in the level of revenues received by SMEs from licences of EUTMs. The sector of activity of the SMEs is defined considering two different specifications: three dummies for the bigger sectors included in the sample (manufacturing, trade and services) or one dummy if the activity is included in the list of TM intensive industries. Other explanatory variables included are the response to Q4 ‘*What type of licence agreement has been granted?*’ represented by three dummies and the responses to Q3.1 ‘*In case of other IPR included in the licence, which IPR or service?*’ with four options represented also by dummies.

Both specifications of the economic sector of the SMEs are significant and including only these explanatory variables, the model with only one dummy for TM intensive industries is better, based on the AIC. Nevertheless, the addition of Q4 and Q3.1 variables improves significantly the models including three dummies for sectors (models 2 and 3) in comparison with the corresponding models with one dummy variable for TM intensive industries (models 5 and 6).

The addition of Q4 variables for the type of licence agreement clearly improves the models. Model 2 has four significant coefficients with 99 % of confidence and the lowest AIC.

Finally, the addition of the Q3.1 variables to the models with sector and Q4 variables add an additional significant coefficient, but has a worse AIC, and the value of the coefficients estimated for these variables are quite different (comparing models 3 and 6).

To clarify the interest of including the results to question Q3.1 in the models the response rate to this multiple-choice question is analysed. The Q3.1c alternative is the only one significant in model 3 with a very high negative value meaning that licence agreements including other IPR additional to the EUTM (and different from patents and designs) have lower revenues. There are 30 questionnaires with licence agreements including other IPR different from patents and designs, of which 9 include also other options and just 9 of these SMEs with a valid value for the total revenues from the licence agreement. This question includes an open field to detail the IPR included in the licence agreement. Among the SMEs completing this field, 6 answer that the licence includes also copyright and 5 another different TM (in general national TMs in non-EU countries). Model 6 presents a significant coefficient for the presence of patents in the licence agreement also with a very negative value and coefficients for other explanatory variables change in comparison with model 5.

Based on the analyses of Q3.1 and the AIC values, the preferred model is number 2 indicating that licence agreements signed by SMEs in service sector and annual licence agreements are associated with higher revenues. The value of the coefficients estimated by this model is used to impute the revenues of SMEs licensing EUTMs based on the economic sector and the type or licence agreement signed.

## Licensing activities by SMEs: evidence from EU trade mark owners



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