

ENHANCING INTELLECTUAL PROPERTY USE FOR A STRONGER INNOVATION ECOSYSTEM IN POLAND

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Enhancing intellectual property use for a stronger innovation ecosystem in Poland

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The paper presents a comprehensive assessment of the strengths and limitations of the intellectual property (IP) system in Poland. It offers policy recommendations to fully exploit the potential of IP to support an innovation-based economy. It finds that the key components of an effective IP strategy in Poland should include the promotion of IP use among economic actors and other stakeholders as well as information campaigns and training programmes to raise awareness and knowledge about the advantages of IP. Recommendations also include reducing barriers to IP use by lowering the costs of and simplifying IP-related procedures, and promoting the valorisation of IP held by universities to enhance technology transfer to the business sector.

Keywords: Intellectual Property; IP strategy; innovation ecosystem

JEL codes: O31, O34, O38

♦ OECD

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Executive summary

Innovation is key to the economic development of countries, as it fosters productivity, competitiveness and growth, especially in an increasingly knowledge-based and globalised economy. Well-designed intellectual property protection can play a significant role in this respect, by providing incentives to innovate, facilitating the dissemination of scientific and technological knowledge and, last but not least, encouraging market entry and entrepreneurship.

This report discusses the main barriers to the effective use of industrial property (IP) in Poland and proposes policy options towards an enhanced IP policy. It closes a two-years long project funded by the European Commission (EC) through the Structural Reform Support Programme (SRSP) entitled "*Effective use of Industrial Property in the Innovative Economy: Strategy Assessment and Development*", focusing on Poland. The project was jointly conducted with the Polish Patent Office (PPO). The observations and recommendations are formulated based on a combination of quantitative and qualitative analyses of IP activities and performance in Poland (including information collected through in-depth interviews and an online survey) and informed by best practices across OECD member countries.

Investments in Research and Development (R&D) in Poland have increased markedly during the last decade, from 0.7% of GDP in 2010 to 1.4% in 2020 (against 2.7% on average across OECD countries). However, only three sectors represent more than half of these R&D expenditures: information and communication, scientific R&D and transport equipment. The sectors that contribute to most of the value added and employment in the country (notably wholesale and retail, agriculture and construction) are notoriously not innovative. In addition, the Polish economy is mainly driven by small and young firms: 95% of them employ less than 10 employees and 46% are less than five years old. These firms are fairly concentrated in the manufacturing and wholesale sectors and are specialised in relatively low- and medium-technology goods' production and export.

Despite a recent growth in the volume of IP registrations (including patents, trademarks and industrial designs), evidence shows that economic agents in Poland still seldom rely on intellectual property rights: 0.4% of firms applied for a patent between 2014 and 2018, and 1% applied for a trademark. At the international level, less than 7% of patents filed at the PPO were transferred to the European Patent Office (EPO) to extend protection beyond the Polish borders. Additionally, the two main users of the patent system in Poland – universities and research institutions – are known for rarely commercially exploiting the outputs of their research protected by IP rights.

The relatively low reliance on IP in Poland might reflect low innovative capacities of firms, but it also signals lack of awareness about IP, as evidenced by results from the survey and the interviews. This prevents firms from appropriating the results of their inventive activities. Raising the awareness towards IP is crucial for companies in Poland, especially SMEs, and for other actors performing research, such as universities and research institutions. IP awareness programmes and continuing education in the field of IP need stronger development and integration at the core of the innovative ecosystem, to provide insights to more researchers and enterprises on how to best appropriate the returns of their research activities, exploit their innovations, and compete on the market, either in their home territory or abroad. This will help turn IP into a strategic rather than a merely technical issue for inventors.

The under-exploitation of IP from universities underlines the lack of incentives for academic researchers to commercialise or license out their innovations, for various reasons: weaknesses in the incentives system, weak access to finance, lack of collaboration with the private sector, etc. The volume of unexploited patents represents a misuse of the IP system, effectively using it as an alternative to peer-reviewed publications in order to attract research funding. Innovative actors should engage more in the valorisation of IP - notably with the support of Technology Transfer Offices (TTOs) - and improve on the skills and understanding of how to use it effectively and how much value it can add. This requires a more effective institutional structure for technology transfer and commercialisation, including monetary incentives for researchers and more pro-active technology licensing organisations.

The PPO has considerably increased its performance and effectiveness in the recent period. However, further improvements in the system are possible. In particular, IP-related costs might act as a brake to IP protection, particularly for small firms, for academic inventors and researchers. Protecting IP requires application fees, translation costs, patent attorneys' costs, renewal fees and possible litigation costs that are typically too high to bear for SMEs as they can run into multi-million euros. A better understanding of the cost structure of IP filing and a better management of the costs of IP protection through various financial incentives would help actors engage in protecting their assets in Poland and on foreign markets. Some form of cheaper resolution mechanism or an effective system of patent litigation insurance (particularly for SMEs) would be extremely useful. The EPO could play a key role in meeting this challenge.

Furthermore, access to more transparent information during the patent examination process (in terms of the stage at which the application is, exchanges with the patent offices, etc.) would help parties to gain time and save on costs: it would allow applicants to dedicate more time to the effective exploitation of innovations, avoiding administrative costs and time spent on the application and grant procedures. Quicker search and examination procedures could also help resolve the uncertainty for applicants.

Finally, more support for international protection of Polish inventions is necessary. Specialised professions, such as IP attorneys, that provide a thorough assistance during the IP filing process, especially to SMEs, need to be properly trained to enhance their knowledge of the IP systems in other jurisdictions, and hence be able to properly assist innovators pursuing national and/or international IP strategies where required. Availability of international training material translated into Polish could be helpful for this. Subsidy schemes to lower the cost of international patent applications could also be envisaged, provided they are targeted at SMEs and come with a substantial co-payment by applicants to avoid subsidising filings of low-value inventions.

The policy actions proposed in this paper are intended to incentivise the use of IP in Poland and increase the economic and societal payoffs of greater IP use. However, while the issues identified in this study are directly related to the IP system in place in Poland, they also affect many other countries in the OECD and beyond. This report provides direction and support to help governments define new IP strategies that can reignite productivity growth and support the ongoing green and digital technological transitions.

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1 Introduction

Effective industrial property systems for innovative and competitive economies

Innovation is key to the economic development of countries, as it fosters productivity, competitiveness and growth, especially in an increasingly knowledge-based and globalised economy. Well-designed intellectual property protection can play a significant role in this respect, by providing incentives to innovate, facilitating the dissemination of scientific and technological knowledge and, last but not least, encouraging market entry and entrepreneurship.

It has long been noted that a country's level of economic development is highly correlated with the level of industrial property (IP) rights protection it grants and with the IP activities of its economic agents, as discussed in Greenhalgh and Rogers (2010^[1]) and Sherwood (2020^[2]). In addition, national and regional IP systems and ecosystems are important enablers of innovativeness and economic performance of countries [see e.g., Lundvall (2010^[3]) or Cooke, Uranga and Etxebarria (1997^[4])].

The design of IP systems has become a key feature of innovation and industrial policies, whose aim is to enhance productivity and economic growth (Criscuolo, Squicciarini and Graham, 2014^[5]). The main features of the legal and regulatory IP framework encompass transparency, timeliness and effectiveness of the IP examination process, costs (fees and provisions related to transactions, litigation and/or social costs), litigation procedures, as well as the internal organisation of IP offices and cooperative and collaborative efforts (e.g., towards harmonisation) with other IP offices.

The different ways in which economies worldwide have designed their IP systems have led to a wide variety of provisions and regulations, often reflecting country-specific concerns, as well as economic and societal needs. Important disparities in innovation ecosystems exist amongst OECD countries, arising from differences in the legal and regulatory framework of the IP offices, in the costs of protecting, maintaining and defending IP in different countries, as well as in the types of IP protected in countries. Within European countries, Eastern Member States of the European Union (EU) have considerably reformed their IP systems over the last decades, but further improvements can be made, learning from better performing innovation ecosystems (especially with regards to entrepreneurship), access to finance, or the role of higher education institutions in enabling innovations, as discussed in Benedetti Fasil et al (2017^[6]) and Baron (2021^[7]).

Objectives of the project

Over the past two years, the OECD has been conducting a project funded by the EC through the Structural Reform Support Programme (SRSP) – now called the Technical Support Instrument (TSI) – titled “Effective use of Industrial Property in the Innovative Economy: Strategy Assessment and Development”, focusing on Poland. The project, jointly conducted with the Polish Patent Office (PPO), was aimed to support the strategy for a sustainable and inclusive development of Poland’s economy by shedding light on the IP activities of Polish companies and identifying the main barriers to a more effective use of IP in Poland.

The objectives of the project are twofold: first, to generate comparative evidence about Polish firms' IP activities and performance; and second, to provide actionable recommendations on the institutional design and legislative activities of Polish authorities and on the definition of an enhanced Polish IP strategy. The expected long-term impacts of the project are to increase awareness and effective use of IP by economic actors in Poland and to boost the innovativeness and competitiveness of the Polish economy.

This document proposes policy options towards an enhanced IP policy in Poland. These recommendations are formulated based on a combination of quantitative and qualitative analyses of IP activities and performance in Poland and informed by best practices across OECD member countries. They suggest a set of policy actions, intended to incentivise the use of IP in Poland and enlarge the economic and societal payoffs of greater IP use, in the context of a long-term IP strategy definition.

Methodology

The design of effective policies requires a solid evidence base to provide a complete, detailed, and up-to-date picture of the different aspects that need to be considered to develop such policies. This report combines empirical analyses on the characteristics of the Polish economy (in terms of industrial structure, production, value added, research and development and international trade) and on the use of different IP assets by economic agents in Poland and abroad, with qualitative information on the use of IP tools by Poland-based stakeholders gathered from online interviews and with a legal review of the Polish IP system.

Empirical analysis on the IP use in Poland

Thanks to the OECD's STI Micro-data Lab infrastructure, the OECD Secretariat conducted a comprehensive empirical analysis on the use of IP rights by Polish innovators and economic actors (including firms, research institutions, universities and individuals), located both in Poland and abroad (Dernis et al., 2023^[8]). This analysis allowed gathering evidence on the current use of the IP system by different applicants seeking to protect technologies, goods, or services. While the analysis focuses on Poland, it also includes a comparative analysis of the IP use in other European countries.

All statistics prepared for the descriptive analysis were derived from official OECD statistics and from administrative IP records collected in the framework of the STI Micro-data Lab. It mostly relies on information contained in the bibliographic records from official documents on patents, utility models, trademarks and industrial designs, which were complemented with business register data (from private source database – the ORBIS© database – and from the Polish register – REGON).

Gathering qualitative evidence on IP use: surveying Polish stakeholders

As a complement to the quantitative analysis of IP use in Poland, a qualitative review of the IP system was conducted. The aim was to collect information directly from IP users, especially on potential obstacles encountered when using the Polish IP system, and to identify leverages that may foster innovation and competitiveness in the country (Magdalinski et al., 2023^[9]).

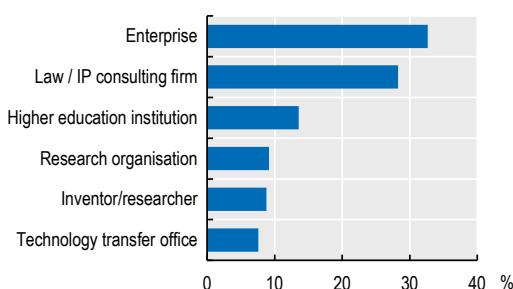
To that end, 25 field interviews were led with a variety of stakeholders, among which Polish representatives from private companies, universities, research institutions, patent attorneys, and from the ministry of Education (see the list in Annex A). One-hour long interviews were held in English and/or in Polish by the OECD Secretariat, together with consultants and representatives from the PPO. Discussions were guided to understand the way in which research activities and/or IP protection were conducted by the entity interviewed, their motivations to file IP rights, their knowledge and awareness of the IP system, and the impact of the legal framework on their IP related activities (see Annex B and Magdalinski et al. (2023^[9])).

In parallel to the interviews, an on-line questionnaire was launched to survey more broadly different economic actors operating in Poland about their use of the IP system, with questions framed specifically to different target groups: enterprises; research organisations; higher education institutions; technology transfer offices; law firms or IP consulting firms; and independent inventors or researchers. The survey questions were drafted in English and in Polish, and included detailed questions related to the type of IP used; the decision to protect IP; where protection is typically sought (in Poland and/or abroad); the reliance on IP attorneys; infringements and IP disputes encountered; knowledge transfer (licensing); and the IP tax regime. The PPO disseminated the on-line questionnaire to various target groups, among which their customers (through their internet home page; via their newsletter and social media streams), the *Polish Agency for Enterprise Development*, the *Polish Chamber of Patent Attorneys*, as well as a random sample of companies identified by the OECD Secretariat.

The on-line survey was fully completed by 87 respondents, of which 29 companies, 6 research organisations, 12 higher education institutions, 5 technology transfer offices, 23 law firms or IP consulting firms and 12 independent researchers (Figure 2.1). The survey was also partially completed by 193 additional respondents. Analyses of the on-line survey responses may provide a partial picture of the IP use in Poland, due to the relatively small sample size and response rate (see Annex C and Magdalinski et al. (2023^[9]) for additional details on the survey's respondents).

Figure 2.1. Respondents to the on-line survey of Polish stakeholders

All respondents, distribution by entity type



Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

Outline

This document presents the main findings from the project and draws more general lessons for other OECD member countries. It first discusses the strengths and weaknesses of the IP system in place in Poland, before reviewing recent changes in the country's IP strategy. The remainder of the paper then highlights the main findings and recommendations for an improved IP strategy, focusing on four salient topics: awareness of IP; valorisation of IP from universities and research institutions; competitiveness of IP procedures in Poland; and the role of patent attorneys. Finally, the paper presents key action points to be considered for the implementation of an IP strategy in Poland.

2 The Polish context

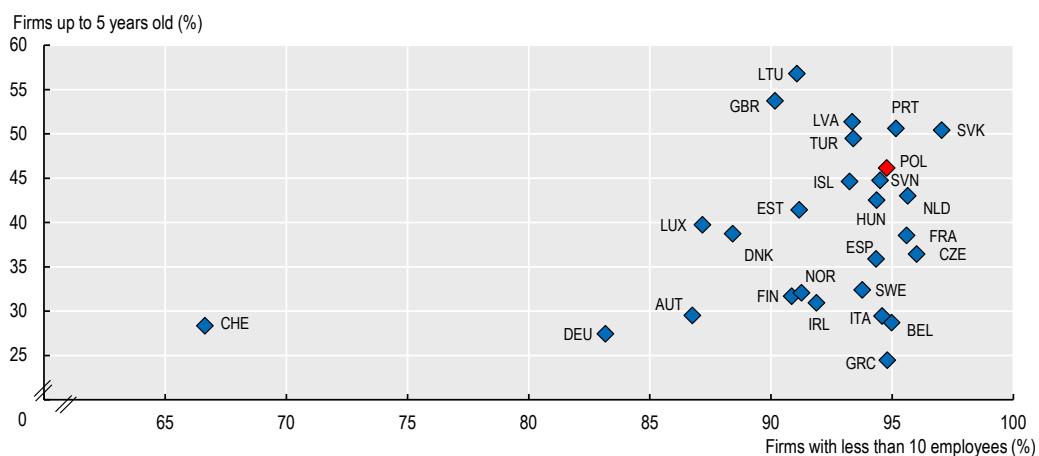
Key features of the Polish economy

Small and young firms drive the Polish economy

The Polish economy is mainly composed of microenterprises that represent more than 94% of all enterprises operating in Poland in 2018, a share above the average of OECD countries (Figure 3.1). Additionally, Polish firms are relatively young: nearly half of them are aged 5 years old or less. Firms located in other eastern European countries - such as Slovenia and Hungary - share a similar profile, while countries such as Germany and Switzerland are home to companies that are on average older and larger-sized.

Figure 3.1. Share of young and small firms by country, 2018

Share of micro-firms and young firms in total active enterprises



Note: Data on active enterprises and firm age refer to total industry, construction and market services, except holding companies, for the year 2018 or the latest available year. Data on enterprises' size classes cover the business economy, except financial and insurance activities. For the United Kingdom, data refer to firms with less than 20 employees.

Source: OECD, SDBS Business Demography Indicators and SDBS Structural Business Statistics, March 2022.

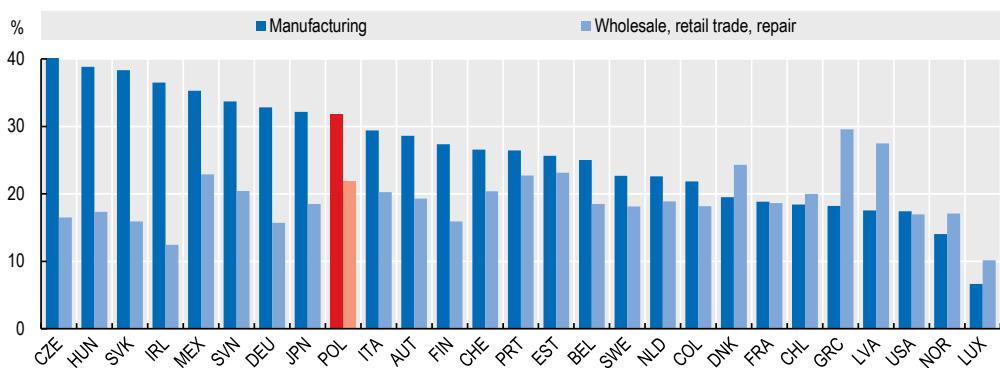
Main economic sectors

The economic activity of Poland is concentrated in a few sectors, according to statistics on production, value added, R&D and employment. About one third of production in Poland takes place in the manufacturing sector (Figure 3.2), mainly in food products, basic metals, and transport equipment. In turn, the sector of wholesale and retail trade alone contributes the most to Polish gross output and value added. OECD analysis suggests that the recent economic growth of Poland was associated with relatively low- and medium-technology goods' production and export (Brandt, 2018^[10]). Furthermore, as stated in the

2020 OECD Economic Survey on Poland, “since transitioning from central planning, the service sector has expanded and manufacturing has become tightly integrated into global value chains (...)” (OECD, 2020^[11]).

Figure 3.2. Contributions of manufacturing and wholesale to production, by country, 2018

Share of manufacturing and share of wholesale sectors in total production of the country



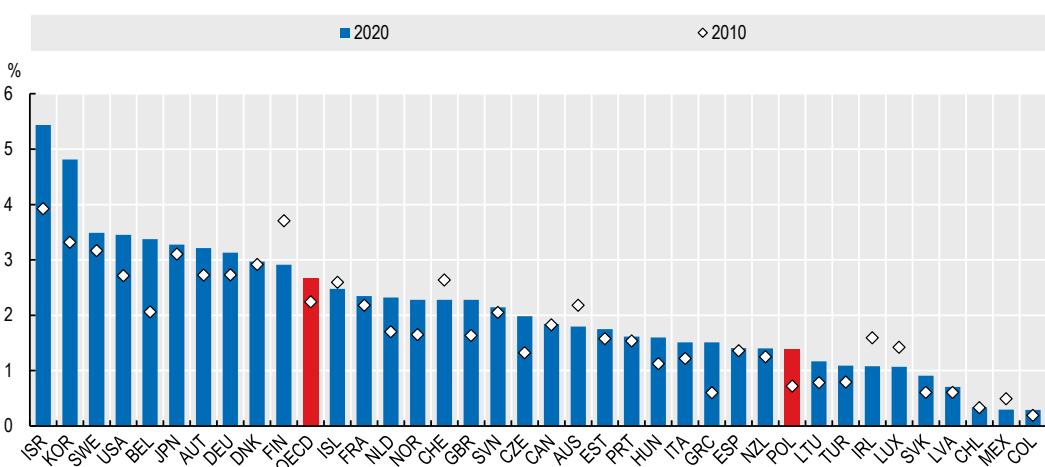
Note: Data refer to 2018 or latest available year.

Source: OECD, STAN Indicators (iSTAN) database, March 2022.

Over the last decade, Poland expanded massively its research and development (R&D) activities: gross expenditures on R&D jumped from 4 796 million PLN in 2000 to 32 402 million PLN in 2020 (OECD, 2022^[12]). Business R&D represents a growing proportion of Poland’s R&D expenditure (nearly 63% in 2020) and the number of businesses conducting R&D has gone up by three times since 2000. As shown in Figure 3.3, R&D expenditures however remain low as compared to other OECD countries, with 1.4% of GDP in 2020 (twice as much as the level of 2010), against 2.7% on average across OECD countries.

Figure 3.3. R&D expenditure as a percentage of GDP, 2010 and 2020

Gross domestic R&D expenditures (GERD)



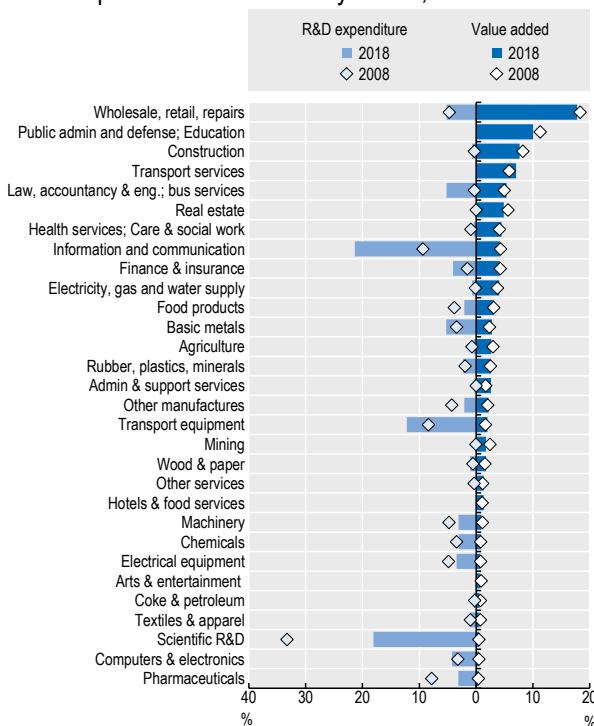
Note: Data refer to 2010 and 2020, or latest available years.

Source: OECD, Main Science and Technology Indicators Database, <http://oe.cd/msti>, November 2022.

Looking at additional indicators on value added and R&D expenditures in Poland, the wholesale and retail trade sector also ranked top in terms of value added, with about 18% of value added in 2018 (right panel of Figure 3.4). The innovation investments in Poland, as reflected by the business R&D expenditures broken down by sector of performance (left panel of Figure 3.4), is highly concentrated in few sectors: the top three sectors represented more than half of total expenditures devoted to R&D activities in 2018. The information and communication sector as a whole - covering activities related to publishing and broadcasting, telecommunications, and IT services - contributed to the largest share of R&D expenditures of the business sector (21%), followed by the scientific R&D sector that comprises activities related to basic or applied research and experimental development. The wholesale, retail, repairs sector also ranked top in terms of employment (Figure 3.5), representing 14% of total employment in Poland, followed by agriculture (10%) and the education sector (8%).

Figure 3.4. Value added and business expenditures on R&D in Poland, by sector, 2008 and 2018

Distribution of value added and R&D expenditures in Poland by sector, ISIC rev.4

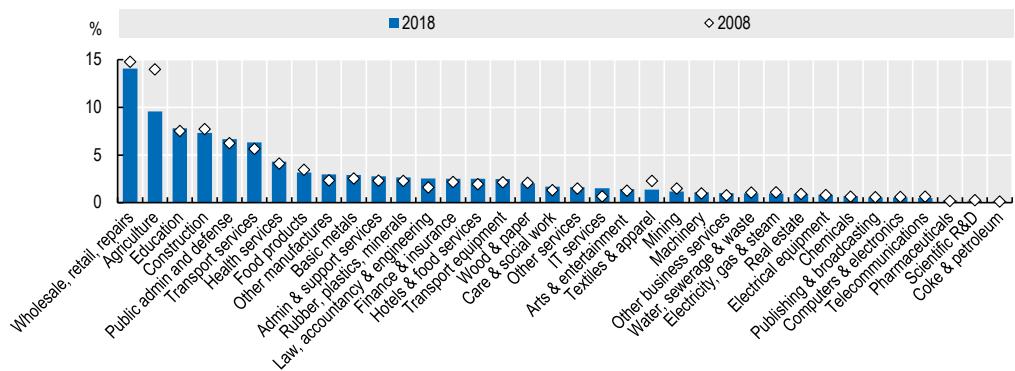


Note: 2008 figures for R&D expenditures are missing for Transport services; Public administration, defense and education; Arts & entertainment.

Source: OECD, Structural Analysis (STAN) Database, <http://oe.cd/stan>, December 2020; and ANBERD Database, <http://oe.cd/anberd>, March 2021.

Figure 3.5. Employment in Poland by sector, 2008 and 2018

Distribution of employment in Poland by sector, number of persons engaged, ISIC rev.4



Source: OECD, Structural Analysis (STAN) Database, <http://oe.cd/stan>, December 2020

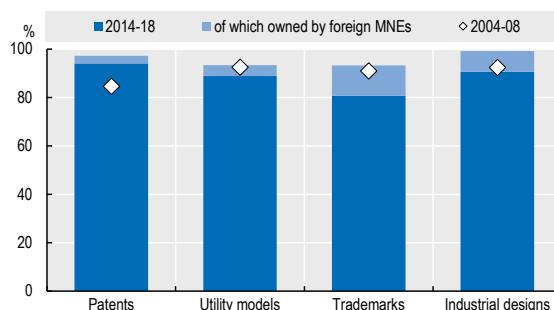
IP use by economic actors in Poland

Main actors using the Polish IP system

The IP use in Poland is measured by looking at four different types of IP rights filed at the PPO: patents, utility models, trademarks, and industrial designs (see Box 3.1). More than 90% of IP rights protected at the PPO in 2014-18 are due to Polish residents (Figure 3.6), while foreign companies rely more on the regional offices to extend protection of their inventions, goods or services in Poland - namely the European Patent Office (EPO) for patents, and the European Union Intellectual Property Office (EUIPO) for trademarks and designs (Figure 3.7). Polish applicants seldom protect their inventions abroad: during the period 2014-18, they filed about 420 EPO patents per year on average, and only 200 patents at the United States Patent and Trademark Office (USPTO). During the same period, less than 7% of PPO patents were extended to the EPO.

Figure 3.6. IP rights at PPO filed by Polish applicants, 2004-08 and 2014-18

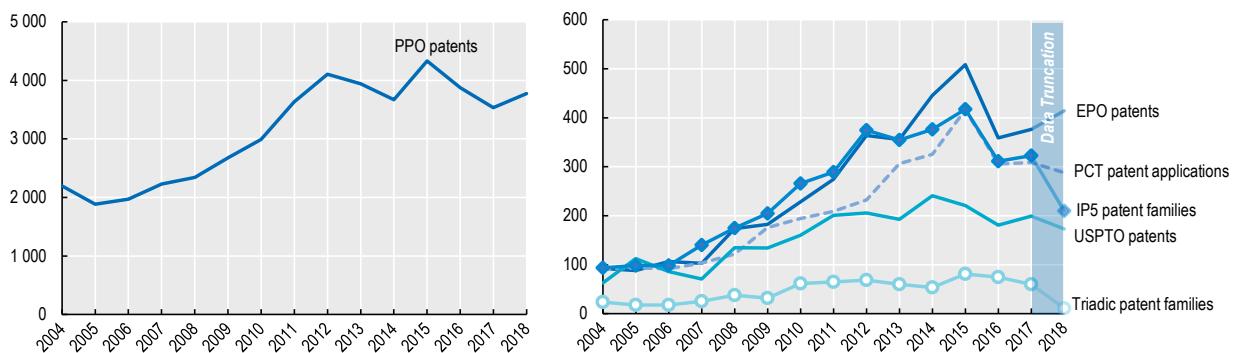
Share of patents, utility models, trademarks and industrial designs filed by Polish applicants



Source: OECD, STI Micro-data Lab: Intellectual Property Database, <http://oe.cd/ipstats>, and ORBIS, version 2.2020, Bureau van Dijk, October 2021.

Figure 3.7. Patents filed by Polish residents, 2004-18

Patent applications at PPO and patents filed abroad



Note: IP5 patent families include patent applications that have been filed at two different IP offices worldwide, of which at least one of the IP5 offices, namely the EPO, the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the People's Republic of China National Intellectual Property Administration (CNIPA) and the USPTO. Triadic patent families are those applied for in each of the three major IP offices: EPO, JPO and USPTO. Indicators of patent families for filing year 2018 are incomplete due to unpublished documents.

Source: OECD, STI Micro-data Lab: Intellectual Property Database, <http://oe.cd/ipstats>, October 2021.

Box 3.1. The IP system in Poland

The Polish Patent Office (PPO), **Urząd Patentowy Rzeczypospolitej Polskiej (UPRP)**, was established in 1918 to support technological and economic development through the protection of IP. The PPO ensures legal protection to all categories of IP, namely inventions, trademarks, utility models, industrial designs, topographies of integrated circuits and geographical indications [see UPRP (2019^[13]) and (2020^[14])]. The PPO's activities consist in examining applications and granting exclusive rights to both physical persons and business entities. They guarantee the holders of rights exclusivity of use of an industrial property object, legal certainty, and enables a commercial exploitation of intellectual achievements. Four main types of IP rights are maintained by the PPO:

- **Patents** are granted for inventions which are new, involve an inventive step and are susceptible of industrial application.
- **Utility models** are new and susceptible of industrial application solutions of a technical nature affecting the shape or construction of a durable object or an object, which consists of functionally connected parts of a durable nature.
- **Trademarks** refer to any sign that enables to distinguish the goods and/or services of one entrepreneur from those of another entrepreneur, which is capable of being presented in the register of trademarks in such a way that it is possible to define explicitly the object of protection granted to the trademark.
- **Industrial designs** are intended to protect the appearance of an industrial or handicraft product (excluding computer programmes).

Exclusive rights granted by the Patent Office of the Republic of Poland

Object of industrial property	Exclusive right granted by the PPO	Maximum protection period
Invention	Patent	Up to 20 years
Utility model	Right of protection	Up to 10 years
Trademark	Right of protection	10 years with the possibility of extending the protection to further 10-year periods
Industrial design	Right in registration	Up to 25 years
Medicinal product or plant protection product based on patented invention	Supplementary protection certificate*	Up to 5 years (up to 5 years and 6 months in case of paediatric medicinal products)
Geographical indication	Right in registration	Unlimited protection
Topography of integrated circuits	Right in registration	Up to 10 years

* Supplementary protection certificate (SPC) for medicinal products and plant protection products is a separate title of protection. SPC ensures legal protection of specific products manufactured on the basis of a patented invention after the expiry of patent protection.

Source: 2018 PPO Annual Report, 2019 (UPRP, 2019^[13])

IP strategies of Polish firms

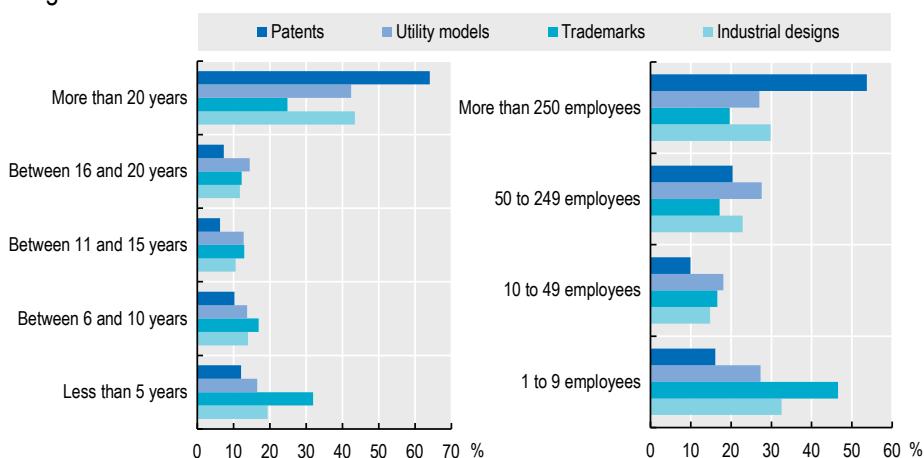
The success of innovative small and medium sized enterprises (SMEs) is linked with the way their IP strategy is conducted and their IP portfolio is managed, to better appropriate the outcomes of their innovations (EPO, 2017^[15]). SMEs do not just contribute to economic development; they are also responsible for some of the biggest breakthrough inventions (EPO, 2019^[13]).

Polish firms, and SMEs especially, relatively to firms in other EU Member States, seemingly perceive less the need for innovation in general, or appreciate less the benefits that may stem from suitably using intellectual property rights (Hall and Helmers, 2019^[17]). Statistics about IP use by firms indicate that economic agents in Poland rely only to a limited extent on IP rights, including patents, registered trademarks, or registered designs (Chybowska, Chybowski and Souchkov, 2018^[18]).

About 0.4% of firms established in Poland filed for at least one patent at the PPO during the period 2014-18, and 1% of Polish firms applied for at least one trademark. Micro-firms and SMEs seldom use patents: in 2014-18, 26% of PPO patents were filed by firms with less than 50 employees, while larger entities accounted for more than half of PPO patents (Figure 3.8). Most IP assets protected in Poland were filed by entities that were more than 20 years old – of which universities and research institutions, except for trademarks. Applicants that had been in business for more than 20 years owned nearly two-thirds of patents filed at the PPO in 2014-18, but only 25% of trademarks. Trademark registrations were rather due to entities new to the market than to older owners: 32% of trademarks were filed by firms aged less than 5 years old.

Figure 3.8. IP rights by applicant's age bands and size classes, PPO, 2014-18

Distribution of IP rights filed at PPO



Note: The age of applicants is calculated as the difference between the date of filing and the incorporation date as provided in ORBIS© or in the Regon register. Size classes were constructed using the number of employees reported in ORBIS© or Regon as observed in the last time period.

Source: OECD, STI Micro-data Lab: Intellectual Property Database, <http://oe.cd/ipstats>; ORBIS, version 2.2020, Bureau van Dijk; and REGON Register, October 2021.

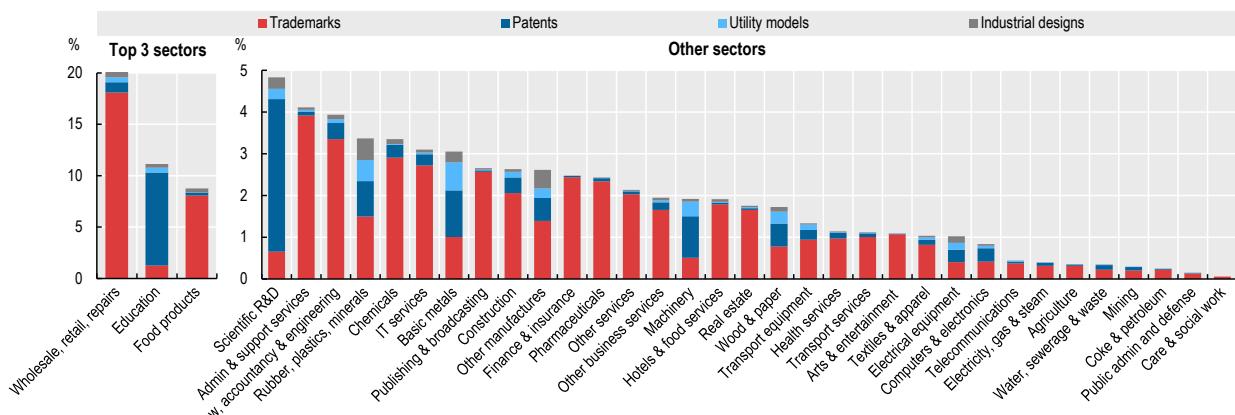
Bundling IP assets

The reliance on IP is highly dependent on the economic sector in which entities operate. Trademarks are the most widely protected asset at the PPO, among the four types of rights considered (patents, utility models, trademarks, and industrial designs, see Box 3.1). During the period 2014-18, trademarks accounted for about three times the volume of patent applications filed at the PPO. Firms from the

wholesale, retail and repair sector are by far the heaviest users of IP at the PPO, mainly to signal their presence on the Polish market (Figure 3.9).

Figure 3.9. Bundle of IP protected in Poland, by sector, ISIC rev. 4, 2014-18

Distribution of the IP portfolio by applicant's sector



Note: Sectors are defined according to the ISIC, rev.4 classification.

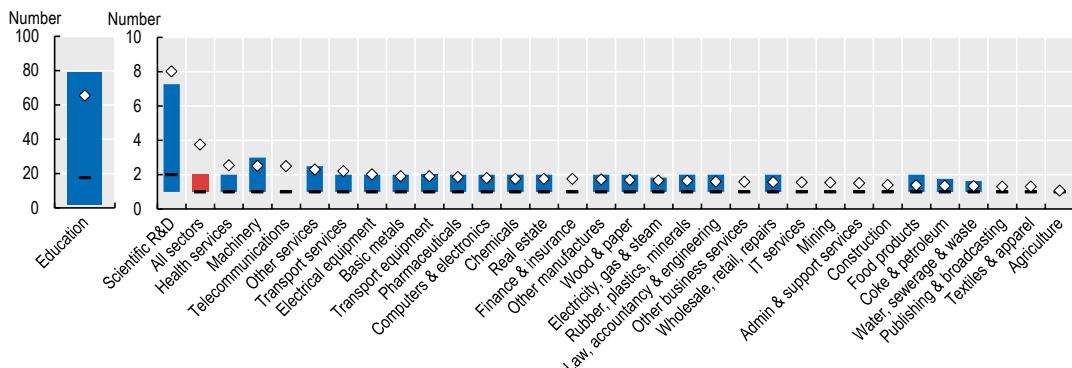
Source: OECD, STI Micro-data Lab: Intellectual Property Database, <http://oe.cd/ipstats>, and ORBIS, version 2.2020, Bureau van Dijk, October 2021.

While the largest share of R&D investments in Poland occurs in the Information and communication sector (as shown on Figure 3.4), it is not reflected in the registration of patents or trademarks. Companies operating in this sector tend to rely on copyrights for software and creative digital assets, which are not registered, and are therefore not easily quantifiable. Copyrights are not covered by the PPO, but the role of ICT R&D investments remains important for the innovation ecosystem in Poland.

Innovations developed by universities and research institutions

Concentration of patents in the Education and Scientific R&D sectors

Two sectors have a strong patenting activity that vastly surpasses trademark filing (Figure 3.9): the education and scientific R&D sectors, which altogether were responsible for 41% of patents filed at the PPO during the period 2014-18. While not all universities protect inventions with PPO patents, those that file for patents are intensive users of the IP system. Patenting applicants from the education sector filed for about 65 patent filings on average in 2014-18, a number far above the average of 4 patents per applicant observed across all sectors (Figure 3.10). The scientific R&D sector also strongly relies on the PPO to protect inventions, accounting for 17% of all patents filed in 2014-18, with more than 7 patents filed on average per applicant during the period. Among public research institutions, the *Lukasiewicz Research Network* is particularly active in patenting.

Figure 3.10. Average number of patents filed at the PPO, by sector, 2014-18

Note: Data refer to the distribution of a given IP right in the portfolio of applicants having at least one of the IP considered in their portfolio. Sectors are defined according to the ISIC, rev.4 classification. Only sectors with at least 10 applicants having filed for the IPR considered are included.

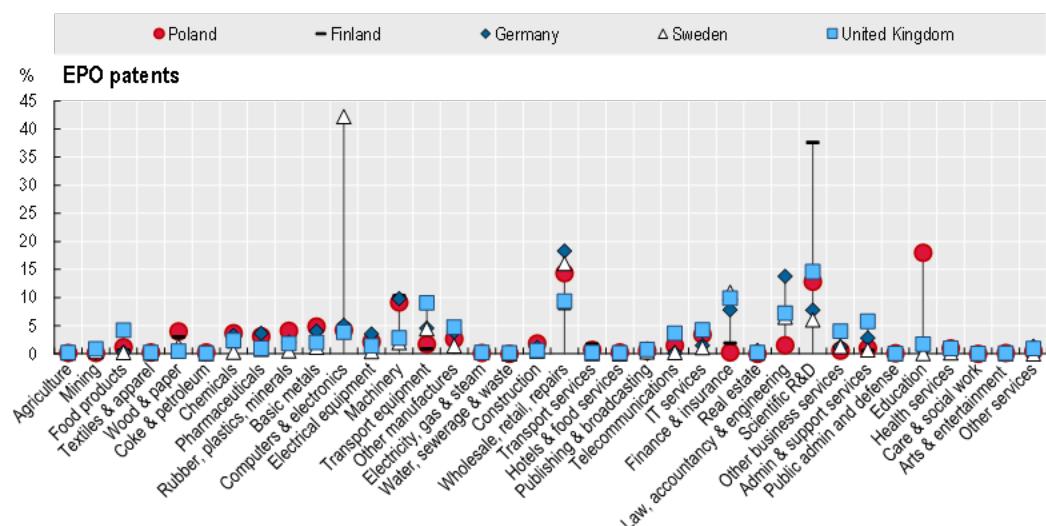
Source: OECD, STI Micro-data Lab: Intellectual Property Database, <http://oe.cd/ipstats>, and ORBIS, version 2.2020, Bureau van Dijk, October 2021.

Lack of commercialisation

Universities and public research organisations (PROs) play a key role in innovation ecosystems, as producers of scientific and technological knowledge that can be transferred to industry. However, innovations arising from those organisations are not always commercially exploited (either produced or licensed out). A recent study from the EPO indicates that only one third of EPO patents filed by universities or PROs are exploited, whatever the country of origin (EPO, 2020^[19]).

Figure 3.11. Top sectors with EPO patents, by selected countries, 2014-18

Share of sectors in total patents



Note: Data refer to the share of patents originating from each sector in total patents owned by the country.

Source: OECD, STI Micro-data Lab: Intellectual Property Database, <http://oe.cd/ipstats>, and ORBIS, version 2.2020, Bureau van Dijk, October 2021.

The issue of a lack of commercialisation of IP rights concerns not only Polish applicants but also applicants in other countries. Comparisons of the distribution of patent filings at the EPO by applicants' sectors in selected countries (i.e., Finland, Germany, Sweden, and the United Kingdom) also reveal an important contribution to patenting at the EPO coming from the Scientific R&D sector (Figure 3.11).

Evolution of the IP system in Poland

Recent changes in the IP system in Poland

The Industrial Property Act (2000)

The tenet of industrial property legislation in Poland is the *Industrial Property Act* passed in 2000.¹ It includes regulation of patents, trademarks, industrial design, utility models, geographical indications, and integrated circuits layout designs, and replaces previous acts. The IP Act gives the ownership rights of a finding to the employer of the innovator, except if a specific clause is negotiated in the contract. Concerning litigations, lawyers are allowed to treat cases related to trademarks, industrial designs, and geographical indications, but the remaining IP rights remain a monopoly of specialised patent attorneys.

The Higher Education Act (2005)

The *Bayh-Dole Act*, which was passed in the United States in 1980, influenced many IP reforms across the world, with a view to enhance technology transfer from universities to private companies. Academia is a major driver for innovation, so it is of utmost importance that these innovations are ultimately commercially exploited. A recent study highlighted that the productivity of university-based incubators in terms of innovation is three times greater than the average national level (Borowy, Pajewski and Rudawska, 2019^[20]).

A keystone of IP regulation in Poland was brought by the *Higher Education Act* (2005).² The law introduces for the first time the independence of *Higher Education Institutions* in the commercialisation of their findings. It gave birth to *Academic Business Incubators* and *Technology Transfer Offices (TTOs)* which were meant to support the economic activities of the academic community and transfer the research and development findings to the economy, free of charge. The legislation gradually granted more and more autonomy to incubators and TTOs but no step was taken to incentivise universities to develop them.

To begin with, in 2011, *Special Purpose Vehicles* were introduced in order to conduct the whole commercialisation process and knowledge transfer and were later authorized to carry autonomous activities. In 2014, a major addendum was introduced to regulate the ownership of rights and the associated remuneration: the employee (innovator) and the university decide together who will commercialise the finding and under which conditions - an agreement which has to be finalised within three months, after what the rights are passed on to the employee. The law also indicates the distribution of profits in case no agreement is reached.

Amendment of the Industrial Property Law (2007)

IP legislation is an essential tool to increase the competitiveness of Polish firms. The previously cited laws and amendments illustrate that numerous changes were made to IP legislation over the years. Many of these tried to facilitate the proceedings of patent application. The Act of 29 June 2007 amending the *Industrial Property Law*³ alleviated the requirements of the procedure and the application was made easier by allowing for electronic filings and by extending limits for submissions - for example (art. 13 (6)-(9); art. 35 (4)-(6)). It remains that potential applicants might be deterred from applying for IP protection because of the uncertainty brought by the frequent changes and the complexity of the law (Ożóg, 2009^[21]).

Introduction of the Polish IP Box (2018)

The *Innovation Box (IP Box)*, a preferential taxation system aimed for entrepreneurs deriving income from commercialisation of IP rights, was introduced into the *Personal Income Tax Act* and the *Corporate Income Tax Act* in 2018. The main purposes of the IP box are to retain and increase the attractiveness of conducting R&D activities in Poland, by Polish and foreign entrepreneurs; to encourage entrepreneurs to undertake R&D activity in Poland; to change the economic model into a knowledge-based economy; and to create high-quality jobs in innovative or R&D-intensive sectors. A preferential rate (5% reduction of the corporate income tax rate) is applied to income from qualified IP rights created, developed or improved by a company as part of its R&D activities. See Box 3.2 for further discussion on the IP Box.

Creation of specialised IP courts (2020)

The enforcement of IP and litigation has been criticised in Poland, with the lack of sanctions for the non-commercialisation of an invention likely to prevent innovation growth (Wolk and Szkalej, 2018^[22]). An effective way to ensure that entrepreneurs follow the regulations would be to implement proper infrastructures and institutions for law enforcement (Podrecki, 2019^[23]). A first step towards this was made through an amendment to the *Polish Civil Procedure Code* and to the *Industrial Property Law* in 2020 establishing special *IP Courts*.⁴ The new IP Courts deal with IP matters covering patents, utility models, designs, trademarks, geographical indications, topographies of integrated circuits, and the protection of copyrights. They aim to dispute unfair competition and protection of personal rights related to scientific or inventive activity. IP Courts have the competence to cancel or revoke a trademark registration or cancel a design registration, a competence that was only given to the PPO beforehand.

Box 3.2. Limitations of IP Box tax regimes

At least 15 major economies have introduced corporate tax reduction for income associated with patents, or in some cases with other forms of IP. They vary in coverage and in the size of the tax reduction offered. The declared policy objectives for IP (or Patent) Boxes are usually to increase incentives for innovation, defined as successful exploitation of patents owned by entities located in the country. However, in some cases, the motivation of governments has been to tackle the potential loss of tax revenue as mobile assets (which include parents and other intangible IP), which can easily be transferred to jurisdictions offering lower corporate tax rates.

The United Kingdom's government evaluation of its own Patent Box claims it to be a success, insofar as firms which have claimed it show a higher investment in IP assets filed in the United Kingdom than they might otherwise have done. Most IP Box regimes, following the OECD's tax principles against Base Erosion and Profit Shifting (BEPS), now contain a development condition tying tax advantages to local development expenditure, not just profit streams. However, this is not universal. One recent assessment of Patent Box regimes in Europe by the Tax Foundation* shows the range of assets covered - most countries cover software investment although the United Kingdom, Switzerland and Türkiye do not - and the range of corporate tax advantages - from 9% in the United Kingdom to 20% in Luxembourg.

IP Box tax regimes adopted in other countries have been criticised as an indirect and inefficient way to promote innovation and its commercialisation. The IP Box is inefficient and costly in terms of tax revenue because the preferential rate is applied to income associated with IP for all firms, not just for SMEs where the obstacles are greatest. A more targeted approach that restricts preferential tax treatment to SMEs would be less wasteful - if the IP Box is to be used at all. While an IP Box may prompt firms of all sizes to be more systematic about cataloguing their IP, educational programs may be an effective and less costly alternative.

Economic studies indicate that IP Boxes adopted in various countries have had no effect on innovation. Instead, they provide tax subsidies to large companies for R&D that would have been undertaken anyway, and they do nothing to support SMEs in undertaking transfers of technology, which is the key to their success. The study by Gaessler, Hall and Harhoff (2019^[24]) finds that the impact on technology transfers is small but positive, especially when the tax instrument does not contain a development condition and for high value patents (those most likely to have generated income). However, innovation, as proxied by R&D expenditure and patent filings, is not affected. According to the authors, introducing a patent box reduces patent transfers out of the country. These results call into question whether the Patent Box is an effective instrument for encouraging innovation in a country, rather than simply preventing or facilitating the shifting of corporate in- come to low tax jurisdictions.

The question which Poland needs to address in future tax policy on IP is whether this is an effective tool in a country where a high proportion of R&D is undertaken in universities, while a high proportion of enterprise activity is in small and medium size enterprises. For the most part, the tax advantages of Patent Boxes accrue to larger established firms with existing revenue streams from IP. The tax costs to government are much more likely to go to these firms than to new innovators, who are better served by other means of support.

The case for a Patent Box in Poland is more likely to rest on the extent to which it helps retain IP developed in Poland within the country, and how far it is effective in attracting international firms to locate their development and exploitation activities in Poland.

There is an important role for the EU to coordinate research on IP tax treatment across Europe. It has supported some work on this, although national tax and IP policies are both national competences under EU treaties. However, as all EU economies become more dependent on intangible assets, there is a competition argument for tax treatment of IP to be 'fair' - in the sense that smaller innovative firms should be able to compete across the single market on a level playing field. This needs to be assessed by the EU in addition to the commitments it has made under the BEPS agreements.

* <https://taxfoundation.org/patent-box-regimes-europe-2021/>

Assessment of the IP system in Poland by its own users

In the framework of the project, the OECD and representatives from the PPO collected insights and feedbacks on the use of the IP system directly from Polish users. Different stakeholders were interviewed, among which representatives from research institutes, universities, enterprises, government and academia, as well as patent attorneys. In addition, an on-line survey on IP use in Poland was launched to collect more evidence from IP users. Study visits to selected IP offices helped collect information on other national IP strategies.

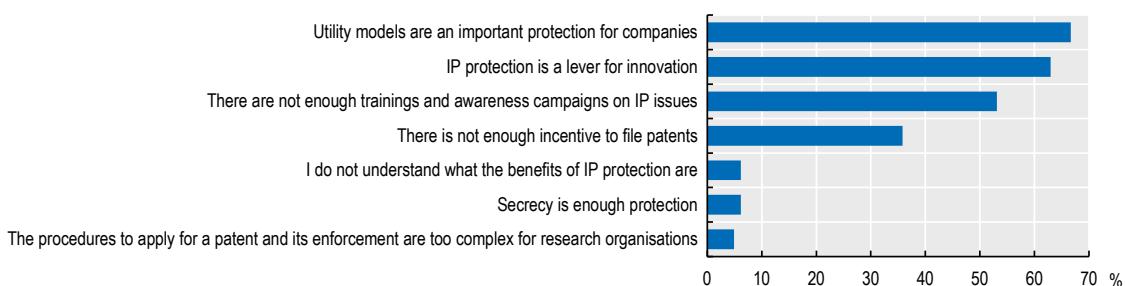
Interviewees agreed that the Polish IP system has improved significantly in the last ten years thanks to a number of important reforms presented above:

- dedicated IP courts, set up in 2020, have led to greater legal certainty in outcomes for IP cases, as well as to faster judgements;
- IP law revisions have created new and strengthened existing incentives to use IP more effectively, and led to greater consistency with other European jurisdictions (e.g. EPO or EUIPO);
- PPO is now updating the body of IP law to consolidate the legal changes which have taken place on one coherent legal framework which is easier for users to interpret;
- faster processing of patent applications at both the search and examination stages have given greater certainty in exploiting IP both in Poland and in wider markets;
- better data on IP registration and processing has helped innovators, although more can be done on this front;
- the Polish trademark and industrial design systems now integrate well into the European and wider international frameworks;
- the IP box tax regime, established in 2018, was set to increase the attractiveness of IP-based innovation for larger and more sophisticated enterprises (however, the IP Box has shown some limitations, as described in Box 3.2).

As previously noted, two main features strongly influence the way in which IP is used in Poland: first, the prominence of smaller and medium sized enterprises in the economy, in most sectors; second, the important role of universities and research institutions in national R&D efforts, which makes collaboration between these organisations and the private sector crucial.

Figure 3.12. General feeling about IP, responses to the on-line survey on IP use

Question: *Regarding intellectual property in general, do you agree with the following statements?*



Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

Analysis from the online survey provided some insights on the general appreciation of Polish IP users towards IP. The importance of IP protection to leverage innovation ranks high for 63% of respondents, who also underlined the shortages of IP-specific training and of IP awareness (53%). Respondents also stressed the lack of incentives to file for patents (Figure 3.12). Those issues were confirmed during the interviews held with various Polish stakeholders.

The creation of the *Łukasiewicz network* (*Centrum Łukasiewicz*) in 2019 to strengthen collaboration with firms is an important improvement for Poland, based on models such as the *Fraunhofer institutes* in Germany or *VTT Technical Research Centre* of Finland. However, the full benefits from common approaches for collaboration on research and IP management are still to come. It would be worth looking at how to extend such approaches to other institutions.

The interviews raised a range of issues that would need to be addressed in the framework of a national IP strategy. Given the diversity of interviewees, issues and suggested improvements to the IP and innovation system in Poland cover a wide field, but they share common themes, including the lack of awareness of the value of IP (both in terms of enhancing revenues but also facilitating access to capital financing), difficulties for public research institutions to commercially exploit innovations, and issues related to the Polish IP legal and regulatory framework. While those issues are directly connected to the IP system in place in Poland, they are quite universal and are likely to be encountered in other countries. These issues are covered in turn in the next sections of this report, with a view to providing recommendations for Poland's national IP strategy.

3 Barriers to the effective use of IP in Poland

Different issues emerged during the consultation with various stakeholders: the shortages in IP training; the lack of awareness of the value of IP, difficulties for public research institutions to commercially exploit innovations; the relative competitiveness of the Polish IP procedures; and the role of patent attorneys. While those issues are directly connected to the IP system in place in Poland, they are quite universal and are likely to be encountered in other countries. Field studies with representatives from different IP offices also informed the discussion about practices implemented in other countries.

Awareness of IP

The relatively low reliance on IP in Poland might simply reflect low innovative capacities of firms. It could also signal lack of awareness about IP, which could prevent firms from appropriating the results of their inventive activities. In this context, IP education is particularly important to raise awareness and use of IP. It has been argued elsewhere that Polish entrepreneurs often fail to appreciate the added value that IP protection may bring to their businesses, and lack the knowledge to suitably develop their IP portfolios (Malo and Norus (2010^[25]); Dabic, Vlajcic and Novak (2016^[26])). Additionally, even R&D companies tend not to rely significantly on patents, also due to scarce knowledge about how to use IP assets effectively (Chen, Hu and Yang, 2013^[27]).

Insufficient knowledge about IP in Poland

Lack of knowledge comes out as the main reason why SMEs do not register IP. Awareness of IP, and its value for business, has grown, but mostly in larger and more sophisticated enterprises. The resources and efforts conducted by the PPO have been widely acknowledged, however there remains much to be done for the wider population of firms. More than half of respondents to the on-line survey on IP use underlined the insufficient level of training or awareness (Figure 3.12), even though almost all of the respondents in the sample hold some form of IP. The lack of training and awareness on IP for graduates in science, technology, engineering and mathematics (STEM) leaves too many enterprises without the knowledge to protect and develop innovations effectively.

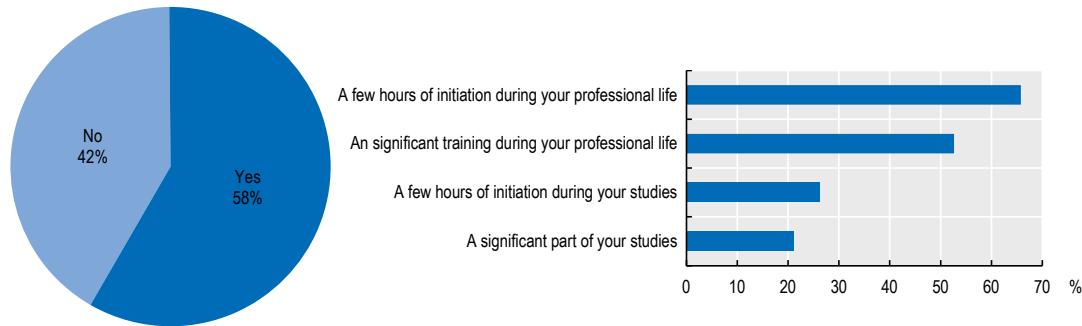
There is an urgent need to introduce reforms that aim at incorporating greater awareness of IP, and the role it plays in high-tech entrepreneurship, into STEM programs, business school education and even earlier. The long-term impact can be substantial, not least by inducing greater demand for IP use, which will inevitably feed through to enhanced supply of IP specialists in business and the legal community.⁵

Some universities include IP training in their engineering and science courses, and for them that is thought to be paying dividends in converting inventions into effectively protected innovations. However, this corresponds to a minority of institutions and the practice could be used more widely.

While some of the larger patent attorney firms are able to properly help their clients, including by offering training for managers and engineers, the most effective enterprise IP cultures seem to lie where innovation and IP managers have an international experience.

Figure 4.1. IP course or training, responses to the on-line survey on IP use

Question: *Have you ever attended an IP course or training? What type of IP training was it?*



Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

The supply of continuing education in the field of IP for businesses seems to be underdeveloped, or, at least, little known. Responses to the on-line survey on IP use in Poland indicated that 58% of respondents have attended specific IP courses, mainly during their professional life (Figure 4.1). Only a couple of survey respondents who do not rely on IP protection indicated having attended an IP-related training, while three quarters of respondents that claimed not having received training on IP nevertheless filed for IP protection. It has to be noted that much of the IP awareness material developed by the EPO and the EU is in languages other than Polish, even though the Polish IP system is now closely aligned with other IP systems across Europe. This is a missed opportunity, given that a relatively high proportion of Polish business managers are not fluent in other languages. Translating resources which are available internationally to promote IP awareness could be a quick way to support training for SMEs.

Access to patent information

Patent library centres (PATLIB) are implemented in EPO member states: in Poland, patent information is provided in 26 PATLIB centres that are established throughout the territory. They provide users with access to patent information and related services in Polish. Their qualified and experienced staff can offer practical assistance on a variety of IP rights, as they are familiar with the needs and requirements of local trade, commerce, and industry. They also provide valuable services to SMEs, private inventors and academics in particular. However, the existence of these centres seems little known to companies while they could act as a strong support for the development of IP awareness.

The deficit of IP awareness is a concern shared with many European countries. Many IP offices do support the development of IP training for various audiences. In France, for example, the training offer includes: teachers' training in cooperation with the Ministry of Education; training for professionals in companies and law firms; and support from the *European Institute for Enterprise and Intellectual Property (IEEPI)*, a dedicated training institute that was created by the French Ministry of industry and the French patent office (INPI). *IEEPI* aims to develop the strategic use of IP in France and provides managers and researchers with training in the field of IP.⁶

Considering IP as a strategic asset

Access to IP advice in Poland is considered as sufficient by most firms. However, several stakeholders commented that quality of advice in some cases has led to poor quality patents which are not well constructed to support innovation and which cannot be internationalised. This may be one of the factors explaining the high number of unused patents

However, most interviewees see IP as a technical issue rather than a strategic one: the main concerns were expressed about the cost of IP, including the cost of registration, and the much larger costs incurred to defend the IP right through the legal process, in particular outside the country. However, raising the awareness of the value of IP as a strategic issue in smaller firms is not straightforward: it will require investing in the training and in the diffusion of “good” and “successful” practices. The implementation of models (from other countries) that could speed the diffusion of IP awareness among economic actors would also be beneficial.

Several European initiatives aim to enhance the perception of IP as strategic assets. As an example, Horizon IP Scan⁷ - a tailored, free-of-charge, first-line IP support service provided by the EC, is specifically designed to help European start-ups and other SMEs involved in EU-funded collaborative research projects to efficiently manage and valorise IP in collaborative research and innovation (R&I) efforts. Such initiatives can also be implemented nationally.

Another important aspect to educating SMEs about IP is to establish an ongoing mechanism to link up representatives from the capital markets – including venture capital companies, investment banks and government agencies providing R&D support – with firms through a series of “information workshops”. These sessions could be recorded and made easily available. They would highlight the importance of IP in serving both as a signal of innovative success - if the patent office screens effectively - and as collateral to improve access to finance markets, especially for start-ups and SMEs, for whom their innovation may be their primary, if not sole, economic asset. The economic literature has documented the critical importance of patents (and other forms of IP) for gaining access to private sector finance, especially in the early stages of the commercialisation of innovation.⁸

Building on the general awareness created by ‘Dragons Den’, the UK IPO encourages other institutions to use the same format for competitions for enterprise support. These can be run by schools, Local Enterprise Partnerships, technology centres, enterprise finance providers and others. Because the brand and format are so well known, they can create interest for innovators at all levels, and for investors.

The UK IPO also publishes a guide to valuing IP in businesses, for innovators and for the wider business community, based on the research work it has commissioned.⁹ While UK IPO does not offer valuation advice, it has held several events to promote the development of markets for valuation and IP insurance services. Its IP Masterclasses to promote effective IP management, which is essential to create enterprise value from IP, is an important complement to the work of independent valuers.

Recommendations

Raising the awareness towards IP is crucial for companies, especially SMEs, and for other actors performing research, such as academia or research institutions. While, in most cases, larger firms have developed a sound understanding of the value of IP, often through recruiting people with international experience, this is much harder for SMEs. The programmes to build awareness by PPO, by universities and research institutes, and by patent attorneys, need stronger development and integration to provide insights to more researchers and enterprises on how to best appropriate the returns of their research activities, exploit their innovations, and compete on the market, either in their home territory or abroad.

Under-exploitation of IP from universities and research institutes

Exploiting patented inventions

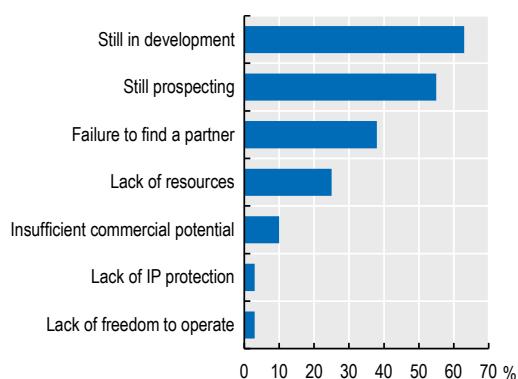
The role of IP, and more specifically patents, in academia and research institutes is changing, as the policies designed to incentivise innovation evolve. Nonetheless, the filing of patents - with no intention to exploit them commercially - by publicly funded universities and research institutes in Poland is still perceived as a mere alternative to the publication of scientific research in peer-reviewed scientific journals, because patent grants feed into the assessments of the research team in order to attract funding.

Therefore, the volume of “dead” patents – those filed for by researchers but not licensed nor exploited – has been cited as an issue. This represents a misuse of the patent system, effectively using it as an alternative to academic peer-review of scientific publications, which should be the foundation of tenure, promotion and grant funding. This does not mean that patenting activity should be given no weight in academia and research institutions, but if the quality of these institutions is to be preserved, the incentives need to be primarily based on scientific contributions subject to peer-review, especially so for untenured faculty. Additionally, the strong role of academic researchers in Poland’s R&D investment can conflict with demands for academic publication: to avoid prior academic disclosure invalidating patent applications, some researchers would like to see a grace period within which published research can be used in patents, as occurs in the United States and Japan. This is an issue which has been considered by the EPO for some time.

However, the issue of unexploited academic inventions is deeper than distorted incentives. What is needed is to put in place a more effective institutional structure for technology transfer and commercialisation. This involves two key elements: first, giving researchers monetary incentives based on the success of their innovations (not based on simply filing patents) – through clear and transparent royalty sharing arrangements – and second, developing more pro-active technology licensing organisations with internal incentives for successful commercialisation through licensing to private sector firms and establishing start-ups, and possibly by introducing some elements of competition and/or consolidation of technology licensing offices to reach effective scale. Putting such a structure in place will give universities greater incentive to focus on, and patent, only those innovations that have commercial potential.¹⁰

Figure 4.2. Reasons for non-exploitation of patents by European universities and PROs

Main reasons for no exploitation



Source: EPO (2020^[19])

This issue is not specific to Poland, as discussed in a recent report by the EPO on the valorisation of scientific results (EPO, 2020^[19]): more than one third of inventions made by European universities and public research organisations are already exploited, but there are still significant barriers to commercialising and transferring knowledge and technology to industry. The difficulties to find a partner and the lack of resources are listed among the main reasons for not exploiting the patent (Figure 4.2).

The recent legal changes implemented in Poland to incentivise the development and use of IP in research institutions appear to have had more impact on the creation than on the effective use of IP rights. Policy changes to incentivise value creation more strongly, by means of sale or licensing of the IP protected by research institutions, are a critical element to an effective technology transfer policy/structure. Also, innovations made by “spinning out” academic IP exploitation, to create new enterprises, might be held up by cautious approaches to accountability: university heads may be held personally liable for decisions to sell IP owned by institutes to entrepreneurs who might be best placed to create value from them. A more flexible approach may be required to reflect the risks undertaken by researchers in valuing IP and on the fact that the values of IP assets depend on access to complementary assets. IP may be worth much more to enterprises - often international - with the best scope to exploit them than to Polish enterprises who could create value and jobs in Poland.

One issue raised by SMEs is the gap in support for ‘proof of concept’ funding. This can be an important issue where patented inventions still have development work required to achieve a marketable product. This is not in itself an IP policy issue, but it can limit the process of exploiting IP generated in academic institutions in the enterprise sector. It particularly affects technology transfer to SMEs if they cannot access funding for pre-market development. In other countries, IP may be used as part of funding mechanisms, either as collateral or in equity arrangements, to speed up proof of concept development before scaling up innovations for market launch.

There are benefits from closer, long-term industry/university collaboration in, and funding of, research activities. In the United States, industry finances about 6% of university research, though it varies by technology field, being particularly high in information technology and biomedical fields. Among the top 50 universities, industry plays an even greater role in research financing – varying from 9% at the *University of Pennsylvania* to 16.9% at *Massachusetts Institute of Technology* and 22.0% at *Duke University*.¹¹

Benefits include not only the additional funding, but also enhanced interaction of faculty and graduate students with business which contributes to greater focus on research with commercial potential and graduate job placement. Of course, safeguards are needed to protect the independence of the university researchers and the continuation of pure scientific research as well.

Collaborating with firms

Because the role of SMEs is so important in most sectors of the Polish economy, helping them to innovate successfully is critical for the national competitive position internationally. As so much of Poland's research investment is concentrated in universities and research institutes, the need for them to collaborate with smaller firms - which is intrinsically harder to manage - is particularly important.

During the interviews, some enterprises complained that academics do not understand the need for continuing support and technical advice after transferring IP. This is soluble if academic researchers are encouraged to appreciate that the value of IP depends on successful use, and usually is not only dependent on information contained in the patent itself. The Łukasiewicz network is developing template approaches to university-business relationships, which needs to include continuing support.

In the United Kingdom, the Lambert working group has created a toolkit to assist academic or research institutions and industrial partners who wish to carry out research projects together. The toolkit¹² contains: a series of model collaboration contracts; a decision guide to help the user choose the type of contract; explanatory notes on the main legal aspects (for non-specialists); checklists of issues to be addressed

when negotiating a partnership; a guide entitled "Intellectual Asset Management for Universities", which provides advice and information to universities to help them understand how they could best use the intellectual property generated by their institutions (inventions, trademarks, original designs, implementation of an idea...).

The model contracts allow viable compromises to be made on key negotiation points between universities and industry, including: issues of ownership of IP rights and IP valuation; publication rights; the responsibilities and guarantees of each of the stakeholders.

Additionally, the IP Finance Kit¹³ encourages companies to assess the value of their IP using simple tools. They can then use this value as collateral to obtain finance to grow their business.

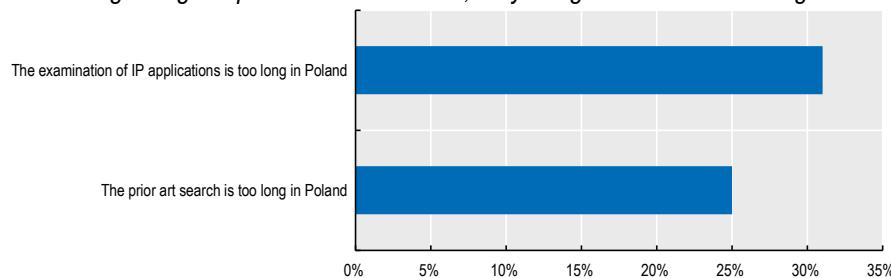
This is not a uniquely Polish issue. In most countries, university-industry collaboration tends to be led by larger enterprises, which have the complementary assets required to innovate. According to some smaller innovative enterprises interviewed, Polish universities tend to be less responsive to working with SMEs. This does not only affect work on IP assets, but also access to the equipment and resources needed to test new ideas. In this framework, the Łukasiewicz network might be able to facilitate collaboration with SMEs, and helping innovation and growth in smaller firms. It has been proved that research projects that are run by partnerships are more likely to reach commercialisation than those without business partners, increasing the prospect revenues of the projects' outcomes (Åstebro and Serrano, 2015^[28]).

Gaining time from the search process

The universities and research institutes interviewed all had professional staff and processes in place for managing IP. Each has systematic criteria for assessing the scope of the protection and frameworks for handling licensing. For some, keeping pace with changes in the Polish regulatory system presented challenges, especially when they affect existing projects. With respect to the IP filing strategy, most apply first for a patent at the PPO, and decide whether to seek more expensive international protection based on search results (normally about 9 months from application date): this leaves only 3 months to organise funding and make market assessments to justify international protection within the limits imposed by the priority date (12 months under the Paris Convention). About one third of respondents to the on-line survey on IP use considered that the IP process was taking too long in Poland (Figure 4.3). If the search process could be faster, this would create more time to plan international exploitation for inventions with greatest potential. In some other countries, IP Offices allow applicants to pay for accelerated search where this matters for decision-making.

Figure 4.3. IP procedures in Poland, responses to the on-line survey on IP use

Question: *Regarding the procedures in Poland, do you agree with the following statements?*



Note: Results based on 38 respondents.

Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

Recommendations

There is evidence from TTOs and other actors that the IP system itself is able to perform well. What is missing are the skills and understanding in large areas of the economy and research institutions of how to use it effectively and how much value it can add.

Patented outcomes of the research performed in publicly funded universities or research institutions are often never exploited. This is partly explained by weaknesses in the system of incentives (or absence thereof) for these institutions, and/or their expertise, to identify innovations with commercial potential and to engage with the private sector to transfer innovations via licensing or sale to ongoing enterprises and via establishing new start-ups. Other challenges include weak access to finance and the difficulties to establish a strong collaboration with the private sector. Technology transfer offices (TTOs) could help overcome such issues, if they could overcome specific difficulties associated with awareness of IP in both researchers and smaller enterprises, and the lack of funding for ‘proof of concept’ research.

Competitiveness of Polish IP procedures

General satisfaction with PPO procedures

All the enterprises interviewed were positive about the performance improvements by the PPO over the last five years: speed and ease of processing are substantially better, and decision-making is much more transparent. However, there are concerns about the time taken to register trademarks, which are the most widely used form of registered IP protection in Poland. In some other EU countries, trademarks can be registered in weeks rather than months, and this can provide early certainty to SMEs investing in new products and services.

Most of enterprises interviewed perform their R&D activities in Poland. Among them, two have significant collaborative R&D with universities or research institutes, including participation with international partners and Horizon projects funded by the EU. The larger sized enterprises interviewed indicated that they mostly outsource their professional IP advice, although decisions on what to protect and how to do it are made within the business. All make significant use of trade secrecy measures, especially where process innovation is important to competitive advantage. The Polish legal protection for trade secrets is used - often in a European context.

The IP legal and regulatory framework

The complexity of the Polish law, tax, administrative procedures and accounting regulations has been shown to represent an important barrier for creating and operating businesses, in addition to the lack of knowledge of public and private actors in the advantages of using IP to protect inventions [OECD (2020_[11]) and (2018_[29])]. Hence, the design and implementation of effective policies, together with improvements of the strategic and regulatory framework of the country, are likely to help Polish firms become more innovative, and leverage more and better on the opportunities offered by IP. The regulatory framework towards IP has evolved throughout the last decades (see section 3). However, further improvements in the system would help make economic agents better able to contribute maximally to the innovative and economic performance of Poland as a whole, in an inclusive and societally enhancing fashion.

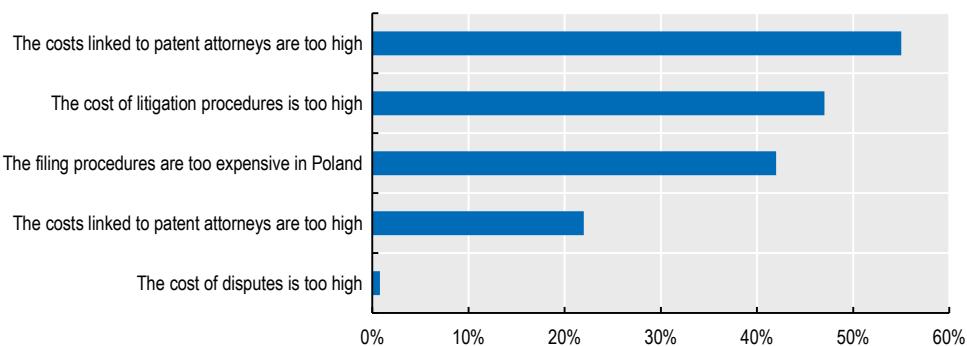
Evidence-based interventions, such as advocacy of regulation or new legislation, may help in this respect and provide IP owners with incentives to innovate and to engage in entrepreneurial endeavours, thus fostering economic development and growth. Such interventions may also help foster innovative entrepreneurship and a better and greater use of IP, to appropriate the results of such creative and innovative endeavours, thus contributing to make countries more competitive and attractive on the global market, as shown by Bochanczyk-Kupka (2018_[30]) for Poland.

Furthermore, Polish innovative research is particularly strong in software and systems which are seen as hard to protect in Europe under EPO rules for patentability. Some Polish firms claimed to make applications in Poland, knowing that patents cannot be granted, in order to secure priority dates for later applications in the United States and elsewhere which may be successful. This is a question which affects firms across all the EPC countries, but which is of particular importance for Polish innovators.

Costs of IP protection

Costs might act as a brake to IP protection, particularly for small firms. In practical terms, protecting IP requires application fees, translation costs, patent attorneys' costs, renewal fees and possible litigation costs. All these costs can discourage entrepreneurs and especially SMEs which usually face stronger financial constraints compared to larger firms (see Dereń (2016^[31]) and Sachpazidu-Wójcicka (2014^[32])) and have low access to external capital (Lissowska, 2007^[33]). Respondents to the on-line survey on IP use indicated that costs of filing and maintaining IP were too high in Poland, be it the costs of filing at the office itself, the costs of the patent attorneys or the costs of litigation (Figure 4.4).

Figure 4.4. Costs of filing and maintaining IP in Poland, responses to the on-line survey on IP use



Note: Results based on 45 respondents.

Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

While applying for a patent does not require the involvement of a patent attorney, filing an application without expertise is rather complex and, therefore, risky. The fees of attorneys vary between PLN 200 and PLN 450 (around USD 53 - USD 120) per hour¹⁴ according to the field of the invention (Lech, 2020^[31]). The cost of patenting could therefore cover application fees (about PLN 550), renewal fees (up to PLN 14 630 for 20 years renewal), attorney fees (that could go over PLN 55 000 depending on the complexity of the technology). Regarding the enforcement costs, the total costs of the proceedings tend to range from EUR 20 000 to EUR 100 000.¹⁵

Moreover, these application (and associated attorney) fees rise sharply when the patent is taken out in multiple countries, despite the centralised application process via the EPO. But the most challenging problem is the cost of enforcing the patent against infringement, which must be done in each country individually. This can be very expensive – running into multi-million Euros – and is beyond the reach of most SMEs. This problem is especially severe in later accession countries which have more SMEs in their industrial mix. Moreover, while there are relatively few litigation cases as a share of total patents granted – most patent disputes end in settlement, not in court – this fact does not indicate there is no problem, contrary to what is sometimes claimed (Lanjouw et al., 2004^[35]). Settlements are reached in the shadow of what would happen in court, so the small firm disadvantage in enforcement means that they settle on less favourable terms, which ultimately dilutes their innovation incentives in the first place.

A key challenge is how to level the playing field for SMEs in the enforcement of their IP (primarily, but not only, patents). What is needed is either some form of cheaper resolution mechanism or an effective system of patent litigation insurance. At present, there is no low-cost, multijurisdictional dispute resolution mechanism for patents in the EU. This is a pan-European problem which should be on the policy agenda at European level. The legal framework for, and practical implementation of, such a mechanism needs to be developed. There is also the question of whether it could be made a mandatory alternative to the courts and, if not, how the two dispute resolution avenues would co-exist and interact.

An alternative (but not mutually exclusive) approach is to make patent litigation insurance more accessible to SMEs. Some worry that patent litigation insurance would exacerbate the situation by giving patentees greater incentive to litigate. However, economic analysis has shown that, quite the contrary, such insurance can lead to less litigation and better settlement terms for SMEs because they would now have a credible threat of litigation in the event settlement cannot be reached, which helps levels the playing field and makes settlement more likely (Gerard and Javier, 2012^[36]).

Such insurance has been available for at least two decades in the United States but it is very expensive, with the consequence being that the market is not well-developed.¹⁶ Part of the reason for this underdeveloped market is that rational (actuarial) pricing requires good data on patent ownership (including changes in it over time) and litigation, which can enable insurance companies to employ data analytics to form predictive models of disputes and their cost. At present, pricing is based more on qualitative information from the patentee applicants. This is particularly a problem in Europe where there is no centralised repository of such data either on ownership or litigation (unlike in the United States). This again is a challenge that needs to be addressed at European level, not by individual countries. The EPO could possibly play a role in meeting this challenge.

Enhanced patent information system

In some IP offices, all transactions between the applicant and the office are registered and privately available to users. A transition to such an information system would help reduce costs and improve quality further. This can avoid significant administration costs and save time, both for the IP Office and for applicants seeking to establish the status of an application, especially where search and examination are spread over years, where complex queries arise and where personnel change on both sides of the transaction.

Speed of search and examination is also important to reduce uncertainty for innovators. Uncertainty is likely most pronounced during the eighteen months following the filing date of a patent application, prior to publication. Early indication from a search for prior art that an application is not likely to infringe pre-existing IP is especially helpful. The time lag between patent filing and final disposition (pendency period) may vary substantially within the office (depending on the examiners or technology fields) and across IP offices. On average the decision to grant may take several (Criscuolo, Squicciarini and Graham, 2014^[5]). A quick search result indicating that what a firm is seeking to protect might infringe an existing patent can avoid a lot of wasted investment. It can also help to shape alternatives with a better chance of success. More than one third of respondents to the on-line survey indicated that the examination and prior art search was too long in Poland (Figure 4.3).

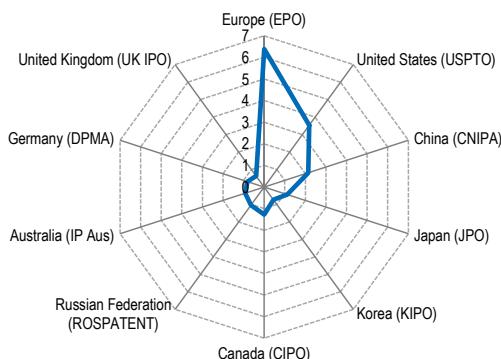
More support for international protection

Only a small proportion of inventions protected by a patent at the PPO are also protected abroad, as shown in Figure 4.5. Less than 7% are extended at the EPO, 3.5% in the United States, 2.1% in the People's Republic of China (hereafter 'China'), 1.1% in Japan, and less than 1% in other neighbouring markets. Several large companies interviewed can make direct comparisons with the IP systems in other countries where they work. For international protection outside Poland, most of the large firms rely on the services

of patent attorneys in markets which are important to them, e.g., in Germany, the United States, and Asian countries. In some foreign markets, patent attorneys help with IP training for researchers in client businesses, more often than in Poland. For these firms, it might be useful for more training to be organised at the European level, to help overcome the barriers to exploiting IP outside Poland. Availability of international training material translated into the Polish language could be helpful for this.

Figure 4.5. International extension of patents filed at PPO, 2014-18

Share of PPO patent families also filed abroad, top 10 offices (%)



Note: Percentage of PPO patent families with members filed at IP offices abroad, of which the Five largest IP offices - the European Patent Office (EPO), United States Patent and Trademark Office (USPTO), the People's Republic of China National Intellectual Property Administration (CNIPA), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO) – as well as the Canadian Intellectual Property Office (CIPO), the Federal Service for Intellectual Property of Russia (ROSPATENT), the Intellectual Property of Australia (IP Aus), the German Patent and Trademark Office (DPMA), and the United Kingdom's Intellectual Property Office (UK IPO).

Source: OECD, STI Micro-data Lab: Intellectual Property Database, <http://oe.cd/ipstats>, October 2021.

Smaller companies interviewed were also able to draw some lessons from their international experience, notably pointing out the high cost of international protection of innovations, especially on the US market, without access to good IP advice, and the gap in the market for good and affordable support. This statement was confirmed in the responses from the survey on IP use: about half of respondents indicated that the costs associated with IP protection are the main criterion for the decision to extend protection internationally (Figure 4.6). Some firms called for direct publicly funded support to extend Polish patents into international applications, without suggesting how this funding might be generated. As decisions on international patent applications have to be taken in a limited timescale, this could be difficult to manage.

However, such a scheme to subsidise international patent applications is likely to be costly and, more importantly, would create the incentive to take out applications on innovations of questionable worth by all firms, small and large alike. This “moral hazard” risk could be reduced by restricting the subsidy to smaller firms, and by requiring a substantial co-payment by the patentee. However, since the survey evidence indicates that the major obstacle for SMEs is the cost of enforcing international patents, this subsidy scheme to lower the cost of international patent applications should be directed at SMEs.

Figure 4.6. Protecting IP abroad, responses to the on-line survey on IP use

Question: *Which criteria lead you to choose specific geographical areas of protection for your IP?*



Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

In addition, several interviewees point out that improvements could be made so that procedures in European countries are further harmonised: general rules in EU countries are the same, but differences, notably regarding the fees and registration time, can be misleading.

Recommendations

Access to more transparent information during the patent examination process (in terms of the stage at which the application is, exchanges with the patent offices, etc.) and a better understanding of the cost structure of IP filing (between patent office fees, IP attorneys' fees, etc.) would help parties to gain time and save on costs, and dedicate more time to the effective exploitation of innovations, rather than on the application and grant procedures. Financial support to international protection targeted at SMEs could be envisaged.

For smaller enterprises, the use of IP in the form of brands, and in digital marketing, is an important issue. Speeding up the creation of trademarks would certainly help; better protection of digital IP, in which Poland has strong capability, could also benefit smaller innovators.

Role of IP attorneys

Evolution of the profession in Poland

Attorneys are IP law specialists that provide companies with comprehensive and business-focused assistance vis à vis the protection and maximisation of their IP assets. IP attorneys typically offer a range of IP protection services, including IP searches, filing and prosecution services, portfolio management, renewal and recordal services, due diligence, commercial transactions and strategic advice. Following from the *Law on Patent Attorneys* (April 2001), the PPO supervises the *Polish Chamber of Patent Attorneys* (UPRP, 2020^[14]).

Companies are able to access patent attorneys and other advice to properly use the IP system in the country. However, there seem to be many fewer patent attorneys well qualified to work internationally, notably with the EPO. The profession still has a substantial number of IP attorneys with '*grandfather*' rights from the point at which Poland joined the European Patent Convention (EPC) back in 2004, and around 40% of its total membership is over the age of 50. There is a need to build a cohort of young IP attorneys who can help companies in the wider European and world markets.

The Polish Chamber of IP Attorneys organises 'one profession' covering patents, trademarks, designs and litigation, overseen by the PPO. Some IP attorneys interviewed by the Secretariat feared that the lack of specialisation can give rise to low quality patents. It was suggested that the increase in the number of IP attorneys in Poland – whose objective was to lower the costs of IP attorneys' services – have adversely affected the quality of attorneys' services and of patent applications (with IP attorneys competing on prices rather than on quality), and reduced the incentives for younger qualified people to enter the profession. The number of 'IP advisers' without qualifications providing support to firms was also seen as a source of risk for the quality of patents. Certification and quality labels to better inform customers of the quality of IP attorneys could help increase the quality of IP services.

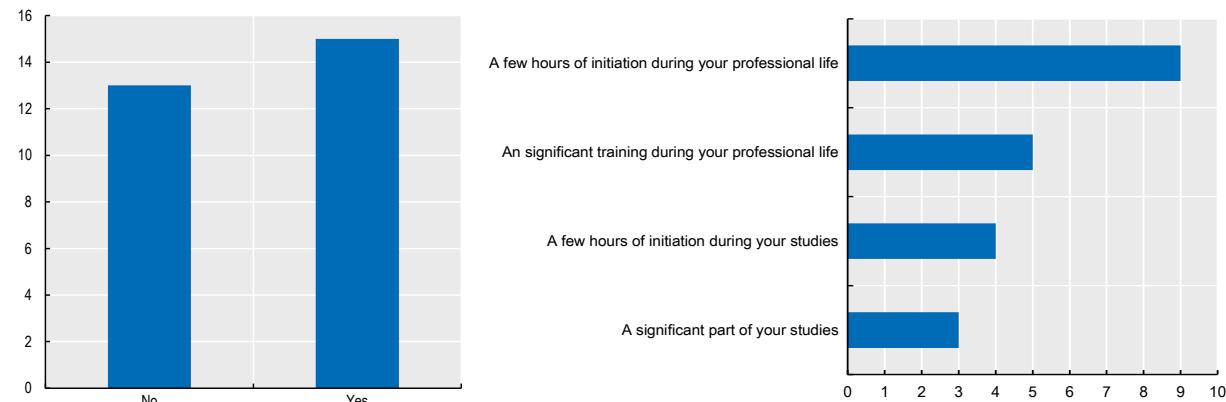
Awareness of IP legislation

Some IP attorneys interviewed had both scientific and legal training on IP, which was particularly the case for those with international experience. However, such mixed scientific and legal background is not required for judges operating in the recently established IP courts. This might affect the certainty of legal cases' outcomes and the quality of legal decisions. International experience of IP courts abroad might help address the issue.

All the IP attorneys interviewed provide support training and awareness raising, either directly for their clients or in wider programmes run by the Chamber of IP Attorneys or the PPO. A majority of attorneys indicated in their responses to the on-line survey that they had provided training on IP to their customers (Figure 4.7). Accelerating the training process and widening its coverage is seen as important by all to improve certainty and reduce risks in the innovation system. Further collaborations between the Chamber of IP Attorneys, leading IP firms, universities and the PPO could be helpful to achieve wider awareness and better understanding. Too many enterprises working in areas of the economy using IP without the necessary comprehension imposes external costs on others, including those who do have the skills and know-how to value IP.

Figure 4.7. IP teaching, responses to the on-line survey on IP use

Lawyers or patent attorneys who already taught a class or a training on IP and its type



Note: Results based on 28 and 13 respondents respectively.

Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

Enforcement of IP

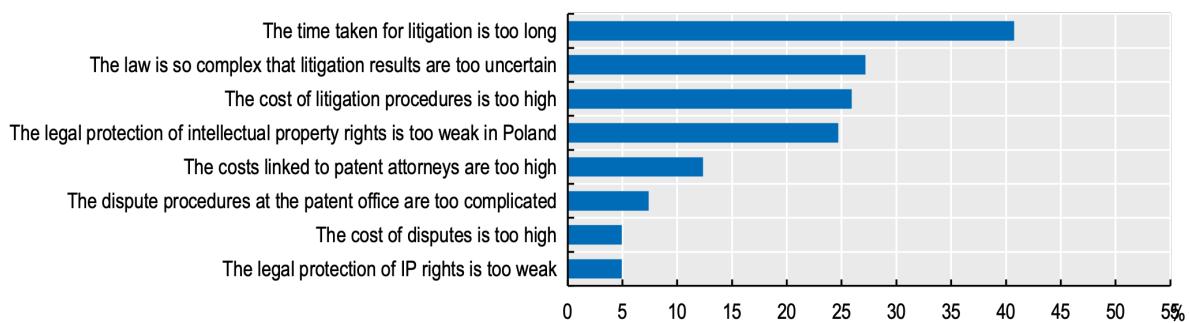
While several IP users commented on the costs of IP attorneys, and of enforcement, the biggest problems appear to be with access to advice on, and the high costs of, IP rights and enforcement in international

markets. For smaller enterprises, this creates a significant barrier to extending their innovating capacity and output across Europe, and especially to the United States.

Feedback from IP attorneys and from smaller enterprises stress the importance of avoiding unnecessary uncertainty in the IP system. One possible policy proposal criticised was the idea to allow the registration of utility models without examination, following the example of Austria. This could create a system similar to that in the European designs regime where it becomes impossible for an innovator to check whether their product infringes an existing right. This can be very costly for a smaller firm that is threatened with infringement proceedings by an existing firm whose rights are registered but impossible to find.

Figure 4.8. IP disputes in Poland, responses to the on-line survey on IP use

Question: *In relation to IP disputes, do you agree with the following statements?*



Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

Respondents to the on-line survey on IP use provided interesting information on the IP disputes in Poland (Figure 4.8). 41% of them indicated that litigations were taking too long, 27% think that the law is too complex, making the litigation results uncertain, and 26% that the litigation costs were too high. Also, the legal IP protection in Poland seems too weak for one fourth of respondents.

During the interviews, one patent attorney pointed out risks in the fact that Poland was covered by the EPC arrangements for European patents but was not part of the Unitary Patent Court (UPC). This could lay Polish exporters - without pan-European patent coverage - open to legal challenge if they came up against competitors with UPC rights, and they would not be able to start their defence in a Polish court. Some consideration of the costs and benefits of this position needs to be made if the long-term objective is more innovation-based exports.

Recommendations

While specialised professions, such as IP attorneys, provide a thorough assistance during the IP filing process, especially to SMEs, they need to be properly trained to enhance their knowledge of the IP systems in other jurisdictions, to be able to help innovators pursuing international IP strategies where required. Accelerating the training process and widening its coverage is an important challenge for the Chamber of IP Attorneys and the PPO.

To level the playing field for SMEs in the enforcement of their IP, a low-cost dispute resolution mechanism could be introduced. An alternative approach is to make patent litigation insurance more accessible to SMEs.

4 Implementing an IP strategy in Poland: key considerations

Well-designed IP protection can play a significant role in the economic development of countries, by stimulating productivity, competitiveness and growth. The development of an IP strategy in countries is aimed to provide incentives to innovate, to facilitate the dissemination of scientific and technological knowledge and to encourage market entry and entrepreneurship.

According to the World Intellectual Property Organization (WIPO), “a national IP strategy consists of a set of measures, formulated and implemented by governments. These measures encourage and facilitate the effective creation, development, management, and protection of IP at national level. It is a cross-cutting document, which outlines links with diverse policy areas to ensure effective coordination with other activities”. The WIPO published a methodological reference document for national project teams involved in the preparation of IP strategies.¹⁷

While there are similarities in the scope and content of IP strategies, particularly in terms of broad objectives, differences exist in the detailed measures they propose. In general, IP strategies include measures to: raise awareness among SMEs; improve IP education in engineering, natural sciences, business and art schools; provide support for technology transfer, especially from universities and public research institutions to the private sector; apply specific changes to national legislation and better coordinate between government agencies. They normally target organisations in the R&D and innovation ecosystem, as well as creative industries where copyrights matter; and possibly law enforcement agencies (judges, customs, and police).

The recommendations made in the context of this project on how to enhance the IP system in Poland aim to: raise awareness of IP in the country; engage in the valorisation of IP assets; manage the costs of IP protection; enhance the patent information system; and realise Poland’s potential for international protection.

Raise awareness of IP in the country

Raising the awareness towards IP is crucial for companies, especially SMEs, and for other actors performing research, such as academia or research institutions. While, in most cases, large firms operating in Poland have developed a sound understanding of the value of IP, often through recruiting people with international experience, this is much less the case for SMEs. Polish entrepreneurs need to appreciate the added value that IP protection may bring to their businesses, to consider IP as a strategic asset and to gain in knowledge to suitably develop their IP portfolios.

Existing programmes to build awareness carried out by PPO, universities and research institutes, and patent attorneys, need stronger development and integration to provide insights to more researchers and enterprises on how to best appropriate the returns of their research activities, exploit their innovations, and compete on the market, either in their home territory or abroad. Such enhanced awareness programmes should entail better IP education programmes in schools, universities (tailored to the fields of study) and

in companies, as well as better promotion of patent information centres, such as the *PATLIB* centres, and the diffusion of “good” and “successful” practices. They should also encompass awareness about international IP protection, to encourage innovators to extend protection of their assets beyond the national territory.

Further collaborations between the *Chamber of IP Attorneys*, leading IP firms, universities and the PPO could be helpful to achieve wider awareness and better understanding of IP. The PPO could build upon the experience of other national IP offices, such as the United Kingdom’s Intellectual Property Office (UK IPO) and the Finnish Patent and Registration Office (PRH).

For example, the UK IPO works with the *Chartered Institute of Patent Attorneys* (CIPA), IP firms around the United Kingdom, and with universities and businesses, to deliver a programme of educational events for enterprises and for students. It is currently funding events to raise awareness of IP value in areas of the United Kingdom where investment in innovation is weaker in order to promote development in these areas. Some of this work is supported financially by the UK IPO, and some is provided *pro bono* by IP professionals who recognise the value of developing awareness to underpin their business.

In Finland, PRH has put time and effort into developing relationships with patent attorneys and patent engineers. These go beyond formal events and now include an annual social gathering where informal discussions can take place, and ideas can be developed, both to improve the experience of users of the IP system in Finland, and to make it more efficient and more user friendly. This programme has helped to change attitudes of patent attorneys and engineers in Finland so that PRH is now seen as a business partner in delivering value to innovators as well as managers of a legal process.

Both UK IPO and PRH work with educators, IP professionals, publishers and content creators on programmes of IP awareness and training from primary school to university and beyond. Both have developed early education material to promote creative information about IP protection. For young children, a successful practice observed in both UK IPO and PRH is using popular cartoon characters for IP promotion - *Wallace and Gromit* in the United Kingdom, *Donald Duck* in Finland - which have had positive impacts well beyond their target audiences. These programmes have the effect of raising awareness of the importance of IP enforcement, as well as of the value of ideas and creativity.

In the context of the digital transformation of the economy, awareness-raising programmes should not only focus on patents and IP rights. They should also raise awareness among innovators on broader issues such as the protection of software or algorithms, the development of creative industries or the ownership of data. These topics are not necessarily within the competence of IP offices as they may not always lead to registered rights. This problem is widespread in Europe and does not only concern Poland.

Engage in the valorisation of IP

Patented outcomes of the research performed in publicly funded universities or research institutions are often never exploited commercially. PPO data shows that while universities almost always pay to establish patents after a favourable examination, over 25% of university patents are not renewed after the first renewal date (three years after grant), which indicates that they are not exploited. This is partly explained by weaknesses in the system of incentives (or absence thereof) for these institutions, and/or their expertise, to identify innovations with commercial potential and to engage with the private sector to transfer innovations via licensing or sale to ongoing enterprises and via establishing new start-ups. Other challenges include weak access to finance and difficulties in establishing a strong collaboration with the private sector. Technology transfer offices (TTOs) could help overcome such issues, if they could overcome specific difficulties associated with awareness of IP among both researchers and smaller enterprises, and the lack of funding for ‘proof of concept’ research. At the same time, structural reforms

within TTOs - introducing better and clearer incentives and ensuring business and technical (as well as legal) expertise among the professional staff – would also be beneficial.

Academic business incubators and TTOs set up in Poland after the Higher Education act in 2005 were meant to support the economic activities of academia, and to foster transfers of R&D findings to the economy. Universities would require further incentives to develop TTOs, which could help overcome issues, particularly those related to the awareness of IP among researchers and smaller enterprises, the lack of funding for ‘proof of concept’ research, and ultimately the commercialisation of inventions. To that end, the efforts undertaken by the Łukasiewicz network to develop template approaches to university-business relationships are extremely valuable and would need to be expanded. The Lambert agreements¹⁸ developed between the United Kingdom’s industry and the UK IPO are known in Poland, but not widely used. These can help set expectations between enterprises and universities and research organisations, supporting longer-term relationships which are almost always more valuable than one-off transactions.

Problems of limited commercialisation of patented innovation also characterise private sector firms, especially in international markets. A relatively low proportion of Polish national patents, from all sectors, go on to secure international protection, and therefore cannot protect export earnings effectively.

Additionally, a faster search process would provide additional time for universities or research institutions to plan international exploitation and seek funding for inventions with greatest potential. However, the difficulty of raising investment for development and scale-up phases of new products is also hampered by lack of appreciation of funders of the value of IP as part of the asset portfolio of a business. A number of IP offices and industry ministries have tried to address this issue, because lack of local funding for growing knowledge-based businesses often leads to overseas acquisition, and the enterprise leaves the domestic market.

The Intellectual Property Office of Singapore (IPOS) is one IP office which has taken the ultimate step of offering IP holders a valuation service, to assess insured value which can be taken as collateral by credit funders. In the United States, private assessors (e.g., MCAM) undertake this role, based on in-depth assessment of IP value in the business. The UK IPO has undertaken a continuing research, education and collaborative capacity building process, launched in 2013 with a report entitled “Banking on IP”.¹⁹ This has led to intensive discussion with financial institutions, venture capital organisation, insurers, IP professionals and others about how to better use IP portfolios to support finance for new and growing IP-based enterprises.

As development finance for IP-based businesses has been raised as an issue during the interviews conducted with IP users for this project, this issue needs to be addressed by the PPO, collaborating with others in Poland’s innovation system, and with financial institutions.

A precondition for successful funding and exploitation of IP is for businesses to understand clearly the assets they have - not only patents but also trade secrets, branding and reputation, business systems, design and the rest. Helping SMEs (as well as universities and public research institutes) to codify what they have via subsidised IP audits (or *IP Scan*) has proved valuable in a number of countries. UK IPO has provided such audits free to selected SMEs, through patent attorneys and other IP professionals. IP audits serve to build understanding in the target companies, start a relationship between enterprises and the IP office, and give a foundation for regarding IP as a strategic asset rather than a technical business cost. Such services are well worth supporting and expanding: these are now offered by the PPO (supported with funds from the EC) and will be expanded with the launch of IP Scan in Poland in 2023, in collaboration with the EUIPO.

Furthermore, having a portfolio of IP assets may facilitate the access to finance for companies, as a leverage to unlock new investments or to get access to more favourable financing conditions (OECD, 2015^[37]). Available data on venture capital (VC) deals indicate that start-ups with an IP portfolio are likely to receive higher VC investments on average than companies with no IP assets at the time of the deal. In turn, information on foreign direct investments (FDI) received by Polish companies shows that companies with IP attract slightly larger investments from abroad than those without IP.

Manage the costs of IP protection

Costs might act as a brake to IP protection, particularly for small firms. In practical terms, protecting IP requires application fees, translation costs, patent attorneys' costs, renewal fees and possible litigation costs. All these costs can discourage entrepreneurs and especially SMEs, which usually face stronger financial constraints compared to larger firms and have low access to external capital. However, the patent office fees associated with creating an effective patent are typically about 10% of the total costs - the rest is usually made up of technical and legal fees, and additional external search costs to establish prior art and avoid duplication, which would invalidate a patent application. Moreover, while applying for a patent does not require the involvement of a patent attorney, filing an application without expertise is rather complex and, therefore, risky. Interviews with IP stakeholders have included evidence that, on the one hand, some IP users find costs of the IP system limit their access especially to international protection, and, on the other hand, poorly drafted patents have no value to their owners and can compromise other users of the system.

Where the costs of IP protection are felt most strongly is where smaller firms need to defend IP rights internationally, and to bear the cost of enforcing the patent against infringement - which must be done in each country individually. This is partly due to international protection rights that are rather more expensive than Polish national rights, but it also reflects very high professional fees for civil law enforcement, particularly in the United States and in some European countries. Costs of infringements can be very expensive – running into multi-million Euros – a financial level beyond the reach of most SMEs. Furthermore, settlements – typically reached in the shadow of what would happen in court – might disadvantage the small firm by settling on less favourable terms. A possible remedy for this could be support for IP legal insurance for smaller innovators operating internationally, provided there are safeguards to support their growth without public subsidy for unjustified legal costs.

The UK IPO and PRH have tackled the financial issue by reducing costs as effectively as possible, cutting out unnecessary processes and ensuring resources are focused on IP rights that are likely to be used to create value. For UK IPO, this has included working with applicants and IP professionals to simplify interactions, and to remove from the patent backlog many applications in process, which are highly unlikely to be granted or used. For PRH, it has meant structuring the rights delivery system to share office processes wherever possible, to make sure there are clear owners of each delivery process, and to give managers and professional staff incentives to make improvements. In this way, productivity improvement has gone hand in hand with quality improvement.

This business-based approach to costs and value is helped, for both UK IPO and PRH, by two important aspects of their operations:

- a very strong focus on understanding the different needs of IP users, and supplementing this with nominated managers of key accounts, so that communications are simpler;
- enough operational and financial independence to allow the offices to invest in process changes, and in communication and awareness programmes which enable IP applicants and owners to use their systems most effectively.

Both offices (like others in the European system) are subject to ministerial control, and at the same time have enough financial independence to invest in people, processes and user communication campaigns to reduce costs while at the same time raising user understanding of IP value. Both also have robust analytical capability to develop strong customer understanding (they also provide commercial services to customers, such as search reports), and to re-engineer internal processes. This underpins a culture of continuous improvement based on evidence and on monitoring performance.

The PPO should review how far these opportunities to improve processes and build relationships with IP users are consistent with their current financial and political control systems. In making this assessment, the role of incentives for management and professionals within the office could be considered.

Some patent offices offer direct incentives or reduced fees to specific groups of applicants, which find costs prohibitive - such as micro-businesses or new start-ups. During the interviews with IP stakeholders, no strong evidence indicated whether further action like this would be helpful in Poland. There certainly are cost barriers, but deeper analysis is needed to show whether targeted support would improve access to the national system for SMEs or new enterprises.

Further communication on public incentives towards IP, notably on the IP Box that was introduced in 2018, would allow businesses including SMEs to offset the total expenditures engaged in IP protection. However, because this is a tax incentive, the IP Box only works for businesses which already have an income stream that can be associated with an existing IP portfolio. One major gain from the introduction of the IP Box in the United Kingdom is a stronger incentive for finance directors and professionals in companies of all sizes to be aware of the IP in their business, to ensure it is registered or recorded properly, and to understand its role in generating earnings. The PPO should work on promoting similar awareness for the new Polish IP Box.

However, IP Box tax regimes adopted in other countries have been criticised as an indirect and inefficient way to promote innovation and its commercialisation. The IP Box might be inefficient and costly in terms of tax revenue because the preferential rate is applied to income associated with IP for all firms, not just for SMEs where the obstacles are greatest. A more targeted approach that restricts preferential tax treatment to SMEs would be more efficient. Furthermore, while an IP Box may prompt firms of all sizes to be more systematic about cataloguing their IP, educational programs may be an effective and less costly alternative.

Enhance patent information during the examination process

Access to more transparent information during the patent examination process (in terms of the stage at which the application is, exchanges with the patent offices, etc.) and a better understanding of the cost structure of IP filing (between patent office fees, IP attorneys' fees, etc.) would help parties to gain time and save on costs. It would allow applicants to dedicate more time to the effective exploitation of innovations, avoiding administrative costs and time spent on the application and grant procedures.

Additionally, the speed of search and examination can act as a lever to reduce uncertainty for the innovators. Uncertainty in a patenting process is likely most pronounced during the eighteen months following the filing date of a patent application, prior to publication. A quick search result indicating that what a firm is seeking to protect might infringe an existing patent can avoid a lot of wasted investment. It can also help to shape alternatives with a better chance of success.

Moreover, for smaller enterprises, the use of IP in the form of brands, and in digital marketing, is a key issue. Across the Polish economy, the use of trademarks is the most common experience of the registered IP system and important for new businesses. Speeding up the creation of trademarks would certainly help; better protection of digital IP, in which Poland has strong capability, could also benefit smaller innovators.

In some offices, including at the PPO, there are options available for applicants to pay for accelerated search and/or examination for patents and trademarks, so that IP users can better manage risks and determine the technology and market options available to them. This is especially important for new enterprises establishing and protecting new market positions. PPO should examine whether the flexible offers available in the United Kingdom and other countries would help their parents and trademark customers.

Realise Poland's potential for international protection

A relatively low proportion of IP rights originating in Poland are extended to other markets. This is particularly true for patents, but also affects trademarks and other rights. In part, this is due to the perceived cost of international protection, and to costs of international enforcement. However, there are also some limitations to professional capacity to work at the European and international level, due to the history of IP professional development. Professional recruitment and development to attract new entrants to the profession may be helped by programmes to raise IP awareness. In addition, PPO - with other partners in the innovation system - should review what additional measures might help draw younger people into the profession and to strengthen international links.

In some foreign markets, patent attorneys help with IP training for researchers in client businesses, more often than in Poland. For these firms, it might be useful for more training to be organised at the European level, to help overcome the barriers to exploiting IP outside Poland. Availability of international training material translated into the Polish language could be helpful for this.

While specialised professions e.g., IP attorneys, provide a thorough assistance during the IP filing process, especially to SMEs, they too need to be properly trained to enhance their knowledge of the IP systems in other jurisdictions, to be able to help innovators pursuing international IP strategies where required. The ability to handle IP applications and grants in other languages (as the Finnish Office handling applications in English) is also worth considering, as it would increase the international footprint of Polish IP.

In the next few years, patent protection strategies in Europe are expected to change with the entry into force of the unitary patent and the Unified Patent Court. This procedure will complement the existing procedures. Poland has not signed the Agreement on the Unified Patent Court. It is too early to identify what impact this new procedure will have on patent applicants and especially on the situation of companies operating in Poland, including Polish businesses. A monitoring system would be required to evaluate their impacts on the Polish patent system and on Polish innovation protection strategies.

The various policy initiatives required to improve the contributions of IP to innovation and productivity in Poland are not limited to the PPO. They will involve close interaction between public and private stakeholders, and coordination in the formulation of complementary policies across a range of Ministries within government. This coordination is likely to be most effective if it grows out of a more encompassing policy debate on innovation and IP strategy.

Strategic issues for IP and innovation policy

Recommendations for IP policy in Poland cannot be made in isolation from the strategy for the rest of the national innovation system, and its place in a wider world. According to the *National Center for Research and Development* (NCBR),²⁰ the Polish government's priorities in terms of innovation policy include:

- digitisation and transformation towards industry 4.0 (e.g., *implementation of the Artificial Intelligence Policy and creation of AI School*);
- supporting the competences of citizens (e.g., *training for entrepreneurs, acquiring skills in specific technologies*);
- green economy (e.g., *building a Green Innovation Hub, support for activities aiming at achieving a zero-emission economy, environmental clauses in trade agreements and public procurement*);
- innovations, start-ups, new technologies (e.g., *industrial property law, help local government units with stimulating the start-up market*).

Such objectives recognise national strengths in ICT and digital skills, the need to build research capability beyond universities and research institutes, the major role of SMEs in the Polish economy and the scope to build awareness towards IP.

Despite Poland's steady economic progress, the overall level of R&D as a proportion of GDP is relatively low, reaching around 1.4% in 2020 (OECD, 2022^[12]). Business R&D represents a growing proportion of Poland's R&D expenditure, nearly 63% in 2020. In turn, the number of businesses conducting R&D has gone up by three times since 2020. R&D figures suggest that the innovation system has started its mutation in Poland, as universities and research institutions no longer dominate R&D activities, and as partnerships with larger enterprises are being built. Long-term academic-enterprise collaboration is highly valuable for national innovation systems. Building to a point where a majority of Polish patents originate from enterprises will take longer.

Investing in IP awareness across the business sector and in a high-quality IP system will require resources. In other countries, the funding for such investment is derived from the renewal fees, both for national patents and for EPO patents validated in the country – as businesses want to exploit them. Ensuring that a high proportion of nationally granted patents are renewed over time is essential to the successful financial business model of an IP office able to lead on promoting innovation.

The IP system in Poland needs to support innovation not just by established firms and research organisations, but also by the new innovators who will grow the population and economic importance of the enterprise research sector. Evidence from some smaller firms suggests that costs are considered as a barrier to securing and enforcing IP rights, while the administrative IP office costs are not the most significant problem. In any event, preferential rates for SMEs are available as a way of reducing them. Enforcement costs, especially in international markets, are more likely to be a deterrent for smaller innovators.

The deterrent of litigation costs could be tackled by insurance for firms to protect against potential costs of enforcing their IP rights. Insurance capacity is developing in other markets, and this is an international issue. The EU developed two initiatives to help innovative SMEs with intangible assets deal with enforcement costs:

- strengthening mechanisms for low-cost dispute resolution across the single market, looking at good practices in individual national systems, like France or the United Kingdom;
- developing better data on which efficiently priced insurance products depend, covering both ownership of IP, and the costs and outcomes of IP litigation across the various national legal systems in Europe.

Finally, raising finance to take patentable innovations through proof of commercial viability to market is a problem which faces SMEs, as it also affects spin-outs from universities in Poland. Developing more sophisticated awareness of the value of IP by funders in the financial sector would help.

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Annex A. Interviewed Polish stakeholders

Companies:

- ITM Poland Sp. z o.o
- Fakro
- TAAT International
- Intermag
- Tytax
- Synthos Group
- BIS Best Industry Solutions

Lawyers and IP attorneys:

- Chamber of Polish Patent Attorneys
- JWP Kancelaria Prawna
- Hasik Rheims i Partnerzy (HRP)
- Prolegit Pijewska & Mazurek Law Office
- Other independent patent attorneys

Universities / academics:

- AGH University of Science and Technology in Krakow
- Technology Transfer office – SGH Warsaw School of Economics
- Technology Transfer office – Jagellonian University in Krakow
- Technology Transfer office – University of Lodz
- University of Wroclaw - Faculty of Law, Administration and Economics
- Poznan Science and Technology Park

Research institutes:

- Centrum Łukasiewicz
- Łukasiewicz research network
- Institute of Physical Chemistry of the Polish Academy of Science
- The Institute for Sustainable Technologies in Radom

Ministry of Science and Higher Education:

- Department for innovation and development

Annex B. Guided questions for the interviews

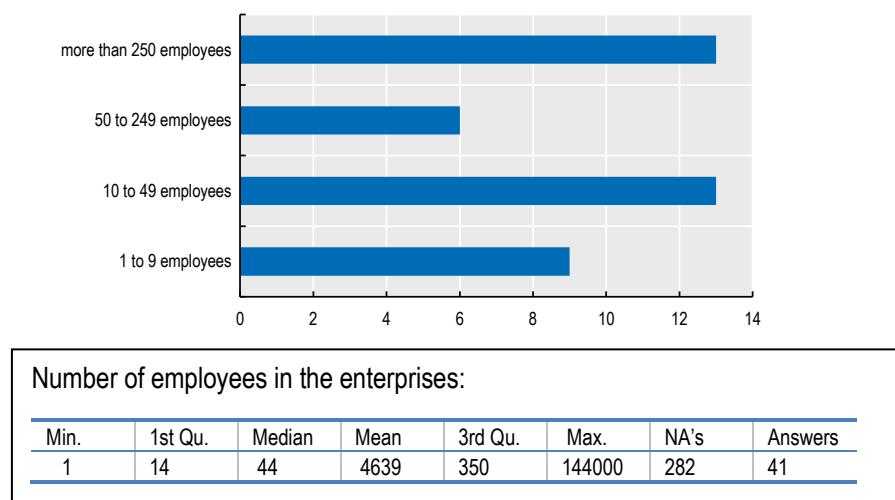
The purpose of the interviews was to better understand the strengths and weaknesses of the Polish IP system. Interviews were meant to complement the online questionnaire administered in Poland among various users of the IP system, including companies and research organisations. They were articulated according to the following guided questions.

1. What type of entity do you work in?
e.g. an enterprise, a research organisation or higher education institution, a technology transfer office, a law firm or an intellectual property consulting firm
2. What position do you hold?
3. What is the number of employees in your enterprise?
4. Where is the firm you work for located?
(or the parent company if applicable in case of enterprises)
5. What is the main sector of activity?
6. What is the REGON number of your enterprise?
7. a. How would you describe your intellectual property practice?
 What type of IP do you hold? Do you licence technology?
 How many patent families? (e.g. IPR, countries, activities)
 b. Where is your IP managed?
 c. How are your R&D activities managed (*separately/coordinated*)?
 d. How many people are involved in R&D activities?
8. What are the motivations driving you to protect your intellectual property?
9. a. Have you ever given up on protecting intellectual property that was protectable?
 b. Have you already been involved in a dispute linked to intellectual property?
 If yes, how many in the past five years? What were its consequences?
10. Do you think that you have a good knowledge of the Polish system?
 Are you familiar with the practices of other systems?
 If so, which ones?
11. a. What are the latest developments in intellectual property in Poland
 that have affected you?
(Which ones and why)
 b. Have you changed your practices since the introduction of the Polish “IP Box”?
 c. What do you think about the length of the search and examination
 when filing for intellectual property protection?
12. Are you aware of any intellectual property approaches or practices that exist
 in other countries and that you feel are lacking in Poland?
(If so, which ones and why)
13. What improvements should be made to the Polish system and to the European system?
(Which ones, why)
14. Do you think there are enough awareness campaigns and trainings on IP in Poland?

Annex C. On-line survey on IP use: overview of the respondents

The percentages of completion of the survey were 29% for enterprises, 33% for research organisations, 29% for higher education institutions, 26% for technology transfer offices, 38% for law firms or IP consulting firms and 41% for independent inventors or researchers.

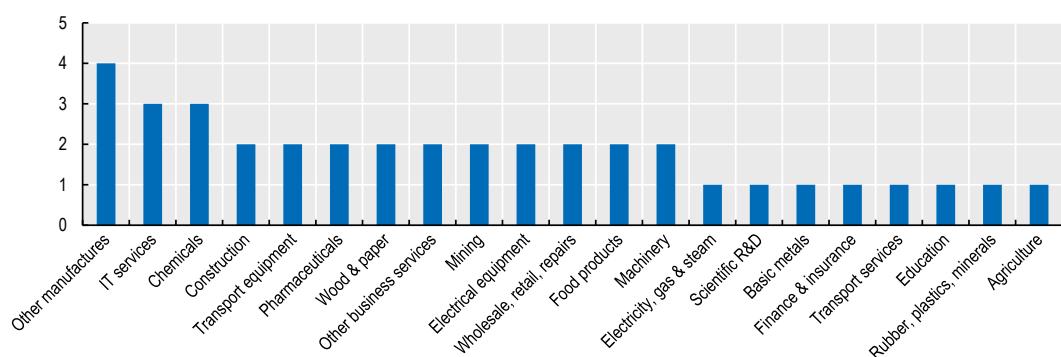
Figure A C.1. Number of employees in the enterprises of the sample



Note: Results are based on 41 observations.

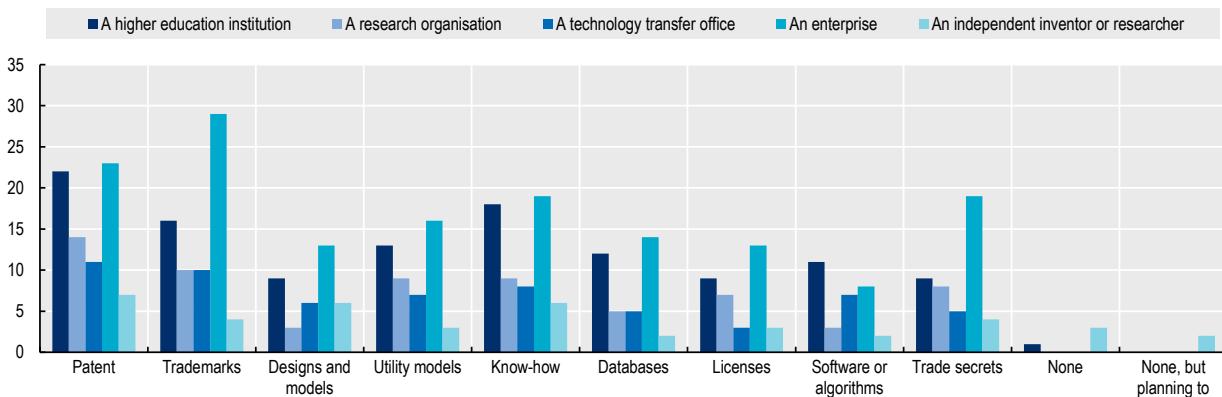
Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

Figure A C.2. Distribution of enterprises in the sample by sector, ISIC rev.4



Note: Results are based on 38 observations.

Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

Figure A C.3. Type of IP owned by the respondents, by type of entity

Note: No one answered to the question “Do you think that not holding IP is a disadvantage for your business? Yes No” which was conditioned on answering “None” to “what type of IP do you own?”. Results are based on 103 observations.

Source: OECD, based on the on-line survey on IP use in Poland, March 2022.

Annex D. Examples of recent implementation of national IP strategies

According to the World Intellectual Property Organization (WIPO), “a national IP strategy consists of a set of measures, formulated and implemented by governments. These measures encourage and facilitate the effective creation, development, management, and protection of IP at national level. It is a cross-cutting document, which outlines links with diverse policy areas to ensure effective coordination with other activities”.²¹

The WIPO published a methodological reference document for national project teams involved in the preparation of IP strategies (WIPO, 2020^[38]). While there are similarities in the scope and content of IP strategies, particularly in terms of broad objectives, differences exist in the detailed measures they propose. In general, IP strategies include measures to: raise awareness among SMEs; improve IP education in engineering, natural sciences, business and art schools; provide support for technology transfer; apply specific changes to national legislation and better coordinate between agencies. They normally target organisations in the R&D and innovation ecosystem, as well as creative industries where copyrights matter; and possibly law enforcement agencies (judges, customs, and police). Recent examples of IP strategies designed for Canada, Ireland and the Czech Republic are presented below.

Canada (from 2018)²²

The IP strategy focuses on the following three aspects:

- **Legislation:** Key IP laws will be amended to ensure that barriers to innovation are removed, particularly any loopholes that allow those seeking to use IP in bad faith to stall innovation for their own gain. The IP Strategy will create an independent body to oversee patent and trademark agents, ensuring that professional and ethical standards are maintained, and will support the provision of quality advice from IP professionals.
- **Literacy and advice:** As part of the IP Strategy, the Canadian Intellectual Property Office (CIPO) will launch a suite of programs to help improve IP literacy among Canadians, including support for domestic and international engagement between indigenous people and decision makers as well as for research activities and capacity building, and training for federal employees dealing with IP governance.
- **Tools:** The IP Strategy will provide tools to support Canadian businesses as they learn about IP and pursue their own IP strategies. The government is creating a patent collective to bring together businesses to facilitate better IP outcomes for members. The patent collective will bring together firms to share IP expertise and strategy, including in terms of gaining access to a larger collection of patents and IP.

Ireland (from 2019)²³

The national IP Protocol 2019 is a revision of the last Protocol issued in Ireland in 2016. It provides a framework for the way in which companies and research organisations can work together and how companies can benefit from access to new ideas, technology and IP-protected inventions. It remains a framework for best practice, providing guidance on what is the expected norm for research-related engagements between industry and research-performing organisations, and comprises:

- **A policy document**, which sets out the framework underpinning research collaboration and access to IP from state-funded research.
- **A resource guide**, which provides an overview of the national IP management guidelines and links to a wealth of resources that support these guidelines. It also provides an overview of the knowledge transfer structures in Ireland and the kinds of agreements that can be used to formalise research-industry engagements, as well as a suite of model agreements and guides related to spin-out companies.

Czech Republic (from 2019)²⁴

The national innovation plan was launched in 2019, with actions on IP. This plan was complemented in 2021 by the Czech recovery plan funded under the European Recovery and Resilience Facility (ERRF).

- **Goals:** To raise awareness of IP protection at all levels of education, in the manufacturing sector and at the application and research phase; increase the use of IP protection and of patent information.
- **Tools:** Create a comprehensive IP Protection Concept, in particular for patents, and set up financial support accordingly; establish long-term support for TTOs at research organisations and universities; provide IP training services for all levels of education; foster the use of licensing to achieve leading-edge results; record and promote financial support for protection and enforcement of IP rights.

Endnotes

¹ Act of 30 June 2000 on Industrial Property, Journal of Laws (Dz.U.) No 49, item 508, in effect since 22 August 2001.

² Act of 27 July 2005 on Higher Education (Text No. 1365).

³ Journal of Laws of 2007, No. 136, item 958

⁴ Act of 13 February 2020 amending the Act – Code of Civil Procedure and certain other Acts (Journal of Laws 2020 item 288)

⁵ For discussion and survey evidence of the potential impact of such programs, see O'Sullivan et al. (2020^[51]), Srivastava (2013^[39]) and Demiralp, Morrison and Zayed (2018^[40]).

⁶ Further information on IEEPI training offers: https://www.ieepi.org/pdfs/ieepi_presentation.pdf

⁷ For further information on Horizon IP Scan: https://intellectual-property-helpdesk.ec.europa.eu/horizon-ip-scan_en

⁸ See for instance Rozen (2020^[52]), Mann (2018^[41]), Farre-Mensa, Hegde and Ljungqvist (2020^[42]), Hochberg, Serrano and Ziedonis (2018^[43]) and Conti, Thursby and Thursby (2013^[44]).

⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/478929/ip-finance-toolkit.pdf

¹⁰ For empirical evidence on the effects of such royalty sharing incentives for faculty and internal incentives in technology licensing organisations, see Lach and Schankerman (2008^[50]); and Belezon and Schankerman (2009^[45]).

¹¹ See Gibbons and National Center for Science and Engineering Statistics (NCSES) (2021^[49]) and Atkinson (2018^[46]).

¹² <https://www.gov.uk/guidance/university-and-business-collaboration-agreements-lambert-toolkit>

¹³ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/478929/ip-finance-toolkit.pdf

¹⁴ A Polish patent law firm estimates that the patent drafting might last about 15 hours minimum, plus additional 10 hours to process the application. This does not include the patent examination step that could take 10 to 30 hours (<https://znakitowarowe-blog.pl/ile-kosztuje-uzyskanie-patentu-oplaty/>).

¹⁵ See "Patents in Europe 2018/19: Helping business compete in the global economy" (<https://www.iam-media.com/regionindustry-guide/patents-in-europe/2018/article/litigation-and-eligibility-poland>) or Patent

enforcement through the courts in Poland (<https://www.lexology.com/library/detail.aspx?g=9f1c474b-8537-406e-a299-01b20fb526db>)

¹⁶ For discussion and evidence, see Freestone (Freestone, 2019^[47]) and (Freestone, 2018^[48]).

¹⁷ <https://www.wipo.int/publications/en/details.jsp?id=4522>

¹⁸ <https://www.gov.uk/guidance/university-and-business-collaboration-agreements-lambert-toolkit>

¹⁹ <https://www.gov.uk/government/publications/banking-on-ip>

²⁰ <https://www.gov.pl/web/ncbr-en/polish-research--innovation-policy>

²¹ See <https://www.wipo.int/ipstrategies/en/index.html>

²² <https://www.ic.gc.ca/eic/site/108.nsf/eng/home>

²³ <https://enterprise.gov.ie/en/Publications/Publication-files/Ireland-National-IP-Protocol-2019.pdf>

²⁴ <https://www.vyzkum.cz/FrontClanek.aspx?idsekce=867922&ad=1&attid=867987>